CITY OF MALIBU
NOTICE OF INTENT TO ADOPT
A MITIGATED NEGATIVE DECLARATION

Notice is hereby given that the City of Malibu has completed an Initial Study for the following project in accordance with California Environmental Quality Act (CEQA):

Project Title	Malibu Jewish Center & Synagogue
Application Nos.	Initial Study No. 18-001, Mitigated Negative Declaration No. 18-001, Coastal Development Permit No. 14-069, Conditional Use Permit No. 16-005, Variance Nos. 14-050, 14-051 and 16-009, Site Plan Review No. 14-050, and Sign Permit No. 16-006
Location	24855 Pacific Coast Highway Assessor's Parcel Number: 4458-032-027
Zoning:	Institutional (I)
Project Applicant	David Lawrence Gray Architects
Property Owner	Malibu Jewish Center and Synagogue

Project Description: An application to remove four modular buildings and redevelop the site with a two-story, 16,410 square foot classroom/administration building with two subterranean levels, one for 28 parking spaces and the second for storage, construct a new synagogue building with 2,013 square foot of above-ground floor area and a basement, redevelop the existing surface parking lot to improve internal circulation and parking, habitat restoration program for Puerco Canyon Creek to be integrated with ongoing fuel modification activities and remove two protected native trees (western sycamore trees), including a conditional use permit for the expansion of the existing religious facility, variances for the required parking spaces and parking space dimensions, construction within the Environmentally Sensitive Habitat Area 100-foot buffer zone and for the rear building and retaining walls on slopes greater than 2.5 to 1, a site plan review for construction over 18 feet in height but not to exceed 28 feet. The complete project description is provided in the Initial Study.

Public Review: The purpose of this review is to allow public agencies and interested members of the public the opportunity to share expertise, disclose agency analysis, check for accuracy, detect omission, discover public concerns and solicit counter proposals pursuant to CEQA Section 15200 (Purposes of Review).

The Initial Study and Mitigated Negative Declaration will be circulated for a 30-day review period. Written comments will be received by the City of Malibu Planning Department until 5:30 p.m. on the ending date of the public review period.

Review Period: Begins: **February 20, 2020** Ends: **March 20, 2020**

Where to Send Comments and Where Documents are Available for Review:

Post: City of Malibu
Planning Department
23825 Stuart Ranch Road
Malibu, CA 90265

Fax: (310) 456-3356
Email: afernandez@malibucity.org

City of Malibu Website: malibucity.org/ceqa

Public Hearing: A public hearing for the City of Malibu Planning Commission to receive comments on the document and to adopt the Initial Study / Mitigated Negative Declaration will be scheduled and noticed at a later date.

Contact: For more information regarding this notice, please contact the following staff member:

Adrian Fernandez, Principal Planner
(310) 456-2489, extension 482
afernandez@malibucity.org

Bonnie Blue, Planning Director

Date: February 20, 2020

City of Malibu
Planning Department
23825 Stuart Ranch Road
Malibu, CA 90265-4861

INITIAL STUDY &
MITIGATED NEGATIVE DECLARATION

Malibu Jewish Center & Synagogue Project
24855 Pacific Coast Highway

1 INTRODUCTION

This *Initial Study and Mitigated Negative Declaration* (IS/MND) has been prepared in accordance with the *California Environmental Quality Act (CEQA) of 1970*, as amended, and the CEQA *Guidelines* as revised. *Section 15063(c)* of the CEQA *Guidelines* indicates that the purposes of an Initial Study are to:

1. Provide the Lead Agency (i.e., the City of Malibu) with information to use as the basis for deciding whether to prepare an Environmental Impact Report (EIR) or Negative Declaration;
2. Enable an applicant or Lead Agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a Negative Declaration;
3. Assist the preparation of an EIR, if one is required, by:
   - Focusing the EIR on the effects determined to be significant;
   - Identifying the effects determined not to be significant;
   - Explaining the reasons why potentially significant effects would not be significant; and
   - Identifying whether a program EIR, tiering, or another appropriate process can be used for analysis of the project's environmental effects.
4. Facilitate environmental assessment early in the design of a project.
5. Provide documentation of the factual basis for the finding in a Negative Declaration that a project will not have a significant effect on the environment;
6. Eliminate unnecessary EIRs; and
7. Determine whether a previously prepared EIR could be applicable to the project.

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CITY OF MALIBU

INITIAL STUDY ENVIRONMENTAL CHECKLIST

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2.	Project Location:	24855 Pacific Coast Highway Malibu, CA 90265
3.	Application:	Coastal Development Permit No. 14-069 Conditional Use Permit No. 16-005 Parking Variance No. 14-050 ESHA Buffer Variance No. 14-051 Retaining Wall Variance No. 16-009 Site Plan Review No. 14-050 Sign Permit No. 16-006 Initial Study No. 18-001 Mitigated Negative Declaration No. 18-001
4.	Lead Agency Name and Address:	City of Malibu Planning Department 23825 Stuart Ranch Road Malibu, CA 90265-4861
5.	Contact Person and Phone Number:	Adrian Fernandez Principal Planner (310) 456-2489, ext. 482
6.	Project Applicant Name and Address:	David Lawrence Gray, FAIA David Lawrence Gray Architects, AIA 353 S Broadway, Suite 200 Los Angeles, CA 90013
7.	Property Owner:	Malibu Jewish Center and Synagogue California Corporation 24855 Pacific Coast Highway Malibu, CA 90265
8.	Malibu Municipal Code (MMC) Zoning:	Institutional (I)
9.	General Plan Land Use Designation:	I
10.	Local Coastal Program (LCP) Zoning:	I
11.	LCP Land Use Designation:	I

1.1 Project Site and Existing Uses

The project site consists of a 4.60-acre, wedge-shaped parcel (APN 4458-032-027) addressed as 24855 Pacific Coast Highway (PCH), in the City of Malibu (City), Los Angeles County, California. The parcel lies atop a low, east-west trending hilltop at the base of the Malibu foothills, located between PCH to the south and Puerco Canyon Creek to the to north. The parcel is located approximately 1,000 feet north of the Pacific Ocean, 0.5 mile west of Pepperdine University, and 0.3 mile east of Puerco Canyon Road (Figure 1). The project site lies partially within the Puerco Canyon watershed at an average elevation of approximately 160 feet above mean sea level.

The City General Plan, Land Use Element, Exhibit LU-1C, designates the project site with the Institutional (I) land use designation and a corresponding zoning of Institutional (I) in the Malibu Municipal Code (MMC). Section 1.5.8 of the General Plan establishes the permitted land uses and maximum floor area ratio (FAR) for the I land use designation. Per MMC Chapter 17, the I designation allows for public and quasi-public uses and facilities in the City, including emergency communications and services, libraries, museums, educational (private and public) and religious institutions, community centers, parks, and recreational and governmental facilities. Allowable FAR may not exceed 0.15.[1]

The project site is located within the appeal jurisdiction of the California Coastal Commission (CCC) as depicted on the City Local Coastal Program (LCP) Post-Certification Permit and Appeal Jurisdiction Map. Additionally, pursuant to the LCP Environmentally Sensitive Habitat Area (ESHA) Overlay Map, the northern portion of the project site supports a designated ESHA.

The southern half of the project site has been graded to provide a level terrace above PCH and Puerco Canyon Creek. From PCH, the topography rises up steeply to the parking lot and existing temple/event building, and rises again slightly to the existing modular buildings. North of the level hilltop, the project site slopes steeply down to Puerco Canyon.

The level, graded hilltop is developed with the Malibu Jewish Center & Synagogue (MJCS). Existing development consists of four, one-story modular structures that house school and administrative uses on the west side and an approximately 28-foot-tall, one-story temple/event building and two support structures containing bathrooms, a kitchen, and mechanical room on the east side. A 0.5-acre surface parking lot lies south of the modular buildings fronting PCH to the west. Existing buildings support roughly 11,080 square feet (sf) of floor area, with an existing FAR of 0.06.[1] The four modular buildings provide 5,775 sf of floor area, consisting of 1,925 sf of pre-school/school uses (with a current attendance of 45 students), 2,406 sf of administrative/office uses, and 1,444 sf of temple/assembly uses. The four modular buildings are connected by exterior walkways. A playground area wraps around the north and west sides of the modular buildings. A level open area located east of the modular buildings was previously graded and is vegetated with annual grasses and used periodically as a toddler play area (Figure 2). In late 2018, the Woolsey Fire burned a portion of the project site's northern vegetation, which changed the formerly heavily vegetated slopes to be largely burned and denuded of ground-based vegetation. While surrounding undeveloped areas were burned, no structures on the project site or on immediately adjacent parcels were damaged during this fire event.

[1] FAR is calculated by dividing the above-ground floor area of a building or buildings located on a parcel by the Net Lot Area of such parcel. Net Lot Area excludes portions of a parcel with a slope greater than 1:1. Approximately 1,425 sf of the project site exceeds a slope of 1:1, resulting in a Net Lot Area of 199,006 sf (4.57 acres).

wood.

Regional Setting and Project Location

FIGURE 1

wood.

Malibu Jewish Center Project Site Existing Setting

FIGURE 2

Photo 1. *The project site currently contains four one-story modular buildings that would be redeveloped with a two-story school and administrative office building with subterranean parking.*

Photo 2. *A surface parking lot lies south of the modular buildings fronting PCH. A 28-foot-tall temple/event building and two support structures are located at the east side of the site. This building features an arched roof that dips to the north and south, and covers a central interior area flanked by two patios.*

The existing temple/event building and two support structures at the east side of the level graded hilltop encompass approximately 5,305 sf of floor area. The existing temple/event building features a central, glass-walled interior flanked by two outdoor patios to the west and east. The building and patios are under an arched roof that dips lower on the north and south. A small amphitheater with bench seating is adjacent to the east patio. A landscaped berm, glass walls, and support buildings wrap around the north and east sides of the building and patios. Outdoor speakers at the patios are directed downward to minimize noise carrying to nearby properties.

The existing surface parking lot provides 83 parking spaces consisting of 26 standard, 24 standard tandem, 33 compact parking spaces, and 4 Americans with Disabilities Act (ADA)-accessible spaces. Of the 83 non-ADA-accessible spaces, 71 are code compliant. Additional public on-street parking is available on PCH. Vehicle access to PCH is provided by an uncontrolled driveway at the west end of the project site; there are no pedestrian crosswalks along this segment of PCH and there are no stop signs or signal-controlled intersections within 0.5-mile. Posted speed limits on PCH are 50 miles per hour in the project vicinity.

More than 50 percent of the project site is landscaping or undeveloped area, with most of the PCH frontage lined with a landscaped hillside buffer of 20 to 50 feet in width which supports a line of 15- to 20-foot-tall landscape trees, several native coast live oak and native sycamore trees, shrubs and groundcover. This landscaped hillside buffer generally screens views of existing buildings from PCH. Ornamental landscaping and planted native trees are interspersed throughout the existing buildings and surface parking lot. North of the existing development and level building pad lies a creek channel at the base of Puerco Canyon, which is dominated by mature native willow trees and non-native riparian vegetation. This area also includes native vegetation consisting of the Mixed Oak-Sycamore Woodland plant community, which lines the canyon slopes. The project site supports many mature native tree species protected by the City's Tree Protection Ordinance and the LCP Local Implementation Plan (LIP).[2] Twenty-one mature trees occur within or adjacent to the existing development footprint, 19 of which are protected by the City. These include 10 Coast Live Oaks, eight Western Sycamores, and one Southern California Black Walnut.

The northern portion of the project site lies within the boundary of 1,498 acres of contiguous ESHA as mapped by the City's LCP ESHA Overlay Map.[3,4] Biologists from David Magney Environmental Consulting surveyed the onsite ESHA and found native habitats to include a Riparian Woodland plant community along Puerco Canyon Creek, a Coastal Sage Scrub plant community on the hillsides north of the creek, and a Mixed Oak-Sycamore Woodland plant community on the creek banks and hillsides. A Mixed Oak-Sycamore Woodland plant community on the canyon slope immediately north of the modular buildings is not mapped as ESHA because the understory is altered and consists primarily of non-native weedy species. Further, the mature, protected trees species on this slope were planted during site development between 1994 and 2002. While the 2018 Woolsey Fire burned vegetation in the northern portion of the site and changed the overall

2 The LCP LIP (Chapter 5, Section 2) affords protection to several native species of trees that have at least one trunk measuring 6 inches or more in diameter, or a combination of any two trunks measuring a total of 8 inches or more in diameter, measured at 4.5 feet above grade.

3 The California Coastal Act and the LCP define an ESHA as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments".

4 City of Malibu, *ESHA Overlay Map 3: Dan Blocker to Malibu Pier*. September 2002. Accessed June 15, 2018 at: https://www.malibucity.org/DocumentCenter/View/4420/LCP-Maps?bidId=

composition of ground-story vegetation, the trees on the site's northern hillside were preserved (see Appendix E).

Wastewater from existing buildings is treated by an onsite wastewater treatment system (OWTS) located beneath the surface parking lot. The Malibu Civic Center Wastewater Treatment Facility (CCWTF), which began operation in May 2018 one mile to the east will not extend to the project site. As a result, wastewater disposal is proposed by installation of a second OWTS to supplement the existing OWTS.

Photos 3 & 4. *An estimated 21 protected trees species, including California Black Walnut, Coast Live Oaks, and Western Sycamores are planted within and adjacent to existing development, including trees that overhang a playground that would be retained by the project (pictured left). Two protected Western Sycamores (pictured right) would be removed to accommodate the proposed two-story building.*

Puerco Canyon Creek runs southeast along the northern portion of the project site, entering the parcel on the northwest corner and exiting on the east end, and then turning south just east of the project site, passing under PCH and draining to the Pacific Ocean. Drainage from most of the project site and the developed area is directed towards landscaped areas, permeable pavers in the parking lot, and catch basins that direct flows to a catchment drainage system (CDS) unit located north of the existing temple/event building. The CDS unit captures large debris and then discharges stormwater through an 18-inch drainage pipe in the north slope of Puerco Canyon. The west side of the parking lot drains down the driveway onto PCH and through stormwater catchments to Puerco Canyon Creek to the east. The remainder of the project site, primarily consisting of the undeveloped north slope of Puerco Canyon, flows directly into Puerco Canyon Creek.

Ceremonial events are currently held onsite at the existing modular buildings and in the existing temple/event building, subject to City approval of a Temporary Use Permit for each event.[5] Typical ceremonial events at the MJCS include weddings, B'nai Mitzvahs, parties, corporate events, and other religious services.

Ceremonial events can have up to 500 attendees, which can exceed the capacity of onsite parking. When these events occur, additional overflow offsite parking has been provided at the Malibu City Hall parking lot when the Applicant requests to rent spaces under a Facility Use Permit with the City. The parking at City Hall is rented as-available, and is not provided as an on-demand

[5] Per the MMC, a special event is defined as a significant occurrence or happening which is arranged for a particular occasion or purpose.

opportunity. Shuttle service between City Hall and the MJCS is provided. The typical large ceremonial event requires about 140 offsite parking spaces. Table 1 provides a summary of the ceremonial events that occur at the MJCS, including associated parking and attendee information. As shown therein, offsite parking and shuttle service are typically provided for ceremonial events with at least 200 attendees, and there are approximately 24 ceremonial events each year that require offsite parking. In the event that City Hall parking is not available, an alternate parking lot with at least 140 parking spaces would be used, with shuttle service provided between the alternate lot and the MJCS.[6]

Table 1. Ceremonial Event Types at the MJCS

Event	Attendees	Day of Week	Frequency (per year)	Location	Offsite Parking with Shuttle
Rosh Hashanah Eve	500	Varies	1	Synagogue	Yes
Rosh Hashanah Day	500	Varies	1	Synagogue	Yes
Yom Kippur Eve	500	Varies	1	Synagogue	Yes
Yom Kippur Day	500	Varies	1	Synagogue	Yes
Weddings (Saturday)	200	Saturday	10	Synagogue	Yes
Weddings (Sunday)	200	Sunday	10	Synagogue	Yes
B'nai Mitzvah	100	Saturday	18	Synagogue[1]	No
Other Parties/ Fundraisers	100	Weekends	6	Synagogue	No
Purim Carnival	100	Weekends	1	Parking Lot	No
Malibu Film Society	70	Varies	25	Synagogue	No
Passover Community Seder	50	Varies	1	Synagogue	No

[1] Bat Mitzvahs would be conducted in the new temple alongside Saturday Service upon completion of the project.
Source: Overland Traffic Consultants 2017.

1.2 Surrounding Land Uses

The project site is bordered on the west by Commercial Neighborhood (CN) uses, including two- to three-story commercial buildings. North and east of the project site is comprised of the Rural Residential, 40-Acre (RR40) land use, which supports open space within Puerco Canyon to the north and Single Family Medium (SFM) homes of the Malibu Country Estates Neighborhood located across Puerco Canyon to the northeast and east. The nearest of these homes is located approximately 750 feet east of the project site. To the south, across PCH, Rural Residential, 2-Acre (RR2) use consists of single-family homes. These large homes are situated between PCH and a coastal bluff which leads down to Malibu Road, additional single-family homes, and the Pacific Ocean. A RR2-designated parcel immediately across PCH from the project site driveway is under development with a new single-family home.

At the project site, PCH is approximately 80 feet wide and supports five lanes, including two travel lanes in each direction and a two-way left turn lane. The center turn lane becomes a curbed median approximately 220 feet east of the project site driveway. On-street parking is available along the project site frontage, with more limited parking located across PCH due to the presence of private driveways. No sidewalks or bike lanes are present within 0.5 mile of the project site. The nearest signalized intersection is PCH's intersection with John Tyler Drive, which is located

[6] If the alternate parking lot occurs in a residential or institutional zone, appropriate permits must be obtained.

Photos 5 & 6. *The project site is bordered on the west by two- to three-story commercial buildings along the north side of PCH.*

approximately 0.5 mile east of the project driveway and supports a pedestrian crosswalk and access to Pepperdine University. This intersection provides an eastbound left-turn lane from PCH; westbound U-turns are prohibited. A signalized intersection of PCH with Corral Canyon Road is located approximately 1.5 miles west of the project site. Several unsignalized roadways and driveways also intersect with PCH within the project vicinity.

1.3 Project Description

The project would include redevelopment of approximately 1.44 acres (62,726 sf) of the project site (Table 2; Figure 2). The four modular buildings would be redeveloped with a two-story, 16,410-sf classroom/administration building with two subterranean levels, one for parking and a second for storage. A new temple with 2,013 sf of above-ground floor area and a basement would be developed immediately east of the proposed two-story building, on a previously graded pad north of the existing parking lot. The surface parking lot would be redeveloped to improve internal circulation and parking. A stormwater management system and a second OWTS would be installed beneath the redeveloped parking lot to accommodate stormwater runoff and wastewater from the new buildings. The existing 5,305-sf temple/event building and associated support buildings would be retained, resulting in 23,325 sf of total floor area and a sitewide FAR of 0.12. The playground area north of the modular buildings would also be retained. The project would also include new landscaping and habitat restoration/fuel modification on the north-facing slope of Puerco Canyon.

With the exception of the proposed habitat restoration/fuel modification, all ground-disturbing activities would occur in areas of previous disturbance. Project development would require grading and excavation of approximately 1.44 acres in two locations to provide level building pads. The footprint of the two-story classroom/administration building would be almost entirely within the footprint of the existing modular buildings and the footprint for the proposed one-story temple would be within a previously graded area. The two-story classroom/administration building would be approximately 28 feet in height above ground level with the floor of the basement located approximately 23 feet beneath ground level (and the associated elevator machinery extending up to 28 feet beneath ground level). The new one-story temple would be 26 feet in height above ground level with a basement approximately 12 feet below ground level (and the associated elevator machinery descending up to 18 feet beneath ground level). No free-standing retaining walls are proposed.

To accommodate a new ramp to the subterranean parking, two Western Sycamores would be removed. Additionally, construction of the proposed temple would encroach into the tree protection zones of three planted Coast Live Oaks.

Table 2. Proposed Project Development Program

Land Use	Area
General	
Gross Lot Area (APN 4458-032-027)	4.60 ac (200,431 sf)
Net Lot Area	4.57 ac (199,006 sf)
Area of Ground Disturbance	1.44 ac (62,726 sf)
Existing Uses	
Temple/Event Venue Buildings (To Remain)	5,305 sf
Four Modular Buildings (To Be Removed)	5,775 sf
Pre-School/School Use	*1,925 sf*
Administration/Office Use	*2,406 sf*
Temple/Assembly Use	*1,444 sf*
Total Existing Floor Area	**11,080 sf**
Existing FAR (Net Lot Area)	0.06:1
Impervious Surface Area	40,200 sf
Proposed Uses	
Temple/Event Venue Buildings (To Remain)	5,305 sf
Proposed School Building	16,410 sf
Proposed Temple Building	2,013 sf
Total Proposed Floor Area	**23,728 sf**
Proposed FAR (Net Lot Area)	0.12:1
Impervious Surface Area	39,602 sf
New Landscaped Area	8,947 sf

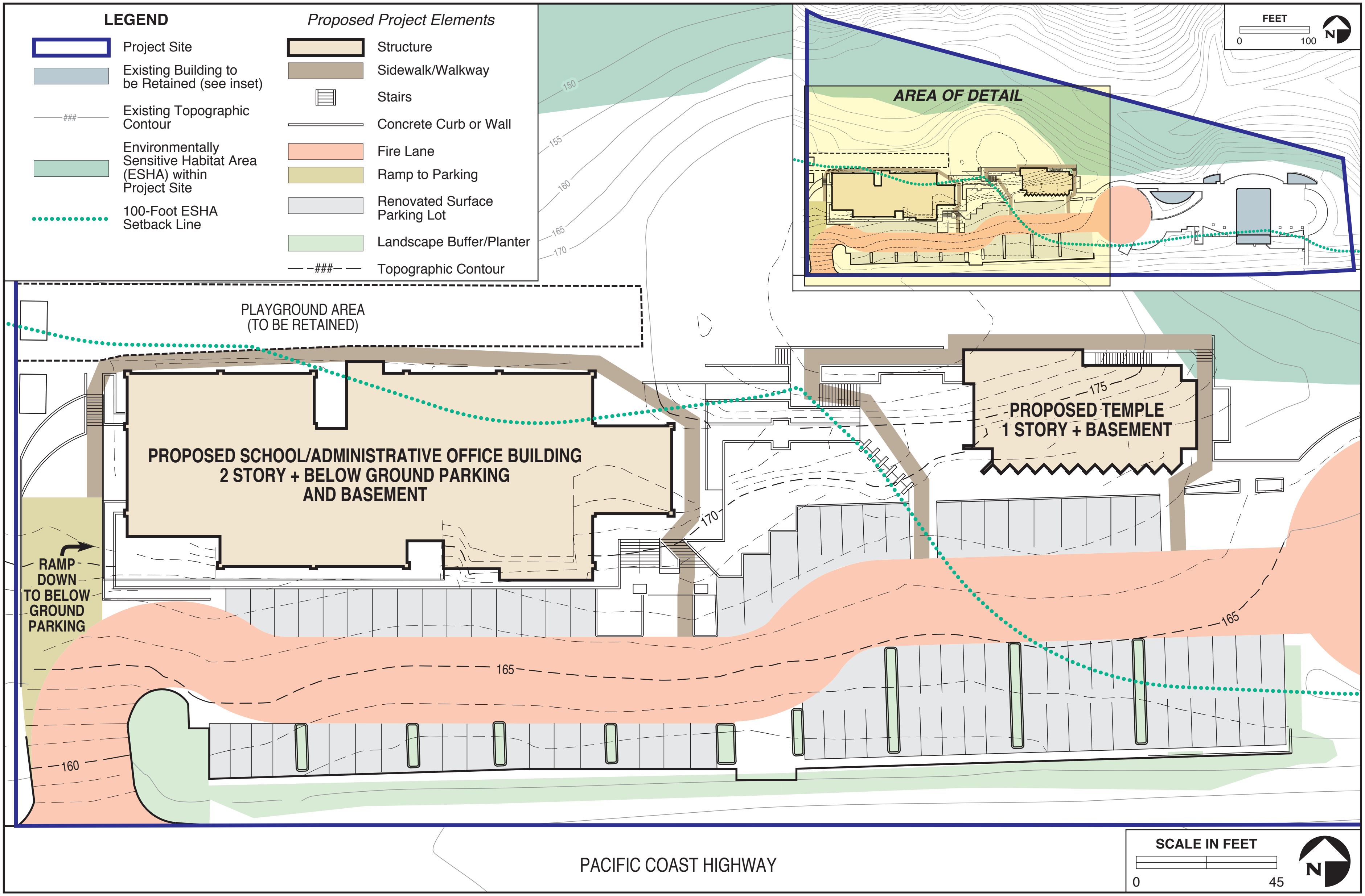
Source: David Lawrence Gray Architects, AIA 2017.

A. Project Design

The proposed buildings would be located north of the existing parking lot above Puerco Canyon approximately 90 to 150 feet north of PCH. The proposed two-story classroom/administration building would be 28 feet tall with two subterranean levels. The proposed new one-story temple building would be approximately 26 feet tall with a basement.

The project would be designed to be consistent with MMC Title 17 and the Malibu LCP LIP Chapter 6.5. Specifically, the project's architectural design incorporates the following design features intended to meet MMC requirements:

- Earth-tone colors that are compatible with the surrounding environment;
- The height of the proposed buildings has been limited to minimize impacts to the visual character of the community;
- The proposed buildings would incorporate natural stone and textured materials, and be partially screened from public view by the line of existing trees along PCH;
- Parking would be screened from public view through the use of underground parking, planter strip landscaping, and existing trees; and
- The project includes perimeter and internal landscaping.



wood.

Malibu Jewish Center and Synagogue Partial Site Plan

FIGURE 3

The two-story classroom/administration building would feature south-facing skylights and the building façade would primarily consist of six structural support pillars with long horizontal panels of glass between each pillar. The façade design would be broken up by landscaped outdoor terraces on the first and second levels of the building, exterior decks, and textured Jerusalem stone walls (Figures 3 and 4).

The new one-story temple building would have an arched roof oriented parallel to the parking lot, with a rectangular façade facing the parking lot and PCH. The temple's southern façade would feature alternating, accordion-style panels of textured concrete and floor-to-ceiling frameless glass. The new temple's western façade would feature glass in a pattern of the Star of David in the arched roof above the entryway, and the lowest and easternmost portions of the new temple building would be accented with textured Jerusalem stone (Figures 3 and 4). All exterior architectural features fronting PCH would be comprised of non-glare glass. Both buildings would have restrooms and elevators between all levels. All mechanical equipment would be screened from public view by decorative walls.

B. Access and Parking

As considered by the traffic study (Appendix C), vehicle access via the existing driveway on PCH would be retained. The project would provide 108 parking spaces (Table 3). The Applicant is proposing to limit the frequency and size of ceremonial events that currently occur onsite, and no concurrent use of the new temple and existing temple/event building is proposed. The Applicant is proposing to not schedule overlapping ceremonial events, and offsite parking would continue to be provided in the City Hall parking lot for ceremonial events that exceed the onsite parking supply, such as during special holiday events and services where the peak number of attendees is up to 500. The parking at City Hall is rented as-available, and is not provided as an on-demand opportunity. If City Hall parking is not available, an alternate parking lot with at least 140 available parking spaces would be sought, with shuttle service provided between the alternate lot and the MJCS.

Americans with Disabilities Act (ADA) access would be provided throughout the project site, and would include ramps to all buildings, six ADA-accessible parking spaces, and elevators in the proposed two-story building.

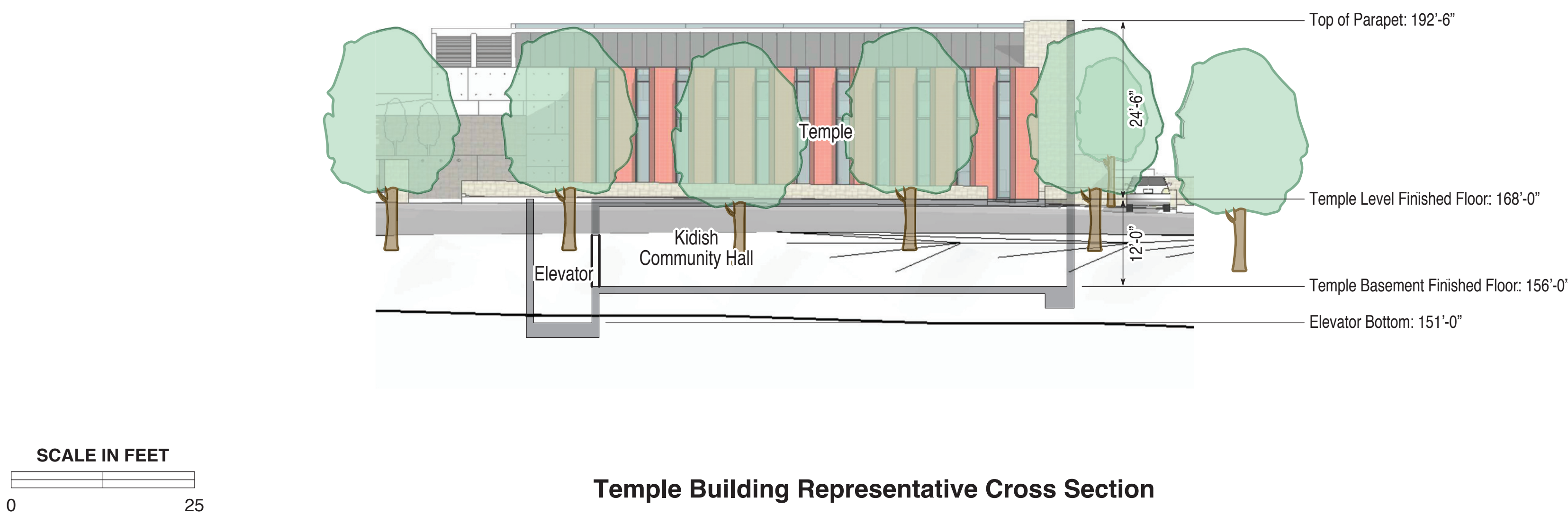
Table 3. Proposed Parking Program

Type of Parking	Number of Spaces
Surface Compact	44 (27 Code compliant)
Regular	*31*
Tandem	*13*
Surface Standard	64 (64 Code compliant)
Surface Standard	*51*
Surface Tandem	*13*
Garage Standard	*26*
Total Non-ADA Accessible	**108 (91 Code compliant)**
Surface ADA Accessible	3 (1 van)
Garage ADA Accessible	2 (2 van)
Total ADA Accessible Parking	**5 (3 van)**

[1] Code compliant parking spaces are those that meet the sizing requirements of MMC 17.48.050(D)(7), which require standard parking spaces to be at least 9 feet by 20 feet. Compact parking spaces shall be at least 8 feet by 15-feet 6-inches and shall be marked for compact use only. The project's new parking spaces would be code compliant; however, 17 existing non-conforming parking spaces would also be retained.

Source: Overland Traffic Consultants, 2017

School Building Representative Cross Section

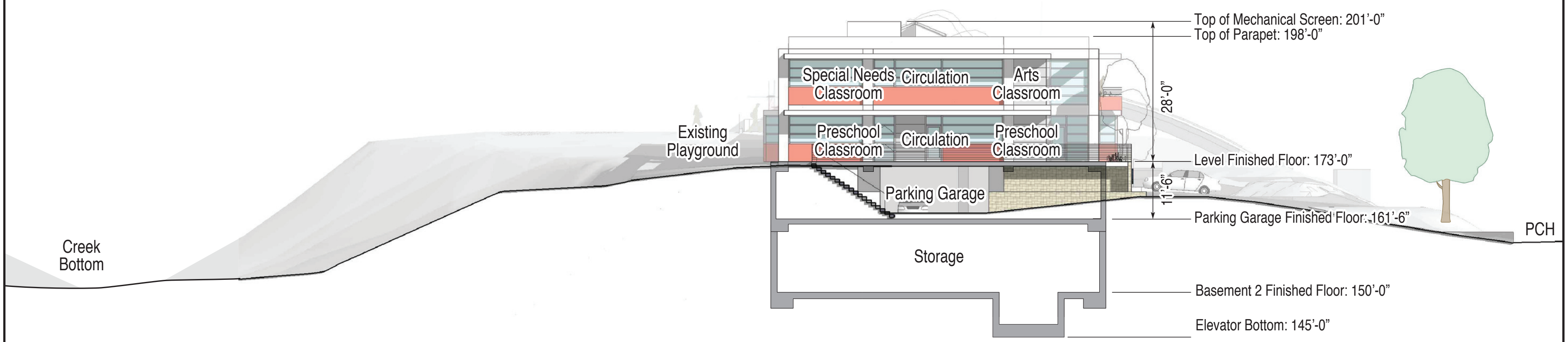


Temple Building Representative Cross Section

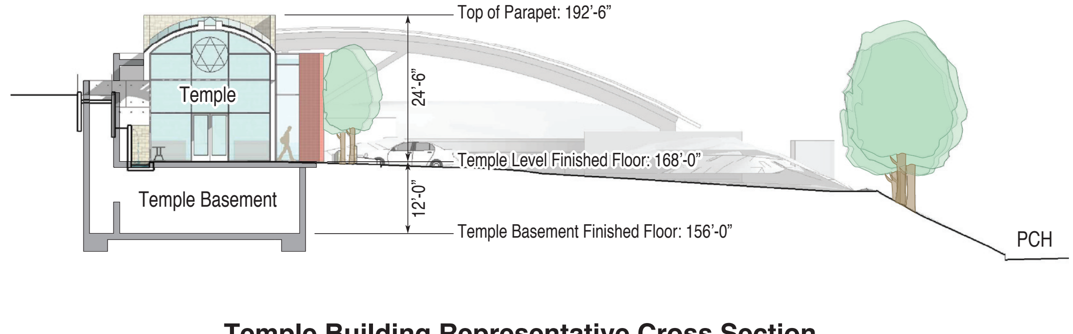
wood.

School and Temple Cross Sections – Facing North

FIGURE 4



School Building Representative Cross Section



Temple Building Representative Cross Section

wood.

School and Temple Cross Sections – Facing East

FIGURE 5

C. Onsite Wastewater Treatment System

The project site is outside of the CCWTF service area, and wastewater disposal would require installation of a second OWTS to accommodate increased wastewater generation from the proposed buildings. The existing OWTS would be retained to accommodate wastewater from the existing temple/event building. The second OWTS would be located beneath the surface parking lot, between PCH and the two-story classroom/administration building. The second OWTS would be composed of a 7,450-gallon treatment tank with ultraviolet (UV) disinfection and a 15,000-gallon equalization tank. These tanks would feed 12 subsurface seepage pits. The OWTS is designed to accommodate 210 fixture units (i.e., sinks, toilets) with an average flow of 1,584 gallons per day (gpd) and a peak flow of 2,465 gpd. The OWTS is also designed to meet the minimum requirements of the Malibu Plumbing Code, the MMC, and the LCP. In addition, the Los Angeles Regional Water Quality Control Board (LARWQCB) would review the proposed OWTS prior to issuing a Waste Discharge Permit (WDR) for the proposed system. The entire OWTS would be contained within the project site.

D. Stormwater and Water Quality Management

The project would not route additional stormwater flows directly downslope to Puerco Creek. The project would reduce the onsite impervious surface area by 598 sf, from 40,200 sf to 39,602 sf. In accordance with LIP Sections 17.3.2 and 17.4.1, the project would implement a Stormwater Management Plan (SWMP) and Water Quality Management Plan (WQMP) to retain and treat stormwater from developed portions of the project site.

To maintain water quality, the project's SWMP would include five infiltration pits beneath the surface parking lot. The infiltration pits would be staged sequentially so that stormwater initially enters a settling chamber and subsequently fills each of the pits in series, as stormwater flow volumes increase. The infiltration pits would be underlain by size-sorted rock to encourage infiltration. The infiltration pits would collect and infiltrate stormwater from 10 catch basins located throughout the project site. The catch basins would include grates and settling chambers to remove large debris, sediment, and pollutants (e.g., oils) from flows prior to entering the infiltrations pits. All roof drains would connect to the proposed storm drain system and would be directed towards the infiltration pits. The SWMP features would be maintained by the applicant per manufacturer design specifications.

The proposed stormwater treatment system would be able to infiltrate runoff from the Storm Water Design Volume (i.e., 50-year storm). Runoff exceeding the design-year storm would pass through the WQMP treatment mechanisms and infiltration pits before being conveyed to the existing CDS unit and 18-inch pipe in the north slope of Puerco Canyon, similar to existing conditions.

E. Landscaping and Hardscapes

Within the I zoning designation, 25 percent of the lot is required to be landscaped and another 5 percent is required to be permeable area; no public open space is required for development in the I zoning designation. Landscaped planter strips would be installed along pedestrian walkways, roadways, and parking lots throughout the project site. In addition, landscaped vegetation would be planted along the upper north slope of Puerco Canyon and limited habitat restoration/fuel modification would occur downslope within the ESHA. A small water feature would be installed as a centerpiece of an exterior courtyard located between the proposed classroom/administration building and the new temple. Further, the classroom/administration building would feature a live roof consisting of low-water use planters. In total, the project includes 16 distinct planting areas based on irrigation demand (known as hydrozones) distributed throughout the project site.

Approximately 5,587 sf of landscaped area would consist of irrigated landscape planted with low-water use California native plants, which after three years would be potentially irrigated once per month in the summer.

The project includes a habitat restoration program for Puerco Canyon Creek to be integrated with ongoing fuel modification activities. Habitat restoration would occur within the designated ESHA. Specifically, non-native riparian habitat consisting of a dense stand of non-native, invasive giant reed (*Arundo donax*) is located along the creek bottom. This stand of giant reed would be removed and replaced by native riparian species. All invasive plants would be removed from the restoration areas within one week of planting and would be disposed of in a manner that prevents their re-establishment. Invasive plants would be removed by hand rather than by chemical means whenever possible, although the use of approved herbicides would also likely be required. Collected seeds, and any purchased seeds, of native species predominant on the project site would be hand sown into the restoration area, or in areas where hand sowing is not feasible, container stock of native species would be planted. Removal of invasive species would be conducted at least twice annually during spring and summer seasons, and as required over a monitoring period of 5 years. The native species would also be temporarily irrigated for a period of 4 years using drip irrigation or other appropriate supplemental irrigation techniques. The project site would be maintained free of invasive plant species according to specific plant density thresholds for each targeted invasive plant species (see Mitigation Plan). The native species would also be temporarily irrigated for a period of 4 years. Best management practices (BMPs) for erosion control would be employed with the revegetation of the restoration area. Please refer to Section 4.4, *Biological Resources*, for a detailed discussion of the habitat restoration activities proposed by the project.

Any encroachment into the onsite ESHA would be limited to habitat restoration activities in the Puerco Canyon Creek bottom. The fuel modification zone would not be increased by the project because the proposed buildings would occur within the footprint of existing or previously proposed buildings which established the existing fuel modification zone. Fuel modification activities in the ESHA began in 2006 and primarily consist of thinning the understory of the Mixed Oak Woodland plant community on the north slope of Puerco Canyon to reduce fuel load and fire hazard at the proposed buildings. Under the project, these fuel modification activities would continue as currently implemented.

Non-vegetated landscaped areas would be made up of concrete walkways, staircases, and pathways, 6,782 sf of which would be comprised of impervious surface areas. Permeable hardscaped areas would total approximately 4,683 sf, and would include a proposed paver deck between the two proposed buildings, and side yard walkways. The total amount of impermeable and permeable hardscaped area would total approximately 11,465 sf.

F. Grading

The project would require grading and excavation to accommodate both proposed buildings, the ramp to access the subterranean parking, and for installation of the OWTS and SWMP. Project grading would occur only previously disturbed areas.

The project would require the excavation of approximately 10,042 cubic yards (cy) of soil, of which approximately 2,492 cy would be use onsite for fill and foundation support. The remaining material (approximately 7,550 cy) would be exported from the project site via 750 heavy haul truck trips (See Section J, below). The total area of ground disturbance would be 1.44 acres with 12,534 cy of grading (Table 4).

Table 4. Grading Plan Summary

Action	Total (cy)
Cut	10,042
Fill	2,492
Total	**12,534**
Import	0
Export	7,550

Source: David Lawrence Gray Architects, AIA 2017.

G. Site Lighting

In accordance with LIP Sections 4.6.2 and 6.5.G, the project would include installation of low-intensity, shielded light fixtures, including a color temperature of proposed lighting less than 3,000 Kelvin. Sources of lighting would include interior lighting, exterior wayfinding, and security lighting. The parking lot areas would primarily be lit by free-standing, 18-foot-tall light-emitting diode (LED) roadway luminaires with 16 LED light squares and downward-facing light shielding. Pathways immediately adjacent to buildings would generally be lit with approximately 74 downward-facing LED light fixtures and light strips recessed into the roof overhangs and walls, particularly near the proposed curved staircase area, new temple, and walkways around the proposed classroom/administration building. No light fixtures would be directed north of the site towards the ESHA boundary.

H. Signage

The project would include the installation of at least three signs. The driveway entry sign would consist of a 4-foot by 6-foot metal sign on steel posts, with blue lettering on a white background, located on the western side of the driveway entrance and visible from PCH. Signage on the proposed two-story classroom/administration building would be comprised of individual raised letters approximately 1- to 3-feet tall, and the new temple signage would be incrementally smaller than the entry sign. Each of the building signs would consist of blue, raised metal lettering installed in the neutral-colored Jerusalem stone siding. Per LIP Section 6.30, project signage would be designed and located to minimize impacts to visual resources. Signage would be subject to City review to ensure adherence to height and width limitations that ensure that signs are visually compatible with surrounding areas and protect scenic views.

I. Project Setbacks

The existing parking lot and Puerco Canyon provide buffers for the proposed buildings from the northern and southern property boundaries. Further, the proposed two-story classroom/administration building would be located a minimum of 35 feet from the western property boundary. As such, the project is designed to be compliant with front, rear, and side yard setbacks as required per LIP Section 3.3.N.3.B.1. However, although the proposed buildings would occur within the footprint of the existing modular buildings and previously approved but unbuilt administration building, a Variance is nonetheless required because both buildings would require construction activities within the ESHA 100-foot buffer zone established by LIP Section 4.6.1, *Buffers*. As detailed below in Table 5, *Setback Requirements*, Variance No. 96-007 (1996) established a 20-foot development setback from the ESHA for the project site. Following this, Coastal Development Permit No. 05-154 (2005) increased this setback to 29 feet. The project would maintain the 29-foot setback established by Coastal Development Permit No. 05-154; however, because new buildings would encroach upon the ESHA 100-foot buffer established by

LIP Section 4.6.1, the project would require a Variance to maintain this 29-foot setback for previously approved development on the project site[7].

Table 5. Setback Requirements

Boundary	Existing Setback (feet)	Approved via Variance 96-007 (feet)	Proposed Under Project (feet)
Front Yard	58	27	68
Side Yard	40 combined 12 minimum	44 combined 12 minimum	75 combined 35 minimum
Rear Yard	85	37	120
ESHA[1]	100	20	29

[1] Construction would occur within the 100-foot ESHA buffer zone, requiring issuance of a Variance.
Source: David Lawrence Gray Architects, AIA 2017.

J. Construction and Staging

Construction would occur for a period of 18 months during which construction activities would utilize construction equipment, haul trucks, and light-duty vehicles to facilitate concrete demolition, grading activities, building construction, and architectural finishing.

Site preparation, grading and excavation of the lower half of the existing southerly slope facing PCH and the parking lot would require uses of excavators, backhoes, bulldozers and heavy haul trucks. Only demolition and grading would require large machinery, utilizing equipment such as excavators, scrapers, loaders, and skiploaders. Site demolition would require approximately 30 days, with subsequent grading requiring approximately 45 days. Export of approximately 7,550 cy of excavated soil would require use of 750 heavy haul truck trips depending upon the size of trucks utilized (using 9- to 10-cy trucks). Pouring of concrete foundations, walls, and floor slabs would occur next, with more limited associated heavy concrete truck activity followed by structure framing.

Construction activities would be limited to the hours permitted by the City Noise Ordinance (MMC Chapter 8.24), occurring between 7:00 A.M. and 7:00 P.M. Monday through Friday and between 8:00 A.M. and 5:00 P.M. on Saturdays. Additionally, no construction activities would occur on Sundays or City designated holidays.

Regarding staging, work would initially commence on the demolition and removal of the existing modular buildings and surface parking lot. Subsequently, excavation and grading would occur. This would be followed by the construction of the proposed buildings and installation of the new surface parking lot. It is anticipated that installation of the SWMP and second OWTS would occur after the existing surface parking lot is removed. All landscaping would then be installed and habitat restoration efforts implemented. The school would temporarily suspend operation during construction, although religious services would continue to be held on Fridays and Saturdays. Because construction would not occur during Saturday service, it is anticipated that a temporary reconfiguration of onsite parking lot spaces combined with available off-site parking on the

[7] The City approved a 20-foot ESHA setback in 1996 with Variance 96-007. The 20-foot setback was subsequently approved by the California Coastal Commission with Coastal Development Permit No. 4-96-077. The California Coastal Commission then approved the City's LCP in 2002, which established a 100-foot setback from the designated ESHA. In 2005, the City approved Coastal Development No. 05-154, which established the existing 29-foot ESHA setback. The Project seeks a Variance to maintain the current 29-foot setback.

landside of PCH similar to existing conditions, would adequately accommodate temporary parking demand during construction.

1.4 Project Approvals

The project requires the following City approvals:

i. Approval of Conditional Use Permit (16-005) for the expansion of an existing religious facility.
ii. Approval of Coastal Development Permit (14-069).
iii. Approval of Parking Variance (14-050) to allow for non-code compliant parking spaces and parking space dimensions.
iv. Approval of Variance (14-051) for construction within an ESHA buffer zone.
v. Approval of Site Plan Review (14-050) for a building in excess of 18 feet in height but not to exceed 28 feet for a flat roof.
vi. Approval of Sign Permit (16-006) for identification and building-mounted signage.
vii. Approval of Construction Permits.
viii. Adoption of Initial Study (18-001).
ix. Adoption of Mitigated Negative Declaration (18-001).

Other agencies whose approval is required (e.g., permits, financing approval, or participating agreement):

i. California Department of Transportation (Caltrans) - The applicant must obtain encroachment permits for any work that requires construction staging, hauling or trash receptacle placement on any Caltrans right-of-way, such as along PCH.
ii. Caltrans - The applicant must obtain approval of a driveway entrance on PCH.
iii. LARWQCB - A WDR would be required for the onsite wastewater treatment system.
iv. Los Angeles County Waterworks District No. 29 - The applicant must obtain a current (less than one year old) Will Serve Letter from the District to demonstrate that the project will be served with potable water.

v. Los Angeles County Fire Department (LACFD) approval of final project and fuel modification plans.

2 EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).
    a. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
    b. Earlier Analysis Used. Identify and state where they are available for review.
    c. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
5. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
    a. The significance criteria or threshold, if any, used to evaluate each question; and
    b. The mitigation measure identified, if any, to reduce the impact to less than significance
10. The LCP is a certified CEQA document. Therefore, if all LCP standard conditions designed to minimize impacts to environmental resources are incorporated, and those conditions mitigate potentially significant impacts to a level of less than significant, then no additional mitigation is required by law. For discussion purposes, standard conditions may be listed below the impact discussions but are not actual mitigation measures.

3 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist and discussed on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☐	Air Quality
☒	Biological Resources	☒	Cultural Resources	☐	Energy
☒	Geology/Soils	☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials
☐	Hydrology/Water Quality	☐	Land Use/Planning	☐	Mineral Resources
☒	Noise	☐	Population/Housing	☐	Public Services
☐	Recreation	☒	Transportation	☐	Tribal Cultural Resources
☐	Utilities/Service Systems	☐	Wildfire	☒	Mandatory Findings of Significance

4 DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Digitally signed by Adrian Fernandez
Date: 2020.02.21 10:14:17 -08'00'

Adrian Fernandez
Principal Planner

Date

4.1 Aesthetics

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? Public views are those that are experienced from publicly accessible vantage point.) If the project is an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

4.1.1 Existing Setting

The Malibu coastline offers consistent ocean views, with several associated scenic vistas. The project site is located along the inland side of PCH, separated from the Pacific Ocean by a coastal bluff. According to the City's General Plan and LCP, the project site is not within a scenic vista. Public views of the Pacific Ocean in the project vicinity are generally limited to motorists and pedestrians along the PCH. No views of the Pacific Ocean or other scenic vistas are available across the project site from public vantage points. Views of the project site are available to motorists and pedestrians traveling along PCH. The project site's frontage is highly visible from PCH and consists of a steep, landscaped slope that supports a mix of dense, 15- to 20-foot-tall coral, oak, and eucalyptus trees that obstruct views of the interior of the project site. From PCH, views north across the project site toward the undeveloped slopes of the Santa Monica Mountains are generally obstructed by onsite landscaping, although the upper portions of these slopes are visible above the landscaping and consist of coastal sage scrub habitat.

The project site is not located along a state scenic highway, although PCH is eligible for State Scenic Highway designation. However, pursuant to LIP Section 6.5(H)(2), the PCH corridor within the boundaries of the LCP shall be protected as a scenic highway. No unique rock outcroppings or historic buildings exist on the project site (CA Dept. of Transportation 2011). The project site does not contain any designated historic features. As further discussed in Section 4.5, *Cultural Resources*, the closest historical resources, Humaliwo, Stevens House, and Adamson House, are located more than 1.5 miles to the southeast.

The visual character of the project vicinity is defined by the interface of buildings along PCH (low-density single-family homes, one- to two-story commercial buildings) and the undeveloped, naturally vegetated steep slopes of the Santa Monica Mountains north of PCH. The project site is bordered to the north by Puerco Canyon, a vegetated ravine with steep slopes leading down to a level creek bed. Two- to three-story commercial buildings along the north side of PCH are located west of the project site. The landscaped planters, parking lots, and driveways of these commercial buildings front PCH. Single-family homes are constructed south across PCH from the project site. These homes are mostly screened from view by dense vegetation and gated driveways. The visual character to the east is defined by the steep slopes and riparian woodland of Puerco Canyon Creek passing under the PCH, which has been largely overtaken by giant reed stands following the Woolsey Fire. Since the fire, the hill and valley behind the site look recently burned and show signs of recent regrowth; alternatively, none of the vegetation immediately visible along PCH within the project site were visually affected by the fire.

Lighting in the project vicinity is characterized by a medium amount of artificial lighting; the project vicinity generates minimal glare. Nighttime lighting is concentrated in the development along PCH; no artificial lighting occurs on the undeveloped slopes of the Santa Monica Mountains. The project site includes downward-facing lighting in the existing parking lot and security, landscaping, and wayfinding lighting[8] throughout. Within the project vicinity, the commercial buildings to the west also include sources of artificial lighting, including parking lot lights, security lighting, and wayfinding lighting. The single-family homes to the south provide minimal sources of lighting.

City Standard Conditions of Approval

The City applies the following LCP standard conditions associated with applicable projects to minimize impacts to aesthetic resources to any project within the City to receive project approval.

- The project is visible from scenic roads or public viewing areas, therefore, shall incorporate colors and exterior materials that are compatible with the surrounding landscape.
    - Acceptable colors shall be limited to colors compatible with the surrounding environment (earth tones) including shades of green, brown and gray, with no white or light shades and no bright tones. Colors shall be reviewed and approved by the Planning Director and clearly indicated on the building plans.
    - The use of highly reflective materials shall be prohibited except for solar energy panels or cells, which shall be placed to minimize significant adverse impacts to public views to the maximum extent feasible.
    - All windows shall be comprised of non-glare glass.
- All driveways shall be a neutral color that blends with the surrounding landforms and vegetation. Retaining walls shall incorporate veneers, texturing and/or colors that blend with the surrounding earth materials or landscape. The color of driveways and retaining walls shall be reviewed and approved by the Planning Director and clearly indicated on all grading, improvement and/or building plans.
- Exterior lighting must comply with the Dark Sky Ordinance and shall be minimized, shielded, or concealed and restricted to low intensity features, so that no light source is directly visible from public view. Permitted lighting shall conform to the following standards:

[8] Wayfinding lighting is typically low-voltage lighting that helps orient visitors by providing focused lighting on passageways, signage, building entrances, and parking areas.

- Lighting for walkways shall be limited to fixtures that do not exceed two feet in height and are directed downward, and limited to 850 lumens (equivalent to a 60-watt incandescent bulb);
- Security lighting controlled by motion detectors may be attached to the residence provided it is directed downward and is limited to 850 lumens;
- Driveway lighting shall be limited to the minimum lighting necessary for safe vehicular use. The lighting shall be limited to 850 lumens;
- Lights at entrances as required by the Building Code shall be permitted provided that such lighting does not exceed 850 lumens;
- Site perimeter lighting shall be prohibited; and
- Outdoor decorative lighting for aesthetic purposes is prohibited.

- Night lighting for sports courts or other private recreational facilities shall be prohibited.
- No permanently installed lighting shall blink, flash, or be of unusually high intensity or brightness. Lighting levels on any nearby property from artificial light sources on the project site shall not produce an illumination level greater than one-foot candle.
- Night lighting from exterior and interior sources shall be minimized. All exterior lighting shall be low intensity and shielded directed downward and inward so there is no offsite glare or lighting of natural habitat areas.
- String lights are allowed in occupied dining and entertainment areas only and must not exceed 3,000 Kelvin.
- Motion sensor lights shall be programmed to extinguish ten minutes after activation.
- Three sequential violations of the conditions by the same property owner will result in a requirement to permanently remove the outdoor light fixture(s) from the site.
- Prior to final Planning Department approval, the applicant shall be required to execute and record a deed restriction reflecting lighting requirements set forth in above restrictions. The property owner shall provide a copy of the recorded document to the Planning Department prior to final Planning Department approval.

4.1.2 Impact Discussion

a-b. **Less than Significant.** The project site is not identified as being within a scenic vista by the City in the General Plan and LCP. The project site does not contain unique rock outcroppings or historic resources. From PCH, limited views of the steep, undeveloped slope north of the project site are available above and in between the existing onsite buildings and vegetation. The project would increase the height of onsite buildings from one story to two stories. As represented by Figure 3, the upper portions of taller buildings would rise above the existing vegetation and marginally increase the obstruction of views north across the project site. However, views of these undeveloped hillsides are not an identified scenic vista and the upper portions of the hillside and the ridgeline would continue to be visible from PCH. The neighborhoods located north and above the project site, in addition to Puerco Canyon Road, look down on the project site. Views of the project site would be changed slightly due to the new landscaping of the northern part of the project site and due to the second level of the school structure. However, the existing trees north of the proposed school structure would remain, visually screening a majority of the building. Therefore, the project would result in less than significant impacts to scenic vistas and scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within proximity to an eligible State Scenic Highway.

c. **Less than Significant.** The project would alter the visual character of the project site by replacing one-story modular buildings with two-story buildings of an increased height and mass. The change in visual character would occur in two parts: (1) demolition and grading/construction, storage of equipment onsite during construction, and similar visual changes, and (2) an overall change to two-story structures.

Construction

Construction activities would largely be obstructed from public view on PCH by existing landscaping. Where visible through existing vegetation, construction activities could be incompatible with the surrounding landscape due to the presence of mobile construction equipment, stockpiled materials, unfinished building pads, and unfinished buildings and landscaping. Public views from PCH would be of construction equipment, construction material laydown areas, and scaffolding against the new structures. While this impact would be contrast with and diminish the quality of public views within the project vicinity, travelers on PCH at speeds of 55 to 65 miles per hour would experience relatively brief views of the largely-obstructed site. Therefore, project construction impacts on visual character would be less than significant.

Operation

Site development would generally conform to, or appear subordinate to, the existing landscaping from public vantage points, being located behind existing foliage. As with the existing modular buildings, the proposed school/administrative building and temple would largely be obstructed from view from PCH by the mature trees adjacent to PCH. Additionally, the setback distance from PCH to the proposed buildings is increased from 58 feet to 68 feet, locating the buildings further from public vantage points on PCH. Additionally, the neighborhood and Puerco Canyon Road located above the project site are greatly removed from the project site by at least 700 feet. Although the project site has been altered by past grading and development, efforts to maintain an attractive visual character would be implemented. The project would replace less-attractive modular buildings with a permanent, two-story building of a contemporary design. The applicable development and design standards of MMC Title 17 and LIP Section 6.5(B) for colors and materials have been incorporated into the project design. The building façades feature an earth-tone color scheme and natural Jerusalem stone to be compatible with the surrounding environment (Figure 3). The height of the buildings has been limited to only minimally extend above existing landscaping. Parking would continue to be screened from public view by existing landscaping and through the use of subterranean parking. The project includes extensive landscaping to complement the proposed buildings and surrounding vicinity; native species would be planted throughout. The two-story buildings would be of a similar height, scale, and contemporary design as recent commercial buildings along PCH. The building's final design would be subject to City review. The design review process would ensure the project would not substantially degrade the visual character or quality of the public views of the site or introduce any aesthetic elements incompatible with the surrounding land uses, and impacts would be less than significant.

d. **Less than Significant.** The project would introduce new sources of light, including increased interior lighting, exterior wayfinding, architectural, and security lighting. Further, the project would increase the amount of west-facing glass on the building façade, which could result in a higher potential for glare if standard glass panels were utilized. However, new lighting would not substantially increase the amount of light generated onsite when compared to existing conditions because the project site would primarily be occupied during daylight hours and lighting would largely mimic existing site lighting conditions. Only one undeveloped portion of the project site would be developed, and the development of a single new area would not generate enough light to change ambient light conditions in the project vicinity. Parking lot lighting would not be increased and would continue to consist of downward-facing lights. All lighting would be designed in compliance with the design standards of LIP Section 6.5, including the installation of low-intensity, shielded light fixtures, with light bulbs that produce a color temperature of less than 3,000 Kelvin.[9] Lighting would comply with MMC Title 17, in that no lighting would exceed 850 lumens or be directly visible from public view, parking lot lighting would continue to be shielded and arranged so as to not cause a nuisance either to PCH traffic or to adjacent properties. Further, site lighting would adhere to the requirements of the recently approved Dark Sky Ordinance. No exterior light fixtures would be directed north towards the ESHA. Regarding glare, glass building façades would comply with the City's standard conditions of approval to prohibit the use of glare producing or reflective materials. With incorporation of these standard conditions, direct light sources would be prevented from spilling over onto nearby properties or the onsite ESHA. With compliance with standard conditions of MMC Title 17 and LIP Sections 4.6.2 and 6.5(G), the potential impacts from the project introducing sources of light and glare are considered less than significant.

[9] Color temperatures below 3,000 Kelvin are white to yellow in appearance, and are good for locations where ambient, unobtrusive lighting is preferred. This color temperature mimics natural sources of light (candle, fire). Color temperatures above 3,000 Kelvin are white to blue in appearance, and are good for task lighting, display areas, or work areas where bright illumination is required.

4.2 Agricultural and Forestry Resources

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997), prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. **Would the project:**				
a) 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?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

4.2.1 Existing Setting

The California Department of Conservation lists Prime Farmland, Unique Farmland, and Farmland of Statewide Importance under the general category of "Important Farmland." According to the Farmland Mapping and Monitoring Program, the project site is classified as Other Land interspersed between Urban and Built Up land areas (Department of Conservation 2014). The project site is not zoned for agricultural use and/or under a Williamson contract, and is zoned by the City for institutional use (I), as discussed further in Section 4.10, *Land Use and Planning*. The site is not located near or within an area that is zoned for timberland production (as defined by Public Resources Code section 4526).

4.2.2 Impact Discussion

a-e. **No Impact.** The project site is not zoned for agricultural use and/or under a Williamson contract. The project would not convert farmland to nonagricultural uses. Further, the project site is not located near or within an area that is zoned for timberland production. No impacts would occur.

4.3 Air Quality

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. **Would the project:**				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

4.3.1 Existing Setting

The project site is located in the South Coast Air Basin (Basin), which covers the non-desert portions of Los Angeles, San Bernardino, Riverside Counties, and Orange County. The South Coast Air Quality Management District (SCAQMD) monitors and regulates the local air quality in the Basin and manages the Air Quality Management Plan (AQMP).

To protect the public health and welfare, the federal and state governments have identified six criteria air pollutants and a range of air toxics and established ambient air quality standards through the federal Clean Air Act and the California Clean Air Act. Federal and state criteria air pollutants include carbon monoxide (CO), lead (Pb), nitrogen oxides (NO_x), ozone (O_3), particulate matter less than 10 microns in diameter (PM_{10}), fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and sulfur dioxide (SO_2). The air quality impacts are assessed by comparing impacts to baseline air quality levels and applicable ambient air quality standards. Standards are levels of air quality considered safe from a regulatory perspective, including an adequate margin of safety, to protect public health and welfare.

The SCAQMD has divided the region into 38 source receptor areas (SRAs) in which 32 monitoring stations operate. The project site is located within SRA 2 that covers the western Santa Monica Mountains and Malibu area. Section 5.3.2 of the AQMP identifies the SCAQMD ambient air quality standards for relevant air pollutants. The project site consists of existing buildings and a parking lot that produces limited automobile exhaust primarily in the form of volatile organic compounds (VOCs), NO_x, CO, and PM (EPA 2015).

The AQMP includes air quality control measures, such as transit use and carpooling, which are to be implemented by local jurisdictions. Regional planning efforts to improve air quality include a variety of strategies to reduce emissions from motor vehicles and minimize emissions from stationary sources. The AQMP is based on the Southern California Association of Government's (SCAG) population projections, which are based in part on land use designations and population projections included in General Plans for those communities located within the Basin. A project may be inconsistent with the AQMP if it proposes development inconsistent with the land use designation or results in population and/or employment growth that exceeds growth estimates for the area.

Surrounding development includes commercial buildings along PCH and single-family residences, both south across PCH and atop the slope across Puerco Canyon. The closest sensitive receptors to air quality conditions are the existing school uses on the project site, and the single-family residences across PCH, which are located approximately 100 feet south of the project site. The closest public school, Webster Elementary School, is located approximately 0.9 mile to the northeast. The school onsite would temporarily cease operation during construction. Construction equipment for excavation and other construction activities would occur approximately 100 feet north of the nearest sensitive receptor.

4.3.2 Emissions Thresholds

Air quality impacts are assessed by comparing impacts to baseline air quality levels and applicable ambient air quality standards. Federal and state air quality standards have been established for criteria air pollutants. Standards are levels of air quality considered safe from a regulatory perspective, including an adequate margin of safety, to protect public health and welfare.

Regional Construction Emissions

The SCAQMD currently recommends that projects with construction-related emissions that exceed any of the following emissions thresholds should be considered potentially significant.

- 75 pounds per day (lbs/day) of VOC
- 100 lbs/day of NO_X
- 150 lbs/day of PM_{10}
- 55 lbs/day of $PM_{2.5}$

Localized Construction Emissions

Localized significance thresholds (LSTs) were developed in response to the SCAQMD Governing Board's Environmental Justice Enhancement Initiative (I-4). LSTs represent the maximum emissions from a project that will not cause or contribute to an air quality exceedance of the most stringent applicable federal or state ambient air quality standard at the nearest sensitive receptor, taking into consideration ambient concentrations in each SRA, project size, and distance to the sensitive receptor, etc. LSTs are only applicable for emissions of CO, NOx, PM_{10}, and $PM_{2.5}$. LSTs do not apply to emissions from mobile sources such as automobile traffic or public transport.

SCAQMD's LST Methodology includes screening tables that can be used for projects less than 5 acres in size to determine the maximum allowable daily emissions that would satisfy the LSTs (i.e., not cause an exceedance of the applicable concentration limits). SCAQMD provides lookup tables for project sites that are 1, 2, or 5 acres. The allowable emission rates depend on (1) the SRA in which the project is located, (2) the size of the project site, and (3) the distance between the project site and the nearest sensitive receptor. For this project site, which requires an area of disturbance of approximately 1.44 acres and is located approximately 100 feet (30.5 meters) from the nearest sensitive receptor within SRA 2, the conservative site area of 2 acres at 25 meters was utilized for this analysis. The following allowable emission thresholds are estimated for construction LSTs from this project:

- 827 lbs/day of CO
- 147 lbs/day of NO_x
- 6 lbs/day of PM_{10}
- 4 lbs/day of $PM_{2.5}$

Regional Operational Emissions

The SCAQMD currently recommends that projects with operational emissions that exceed any of the following emissions thresholds should be considered potentially significant.

- 550 lbs/day of CO
- 55 lbs/day of VOC
- 55 lbs/day of NO_X
- 150 lbs/day of SO_X
- 150 lbs/day of PM_{10}
- 55 lbs/day of $PM_{2.5}$

Localized Operational Emissions

A project's localized air quality impact is considered significant if CO emissions create a hotspot where either the California one-hour standard of 20 ppm or the federal and state eight-hour standard of 9.0 ppm is exceeded. This typically occurs at severely congested intersections (Level of Service [LOS] E or worse). CO emissions have decreased dramatically in the SCAQMD with the introduction of the automobile catalytic converter in 1975. No exceedances of CO have been recorded at monitoring stations in the SCAQMD in recent years and the Basin is currently designated as a CO attainment area for both federal and state standards. Thus, it is not expected that CO levels at project-impacted intersections would rise to such a degree as to cause an exceedance of these standards. For instance, based on analyses of localized concentrations of ambient CO concentrations as the project vicinity, a project would have to increase traffic volumes at affected intersections to more than 31,600 vehicles per hour for a CO hotspot to occur.

4.3.3 Impact Discussion

a. **Less than Significant.** The project does not include residential development or large local or regional employment centers and would not result in significant population or employment growth, thus avoiding an increase in currently established regional population projections. Construction activities would comply with SCAQMD Rule 403 to control fugitive dust. Additionally, the project would comply with the California Air Resources Board (CARB) requirements to minimize idling emissions from diesel-fueled vehicles (i.e., diesel-powered vehicles are not permitted to idle for a period of more than 5 minutes). As such, the project would not conflict with or obstruct implementation of the applicable AQMP and would therefore have a less than significant impact.

b. **Less than Significant.** The SCAQMD's *CEQA Air Quality Handbook* identifies methodologies to determine the cumulative significance of land use projects. The SCAQMD's methodology is based on performance standards and emission reduction targets necessary to attain the federal and state air quality standards identified in the AQMP. According to the SCAQMD's *CEQA Air Quality Handbook*, projects that are within the emission thresholds identified above for construction and operation should be considered less than significant on a cumulative basis.[10] Utilizing CalEEMod, an air pollutant emissions model acceptable to the SCAQMD, to estimate potential emissions of the project during construction and operational activities that may result in

[10] South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (1993) 9–12.

a considerable net increase of a criteria pollutant, the project was determined to have less than significant impacts, as follows.

Construction

Construction activities would generate dust and equipment exhaust, grading, and building construction. Dust is typically a primary concern during grading associated with the construction of new buildings. Because such emissions are not readily collected and discharged through a controlled source, they are called "fugitive dust emissions." Fugitive dust includes larger dust particles that settle out near the source, as well as smaller particles that remain suspended indefinitely. The number and types of construction equipment, vendor trips (e.g., transport of building materials), and worker trips were based on values provided by CalEEMod.

Table 6, *Estimated Regional Unmitigated Construction Emissions*, shows the estimated emissions that would occur during construction of the project. Maximum emissions of NO_X, CO, PM_{10}, or $PM_{2.5}$ would occur during the grading and excavation phases. The analysis assumed that construction activities would comply with SCAQMD Rule 403 to control fugitive dust. Additionally, the project would comply with CARB requirements to minimize idling emissions from diesel-fueled vehicles (i.e., diesel-powered vehicles are not permitted to idle for a period of more than 5 minutes). Compliance with these requirements is consistent with and meets the AQMP requirements for control strategies intended to reduce emissions from construction equipment and activities. The emissions analysis also assumes that all equipment would be operating simultaneously as the worst-case scenario. Emissions resulting from average daily construction activities would likely be less than those presented in Table 6. As shown in Table 6, construction emissions would not exceed SCAQMD's regional or localized thresholds of significance.

Table 6. Estimated Regional Unmitigated Construction Emissions

Air Pollutant	SCAQMD Thresholds (lbs/day)	LST Thresholds (lbs/day)	Estimated Peak Daily Total Construction Emissions (lbs/day)[1]	Exceeds Threshold?
			2017 - 2018	
CO	550	827	11.13	No
NO_x	55	147	20.38	No
SO_x	150	NA	0.03	No
ROG	75	NA	13.14	No
PM_{10}	150	6	1.52	No
$PM_{2.5}$	55	4	1.01	No

[1] Refer to Appendix A for CALEEMOD output sheets; overall emissions based on rounded totals.

Operation

Operational emissions would be generated by both area sources and mobile sources as a result of normal day-to-day activities on the project site after occupation. Mobile emissions would be generated by motor vehicles traveling to, from, and within the project site, and are considered to be the primary source of operational emissions for the project.

As the project would replace four one-story modular buildings with a two-story school/administration building and develop a new temple, it would increase onsite floor area and result in additional vehicle trips to and from the project site when compared to existing conditions. The operational emissions associated with the project were estimated using CalEEMod (see

Appendix A). CalEEMod can estimate mobile and area source emissions associated with land uses specific to a given operational year and location.

Table 7, *Estimated Regional Unmitigated Operational Emissions*, shows the estimated pollutant emissions associated with operation of the project. Since the majority of project-related operational emissions would be due to vehicle trips to and from the project site, the air quality analysis relies on the traffic study trip rates. As discussed in Section 4.17, the project would not significantly increase the number of vehicles at the two nearest intersections, and the volume-to-capacity (V/C) ratio at these intersections would increase by less than 0.010. The relatively minor amount of new traffic added by the project would not cause any intersection to operate at a level of service (LOS) of E or below during any period. As described in Section 4.17, *Transportation and Traffic*, the project is projected to only generate a maximum of 39 peak-hour trips, which would not trigger a CO hotspot at local intersections.

As shown in Table 7, operational emissions associated with implementation of the project would be well below the SCAQMD thresholds for significance for criteria pollutants. Projects that generate emissions below the thresholds of significance would not be considered to contribute a substantial amount of air pollutant to regional or local air quality.

Table 7. Estimated Regional Unmitigated Operational Emissions

CalEEMod Subcategory	Pounds per Day					
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	SO_X
Area Sources	0.46	<0.01	<0.01	<0.01	<0.01	0
Energy Sources	<0.01	0.08	0.06	<0.01	<0.01	<0.01
Mobile Sources	0.89	3.65	8.39	1.79	0.50	0.02
Total	**1.36**	**3.73**	**8.46**	**1.80**	**0.50**	**0.02**
SCAQMD Thresholds	**55**	**55**	**550**	**150**	**55**	**NA**
Exceeds Threshold?	No	No	No	No	No	No

[1] Refer to Appendix A for CALEEMOD output sheets; overall emissions based on rounded totals.

As detailed in Table 6 and discussed above, emissions associated with construction activities of the project would not exceed SCAQMD-recommended construction thresholds of significance, and therefore, would not cause an individually significant impact. Likewise, as detailed in Table 7 and discussed above, emissions associated with the operation of the project would not exceed SCAQMD-recommended operational thresholds of significance, and therefore, would not cause an individually significant impact. As construction emissions and operational emissions are below the thresholds of significance, the project would not result in a cumulatively considerable impact and would be less than significant.

c. **Less than Significant.** As determined in Table 6 above, the project would not generate emissions proximate to sensitive receptors that would exceed established LST thresholds, as the nearest sensitive receptor during construction would be located approximately 100 feet south of the project site. As discussed above, the existing onsite school would temporarily suspend operation until construction activities are completed to avoid impacts to this sensitive receptor. Further, the project would not result in a CO hotspot at area intersections. As indicated above, emissions would be less than significant, with the highest emissions occurring during construction. Additionally, given that the project would be located near the ocean, the prevailing winds, and the relatively small size of the project and area of ground disturbance, it is not expected that nearby sensitive receptors would be exposed to pollutant concentrations that would exceed established thresholds and impacts would be considered less than significant.

d. **Less than Significant.** Odors generated during project construction would be primarily limited to exhaust fumes from construction equipment. According to the SCAQMD *CEQA Air Quality Handbook*, construction equipment is not a listed source of odor emissions. Compliance with existing regulations, including the CARB anti-idling regulation that limits idling to five minutes or less at any location would minimize the potential for odorous emissions. Construction activities would be of short duration (phased with an expected total time of approximately 18 months) and emissions would not be persistent or lingering due to the high air circulation at the project site. Odors generated by the project would be short-term in nature and limited to exhaust fumes from construction equipment and other possible construction related odors constituting a less than significant impact.

The project's proposed uses and associated emissions would not generate nuisance odors at nearby sensitive receptors during operation. According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The project would not involve elements related to these types of uses. However, trash receptacles on the project site may produce localized odor emissions during daily operation. These odors are not anticipated to substantively affect area land uses or extend beyond project property lines. LIP Chapter 17.5.5, *Trash Storage Areas*, includes measures to protect water quality from the introduction of trash and debris. These requirements would also serve to reduce odors from trash containers by requiring that all trash, rubbish, garbage and recyclables shall be kept in containers with tight fitting covers. The regulations also require that an adequate number of such containers shall be provided, and the contents shall be placed for regular pickup by an authorized solid waste hauler. Waste from dumpsters shall be disposed at least once a week or more if needed. Adherence to these regulations would minimize the potential transfer or emanation of odor emissions from the project site to surrounding land uses. As proposed, project operation is not anticipated to produce any emissions, including those leading to odors, nor expose sensitive receptors to any substantial pollutant concentrations, and the impact would be less than significant.

4.4 Biological Resources

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	☐	☐	☐	☒

Information regarding biological resources was derived from a variety of assessments and reports prepared for the project site. Appendix B includes the *Biological Resources Assessment for the Malibu Jewish Center & Synagogue* (BRA), *Tree Protection Plan for the Malibu Jewish Center & Synagogue* (Tree Protection Plan), the *Mitigation Plan and Monitoring Program for the Malibu Jewish Center & Synagogue* (Mitigation Program), all prepared for the project by David Magney Environmental Consulting in September 2017, in addition to the *Wetlands of the Malibu Jewish Center & Synagogue* (Wetlands Report), also prepared for the project by David Magney Environmental Consulting in October 2018. The *Malibu Jewish Center & Synagogue Project Post-Fire Assessment* (Post-Fire Assessment) was conducted by Wood Environment & Infrastructure Solutions, Inc. (Wood) in October 2019 to assess changes to vegetation that may have occurred on the site following the 2018 Woolsey Fire.

4.4.1 Existing Setting

The southern portion of the project site has been extensively graded and developed with the existing buildings. Puerco Canyon and Puerco Canyon Creek flows south and bends eastward just north of the project site, entering the project site on the northwest corner and exiting on the east end. The northern, undeveloped portion of the project site consists of a natural slope and riparian area that lies within the boundary of 1,498 acres of contiguous ESHA mapped by the City's LCP ESHA Overlay Map, confirmed during site-specific surveys, and recently altered by the 2018 Woolsey Fire (see Appendices B and E).[11] ESHA habitat occupies approximately 1.21 acres of the northern project site. The City's LCP also considers areas within 200 feet of the mapped ESHA.

Site surveys for the 2017 BRA (see Appendix B) identified seven distinct habitats and/or land cover types on the project site: Mixed Oak-Walnut Woodland, Mixed Oak-Sycamore Woodland, Giant Reed Stand (Riparian), Willow Thicket (Riparian), Coastal Sage Scrub, Ruderal Grassland, and Disturbed/Developed (Figure 6, Table 8). The 2018 Woolsey Fire affected these communities; general changes are described further below and were addressed in-depth during a 2019 Post-Fire Assessment (see Appendix E). The 2017 site surveys found the onsite ESHA to include the riparian communities associated with Puerco Canyon Creek, Coastal Sage Scrub on the hillsides north of the creek, and Mixed Oak-Walnut Woodland with natural understory on the creek banks and hillsides. The Mixed Oak-Sycamore Woodland just north of the existing modular buildings is excluded from the ESHA because the understory is altered and consists primarily of non-native ruderal species, and because the native trees in this area were planted as part of a past development sometime between 1994 and 2002. Giant reed is an aggressive invasive species that typically would not meet the definition of a protected plant species, plant community, or ESHA habitat per the Coastal Act or the City's LCP. The BRA nonetheless includes the giant reed stand as ESHA, because it is bounded on all sides by native riparian habitat and is therefore functioning as part of the onsite riparian community. Similarly, Ruderal Grassland would not typically meet the ESHA designation per the Coastal Act or LCP. While most of the Ruderal Grassland areas on the project site are excluded as ESHA, one meadow dominated primarily by ruderal/non-native species is included as ESHA because it is bounded on all sides by natural or riparian habitats and not managed for fuel reduction. Disturbed/Developed areas are excluded as ESHA, and mainly occur in the southern portion of the project site, which has been affected by physical disturbance or developed as buildings, roads, and landscaping.

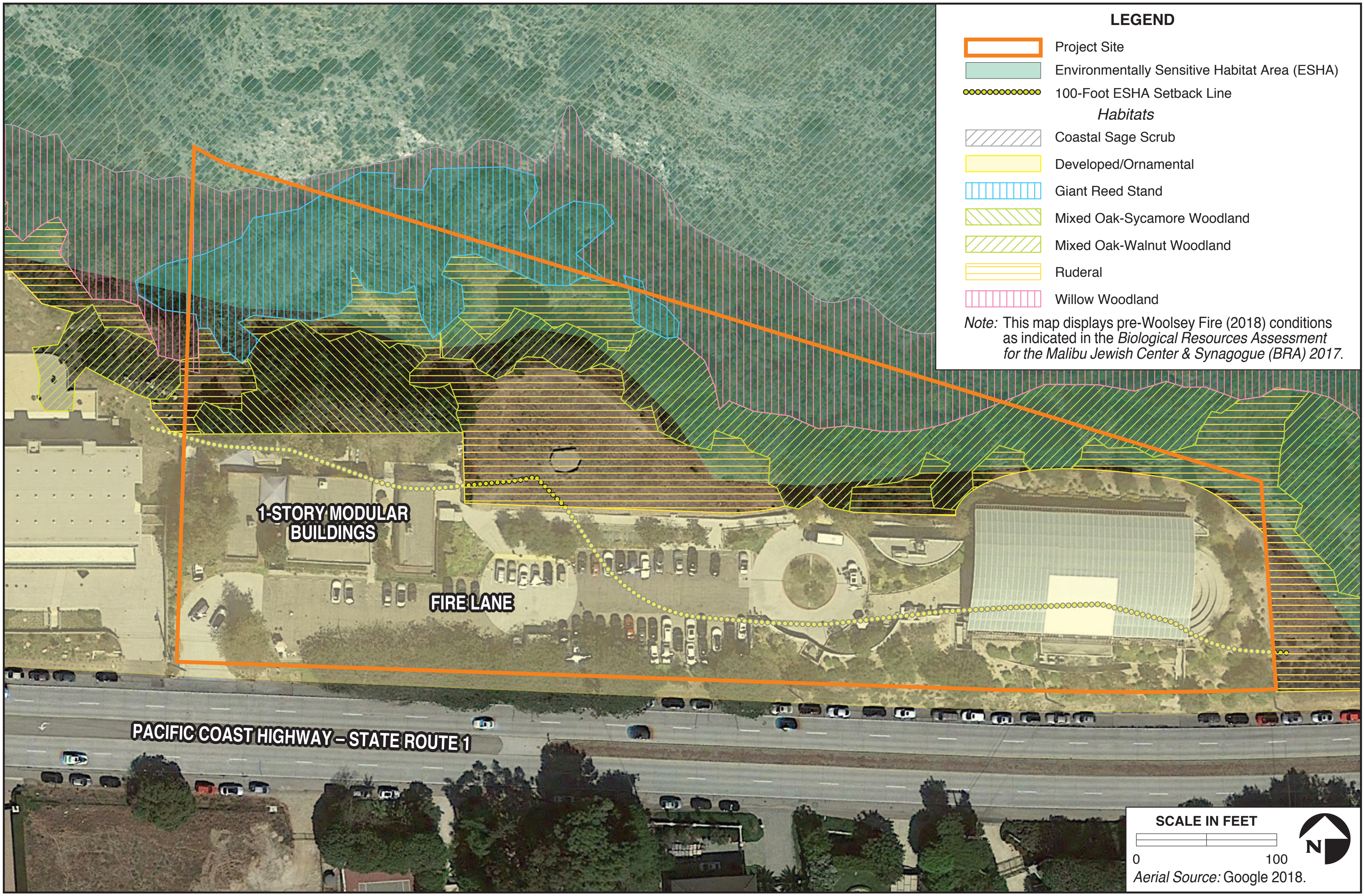
[11] City of Malibu, E*SHA Overlay Map 3: Dan Blocker to Malibu Pier*. September 2002. Accessed June 15, 2018 at: https://www.malibucity.org/DocumentCenter/View/4420/LCP-Maps?bidId=

Table 8. Habitats and Land Cover Occurring Onsite

Existing Habitats and Land Cover Observed	Total Onsite Acres	Onsite ESHA Acres	Location (Figure 6)	Dominant Plant Species	Other Plant Species
Mixed Oak-Walnut Woodland	0.43	0.43	North-Facing Slope of Puerco Canyon	Coast Live Oak (*Quercus agrifolia*)	Southern California Black Walnut (*Juglans californica*)
Mixed Oak-Sycamore Woodland	0.23	0	North-Facing Slope of Puerco Canyon	Coast Live Oak (*Quercus agrifolia*)	Western Sycamore (*Platanus racemosa*)
Giant Reed Stand (Riparian)	0.35	0.35[a]	Puerco Canyon Creek Bed	Giant Reed (*Arundo dorax)*	--
Willow Thicket (Riparian)	0.29	0.29	Puerco Canyon Creek Bed	Arroyo Willow (*Salix lasiolepsis*)	--
Coastal Sage Scrub	0.03	0.03	South-Facing Slope of Puerco Canyon	Laurel Sumac (*Malosma laurina*)	Coastal Buckwheat (*Eriogonum cinereum*) Various Annual Herbs
Ruderal Grassland	0.76	0.11[a]	Areas with no Tree Canopy Dominated by Non-native Grasses	Nonnative Grasses	--
Disturbed/Developed	2.54	0	Areas Affected by Physical Disturbance	Ornamental Plantings	--
Acreage Totals	**4.64**	**1.21**			

[a] *Although these habitats are nonnative and not typically classified as ESHA by the City, they are classified as ESHA in this case due to their location and function within native ESHA habitat.*
Refer to Appendix B for a full description of the habitats and land cover on the project site, including ESHA areas.

Source: (David Magney Environmental Consulting 2017a), Table 3; Appendix B.



wood.

Habitat Types and Land Cover on the Project Site

FIGURE 6

During biological surveys in August/September 2014 and February 2017 for the BRA and October 2019 for the Post-Fire Assessment, no plant species that are considered sensitive or afforded protection under the City LCP were identified. Two special-status plant species afforded protection under CEQA were observed onsite: Southern California Black Walnut and Plummer's Baccharis (*Baccharis plummerae*). Southern California Black Walnut is tracked by the California Natural Diversity Database (CNDDB) as a sensitive habitat when occurring in woodlands, as it does in a portion of the Mixed Oak-Walnut Woodland on the north-facing slope of Puerco Canyon (David Magney Environmental Consulting 2017a). Southern California Black Walnut is a California Native Plant Society (CNPS) Rank 4.2 species and Plummer's Baccharis is a CNPS Rank 4.3 species (Table 9). CNPS Rank 4 is a watchlist of plants of limited distribution that are not considered special-status plant species or formally afforded legal protection by the City's LCP. Mature Southern California Black Walnut individuals are afforded protection by the City's Native Protected Tree Ordinance if they meet established size requirements. Plummer's Baccharis is considered uncommon and vulnerable within California, and considered to be a special-status plant species pursuant to CEQA. According to CNDDB, a total of 33 special-status plant species are known or reported in the vicinity of the project site and have the potential to occur onsite, and the CNPS lists 13 additional vascular plants potentially occurring onsite (David Magney Environmental Consulting 2017a). A summary of those special-status plant species with a "possible" or "likely" potential to occur onsite or in the vicinity of the project site is provided in Table 9 (David Magney Environmental Consulting 2017).

Photo 7. *The dense stand of giant reed occupying Puerco Creek within ESHA would be eradicated as part of the project's habitat restoration program.*

During biological surveys in August/September 2014 and February 2017 for the BRA, no special-status wildlife species were observed onsite or near the project site, but a total of 33 special-status wildlife species are known or reported in the vicinity of the project site and have the potential to occur onsite. In addition, all raptors, raptor nests (active or inactive), and other active bird nests are protected (David Magney Environmental Consulting 2017a). A summary of those special-status wildlife species with a "possible" or "likely" potential to occur onsite or in the vicinity of the project site is provided in Table 10.

The project site contains a variety of mature native tree species afforded protection under the City's Native Tree Protection Ordinance[12]. A total of 19 trees were identified during surveys of the project site that meet the criteria for protected trees and have potential to be impacted by the proposed development. These include 10 Coast Live Oaks, 8 Western Sycamores, and 1 Southern California Black Walnut.

[12] The City's LCP (Local Implementation Plan Chapter 5 Section 2) affords protection to several native species of trees that have at least one trunk measuring six inches or more in diameter, or a combination of any two trunks measuring a total of eight inches or more in diameter, measured at four and one-half feet above grade.

The Wetland Report determined that 0.729 acre of riparian wetland habitat is present onsite that is under the jurisdiction of the U.S. Army Corps of Engineers (USACE), and that wetlands under jurisdiction of CDFW total approximately 1.411 acres. As the USACE typically does not take jurisdiction of riparian habitats upslope of the ordinary high-water mark, a narrowing area of jurisdiction was determined along Puerco Canyon Creek (see Appendix B).

A Post-Fire Assessment was performed to determine potential changes in onsite habitats and sensitive species as a result of the 2018 Woolsey Fire, which burned Puerco Creek and the hillsides immediately east of the developed portions of the project site. This survey found that while onsite and adjacent vegetation communities to the south of Puerco Canyon Creek were burned by the Woolsey Fire, overall habitat composition remains the same and these habitats overall are recovering. The oak-sycamore woodland contains some trees that appear to have been blackened/burned by the Woolsey Fire; however, the burned trees are still living and cover large portions of the upland slope. The walnut-woodland shows some patterns of burning but overall is alive and survived the fire. Neither the oak-sycamore nor the oak-walnut woodlands have a substantial reduction in volume, and still cover approximately the same area that they previously did. Ruderal grassland still exists between the two woodlands and reaches down to the creek bottom and to the hilltop near the existing project site structures. As a fire-adapted habitat, the coastal sage scrub is recovering with similar species composition as pre-fire conditions. However, major changes in species composition in the willow riparian community have occurred since the Woolsey Fire. The fire removed portions of the mature willow overstory which has benefited the giant reed, which has spread throughout the creek bottom following the effects of the fire. The willow canopy has not recovered from the fire and the giant reed now accounts for the highest percentage of vegetation community coverage within the project site (see Appendix E). While the long-term changes in the species composition and dominance within willow riparian community are difficult to project, giant reed is extremely persistent. Nevertheless, some new young willow riparian trees and trunks of burned willow riparian trees showing green branches are mixed among the burned willows and giant reed, indicating dominant mature willow trees which will likely survive through the near future. Overall, the threat remains high that this habitat may undergo some transition from willow riparian to giant reed in the immediate future, with significant diminishment in habitat values.

Puerco Canyon is one of two habitat linkages or wildlife corridors with remaining areas of native vegetation that provide a connection between the open undeveloped native habitats within Malibu Bluffs Park and the more extensive habitats of the Santa Monica Mountains. Although riparian habitat of Puerco Canyon and the associated wildlife corridor are bordered by adjacent development and bisected by PCH, wildlife regularly move through such development and cross barriers such as PCH to move between habitats.

City Standard Conditions of Approval

The City applies the following LCP standard conditions to applicable projects to minimize impacts to biological resources.

- A construction staging plan shall be reviewed and approved by the Planning Director prior to plan check submittal.
- Construction hours shall be limited to Monday through Friday from 7:00 a.m. to 7:00 p.m. and Saturdays from 8:00 a.m. to 5:00 p.m. No construction activities shall be permitted on Sundays or City-designated holidays.
- Construction management techniques, including minimizing the amount of equipment used simultaneously and increasing the distance between emission sources, shall be

employed as feasible and appropriate. All trucks leaving the construction site shall adhere to the California Vehicle Code. In addition, construction vehicles shall be covered when necessary; and their tires rinsed prior to leaving the property.

- All new development, including construction, grading, and landscaping shall be designed to incorporate drainage and erosion control measures prepared by a licensed engineer that incorporate structural and non-structural BMPs to control the volume, velocity and pollutant load of storm water runoff in compliance with all requirements contained in LIP Chapter 17, including:
  - Construction shall be phased to the extent feasible and practical to limit the amount of disturbed areas present at a given time;
  - Grading activities shall be planned during the Southern California dry season (April through October);
  - During construction, contractors shall be required to utilize sandbags and berms to control runoff during on-site watering and periods of rain in order to minimize surface water contamination; and
  - Filter fences designed to intercept and detain sediment while decreasing the velocity of runoff shall be employed within the project site.
- Construction fencing shall be installed no more than 10 feet back from the edge of the north-facing hillside just north of the project site prior to the beginning of any construction to prevent impacts related to any dumping of sediments, debris, fluids, or significant runoff down the hillside upon which ESHA and protected habitat occurs. The construction fencing shall be maintained throughout the construction period to protect the site's sensitive habitat areas.
- Protective fencing shall be used around the outermost limits of the protected zones of the native trees within or adjacent to the construction area that may be disturbed during construction or grading activities. Before the commencement of any clearing, grading, or other construction activities, protective fencing shall be placed around each applicable tree. Fencing shall be maintained in place for the duration of all construction. No construction, grading, staging, or materials storage shall be allowed within the fenced exclusion areas, or within the protected zones of any on site native trees. The protective fencing for protected native trees species may also serve as the general construction fencing so that only one fence is required.
- The applicant shall retain the services of a certified arborist, approved by the Planning Director to monitor native trees that are within or adjacent to the construction area. Public agencies may utilize their own staff who have the appropriate qualifications. If any breach in the protective fencing occurs, all work shall be suspended until the fence is repaired or replaced.
- Prior to the issuance of the coastal development permit that includes native tree removal or the loss or worsened health of native trees resulting from encroachment, the applicant shall submit a native tree replacement planting program, prepared by a certified arborist, which specifies replacement tree locations, tree or seedling size, planting specifications, and a monitoring program to ensure that the replacement planting program is successful, including performance standards for determining whether replacement trees are healthy and growing normally, and procedures for periodic monitoring and implementation of corrective measures in the event that the health of replacement trees declines. Where the removal of native trees cannot be avoided or where development encroachments into the

protected zone of native trees result in the loss or worsened health of the trees, mitigation measures shall include, at a minimum, the planting of replacement trees on-site, if suitable area exists on the project site, at a ratio of no less than 10 replacement trees for every 1 tree removed. The applicant shall plant seedlings, less than one year old on an area of the project site where there is suitable habitat. In the case of oak trees, the seedlings shall be grown from acorns collected in the area. Where on-site mitigation through planting replacement trees is not feasible, mitigation shall be provided by one of the following methods:

    - Offsite mitigation shall be provided by planting no less than 10 replacement trees for every 1 tree removed, at a suitable site that is restricted from development or is public parkland. The applicant shall plant seedlings, less than one year old in an area where there is suitable habitat. In the case of oak trees, the seedlings shall be grown from acorns collected in the area; or
    - An in-lieu fee shall be provided for the unavoidable impacts of the loss of native tree habitat. The fee shall be based on the type, size and age of the tree(s) removed. The fee shall be paid into the Native Tree Impact Mitigation Fund, administered by the Santa Monica Mountains Conservancy. The accumulated fees shall be used for the restoration or creation of native tree woodland or savanna habitat areas within the Santa Monica Mountains Coastal Zone. Fees paid to mitigate impacts of development approved within the City may be used to restore native tree habitat anywhere within this area. Priority shall be given to restoration or creation on properties containing areas designated ESHA, and to properties contiguous with existing parklands containing suitable native tree habitat.

- Where approved development encroaches into the root zone of native trees, each affected tree shall be monitored annually for a period of not less than ten years. An annual monitoring report shall be submitted for review by the City for each of the ten years. Should any of these trees be lost or suffer worsened health or vigor as a result of the proposed development, the applicant shall mitigate the impacts as required in Section 5.5 of the Malibu LIP. If replacement plantings are required as mitigation, monitoring of the replacement trees shall be provided as required by Section 5.6.2 of the Malibu LIP. Where the planting of replacement trees is required as mitigation, as required by Section 5.5 of the Malibu LIP, each replacement tree shall be monitored annually for a period of not less than ten years. An annual monitoring report shall be submitted for the review and approval of the City for each of the ten years. The monitoring report shall identify the size and health of each replacement tree, comparing this information with the criteria provided in the native tree replacement planting program required in Section 5.5.1 (A) of the Malibu LIP for determining that replacement trees are healthy and growing normally. Mid-course corrections shall be implemented if necessary. Monitoring reports shall be provided to the City annually and at the conclusion of the ten-year monitoring period that document the success or failure of the mitigation. If performance standards are not met by the end of ten years, the monitoring period shall be extended until the standards are met.
- The landscape and fuel modification plan has been conditioned to protect natural resources in accordance with the LCP. All areas shall be planted and maintained as described in the landscape and fuel modification plan. Failure to comply with the landscape conditions is a violation of the conditions of approval for this project.
- Invasive plant species, as determined by the City of Malibu, are prohibited.

- Plantings required for fuel modification, except for within irrigated Zone A nearest to approved residential structures, must be native, drought-tolerant species and shall blend with the existing natural vegetation and natural habitats on the site.

- Any site preparation activities, including removal of vegetation, between February 1 and September 15 will require nesting bird surveys by a qualified biologist at least five days prior to initiation of site preparation activities. Should active nests be identified, a buffer area no less than 150 feet (300 feet for raptors) shall be fenced off until it is determined by a qualified biologist that the nest is no longer active. A report discussing the results of nesting bird surveys shall be submitted to the City within two business days of completing the surveys.

- Earthmoving shall be scheduled only during the dry season from April 1 through October 31. If it becomes necessary to conduct earthmoving activities from November 1 through March 31, a comprehensive erosion control plan shall be submitted to the City Biologist for approval prior to the issuance of a grading permit and implemented prior to initiation of vegetation removal and/or earthmoving activities.

- Native species of the Santa Monica Mountains and characteristic of the local habitat shall be used on graded slopes or where slope plantings are required for slope stabilization, erosion control, and watershed protection. Plants should be selected to have a variety of rooting depths. A spacing of 15 feet between large woody shrubs (greater than or equal to a 10-foot canopy) is recommended by the LACFD. Lawns are prohibited on slopes greater than 5 percent.

- Night lighting from exterior and interior sources shall be minimized. All exterior lighting shall be low intensity, shielded, and directed downward and inward so there is no offsite glare or lighting of natural habitat areas.

- The project shall receive LACFD approval of a Final Fuel Modification Plan prior to the issuance of final building permits.

4.4.1 Impact Discussion

a. **Less than Significant with Mitigation.** Construction activities could result in temporary impacts to onsite special-status species due to noise, light, and dust pollution. These impacts would only occur during daylight hours when construction is occurring. While most species would be able to temporarily avoid the project site when construction activities are occurring, there may nonetheless be some physical detriment to the species' ability to travel through the property, nest, or acquire food, especially during short-term, periodic restoration activities to remove the giant reed stand in the creek bed. For example, construction within 100 feet of active bird nests could disrupt breeding and nesting. This is considered a potentially significant impact. With adherence to the City's standard conditions of approval, which require pre-construction nesting bird surveys and avoidance if active nests are discovered, impacts to nesting birds would be less than significant. Although the project also includes a habitat restoration component that would occur directly in the ESHA, the replacement of the giant reed stand with native species would be accomplished primarily with hand tools where feasible; where not feasible, approved herbicides may be used. However, if and/or when herbicides must be used within the ESHA to eradicate invasive plant species or restore habitat, City LCP Policy 3.19 prohibits the use of herbicides during the winter season or when rain is predicted within a week of application, and implementation of MM BIO-1 restricts herbicides used to those approved by LARWQCB, which would limit impacts to special-status species in the area to a less than significant level.

Table 9. Special Status Plant Species Potentially Occurring Onsite

Common Name	Scientific Name	Federal Status	State Status	CNPS Rank	Likelihood of Occurrence
Braunton's Milkvetch	*Astragalus brauntonii*	E	--	1B.1	Possible
Malibu Baccharis	*Baccharis malibuensis*	--	--	1B.1	Possible
Plummer's Baccharis	*Baccharis plummerae* ssp. *plummerae*	--	--	4.3	**Observed**
Slender Mariposa Lily	*Calochortus clavatus* var. *gracilis*	--	--	1B.2	Possible
Plummer's Mariposa Lily	*Calochortus plummerae*	--	--	4.2	Possible
Parry's Spineflower	*Chorizanthe parryi,* var. *parryi*	--	--	1B.1	Possible
White-veined mondardella	*Monardella hypoleuca* ssp. *hypoleuca*	--	--	1B.3	Possible
Catalina Mariposa Lily	*Calochortus catalinae*	--	--	4.2	Possible
Southern California Black Walnut	*Juglans californica*	--	--	4.2	**Observed**
Ocellated Humboldt Lily	*Lilium humboldtii* ssp. *ocellatum*	--	--	4.2	Possible
Hubby's Phacelia	*Phacelia hubbyi*	--	--	4.2	Possible
South Coast Branching Phacelia	*Phacelia ramosissima*	--	--	3.2	Possible

Notes:

Federal Status:
- E: Endangered = Danger of extinction throughout range
- T: Threatened = Likely to become endangered in foreseeable future throughout range

State Status:
- E: Endangered = Applies to a species whose survival and reproduction in the wild are in immediate jeopardy from one or more causes
- T: Threatened = Applies to a species that is existing in small numbers throughout all or a significant portion of its range that it may become endangered

CNPS:
- Rank 1A: Plants presumed Extinct in California
- Rank 1B: Plants Rare, Threatened, or Endangered in California and elsewhere
- Rank 2: Plants Rare, Threatened, or Endangered in California, but more common elsewhere
- Rank 3: Plants about which we need more information
- Rank 4: Plants of limited distribution
  - .1 – Seriously threatened in California
  - .2 – Fairly threatened in California
  - .3 – Not very threatened in California

Refer to Appendix B for a full list of all special-status plant species identified and a statement of the reasoning for their potential to occur onsite or within the vicinity of the project site.

Source: David Magney Environmental Consulting 2017a; Appendix B.

Table 10. Special Status Wildlife Species Potentially Occurring Onsite

Common Name	Scientific Name	Federal Status	State Status	CDFW Rank	Likelihood of Occurrence
Reptiles					
Coastal Whiptail	*Aspidoscelis tigris* ssp. *stejnegeri*	--	--	--	Likely
San Bernardino Ringneck Snake	*Diadophis punctatus* ssp. *modestus*	--	--	--	Possible
California Mountain Kingsnake (San Diego Population)	*Lampropeltis zonata (pulchra)*	--	--	SSC	Possible
Coast horned lizard	*Phyrnosoma blainvilli*	--	--	SSC	Moderate
Birds					
Cooper's hawk	*Accipiter cooperii*	--	--	WL	Possible
Southern California Rufous-crowned Sparrow	*Aimophila ruficeps* ssp. *canescens*	--	--	WL	Possible
Least Bell's Vireo	*Vireo belli* ssp. *pusillus*	E	E	--	Possible
Mammals					
Pallid bat	*Antrozous pallidus*	--	--	SSC	Possible
Spotted Bat	*Euderma maculatum*	--	--	SSC	Possible
Western Mastiff Bat	*Eumops perotis* ssp. *californicus*	--	--	SSC	Possible
Western Red Bat	*Lasiurus blossevillii*	--	--	SSC	Possible
Hoary Bat	*Lasiurus cinereus*	--	--	--	Possible
Western Small-Footed Myotis	*Myotis ciliolabrum*	--	--	--	Possible
San Diego Desert Woodrat	*Neotoma lepida* ssp. *intermedia*	--	--	SSC	Possible
American Badger	*Taxidea taxus*	--	--	SSC	Possible
Invertebrates					
Transverse Range Shoulderband Snail	*Helminthoglypta traskii*	--	--	--	Likely
Santa Monica Shieldback Katydid	*Aglaothorax [Nebula] longipennis*	--	--	--	Possible
Gertsch's Socalchemmis Spider	*Socalchemmis gertschi*	--	--	--	Possible

Santa Monica Grasshopper	*Trimerotropis occidentiloides*	--	--	--	Possible

Notes:
Federal Status:
E: Endangered = Danger of extinction throughout range
T: Threatened = Likely to become endangered in foreseeable future throughout range
State Status:
E: Endangered = Applies to a species whose survival and reproduction in the wild are in immediate jeopardy from one or more causes
T: Threatened = Applies to a species that is existing in small numbers throughout all or a significant portion of its range that it may become endangered

California Department of Fish and Wildlife (CDFW):
SSC: Species of Special Concern
WL: Watchlist Species
FP: Fully Protected = Fully protected under the California Department of Fish and Game Code

Refer to Appendix B for a full list of all special-status wildlife species identified and a statement of the reasoning for their potential to occur onsite or within the vicinity of the project site.

Source: (David Magney Environmental Consulting 2017a); Appendix B.

As noted above, CNDDB results and site surveys revealed the presence of two special-status plant species afforded protection under CEQA on the project site: Plummer's Baccharis and Southern California Black Walnut. Neither of these species is considered sensitive or afforded protection by the LCP. With regard to Plummer's Baccharis, the BRA identified this onsite CNDDB Rank 4 plant species as a special-status species because it is uncommon and vulnerable. However, this species is common in the Malibu area, and potential loss of individuals during restoration in the creek bottom, particularly following the riparian habitat modifications resulting from the Woolsey Fire in which giant reed has overtaken a large portion of this habitat, would not constitute a significant impact. Regarding Southern California Black Walnut, several mature individuals of this species on the north-facing slope of Puerco Canyon are also afforded consideration by the BRA per the standards of the CNDDB because they are located within the Mixed Oak-Walnut Woodland Alliance, which can provide habitat for numerous wildlife species. As noted above, mature Southern California Black Walnut individuals are also afforded formal legal protection by the LCP.

With the exception of one mature Southern California Black Walnut tree on the northwest corner of the proposed development area where the Tree Protection Zone may be encroached by construction (refer to Checklist Question 4.4(e) below), the BRA found that all impacts to these two plant species would occur only if fuel modification activities were increased by the project. Impacts to the Southern California Black Walnut in particular were concluded to be directly dependent on the extent of fuel modification by the City. Because the required fuel modification zone would remain the same as under historical and existing conditions and would not require the further removal or loss of these two species, impacts to these species would be less than significant. With the implementation of MM BIO-2, which requires a pre-construction survey for special-status plant species as defined by the City LCP, impacts would be further reduced. The City's standard conditions of approval would also ensure that the one mature Southern California Black Walnut northwest of the administration/school building is protected during construction or replaced at an appropriate ratio if health of the affected tree worsen during construction or operation (refer to Checklist Question 4.4(e) below).

No special-status animal species were identified on the project site. As such, while numerous special-status animal species may occur in the vicinity, project operation, including noise and lighting, would have less than significant impacts. Existing activities on the project site would continue under the project, with no anticipated change in the frequency of noise-generating events. Vehicle movements would continue to be located on the southern portion of the project site and separated from special-status species by the proposed buildings. As discussed in Section 4.1, *Aesthetics*, the effect of lighting on adjacent habitat would be reduced through the installation of only downward-facing lighting that does not exceed allowable levels at the adjacent habitat. As discussed in Section 4.9, *Hydrology and Water Quality*, the project would reduce the amount of impervious surface area and develop a stormwater treatment system. This system would improve the quality of runoff from the project site and into Puerco Canyon Creek, thereby maintaining water quality in the adjacent habitat. Lastly, the project proposes a habitat restoration program that would replace a stand of invasive giant reed in the creek bed with riparian trees and shrubs indigenous to the area, thereby improving onsite habitat for special-status animal species. However, the habitat restoration would require several years to successfully eradicate invasive non-native giant reed and maintain native plantings, with periodic disturbances to habitat due to hand crews working in the creek with possible herbicide application. Nonetheless, with implementation of MM BIO-1, long-term effects of the restoration program would have a positive effect on special-status species. Thus, operational impacts to candidate, sensitive, or special-status animals would be less than significant.

In addition to individual protected species habitats, the project site contains habitats that function as part of the larger ecosystem, and are therefore designated ESHA. However, the proposed development is entirely within the footprint of existing buildings and previously graded or disturbed areas. Therefore, only 0.03 acre of Ruderal Grassland included as ESHA would be permanently disturbed. The portion of Ruderal Grassland included as ESHA provides very little value to the ESHA as it is dominated by non-native grasses on disturbed portions of the project site.

Although giant reed stand is not a protected plant community, the project's BRA classified this community as ESHA because it occurs within a riparian community which is ESHA. The invasive giant reed stand has expanded significantly after the mature willow canopy burned during the 2018 Woolsey Fire and it remains unclear in late 2019 if this willow woodland will recover, particularly given current dominance by the apparently expanding coverage of giant reed. Giant reed provides substantially lower-value habitat than native riparian plant species, and thus, the project proposes a restoration program to restore high-value native habitat to the creek bottom along this portion of Puerco Canyon Creek. This habitat restoration proposal has become more important in terms of protecting ESHA and more challenging given the substantial expansion of giant reed coverage since the Woolsey Fire. Because the stand of invasive giant reed provides a lower value to the existing riparian habitat, the removal of the giant reed stand could temporarily decrease the overall habitat function of the ESHA. Following successful implementation of the habitat restoration program, it is expected that the habitat restoration program would improve habitat function within the designated ESHA. However, it is possible that individual plants do not successfully establish themselves following restoration or that offsite areas of giant reed stand encroach the project site. The failure of plants to establish successfully or the encroachment of offsite giant reed stand would result in a permanent impact to the ESHA habitat. This is considered a potentially significant impact. Nevertheless, particularly following the 2018 Woolsey Fire, the encroachment of the giant reed has already occurred throughout the lower elevation areas, altering the existing ESHA habitat and becoming the most prominent vegetation type within the project site prior to project implementation. To prevent further encroachment, MM BIO-1 would require at least 5 years of monitoring to ensure the establishment and progress of the project's restoration plan, and MM BIO-3 would require preconstruction training to recognize potential special-status resources in the project area. With implementation of the identified mitigation, impacts would be reduced.

In summary, the project would result in temporary and permanent potentially significant impacts to special-status species, habitat, and the designated ESHA. However, with implementation of

City's standard conditions of approval and the proposed MM BIO-1, MM BIO-2, MM BIO-3, and MM BIO-4, impacts would be less than significant. These mitigation measures are developed in accordance with the Mitigation Plan and Monitoring Program prepared for the project by David Magney Environmental Consulting in September 2017 (David Magney Environmental Consulting 2017c; see Appendix B).

b-c. **Less than Significant with Mitigation.** As discussed in Impact Discussion (a) above, impacts to the ESHA plant communities would be less than significant with the implementation of identified mitigation measures. As also discussed above, the project site and immediate project vicinity supports riparian habitat and other mapped sensitive natural communities that are not included in the ESHA and have been recently affected by the Woolsey Fire. Any significant runoff and/or dumping of debris/sediments/fluids down the hillside north of the project site during construction could result in indirect significant impacts to these other sensitive natural communities, including the Mixed Oak-Walnut Woodland and riparian habitat below. With implementation of City's standard conditions of approval, which require standard BMPs to be used during construction activities, temporary fencing to be erected prior to construction activities, and additional tree protection measures that may include implementation of a tree replacement program, such impacts would be less than significant.

The project site contains riparian habitat; however, development of the proposed buildings avoids this habitat. Habitat restoration would occur in portions of the Puerco Canyon Creek bed that are likely federal- and/or state-regulated wetlands/waters under the Clean Water Act (jurisdictional waters). Specifically, the project's habitat restoration program would disturb up to 0.5 acre of jurisdictional waters and/or riparian area. If the USACE and/or CDFW identifies impacts to waters or riparian areas under their jurisdiction that are above those identified in the BRA and not mitigated as required by these agencies, this would be considered a potentially significant impact. Further, because temporary and permanent impacts to jurisdictional waters are expected to be greater than 0.10 acre, a Pre-Construction Notification would be required to be submitted to the LARWQCB prior to the start of habitat restoration. Therefore, MM BIO-4 is included to require jurisdictional permitting to be obtained prior to the start of the habitat restoration in the jurisdictional waters and riparian areas of Puerco Canyon Creek prior to implementation of the fuel modification program. This MM also requires the identification of permitting requirements and/or avoidance documentation required by the LARWQCB and CDFW, as well as a list of minimum MMs that would be required to reduce physical impacts to protected waters during implementation of the habitat restoration program. With implementation of MM BIO-4, impacts on waters protected by Section 404 of the Clean Water Act would be less than significant.

Because of the project site's proximity to the Pacific Ocean, runoff containing pollutants from construction or excavation may result in indirect impacts to water quality. However, as discussed in Section 4.9, *Hydrology and Water Quality*, below, clearing, excavation, and grading would be prohibited during the rainy season (November 1 to March 31). Further, as also discussed therein, project construction and operation would occur in accordance with applicable water quality regulations and site-specific stormwater plans to ensure that pollutants do not enter stormwater flows to Puerco Canyon Creek or the Pacific Ocean. In addition, as discussed further in Section 4.9, *Hydrology and Water Quality*, the project is anticipated to reduce stormwater flows from the project site when compared to existing conditions. In this manner, the project may represent an improvement in water quality when compared to existing conditions. Therefore, with implementation of the City's standard conditions of approval, MM BIO-1, MM BIO-3, and MM BIO-4, impacts would be less than significant with mitigation.

d. **Less than Significant.** As discussed above, the project site is located adjacent to Puerco Canyon, which serves as an important wildlife corridor in the region and has recently been largely affected by the 2018 Woolsey Fire. While temporary construction activities would introduce new sources of disturbance that might disrupt the movement of any wildlife (e.g., construction and/or mechanical noise, concentrated work activities), construction would occur over a short period of time and would not present a long-term interference with wildlife movement. Weeding and planting activities associated with the habitat restoration program could periodically disturb areas of the project site, especially in Puerco Creek where eradication of the dense and expansive giant reed stand would occur following post-Woolsey Fire conditions. These periodic restoration activities would individually occur over short periods of time and would not present a long-term interference with wildlife movement. Operation of the project would not introduce substantial threat to the movement of any wildlife, as there would be no change in the type of use of the project site. The project would not involve the construction of any new structures that would affect the movement of any wildlife, either as a direct barrier to their movement, or as a choke point, as all proposed development is contained within the existing building footprints or previously graded areas. While the project site and immediately adjacent areas support riparian habitat and ESHA, the project's impacts on these areas would not substantially interfere with the wildlife corridor in Puerco Canyon. Additionally, the restoration of native habitat to the creek bed may improve wildlife connectivity for native animal and bird species.

Due to the developed character of the existing project site, including the presence of fencing, the potential for native resident or migratory wildlife species movement to occur through the developed portion of the project site, though continuously possible, is unlikely. Nevertheless, under the project, installation of primarily native and drought-tolerant plant species may provide limited opportunities for native wildlife, particularly birds, to utilize the project site with the potential for limited beneficial effects. However, the project would not have a substantial adverse effect on federally protected areas nor would it interfere with any native resident or migratory wildlife corridors and, therefore, impacts would be less than significant.

e. **Less than Significant.** The project would potentially impact 19 trees protected under the City's LCP, including 10 Coast Live Oaks, 8 Western Sycamores, and 1 Southern California Black Walnut, all of which are located on the western half of the project site. Of these trees, 16 are located north of the existing playground, lawn, and sandbox area north of the existing modular buildings. Though affected by the Woolsey Fire, these trees and associated habitats remain largely intact with the opportunity for, and signs of, regrowth.

Permanent impacts would result from the required removal of two Western Sycamores located near the project site's western boundary within the toddler playground. The Tree Protection Plan concluded that permanent impacts are not likely to occur for the remaining trees because they are well adapted to conditions that would remain unchanged by the project, including the current location, current extent of impervious surfaces, and compacted soils that exist within the playground, lawn, and sandbox areas north of the current facilities.

Construction would result in temporary impacts by encroaching upon the Tree Protection Zones of 17 protected trees, comprised of: three Coast Live Oak trees located in a landscaped area just north of the current parking lot and west of the current septic system; one California Black Walnut northwest of the proposed buildings; and seven Coast Live Oak trees and six Western Sycamore trees located on the north slope of Puerco Canyon. By encroaching on their Tree Protection Zones, project construction has the potential to affect the health of these trees and result in a potentially significant impact. Nonetheless, the City's standard conditions of approval require temporary fencing during construction to limit alteration or activity in the trees' Tree Protection Zones. Even with this requirement, some construction activities would be required inside the fencing and within the Tree Protection Zones. If construction activities result in the permeant loss of a tree, it would be considered a potentially significant impact. In this case, the City's standard conditions of approval require that additional tree protection measures that include implementation of a tree replacement program should a protected tree not survive 10 years after completion of the project. With adherence to the City's standard conditions of approval, which requires replacement planting at a 10:1 ratio for all lost trees within 10 years of project completion, impacts would be less than significant.

f. **No Impact.** The project is not located within any approved local, regional, or state Habitat Conservation Plan or Natural Community Conservation Plan. Therefore, no impacts would occur.

Mitigation Measures

The following mitigation measures are required to reduce potential impacts related to biological resources to a less than significant level.

BIO-1 ***Habitat Restoration Mitigation Plan and Monitoring Program.*** *All restoration of the currently degraded areas of the ESHA onsite shall be completed in accordance with the recommendations of the Mitigation Plan and Monitoring Program prepared for the Malibu Jewish Center & Synagogue prepared by David Magney Environmental Consulting in September 2017. Invasive plants shall be removed by hand rather than by chemical means whenever possible, and shall only be conducted by persons able to identify native plants and their seedlings, and able to avoid removal of naturally colonizing native plants at the project site. Any herbicides used for the removal of giant reed shall be limited to those approved by the Los Angeles Regional Water Resources Control Board for the removal of invasive plant species within a riparian area. Targeted herbicide treatments shall be applied by hand to avoid inadvertent loss of native riparian plants. Per LCP Policy 3.19, the use of herbicides is prohibited during the winter season or when rain is predicted within a week of application. The use of anti-coagulant rodenticides shall be prohibited. Maintenance of the program shall occur on a monthly basis for the first 6 months, bi-monthly for the remaining 6 months of the first year, and quarterly for the following 4 years. The area of habitat to be restored shall be permanently preserved through the recordation of an open space deed restriction that applies to the entire restored area.*

Plan Requirements and Timing: Restoration of ESHA habitat shall be carried out in accordance with the Mitigation Plan and Monitoring Program. The open space deed restriction shall be recorded prior to issuance of the coastal development permit. Prior to issuance of building permits, the applicant shall file a performance bond with the City to complete and maintain plantings until pre-established performance criteria are met. Restoration work shall be completed prior to release of the performance bond.

Monitoring: The applicant shall submit monitoring reports for the restoration to the City to demonstrate the performance and success of restoration annually. City staff shall monitor for final performance of the restored habitat.

BIO-2 ***Special-status Plant Surveys.*** *An approved biologist shall be retained by the applicant to monitor construction and fuel modification activities to identify any individual special-status plant species, as defined by the City, located within the proposed area of disturbance. If rare or special-status plants are found during* *construction or fuel modification, and determined to be vulnerable, the monitoring biologist shall make recommendations so that the individuals are avoided. If avoidance is not feasible, then potentially affected individuals or populations of special-status plants shall be protected until an appropriate relocation and mitigation plan is developed and implemented. Any compensatory replacement of individual specimens or populations shall require seed and/or plant salvage from onsite or local populations, and reestablishment of any equivalent area occupied by the plant either on- or offsite, to be preserved and managed in perpetuity.*

Plan Requirements and Timing: All requirements shall be included on final grading plans. Construction crews shall adhere to direction from the monitoring biologist. The biologist shall have complete authority to stop all construction in the event they feel conditions of approval either have been or will potentially be violated. The monitoring biologist shall confer with the City Biologist and/or project planner to determine a suitable remedy for the situation. Any relocation and mitigation plans developed by the monitoring biologist shall be submitted to the applicant and the City for review and approval prior to continuation of construction.

Monitoring: The applicant must submit final grading plans to the City for review and approval prior to issuance of a grading permit. The applicant shall submit to City permitting staff the name and contact information for the approved biologist prior to commencement of construction activities. The monitoring biologist must discuss any restrictions with construction crews during construction. City permit compliance monitoring staff shall inspect the site as appropriate.

BIO-3 ***Worker Environmental Awareness Program (WEAP).*** *Prior to the issuance of grading permits, the applicant shall submit to the City a WEAP for restoration activities within the ESHA. Prior to initiation of habitat restoration activities (including staging and mobilization) within the ESHA, all personnel associated with habitat restoration shall attend WEAP training, conducted by a qualified biologist, to aid workers in recognizing special-status resources that may occur in the restoration area.*

- *The WEAP training shall include identification of the sensitive species and habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. The WEAP shall also include detailed information regarding aquatic invasive species and the necessary steps required to prevent the spread of these specie (i.e., equipment and gear cleaning). A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employers, and other personnel involved with construction of the project.*

- *All restoration employees shall sign a form documenting that they have attended the WEAP and understand the information presented to them. The form shall be submitted to the appropriate local jurisdiction for document compliance.*

Plan Requirements and Timing: WEAP shall be held by a qualified biologist prior to the start of construction activities.

Monitoring: The applicant shall document compliance to City Planning staff or the City Biologist.

BIO-4 ***Jurisdictional Permitting.*** *Prior to the commencement of habitat restoration activities, the applicant shall obtain all appropriate federal and state permits, including Clean Water Act Section 404 Nationwide Permit (NWP), Section 401 Water Quality Certification, and Section 1602 Lake and Streambed Alteration Agreement (LSAA).*

The Los Angeles Regional Water Quality Control Board (LARWQCB) Section 401 Pre-Construction Notification and the CDFW LSAA Application shall identify the site owner and contact person, site location, total area of disturbance, watercourse information, area of respective jurisdictional disturbance and area of dredge/fill, brief project description with information specific to habitat restoration activities including a list of equipment and herbicides that would be utilized, discharge information, purpose of the activity, the types of riparian habitat communities to be affected, erosion-protection measures to protect the water quality of stormwater runoff, and additional measures to reduce impacts to onsite biological resources. A copy of the proposed site plans must also be provided with each application.

Habitat restoration shall adhere to the notification requirements and standard BMPs specified in the Statewide General Construction Permit for a construction project which would result in land disturbance of one or more acres. Habitat restoration shall also adhere to all BMP requirements required by the City's standard conditions of approval for maintaining water quality, including implementation of a Wet Weather Erosion Control Plan (WWECP). The site shall be made available for inspection by the City, LARWQCB, and/or CDFW.

Plan Requirements and Timing: The applicant shall obtain all appropriate federal and state permits prior to the start of habitat restoration. All necessary pre-construction notifications shall be submitted to the LARWQCB prior to the start of habitat restoration.

Monitoring: The habitat restoration project manager shall monitor all restoration activities for compliance with federal and state water quality regulations.

4.5 Cultural Resources

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

4.5.1 Existing Setting

There is documented evidence for human occupation of southern California mainland areas for at least 11,000 years. However, many ancient sites may have been lost, inundated, or deeply buried as a result of marine transgression, erosion, aggradations, and other natural forces. Approximately 3,000 years ago, a transfer from mobile populations to stationary groups began, bringing a change in subsistence strategies and specialized labor. Trade and technological advances altered the southern Californian Native American communities to resemble contemporary ethnographic populations encountered by the Spanish. The Chumash and Tongva were the primary populations established within the Malibu region. The project site is located on a low hilltop adjacent to PCH and Puerco Canyon Creek

The project site contains a segment of archaeological site CA-LAN-19, which is believed to have been a peripheral portion of a Chumash village site, probably dating between about 3,500 and 1,500 years ago during the Intermediate Period. A Phase II archaeological test excavation in 1992 found that while much of CA-LAN-19 within the project site and vicinity was heavily disturbed by previous grading and terracing, the project site still contained an intact archaeological midden deposit buried under a 40 centimeter layer of mixed fill, reaching 90 centimeters below ground level, and located approximately 75 by 75 meters from the southwestern corner of the project site (W and S Consultants 1992). However, extensive grading and construction has occurred on the project site since the 1992 test excavation. This disturbance includes extensive activity in 1996 to construct the four modular buildings and driveway, and disturbance in 2006 to complete the existing temple/event venue. It is likely the onsite portion of CA-LAN-19, which was noted as early as 1948 to have been mostly obliterated by the construction of PCH, was likely removed and/or destroyed during construction of the existing buildings and parking lot.

The project site is not located within the vicinity of any known historical resources; the closest historical resources, Humaliwo, Stevens House, and Adamson House, are located more than 1.5 miles to the southeast (National Park Service 2018).

The California Register of Historical Resources (CRHR) provides the grounds for and extent to which historical resources of the State are protected. California Health and Safety Code Section 7050.5 directs procedures to undertake in the case that human remains are found. California Public Resources Code Section 5097.98 additionally provides procedures that would direct action in the case that Native American remains are discovered.

City Standard Conditions of Approval

The City applies the following LCP standard conditions to applicable projects to minimize impacts to cultural resources.

- In the event that potentially important cultural resources are found in the course of geologic testing or during construction, work shall immediately cease until a qualified archaeologist can provide an evaluation of the nature and significance of the resources and until the Planning Director can review this information. Thereafter, the procedures contained in LIP Chapter 11 and those in MMC Section 17.54.040(D)(4)(b) shall be followed.

- If human bone is discovered during geologic testing or during construction, work shall immediately cease and the procedures described in Section 7050.5 of the California Health and Safety Code shall be followed. Section 7050.5 requires notification of the coroner. If the coroner determines that the remains are those of a Native American, the applicant shall notify the Native American Heritage Commission by phone within 24 hours. Following notification of the Native American Heritage Commission, the procedures described in Section 5097.94 and Section 5097.98 of the California Public Resources Code shall be followed.

4.5.2 Impact Discussion

a. **Less than Significant.** A project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment.[13] Section 15064.5 of the *State CEQA Guidelines* defines an historical resource as (1) a resource listed in or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources; (2) a resource listed in a local register of historical resources or identified as significant in an historical resource survey meeting certain state guidelines; or (3) an object, building, structure, site, area, place, record or manuscript that a lead agency determines to be significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided that the lead agency's determination is supported by substantial evidence in light of the whole record. The project does not propose any alteration or damage to any designated historic structures or resources. Therefore, the project is anticipated to have a less than significant impact on historical resources.

b–c. **Less than Significant with Mitigation.** Section 15064.5 of the *State CEQA Guidelines* defines significant archaeological resources as resources that meet the criteria for historical resources, as discussed above, or resources that constitute unique archaeological resources. Although a previously recorded archaeological site is located on the project site (CA-LAN-19), it is likely this site was previously recorded and removed during previous grading activities (W and S Consultants 1992). Project construction activities would be confined to previously developed/disturbed areas, which have been subject to several series of archaeological excavations. As such, the potential to encounter an intact archeological resource within the project site is very low. However, the proposed subterranean parking garage would excavate previously undisturbed native soils within the previously discovered midden deposit described above. While this deposit was likely removed during grading for the existing buildings, the subterranean parking garage would extend into native soils and there remains the potential that archaeological resources could be discovered during excavation. Thus, impacts are potentially significant. However, the monitoring of initial construction activities by a qualified archaeologist and Chumash

[13] *California Public Resources Code Section 21084.1*

monitor as described in MM CR-1 below, as well as required adherence to the City's standard conditions of approval and LIP Chapter 11, would ensure that potential impacts to archaeological resources be mitigated to a less than significant level.

Mitigation Measures

The following mitigation measure is required to reduce potential impacts related to cultural resources to a less than significant level.

CR-1 ***Initial Construction Monitoring.*** *A qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (2008) and designated Chumash monitor shall be present onsite for monitoring during initial site grading and trenching activities performed below ground surface areas. The archaeological monitor and Chumash monitor shall meet and consult on the scope of the monitoring responsibilities prior to any soil disturbing activities. The City shall further determine the extent of project activities to be monitored. The archaeological monitor and Chumash monitor shall be present on the project site according to an agreed upon schedule, until the City, in consultation with the project archaeological consultant, determines that future construction activities would have no effects on significant archaeological resources. The archaeological monitor shall record and be authorized to collect soil samples and artefactual material as warranted for analysis. In the event that an intact archaeological deposit is encountered, the monitors shall be permitted to temporarily redirect construction activities and equipment until the resource is evaluated.*

Plan Requirements and Timing: The applicant shall retain a qualified archaeologist and Chumash monitor prior to the start of construction. The City shall approve the agreed-upon schedule prior to the start of construction.

Monitoring: The qualified archaeologist and Chumash monitor shall monitor initial grading and excavation for the entirety of the agreed-upon schedule. The qualified archaeologist and Chumash monitor would not be required for subsequent construction activities.

4.6 Energy

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

4.6.1 Existing Setting

The City of Malibu, including the project site, is served by Southern California Edison for electricity and natural gas is provided by the Southern California Gas Company (see Section 4.19, *Utilities*). Energy use and conservation in the City is guided several state and regional plans, including guidance by the County of Los Angeles Community Climate Action Plan, which .aims to address the effects of climate change as required by the California Assembly Bill (AB) 32, the Global Warming Solutions Act (Los Angeles County Department of Regional Planning 2015). The California Air Resources Board has suggested a significant role of local governments and communities to reduce GHG emission to statewide reduction efforts for GHG emissions. The Community Climate Action Plan includes an inventory of GHG emissions and strategies to mitigate and avoid GHG emissions in the Los Angeles County area including from building energy. Additionally, the project site is subject to energy conservation requirements in the California Building Standards Code (Title 24), California Energy Code (Part 6). Title 24, Part 6 of the California Code of Regulations, *California's Energy Efficiency Standards for Residential and Non-Residential Buildings*, is the primary legislation governing energy use in new buildings in the state.

4.6.2 Impact Discussion

a. **Less than Significant Impact.** The project site would include the construction and operation of an additional 18,423 sf in two buildings for school, administration and temple services. During construction, temporary consumption of energy resources would be required for the movement and use of construction equipment and building materials. Construction activities would be similar in character to the City's urban in-fill developments. The project would be developed in accordance with applicable local, state, and federal plans and policies in regard to energy usage including but not limited to the Community Climate Action Plan. Compliance with local, state, and federal regulations (e.g., limiting engine idling times) would reduce temporary energy demand usage to the maximum extend feasible, so construction-related impacts to energy resources would be less than significant.

Project operations would not require the use of equipment that would be more energy intensive than is used for comparable activities, or the use of equipment that would not conform to current emissions standards and related fuel efficiencies. The project would be subject to energy conservation requirements in the California Building Standards Code (Title 24), California Energy Code (Part 6) and CALGreen. Project compliance with applicable requirements and/or regulations discussed in the *Air Quality* and *Greenhouse Gas Emissions* discussion (e.g., 2016 California

Code of Regulation Title 24, Part 6 – Energy Efficiency Standards) as well as the County of Los Angeles' Community Climate Action Plan, would be consistent with state and local energy reduction policies and strategies and would not be anticipated to consume energy resources in a wasteful or inefficient manner; therefore, impacts would be less than significant.

b. **No Impact.** As the project would occur within an existing, developed site in an urbanized area (as defined in CEQA), the project would not obstruct the use of renewable energy, would not serve as a barrier to the use or development of renewable energy resources, and would not displace any existing renewable energy facilities. During construction and operation, vehicles and equipment used would be required to conform with applicable state and federal fuel efficiency requirements including, as discussed above, the Community Climate Action Plan for Los Angeles County. Therefore, the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and impacts would be less than significant.

4.7 Geology and Soils

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death, involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) 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?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☒	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

4.7.1 Existing Setting

The geologic setting of the project site is based on existing reports and maps, including the City's General Plan, U.S. Geological Survey (USGS) and California Geological Survey maps; and other available technical documents. The project site is in Southern California, which is a seismically active region at the junction of the North American and Pacific tectonic plates on a slope that experiences frequent erosion. The project site is north and south of components of the Malibu Coast Fault, and the project site is also located at the southeast portion of a shale Monterey Formation Miocene-Tertiary soil component and within and surrounded to the east and south by and Old Alluvium Quaternary soil component, per Plate II of the Geotechnical Reports (January 6, 2015). Artificial fill soils were encountered, consisting predominantly of moderately compacted silty to clayey medium to coarse grained sand. Terrace geologic profiles encountered onsite are comprised of ancient beach deposits with some continental deposits. Bedrock of the Monterey Formation was encountered immediately beneath fill on the property's central plateau and observed to consist of thinly interbedded shale and siltstone of the formation covered by artificial fill and terrace deposit soils, considered "soft rock".

The level portions of the project site are located outside of both liquefaction[14] and landslide-risk areas, though the northern areas of the project site are mapped immediately adjacent to and within an earthquake-induced landslide zone, where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation would be required. Landslides and other types of slope failures, such as rock falls and mud and debris flows, can result in areas with varying topography in the event of an earthquake or wet winters.[15] (California Department of Conservation 2014)

In the event of a wildfire, the fire's high temperature can fuse soils and limit percolation, which may reduce the ability of water to penetrate into soils. When combined with high-intensity rainfall events, these conditions increase the risk of slope instability, landslides, or debris flows. The 2018 Woolsey Fire burned vegetation in the northern portion of the project site, which changed the formerly heavily vegetated slopes to be largely burned and denuded of ground-based vegetation, increasing the potential for soil slumping, landslides, and erosion until vegetation regrows over the next 1-2 years, when most barren areas are anticipated to again have vegetative cover. As described further in Section 4.4, *Biological Resources*, and Section 4.20, *Wildfires*, supported by Appendix E, vegetation has regrown within and adjacent to the site and large trees remain on the slope that would continue to assist with overall site soil retention.

The project site is primarily located overlying Chumash-Boades-Malibu soil association with 30 to 75 percent slopes.[16,17] The soil is generally composed of gravelly loam, loam, clay, and weathered bedrock, which drains moderately well and has moderate to high runoff characteristics. Geotechnical Reports were assembled for the project to determine slope stability and soil compatibility (Appendix D).

Because paleontological resources are tied to the rock units in which they occur, the geologic setting is key to understanding potentially important paleontological resources in the project site.

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[14] A liquefaction zone is where historic occurrence of liquefaction, or local geological, geotechnical, and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required. Liquefaction is a seismic phenomenon in which loose, saturated, fine-grained granular soils behave similarly to a fluid when subjected to high-intensity ground shaking. Liquefaction occurs when three general conditions exist: (1) shallow groundwater; (2) low-density, fine, clean sandy soils; and (3) high intensity ground motion. Studies indicate that saturated, loose and medium dense, near-surface cohesionless soils exhibit the highest liquefaction potential, while dry, dense, cohesionless soils and cohesive soils exhibit low to negligible liquefaction potential.

[15] California Department of Conservation. *State of California Seismic Hazards Zone: Malibu Beach Quadrangle. 2001.* Available at: http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_malib.pdf Accessed December 14, 2016

[16] US Department of Agriculture, Natural Resources Conservation Service. *Soil Survey: Santa Monica Mountains National Recreation area.* Available at: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx Accessed December 14, 2016.

[17] 30 to 75 percent slopes are slopes with a horizontal to vertical ratio (H:V) of 10:3 slopes and 4:3 slopes, respectively.

Paleontological resources have been discovered intermittently throughout the Malibu area and include marine vertebrates and invertebrates of the Tertiary-aged Monterrey Formation to terrestrial vertebrates of younger Quaternary-aged alluvium and terrace deposits. The subsurface of the project site is comprised of four different geologic units that each have an associated potential for paleontological resources (see Table 11). Geologic units at the project site are assigned low to moderate potential for the discovery of paleontological resources.

Table 11. Geologic Units and Paleontological Potential Within Project Vicinity

Geologic Unit Label	Geologic Unit Name	Age	Paleontological Potential
af	Artificial Fill	Recent	None
Qa	Quaternary Alluvium	Quaternary	Low
Qt	Quaternary Terrace Deposits	Quaternary	Moderate
Tm	Monterey Formation	Tertiary	Moderate

Source: Geotechnical Reports (see Appendix B)

City Standard Conditions of Approval

The City applies the following LIP standard conditions to applicable projects to minimize impacts to geology and soils.

- Clearing and grading during the rainy season (extending from November 1 to March 31) shall be prohibited for development that:
    - Is located within or adjacent to ESHA, or
    - Includes grading on slopes greater than 4 to 1.
- Approved grading for development that is located within or adjacent to ESHA or on slopes greater than 4 to 1 shall not be undertaken unless there is sufficient time to complete grading operations before the rainy season. If grading operations are not completed before the rainy season begins, grading shall be halted and temporary erosion control measures shall be put into place to minimize erosion until grading resumes after March 31, unless the City determines that completion of grading would be more protective of resources.
- Construction fencing shall be installed within five feet of the limits of grading or at the top of slope prior to the beginning of any construction and shall be maintained throughout the construction period to protect the site's sensitive habitat areas.
- All recommendations of the consulting certified engineering geologist or geotechnical engineer and/or the City geotechnical staff shall be incorporated into all final design and construction including foundations, grading, sewage disposal, and drainage. Final plans shall be reviewed and approved by the City geotechnical staff prior to the issuance of a grading permit.
- Final plans approved by the City geotechnical staff shall be in substantial conformance with the approved Coastal Development Permit relative to construction, grading, sewage

disposal and drainage, as applicable. Any substantial changes may require a Coastal Development Permit amendment or a new Coastal Development Permit.

4.7.2 Impact Discussion

a(i) - a(ii). **Less than Significant**. The project site is not located in a designated Alquist-Priolo Earthquake Fault Zone, nor was there positive evidence of active faulting during subsurface explorations conducted at the project site, and the potential for surface rupture during a seismic event is considered remote. As the project site is located within the seismically active Southern California region, there is a possibility that there could be traces of previously unidentified fault(s) onsite. However, the project would be designed to follow design provisions through the International Building Code (IBC) and California Building Code (CBC) (as adopted by the City in codified in MMC Section 15.04.010) to employ design standards that consider seismically active areas to safeguard against major structural failures or loss of life. Therefore, while the project site would be subject to ground shaking during future seismic events (as most structures within Southern California are), through the incorporation of proper engineering measures in accordance with existing regulations, building codes, and the application of the engineering recommendations provided in the approved Geotechnical Reports, risks to life and property would be minimized. With adherence to applicable building codes and the recommendations of the project-specific Geotechnical Report, direct and indirect impacts associated with the exposure of people or structures to potential substantial adverse effects, including the risk of loss of life, injury, or death involving rupture of a known earthquake fault would be less than significant.

a(iii). **Less than Significant**. The project site is not located within an area susceptible to liquefaction, and modern buildings designed in accordance with the CBC and City requirements generally preclude significant impacts resulting from liquefaction during a seismic event. Therefore, with implementation of CBC design standards, impacts related to liquefaction would be less than significant.

a (iv). **Less than Significant**. The onsite hillside is located adjacent to a designated landslide hazard zone; however, project activities other than revegetation would not occur within this area.[18] Vegetation changes since the 2018 Woolsey Fire are not anticipated to have substantially altered the overall slope stability required for proposed construction within the project site; further, project construction activities would adhere to CBC and project-specific recommendations. Impacts associated with the risk of landslide or slope failure would be further reduced over time with the reestablishment of vegetation and natural slope-stabilizing features. The Project will further comply with the City's standard conditions of approval listed below to ensure the safety of the public during project construction. Slope stability analyses were also completed for the slope to determine the potential for slope instability during a seismic event (Appendix D). The Slope Stability Analysis concluded that the City's static and pseudo-static seismic and slope stability safety standards would be satisfied by the proposed foundations and structures with implementation of the design specifications of the CBC and project-specific recommendations of the approved Geotechnical Reports that required for incorporation into the project designs per the City's standard conditions of approval (see above). Therefore, potential direct and indirect impacts to people and/or structures related to the exposure of landslides/slope stability would be less than significant.

b. **Less than Significant**. Construction activity associated with large-scale grading may result in wind, gravity, and water driven erosion of soils. The project would require a total of 12,534 cubic

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[18] California Department of Conservation. *State of California Seismic Hazards Zone: Malibu Beach Quadrangle. 2001.* Available at: http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_malib.pdf Accessed December 14, 2016

yards of cut and fill. As discussed in Section 4.4.1 above, clearing, excavation, and grading would be prohibited during the rainy season (November 1 to March 31) per the City's standard conditions of approval. Further, project construction would be required to implement a Stormwater Pollution Prevention Plan (SWPPP) and Erosion and Sediment Control Plan (ESCP) pursuant to LIP Section 17.4.1. These plans shall identify BMPs during the construction phase to minimize or prevent construction-related pollutant runoff. BMPs include practices such as installing sandbag barriers, temporary desilting basins near inlets, gravel driveways, dust controls, employee training, and other good housekeeping practices that help prevent water quality contamination. Once constructed, the project site would be developed with hardscapes and landscaped with vegetation, which would prevent erosion and loss of topsoil by eliminating the potential for rain to encounter undisturbed soils. Further, as discussed in Section 4.9, *Hydrology and Water Quality*¸ BMPs would be implemented in accordance with a Stormwater Management Plan (SWMP) and Water Quality Management Plan (WQMP) to ensure that all runoff is retained and treated onsite during the design year storm. The WQMP would ensure that the Storm Water Quality Design Volume is infiltrated onsite. As discussed in Section 4.9, *Hydrology and Water Quality*, below, infiltration would be accomplished through the installation of five infiltration pits below the surface parking lot. The foundations and structures, designed in accordance with applicable design standards and the project-specific recommendations of the Geotechnical Report, would ensure that un-vegetated portions of the hillside above the project site are stable and do not result in erosion or the loss of topsoil. Thus, impacts from soil erosion or the loss of topsoil during the operation of the project would be less than significant.

c - d. **Less than Significant**. Potential impacts regarding liquefaction and landslide potential are evaluated above, and the Geotechnical Reports note that the onsite soils are considered to have a low expansion potential. Nonetheless, the project would be constructed in conformance with the CBC, the requirements of the City Public Works Department, and the project-specific recommendations of the Geotechnical Reports as standard conditions of approval (see above). These conditions include foundation and slab-on-grade design recommendations generally used in the Malibu area for foundation design for soils with similar degrees of expansiveness, and inclusion of a structural engineer. Compliance with these codes and requirements would assure direct and indirect impacts related to unstable soils would be less than significant.

e. **Less than Significant.** The project would be constructed in conformance with the City's standard conditions of approval for septic systems and the City Environmental Health Department's Environmental Health Review. The Environmental Health Review recommends project approval only when it determines that septic systems can be adequately operated without negatively affecting groundwater quality, ocean water quality, building foundations, or structures. The project would also be subject to obtaining a WDR from the LARWQCB. Section 4.9, *Hydrology & Water Quality*, evaluates the potential for the OWTS to combine with the stormwater infiltration system and result in groundwater mounding that reaches the ground surface. As concluded therein, effluent from the OTWS would form a small local mound, which would rapidly begin infiltrating to the underlying soils almost immediately adjacent to the OWTS. The northern extent of any groundwater mound is limited by the orientation of underlying bedrock, which forms a physical barrier to further northern movement of wastewater. As a result, no wastewater would daylight on the surface of the onsite hillsides. Because onsite soils have a high infiltration rate, the mound would not extend far enough to co-mingle with the effluent from the stormwater infiltration system and vice versa. Conformance with the LIP standard conditions of approval, the WDR, and the recommendation of the Environmental Health Review would ensure soils intended for septic system utilization would be capable of supporting the proposed septic systems. Therefore, impacts would be less than significant.

f. **Less than Significant with Mitigation**. The project site is located on urbanized developed land, so the potential for project operation to impact unidentified surficial paleontological resources is low. Nevertheless, subsurface excavation associated with construction of the project has the potential to impact paleontological resources as it extends through more paleontologically sensitive Quaternary-aged Terrace Deposits and underlying Tertiary-aged Monterey Formation, both of which have intermittent local potential to contain significant fossil resources. Therefore, the Project would include implementation of MM GEO-1, which includes a requirement to retain an on-call paleontologist to respond to any unanticipated discovery of paleontological resources during ground-disturbing construction activities. With implementation of MM GEO-1, impacts to paleontological resources would be less than significant with mitigation.

Mitigation Measures

The following mitigation measure is required to reduce potential impacts related to cultural resources to a less than significant level.

GEO-1 ***Qualified Paleontologist.*** *A qualified Paleontologist as approved by the City of Los Angeles and the Los Angeles County Natural History Museum Vertebrate Paleontology Department shall be retained prior to earth-moving activities associated with construction of any individual project phase. Prior to these earth-moving activities, the Paleontologist shall determine if a site-specific mitigation plan is required for the project based on the underlying geology. If a site-specific mitigation plan is required, the plan shall specify the level and types of mitigation efforts as set forth below, based on the types and depths of any ground disturbing activities and associated, impacted geological unit.*

- *The mitigation efforts shall address specific excavation activities within Qt or Tm soils as determined by the scope of work and final grading plan, including all excavation located under the proposed chapel and proposed school structure, and driveway into the proposed subterranean parking garage.*
- *The Paleontologist shall provide the construction crew(s) a brief summary of the sensitivity, the rationale behind the need for protection of these resources, and information on the initial identification of paleontological resources.*
- *In the case that paleontological resources are uncovered at any point of construction activities, the Construction Contractor shall halt ground-disturbing activities to notify the Paleontologist and City, at which time the Paleontologist shall make a preliminary taxonomic identification using comparative manuals. The Paleontologist then shall inspect the discovery, determine whether further action is required, and recommend measures for further evaluation, fossil collection, or protection of the resource, as appropriate.*
  - *Ground-disturbing activities shall not resume until the discovery has been assessed by the Paleontologist.*
  - *The paleontologist shall have the authority to halt construction activities to allow a reasonable amount of time to identify potential resources.*
  - *Significant resources found shall be curated as determined necessary by the Paleontologist.*

Plan Requirements and Timing: The applicant shall retain a qualified Paleontologist for the excavation located under the proposed chapel and proposed school structure, and driveway into proposed subterranean parking garage prior to the start of construction. The City shall approve the agreed-upon schedule prior to the start of construction. The conditions for monitoring and treatment of discoveries shall be printed on all grading plans.

Monitoring: The qualified Paleontologist shall provide the construction crew(s) a brief summary of the sensitivity and initial identification of paleontological resources, particularly for excavation activities for the excavation located under the proposed chapel and proposed school structure. The City shall review and approve construction-related recommendations by the Paleontologist prior to their adoption and implementation.

4.8 Greenhouse Gas Emissions

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

4.8.1 Existing Setting

Global climate change can be measured by changes in wind patterns, storms, precipitation, and temperature. Scientific consensus has identified human-related emissions of greenhouse gases (GHGs) above natural levels is a significant contributor to global climate change. GHGs are substances that trap heat in the atmosphere and regulate the Earth's temperature, and include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ground level ozone, and fluorinated gases, such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and halons. The potential impacts of climate change include severe weather patterns, flooding, reduced quality and availability of water, sea level rise, and beach erosion. Primary activities associated with GHG emissions include transportation, utilities (e.g., power generation and transport), industry, manufacturing, agriculture, and residential. End-use sector sources of GHG emissions in California are as follows: transportation (37 percent), industry (23 percent), electricity generation (20 percent), agriculture and forestry (8 percent), residential (7 percent) and other (5 percent) (ARB 2015).

Assembly Bill (AB) 32 is a California State Law that establishes a comprehensive program to reduce GHG emissions from all sources throughout the state. AB 32 requires CARB to develop regulations and market mechanisms to reduce California's GHG emissions to 1990 levels by 2020, representing a 25 percent reduction statewide, with mandatory caps beginning in 2012 for significant emissions sources. The 2015 Energy Report Card for the County of Los Angeles accounted for building energy, on-road transportation, stationary sources, solid waste, water conveyance, ports, off-road transportation, wastewater treatment, agriculture, and the Los Angeles World Airports. Total existing emissions in 2010 were estimated at approximately 99,134,526 metric tons CO_2e (carbon dioxide equivalents). Building energy accounted for 39.2 percent of emissions, followed closely by transportation that represented 33.5 percent. Stationary sources, solid waste, water conveyance, and ports accounted for 19.7 percent, 4.4 percent, 1.1 percent, and 1.1 percent respectively. Off-road transportation, wastewater treatment, agriculture, and Los Angeles World Airports each accounted for less than 1.0 of emissions. Total per capita GHG emissions from the County in 2010 were approximately 10.1 MT CO_2e per person, compared to 12.3 MT CO_2e per person for the state (Institute of the Environment and Sustainability 2015).

As described in Section 4.3, *Air Quality*, the project site is in the City within the Basin. The major sources of GHG emissions in the vicinity include motor vehicles and building energy needs, as well as the construction and maintenance of buildings, streets, and infrastructure.

Neither the City nor SCAQMD have approved a threshold of significance for GHG emissions. Section 15064.4 of the CEQA Guidelines was adopted to assist lead agencies in determining the significance of the impacts of GHGs. Consistent with developing practice, this Guideline section urges lead agencies to quantify GHG emissions of projects where possible. When no guidance exists under CEQA, the lead agency may look to and assess general compliance with comparable regulatory schemes. In its January *2008 CEQA and Climate Change* white paper, the California Air Pollution Control Officers Association (CAPCOA) investigated a variety of analytical procedures and ranges of what would be considered significant for a project. Therein, CAPCOA suggested a possible quantitative threshold option that would capture 90 percent of GHG emissions from future discretionary development projects. According to CAPCOA, the “objective was to set the emission threshold low enough to capture a substantial fraction of future residential and nonresidential development that will be constructed to accommodate future statewide population and job growth, while setting the emission threshold high enough to exclude small development projects that will contribute a relatively small fraction of the cumulative statewide GHG emissions.” A 90 percent capture rate would “exclude the smallest proposed developments from potentially burdensome requirements … to mitigate GHG emissions.”

The SCAQMD released draft guidance regarding interim CEQA GHG thresholds of significance in October 2008, proposing a tiered approach whereby the level of detail and refinement needed to determine significance increases with a project’s total GHG emissions. “Tier 3,” the primary tier by which SCAQMD currently determines the significance of stationary emission sources, relies on Executive Order S-3-05 as the basis for a screening level, and was established at a level that captures 90 percent of Air Basin-wide land use GHG emissions. For Tier 3, the SCAQMD proposes that lead agencies choose between two options: Option #1 provides screening levels of 3,500 MT/yr CO_2e for residential projects, 1,400 MT/yr CO_2e for commercial projects and 3,000 MT/yr CO_2e for mixed-use; whereas Option #2 is a single threshold of 3,000 MT/yr CO_2e for all land use types. The SCAQMD’s proposed screening level of 3,000 MT/yr CO_2e per year is a South Coast Air Basin-specific level that would meet CAPCOA’s intent for the suggested quantitative threshold option. It should be noted that the SCAQMD has formally adopted a GHG significance threshold of 10,000 MT/yr CO_2e per year for industrial/stationary source projects where the SCAQMD is the lead agency based on a 90 percent capture rate for the industrial/stationary source sector. Because the project proposed only commercial uses, its resulting emissions are compared against the SCAQMD recommended threshold of 1,400 MT/yr CO_2e.

4.8.2 Impact Discussion

a-b. **Less than Significant.** The project would generate increased GHG emissions over the short term from construction equipment. The total emission from project construction was modeled using CalEEMod projections for the proposed construction duration of 18 months (see Appendix A). Emissions from construction would consist of mobile sources such as haul trucks, excavators, and other construction equipment. The total estimated emissions from unmitigated construction activity would be 207 MT/yr CO_2e, which is well beneath the SCAQMD recommended significance threshold of 1,400 MT/yr CO_2e. It is important to consider that this represents a one-time emission of GHGs. The SCAQMD defines a project lifetime as 30 years. For construction-related GHGs, SCAQMD recommends that construction emissions be amortized over 30 years and added to operational emissions and then compared to the significance threshold. As a result, the above estimate provides a conservative estimate of GHG emissions resulting from project construction.

Once operational, the project would result in direct and indirect GHG emissions, primarily CO_2, CH_4, and N_2O, as a result of fuel combustion for heating ventilation and air conditioning (HVAC) systems, lighting, and motor vehicle operations. For operational activities, the CalEEMod emission model is based on trip generation rates, land use types, and the proposed floor area. As discussed in Section 4.16, *Transportation and Traffic*, the project would result in a net increase in vehicle trips at the project site. As a result, the total estimated emissions for unmitigated operational activities would be 508 MT/yr CO_2e, which is also well below the SCAQMD recommended significance threshold of 1,400 MT/yr CO_2e.

As neither construction nor operation of the project were estimated to exceed the SCAQMD recommended significance threshold of 1,400 MT/yr CO_2e, impacts would be less than significant. As demonstrated in Table 12, *Project Consistency with Applicable GHG Reduction Policies*, the project is consistent with applicable policies to reduce GHG emissions.

Table 12. Project Consistency with Applicable GHG Reduction Policies

Policy	Description	Demonstration of Project Consistency
AB 1493	Reduces GHG emissions in new passenger vehicles from 2012 through 2016. Also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020	**Consistent.** This measure applies to all new vehicles and the project would not conflict with its implementation.
Low Carbon Fuel Standard	Establishes protocols for measuring life-cycle carbon intensity of transportation fuels and helps to establish use of alternative fuels.	**Consistent.** This measure applies to transportation fuels utilized by vehicles in California. The project would not conflict with the implementation of this measure. Construction and operational vehicles association with the project would utilize low carbon transportation fuels as required under this measure.
CALGREEN Requirements	Comply with applicable site development planning and design measures such as bicycle parking and light pollution reduction.	**Consistent.** The project would be consistent with this requirement via compliance with the MMC, LIP standard conditions of approval, and/or the CALGreen Code.
	Comply with indoor water usage requirements by using low-flow water fixtures that meet the prescribed flow rates (residential and non-residential) or reduce water use by 20 percent from the water use baseline (non-residential).	**Consistent.** The project would be consistent with this requirement via compliance with the MMC, LIP standard conditions of approval, and/or the CALGreen Code.
	Comply with material conservation and resource efficiency measures including applicable weather resistance and moisture management measures.	**Consistent.** The project would be consistent with this requirement via compliance with the MMC, LIP standard conditions of approval, and/or the CALGreen Code.
	Comply with VOC emissions limits for carpet systems, composite wood products, and flooring.	**Consistent.** The project would be consistent with this requirement via compliance with the MMC, LIP standard conditions of approval, and/or the CALGreen Code.

Table 12. Project Consistency with Applicable GHG Reduction Policies (Continued)

Policy	Description	Demonstration of Project Consistency
	Reduce diesel-fueled commercial motor vehicle idling.	**Consistent.** The project is committed to implementing this action to the extent feasible. Construction trucks would comply with CARB's anti-idling measure.
Climate Action Team	Achieve California's 50 percent waste diversion mandate (Integrated Waste Management Act of 1989) to reduce GHG emissions associated with virgin material extraction.	**Consistent.** The CALGreen Code implements this goal, and the project would be consistent with the requirements.
	Plant five million trees in urban areas by 2020 to effect climate change emission reductions.	**Consistent.** The project would provide appropriate landscaping on the project site including vegetation and trees.
	Implement efficient water management practices and incentives, as saving water saves energy and GHG emissions.	**Consistent.** CALGreen Code implements this goal, and the project would be consistent with the requirements.
	The California Energy Commission updates building energy efficiency standards that apply to newly constructed buildings and additions and alterations to existing buildings. Both the Energy Action Plan and the Integrated Energy Policy Report call for ongoing updating of the standards.	**Consistent.** CALGreen Code implements this goal, and the project would be consistent with the requirements.
	Reduce GHG emissions from electricity by reducing energy demand. The California Energy Commission updates appliance energy efficiency standards that apply to electrical devices or equipment sold in California. Recent policies have established specific goals for updating the standards; new standards are currently in development.	**Consistent.** CALGreen Code implements this goal, and the project would be consistent with the requirements.
	Apply strategies that integrate transportation and land use decisions, including but not limited to promoting jobs/housing proximity, high-density residential/commercial development along transit corridors, and implementing intelligent transportation systems.	**Consistent.** The project would be located on an existing institutional property in proximity to existing residential and commercial businesses, which would minimize trip lengths and associated emissions.

4.9 Hazards and Hazardous Materials

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☐

4.9.1 Existing Setting

According to the State of California EnviroStor Database compliant with Government Code Section 65962.5, there are no current known hazardous waste clean-up sites within the project site or immediate vicinity. However, the project site may support asphalt-based contaminants within paved surfaces. There are two hazardous materials sites located within 1.0 mile of the project site; a site in Alumni Park at Pepperdine University (24255 W PCH, 0.6 mile to the northeast), and the Webster Elementary School site (3602 Winter Canyon Road; 0.9 mile to the northeast). Both sites were identified as having leaking underground storage tanks (LUST), but both have been properly remediated. The LARWQCB issued the Pepperdine University site a

"Case Closed" status in 2013, and the Webster Elementary School site a "Case Closed" status in 1994. (California EnviroStor 2018).

The closest public school to the project site is Webster Elementary School, located approximately 0.9 mile northeast. The project site is not located in the vicinity of any public airport or a public airport land use plan area. The nearest airport to the project site is Santa Monica Airport, located approximately 15.0 miles southeast, followed by Van Nuys Airport located approximately 17.5 miles to the northeast, and Los Angeles International Airport located approximately 17.2 miles southeast; the project site is not located within any airport areas of influence.

According to the City Emergency Operations Plan (EOP), in the project vicinity, the adjacent PCH and 0.7 mile away Malibu Canyon Road are the designated disaster routes. Designated disaster routes function as primary thoroughfares for the movement of emergency response traffic and access to critical facilities (City of Malibu 2012).

Additionally, the City is located in operational disaster management area "B" as described in the 2015 *Los Angeles County Operational Area Emergency Response Plan* (OAERP) that gives guidance for emergencies including hazards and threats such as a major earthquake, hazardous material incident, wildland fire, flooding, mudslide, landslide, major air crash, civil unrest, transportation, and terrorism threat. The OAERP additionally outlines management, operations, planning, logistics, finance, recovery, and supporting documentation for the implementation of the plan (Los Angeles County 2015).

The 2015 OAERP notes that the Santa Monica Mountains, which includes the City along its southern edge, are known for the "chaparral-urban interface" between dry vegetation and surrounding urban development. The mountains are subject to dry conditions, seasonal 40- to 50-mile-per-hour winds, and high temperatures of over 90 degrees that contribute to a much higher threat of wildfire year-round (Los Angeles County 2015). The dense stand of giant reed present in the creek bottom within the project site contributes to the fire fuel load and hazard potential, and the project site borders major areas of undeveloped chaparral habitat to the north. In the past, the project site burned in the Piuma (1985), Old Topanga (1993), and Calabasas (1995) fires, and was approximately 1.0 mile east of the 2007 Corral Fire's eastern extent (David Magney Environmental Consulting 2017a). The 2018 Woolsey Fire represents the most recent wildfire to have affected the property. The project site is located within an area designated as a Fire Zone 4 – Very High Fire Hazard Severity Zone (VHFHSZ) by the California Department of Forestry and Fire Protection (CAL FIRE) and the LACFD County Forester. In addition to high fire hazards associated with wildland vegetation, the northern areas of the project site support steep slopes potentially prone to slope failure such as landslides and mudslides, especially in burned areas (see also, Section 4.6, *Geology and Soils*).

City Standard Conditions of Approval

The City applies the following LCP standard conditions to applicable projects to minimize impacts to hazards and hazardous materials.

- The project shall receive LACFD approval of a Final Fuel Modification Plan prior to the issuance of building permits.

4.9.2 Impact Discussion

a. **Less than Significant.** Construction of the project would involve the use of those hazardous materials that are typically necessary for construction of commercial development (e.g., paints, building materials, cleaners, fuel for construction equipment, etc.). Therefore, construction of the project would involve routine transport, use, and disposal of these types of hazardous materials throughout the duration of construction activities. The project's habitat restoration program could involve the use of herbicides to eradicate invasive non-native species such as the dense stand of giant reed in Puerco Creek. However, as discussed in Section 4.4, *Biological Resources*, and Section 4.9, *Hydrology and Water Quality*, implementation of MM BIO-3 restricts herbicides used to those approved by LARWQCB for use in riparian habitats, which would limit the use of hazardous herbicides as part of the restoration program. The transport, use, and disposal of construction-related hazardous materials would occur in conformance with all applicable local, state, and federal regulations governing such activities and all hazardous materials would be contained, stored, and used in accordance with manufacturers' instructions and handled in compliance with applicable standards and regulations. Therefore, the project would not create a significant impact related to routine transport, use, or disposal of hazardous materials during construction and impacts would be less than significant.

Operation of the project would include the use of solvents, cleaning products, and landscaping fertilizer. These materials would be used for facility upkeep and would only be considered hazardous if used inappropriately or if exposed to unfavorable conditions. Such materials include cleaning solvents used for janitorial purposes, materials used for landscaping, and materials used for maintenance. However, all potentially hazardous materials transported, stored, offered for sale, or used onsite for daily upkeep would be contained, stored, and used in accordance with manufacturers' instructions and handled in compliance with applicable standards and regulations. Compliance with existing local, state, and federal regulations would ensure the transport, disposal, and storage of these materials would not pose a significant hazard to the public or the environment. Therefore, project impacts related to this issue would be less than significant.

b. **Less than Significant.** A significant impact would occur if the project created a significant hazard to the public or environment due to a reasonably foreseeable release of hazardous materials. As discussed above, compliance with federal, state, and local laws and regulations relating to transport, storage, and disposal of hazardous materials would minimize any potential for accidental release or upset of hazardous materials, and impacts would be less than significant.

c. **Less than Significant.** Although there is a private school onsite within the project area, school operations would be suspended during project construction. The nearest public school facilities are at least 0.9 mile away from any construction or most operational activities of the proposed project. Construction and operation of the project would not create a hazard through the release of hazardous materials, routine use, transport, or handling of any notable quantities of hazardous materials. Further, as discussed in Section 4.3, *Air Quality*, construction of the project would involve the use of diesel construction equipment, but the nearest school is located too far away to be significantly affected by these emissions. Therefore, potential impacts associated with the handling or emission of hazardous materials within a quarter-mile of an existing or proposed school would be less than significant.

d. **No Impact.** The project site is not listed on any databases where releases of known hazardous materials have occurred and is not listed as a site containing historical or existing underground storage tanks, gasoline stations, or drycleaners. As discussed in Section 4.8.1 (Existing Setting) above, the closest identified hazardous materials site is located approximately 0.6 mile northeast of the project site. Project operations do not anticipate interaction with hazardous waste sites or production of materials that may require the use of hazardous waste site services. Therefore, no impact would occur.

e. **No Impact**. The project site is not located in an airport land use plan area. The project does not involve placing people in proximity to aircraft operations, and no risks to life or property from airport operations could occur as a result of the project. Therefore, there would be no impact to employees, customers, visitors, or workers from aircraft activities.

f. **Less than Significant.** The project is not anticipated to interfere with any emergency response plan or fire evacuation plan, with direct access to PCH and secondary access to Malibu Canyon Road via PCH. Though the project site is situated in the general vicinity of these roadways, neither construction nor the operation of the project would require or result in long-term modifications to any of these roadways that would impact emergency traffic.

Construction of the project could temporarily interfere with local and onsite emergency response as construction activities would require the movement of larger construction vehicles, such as haul trucks, to and from the project site, and could require the closure of roadway shoulders. However, construction traffic would conform to all local access standards to allow adequate emergency access. The majority of project construction activities would be confined to the site, although the parking of construction vehicles may occur on the shoulder of PCH and potential infrastructure improvements may require some work in the PCH right-of-way. As discussed in Section 4.16, *Transportation and Traffic*, any construction staging and/or construction vehicle parking would occur in accordance with a City-approved construction staging plan and a Caltrans-approved transportation permit, as required by the City standard conditions of approval. The required use of appropriate signs and flag personnel during these periods would minimize traffic obstruction and delays.

While the project is anticipated to incrementally increase vehicle trips in the project vicinity, the project would have less than significant impacts to area traffic and circulation (refer to Section 4.16, *Transportation and Traffic*). The project would maintain the existing driveway access on PCH at the west side of the project site. The existing driveway does not represent an impediment to the efficient operation of traffic or emergency vehicles along PCH. Additionally, options available to emergency vehicles such as using sirens to clear a path of travel or driving in opposite traffic lanes would reduce the effect of any incremental increases in traffic. Impacts would be less than significant. In addition, Section 4.16, *Traffic and Transportation*, recommends MM TRAF-1 to further ensure that driveway movements are managed by the applicant during ceremonial events to ensure excessive queuing does not occur on PCH during these ceremonial events.

g. **Less than Significant.** As mentioned above, the project site is located within a VHFHSZ. All project construction would be in compliance with the goals, policies, and implementation measures and codes of the LACFD; the City's General Plan Safety Element; the LCP; the Public Works Department, Building Safety Division; and VHFHSZ building codes and requirements. Project operation could potentially expose people and/or structures to wildfire risk due to the undeveloped hillsides north of the proposed buildings. The project would replace the dense stand of giant reed located along the creek bottom with more fire-resistant native riparian species as a habitat restoration component although this restoration would have the secondary effect of reducing fuel loading near the project site. Further, the understory of the tree community located on the north slope of Puerco Canyon north of the project site would continue to be thinned as directed by the LACFD and Applicant as under existing conditions to reduce fire hazard at the proposed buildings. In addition, the project would continue to implement the other miscellaneous activities of the existing fuel modification zone within 100 feet of any onsite structures, and LACFD would continue the existing fuel modification activities within this existing zone.

The fuel modification plan separates the project site into Zone A "Setback Zone", Zone B "Irrigated Zone", and Zone C "Native Brush Thinning Zone". Zone A extends 20 feet beyond the edge of any combustible structure, accessory structure, appendage, or projection. Zone A has an area of 16,970 sf. As the project site is already developed, most of Zone A consists of a portion of the existing parking lot, playground and concrete walkways, and grassland that is already being cleared routinely for fire protection of the existing structures. Continued fuel modification in Zone A would continue to clear approximately 7,337 sf of Ruderal Grassland around the north and east side of the proposed chapel building. In Zone A, the project's landscaping plan would place highly fire-resistant plants spaced appropriately, along with irrigation provided to maintain fire resistance. Plant species would be selected using the fuel modification plant list provided in project plans.

Zone B extends from the outermost edge of Zone A to 100 feet from any structure. As under existing conditions, its total area on the project site is 97,512 sf. The southern and eastern area of Zone B consists of the existing parking lot and concrete walkways, while the northern and western portion consists of mature trees, where the understory of grasses that have been historically and routinely thinned for fuel modification, including approximately 28,339 sf of existing and continued thinning in the ESHA. Under the fuel modification plan, watering would continue to be controlled by manual valves, and all work in this zone would continue to be under the direction of an approved biologist.

Zone C extends from the outermost edge of Zone B up to 200 feet from any structure or to the property line. The southern and eastern area of Zone C consists of the existing parking lot, concrete walkways, the existing synagogue building, and irrigated ornamental landscaping. The northern and western portion of Zone C consists of 30,478 sf of ESHA. No long-term fuel modification activities would be started within Zone B, but the stand of giant reed would be removed by the project's habitat restoration program, which would have the secondary effect of reducing fuel loading within Zone B.

An unpaved fire access road zone extends from the playground to Zones A and B. Under the existing and proposed fuel modification plan, any flammable growth would be cleared and removed for a minimum of 10 feet on each side of this fire access road. Routine maintenance would be regularly performed in all zones, pursuant to fuel modification guidelines. Clearance of brush and vegetative growth within the fuel modification zone would be maintained per Fire Code 1117.2.2. Per the City's standard conditions of approval, the required fuel modification plan is required to be reviewed and approved by the LACFD prior to the issuance of building permits. With implementation of required fuel modification on the project site, wildfire impacts would be less than significant.

4.10 Hydrology and Water Quality

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☐	☐
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☐	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☐
iv) impede or redirect flood flows?	☐	☐	☐	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

4.10.1 Existing Setting

The federal Clean Water Act establishes the framework for regulating discharges to waters of the U.S. to protect their beneficial uses. The Porter-Cologne Water Quality Act (Division 7 of the California Water Code) regulates water quality within California and establishes the authority of the State Water Resources Control Board and the nine regional water boards. For stormwater, development projects are required by the State Board to provide careful management and close monitoring or runoff during construction, including onsite erosion protection, sediment management and prevention of non-storm discharges. The Regional and State Boards issue National Pollutant Discharge Elimination System (NPDES) permits to regulate specific discharges. That permit requires that development projects also provide for ongoing treatment of stormwater from the site, using low-impact design (LID), infiltration, or onsite reuse, to address project runoff using specific design criteria. The protection of water quality in the watercourses in the City is under the jurisdiction of the LARWQCB. The WQMP, which is part of the NPDES Permit, addresses specific stormwater pollution requirements for new developments. As co-permittee, the City is responsible for assuring that new developments are in compliance with the WQMP.

As further discussed within Section 4.18, *Utilities and Service Systems*, while the CCWTF is currently online and treating wastewater in the Civic Center area, the CCWTF will not extend to the project site. Instead, there is an existing OWTS at the project site, and a second OWTS would be installed under the project to supplement existing wastewater disposal onsite. The existing OWTS utilizes wastewater treatment tanks and seepage pits to discharge waste. This septic disposal system was previously approved during construction of the existing buildings onsite.

Drainage from most of the project site and the developed area is directed towards landscaped areas, permeable pavers in the parking lot, and catch basins that direct flows to a CDS unit located north of the existing temple/event building. The CDS unit captures large debris and pollutants, and then discharges stormwater through an 18-inch drainage pipe in the north slope of Puerco Canyon. The west side of the parking lot drains down the driveway onto PCH and through stormwater catchments to Puerco Canyon Creek to the east. The remainder of the project site, primarily consisting of the undeveloped north slope of Puerco Canyon, flows directly into Puerco Canyon Creek.

The existing stormwater infrastructure is capable of discharging peak 100-year frequency storm runoff through the 18-inch PVC drainage pipe in the north slope of Puerco Canyon, which can accommodate a flow capacity of 19.31 cubic feet per second (cfs) (Peak Surveys Inc. 2016). Riprap is installed to minimize the velocity and erosion as part of the approved grading plan for the existing development on the project site. Within Malibu, natural drainage is the primary drainage means for water runoff, with the existing drain systems maintained by the Los Angeles County Flood Control District (LACFCD) and the City. A LACFCD-maintained storm drain connects the Puerco Canyon Creek to the Pacific Ocean, approximately 0.2 mile southeast of the project site (Los Angeles County Department of Public Works 2018). The project site exists within the Solstice Canyon-Frontal Santa Monica Bay Watershed (EPA 2017). The project site lies partially within the Puerco Canyon watershed, and the existing drainage discharges to Puerco Canyon and Puerco Canyon Creek, which runs southeast along the northern and eastern portions of the project site before draining to the Pacific Ocean.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), the project site is not located within a 100-year floodplain, and is not located in a special flood hazard zone (FEMA 2016). Additionally, as noted by the Intergovernmental Panel on Climate Change (IPCC), due to global and continental temperature changes, global sea level rise is anticipated to increase between approximately 1 and 3 feet by the year 2100 (IPCC 2013). According to the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management, which digitally maps the potential for varying degrees of sea level rise based on IPCC data, even with a 6-foot rise in sea level, the project site would be located outside of potential sea inundation (NOAA 2016).

The California Department of Conservation Tsunami Inundation maps for southern California indicate that the project site would be outside of any potential tsunami inundation area. The project site is within 800 feet of the upper limit of the potential inundation area, located on the opposite (southern) edge of Malibu Road (California Department of Conservation 2015a).

Project site inundation by seiche, tsunami, or mudflow may harm exposed persons or structures to damaging effects. A seiche is an oscillation of a body of water in an enclosed or semi-enclosed basin, such as a reservoir, harbor, or lake. A tsunami is a large sea wave produced by an earthquake or submarine landslide. Mudflows result from the downslope movement of soil and/or rock under the influence of gravity.

City Standard Conditions of Approval

The City applies the following LCP standard conditions to applicable projects to minimize impacts to hydrology and water quality.

- Prior to the issuance of a building permit the applicant shall demonstrate, to the satisfaction of the Building Official, compliance with the City of Malibu's onsite wastewater treatment regulations including provisions of MMC Chapters 15.40, 15.42, 15.44, and LIP Chapter 18 related to continued operation, maintenance, and monitoring of the OWTS.
- Prior to final Environmental Health approval, a final OWTS plot plan shall be submitted showing an OWTS design meeting the minimum requirements of the Malibu Plumbing Code and the LCP, including necessary construction details, the proposed drainage plan for the developed property and the proposed landscape plan for the developed property. The OWTS plot plan shall show essential features of the OWTS and must fit onto an 11-inch by 17-inch sheet leaving a 5-inch margin clear to provide space for a City-applied legend. If the scale of the plans is such that more space is needed to clearly show construction details and/or all necessary setbacks, larger sheets may also be provided (up to a maximum size of 18 inches by 22 inches).
- Any above-ground equipment associated with the installation of the OWTS shall be screened from view by a solid wall or fence on all four sides. The fence or walls shall not be higher than 42-inches tall.
- The final design report shall contain the following information (in addition to the items listed above).

  Required treatment capacity for wastewater treatment and disinfection systems. The treatment capacity shall be specified in terms of flow rate, gallons per day, and shall be supported by calculations relating the treatment capacity to the number of bedroom equivalents, plumbing fixture equivalents, and/or the subsurface effluent dispersal system acceptance rate. The fixture unit count must be clearly identified in association with the design treatment capacity, even if the design is based on the number of bedrooms. Average and peak rates of hydraulic loading to the treatment system shall be specified in the final design;

  - Sewage and effluent pump design calculations (as applicable);
  - Description of proposed wastewater treatment and/or disinfection system equipment. State the proposed type of treatment system(s) (e.g., aerobic treatment, textile filter ultraviolet disinfection, etc.); major components, manufacturers, and model numbers for "package" systems; and conceptual design for custom engineered systems;
  - Specifications, supporting geology information, and percolation test results for the subsurface effluent dispersal portion of the onsite wastewater disposal system. This must include the proposed type of effluent dispersal system (drainfield, trench, seepage pit subsurface drip, etc.) as well as the system's geometric dimensions and basic construction features. Supporting calculations shall be presented that relate the results of soils analysis or percolation/infiltration tests to the projected subsurface

effluent acceptance rate, including any unit conversions or safety factors. Average and peak rates of hydraulic loading to the effluent dispersal system shall be specified in the final design. The projected subsurface effluent acceptance rate shall be reported in units of total gallons per day and gallons per square foot per day. Specifications for the subsurface effluent dispersal system shall be shown to accommodate the design hydraulic loading rate (i.e., average and peak OWTS effluent flow, reported in units of gallons per day). The subsurface effluent dispersal system design must take into account the number of bedrooms, fixture units and building occupancy characteristics;

  - All final design drawings shall be submitted with the wet signature and typed name of the OWTS designer. If the scale of the plan is such that more space is needed to clearly show construction details, larger sheets may also be provided (up to a maximum size of 18 inch by 22 inch, for review by Environmental Health). Note: For OWTS final designs, full-size plans are required for review by the Building Safety Division and/or the Planning Department.

- Prior to final Environmental Health approval, the construction plans for all structures and/or buildings with reduced setbacks must be approved by the City Building Safety Division. The architectural and/or structural plans submitted to Building and Safety plan check must detail methods of construction that will compensate for the reduction in setback (e.g., waterproofing, concrete additives, etc.). For complex waterproofing installations, submittal of a separate waterproofing plan may be required. The architectural/structural/ waterproofing plans must show the location of OWTS components in relation to those structures from which the setback is reduced, and the plans must be signed and stamped by the architect, structural engineer, and geotechnical consultants (as applicable).

- Prior to final Environmental Health approval, the applicant shall provide engineer's certification for reduction in setbacks to buildings or structures: All proposed reductions in setback from the OWTS to structures (i.e., setbacks less than those shown in MPC Table 15.42.030(E) must be supported by a letter from the project structural engineer and a letter from the project soils engineer (i.e., a geotechnical engineer or civil engineer practicing in the area of soils engineering). Both engineers must certify unequivocally that the proposed reduction in setbacks from the treatment tank and effluent dispersal area will not adversely affect the structural integrity of the OWTS, and will not adversely affect the structural integrity of the structures for which the Table 15.42.030(E) setback is reduced. Construction drawings submitted for plan check must show OWTS components in relation to those structures from which the setback is reduced. Construction drawings submitted for plan check must show OWTS components in relation to those structures from which the setback is reduced. All proposed reductions in setback from the OWTS to buildings (i.e., setbacks less than those shown in Table 15.42.030(E)) also must be supported by a letter from the project architect, who must certify unequivocally that the proposed reduction in setbacks will not produce a moisture intrusion problem for the proposed building(s). If the building designer is not a California-licensed architect, then the required architect's certification may be supplied by an engineer who is responsible for the building design with respect to mitigation of potential moisture intrusion from reduced setbacks to the wastewater system. In this case, the engineer must include in his/her letter an explicit statement of responsibility for mitigation of potential moisture intrusion. If any specific construction features are proposed as part of a moisture intrusion mitigation system in connection with the reduced setback, then the architect or engineer must provide associated construction documents for review and approval during Building Safety Division plan check. The wastewater plans and the construction plans must be specifically referenced in all certification letters.

- The following note shall be added to the plan drawings included with the OWTS final design: “Prior to commencing work to abandon, remove, or replace the existing Onsite Wastewater Treatment System (OWTS) components, an ‘OWTS Abandonment Permit’ shall be obtained from the City of Malibu. All work performed in the OWTS abandonment, removal or replacement area shall be performed in strict accordance with all applicable federal, state, and local environmental and occupational safety and health regulatory requirements. The obtainment of any such required permits or approvals for this scope of work shall be the responsibility of the applicant and their agents.”

- Final plans shall clearly show the locations of all existing OWTS components (serving pre-existing development) to be abandoned and provide procedures for the OWTS’ proper abandonment in conformance with the MMC.

- All project architectural plans and grading/drainage plans shall be submitted for Environmental Health review and approval. The floor plans must show all drainage fixtures, including in the kitchen and laundry areas. These plans must be approved by the Building Safety Division prior to receiving Environmental Health final approval.

- A covenant running with the land shall be executed by the property owner and recorded with the Los Angeles County Recorder’s Office. Said covenant shall serve as constructive notice to any successors in interest that: 1) the private sewage disposal system serving the development on the property does not have a 100 percent expansion effluent dispersal area (i.e., replacement disposal field(s) or seepage pit(s)), and 2) if the primary effluent dispersal area fails to drain adequately, the City of Malibu may require remedial measures including, but not limited to, limitations on water use enforced through operating permit and/or repairs, upgrades or modifications to the private sewage disposal system. The recorded covenant shall state and acknowledge that future maintenance and/or repair of the private sewage disposal system may necessitate interruption in the use of the private sewage disposal system and, therefore, any building(s) served by the private sewage disposal system may become non-habitable during any required future maintenance and/or repair. Said covenant shall be in a form acceptable to the City Attorney and approved by the City Environmental Sustainability Department.

- Proof of ownership of subject property shall be submitted to the City Environmental Health Administrator.

- An operations and maintenance manual specified by the OWTS designer shall be submitted to the property owner and maintenance provider of the proposed OWTS.

- A maintenance contract executed between the owner of the subject property and an entity qualified in the opinion of the City of Malibu to maintain the proposed onsite wastewater disposal system after construction shall be submitted. Please note only original “wet signature” documents are acceptable.

- Prior to final Environmental Health approval, a maintenance contract executed between the owner of the subject property and an entity qualified in the opinion of the City of Malibu to maintain the proposed OWTS after construction shall be submitted. Only original wet signature documents are acceptable and shall be submitted to the City Environmental Health Administrator.

- The City geotechnical staff final approval shall be submitted to the City Environmental Health Administrator.

- The City Biologist's final approval shall be submitted to the City Environmental Health Administrator. The City Biologist shall review the AOWTS design to determine any impact on ESHA if applicable.
- In accordance with MMC Chapter 15.14, prior to Environmental Health approval, an application shall be made to the Environmental Sustainability Department for an OWTS operating permit.
- A grading and drainage plan containing the following information shall be approved, and submitted to the Public Works Department, prior to the issuance of grading permits for the project:
  - Public Works Department general notes;
  - The existing and proposed square footage of impervious coverage on the property shall be shown on the grading plan (including separate areas for buildings, driveways, walkways, parking, tennis courts and pool decks);
  - The limits of land to be disturbed during project development shall be delineated and a total area shall be shown on this plan. Areas disturbed by grading equipment beyond the limits of grading, areas disturbed for the installation of the septic system, and areas disturbed for the installation of the detention system shall be included within the area delineated;
  - The limits to land to be disturbed during project development shall be delineated and a total area of disturbance should be shown on this plan. Areas disturbed by grading equipment beyond the limits of grading shall be included within the area delineated;
  - If the property contains rare, endangered or special status species as identified in the Biological Assessment, this plan shall contain a prominent note identifying the areas to be protected (to be left undisturbed). Fencing of these areas shall be delineated on this plan is required by the City Biologist;
  - The grading limits shall include the temporary cuts made for retaining walls, buttresses and over excavations for fill slopes; and
  - Private storm drain systems shall be shown on this plan. Systems greater than 12 inch in diameter shall also have a plan and profile for the system included with this plan.
- A Storm Water Pollution Prevention Plan (SWPPP) shall be provided prior to issuance of grading/building permits. This plan shall include and Erosion and Sediment Control Plan (ESCP) that includes, but not limited to:

Erosion Controls:	• Scheduling • Preservation of Existing Vegetation
Sediment Controls:	• Silt Fence • Sand Bag Barrier • Stabilized Construction Entrance
Non-Storm Water Management:	• Water Conservation Practices • Dewatering Operations
Waste Management:	• Material Delivery and Storage

- Stockpile Management
- Spill Prevention and Control
- Solid Waste Management
- Concrete Waste Management
- Sanitary/Septic Waste Management

- All Best Management Practices (BMP) shall be in accordance to the latest version of the California Stormwater Quality Association (CASQA) BMP Handbook. Designated areas for the storage of construction materials, solid waste management, and portable toilets must not disrupt drainage patterns or subject the material to erosion by site runoff.

- Prior to the approval of any permits and prior to the submittal of the required construction general permit document to the Los Angeles RWQCB, the property owner / applicant shall submit the Public Works Department an ESCP for review. The ESCP shall contain appropriate site-specific construction site BMPs prepared and certified by a qualified SWPPP developer (QSD). All structural BMPs must be designed by a licensed California civil engineer. The ESCP must address the following elements:

    - Methods to minimize the footprint of the disturbed area and to prevent soil compaction outside the disturbed area
    - Methods used to protect native vegetation and trees
    - Sediment / erosion control
    - Controls to prevent tracking on- and offsite
    - Non-stormwater control
    - Material management (delivery and storage)
    - Spill prevention and control
    - Waste management
    - Identification of site risk level as identified per the requirements in Appendix 1 of the Construction General Permit
    - Landowner must sign the following statement on the ESCP:

      "I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that quality personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate and complete. I am aware that submitting false and/or inaccurate information, failing to properly and/or adequately implement the ESCP may result in revocation of grand and/or other permits or other sanctions provided by law."

- Storm drainage improvements are required to mitigate increased runoff generated by property development. The applicant shall have the choice of one method specified within LIP Section 17.3.2.B.2.

- A Storm Water Management Plan (SWMP) shall be submitted for review and approval of the Public Works Director. The SWMP shall be prepared in accordance with the LIP Section 17.3.2 and all other applicable ordinances and regulations. Storm drainage improvements are required to mitigate increased runoff generated by property development. The applicant shall have the choice of one method specified within the City's LIP Section 17.3.2.B.2. The SWMP shall be supported by a hydrology and hydraulic study that identifies all areas contributory to the property and an analysis of the predevelopment and post development drainage of the site. The SWMP shall identify the Site design and Source control BMPs that have been implemented in the design of the project (See LIP Chapter 17 Appendix A). The SWMP shall be reviewed and approved by the Public Works Department prior to the issuance of the grading/building permits for this project.

- The Building Official may approve grading during the rainy season to remediate hazardous geologic conditions that endanger public health and safety.
- Exported soil from a site shall be taken to the Los Angeles County Landfill or to a site with an active grading permit and the ability to accept the material in compliance with LIP Section 8.3.
- All cut and fill slopes shall be stabilized with landscaping at the completion of final grading.
- A Water Quality Mitigation Plan (WQMP) shall be submitted for review and approval of the Public Works Director. The WQMP shall be prepared in accordance with the LIP Section 17.3.3 and all other applicable ordinances and regulations. A Water Quality Management Plan (WQMP) is required for this project. The WQMP shall be supported by a hydrology and hydraulic study that identifies all areas contributory to the property and an analysis of the predevelopment and post development drainage of the site. The WQMP shall meet all the requirements of the City's current Municipal Separate Stormwater Sewer System (MS4) permit. The following elements shall be included within the WQMP:
  - Site Design BMPs
  - Source Control BMPs
  - Treatment Control BMPs that retains onsite the Stormwater Quality Design Volume (SWQDv). Or where it is technical infeasible to retain onsite, the project must biofiltrate 1.5 times the SWQDv that is not retained onsite.
  - Drainage Improvements
  - Methods for onsite percolation, site re-vegetation and an analysis for offsite project impacts;
  - Measures to treat and infiltrate runoff from impervious areas;
  - A plan for the maintenance and monitoring of the proposed treatment BMPs for the expected life of the structure.
  - A copy of the WQMP shall be filed against the property to provide constructive notice to future property owners of their obligation to maintain the water quality measures installed during construction prior to the issuance of grading or building permits.
  - The WQMP shall be submitted to Public Works and the fee applicable at time of submittal for the review of the WQMP shall be paid prior to the start of the technical review. The WQMP shall be approved prior to the Public Works Department's approval of the grading and drainage plan and or building plans. The Public Works Department will tentatively approve the plan and will keep a copy until the completion of the project. Once the project is completed, the applicant shall verify the installation of the BMPs, make any revisions to the WQMP, and resubmit to the Public Works Department for approval. The original singed and notarized document shall be recorded with the County Recorder. A certified copy of the WQMP shall be submitted to the Public Works Department prior to the certificate of occupancy.

- A State Construction Activity Permit is required for this project due to the disturbance of more than one acre of land for development. Provide a copy of the letter from the State Water Quality Control Board containing the Waste Discharge Identification (WDID) number prior to the issuance of grading or building permits.
- Prior to the issuance of a building permit, the applicant shall submit an updated Will Serve Letter from Los Angeles County Waterworks District No. 29 to the Planning Department indicating the ability of the property to receive adequate water service.
- Prior to final inspection (or project sign off, as applicable) by the Planning Department, the applicant shall demonstrate that all requirements of Los Angeles County Waterworks District No. 29 have been met, including installation of a meter, if applicable.

4.10.2 Impact Discussion

a. **Less than Significant.** Regarding project construction, pursuant to LIP Section 17.3, prior to the issuance of a grading or building permit, the project applicant shall be required to prepare and submit a SWPPP and ESCP for approval (MS4 Permit Section VI.D.8.h.ii) that identifies BMPs during the construction phases of development to minimize or prevent construction-related polluted runoff. The SWPPP would be prepared by a QSD. Because project development would require more than one acre of ground disturbance, project construction would occur in accordance with the requirements of the NPDES General Construction Permit (Order No. 2009-0009-DWQ). The General Construction Permit required BMPs and runoff control measures to be identified on the SWPPP submitted to the LARWQCB and employed during Project construction to minimize pollutants and reduce runoff to levels that comply with applicable water quality standards. BMPs include practices such as installing sandbag barriers, temporary desilting basins near inlets, gravel driveways, dust controls, employee training, and other good housekeeping practices that help prevent water quality contamination. Construction would not occur during the rainy season. However, if construction is to occur during wet weather, a Wet Weather Erosion and Sediment Control Plan (WWESCP) would also be required; the WWESCP is required to identify locations where concentrated runoff will occur; plans for the stabilization of disturbed areas of the property, landscaping and hardscape, along with the proposed schedule for the installation of protective measures; location and sizing criteria for silt basins, sandbags barriers, and silt fencing; and a stabilized construction entrance and a monitoring program for the sweeping of material tracked off the site. Project hydrology and drainage plans would be reviewed and approved by the City Department of Public Works. The SWPPP would ultimately be reviewed and approved by the LARWQCB as part of the NPDES General Construction Permit. With the implementation of standard conditions, short-term surface and ground water quality impacts would be reduced to less than significant levels.

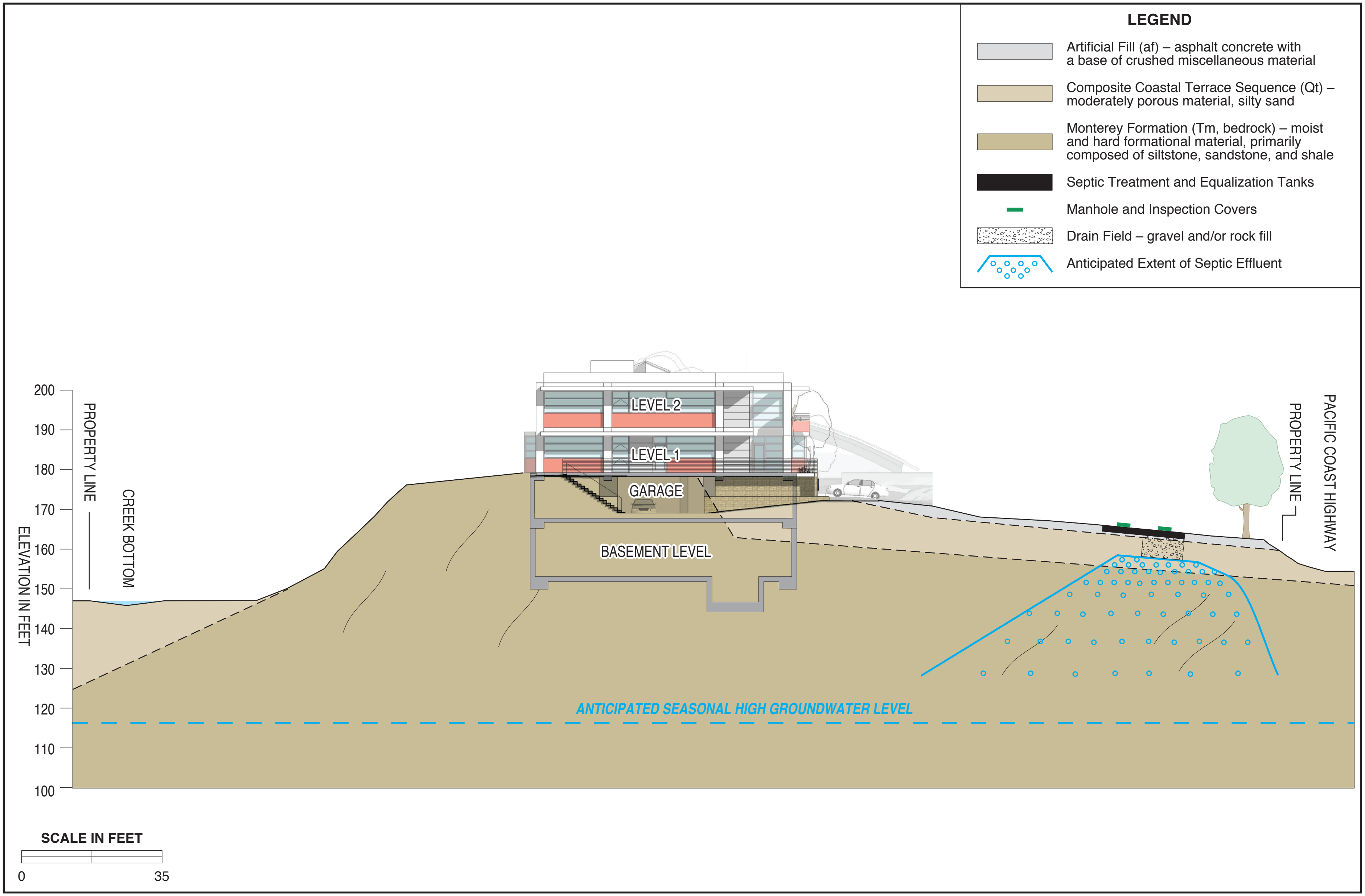
Regarding the project's habitat restoration work in Puerco Creek, the hand removal and/or herbicide application to remove the dense stand of giant reed could cause water quality impacts due to sediment being released into the creek from excavation of root masses, and/or introduction of herbicide chemicals into the creek. However, as discussed in Section 4.4, *Biological Resources*, City LCP Policy 3.19 prohibits the use of herbicides during the winter season or when rain is predicted within a week of application, and implementation of MM BIO-1 restricts herbicides used to those approved by LARWQCB and requires that targeted herbicide treatments be applied by hand, which would limit impacts to water quality. As with all projects in the City, the use of anti-coagulant rodenticides is prohibited on the project site. In addition, the habitat restoration activities would occur over a short period of time and would not present a long-term impact to water quality.

Regarding project operation, as discussed in Section 1.3, the project would reduce the onsite impervious surface by 598 sf from existing conditions, so stormwater runoff would be incrementally reduced under the project. The project would be designed in accordance with a SWMP and WQMP pursuant to MMC Section 13.04 and LIP Sections 17.3 and 17.4, which would be required to retain the Storm Water Design Volume. For the project, specific SWMP BMPs proposed to retain and treat stormwater runoff from the project site include 10 catch basins located throughout the project site that would remove large debris, sediment, and pollutants from stormwater flows prior to leading to five infiltration pits beneath the surface parking lot. These infiltration pits would be staged sequentially so that as stormwater flow volumes increase, each of the pits are filled in a series. All roof drains would connect to the storm drain system and direct flows toward the infiltration pits. The project applicant would be responsible for the routine maintenance of the catch basins, infiltration pits, drains, and any other SWMP features per manufacturer design specifications.

When drainage flows exceed the Storm Water Design Volume, runoff from the project site would pass through the WQMP treatment mechanisms (i.e., the catch basins and infiltration pits) before being conveyed to the existing CDS unit and 18-inch pipe in the north slope of Puerco Canyon, as under existing conditions. Because of the proposed uses of the site, stormwater runoff could contain contaminants typical of urban areas including oil, grease, metals, pesticides/herbicides, and entrained dust. The catch basins and infiltration pits would be designed to retain and treat these pollutants through the installation of petrochemical sponges, screened intakes, cartridge filters, and settling chambers. The infiltration pits themselves would act as five large settling chambers to remove pollutants from stormwater flows.

Although the project proposes to infiltrate effluent, there would not be substantial subsurface impact from the combined effect of infiltrating OWTS effluent and stormwater. The percolation and infiltration report, prepared by Earth Systems, concluded that the effluent would not extend far beyond the location of the proposed seepage pits. The infiltrating effluent would form a small local ground seepage mound area that would be limited by the geologic composition in the area. The seepage mound would be especially limited to the north, such as beneath the proposed school and temple structures, due to the geologic sediment texture (coarsening downward) and orientation (which dips to the north). This geologic sediment consistency would protect Puerco Creek from coming into contact with any effluent that may occur from within the project site. Average flow rate for the proposed OWTS would be 1,584 gpd, or approximately 1.8 acre-feet[19] annually. If all runoff from the proposed impervious area (12,600 sf) is infiltrated, the annual volume would be up to 0.4 acre-feet annually. Based on this information and the layout of drywells in the design documents, it is unlikely that the OWTS effluent seepage mounds and the infiltrated stormwater would commingle. In the case that both infiltrating substances do overlap, the northern extent of the infiltrating mounds is still expected to be limited by the subsurface conditions discussed above, including the coarsening of sediment texture downward and the orientation of the mound, which dips down to the north. The onsite soils have a high percolation rate and would be able to accommodate any unexpected comingling of groundwater mounds, so that there would be no daylighting of water or decreased operation of the infiltration systems even if the groundwater mounds commingle. Therefore, the potential for Puerco Creek water quality to be affected by the project's proposed OWTS and stormwater systems is very low. Please also refer to Figure 7 for a conceptual representation of the above system. With the successful implementation of a SWMP and WQMP pursuant to MMC Section 13.04 and LIP Sections 17.3 and 17.4, impacts to water quality would be less than significant.

[19] An acre-foot is a volume of water equal to one acre of land area being covered in one foot of water.



wood.

Anticipated Hydrologic Infiltration Extent
(Conceptual Representation)

FIGURE 7

b & e. **Less than Significant**. As discussed above, project construction would involve grading and excavation of the site. If required during construction activities, dewatering could result in the withdrawal of groundwater. If this occurs, dewatering would occur in accordance with LARWQCB regulations to ensure that construction activities do not affect water quality or degrade the groundwater supply or sustainability.[20] Since the project site is outside of the CCWTF service area, wastewater disposal for the proposed project would require installation of a second OWTS beneath the surface parking lot between PCH and the two-story classroom/administration building, supplementing the existing OWTS. The second OWTS would include a 7,450-gallon treatment tank and a 15,000-gallon equalization tank, which would feed 12 subsurface seepage pits. Therefore, the project site would act as a source of groundwater recharge for the immediate project vicinity, with an incremental increase in volume of recharge due to increased wastewater generation under the project. Please refer to the discussion above for information pertaining to potential water quality impacts, in addition to Figure 7. As a result, the project would result in a less than significant impact on groundwater supplies, a water quality control plan, or sustainable groundwater management plan.

ci, cii, & ciii. **Less than Significant**. As discussed above, the project would be designed in accordance with a SWMP and WQMP, which would be required to retain the Storm Water Design Volume onsite . When drainage flows exceed the Storm Water Design Volume, treated runoff from the proposed infiltration system would continue to outlet to Puerco Canyon and ultimately the Pacific Ocean as under existing conditions. Additionally, though the project site is located at the base of the Malibu foothills with the potential for landslides (mudslides) as discussed in Section 4.6, *Geology and Soils*, the project site is elevated on a hilltop, and proposed structures have been designed in accordance with applicable standards to exceed minimum safety levels and ensure the slope is stable following project implementation. Further, while the Woolsey Fire has affected the current condition of the project site's northern slope, the northern portion of the project site adjacent to a designated landslide hazard zone would only include revegetation activities. The steep slopes of Puerco Canyon, set back from proposed project construction activities, would channel erosion and mudflows away from the project site along the Puerco Canyon Creek corridor.

During construction, erosion and siltation would be controlled by the SWPPP and implementation of BMPs for erosion control prepared in accordance with a NPDES General Construction Permit. As a result, project construction would not substantially alter the existing drainage pattern of the site in a manner that would result in substantial erosion or siltation on- or offsite. There would be some potential for instream siltation due to giant reed root mass removal by hand crews during implementation of the restoration program. Compliance with regulatory measures would result in less than significant impacts to erosion or siltation on- or offsite during construction of the project.

During operation, the SWMP and WQMP would be implemented to capture and treat runoff from the project site for the Storm Water Design Volume and further would ensure that all stormwater discharged into the municipal drainage system is within water quality standards pursuant to MMC Section 13.04. Because the project would reduce the amount of impervious surface area and channel stormwater flows to a carefully designed stormwater treatment system, where excess treated runoff would continue to be conveyed to Puerco Canyon and PCH through PVC pipe and concrete conveyance structures, the project would not increase erosion or sedimentation on- or offsite. Wastewater impacts are further discussed within Section 4.18, *Utilities and Service Systems*.

[20] LARWQCB Order No. R4-2013-0095 establishes standards for monitoring discharges of groundwater from construction and project operation.

Since the project would decrease impervious surface area on the project site by 598 sf, and would implement a stormwater treatment system able to accommodate the Storm Water Design Volume, implementation of the project would be anticipated to reduce runoff flows from the project site when compared to existing conditions. As there are no known capacity constraints in the stormwater system serving the project site, the project would not result in flows which exceed the capacity of the system and a less than significant impact would result.

civ & d. **Less than Significant**. The project site is not located within an area susceptible to flooding; the site is not located in a 100-year floodplain, nor in proximity to dams or levees. Due to its proximity to the Pacific Ocean, the City is susceptible to tsunamis. However, the project site is elevated outside of mapped tsunami inundation areas. Additionally, considering worst-case assumptions for sea level rise, the project site would remain outside of projected mapped potential sea level rise flooding areas. Seiches are not applicable to this site, as no standing water bodies exist onsite or nearby. Therefore, the project site would not be at risk to flood hazards and associated project site inundation that may increase the risk of pollutant release, nor would the project impede or redirect flood flows. Impacts related to flooding would be less than significant.

4.11 Land Use and Planning

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☒	☐	☐

4.11.1 Existing Setting

The project site contains a surface parking lot and disturbed hillside within the Institutional (I) zone district. Parcels west of the project site contain commercial uses, and residential uses are located northeast and south of the project site. The residential land use north of the project site supports open space within Puerco Canyon, including approximately 1,498 acres of contiguous ESHA as mapped by the City. The project area does not lie within the Airport Influence Area of any airfield.

City Standard Conditions of Approval

The City applies the following LCP standard conditions to applicable projects to minimize impacts to land use and planning. Topic-specific City standard conditions of approval may also apply to the analysis of land use impacts. However, rather than re-stating them here, these conditions have been cross-referenced in the impact discussion where appropriate.

- All open areas not used for buildings, driveways, parking areas, or walkways shall be attractively landscaped and maintained in accordance with a landscape plan comprised of native plant species, to the satisfaction of the Planning Director.
- Native species of the Santa Monica Mountains, characteristic of the local habitat, shall be used on graded slopes and where slope plantings are required for slope stabilization, erosion control, and watershed protection. Plants should be selected to have a variety of rooting depths. A spacing of 15 feet between large woody (≥10-foot canopy) shrubs is recommended by the LACFD. Lawns are prohibited on slopes greater than 5 percent.
- Slope planting measures such as contour planting and terracing or other techniques shall be incorporated on slopes to interrupt the flow and rate of surface runoff in order to prevent surface soil erosion.

4.11.2 Impact Discussion

a. **No Impact.** The project proposes continued institutional uses, including school and religious uses, on a parcel located adjacent to existing commercial and residential uses. As such, the project would not divide an established community, nor would development within the project site divide or disrupt the physical arrangement of an established community. No impact would occur.

b. **Less than Significant with Mitigation.** Since the project site is zoned for institutional use, proposed school/religious uses are consistent with existing uses, the zoning designation, and compatible with existing land uses in the vicinity. Specifically, MMC Chapter 17.34, I *Institutional District*, permits the development of public and quasi-public uses and facilities in the City, such as educational (private and public) and religious institutions. MMC Chapter 17.40.110, *Institutional Development Standards*, limits institutional development to a maximum FAR of 0.15. As the project proposes 23,728 sf of institutional floor area on a 200,431 sf (4.60 acre) parcel, the resulting FAR would be 0.12, less than the maximum FAR permitted. The project would require approval of Coastal Development Permit No. 14-069, ensuring adherence to local and regional policies and goals addressing environmental concerns throughout implementation of the project. The project would also require approval of Parking Variance (14-050) to allow for non-code compliant parking spaces and parking space dimensions within the onsite parking lot.

The project is generally consistent with the goals and policies of the LUP; however, the project is partially consistent Policy 6.14 to limit retaining walls to six feet in height, and require stepped or terraced designs, and textures, veneers, or colors that blend with the surrounding earth or landscape, and with Policy 5.6, which implements additional protections for ESHA designated habitat and setback requirements. The criterion for determining a significant LUP impact is based on the potential for the project to substantially conflict with, or actively obstruct the implementation of, plans adopted for the purpose of avoiding or mitigating an environmental effect. Minor inconsistencies with a plan, policy, or regulation do not necessarily equate to a significant physical impact on the environment. Because the project is generally consistent with the LCP's overall goals and policies, impacts associated with consistency with the LCP are less than significant.

The project would require approval of several variances from the development standards established under MMC Chapter 17.40.080 and LIP Section 3.8. Approval of Conditional Use Permit No. 16-005 would enable expansion of the existing religious facilities, and Parking Variance No. 14-050 would allow for non-code compliant parking spaces and parking space dimensions. The applicant is requesting approval of Site Plan Review No. 14-050 for approval of the proposed school structure in excess of 18 feet in height but not to exceed 28 feet for a flat roof. Approval of Sign Permit No. 16-006 would allow for identification and building-mounted signage. Approval of Variance No. 14-051 would permit construction within an ESHA Buffer Zone, where previous grading and construction activities have occurred, as discussed further in Section 4.4, *Biological Resources*. With City approval of the requested Conditional Use Permit No. 16-005 for an expansion of religious facilities, Parking Variance No. 14-050 for non-code compliant spaces, and Site Plan Review No. 14-050 for a structure exceeding 18 feet but not to exceed 28 feet, and Variance No. 14-051 for construction within an ESHA Buffer Zone, the project would be consistent with the MMC, and LCP, and impacts would be less than significant.

In summary, impacts to adopted land use policies for avoiding environmental effects would be less than significant with mitigation, as provided throughout Section 4, and dependent on approval of the discretionary requests and implementation of standard conditions of approval, applied mitigation measures, and applicable development and design standards.

4.12 Mineral Resources

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) 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) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

4.12.1 Existing Setting

The State Divisions of Mines and Geology has not mapped any mineral resources in the City.[21] [22] No mineral resource recovery sites have been established or considered in the project site or in the surrounding vicinity (California Department of Conservation 2015b). Additionally, no oil or gas wells are located near or within the project site (DOGGR 2015).

4.12.2 Impact Discussion

a & b. **No Impact**. No known mineral resources are located on the site. The project would not result in the loss of availability of a known or locally important mineral resource. Further, the project vicinity does not contain active aggregate or petroleum mining operations, and given the nature of the project vicinity, no such operations would be explored. Therefore, there would be no impact to mineral resources. No impacts would occur.

[21] City of Malibu General Plan, Conservation Element
[22] City of Malibu Rancho Malibu Draft EIR, 2013.

4.13 Noise

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies?	☐	☒	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

4.13.1 Existing Setting

Noise is typically defined as unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Prolonged exposure to high levels of noise is known to have several adverse effects on people, including hearing loss, interference with communications and sleep, physiological responses, and annoyance. The noise environment includes background noise generated from both near and distant noise sources, as well as the sound from individual local sources. The primary source of noise in the project vicinity is vehicle traffic on the PCH.

The standard unit of measurement of the loudness of sound is the Decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more useable range of numbers in a manner similar to the way that the Richter scale is used to measure earthquakes. In terms of human response to noise, studies have indicated that a noise level increase of 3 dBA is barely perceptible to most people, a 5-dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness.

The project site is located between central and eastern Malibu, in an area with other commercial properties adjacent to PCH and across from residential homes. The ambient noise environment is defined by traffic noise on PCH. Existing noise generated at the project site is limited to temple services, ceremonial events with loudspeakers, and parking lot uses.

The nearest noise sensitive land use to the project site are the single-family homes located approximately 100 feet south of the project site across PCH. The nearest location where construction equipment would be used for excavation and construction activities would occur approximately 100 feet away from and upslope of these sensitive receptors. Additional residences are located approximately 750 feet east of the project site, across Puerco Canyon. The project is not located within the vicinity of a public or private airport land use plan or influence area.

The City's Noise Ordinance (MMC Chapter 8.24) dictates the working hours of construction activities as indicated in Table 13, *Allowable Construction Hours*:

Table 13. Allowable Construction Hours

Days	Allowable Construction Hours
Monday-Friday	7:00 a.m. – 7:00 p.m.
Saturdays	8:00 a.m. – 5:00 p.m.
Sundays and Holidays	Not permitted

For the purposes of this analysis, the project's construction activities are assumed to result in significant impacts if they increase ambient noise levels above 85 dB(A) for commercial and institutional uses, and 75 dB(A) for residential uses, (considered by the City General Plan Noise Element to be the "maximum exterior noise limits for non-transportation sources."), unless compliance is technically infeasible. Technically infeasible means that the noise limitations cannot be attained during use of the equipment even with the use of mufflers, shields, sound barriers and/or other noise reduction techniques (City of Malibu 1995). Even so, limiting construction hours to the above time reduces significant impacts to a less than significant level.

Temporary construction-related noise and groundborne vibration would be generated by various types of equipment as a result of construction activities anticipated to occur in the project site. Construction noise would primarily occur during demolition, grading, and excavation activities, followed by building construction. Additional sources of noise during construction may occur from general truck movement and unknown construction sources. The analysis of construction-related noise impacts is qualitative in nature, discussing the potential range of construction-related impacts that could potentially occur from the project site. Construction noise levels for the project are evaluated using data published by the U.S. Department of Transportation, as indicated in Table 14, *Noise Ranges of Typical Construction Equipment*:

Table 14. Noise Ranges of Typical Construction Equipment

Construction Equipment	Noise Levels in dBA L_{eq} at 50 Feet
Trucks	82–95
Excavator	81-85
Generator	71–83
Compressor	75–87
Concrete Mixer	75–88
Concrete Pump	81–85
Dozer	82–85
Back Hoe	73–95
Scraper	84-85
Loader	79–80
Pile Driver (Impact)	95-101
Pile Driver (Sonic)	88-96

Note: Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.
Source: U.S. DOT. Construction Noise Handbook (2017).

Noise levels diminish rapidly with distance from construction areas, at a rate of approximately 6 dBA per doubling of distance from the reference distance (i.e., 50 feet) as equipment is generally stationary or confined to specific areas during construction. For example, a noise level of 86 dBA measured at 50 feet from the noise source to the receptor would reduce to 80 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA to 74 dBA at 200 feet from the source to the receptor. The noise levels from construction at the offsite sensitive uses can be determined with the following equation from the Harris Miller Miller & Hanson Inc. Transit Noise and Vibration Impact Assessment, Final Report:

$$L_{eq} = L_{eq} \text{ at 50 feet} - 20 \text{ Log}(D/50)$$

Where L_{eq} = noise level of noise source, D = distance from the noise source to the receptor, L_{eq} at 50 feet = noise level of source at 50 feet.

Typically, groundborne vibration is of concern in urban areas when heavy construction (e.g., pile driving, major excavation) immediately abuts sensitive uses such as residences. Groundborne vibration typically does not travel far and intensity of vibration is affected by soil type, ground profile, distance to the receptor and the construction characteristics of the receptor building. While groundborne vibration is of much less concern in open space areas, the Caltrans Transportation and Construction Vibration Guidance Manual provides a method to estimate potential effects from project activities based on common human response to conditions and construction equipment. Table 15, *Caltrans Vibration Annoyance Potential Criteria*, indicates vibration levels at which humans would be affected. Table 16, *Vibration Source Levels for Construction Equipment*, identifies anticipated vibration velocity levels (in/sec) for standard types of construction equipment.

Table 15. Caltrans Vibration Annoyance Potential Criteria

Human Response Condition	Maximum Vibration Level (in/sec) for Transient Sources	Maximum Vibration Level (in/sec) for Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: Caltrans, 2013. Transportation and Construction Vibration Guidance Manual – Table 20.

Table 16. Vibration Source Levels for Construction Equipment

Construction Equipment	Vibration Level (in/sec) at 25 feet	Vibration Level (in/sec) at 50 feet	Vibration Level (in/sec) at 100 feet
Loaded Trucks	0.076	0.035	0.017
Jackhammer	0.035	0.016	0.008
Pile Driver (Impact)	0.644	0.297	0.137

Source: Caltrans, 2013. Transportation and Construction Vibration Guidance Manual – Table 18.

City Standard Conditions of Approval

The City applies the following LCP standard conditions to applicable projects to minimize impacts to noise.

- A construction staging plan shall be reviewed and approved by the Planning Director prior to plan check submittal.
- Construction hours shall be limited to Monday through Friday from 7:00 a.m. to 7:00 p.m. and Saturdays from 8:00 a.m. to 5:00 p.m. No construction activities shall be permitted on Sundays or City-designated holidays.
- Construction management techniques, including minimizing the amount of equipment used simultaneously and increasing the distance between emission sources, shall be employed as feasible and appropriate. All trucks leaving the construction site shall adhere to the California Vehicle Code. In addition, construction vehicles shall be covered when necessary; and their tires rinsed prior to leaving the property.

4.13.2 Impact Discussion

a-b. **Less than Significant with Mitigation.** The project would create temporary periods of ambient noise and vibration from construction activities, particularly during demolition of the existing school structures and foundations, excavation for the subsurface levels, and construction of the proposed school structure and temple. Depending on approval and permit processing, construction for the project is anticipated to begin in spring 2019. Consistent with the City's Noise Ordinance, construction activities would be restricted to the hours of 7:00 a.m. to 7:00 p.m. on weekdays, 8:00 a.m. to 5:00 p.m. on Saturdays, and no construction activities would be allowed on Sundays or holidays.

Although alternative means of installation are available, pile drivers are typically used to install hydraulic elevator shafts. If the project requires the use of a pile driver, the loudest equipment would be the pile driver. The maximum noise levels anticipated to occur from a pile driver would be 101 dBA at 50 feet, with a reduction to approximately 86 dBA at 315 feet, which exceeds City noise standards of 75 dBA for residential areas. If a pile driver is not used, the loudest piece of equipment would be a back hoe. The loudest maximum noise levels anticipated to occur from a back hoe would be a maximum of 95 dBA at 50 feet, with a reduction to approximately 80 dBA at 315 feet, which still exceeds City noise standards for residential areas, but not by as much. The highest noise levels at the nearby sensitive residential receptor would occur in the few months at the beginning of the construction period when the existing structures are demolished and the foundations are graded and excavated, though would decrease as project construction moves into the building construction and finishing phases. Thus, these instances would not be permanent, and by limiting construction hours to those allowed by the City Noise Ordinance, the corresponding noise would be minimized. Nonetheless, project construction would still exceed the maximum ambient noise levels for residential uses during daytime construction hours. Mitigation Measure NOI-1 requires that construction equipment be fitted with feasible noise controls, that the distance between construction/staging and residences be maximized through responsible site layout, and that residents within 500 feet of the property line be notified prior to the start of construction. With implementation of the identified mitigation measure, potentially significant impacts would be reduced to less than a significant level.

As shown in Table 16, vibration from pile drivers would have the greatest impact on nearby sensitive receptors. However, the nearest residential structures are located across PCH, approximately 315 feet away from where pile driving would occur during project construction activities. At approximately 315 feet away, in addition to traffic along PCH, ground vibration from the use of pile drivers would not be perceptible. The homes located approximately 750 feet to the north of the project site and east across Puerco Canyon would similarly be unable to perceive potential vibrations from the construction activities.

The project would introduce a net increase of 12,648 sf of new school and temple space. Permanent ambient noise generated by school activities and student drop-off would be materially the same as under existing conditions. The existing playground north of the modular buildings would be retained and student pick-up and drop-off would continue to occur in the surface parking lot on the south portion of the project site. All other school and administrative uses would continue to occur indoors. With regard to ceremonial events, the project would limit the frequency and size of ceremonial events to that currently occurring onsite, and no concurrent use of the new temple and existing temple/event building is proposed. Additionally, the MJCS would not schedule overlapping ceremonial events that may result in additional noise.

Any increased permanent noise during the operation of the project would be controlled by the noise regulations contained in the MMC (Chapter 8.24). Those regulations restrict certain noise-generating activities (e.g., loading and unloading of delivery trucks or trash pick-up) between 10:00 p.m. and 7:00 a.m. Ambient noise associated from the site would continue to be subordinate to noise levels in the existing environment, where ambient noise is dominated by traffic along PCH. The project site is buffered from residential areas to the north and west by open space and vegetation of Puerco Canyon. Because no increase in the frequency or size of ceremonial events is proposed, the net effect of the new temple is that some of the existing ceremonial events held at the existing temple/event building would occur at the new temple instead. Moving these events from one building to another that is located approximately 200 feet to the west would have no material effect on noise generated at the project site. The design of the proposed buildings will also serve as barriers that reduce noise transmission as they accommodate the pick-up and drop-off zone in its current location and contain some vehicle noise within the subterranean parking garage. The project's net increase of 27 A.M. peak-hour trips, and 13 P.M. peak-hour trips represents a less than 1-percent increase in traffic along PCH at the project driveway (i.e., 57,500 average daily trips in 2016). When compared to the volume of traffic on PCH, project trips would not cause a measurable increase in vehicle traffic noise on PCH.

Therefore, the noise that is anticipated to occur from both construction and operation would be nominal to nearby sensitive noise receptors and would not cause a substantial increase in noise for any extended period of time. Following Chapter 8.24 of the MMC, in addition to City standard conditions of approval and Mitigation Measure NOI-1, would reduce the potential impacts to less than significant.

c. **No Impact.** The project site is not located within two miles of a private airstrip or within an area covered by an airport land use plan. The project does not involve placing people in proximity to aircraft operations, including noise and vibration occurrences. Therefore, no impacts from aircraft noise would occur.

Mitigation Measures

The following mitigation measure is required to reduce potential temporary impacts related to noise to a less than significant level.

NOI-1 ***Construction Noise Control****. All construction machinery and delivery trucks shall be maintained to the highest level of performance, and shall be outfitted with all* *noise reduction accessories, e.g., mufflers, enclosures, etc. that are offered by the equipment manufacturers. The construction site shall be laid out such that materials are stored and staged near the central portion of the site to maximize the distance from nearby residences. Prior to construction, all residences within 500 feet of the property line shall be individually notified of the project's construction schedule. Prior to construction, a sign shall be posted on the site that is legible from at least 50 feet offsite. The sign shall include a telephone number that residents can call to inquire about the construction process and to register complaints. The project applicant shall designate a "noise control coordinator" who will reply to all construction noise-related questions and complaints. Pile driving shall not be conducted onsite unless approved by the City.*

Plan Requirements and Timing: The applicant shall include requirements of MM NOI-1 in project plans for City review and approval. The City shall approve the noise controls prior to the start of construction.

Monitoring: The City shall ensure all required construction noise controls are implemented throughout construction of the project and shall respond to any complaints related to construction noise, as needed.

4.14 Population and Housing

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

4.14.1 Existing Setting

Though the project site is located on a parcel zoned for institutional uses, the property is bounded by businesses to the west and by residential uses to the north, east, and south. The nearest residential uses are located across PCH to the south approximately 150 feet away, and beyond Puerco Canyon to the north and east approximately 750 feet away. Project site roadways do not lead to residential subdivisions, nor provide other means of access to residential areas. There are no residential uses within the project site.

4.14.2 Impact Discussion

a. **No impact.** The project does not include a residential component and therefore would not directly induce unplanned population growth. Further, the project is located in a developed area with existing roads and services, and does not include the extension of infrastructure, such as roads, that could indirectly induce unplanned population growth. As such, no impact would occur.

b. **No impact.** The project site does not contain or provide access to any residential uses; therefore, no residential uses would be removed to accommodate development of the project and, no residents would be displaced. No impact would occur.

4.15 Public Services

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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:				
a) Fire protection?	☐	☐	☒	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☒	☐
d) Parks?	☐	☐	☒	☐
e) Other public facilities?	☐	☐	☒	☐

4.15.1 Existing Setting

The LACFD provides fire protection and emergency medical services for the City. Additionally, this property is located within the area described by CAL FIRE as a Fire Zone 4, VHFHSZ. Police services are provided by contract with the Los Angeles County Sherriff's Department from the Malibu/Lost Hills Sheriff's Station. The nearest public school to the project site is Webster Elementary School, located approximately 0.9 mile to the northeast. The nearest public parks to the project site are Malibu Bluffs Park and Corral Canyon Park, as further described in Section 4.15, *Recreation*.

4.15.2 Impact Discussion

a. **Less than Significant.** Project construction could result in a variety of operations that have the potential to increase the risk of fire, such as the use of mechanical equipment in vegetated areas, cutting and grinding metal, welding, and the storage of flammable materials such as fuel, wood and other building materials. Although rare, fires do occur at construction sites. Installation of the electrical, plumbing, and communication infrastructure would be subject to City codes and inspection by City personnel prior to dry walling. In addition, construction sites would also be subject to City requirements relative to water availability and accessibility to fire-fighting equipment during construction. The school would suspend operation during construction although religious services would continue to be held on Fridays and Saturdays. Because construction would also occur on Friday, construction may restrict emergency access to the site on Fridays if not managed properly. Construction personnel would be onsite during construction and would be responsible for managing the efficient vehicle ingress/egress from the project site. Compliance with MMC and LACFD requirements would reduce potential fire related impacts from construction activities to less than significant.

Operation of the project would increase the demand for fire and emergency services. Increased demand for non-emergency services could include services such as fire safety inspections (e.g., vegetation clearance), building inspections, fire code investigations and code compliance. Emergency responses could include medical and fire protection services.

In addition to the incremental increase in routine emergency and non-emergency response, the project site is located in a VHFHSZ and would be subject to wildfire risk. 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. Development within the VHFHSZ has the potential to increase the need for fire protection services. The project applicant would be required to obtain a current will-serve letter from Los Angeles County Waterworks District No. 29 (WWD No. 29) to ensure adequate water flow capacity exists to serve the project site prior to the commencement of any construction activities.

The project would be required to comply with all applicable CBC and City Building Code and Fire Code requirements for items such as types of roofing materials, building construction, brush clearance, water mains, fire hydrant flows, hydrant spacing, access, and design, and other hazard reduction programs, for VHFHSZ, as set forth and reviewed for compliance by the LACFD Land Development Unit, Fire Prevention Division, and the County Forester.

Emergency vehicles would enter and exit the site via its uncontrolled driveway on PCH at the west end of the project site. Internal circulation is designed to accommodate a code-compliant fire lane that extends from the driveway to a roundabout at the end of the surface parking lot, just west of the existing event/temple building (Figure 2). Using this internal fire lane, emergency vehicles would enter at the driveway, drive through the middle of the surface parking lot, and turn around at the roundabout, exiting at the driveway again. The interior fire access lane is designed in conformance with City and LACFD access requirements, and would replace an internal circulation system that currently does not meet applicable access standards. Consequently, LACFD access to the project site would be improved with implementation of the project.

The project would increase the intensity of development on the site by adding a new temple and increasing the floor area for school/administration uses and parking. Emergency calls may incrementally increase; however, in general, the proposed land uses in combination with the size of the project would be expected to generate only a few additional service calls per year at maximum. Further, additional staff time may be required to inspect the fuel modification zone and ensure adequate safety measures (e.g., fire extinguishers) are maintained for ceremonial events. Most calls for service would be expected to be medical in nature. While this may place additional demand on fire services, it would not increase demand to the extent that the provision of a new or physically altered existing fire station is warranted. Any increase in calls for service would be reduced through building design which would meet all City Building Codes, regulations, and the Los Angeles County Fire Code (Title 32) requirements for access and fire prevention (e.g., emergency plans and evacuation routes).

Based on the above information, implementation of the project would not create capacity or service level problems or result in substantial adverse physical or economic impacts associated with the provision of new or physically altered fire and/or emergency facilities and/or the need for new or physically altered fire and/or emergency facilities to maintain acceptable service ratios, response times or other performance objectives. Impacts would be less than significant.

b. **Less than Significant.** Project construction would normally not require services from the Los Angeles County Sheriff's Department, except in the cases of trespass, theft, and/or vandalism. Such activities at a construction site do not typically place undue demands on law enforcement services. Construction activity would increase traffic adjacent to the project site during working hours due to commuting construction workers, trucks, and other large construction vehicles that would increase traffic volumes. The school would suspend operation during construction although religious services would continue to be held on Fridays and Saturdays. Because construction would also occur on Friday, construction may restrict emergency access to the site on Fridays if not managed properly. Slow moving construction-related traffic along PCH may also reduce optimal traffic flows and conceivably could incrementally increase response times. During construction, the Los Angeles County Sheriff's Department would require adequate access for emergency vehicles and access for Sheriff's vehicles conducting routine patrol. Construction personnel would be onsite during construction and would be responsible for managing the efficient vehicle ingress/egress from the project site. With adequate access, response times would not be extended and the ability of deputies to provide proactive policing and efficient crime suppression would not be diminished. Implementation of standard construction-traffic control procedures such as flagmen and signage would further reduce any potential impact. Additionally, options available to emergency vehicles such as using sirens to clear a path of travel or driving in opposite traffic lanes would reduce the effect of any temporary incremental increases in traffic. Potential construction impacts related to Sheriff's emergency access and adequacy of Sheriff's response times is considered less than significant.

During project operation, the County Sheriff's Department would have the responsibility to provide sheriff protection services for the project site. The project could incrementally increase demands for sheriff services due to potential theft, vandalism, and/or trespassing. However, as the project does not involve any development that would result in population growth, this incremental increase would not warrant the provision of new or physically altered sheriff station.

Based on the above information, implementation of the project would not result in substantial adverse physical impacts associated with the provision of new or physically altered sheriff facilities and/or the need for new or physically altered sheriff facilities, the construction of which could cause significant environmental impacts, to maintain acceptable response times or other performance objectives.

c, d, & e. **Less than Significant**. The project would not directly result in population growth. As such there would be no increase in demand for schools, library services, or parks. No impact would occur.

4.16 Recreation

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Include recreational facilities, or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒
c) Substantially conflict with the area's established recreational uses?	☐	☐	☐	☒

4.16.1 Existing Setting

The City Community Services Department manages the Equestrian Center, Trancas Canyon Park, Las Flores Creek Park, Legacy Park, and Malibu Bluffs Park and administers programs in these parks and other locations. Other parks and beaches are maintained by the Los Angeles County Harbors and Beaches Departments, the State Department of Parks and Recreation, the Santa Monica Mountains Conservancy/Mountains Recreation and Conservation Authority, and the National Park Service.

Approximately 14.9 percent of the total land in Malibu is designated open space, accounting for 1,869.9 acres of local and regional parks, beach parks, and public open space for recreation. The nearest existing public recreation facility is Malibu Bluffs Park, located across PCH approximately 850 feet southeast from the project site. The next nearest facility is Corral Canyon Park, located approximately 1,820 feet northwest from the project site.

There is no immediate access to City or other agency trails from the project site, as indicated in the LCP Public Access Map. The nearest mapped trails are the Bluffs Park Loop Trail, which consists of multiple trail segments within Malibu Bluffs Park, including public beach access points; and the Malibu Pacific Trail, accessible via Puerco Canyon Road approximately 1,630 feet west from the project site, and extends west into Corral Canyon Park, connecting with other trails ranging north and northwest.

4.16.2 Impact Discussion

a-c. **No impact**. The project would not increase demand on local or regional parks. Please also refer to Section 4.14, *Public Services*. Because the project would not alter access or the use of the project site in relation to adjacent recreational uses, the project would not conflict with the area's established recreational uses. Therefore, there would be no impact to existing local and regional parks.

4.17 Transportation

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines for section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☒	☐	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

4.17.1 Existing Setting

This analysis is based, in part, on Traffic Studies prepared to evaluate the potential impacts to the traffic and circulation system that serve the project site (see Appendix C). These studies address estimated trip generation, potential congestion impacts, and site access. Please refer to the traffic studies for detailed analysis of trip and access related issues.

The project site is located adjacent to PCH on a stretch of highway between Pepperdine University and Corral Canyon Park, connecting Central Malibu with the eastern region of the City and further to the Los Angeles metropolitan area. PCH is the only major arterial within the City and contains limited signalized intersections along this route, partially due to the infrequent opportunities for major roadways to connect with PCH from between gaps in the Santa Monica Mountains. The posted speed limit along PCH in this area is 50 miles per hour. Peak periods for visitor traffic are on weekends, particularly during the summer months, and coincidental with the weekday afternoon commuter peak period. Left turn lanes are provided at major (signalized) intersections, and an intermittent center lane serves as a turn lane for developments along the highway. PCH is also a designated route within the Congestion Management Plan (CMP) for Los Angeles County's roadway system. The 2016 Caltrans traffic count for this section of PCH is 57,500 annual average daily traffic (AADT), representing the total volume of traffic on the roadway for the year divided by 365 days (California Department of Transportation 2017). The project driveway is approximately 34 feet wide and accommodates 2-way traffic.

Traffic safety is an important concern to residents and public agencies along the 21-mile reach of PCH in the City. PCH serves as a major commuter route, providing access to local residential neighborhoods and business as well as to visitors and beachgoers. The City commissioned a PCH Safety Study that included a review of accident data for the 2012, 2013, and 2014 time period. The PCH Safety Study found that there were two accidents near the PCH/Project driveway intersection during the 3-year period. The two accidents included a sideswipe with a parked car and an accident involving a bicyclist and a parked motor vehicle. No collisions were associated with operation of the driveway (City of Malibu & SCAG 2015). The City also issued the Final PCH Parking Study (Parking Study) in May 2017. The Parking Study found four parking-related collisions between 2011 and 2015 within 400 feet of the project site driveway entrance, with three of the collisions associated with a driveway two down from the project site approximately 200 feet west. These three incidents include a collision involving a parked vehicle, a vehicle struck while entering/exiting shoulder parking, and a bicyclist hitting a parked car door that was opening. Another collision occurred 350 east of the Project driveway and was a collision involving a parked vehicle. (City of Malibu 2017). Although the Parking Study did not identify the two parking-related collisions as those also identified in the PCH Safety Study, it is likely that they are same collisions given the similar location and nature of the collisions.

The nearest signalized intersection to the east is the intersection of PCH and John Tyler Road approximately 0.2 mile to the east. The nearest intersection to the west is the intersection of PCH and Corral Canyon Road approximately 1.5 miles to the west. As the two nearest signalized intersections to the project site, they would experience the greatest impact from project trips. Impacts at more distant intersections would be less as cars turn off the PCH away from the project site. PCH Traffic impacts would be minimized to the PCH from the implementation of a Student Drop-Off and Pick-Up Traffic Management Plan, which would be reviewed and approved by the City, to reduce vehicle queues within the site's surface parking lot.

Several unsignalized driveways also intersect with PCH to both the east and west within the general area. As detailed in Table 17, *Existing Intersection Operations*, the intersection closest to the project site operates at acceptable LOS, while those further from the project site operate at almost unacceptable and unacceptable LOS. LOS A through F are used to rate traffic operations, with LOS A indicating very good operations and low delays, and LOS F indicating poor operations and high delays (Associated Transportation Engineers 2018). There are summer holidays and other miscellaneous peak periods when the intersections can operate at more congested conditions than captured in the traffic counts; however, the project site is generally removed from major intersections in a relatively free-flow portion of PCH.

Table 17. Existing Intersection Operations

Intersection	Distance	LOS Conditions
PCH/Webb Way	1.5 miles east	LOS D on weekdays, LOS F in Saturday midday peak hour
PCH/Cross Creek	1.9 miles east	LOS D during a.m., p.m., and Saturday midday peak hours
PCH/Latigo Canyon Road	2.2 miles west	Unacceptable LOS for southbound approach

Source: PCH Safety Study Final Report, Appendix 2 Corridorwide Safety Assessment Report, Table B: Safety Assessment Matrix, LSA Associates Inc., 2013.

[a] LOS is a qualitative measure used to describe traffic flow conditions, which range from excellent, nearly free-flow traffic at LOS A to stop-and-go conditions at LOS F.

Onsite parking is exclusively used for project site activities, and public shoulder parking that is available along PCH is generally not used for coastal access or commercial shopping activities in the area because it is too far from the beach and there are parking lots associated with other commercial businesses in the area.

Los Angeles County Metropolitan Transportation Authority (Metro) Bus Route 534 is the nearest bus route to the project site, and travels from the Downtown Santa Monica area (as far as Colorado Avenue & Lincoln Boulevard) past Pepperdine University and the project site to the Trancas Country Market in the west side of Malibu. The bus route has stops at the intersection of John Tyler Drive and PCH within 0.2 mile east of the project site with a frequency between 10 to

25 minutes throughout the week; however, no pedestrian sidewalks are provided between this bus stop and the project site on either side of PCH.

City Standard Conditions of Approval

The City applies the following LCP standard conditions to applicable projects to minimize impacts to transportation and traffic.

- For the transportation of heavy construction equipment and/or material, which requires the use of oversized-transport vehicles on State highways, the applicant / property owner is required to obtain a transportation permit from Caltrans.
- A construction staging plan shall be reviewed and approved by the Planning Director prior to plan check submittal.
- Construction hours shall be limited to Monday through Friday from 7:00 a.m. to 7:00 p.m. and Saturdays from 8:00 a.m. to 5:00 p.m. No construction activities shall be permitted on Sundays or City-designated holidays.
- Construction management techniques, including minimizing the amount of equipment used simultaneously and increasing the distance between emission sources, shall be employed as feasible and appropriate. All trucks leaving the construction site shall adhere to the California Vehicle Code. In addition, construction vehicles shall be covered when necessary; and their tires rinsed prior to leaving the property.

4.17.2 Impact Discussion

a. Less than Significant. The project site's compliance with the City's standard conditions of approval as well as the implementation of a Student Drop-Off and Pick-Up Traffic Management required by the City's Department of Public Works will ensure consistency with applicable plans and policies regarding circulation. Metro provides public transportation services in the area. Bus service Route 534 operates along PCH, with stops approximately 0.2 mile from the project site, though with no designated pedestrian access to the project site. There are no designated sidewalks or bicycle lanes adjacent to the project site, though there is a shoulder where vehicles typically park that may be infrequently used by pedestrians. Nevertheless, development of the project would not interfere with public transit, bicycle, and/or pedestrian facilities, and would facilitate ADA access within the project site via ADA compliant parking spaces, elevators within both proposed structures, and interspersed ramps. The project would not conflict with any local and/or regional adopted alternative transportation policies, plans, or programs. Therefore, there would be less than significant impacts to transportation plans and/or infrastructure.

Pursuant to SB 743, the Governor's Office of Planning and Research (OPR) released a *Draft of Updates to the CEQA Guidelines*. OPR's *Draft of Updates* proposes vehicle miles traveled (VMT) as the replacement metric for LOS in the context of CEQA. While OPR emphasizes that a lead agency has the discretionary authority to establish thresholds of significance, the Draft of Updates suggests criteria that indicate when a project may have a significant, or less than significant, transportation impact on the environment. For instance, a project that results in VMTs greater than the regional average for the land use type (e.g. residential, employment, commercial) may indicate a significant impact. Alternatively, a project may have a less than significant impact if it is located within a transit priority area, or results in a net decrease in VMTs compared to existing conditions. Official VMT assessment guidelines have not been finalized and are not yet used in practice for the City, which utilizes LOS thresholds to assess project impacts on traffic per the

Malibu Traffic Impact Analysis Guidelines. Table 18, *City of Malibu Significant Impact Criteria For Signalized Intersections*, lists the City's traffic impact criteria for signalized intersections.

Table 18. City of Malibu Significant Impact Criteria For Signalized Intersections

Level of Service	Final V/C Value	Increase in V/C Value
LOS C	>0.710–0.800	+0.040 or more
LOS D	>0.810–0.900	+0.020 or more
LOS E, F	0.91 or more	+0.010 or more

[a] Trip generation rates are per 1,000 sf of floor area.

Including consideration for Institute of Transportation Engineers (ITE) calculations, new traffic counts conducted in September 2018, and City Public Works Department review (see Table 19), the project is estimated to generate approximately 39 AM peak-hour trips (32 inbound, 7 outbound) and 27 PM peak-hour trips (10 inbound,17 outbound), and would have net trip generation estimations of 27 AM peak-hour trips (22 inbound, 5 outbound) and 13 PM peak-hour trips (5 inbound, 8 outbound) (see Appendix C, Traffic Study). These net Project trip estimates are below the City TIA Guidelines thresholds (30 or more peak-hour trips), which require a preparation of a formal transportation impact analysis.

Table 19. Project Trip Generation – Weekday Trip Generation Study Results and Proposed Project Trip Generation Estimates

Land Use	Pre-School Intensity	Youth Religious Intensity	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Trip Generation Rates								
Pre-School and Youth Religious Programs	1 stu	1 stu	83%	17%	0.86	36%	64%	0.27
Trip Generation Summary								
Description	**Size**	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Proposed Uses								
Pre-School and Youth Religious Programs	45 stu	100 stu	32	7	39	10	17	27
Proposed Project Trips			**32**	**7**	**39**	**10**	**17**	**27**
Existing Uses								
Pre-School and Youth Religious Programs	14 stu	52 stu	10	2	12	5	9	14
Existing Project Trips			**10**	**2**	**12**	**5**	**9**	**14**
Net Project Trips			**22**	**5**	**27**	**5**	**8**	**13**

Stu = pre- and after-school students
AM peak hour of generator during 7:00 AM to 9:00 AM period.
PM peak hour of generator during 4:00 PM to 6:00 PM period.
Source: Traffic Study (see Appendix C)

As discussed above, PCH is a designated route within the CMP for Los Angeles County's roadway system. Under the CMP, an increase in the freeway volume by 150 vehicles per hour during the AM or PM peak hours in any direction requires further analysis. As demonstrated above, the project would add a maximum of 27 trips during the AM peak hour and 13 trips during the PM peak hour period, which is below the thresholds requiring further analysis, indicating compliance with the County CMP.

Existing queues for vehicles entering and exiting the site are minimal outside of during high-volume events and is considered in the 95th percentile for vehicle queue length based on existing conditions. Queue-related impacts are not anticipated for the project site as the project site driveway will hold a maximum of four vehicles; however, the site will implement the Student Pick-Up and Drop-Off Traffic Management Plan to further minimize any potential traffic related impacts. trips would all be added to the driveway intersection and then distributed to nearby intersections. These trip additions would increase the V/C ratios at the offsite intersections by less than 0.010, which is the City's minimum threshold for determining significant impacts. The Project would therefore not significantly impact the study-area intersections based on the City of Malibu's thresholds.

The project would increase the amount of onsite parking by 17 spaces from 83 spaces to a total of 100 spaces, and no changes to parking along PCH would occur with implementation of the project. The project site's existing peak usage is estimated at approximately 20 to 25 parked vehicles during an average day, which is much lower than the existing 83 current parking spaces. The project site's facility usage varies by type of activity throughout a typical day reducing the number of necessary parking spaces. Future peak parking demand is estimated at 48 parking spaces on Friday evenings and Saturday mornings during hours of religious services and weekday peak parking demand is estimated at 50 parking spaces for the evening adult educational program. Additionally, the Synagogue chapel on the project site offers offsite valet program services to alleviate any religious Holiday service parking needs, as discussed in MM-TRANS-1. Future anticipated parking demand is significantly under 100 spaces. Project site access on PCH via a median left turn lane would not be altered. Applying the LIP parking rates for the MJCS project's individual uses shows a parking requirement of 180 parking spaces. However, using the schedule of operations established for the various facilities, the number of LIP required parking spaces for the site at any one time does not exceed 59 parking spaces, which occurs during the evening adult educational program, unless otherwise anticipated by a distinct high volume event.

Operations at the PCH/Project Driveway were evaluated for the AM and PM peak hour commuter periods using the operations methodologies for stop sign controlled intersections that are outlined in the Highway Capacity Manual (HCM). Each movement required to yield (eastbound left-turn from PCH) or stop (left and right turns from the Project driveway) has an average delay per vehicle and a level of service rating. There is also average delay per vehicle and level of service rating presented for all movements that are required to yield or stop (i.e. overall intersection). For the Existing Plus Project Conditions, delays for turning into the Project driveway from PCH (eastbound left turns) are forecast at LOS B-C during the AM and PM peak hour periods (Table 20). Delays for turning from the Project driveway onto PCH (southbound left and right turns) are forecast at LOS C-D during the AM and PM peak hour periods. The delays for turning onto PCH during the p.m. peak commuter period (LOS D) are common for driveways along PCH. The data indicate that the driveway would operate acceptably with the addition of traffic due to the Project (Associated Transportation Engineers 2018).

Table 20. PCH/Project Driveway Operations: Existing + Project

Intersection / Movement	ADT		AM Peak Hour	
	Rate[a]	Trips	Rate[a]	Trips
PCH/Project Driveway	4.11	123	0.91	27
Eastbound Left Turn	NA	445	NA	0
	NA	4	NA	0
Total Trips		**572**		**27**

[a] Trip generation rates are per 1,000 sf of floor area.

The MJCS has established that they would not schedule overlapping ceremonial events on the site and would secure offsite parking for events that have a parking demand that exceeds the site's parking supply. As detailed in Table 1, *Ceremonial Event Types at the MJCS*, there would be approximately 24 days per year in which offsite parking would be necessary. Special event parking would continue to be accommodated via an offsite valet parking program to alleviate overflow parking for high-volume ceremonial events, in which up to 500 attendees would be accommodated. This program includes informational outreach which is implemented ahead of events by publishing parking procedures directing the attendees to the offsite lot rather than parking along PCH. The offsite parking and associated shuttle service to and from the project site would continue to reduce vehicle trips and mitigate traffic impacts, resulting in less than significant traffic impacts during high-volume ceremonial events. Despite implementation of the parking program during high-volume ceremonial events, the structure of the median left turn lane on PCH has the potential to result in vehicle queuing onsite and on PCH and similar traffic hazards. With implementation of MM TRANS-1, *Special Event Parking Program Monitoring*, MJCS staff would monitor the driveway operations during high-volume ceremonial events to avoid potential vehicle queuing both on- and offsite along PCH. Implementation of MM TRANS-1 would also include an informational outreach program implemented ahead of events by publishing parking procedures directing the attendees to the offsite lot rather than parking along PCH.

Project implementation would not conflict with any ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. With the implementation of MM TRANS-1, this impact would be less than significant.

b. **Less than Significant.** Pursuant to CEQA Guidelines Section 15064.3 (b), the project site would not increase operational vehicle miles traveled as the site is directly adjacent to the existing major transportation resource, PCH. The site is located within the vicinity of public transit and is within the City limits of Malibu allowing for low Vehicle Miles Traveled for residences to use the future facilities. The 2018 Traffic Study for the project site concluded the increase in site square footage and enrolled pre-school students and after-school youth religious program would not impact overall traffic levels on PCH.

c. **Less than Significant with Mitigation Incorporated.** Project construction would be short-term and involve low traffic levels. PCH, adjacent to the site, does not contain any significant curves and the project site's median turn lane has been identified as a safe means of transportation access (see Appendix C). Nevertheless, a large number of haul trucks would be required to enter and exit the property, especially during excavation and soil export efforts (750 vehicles over 75 days – including both demolition and excavation – or approximately 10 vehicles per work day, or between 1 and 2 trucks per hour). Construction crews would be required to adhere to standard safety practices include posting of signs, use of construction cones, and other methods, with approval of Caltrans' Stage Construction, Traffic Handling, and Detour Construction plans. Construction activities are not anticipated to result in substantial conflicts or create safety hazards. Nevertheless, the potential need for modifying onsite parking lot space configurations during construction would potentially require identifying offsite parking capacity during synagogue services and activities. Depending on the extent of onsite construction parking lot reconfiguration, this would result in additional attendees parking along PCH that could increase safety hazards.

A sight distance analysis was conducted at the MJCS driveway intersection with PCH, in compliance with requirements of the Caltrans HDM last updated on December 14, 2018. Stopping sight distance (SSD) and corner sight distance (CSD) measurements were performed at the intersection and compared with minimum line-of-sight requirements. A Time Gap Analysis was also performed and compared with conservative minimum time gap requirements acceptable for safe turning into and out of the MJCS driveway intersection with PCH. A left-turn restriction analysis was also conducted to determine whether or not left-turn prohibitions were required at the MJCS driveway intersection. The results of the supplemental transportation analyses (the sight distance analysis including SSD and CSD, the time gap analysis, and the left-turn restriction analysis) indicate that continued operation of the MJCS driveway at PCH as a full-access facility would be acceptable, and no driveway restrictions are recommended for implementation as part of the project.

Operationally, there would be no changes to the project site's PCH frontage. According to the Parking Study, the existing median two-way-left-turn-lane on PCH would be able to accommodate vehicles entering and exiting the project site driveway. Additionally, the incremental increase in traffic, as indicated in Table 19, *Project Trip Generation*, would not significantly affect driveway operations or operations along PCH. Additionally, the onsite parking lot would be adjusted to enable easier fire and emergency vehicle access via an enlarged turnaround circle. The facility would continue to be able to support large events that would require offsite parking in order to handle the number of attending individuals. In some cases, these high-volume events have resulted in unsafe parking practices for event attendees, including the parking of personal vehicles along the southern edge of PCH. Because there is no easy pedestrian access from the southern edge of PCH to or from the northern edge of PCH at the project site location, event attendees have run across PCH in high speed traffic and nighttime conditions to get to and from their vehicles. Because the project would facilitate continued high-volume events during operation that would result in future potential hazards associated with roadway design, and additional parking would potentially occur along the inland side of PCH during Project construction, implementation of MM TRANS-1, *Construction and Special Event Parking Program Monitoring*, would serve to reduce safety conflicts between the project site and adjacent PCH, and impacts would be less than significant with mitigation.

d. **Less than Significant.** As discussed in Section 4.17.1 above, the project would result in only minimal increases in traffic on PCH, would retain the existing driveway to the project site, and would not significantly impact the operational efficiency of nearby signalized intersections. Neither the construction nor the operation of the project would require or result in long-term modifications to any of these roadways that would impact emergency traffic. Caltrans would continue to monitor operations on the project vicinity to ensure the driveway does not impact emergency operations on PCH. Additionally, construction crew adherence to standard safety practices would ensure safe access and circulation during temporary construction activities. Since the project would not substantially affect emergency access and traffic flow, this would result in a less than significant impact.

Mitigation Measures

The following mitigation measure is required to reduce potential impacts related to transportation and traffic to a less than significant level.

MM TRANS-1 ***Construction and Special Event Parking Program Procedures.*** *MJCS staff shall establish and implement a parking program during construction and for high-volume events (200+) that would require offsite parking. Each high-volume event shall follow the established parking program, utilizing a checklist to ensure its implementation, which may include, but not be limited to, the following items:*

- *Informational outreach shall occur ahead of events by publishing parking procedures directing the attendees to the offsite lot rather than parking along PCH.*

- *MJCS staff shall hire sheriffs to monitor the driveway operations during high-volume ceremonial events to avoid potential vehicle queuing both on- and offsite.*

    - *Each high-volume special event shall have an individual dedicated as a parking monitor prior to the event's scheduled start time.*

    - *The parking monitor shall be visible from within the parking lot during the beginning and end of each high-volume special event.*

- *In coordination with the appropriate regulating authorities, signage shall be installed along the southern shoulder of PCH which indicates that the roadway edge should not be used for parking for events at the project site.*

- *In coordination with the appropriate regulating authorities, temporary pedestrian crosswalk lights shall be installed to enable safer crossing across PCH.*

- *Additional requirements as deemed necessary to ensure public and event attendee safety during high-volume events.*

Plan Requirements and Timing: A parking procedure plan directing attendees to the offsite lot and associated checklist shall be established prior to project approval. The parking procedure plan for each event shall be approved by the City Planning Department and Public Works Department prior to each event.

Monitoring: The parking procedure plan and associated checklist shall be available during all high-volume ceremonial events taking place at the MJCS.

4.18 Tribal Cultural Resources

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, scared place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☒	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

4.18.1 Existing Setting

AB 52, which went into effect on July 1, 2015, established a consultation process with all California Native American Tribes on the Native American Heritage Commission (NAHC) List and required consideration of Tribal Cultural Values in the determination of project impacts and mitigation. AB 52 established a new class of resources, tribal cultural resources, defined as a site feature, place, cultural landscape, sacred place or object, which is of cultural value to a Tribe that is either: (1) on or eligible for the California Historic Register or a local historic register; or (2) treated by the lead agency, at its discretion, as a traditional cultural resource per Public Resources Code 21074 (a)(1)(A)-(B).

Public Resources Code Section 21083.09, added by AB 52, required the California Natural Resources Agency to update Appendix G of the CEQA Guidelines to address tribal cultural resources. Pursuant to Government Code Section 11346.6, on September 27, 2016, the California Natural Resources Agency adopted and amended the CEQA Guidelines to include consideration of impacts to tribal cultural resources. These amendments separated the consideration of paleontological resources from tribal cultural resources and updated the relevant sample questions to add specific consideration of tribal cultural resources.

4.18.2 Impact Discussion

a. **Less than Significant.** As discussed in Section 4.5, *Cultural Resources*, the project does not propose any alteration or damage to any designated historic structures or resources. Therefore, this impact would be less than significant.

b. **Less than Significant with Mitigation.** In accordance with AB 52 and Section 11346.6 of the State CEQA Guidelines, the City notified those Tribal representatives identified by the NAHC of the project, starting a 30-day comment period that extended from March 9, 2018 to April 8, 2018. No requests for additional consultation, comments, or questions about the project were received. The project site is located within a region that has a history of habitation by the Chumash and Tongva populations and includes a segment of site CA-LAN-19, thought to have contained a Chumash village in the Intermediate Period. While much of the archaeological resources at the project site have been previously disturbed or destroyed by past grading and excavations, as discussed in Section 4.5, *Cultural Resources*, archaeological/tribal cultural resources could potentially be discovered during excavation of the proposed subterranean parking garage. However, in the event that unexpected tribal cultural resources are found during construction, the project has been conditioned via standard conditions of approval to stop work until further evaluation. In addition, with implementation of MM CR-1, in the event that Native American artifacts or human remains are encountered during grading activities, a qualified Chumash monitor shall be brought onsite and evaluate any remaining grading operations alongside a qualified archaeologist. Therefore, potential impacts to tribal cultural resources would be mitigated to a less than significant level.

4.19 Utilities and Service Systems

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

4.19.1 Existing Setting

Water service to the project site is provided mainly by WWD No. 29 with water supplied from the Metropolitan Water District of Southern California (MWD). The MWD obtains its water from the State Water Project and the Colorado River. The City receives water through a 30-inch water main running along PCH, with several distribution pipelines running north towards the canyons. Water is pumped at several locations from the main transmission pipeline into canyons and other parts of the City. Historical data analyzed by the West Basin MWD has shown that due to a lack of precipitation during drought conditions, there can be an increase in water demand by four to eight percent during successive dry years.

As discussed in Section 4.9, *Hydrology and Water Quality*, the CCWTF is operational and currently treating wastewater. The CCWTF includes development of a centralized wastewater treatment facility in the Malibu Civic Center area that would treat, reuse, and/or dispose of wastewater flows from properties in the surrounding areas (City of Malibu 2018). There are five small, package sewage treatment plants within the City: the Latigo Bay Shores, Point Dume, Trancas Canyon, Malibu Mesa, and Maison de Ville. Hughes Research Lab operates their own facilities and Pepperdine University and Malibu Country Estates are served by the Malibu Mesa Plant. Most wastewater is treated using onsite treatment technologies, such as septic systems. Improperly maintained septic systems have caused alleged health and safety problems, but, with adequate area for leaching fields or regular disposal, can be safely operated in almost all areas of the City. In the project vicinity, all of the property is serviced by septic systems (City of Malibu 2016). There is an existing OWTS onsite to accommodate wastewater from the existing synagogue building, which is located between the existing school structures and the existing synagogue building immediately adjacent to the northern edge of the parking lot. The existing OWTS comprises an area of approximately 140 sf and has a series of surface maintenance access ports within a landscaped median between the pedestrian walkway and parking lot. This existing OWTS currently accommodates all effluent waste from the existing structures.

Solid waste disposal in Malibu is presently handled by four private hauling companies, one of which is under contract to service the Los Angeles County/Malibu Garbage Disposal District. The Simi Valley Landfill and Recycling Center and the Calabasas Landfill are the primary disposal facilities of non-recyclable solid waste for the City. The Simi Valley landfill has an estimated remaining capacity of 52 million tons with a design lifespan of approximately 67 years. The Calabasas landfill has an estimated remaining capacity of 6 million tons and is projected to reach its capacity around 2030. Further, several other landfill facilities in the County, including the Lancaster Landfill and Recycling Center and the Sunshine Canyon City/County Landfill would accept solid waste generated by the proposed project (County of Los Angeles 2017).

Southern California Edison (SCE) provides electricity to the project site area and has enough capacity to satisfy the existing electricity demands of the City (City of Malibu 2019). Natural gas is provided to the project site by Southern California Gas Company. These providers have not indicated that limited power or energy is available for new development in the City. Additionally, a range of telecommunication providers including internet and phone services are available in the City of Malibu including but not limited to Frontier, Spectrum, and Viasat. The project site is currently served by telecommunication providers and is within the service area of cable fibers and underground and aerial telephone transmission lines within the City limits.

4.19.2 Impact Discussion

a. **Less than Significant.** The project proposes an additional OWTS composed of seepage pits, treatment tank, and disinfection system, subject to review by the City Environmental Health Administrator to meet the minimum requirements of the Malibu Plumbing Code, LARWQCB Resolution No. R4-2009-007, MMC, and LCP. The Environmental Health Division review recommends project approval only when it determines that septic systems can be adequately operated without negatively affecting groundwater quality, ocean water quality, building foundations, or structures. The proposed OWTS would comprise of one 7,450-gallon subterranean treatment tank with UV disinfection, one 15,000-gallon equalization tank, and 12 subsurface seepage pits. The LARWQCB would review the proposed development to issue a WDR for the proposed systems. The project's wastewater system is designed to meet all applicable requirements, and operating permits would be required. The project's proposed wastewater treatment system has been designed to accommodate the requirements of the project's proposed uses. The new OWTS would accommodate increased wastewater generation from the proposed buildings. The entire system would be contained within the project site. With the City Environmental Health Division review and approval of the OWTS, the project would adequately accommodate wastewater flows of the project and not result in a seepage of groundwater pollutants into the ocean. Expanded discussion of effluent disposal, groundwater mounding, and the proximity of the OWTS seepage pits to Puerco Canyon Creek is contained within Section 4.9, *Hydrology and Water Quality*. With adherence to applicable requirements, impacts to wastewater facilities would be less than significant.

As discussed within Section 4.9, *Hydrology and Water Quality*, there are no large stormwater facilities adjacent to the project site. The project site generally drains towards Puerco Canyon and PCH, which connects to Puerco Canyon Creek to the southeast. MMC Section 13.04.110 requires runoff to be retained and treated onsite though the use of properly designed BMPs. In the event that peak runoff exceeds runoff produced by the design year storm, these excess flows would continue to outlet to Puerco Canyon and the PCH and ultimately the Pacific Ocean as under existing conditions. The project proposes BMPs that include drains, catch basins, and infiltration pits to meet SWMP and WQMP requirements. There are no known capacity constraints in the stormwater system serving the project site. Since stormwater flows would be primarily controlled onsite and BMPs can be expected to reduce stormwater flows when compared to existing conditions, the project is not anticipated to result in runoff exceeding the capacity of an existing or planned storm drain system. Therefore, there would be a less than significant impact to stormwater drainage facilities as a result of the project.

SCE and Southern California Gas Company prepare ten-year load forecasts to ensure the reliability of the electric supply and conveyance systems in the area. Projected electrical demand for the Project would be factored into load forecasts and supply planning efforts, as project implementation would occur over approximately two years. Additionally, SCE and Southern California Gas Company would install new distribution facilities as needed according to the California Public Utilities Commission rules (California Public Utilities Commission 2019). While electric and natural gas services are required to be provided upon demand from consumers and expanded as needed to meet demand, SCE and the Southern California Gas Company have not indicated the need for expansion of power or energy infrastructure to supply development within the City. The existing electrical and natural gas supply is adequate to serve existing project facilities, and any increased demand for power utilities services are anticipated to be available based on the California Public Utilities Commission rules. Therefore, the project would not result in the relocation or construction of new or expanded electric or natural gas facilities, and potential impacts to energy facilities are considered less than significant. Additionally, as the project would not require the expansion or relocation of telecommunication facilities, due to the existing number of providers and project site’s location within an existing service area, impacts would be less than significant.

b. **Less than Significant.** Limited and temporary alterations to water supply would occur with implementation of the project. While some water would be used during construction activities through activities such as dust control and landscaping efforts, the effects would be temporary. Water supply entitlements have been secured by WWD No. 29 and are adequate to serve the projected growth in Malibu, including the proposed project for foreseeable future normal, dry, and multiple dry years. WWD No. 29 purchases water from the MWD. MWD includes adequate water resources in its Integrated Resources Plan. Therefore, WWD No. 29 would be able to adequately supply the project. In addition, the project applicant is required to provide the City with a will serve letter from WWD No. 29 confirming their ability to serve the project. Thus, impacts would remain less than significant, and no mitigation is required. Therefore, the project would have a less than significant impact on water resources, capacity, or demand.

c. **No Impact.** As discussed above, there is no municipal wastewater treatment provider that serves the project site, and most wastewater in the project vicinity is treated using onsite treatment technologies, such as the OWTS the project would implement. Therefore, there would be no impact to wastewater treatment providers.

d. **Less than Significant**. Implementation and operation of the project would result in the generation of solid waste; however, levels would be in compliance with state and local standards. Construction and renovation/demolition activities would also generate solid waste; however, the generation of solid waste during construction and demolition would be a one-time event and would not result in a significant impact to solid waste management infrastructure, which is intended to handle the continuous generation of solid waste throughout the project area. With regard to operation, as discussed above, landfills available to solid waste haulers serving the project site have adequate capacity to serve the project within the existing capacity of local infrastructure, and a less than significant impact would result.

e. **Less than Significant.** During construction and operation of the project, the project applicant would comply with all applicable federal, state, and local management and reduction statutes on solid waste diversion, reduction, and recycling mandates, including compliance with the City's Source Reduction and Recycling Element (SRRE), and the MMC. Compliance with these regulations and mandates would assist in reducing the amount of waste deposited in local landfills. Therefore, impacts related to regulatory compliance would be less than significant.

City Standard Conditions of Approval

The City applies the following LCP standard conditions to applicable projects to minimize impacts to utilities.

- Prior to the issuance of a building/demolition permit, an Affidavit and Certification to implement a Waste Reduction and Recycling Plan (WRRP) shall be signed by the Owner or Contractor and submitted to the Environmental Sustainability Department. The WRRP shall indicate the agreement of the applicant to divert at least 50 percent of all construction waste generated by the project.

- Prior to a final Building inspection, the applicant shall provide a final Waste Reduction and Recycling Summary Report (Summary Report) and obtain the approval from the Environmental Sustainability Department. The final Summary Report shall designate all material that were land filled or recycled, broken down by material types.

4.20 Wildfire

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

4.20.1 Existing Setting

Average fire seasons in California typically span from roughly May through October; however, recent events indicate wildfire behavior, frequency, and duration are changing in California, as seen by the 250,000-acre Thomas Fire in December 2018. The duration of the fire season is influenced by a combination of climatic, vegetative, and physiographic conditions that may affect the duration of the period. Structural losses or damage from wildfires are often caused from the siting of structures within or adjacent to high fire hazard areas, inappropriate construction materials, or flammable landscaping. Climate change has the potential to impact fire frequencies, intensities, and total burn area, and large intense fires have become more common in the past two decades (US Forest Service 2012). While the frequency, intensity, and burn area of a fire is influenced by a diverse range of factors, it is accepted that the general increase in temperature is correlated to a higher fire hazard risk.

The 2015 OAERP notes that the Santa Monica Mountains, which includes the City along its southern edge, are known for the “chaparral-urban interface” between dry vegetation and surrounding urban development. The mountains are subject to dry conditions, seasonal 40- to 50-mile-per-hour winds, and high temperatures of over 90 degrees that contribute to a much higher threat of wildfire year-round (Los Angeles County 2015). The dense stand of giant reed present in the creek bottom within the project site contributes to the fire fuel load and hazard potential, and the project site borders major areas of undeveloped chaparral habitat to the north. In the past, the project site burned in the Piuma (1985), Old Topanga (1993), and Calabasas (1995) fires, and was approximately 1.0 mile east of the 2007 Corral Fire’s eastern extent (David Magney Environmental Consulting 2017a). The 2018 Woolsey Fire represents the most recent wildfire to have affected the property. The Woolsey Fire burned over 96,900 acres of land in Los Angeles and Ventura Counties in November 2018. The fire began in Woolsey Canyon on the Santa Susana Field Laboratory property in the Santa Susana Mountains, above the Simi Valley and near the boundary between Los Angeles and Ventura Counties. The fire headed south into the Santa Monica Mountains, passing through Puerco Canyon and Puerco Canyon Creek, just to the north of the project site. The fire burned up to the edge of the hilltop, where it burned vegetation but did not burn any of the Jewish Center structures.

Fire Hazard Severity Zones are defined by the California Department of Forestry and Fire Protection (CalFire) based on the presence of fire-prone vegetation, climate, topography, assets at risk (e.g., high population centers), and a fire protection agency's ability to provide service to the area. The project site is located within an area designated as a Fire Zone 4 – Very High Fire Hazard Severity Zone (VHFHSZ) by CalFire and the LACFD County Forester (CalFire 2007; County of Los Angeles 2012). In addition to high fire hazards associated with wildland vegetation, the northern areas of the project site support steep slopes potentially prone to slope failure such as landslides and mudslides, especially in burned areas where soil stability can be compromised (see also, Section 4.6, Geology and Soils).

The project site includes moderate to steep slopes (e.g., 15 to 75 percent) surrounding the site's area and perimeter with PCH. Slope steepness and the ruggedness of terrain may affect both fire behavior and firefighting access. As slope gradients increase, hand crews are less likely to establish fire-containment lines in areas of excessively steep slopes to the lack of accessibility and safety concerns (Barros et al. 2013). The steep slopes with chaparral vegetation along the site's northern perimeter present a wildland fire hazard, as shown by the changes to vegetation that occurred during the 2018 Woolsey Fire (see Appendix E). In addition, prevailing wind direction varies throughout the year in Malibu. From March 4th to October 24th, wind is typically from the west, and from October 25th to March 3rd, wind is typically from the north (Weather Spark 2019). The Santa Monica Mountains border the site from the north, causing an increased risk from late fall to end of winter if wildfire were to spread from the surrounding area.

Within the Project vicinity, the Santa Monica Mountains to the north contain chaparral vegetation, which can burn quickly during the dry fire season, particularly under conditions of strong, dry winds. The surrounding vegetation communities have a propensity to burn on an intermittent basis, with grassland fires particularly susceptible to expand rapidly (Keeley & Borchert 2005). Consequently, recurrent fire has developed into an ecological factor necessary for the survival of some chaparral species to prompt seed germination after fires; however, fires do not seem to be required by these species to remain at healthy levels. Additionally, coastal sage scrub, which is found in surrounding areas of the project site, tends to have the highest associated fire frequency as they tend to accumulate more plants annually than do areas of woody chaparral scrub.

4.20.2 Impact Discussion

a. **No Impact.** The project is required to comply with existing County of Los Angeles and City of Malibu Emergency Response Plans. The City of Malibu's 2018 Emergency Operations Plan provides an operational approach to response and recovery from potential hazards (City of Malibu 2018) While the project is located within a designated Fire Hazard Severity Area, the site has existing development and is along the regional transportation resource, US Highway 1, so no new areas of service would be required for emergency personnel. Additionally, the internal circulation roadways allow for fire department access throughout the project site adjacent to each site building. The project would not impair any adopted emergency response plan or emergency evacuation plan's effectiveness, and no impact would occur.

b. **Less than Significant.** Slope steepness and prevailing wind direction are the most significant factors in determining the rate of wildfire spread. Additionally, slope steepness and the ruggedness of terrain may affect both fire behavior and firefighting access, however the project would improve pedestrian circulation within the site and would not exacerbate fire service access to the northern slope. From approximately March to October the wind is from the west and from the end of October to the end of March the wind is from the north (Weather Spark 2019). In the event of a wildfire, particularly when the wind is directed south between March and October, potential fire hazard exposure would increase to the site. However, the site would retain access to its main transportation access point along PCH, and the project would not otherwise impede access along this route or substantially within the site. Overall, the project site's use would remain relatively the same and accessible to the County of Los Angeles fire services, and impacts would be less than significant.

c. **No Impact**. No new roads or associated infrastructure would be implemented under the project, and the site would retain access to PCH within the City of Malibu. The nearest fire station, Fire Station 88, is located 1.5 miles east of the site. The site is an existing developed site in an urbanized area and would not require installation of any infrastructure that may exacerbate fire risk; therefore, no impacts would occur.

d. **Less than Significant**. The project would not exacerbate exposure of people or structures to significant risks related to post-fire instability. The site has existing development, and no major changes would occur to the site's topography due to the project. Additionally, the project would not substantially alter the local drainage pattern or increase the risk of flooding to the surrounding area. The project would minimize water runoff during construction and operation by the use of BMPs and facilitating onsite percolation to the south, so an increase in runoff to the northern slopes would not be present that could increase post-fire slope instability and impacts would be less than significant. Please refer to Section 4.10, Hydrology and Water Quality, for further analysis regarding flooding.

4.21 Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 wild-life population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?	☐	☐	☐	☒
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a 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.)	☐	☒	☐	☐
d) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

4.21.1 Existing Setting

Not Applicable.

4.21.2 Impact Discussion

a. **Less than significant with mitigation incorporated.** Based on the preceding discussion, the project would neither degrade the quality of the environment nor significantly affect any endangered fauna or flora with the incorporation of standard conditions and mitigation measures discussed above. Due to the project's features, including the site design and mitigation measures (e.g., habitat monitoring), as well as the project's environmental setting (e.g., the disturbed nature of the project site where buildings are proposed, the subsurface infiltration pattern), the project would not impact the habitat or population level of fish or wildlife species, nor would it threaten a plant or animal community, nor impact the range of a rare or endangered plant or animal. Potential impacts related to archaeological and paleontological resources would be less than significant with implementation of standard conditions of approval, and there would be no impacts related to potential historic resources.

b) No Impact. No potential for the project to achieve short-term, to the disadvantage of long-term, environmental goals has been identified.

c) Less than significant with mitigation incorporated. It is not anticipated that the project when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects, would have a significant effect on the environment. While the project and cumulative development are anticipated to minimally affect roadways in the project vicinity, the project would have less than significant impacts to area traffic both on a project and cumulative level. Also, as previously discussed in Section 4.12, *Noise*, cumulative impacts were analyzed and with implementation of mitigation measures, the proposed project is not expected to result in significant adverse impacts either individually or cumulatively. Although excavation of the subterranean basement could potentially uncover previously undisturbed cultural and paleontological resources, MM CR-1 and MM GEO-1 would ensure the proper steps are taken to avoid impacts. Therefore, the project in combination with recommended mitigation measures would not result in any cumulative impacts.

d) Less than significant with mitigation incorporated. As discussed in the above analyses for the project, with implementation of the required mitigation measures, the proposed project would not result in significant adverse impacts. Thus, the project would not have the potential to result in substantial adverse effect on human beings.

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Appendix A

CalEEMod Output Sheets

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Malibu Jewish Center & Synagogue

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	16.41	1000sqft	0.38	16,410.00	0
Place of Worship	4.15	1000sqft	0.10	4,147.00	0
Enclosed Parking with Elevator	9.78	1000sqft	0.22	9,777.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 33

Climate Zone 8 **Operational Year** 2020

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 702.44 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Schedule based on 18-month construction schedule from project description

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Grading - area of disturbance established from project description

Demolition -

Trips and VMT - haul trips obtained from project description assumption

Vehicle Trips - trip rate established based on traffic study ADT

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	100.00	350.00
tblConstructionPhase	NumDays	10.00	30.00
tblConstructionPhase	NumDays	2.00	45.00
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	1.00	20.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	8/20/2019	9/4/2020
tblConstructionPhase	PhaseEndDate	8/6/2019	7/31/2020
tblConstructionPhase	PhaseEndDate	3/14/2019	4/4/2019
tblConstructionPhase	PhaseEndDate	3/19/2019	6/19/2019
tblConstructionPhase	PhaseEndDate	8/13/2019	8/18/2020
tblConstructionPhase	PhaseEndDate	3/15/2019	4/27/2019
tblConstructionPhase	PhaseStartDate	8/14/2019	8/19/2020
tblConstructionPhase	PhaseStartDate	3/20/2019	6/20/2019
tblConstructionPhase	PhaseStartDate	3/16/2019	4/28/2019
tblConstructionPhase	PhaseStartDate	8/7/2019	8/1/2020
tblConstructionPhase	PhaseStartDate	3/15/2019	4/5/2019
tblGrading	AcresOfGrading	0.00	1.44
tblGrading	AcresOfGrading	10.00	0.50
tblGrading	MaterialExported	0.00	7,550.00
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Building Construction
tblTripsAndVMT	HaulingTripNumber	0.00	750.00
tblVehicleTrips	ST_TR	6.21	34.86
tblVehicleTrips	ST_TR	10.37	0.00
tblVehicleTrips	SU_TR	5.83	34.86
tblVehicleTrips	SU_TR	36.63	0.00
tblVehicleTrips	WD_TR	74.06	34.86
tblVehicleTrips	WD_TR	9.11	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1504	1.5768	1.1275	2.2700e-003	0.0469	0.0809	0.1277	0.0168	0.0752	0.0920	0.0000	205.4301	205.4301	0.0452	0.0000	206.5590
2020	0.1950	0.9567	0.8331	1.4700e-003	0.0176	0.0529	0.0706	4.7500e-003	0.0489	0.0536	0.0000	128.7830	128.7830	0.0333	0.0000	129.6153
Maximum	**0.1950**	**1.5768**	**1.1275**	**2.2700e-003**	**0.0469**	**0.0809**	**0.1277**	**0.0168**	**0.0752**	**0.0920**	**0.0000**	**205.4301**	**205.4301**	**0.0452**	**0.0000**	**206.5590**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1504	1.5768	1.1275	2.2700e-003	0.0347	0.0809	0.1156	0.0112	0.0752	0.0864	0.0000	205.4300	205.4300	0.0452	0.0000	206.5588
2020	0.1950	0.9567	0.8331	1.4700e-003	0.0176	0.0529	0.0706	4.7500e-003	0.0489	0.0536	0.0000	128.7829	128.7829	0.0333	0.0000	129.6152
Maximum	**0.1950**	**1.5768**	**1.1275**	**2.2700e-003**	**0.0347**	**0.0809**	**0.1156**	**0.0112**	**0.0752**	**0.0864**	**0.0000**	**205.4300**	**205.4300**	**0.0452**	**0.0000**	**206.5588**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	18.85	0.00	6.13	26.31	0.00	3.90	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-1-2019	5-31-2019	0.5600	0.5600
2	6-1-2019	8-31-2019	0.5482	0.5482
3	9-1-2019	11-30-2019	0.4610	0.4610
4	12-1-2019	2-29-2020	0.4322	0.4322
5	3-1-2020	5-31-2020	0.4215	0.4215
6	6-1-2020	8-31-2020	0.4248	0.4248
7	9-1-2020	9-30-2020	0.0254	0.0254
		Highest	0.5600	0.5600

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0846	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004
Energy	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	76.2032	76.2032	2.8100e-003	8.0000e-004	76.5113
Mobile	0.1515	0.6771	1.5192	4.2900e-003	0.3157	4.5500e-003	0.3202	0.0846	4.2600e-003	0.0889	0.0000	396.3485	396.3485	0.0249	0.0000	396.9698
Waste						0.0000	0.0000		0.0000	0.0000	9.1326	0.0000	9.1326	0.5397	0.0000	22.6255
Water						0.0000	0.0000		0.0000	0.0000	0.2645	10.5842	10.8487	0.0276	7.3000e-004	11.7568
Total	**0.2377**	**0.6909**	**1.5311**	**4.3700e-003**	**0.3157**	**5.6000e-003**	**0.3213**	**0.0846**	**5.3100e-003**	**0.0899**	**9.3970**	**483.1366**	**492.5337**	**0.5950**	**1.5300e-003**	**507.8642**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0846	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004
Energy	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	76.2032	76.2032	2.8100e-003	8.0000e-004	76.5113
Mobile	0.1515	0.6771	1.5192	4.2900e-003	0.3157	4.5500e-003	0.3202	0.0846	4.2600e-003	0.0889	0.0000	396.3485	396.3485	0.0249	0.0000	396.9698
Waste						0.0000	0.0000		0.0000	0.0000	9.1326	0.0000	9.1326	0.5397	0.0000	22.6255
Water						0.0000	0.0000		0.0000	0.0000	0.2645	10.5842	10.8487	0.0276	7.3000e-004	11.7568
Total	**0.2377**	**0.6909**	**1.5311**	**4.3700e-003**	**0.3157**	**5.6000e-003**	**0.3213**	**0.0846**	**5.3100e-003**	**0.0899**	**9.3970**	**483.1366**	**492.5337**	**0.5950**	**1.5300e-003**	**507.8642**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/1/2019	4/4/2019	6	30	
2	Site Preparation	Site Preparation	4/5/2019	4/27/2019	6	20	
3	Grading	Grading	4/28/2019	6/19/2019	6	45	
4	Building Construction	Building Construction	6/20/2019	7/31/2020	6	350	
5	Paving	Paving	8/1/2020	8/18/2020	6	15	
6	Architectural Coating	Architectural Coating	8/19/2020	9/4/2020	6	15	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 1.44

Acres of Paving: 0.22

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 30,836; Non-Residential Outdoor: 10,279; Striped Parking Area: 587 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Building Construction	Cement and Mortar Mixers	1	6.00	9	0.56

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	750.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	13.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.8400e-003	0.0000	2.8400e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0143	0.1291	0.1154	1.8000e-004		8.0600e-003	8.0600e-003		7.6900e-003	7.6900e-003	0.0000	15.7804	15.7804	3.0100e-003	0.0000	15.8556
Total	**0.0143**	**0.1291**	**0.1154**	**1.8000e-004**	**2.8400e-003**	**8.0600e-003**	**0.0109**	**4.3000e-004**	**7.6900e-003**	**8.1200e-003**	**0.0000**	**15.7804**	**15.7804**	**3.0100e-003**	**0.0000**	**15.8556**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.5000e-004	6.3000e-004	6.8100e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.5800	1.5800	5.0000e-005	0.0000	1.5814
Total	**7.5000e-004**	**6.3000e-004**	**6.8100e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.5800**	**1.5800**	**5.0000e-005**	**0.0000**	**1.5814**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2200e-003	0.0000	1.2200e-003	1.8000e-004	0.0000	1.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0143	0.1291	0.1154	1.8000e-004		8.0600e-003	8.0600e-003		7.6900e-003	7.6900e-003	0.0000	15.7803	15.7803	3.0100e-003	0.0000	15.8556
Total	**0.0143**	**0.1291**	**0.1154**	**1.8000e-004**	**1.2200e-003**	**8.0600e-003**	**9.2800e-003**	**1.8000e-004**	**7.6900e-003**	**7.8700e-003**	**0.0000**	**15.7803**	**15.7803**	**3.0100e-003**	**0.0000**	**15.8556**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.5000e-004	6.3000e-004	6.8100e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.5800	1.5800	5.0000e-005	0.0000	1.5814
Total	**7.5000e-004**	**6.3000e-004**	**6.8100e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.5800**	**1.5800**	**5.0000e-005**	**0.0000**	**1.5814**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2000e-003	0.0892	0.0414	1.0000e-004		3.6700e-003	3.6700e-003		3.3800e-003	3.3800e-003	0.0000	8.7559	8.7559	2.7700e-003	0.0000	8.8251
Total	**7.2000e-003**	**0.0892**	**0.0414**	**1.0000e-004**	**2.7000e-004**	**3.6700e-003**	**3.9400e-003**	**3.0000e-005**	**3.3800e-003**	**3.4100e-003**	**0.0000**	**8.7559**	**8.7559**	**2.7700e-003**	**0.0000**	**8.8251**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	2.1000e-004	2.2700e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5267	0.5267	2.0000e-005	0.0000	0.5271
Total	**2.5000e-004**	**2.1000e-004**	**2.2700e-003**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.5267**	**0.5267**	**2.0000e-005**	**0.0000**	**0.5271**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1000e-004	0.0000	1.1000e-004	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2000e-003	0.0892	0.0414	1.0000e-004		3.6700e-003	3.6700e-003		3.3800e-003	3.3800e-003	0.0000	8.7559	8.7559	2.7700e-003	0.0000	8.8251
Total	**7.2000e-003**	**0.0892**	**0.0414**	**1.0000e-004**	**1.1000e-004**	**3.6700e-003**	**3.7800e-003**	**1.0000e-005**	**3.3800e-003**	**3.3900e-003**	**0.0000**	**8.7559**	**8.7559**	**2.7700e-003**	**0.0000**	**8.8251**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	2.1000e-004	2.2700e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5267	0.5267	2.0000e-005	0.0000	0.5271
Total	**2.5000e-004**	**2.1000e-004**	**2.2700e-003**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.5267**	**0.5267**	**2.0000e-005**	**0.0000**	**0.5271**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0181	0.0000	0.0181	9.4600e-003	0.0000	9.4600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0324	0.3412	0.2143	4.2000e-004		0.0168	0.0168		0.0159	0.0159	0.0000	37.0512	37.0512	8.7500e-003	0.0000	37.2699
Total	**0.0324**	**0.3412**	**0.2143**	**4.2000e-004**	**0.0181**	**0.0168**	**0.0350**	**9.4600e-003**	**0.0159**	**0.0254**	**0.0000**	**37.0512**	**37.0512**	**8.7500e-003**	**0.0000**	**37.2699**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5600e-003	0.1187	0.0252	3.0000e-004	6.4400e-003	4.2000e-004	6.8700e-003	1.7700e-003	4.1000e-004	2.1800e-003	0.0000	29.2007	29.2007	2.0600e-003	0.0000	29.2522
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1300e-003	9.4000e-004	0.0102	3.0000e-005	2.4700e-003	2.0000e-005	2.4900e-003	6.5000e-004	2.0000e-005	6.7000e-004	0.0000	2.3701	2.3701	8.0000e-005	0.0000	2.3721
Total	**4.6900e-003**	**0.1196**	**0.0354**	**3.3000e-004**	**8.9100e-003**	**4.4000e-004**	**9.3600e-003**	**2.4200e-003**	**4.3000e-004**	**2.8500e-003**	**0.0000**	**31.5708**	**31.5708**	**2.1400e-003**	**0.0000**	**31.6243**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.7500e-003	0.0000	7.7500e-003	4.0400e-003	0.0000	4.0400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0324	0.3412	0.2143	4.2000e-004		0.0168	0.0168		0.0159	0.0159	0.0000	37.0512	37.0512	8.7500e-003	0.0000	37.2698
Total	**0.0324**	**0.3412**	**0.2143**	**4.2000e-004**	**7.7500e-003**	**0.0168**	**0.0246**	**4.0400e-003**	**0.0159**	**0.0199**	**0.0000**	**37.0512**	**37.0512**	**8.7500e-003**	**0.0000**	**37.2698**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5600e-003	0.1187	0.0252	3.0000e-004	6.4400e-003	4.2000e-004	6.8700e-003	1.7700e-003	4.1000e-004	2.1800e-003	0.0000	29.2007	29.2007	2.0600e-003	0.0000	29.2522
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1300e-003	9.4000e-004	0.0102	3.0000e-005	2.4700e-003	2.0000e-005	2.4900e-003	6.5000e-004	2.0000e-005	6.7000e-004	0.0000	2.3701	2.3701	8.0000e-005	0.0000	2.3721
Total	**4.6900e-003**	**0.1196**	**0.0354**	**3.3000e-004**	**8.9100e-003**	**4.4000e-004**	**9.3600e-003**	**2.4200e-003**	**4.3000e-004**	**2.8500e-003**	**0.0000**	**31.5708**	**31.5708**	**2.1400e-003**	**0.0000**	**31.6243**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0836	0.8431	0.6492	1.0000e-003		0.0515	0.0515		0.0474	0.0474	0.0000	88.2909	88.2909	0.0273	0.0000	88.9740
Total	**0.0836**	**0.8431**	**0.6492**	**1.0000e-003**		**0.0515**	**0.0515**		**0.0474**	**0.0474**	**0.0000**	**88.2909**	**88.2909**	**0.0273**	**0.0000**	**88.9740**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.7700e-003	0.0493	0.0135	1.1000e-004	2.6300e-003	3.1000e-004	2.9400e-003	7.6000e-004	3.0000e-004	1.0600e-003	0.0000	10.4402	10.4402	7.0000e-004	0.0000	10.4576
Worker	5.4400e-003	4.5300e-003	0.0493	1.3000e-004	0.0119	1.0000e-004	0.0120	3.1600e-003	1.0000e-004	3.2600e-003	0.0000	11.4342	11.4342	3.9000e-004	0.0000	11.4440
Total	**7.2100e-003**	**0.0538**	**0.0628**	**2.4000e-004**	**0.0145**	**4.1000e-004**	**0.0149**	**3.9200e-003**	**4.0000e-004**	**4.3200e-003**	**0.0000**	**21.8744**	**21.8744**	**1.0900e-003**	**0.0000**	**21.9016**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0836	0.8431	0.6492	1.0000e-003		0.0515	0.0515		0.0474	0.0474	0.0000	88.2907	88.2907	0.0273	0.0000	88.9738
Total	**0.0836**	**0.8431**	**0.6492**	**1.0000e-003**		**0.0515**	**0.0515**		**0.0474**	**0.0474**	**0.0000**	**88.2907**	**88.2907**	**0.0273**	**0.0000**	**88.9738**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.7700e-003	0.0493	0.0135	1.1000e-004	2.6300e-003	3.1000e-004	2.9400e-003	7.6000e-004	3.0000e-004	1.0600e-003	0.0000	10.4402	10.4402	7.0000e-004	0.0000	10.4576
Worker	5.4400e-003	4.5300e-003	0.0493	1.3000e-004	0.0119	1.0000e-004	0.0120	3.1600e-003	1.0000e-004	3.2600e-003	0.0000	11.4342	11.4342	3.9000e-004	0.0000	11.4440
Total	**7.2100e-003**	**0.0538**	**0.0628**	**2.4000e-004**	**0.0145**	**4.1000e-004**	**0.0149**	**3.9200e-003**	**4.0000e-004**	**4.3200e-003**	**0.0000**	**21.8744**	**21.8744**	**1.0900e-003**	**0.0000**	**21.9016**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0829	0.8353	0.6971	1.0900e-003		0.0488	0.0488		0.0450	0.0450	0.0000	94.7003	94.7003	0.0299	0.0000	95.4487
Total	**0.0829**	**0.8353**	**0.6971**	**1.0900e-003**		**0.0488**	**0.0488**		**0.0450**	**0.0450**	**0.0000**	**94.7003**	**94.7003**	**0.0299**	**0.0000**	**95.4487**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6600e-003	0.0496	0.0134	1.2000e-004	2.8800e-003	2.3000e-004	3.1100e-003	8.3000e-004	2.2000e-004	1.0500e-003	0.0000	11.3655	11.3655	7.2000e-004	0.0000	11.3836
Worker	5.4900e-003	4.4300e-003	0.0490	1.3000e-004	0.0130	1.1000e-004	0.0132	3.4600e-003	1.0000e-004	3.5600e-003	0.0000	12.1490	12.1490	3.8000e-004	0.0000	12.1585
Total	**7.1500e-003**	**0.0540**	**0.0624**	**2.5000e-004**	**0.0159**	**3.4000e-004**	**0.0163**	**4.2900e-003**	**3.2000e-004**	**4.6100e-003**	**0.0000**	**23.5145**	**23.5145**	**1.1000e-003**	**0.0000**	**23.5421**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0829	0.8353	0.6971	1.0900e-003		0.0488	0.0488		0.0450	0.0450	0.0000	94.7002	94.7002	0.0299	0.0000	95.4486
Total	**0.0829**	**0.8353**	**0.6971**	**1.0900e-003**		**0.0488**	**0.0488**		**0.0450**	**0.0450**	**0.0000**	**94.7002**	**94.7002**	**0.0299**	**0.0000**	**95.4486**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6600e-003	0.0496	0.0134	1.2000e-004	2.8800e-003	2.3000e-004	3.1100e-003	8.3000e-004	2.2000e-004	1.0500e-003	0.0000	11.3655	11.3655	7.2000e-004	0.0000	11.3836
Worker	5.4900e-003	4.4300e-003	0.0490	1.3000e-004	0.0130	1.1000e-004	0.0132	3.4600e-003	1.0000e-004	3.5600e-003	0.0000	12.1490	12.1490	3.8000e-004	0.0000	12.1585
Total	**7.1500e-003**	**0.0540**	**0.0624**	**2.5000e-004**	**0.0159**	**3.4000e-004**	**0.0163**	**4.2900e-003**	**3.2000e-004**	**4.6100e-003**	**0.0000**	**23.5145**	**23.5145**	**1.1000e-003**	**0.0000**	**23.5421**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7900e-003	0.0542	0.0534	8.0000e-005		2.9600e-003	2.9600e-003		2.7500e-003	2.7500e-003	0.0000	7.0447	7.0447	2.0500e-003	0.0000	7.0960
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.7900e-003**	**0.0542**	**0.0534**	**8.0000e-005**		**2.9600e-003**	**2.9600e-003**		**2.7500e-003**	**2.7500e-003**	**0.0000**	**7.0447**	**7.0447**	**2.0500e-003**	**0.0000**	**7.0960**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	5.0000e-004	5.5600e-003	2.0000e-005	1.4800e-003	1.0000e-005	1.4900e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	1.3788	1.3788	4.0000e-005	0.0000	1.3799
Total	**6.2000e-004**	**5.0000e-004**	**5.5600e-003**	**2.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4900e-003**	**3.9000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.3788**	**1.3788**	**4.0000e-005**	**0.0000**	**1.3799**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7900e-003	0.0542	0.0534	8.0000e-005		2.9600e-003	2.9600e-003		2.7500e-003	2.7500e-003	0.0000	7.0447	7.0447	2.0500e-003	0.0000	7.0960
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.7900e-003**	**0.0542**	**0.0534**	**8.0000e-005**		**2.9600e-003**	**2.9600e-003**		**2.7500e-003**	**2.7500e-003**	**0.0000**	**7.0447**	**7.0447**	**2.0500e-003**	**0.0000**	**7.0960**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	5.0000e-004	5.5600e-003	2.0000e-005	1.4800e-003	1.0000e-005	1.4900e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	1.3788	1.3788	4.0000e-005	0.0000	1.3799
Total	**6.2000e-004**	**5.0000e-004**	**5.5600e-003**	**2.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4900e-003**	**3.9000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.3788**	**1.3788**	**4.0000e-005**	**0.0000**	**1.3799**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0966					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8200e-003	0.0126	0.0137	2.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	1.9149	1.9149	1.5000e-004	0.0000	1.9187
Total	**0.0985**	**0.0126**	**0.0137**	**2.0000e-005**		**8.3000e-004**	**8.3000e-004**		**8.3000e-004**	**8.3000e-004**	**0.0000**	**1.9149**	**1.9149**	**1.5000e-004**	**0.0000**	**1.9187**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	8.0000e-005	9.3000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2298	0.2298	1.0000e-005	0.0000	0.2300
Total	**1.0000e-004**	**8.0000e-005**	**9.3000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2298**	**0.2298**	**1.0000e-005**	**0.0000**	**0.2300**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0966					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8200e-003	0.0126	0.0137	2.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	1.9149	1.9149	1.5000e-004	0.0000	1.9186
Total	**0.0985**	**0.0126**	**0.0137**	**2.0000e-005**		**8.3000e-004**	**8.3000e-004**		**8.3000e-004**	**8.3000e-004**	**0.0000**	**1.9149**	**1.9149**	**1.5000e-004**	**0.0000**	**1.9186**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	8.0000e-005	9.3000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2298	0.2298	1.0000e-005	0.0000	0.2300
Total	**1.0000e-004**	**8.0000e-005**	**9.3000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2298**	**0.2298**	**1.0000e-005**	**0.0000**	**0.2300**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1515	0.6771	1.5192	4.2900e-003	0.3157	4.5500e-003	0.3202	0.0846	4.2600e-003	0.0889	0.0000	396.3485	396.3485	0.0249	0.0000	396.9698
Unmitigated	0.1515	0.6771	1.5192	4.2900e-003	0.3157	4.5500e-003	0.3202	0.0846	4.2600e-003	0.0889	0.0000	396.3485	396.3485	0.0249	0.0000	396.9698

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Day-Care Center	571.99	571.99	571.99	831,714	831,714
Enclosed Parking with Elevator	0.00	0.00	0.00		
Place of Worship	0.00	0.00	0.00		
Total	571.99	571.99	571.99	831,714	831,714

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Day-Care Center	16.60	8.40	6.90	12.70	82.30	5.00	28	58	14
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Place of Worship	16.60	8.40	6.90	0.00	95.00	5.00	64	25	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Day-Care Center	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Enclosed Parking with Elevator	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Place of Worship	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	61.2098	61.2098	2.5300e-003	5.2000e-004	61.4288
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	61.2098	61.2098	2.5300e-003	5.2000e-004	61.4288
NaturalGas Mitigated	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	14.9935	14.9935	2.9000e-004	2.7000e-004	15.0826
NaturalGas Unmitigated	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	14.9935	14.9935	2.9000e-004	2.7000e-004	15.0826

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Day-Care Center	194294	1.0500e-003	9.5200e-003	8.0000e-003	6.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	10.3683	10.3683	2.0000e-004	1.9000e-004	10.4299
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Place of Worship	86672.3	4.7000e-004	4.2500e-003	3.5700e-003	3.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.6252	4.6252	9.0000e-005	8.0000e-005	4.6527
Total		**1.5200e-003**	**0.0138**	**0.0116**	**9.0000e-005**		**1.0400e-003**	**1.0400e-003**		**1.0400e-003**	**1.0400e-003**	**0.0000**	**14.9935**	**14.9935**	**2.9000e-004**	**2.7000e-004**	**15.0826**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Day-Care Center	194294	1.0500e-003	9.5200e-003	8.0000e-003	6.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	10.3683	10.3683	2.0000e-004	1.9000e-004	10.4299
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Place of Worship	86672.3	4.7000e-004	4.2500e-003	3.5700e-003	3.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.6252	4.6252	9.0000e-005	8.0000e-005	4.6527
Total		**1.5200e-003**	**0.0138**	**0.0116**	**9.0000e-005**		**1.0400e-003**	**1.0400e-003**		**1.0400e-003**	**1.0400e-003**	**0.0000**	**14.9935**	**14.9935**	**2.9000e-004**	**2.7000e-004**	**15.0826**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Day-Care Center	99772.8	31.7898	1.3100e-003	2.7000e-004	31.9035
Enclosed Parking with Elevator	57293.2	18.2549	7.5000e-004	1.6000e-004	18.3202
Place of Worship	35042.1	11.1652	4.6000e-004	1.0000e-004	11.2051
Total		**61.2098**	**2.5200e-003**	**5.3000e-004**	**61.4288**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Day-Care Center	99772.8	31.7898	1.3100e-003	2.7000e-004	31.9035
Enclosed Parking with Elevator	57293.2	18.2549	7.5000e-004	1.6000e-004	18.3202
Place of Worship	35042.1	11.1652	4.6000e-004	1.0000e-004	11.2051
Total		**61.2098**	**2.5200e-003**	**5.3000e-004**	**61.4288**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0846	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004
Unmitigated	0.0846	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	9.6600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0749					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004
Total	**0.0846**	**0.0000**	**3.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**7.5000e-004**	**7.5000e-004**	**0.0000**	**0.0000**	**8.0000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	9.6600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0749					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004
Total	**0.0846**	**0.0000**	**3.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**7.5000e-004**	**7.5000e-004**	**0.0000**	**0.0000**	**8.0000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	10.8487	0.0276	7.3000e-004	11.7568
Unmitigated	10.8487	0.0276	7.3000e-004	11.7568

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Day-Care Center	0.703818 / 1.80982	9.5498	0.0233	6.2000e-004	10.3179
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Place of Worship	0.129849 / 0.203097	1.2989	4.2800e-003	1.1000e-004	1.4389
Total		**10.8487**	**0.0276**	**7.3000e-004**	**11.7568**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Day-Care Center	0.703818 / 1.80982	9.5498	0.0233	6.2000e-004	10.3179
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Place of Worship	0.129849 / 0.203097	1.2989	4.2800e-003	1.1000e-004	1.4389
Total		**10.8487**	**0.0276**	**7.3000e-004**	**11.7568**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.1326	0.5397	0.0000	22.6255
Unmitigated	9.1326	0.5397	0.0000	22.6255

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Day-Care Center	21.33	4.3298	0.2559	0.0000	10.7269
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Place of Worship	23.66	4.8028	0.2838	0.0000	11.8987
Total		**9.1326**	**0.5397**	**0.0000**	**22.6255**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Day-Care Center	21.33	4.3298	0.2559	0.0000	10.7269
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Place of Worship	23.66	4.8028	0.2838	0.0000	11.8987
Total		**9.1326**	**0.5397**	**0.0000**	**22.6255**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Malibu Jewish Center & Synagogue

Los Angeles-South Coast County, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demolition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	1	No Change	0.00
Cement and Mortar Mixers	Diesel	No Change	0	4	No Change	0.00
Concrete/Industrial Saws	Diesel	No Change	0	2	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Forklifts	Diesel	No Change	0	2	No Change	0.00
Graders	Diesel	No Change	0	1	No Change	0.00
Pavers	Diesel	No Change	0	1	No Change	0.00
Rollers	Diesel	No Change	0	1	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	2	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	8	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Air Compressors	1.82000E-003	1.26300E-002	1.37400E-002	2.00000E-005	8.30000E-004	8.30000E-004	0.00000E+000	1.91494E+000	1.91494E+000	1.50000E-004	0.00000E+000	1.91865E+000
Cement and Mortar Mixers	9.03000E-003	5.66100E-002	4.74200E-002	1.10000E-004	2.21000E-003	2.21000E-003	0.00000E+000	7.04600E+000	7.04600E+000	7.30000E-004	0.00000E+000	7.06429E+000
Concrete/Industrial Saws	1.73200E-002	1.34570E-001	1.38830E-001	2.30000E-004	8.60000E-003	8.60000E-003	0.00000E+000	2.01622E+001	2.01622E+001	1.42000E-003	0.00000E+000	2.01976E+001
Cranes	4.17900E-002	4.97450E-001	1.92510E-001	5.00000E-004	2.08000E-002	1.91400E-002	0.00000E+000	4.48264E+001	4.48264E+001	1.43500E-002	0.00000E+000	4.51851E+001
Forklifts	3.98000E-002	3.56980E-001	3.11560E-001	4.00000E-004	2.71300E-002	2.49600E-002	0.00000E+000	3.56253E+001	3.56253E+001	1.14000E-002	0.00000E+000	3.59103E+001
Graders	1.57800E-002	2.13370E-001	5.96100E-002	2.20000E-004	6.85000E-003	6.30000E-003	0.00000E+000	1.93466E+001	1.93466E+001	6.12000E-003	0.00000E+000	1.94996E+001
Pavers	1.72000E-003	1.84400E-002	1.90200E-002	3.00000E-005	9.00000E-004	8.20000E-004	0.00000E+000	2.71042E+000	2.71042E+000	8.80000E-004	0.00000E+000	2.73233E+000
Rollers	1.37000E-003	1.36600E-002	1.24300E-002	2.00000E-005	8.70000E-004	8.00000E-004	0.00000E+000	1.51256E+000	1.51256E+000	4.90000E-004	0.00000E+000	1.52479E+000
Rubber Tired Dozers	5.32000E-003	5.66000E-002	2.00800E-002	4.00000E-005	2.76000E-003	2.54000E-003	0.00000E+000	3.59512E+000	3.59512E+000	1.14000E-003	0.00000E+000	3.62356E+000
Tractors/Loaders/ Backhoes	9.40200E-002	9.44250E-001	9.69240E-001	1.31000E-003	6.16300E-002	5.67000E-002	0.00000E+000	1.16799E+002	1.16799E+002	3.73200E-002	0.00000E+000	1.17732E+002

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Air Compressors	1.82000E-003	1.26300E-002	1.37400E-002	2.00000E-005	8.30000E-004	8.30000E-004	0.00000E+000	1.91494E+000	1.91494E+000	1.50000E-004	0.00000E+000	1.91864E+000
Cement and Mortar Mixers	9.03000E-003	5.66100E-002	4.74200E-002	1.10000E-004	2.21000E-003	2.21000E-003	0.00000E+000	7.04599E+000	7.04599E+000	7.30000E-004	0.00000E+000	7.06428E+000
Concrete/Industrial Saws	1.73200E-002	1.34570E-001	1.38830E-001	2.30000E-004	8.60000E-003	8.60000E-003	0.00000E+000	2.01621E+001	2.01621E+001	1.42000E-003	0.00000E+000	2.01976E+001
Cranes	4.17900E-002	4.97450E-001	1.92510E-001	5.00000E-004	2.08000E-002	1.91400E-002	0.00000E+000	4.48264E+001	4.48264E+001	1.43500E-002	0.00000E+000	4.51850E+001
Forklifts	3.98000E-002	3.56980E-001	3.11560E-001	4.00000E-004	2.71300E-002	2.49600E-002	0.00000E+000	3.56252E+001	3.56252E+001	1.14000E-002	0.00000E+000	3.59102E+001
Graders	1.57800E-002	2.13370E-001	5.96100E-002	2.20000E-004	6.85000E-003	6.30000E-003	0.00000E+000	1.93466E+001	1.93466E+001	6.12000E-003	0.00000E+000	1.94996E+001
Pavers	1.72000E-003	1.84400E-002	1.90200E-002	3.00000E-005	9.00000E-004	8.20000E-004	0.00000E+000	2.71041E+000	2.71041E+000	8.80000E-004	0.00000E+000	2.73233E+000
Rollers	1.37000E-003	1.36600E-002	1.24300E-002	2.00000E-005	8.70000E-004	8.00000E-004	0.00000E+000	1.51256E+000	1.51256E+000	4.90000E-004	0.00000E+000	1.52479E+000
Rubber Tired Dozers	5.32000E-003	5.66000E-002	2.00800E-002	4.00000E-005	2.76000E-003	2.54000E-003	0.00000E+000	3.59512E+000	3.59512E+000	1.14000E-003	0.00000E+000	3.62356E+000
Tractors/Loaders/Backhoes	9.40200E-002	9.44250E-001	9.69240E-001	1.31000E-003	6.16300E-002	5.67000E-002	0.00000E+000	1.16799E+002	1.16799E+002	3.73200E-002	0.00000E+000	1.17732E+002

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	5.21200E-006
Cement and Mortar Mixers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.41924E-006	1.41924E-006	0.00000E+000	0.00000E+000	1.41557E-006
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.48794E-006	1.48794E-006	0.00000E+000	0.00000E+000	1.48532E-006
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.33850E-006	1.33850E-006	0.00000E+000	0.00000E+000	1.10656E-006
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.40350E-006	1.40350E-006	0.00000E+000	0.00000E+000	1.11389E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.03377E-006	1.03377E-006	0.00000E+000	0.00000E+000	1.53849E-006
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	3.68947E-006	3.68947E-006	0.00000E+000	0.00000E+000	0.00000E+000
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.19864E-006	1.19864E-006	0.00000E+000	0.00000E+000	1.18914E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
Yes	Soil Stabilizer for unpaved Roads	PM10 Reduction	10.00	PM2.5 Reduction	10.00		
Yes	Replace Ground Cover of Area Disturbed	PM10 Reduction	5.00	PM2.5 Reduction	5.00		
Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00
Yes	Unpaved Road Mitigation	Moisture Content %	12.00	Vehicle Speed (mph)	15.00		
No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	0.03	0.01	0.03	0.01	0.00	0.00
Demolition	Fugitive Dust	0.00	0.00	0.00	0.00	0.57	0.58
Demolition	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Grading	Fugitive Dust	0.02	0.01	0.01	0.00	0.57	0.57
Grading	Roads	0.01	0.00	0.01	0.00	0.00	0.00
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	Fugitive Dust	0.00	0.00	0.00	0.00	0.59	0.67
Site Preparation	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting:

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	0.08	0.28		
No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			
	Land Use	Land Use SubTotal	0.00			

No	Neighborhood Enhancements	Improve Pedestrian Network				
No	Neighborhood Enhancements	Provide Traffic Calming Measures				
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.00			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"				
No	Commute	Workplace Parking Charge				
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program				
	Commute	Commute Subtotal	0.00			

No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.00			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	50.00
No	Use Low VOC Paint (Residential Exterior)	50.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	100.00
No	Use Low VOC Paint (Parking)	100.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		
No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Solid Waste Mitigation

Mitigation Measures	Input Value

Institute Recycling and Composting Services Percent Reduction in Waste Disposed	

Malibu Jewish Center & Synagogue

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	16.41	1000sqft	0.38	16,410.00	0
Place of Worship	4.15	1000sqft	0.10	4,147.00	0
Enclosed Parking with Elevator	9.78	1000sqft	0.22	9,777.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Schedule based on 18-month construction schedule from project description

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Grading - area of disturbance established from project description

Demolition -

Trips and VMT - haul trips obtained from project description assumption

Vehicle Trips - trip rate established based on traffic study ADT

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	100.00	350.00
tblConstructionPhase	NumDays	10.00	30.00
tblConstructionPhase	NumDays	2.00	45.00
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	1.00	20.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	8/20/2019	9/4/2020
tblConstructionPhase	PhaseEndDate	8/6/2019	7/31/2020
tblConstructionPhase	PhaseEndDate	3/14/2019	4/4/2019
tblConstructionPhase	PhaseEndDate	3/19/2019	6/19/2019
tblConstructionPhase	PhaseEndDate	8/13/2019	8/18/2020
tblConstructionPhase	PhaseEndDate	3/15/2019	4/27/2019
tblConstructionPhase	PhaseStartDate	8/14/2019	8/19/2020
tblConstructionPhase	PhaseStartDate	3/20/2019	6/20/2019
tblConstructionPhase	PhaseStartDate	3/16/2019	4/28/2019
tblConstructionPhase	PhaseStartDate	8/7/2019	8/1/2020
tblConstructionPhase	PhaseStartDate	3/15/2019	4/5/2019
tblGrading	AcresOfGrading	0.00	1.44
tblGrading	AcresOfGrading	10.00	0.50
tblGrading	MaterialExported	0.00	7,550.00
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Building Construction
tblTripsAndVMT	HaulingTripNumber	0.00	750.00
tblVehicleTrips	ST_TR	6.21	34.86
tblVehicleTrips	ST_TR	10.37	0.00
tblVehicleTrips	SU_TR	5.83	34.86
tblVehicleTrips	SU_TR	36.63	0.00
tblVehicleTrips	WD_TR	74.06	34.86
tblVehicleTrips	WD_TR	9.11	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.6448	20.3041	11.0945	0.0331	1.2089	0.7673	1.9761	0.5298	0.7249	1.2548	0.0000	3,377.347 2	3,377.347 2	0.5319	0.0000	3,390.644 9
2020	13.1419	9.7029	8.3274	0.0148	0.2012	0.5368	0.7141	0.0534	0.4948	0.5426	0.0000	1,432.272 3	1,432.272 3	0.3739	0.0000	1,441.620 6
Maximum	**13.1419**	**20.3041**	**11.0945**	**0.0331**	**1.2089**	**0.7673**	**1.9761**	**0.5298**	**0.7249**	**1.2548**	**0.0000**	**3,377.347 2**	**3,377.347 2**	**0.5319**	**0.0000**	**3,390.644 9**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.6448	20.3041	11.0945	0.0331	0.7476	0.7673	1.5149	0.2892	0.7249	1.0142	0.0000	3,377.347 2	3,377.347 2	0.5319	0.0000	3,390.644 9
2020	13.1419	9.7029	8.3274	0.0148	0.2012	0.5368	0.7141	0.0534	0.4948	0.5426	0.0000	1,432.272 3	1,432.272 3	0.3739	0.0000	1,441.620 6
Maximum	**13.1419**	**20.3041**	**11.0945**	**0.0331**	**0.7476**	**0.7673**	**1.5149**	**0.2892**	**0.7249**	**1.0142**	**0.0000**	**3,377.347 2**	**3,377.347 2**	**0.5319**	**0.0000**	**3,390.644 9**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	32.71	0.00	17.15	41.26	0.00	13.39	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.4637	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Energy	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003		90.5614	90.5614	1.7400e-003	1.6600e-003	91.0996
Mobile	0.8862	3.6142	8.3932	0.0245	1.7686	0.0249	1.7936	0.4734	0.0234	0.4967		2,489.0416	2,489.0416	0.1499		2,492.7884
Total	**1.3582**	**3.6897**	**8.4597**	**0.0249**	**1.7686**	**0.0307**	**1.7993**	**0.4734**	**0.0291**	**0.5025**		**2,579.6096**	**2,579.6096**	**0.1516**	**1.6600e-003**	**2,583.8950**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.4637	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Energy	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003		90.5614	90.5614	1.7400e-003	1.6600e-003	91.0996
Mobile	0.8862	3.6142	8.3932	0.0245	1.7686	0.0249	1.7936	0.4734	0.0234	0.4967		2,489.0416	2,489.0416	0.1499		2,492.7884
Total	**1.3582**	**3.6897**	**8.4597**	**0.0249**	**1.7686**	**0.0307**	**1.7993**	**0.4734**	**0.0291**	**0.5025**		**2,579.6096**	**2,579.6096**	**0.1516**	**1.6600e-003**	**2,583.8950**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/1/2019	4/4/2019	6	30	
2	Site Preparation	Site Preparation	4/5/2019	4/27/2019	6	20	
3	Grading	Grading	4/28/2019	6/19/2019	6	45	
4	Building Construction	Building Construction	6/20/2019	7/31/2020	6	350	
5	Paving	Paving	8/1/2020	8/18/2020	6	15	
6	Architectural Coating	Architectural Coating	8/19/2020	9/4/2020	6	15	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 1.44

Acres of Paving: 0.22

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 30,836; Non-Residential Outdoor: 10,279; Striped Parking Area: 587 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Building Construction	Cement and Mortar Mixers	1	6.00	9	0.56

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	750.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	13.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1895	0.0000	0.1895	0.0287	0.0000	0.0287			0.0000			0.0000
Off-Road	0.9530	8.6039	7.6917	0.0120		0.5371	0.5371		0.5125	0.5125		1,159.6570	1,159.6570	0.2211		1,165.1847
Total	**0.9530**	**8.6039**	**7.6917**	**0.0120**	**0.1895**	**0.5371**	**0.7266**	**0.0287**	**0.5125**	**0.5412**		**1,159.6570**	**1,159.6570**	**0.2211**		**1,165.1847**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0500	0.0367	0.4822	1.2200e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		121.2953	121.2953	4.1700e-003		121.3995
Total	**0.0500**	**0.0367**	**0.4822**	**1.2200e-003**	**0.1118**	**9.6000e-004**	**0.1127**	**0.0296**	**8.9000e-004**	**0.0305**		**121.2953**	**121.2953**	**4.1700e-003**		**121.3995**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0810	0.0000	0.0810	0.0123	0.0000	0.0123			0.0000			0.0000
Off-Road	0.9530	8.6039	7.6917	0.0120		0.5371	0.5371		0.5125	0.5125	0.0000	1,159.657 0	1,159.657 0	0.2211		1,165.184 7
Total	**0.9530**	**8.6039**	**7.6917**	**0.0120**	**0.0810**	**0.5371**	**0.6181**	**0.0123**	**0.5125**	**0.5247**	**0.0000**	**1,159.657 0**	**1,159.657 0**	**0.2211**		**1,165.184 7**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0500	0.0367	0.4822	1.2200e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		121.2953	121.2953	4.1700e-003		121.3995
Total	**0.0500**	**0.0367**	**0.4822**	**1.2200e-003**	**0.1118**	**9.6000e-004**	**0.1127**	**0.0296**	**8.9000e-004**	**0.0305**		**121.2953**	**121.2953**	**4.1700e-003**		**121.3995**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0265	0.0000	0.0265	2.8600e-003	0.0000	2.8600e-003			0.0000			0.0000
Off-Road	0.7195	8.9170	4.1407	9.7500e-003		0.3672	0.3672		0.3378	0.3378		965.1690	965.1690	0.3054		972.8032
Total	**0.7195**	**8.9170**	**4.1407**	**9.7500e-003**	**0.0265**	**0.3672**	**0.3937**	**2.8600e-003**	**0.3378**	**0.3407**		**965.1690**	**965.1690**	**0.3054**		**972.8032**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0250	0.0184	0.2411	6.1000e-004	0.0559	4.8000e-004	0.0564	0.0148	4.4000e-004	0.0153		60.6476	60.6476	2.0800e-003		60.6997
Total	**0.0250**	**0.0184**	**0.2411**	**6.1000e-004**	**0.0559**	**4.8000e-004**	**0.0564**	**0.0148**	**4.4000e-004**	**0.0153**		**60.6476**	**60.6476**	**2.0800e-003**		**60.6997**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0113	0.0000	0.0113	1.2200e-003	0.0000	1.2200e-003			0.0000			0.0000
Off-Road	0.7195	8.9170	4.1407	9.7500e-003		0.3672	0.3672		0.3378	0.3378	0.0000	965.1690	965.1690	0.3054		972.8032
Total	**0.7195**	**8.9170**	**4.1407**	**9.7500e-003**	**0.0113**	**0.3672**	**0.3785**	**1.2200e-003**	**0.3378**	**0.3391**	**0.0000**	**965.1690**	**965.1690**	**0.3054**		**972.8032**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0250	0.0184	0.2411	6.1000e-004	0.0559	4.8000e-004	0.0564	0.0148	4.4000e-004	0.0153		60.6476	60.6476	2.0800e-003		60.6997
Total	**0.0250**	**0.0184**	**0.2411**	**6.1000e-004**	**0.0559**	**4.8000e-004**	**0.0564**	**0.0148**	**4.4000e-004**	**0.0153**		**60.6476**	**60.6476**	**2.0800e-003**		**60.6997**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8057	0.0000	0.8057	0.4203	0.0000	0.4203			0.0000			0.0000
Off-Road	1.4382	15.1626	9.5240	0.0186		0.7476	0.7476		0.7061	0.7061		1,815.1990	1,815.1990	0.4285		1,825.9118
Total	**1.4382**	**15.1626**	**9.5240**	**0.0186**	**0.8057**	**0.7476**	**1.5533**	**0.4203**	**0.7061**	**1.1265**		**1,815.1990**	**1,815.1990**	**0.4285**		**1,825.9118**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1566	5.1047	1.0884	0.0133	0.2914	0.0187	0.3101	0.0799	0.0179	0.0978		1,440.8529	1,440.8529	0.0992		1,443.3337
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0500	0.0367	0.4822	1.2200e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		121.2953	121.2953	4.1700e-003		121.3995
Total	**0.2066**	**5.1414**	**1.5705**	**0.0145**	**0.4032**	**0.0197**	**0.4229**	**0.1095**	**0.0188**	**0.1283**		**1,562.1482**	**1,562.1482**	**0.1034**		**1,564.7331**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3444	0.0000	0.3444	0.1797	0.0000	0.1797			0.0000			0.0000
Off-Road	1.4382	15.1626	9.5240	0.0186		0.7476	0.7476		0.7061	0.7061	0.0000	1,815.1990	1,815.1990	0.4285		1,825.9118
Total	**1.4382**	**15.1626**	**9.5240**	**0.0186**	**0.3444**	**0.7476**	**1.0920**	**0.1797**	**0.7061**	**0.8858**	**0.0000**	**1,815.1990**	**1,815.1990**	**0.4285**		**1,825.9118**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1566	5.1047	1.0884	0.0133	0.2914	0.0187	0.3101	0.0799	0.0179	0.0978		1,440.852 9	1,440.852 9	0.0992		1,443.333 7
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0500	0.0367	0.4822	1.2200e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		121.2953	121.2953	4.1700e-003		121.3995
Total	**0.2066**	**5.1414**	**1.5705**	**0.0145**	**0.4032**	**0.0197**	**0.4229**	**0.1095**	**0.0188**	**0.1283**		**1,562.148 2**	**1,562.148 2**	**0.1034**		**1,564.733 1**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0016	10.0968	7.7744	0.0119		0.6162	0.6162		0.5677	0.5677		1,165.556 9	1,165.556 9	0.3607		1,174.574 8
Total	**1.0016**	**10.0968**	**7.7744**	**0.0119**		**0.6162**	**0.6162**		**0.5677**	**0.5677**		**1,165.556 9**	**1,165.556 9**	**0.3607**		**1,174.574 8**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0208	0.5787	0.1535	1.3100e-003	0.0320	3.6900e-003	0.0357	9.2200e-003	3.5300e-003	0.0128		139.4073	139.4073	8.9300e-003		139.6307
Worker	0.0649	0.0477	0.6268	1.5800e-003	0.1453	1.2500e-003	0.1466	0.0385	1.1500e-003	0.0397		157.6839	157.6839	5.4200e-003		157.8193
Total	**0.0857**	**0.6264**	**0.7804**	**2.8900e-003**	**0.1773**	**4.9400e-003**	**0.1823**	**0.0478**	**4.6800e-003**	**0.0524**		**297.0912**	**297.0912**	**0.0144**		**297.4499**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0016	10.0968	7.7744	0.0119		0.6162	0.6162		0.5677	0.5677	0.0000	1,165.556 9	1,165.556 9	0.3607		1,174.574 8
Total	**1.0016**	**10.0968**	**7.7744**	**0.0119**		**0.6162**	**0.6162**		**0.5677**	**0.5677**	**0.0000**	**1,165.556 9**	**1,165.556 9**	**0.3607**		**1,174.574 8**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0208	0.5787	0.1535	1.3100e-003	0.0320	3.6900e-003	0.0357	9.2200e-003	3.5300e-003	0.0128		139.4073	139.4073	8.9300e-003		139.6307
Worker	0.0649	0.0477	0.6268	1.5800e-003	0.1453	1.2500e-003	0.1466	0.0385	1.1500e-003	0.0397		157.6839	157.6839	5.4200e-003		157.8193
Total	**0.0857**	**0.6264**	**0.7804**	**2.8900e-003**	**0.1773**	**4.9400e-003**	**0.1823**	**0.0478**	**4.6800e-003**	**0.0524**		**297.0912**	**297.0912**	**0.0144**		**297.4499**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9058	9.1285	7.6188	0.0119		0.5331	0.5331		0.4913	0.4913		1,140.8653	1,140.8653	0.3607		1,149.8818
Total	**0.9058**	**9.1285**	**7.6188**	**0.0119**		**0.5331**	**0.5331**		**0.4913**	**0.4913**		**1,140.8653**	**1,140.8653**	**0.3607**		**1,149.8818**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0178	0.5319	0.1394	1.3000e-003	0.0320	2.5000e-003	0.0345	9.2200e-003	2.3900e-003	0.0116		138.5124	138.5124	8.4500e-003		138.7237
Worker	0.0598	0.0426	0.5692	1.5400e-003	0.1453	1.2100e-003	0.1465	0.0385	1.1200e-003	0.0397		152.8947	152.8947	4.8200e-003		153.0152
Total	**0.0776**	**0.5744**	**0.7086**	**2.8400e-003**	**0.1773**	**3.7100e-003**	**0.1810**	**0.0478**	**3.5100e-003**	**0.0513**		**291.4070**	**291.4070**	**0.0133**		**291.7388**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9058	9.1285	7.6188	0.0119		0.5331	0.5331		0.4913	0.4913	0.0000	1,140.865 3	1,140.865 3	0.3607		1,149.881 8
Total	**0.9058**	**9.1285**	**7.6188**	**0.0119**		**0.5331**	**0.5331**		**0.4913**	**0.4913**	**0.0000**	**1,140.865 3**	**1,140.865 3**	**0.3607**		**1,149.881 8**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0178	0.5319	0.1394	1.3000e-003	0.0320	2.5000e-003	0.0345	9.2200e-003	2.3900e-003	0.0116		138.5124	138.5124	8.4500e-003		138.7237
Worker	0.0598	0.0426	0.5692	1.5400e-003	0.1453	1.2100e-003	0.1465	0.0385	1.1200e-003	0.0397		152.8947	152.8947	4.8200e-003		153.0152
Total	**0.0776**	**0.5744**	**0.7086**	**2.8400e-003**	**0.1773**	**3.7100e-003**	**0.1810**	**0.0478**	**3.5100e-003**	**0.0513**		**291.4070**	**291.4070**	**0.0133**		**291.7388**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7716	7.2266	7.1128	0.0113		0.3950	0.3950		0.3669	0.3669		1,035.3926	1,035.3926	0.3016		1,042.9323
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7716**	**7.2266**	**7.1128**	**0.0113**		**0.3950**	**0.3950**		**0.3669**	**0.3669**		**1,035.3926**	**1,035.3926**	**0.3016**		**1,042.9323**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0828	0.0589	0.7881	2.1300e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		211.7003	211.7003	6.6700e-003		211.8672
Total	**0.0828**	**0.0589**	**0.7881**	**2.1300e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**211.7003**	**211.7003**	**6.6700e-003**		**211.8672**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7716	7.2266	7.1128	0.0113		0.3950	0.3950		0.3669	0.3669	0.0000	1,035.3926	1,035.3926	0.3016		1,042.9323
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7716**	**7.2266**	**7.1128**	**0.0113**		**0.3950**	**0.3950**		**0.3669**	**0.3669**	**0.0000**	**1,035.3926**	**1,035.3926**	**0.3016**		**1,042.9323**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0828	0.0589	0.7881	2.1300e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		211.7003	211.7003	6.6700e-003		211.8672
Total	**0.0828**	**0.0589**	**0.7881**	**2.1300e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**211.7003**	**211.7003**	**6.6700e-003**		**211.8672**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	12.8859					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**13.1281**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0138	9.8200e-003	0.1314	3.5000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		35.2834	35.2834	1.1100e-003		35.3112
Total	**0.0138**	**9.8200e-003**	**0.1314**	**3.5000e-004**	**0.0335**	**2.8000e-004**	**0.0338**	**8.8900e-003**	**2.6000e-004**	**9.1500e-003**		**35.2834**	**35.2834**	**1.1100e-003**		**35.3112**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	12.8859					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**13.1281**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0138	9.8200e-003	0.1314	3.5000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		35.2834	35.2834	1.1100e-003		35.3112
Total	**0.0138**	**9.8200e-003**	**0.1314**	**3.5000e-004**	**0.0335**	**2.8000e-004**	**0.0338**	**8.8900e-003**	**2.6000e-004**	**9.1500e-003**		**35.2834**	**35.2834**	**1.1100e-003**		**35.3112**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8862	3.6142	8.3932	0.0245	1.7686	0.0249	1.7936	0.4734	0.0234	0.4967		2,489.0416	2,489.0416	0.1499		2,492.7884
Unmitigated	0.8862	3.6142	8.3932	0.0245	1.7686	0.0249	1.7936	0.4734	0.0234	0.4967		2,489.0416	2,489.0416	0.1499		2,492.7884

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Day-Care Center	571.99	571.99	571.99	831,714	831,714
Enclosed Parking with Elevator	0.00	0.00	0.00		
Place of Worship	0.00	0.00	0.00		
Total	571.99	571.99	571.99	831,714	831,714

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Day-Care Center	16.60	8.40	6.90	12.70	82.30	5.00	28	58	14
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Place of Worship	16.60	8.40	6.90	0.00	95.00	5.00	64	25	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Day-Care Center	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Enclosed Parking with Elevator	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Place of Worship	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003		90.5614	90.5614	1.7400e-003	1.6600e-003	91.0996
NaturalGas Unmitigated	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003		90.5614	90.5614	1.7400e-003	1.6600e-003	91.0996

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Day-Care Center	532.313	5.7400e-003	0.0522	0.0438	3.1000e-004		3.9700e-003	3.9700e-003		3.9700e-003	3.9700e-003		62.6251	62.6251	1.2000e-003	1.1500e-003	62.9973
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Place of Worship	237.458	2.5600e-003	0.0233	0.0196	1.4000e-004		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003		27.9363	27.9363	5.4000e-004	5.1000e-004	28.1023
Total		**8.3000e-003**	**0.0755**	**0.0634**	**4.5000e-004**		**5.7400e-003**	**5.7400e-003**		**5.7400e-003**	**5.7400e-003**		**90.5614**	**90.5614**	**1.7400e-003**	**1.6600e-003**	**91.0996**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Day-Care Center	0.532313	5.7400e-003	0.0522	0.0438	3.1000e-004		3.9700e-003	3.9700e-003		3.9700e-003	3.9700e-003		62.6251	62.6251	1.2000e-003	1.1500e-003	62.9973
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Place of Worship	0.237458	2.5600e-003	0.0233	0.0196	1.4000e-004		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003		27.9363	27.9363	5.4000e-004	5.1000e-004	28.1023
Total		**8.3000e-003**	**0.0755**	**0.0634**	**4.5000e-004**		**5.7400e-003**	**5.7400e-003**		**5.7400e-003**	**5.7400e-003**		**90.5614**	**90.5614**	**1.7400e-003**	**1.6600e-003**	**91.0996**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4637	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Unmitigated	0.4637	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0530					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.4105					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Total	**0.4637**	**3.0000e-005**	**3.1200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.6400e-003**	**6.6400e-003**	**2.0000e-005**		**7.0800e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0530					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.4105					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Total	**0.4637**	**3.0000e-005**	**3.1200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.6400e-003**	**6.6400e-003**	**2.0000e-005**		**7.0800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Malibu Jewish Center & Synagogue

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	16.41	1000sqft	0.38	16,410.00	0
Place of Worship	4.15	1000sqft	0.10	4,147.00	0
Enclosed Parking with Elevator	9.78	1000sqft	0.22	9,777.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 33

Climate Zone 8 **Operational Year** 2020

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 702.44 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Schedule based on 18-month construction schedule from project description

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Grading - area of disturbance established from project description

Demolition -

Trips and VMT - haul trips obtained from project description assumption

Vehicle Trips - trip rate established based on traffic study ADT

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	100.00	350.00
tblConstructionPhase	NumDays	10.00	30.00
tblConstructionPhase	NumDays	2.00	45.00
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	1.00	20.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	8/20/2019	9/4/2020
tblConstructionPhase	PhaseEndDate	8/6/2019	7/31/2020
tblConstructionPhase	PhaseEndDate	3/14/2019	4/4/2019
tblConstructionPhase	PhaseEndDate	3/19/2019	6/19/2019
tblConstructionPhase	PhaseEndDate	8/13/2019	8/18/2020
tblConstructionPhase	PhaseEndDate	3/15/2019	4/27/2019
tblConstructionPhase	PhaseStartDate	8/14/2019	8/19/2020
tblConstructionPhase	PhaseStartDate	3/20/2019	6/20/2019
tblConstructionPhase	PhaseStartDate	3/16/2019	4/28/2019
tblConstructionPhase	PhaseStartDate	8/7/2019	8/1/2020
tblConstructionPhase	PhaseStartDate	3/15/2019	4/5/2019
tblGrading	AcresOfGrading	0.00	1.44
tblGrading	AcresOfGrading	10.00	0.50
tblGrading	MaterialExported	0.00	7,550.00
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Building Construction
tblTripsAndVMT	HaulingTripNumber	0.00	750.00
tblVehicleTrips	ST_TR	6.21	34.86
tblVehicleTrips	ST_TR	10.37	0.00
tblVehicleTrips	SU_TR	5.83	34.86
tblVehicleTrips	SU_TR	36.63	0.00
tblVehicleTrips	WD_TR	74.06	34.86
tblVehicleTrips	WD_TR	9.11	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
2019	1.6541	20.3761	11.1284	0.0328	1.2089	0.7676	1.9765	0.5298	0.7253	1.2551	0.0000	3,345.8282	3,345.8282	0.5355	0.0000	3,359.2145
2020	13.1434	9.7073	8.2938	0.0146	0.2012	0.5369	0.7142	0.0534	0.4949	0.5426	0.0000	1,419.5545	1,419.5545	0.3742	0.0000	1,428.9096
Maximum	**13.1434**	**20.3761**	**11.1284**	**0.0328**	**1.2089**	**0.7676**	**1.9765**	**0.5298**	**0.7253**	**1.2551**	**0.0000**	**3,345.8282**	**3,345.8282**	**0.5355**	**0.0000**	**3,359.2145**

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
2019	1.6541	20.3761	11.1284	0.0328	0.7476	0.7676	1.5152	0.2892	0.7253	1.0145	0.0000	3,345.8282	3,345.8282	0.5355	0.0000	3,359.2145
2020	13.1434	9.7073	8.2938	0.0146	0.2012	0.5369	0.7142	0.0534	0.4949	0.5426	0.0000	1,419.5545	1,419.5545	0.3742	0.0000	1,428.9096
Maximum	**13.1434**	**20.3761**	**11.1284**	**0.0328**	**0.7476**	**0.7676**	**1.5152**	**0.2892**	**0.7253**	**1.0145**	**0.0000**	**3,345.8282**	**3,345.8282**	**0.5355**	**0.0000**	**3,359.2145**

Malibu Jewish Center & Synagogue - Los Angeles-South Coast County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	32.71	0.00	17.14	41.26	0.00	13.39	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.4637	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Energy	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003		90.5614	90.5614	1.7400e-003	1.6600e-003	91.0996
Mobile	0.8617	3.6546	8.3178	0.0232	1.7686	0.0252	1.7938	0.4734	0.0236	0.4970		2,361.2868	2,361.2868	0.1523		2,365.0934
Total	**1.3338**	**3.7301**	**8.3843**	**0.0237**	**1.7686**	**0.0309**	**1.7996**	**0.4734**	**0.0294**	**0.5027**		**2,451.8548**	**2,451.8548**	**0.1540**	**1.6600e-003**	**2,456.2000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.4637	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Energy	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003		90.5614	90.5614	1.7400e-003	1.6600e-003	91.0996
Mobile	0.8617	3.6546	8.3178	0.0232	1.7686	0.0252	1.7938	0.4734	0.0236	0.4970		2,361.2868	2,361.2868	0.1523		2,365.0934
Total	**1.3338**	**3.7301**	**8.3843**	**0.0237**	**1.7686**	**0.0309**	**1.7996**	**0.4734**	**0.0294**	**0.5027**		**2,451.8548**	**2,451.8548**	**0.1540**	**1.6600e-003**	**2,456.2000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/1/2019	4/4/2019	6	30	
2	Site Preparation	Site Preparation	4/5/2019	4/27/2019	6	20	
3	Grading	Grading	4/28/2019	6/19/2019	6	45	
4	Building Construction	Building Construction	6/20/2019	7/31/2020	6	350	
5	Paving	Paving	8/1/2020	8/18/2020	6	15	
6	Architectural Coating	Architectural Coating	8/19/2020	9/4/2020	6	15	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 1.44

Acres of Paving: 0.22

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 30,836; Non-Residential Outdoor: 10,279; Striped Parking Area: 587 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Building Construction	Cement and Mortar Mixers	1	6.00	9	0.56

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	750.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	13.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1895	0.0000	0.1895	0.0287	0.0000	0.0287			0.0000			0.0000
Off-Road	0.9530	8.6039	7.6917	0.0120		0.5371	0.5371		0.5125	0.5125		1,159.6570	1,159.6570	0.2211		1,165.1847
Total	**0.9530**	**8.6039**	**7.6917**	**0.0120**	**0.1895**	**0.5371**	**0.7266**	**0.0287**	**0.5125**	**0.5412**		**1,159.6570**	**1,159.6570**	**0.2211**		**1,165.1847**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0554	0.0407	0.4425	1.1500e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		114.2131	114.2131	3.9300e-003		114.3113
Total	**0.0554**	**0.0407**	**0.4425**	**1.1500e-003**	**0.1118**	**9.6000e-004**	**0.1127**	**0.0296**	**8.9000e-004**	**0.0305**		**114.2131**	**114.2131**	**3.9300e-003**		**114.3113**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0810	0.0000	0.0810	0.0123	0.0000	0.0123			0.0000			0.0000
Off-Road	0.9530	8.6039	7.6917	0.0120		0.5371	0.5371		0.5125	0.5125	0.0000	1,159.6570	1,159.6570	0.2211		1,165.1847
Total	**0.9530**	**8.6039**	**7.6917**	**0.0120**	**0.0810**	**0.5371**	**0.6181**	**0.0123**	**0.5125**	**0.5247**	**0.0000**	**1,159.6570**	**1,159.6570**	**0.2211**		**1,165.1847**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0554	0.0407	0.4425	1.1500e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		114.2131	114.2131	3.9300e-003		114.3113
Total	**0.0554**	**0.0407**	**0.4425**	**1.1500e-003**	**0.1118**	**9.6000e-004**	**0.1127**	**0.0296**	**8.9000e-004**	**0.0305**		**114.2131**	**114.2131**	**3.9300e-003**		**114.3113**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0265	0.0000	0.0265	2.8600e-003	0.0000	2.8600e-003			0.0000			0.0000
Off-Road	0.7195	8.9170	4.1407	9.7500e-003		0.3672	0.3672		0.3378	0.3378		965.1690	965.1690	0.3054		972.8032
Total	**0.7195**	**8.9170**	**4.1407**	**9.7500e-003**	**0.0265**	**0.3672**	**0.3937**	**2.8600e-003**	**0.3378**	**0.3407**		**965.1690**	**965.1690**	**0.3054**		**972.8032**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0277	0.0203	0.2212	5.7000e-004	0.0559	4.8000e-004	0.0564	0.0148	4.4000e-004	0.0153		57.1065	57.1065	1.9600e-003		57.1557
Total	**0.0277**	**0.0203**	**0.2212**	**5.7000e-004**	**0.0559**	**4.8000e-004**	**0.0564**	**0.0148**	**4.4000e-004**	**0.0153**		**57.1065**	**57.1065**	**1.9600e-003**		**57.1557**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0113	0.0000	0.0113	1.2200e-003	0.0000	1.2200e-003			0.0000			0.0000
Off-Road	0.7195	8.9170	4.1407	9.7500e-003		0.3672	0.3672		0.3378	0.3378	0.0000	965.1690	965.1690	0.3054		972.8032
Total	**0.7195**	**8.9170**	**4.1407**	**9.7500e-003**	**0.0113**	**0.3672**	**0.3785**	**1.2200e-003**	**0.3378**	**0.3391**	**0.0000**	**965.1690**	**965.1690**	**0.3054**		**972.8032**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0277	0.0203	0.2212	5.7000e-004	0.0559	4.8000e-004	0.0564	0.0148	4.4000e-004	0.0153		57.1065	57.1065	1.9600e-003		57.1557
Total	**0.0277**	**0.0203**	**0.2212**	**5.7000e-004**	**0.0559**	**4.8000e-004**	**0.0564**	**0.0148**	**4.4000e-004**	**0.0153**		**57.1065**	**57.1065**	**1.9600e-003**		**57.1557**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8057	0.0000	0.8057	0.4203	0.0000	0.4203			0.0000			0.0000
Off-Road	1.4382	15.1626	9.5240	0.0186		0.7476	0.7476		0.7061	0.7061		1,815.1990	1,815.1990	0.4285		1,825.9118
Total	**1.4382**	**15.1626**	**9.5240**	**0.0186**	**0.8057**	**0.7476**	**1.5533**	**0.4203**	**0.7061**	**1.1265**		**1,815.1990**	**1,815.1990**	**0.4285**		**1,825.9118**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1605	5.1728	1.1619	0.0131	0.2914	0.0191	0.3105	0.0799	0.0183	0.0981		1,416.4161	1,416.4161	0.1030		1,418.9914
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0554	0.0407	0.4425	1.1500e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		114.2131	114.2131	3.9300e-003		114.3113
Total	**0.2159**	**5.2135**	**1.6044**	**0.0142**	**0.4032**	**0.0200**	**0.4232**	**0.1095**	**0.0192**	**0.1287**		**1,530.6292**	**1,530.6292**	**0.1069**		**1,533.3027**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3444	0.0000	0.3444	0.1797	0.0000	0.1797			0.0000			0.0000
Off-Road	1.4382	15.1626	9.5240	0.0186		0.7476	0.7476		0.7061	0.7061	0.0000	1,815.1990	1,815.1990	0.4285		1,825.9118
Total	**1.4382**	**15.1626**	**9.5240**	**0.0186**	**0.3444**	**0.7476**	**1.0920**	**0.1797**	**0.7061**	**0.8858**	**0.0000**	**1,815.1990**	**1,815.1990**	**0.4285**		**1,825.9118**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1605	5.1728	1.1619	0.0131	0.2914	0.0191	0.3105	0.0799	0.0183	0.0981		1,416.4161	1,416.4161	0.1030		1,418.9914
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0554	0.0407	0.4425	1.1500e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		114.2131	114.2131	3.9300e-003		114.3113
Total	**0.2159**	**5.2135**	**1.6044**	**0.0142**	**0.4032**	**0.0200**	**0.4232**	**0.1095**	**0.0192**	**0.1287**		**1,530.6292**	**1,530.6292**	**0.1069**		**1,533.3027**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0016	10.0968	7.7744	0.0119		0.6162	0.6162		0.5677	0.5677		1,165.5569	1,165.5569	0.3607		1,174.5748
Total	**1.0016**	**10.0968**	**7.7744**	**0.0119**		**0.6162**	**0.6162**		**0.5677**	**0.5677**		**1,165.5569**	**1,165.5569**	**0.3607**		**1,174.5748**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0217	0.5794	0.1692	1.2700e-003	0.0320	3.7500e-003	0.0358	9.2200e-003	3.5900e-003	0.0128		135.6386	135.6386	9.5300e-003		135.8768
Worker	0.0720	0.0529	0.5752	1.4900e-003	0.1453	1.2500e-003	0.1466	0.0385	1.1500e-003	0.0397		148.4770	148.4770	5.1100e-003		148.6047
Total	**0.0937**	**0.6323**	**0.7445**	**2.7600e-003**	**0.1773**	**5.0000e-003**	**0.1823**	**0.0478**	**4.7400e-003**	**0.0525**		**284.1156**	**284.1156**	**0.0146**		**284.4815**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0016	10.0968	7.7744	0.0119		0.6162	0.6162		0.5677	0.5677	0.0000	1,165.556 9	1,165.556 9	0.3607		1,174.574 8
Total	**1.0016**	**10.0968**	**7.7744**	**0.0119**		**0.6162**	**0.6162**		**0.5677**	**0.5677**	**0.0000**	**1,165.556 9**	**1,165.556 9**	**0.3607**		**1,174.574 8**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0217	0.5794	0.1692	1.2700e-003	0.0320	3.7500e-003	0.0358	9.2200e-003	3.5900e-003	0.0128		135.6386	135.6386	9.5300e-003		135.8768
Worker	0.0720	0.0529	0.5752	1.4900e-003	0.1453	1.2500e-003	0.1466	0.0385	1.1500e-003	0.0397		148.4770	148.4770	5.1100e-003		148.6047
Total	**0.0937**	**0.6323**	**0.7445**	**2.7600e-003**	**0.1773**	**5.0000e-003**	**0.1823**	**0.0478**	**4.7400e-003**	**0.0525**		**284.1156**	**284.1156**	**0.0146**		**284.4815**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9058	9.1285	7.6188	0.0119		0.5331	0.5331		0.4913	0.4913		1,140.8653	1,140.8653	0.3607		1,149.8818
Total	**0.9058**	**9.1285**	**7.6188**	**0.0119**		**0.5331**	**0.5331**		**0.4913**	**0.4913**		**1,140.8653**	**1,140.8653**	**0.3607**		**1,149.8818**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0186	0.5318	0.1537	1.2600e-003	0.0320	2.5400e-003	0.0346	9.2200e-003	2.4300e-003	0.0117		134.7245	134.7245	9.0100e-003		134.9498
Worker	0.0664	0.0471	0.5213	1.4500e-003	0.1453	1.2100e-003	0.1465	0.0385	1.1200e-003	0.0397		143.9647	143.9647	4.5400e-003		144.0781
Total	**0.0850**	**0.5789**	**0.6750**	**2.7100e-003**	**0.1773**	**3.7500e-003**	**0.1811**	**0.0478**	**3.5500e-003**	**0.0513**		**278.6892**	**278.6892**	**0.0136**		**279.0279**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9058	9.1285	7.6188	0.0119		0.5331	0.5331		0.4913	0.4913	0.0000	1,140.8653	1,140.8653	0.3607		1,149.8818
Total	**0.9058**	**9.1285**	**7.6188**	**0.0119**		**0.5331**	**0.5331**		**0.4913**	**0.4913**	**0.0000**	**1,140.8653**	**1,140.8653**	**0.3607**		**1,149.8818**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0186	0.5318	0.1537	1.2600e-003	0.0320	2.5400e-003	0.0346	9.2200e-003	2.4300e-003	0.0117		134.7245	134.7245	9.0100e-003		134.9498
Worker	0.0664	0.0471	0.5213	1.4500e-003	0.1453	1.2100e-003	0.1465	0.0385	1.1200e-003	0.0397		143.9647	143.9647	4.5400e-003		144.0781
Total	**0.0850**	**0.5789**	**0.6750**	**2.7100e-003**	**0.1773**	**3.7500e-003**	**0.1811**	**0.0478**	**3.5500e-003**	**0.0513**		**278.6892**	**278.6892**	**0.0136**		**279.0279**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Off-Road	0.7716	7.2266	7.1128	0.0113		0.3950	0.3950		0.3669	0.3669		1,035.392 6	1,035.392 6	0.3016		1,042.932 3
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7716**	**7.2266**	**7.1128**	**0.0113**		**0.3950**	**0.3950**		**0.3669**	**0.3669**		**1,035.392 6**	**1,035.392 6**	**0.3016**		**1,042.932 3**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0652	0.7218	2.0000e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		199.3357	199.3357	6.2800e-003		199.4927
Total	**0.0920**	**0.0652**	**0.7218**	**2.0000e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**199.3357**	**199.3357**	**6.2800e-003**		**199.4927**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7716	7.2266	7.1128	0.0113		0.3950	0.3950		0.3669	0.3669	0.0000	1,035.3926	1,035.3926	0.3016		1,042.9323
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7716**	**7.2266**	**7.1128**	**0.0113**		**0.3950**	**0.3950**		**0.3669**	**0.3669**	**0.0000**	**1,035.3926**	**1,035.3926**	**0.3016**		**1,042.9323**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0652	0.7218	2.0000e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		199.3357	199.3357	6.2800e-003		199.4927
Total	**0.0920**	**0.0652**	**0.7218**	**2.0000e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**199.3357**	**199.3357**	**6.2800e-003**		**199.4927**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	12.8859					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**13.1281**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0153	0.0109	0.1203	3.3000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		33.2226	33.2226	1.0500e-003		33.2488
Total	**0.0153**	**0.0109**	**0.1203**	**3.3000e-004**	**0.0335**	**2.8000e-004**	**0.0338**	**8.8900e-003**	**2.6000e-004**	**9.1500e-003**		**33.2226**	**33.2226**	**1.0500e-003**		**33.2488**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	12.8859					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**13.1281**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0153	0.0109	0.1203	3.3000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		33.2226	33.2226	1.0500e-003		33.2488
Total	**0.0153**	**0.0109**	**0.1203**	**3.3000e-004**	**0.0335**	**2.8000e-004**	**0.0338**	**8.8900e-003**	**2.6000e-004**	**9.1500e-003**		**33.2226**	**33.2226**	**1.0500e-003**		**33.2488**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8617	3.6546	8.3178	0.0232	1.7686	0.0252	1.7938	0.4734	0.0236	0.4970		2,361.2868	2,361.2868	0.1523		2,365.0934
Unmitigated	0.8617	3.6546	8.3178	0.0232	1.7686	0.0252	1.7938	0.4734	0.0236	0.4970		2,361.2868	2,361.2868	0.1523		2,365.0934

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Day-Care Center	571.99	571.99	571.99	831,714	831,714
Enclosed Parking with Elevator	0.00	0.00	0.00		
Place of Worship	0.00	0.00	0.00		
Total	571.99	571.99	571.99	831,714	831,714

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Day-Care Center	16.60	8.40	6.90	12.70	82.30	5.00	28	58	14
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Place of Worship	16.60	8.40	6.90	0.00	95.00	5.00	64	25	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Day-Care Center	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Enclosed Parking with Elevator	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Place of Worship	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003		90.5614	90.5614	1.7400e-003	1.6600e-003	91.0996
NaturalGas Unmitigated	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003		90.5614	90.5614	1.7400e-003	1.6600e-003	91.0996

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Day-Care Center	532.313	5.7400e-003	0.0522	0.0438	3.1000e-004		3.9700e-003	3.9700e-003		3.9700e-003	3.9700e-003		62.6251	62.6251	1.2000e-003	1.1500e-003	62.9973
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Place of Worship	237.458	2.5600e-003	0.0233	0.0196	1.4000e-004		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003		27.9363	27.9363	5.4000e-004	5.1000e-004	28.1023
Total		**8.3000e-003**	**0.0755**	**0.0634**	**4.5000e-004**		**5.7400e-003**	**5.7400e-003**		**5.7400e-003**	**5.7400e-003**		**90.5614**	**90.5614**	**1.7400e-003**	**1.6600e-003**	**91.0996**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Day-Care Center	0.532313	5.7400e-003	0.0522	0.0438	3.1000e-004		3.9700e-003	3.9700e-003		3.9700e-003	3.9700e-003		62.6251	62.6251	1.2000e-003	1.1500e-003	62.9973
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Place of Worship	0.237458	2.5600e-003	0.0233	0.0196	1.4000e-004		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003		27.9363	27.9363	5.4000e-004	5.1000e-004	28.1023
Total		**8.3000e-003**	**0.0755**	**0.0634**	**4.5000e-004**		**5.7400e-003**	**5.7400e-003**		**5.7400e-003**	**5.7400e-003**		**90.5614**	**90.5614**	**1.7400e-003**	**1.6600e-003**	**91.0996**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4637	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Unmitigated	0.4637	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0530					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.4105					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Total	**0.4637**	**3.0000e-005**	**3.1200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.6400e-003**	**6.6400e-003**	**2.0000e-005**		**7.0800e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0530					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.4105					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9000e-004	3.0000e-005	3.1200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		6.6400e-003	6.6400e-003	2.0000e-005		7.0800e-003
Total	**0.4637**	**3.0000e-005**	**3.1200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**6.6400e-003**	**6.6400e-003**	**2.0000e-005**		**7.0800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Biological Reports

B-1 Biological Resources Assessment

Prepared by: David Magney Environmental Consulting

September 2017

B-2 Tree Protection Plan

Prepared by: David Magney Environmental Consulting

September 2017

B-3 Mitigation Plan and Monitoring Program

Prepared by: David Magney Environmental Consulting

September 2017

B-4 Wetlands

Prepared by: David Magney Environmental Consulting

October 2018

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BIOLOGICAL RESOURCES ASSESSMENT FOR THE MALIBU JEWISH CENTER & SYNAGOGUE 24855 PACIFIC COAST HIGHWAY MALIBU, CALIFORNIA

Prepared for:

CITY OF MALIBU

On behalf of:

DAVID LAWRENCE GRAY ARCHITECTS

September 2014, Updated September 2017

DMEC Mission Statement

To provide quality environmental consulting services with integrity that protect and enhance the human and natural environment

DMEC

Biological Resources Assessment for the Malibu Jewish Center & Synagogue 24855 Pacific Coast Highway Malibu, California

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25 September 2014, Updated 16 September 2017

This document should be cited as:

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DMEC

SECTION I. INTRODUCTION

BACKGROUND

David Magney Environmental Consulting (DMEC) was contracted to conduct this biological resources assessment and impacts analysis for the subject property and proposed project at the request of Mark Meyer of David Lawrence Gray Architects, project architect. The project site and grading plans were prepared by David Lawrence Gray Architects, of Los Angeles, California.

PROJECT PURPOSE AND SCOPE

The proposed project involves the demolition of existing structures and construction of a new two-story school with basement garage and chapel facility. The parcel is approximately 4.63 acres in size (Los Angeles County parcel data indicates an area of 202,078 square feet). The total footprint of the structures to be built is approximately 11,167 sf (0.256 acre). The school building footprint is almost entirely within the footprint of the existing structures, and the chapel footprint is entirely within a previously approved CDP.

PROJECT LOCATION

The project site is located in the City of Malibu in western Los Angeles County (Figure 1 – General Project Site Location). The Malibu Jewish Center & Synagogue (project site) is located at 24855 Pacific Coast Highway (PCH), Malibu, Los Angeles County, California (AIN 4458-032-027). The project site is east of Corral Canyon Road, and between PCH and Puerco Canyon Creek, as shown on Figure 2 – Project Site and Project Footprint. The site is in the Malibu Beach Quadrangle (USGS 7.5-minute Series) at the approximate geographic coordinates of 34.034°N latitude and -118.717°W longitude, located in the Topanga Malibu Sequit Mexican Land Grant, at the logical location of SW¼ NE¼ Section 1 T3S R18W, San Bernardino Base Line, as illustrated on Figure 1.

The Malibu Jewish Center & Synagogue is partially in the Puerco Canyon watershed at an elevation of approximately 160 feet (50 meters) above mean sea level. The parcel is wedge-shaped trending east-west, as illustrated on Figure 1 and Figure 2. The project site, and all of Puerco Canyon, is within the Coastal Zone. The project site and the proposed facilities are illustrated on Figure 2.

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Figure 1 – General Project Site Location

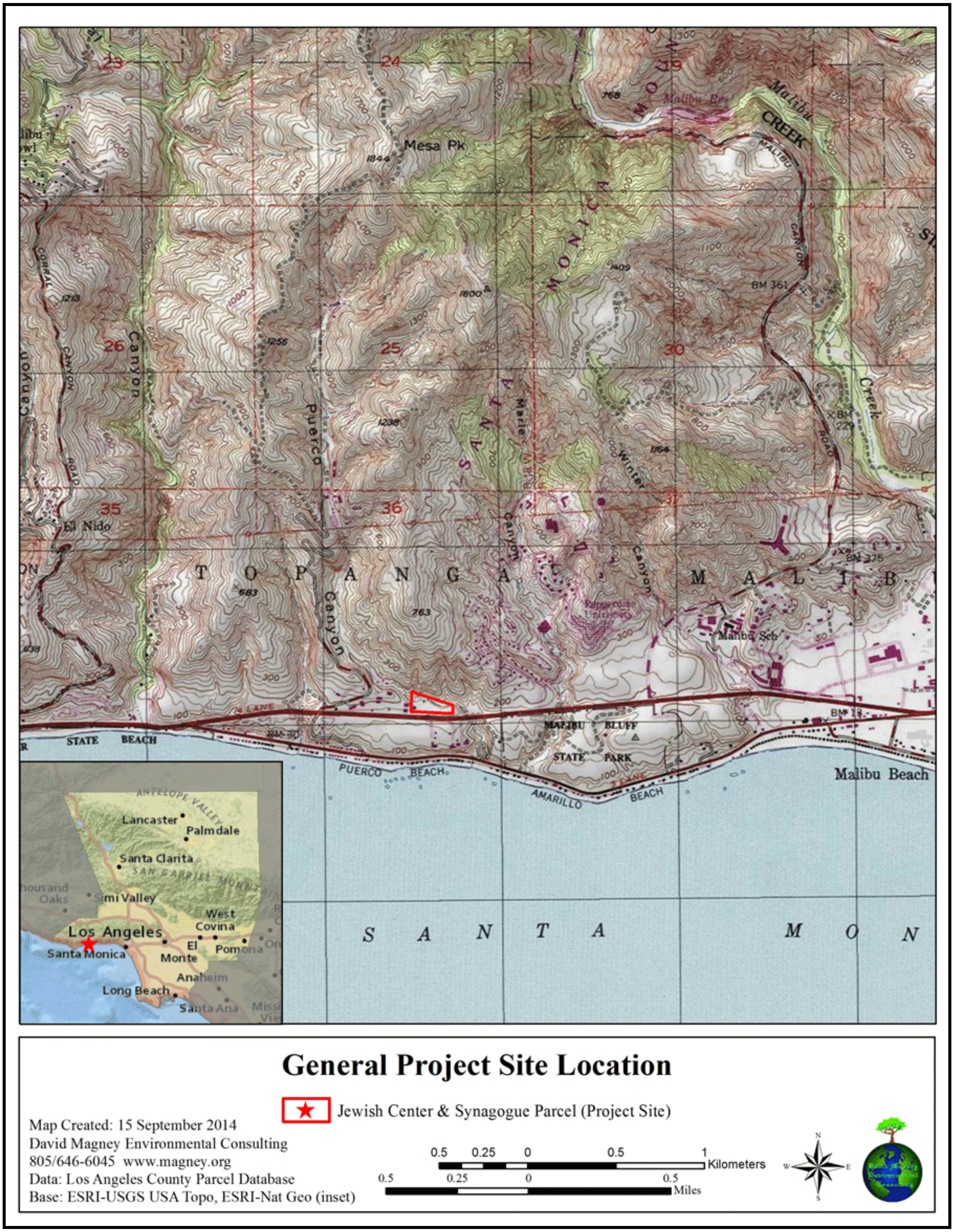

Figure 2 – Project Site and Project Footprint

SECTION II. EXISTING CONDITIONS

METHODS

DMEC biologist Evan Lashly conducted a survey of the project site on 28 August 2014, DMEC biologists David Magney and Evan Lashly conducted a supplementary survey and tree assessment on the project site on 3 September 2014. Mr. Magney conducted a subsequent survey of the site on 28 February 2017.

Surveys were biotic in nature. The main objectives of surveys were to (1) identify and detect as many plant and wildlife species as possible onsite, (2) determine the potential for special-status wildlife and botanical resources to occur onsite, (3) classify and map all vegetation communities onsite, and (4) assess the condition of the general habitats making up the project site. The project site was walked over to account for as many taxa as possible onsite. A Global Positioning System (GPS) unit (Garmin GPSMAP 62stc) was carried to track survey paths and to mark waypoints of findings of interest. Photographs were taken of findings of interest, the various habitats present onsite, and all taxa encountered (when possible) using a Nikon CoolPix P80 and Canon EOS 4Ti digital cameras.

Wildlife observations were aided by the use of binoculars (Nikon Monarch 8x42 and Nikon ProStaff 10x25). Relevant plant vouchers were collected, identified, catalogued, and will be deposited into a public herbarium (UCSB[1]) upon completion of the project. The flora, fauna, and habitats observed are described in the following sections. The botanical surveys were floristic in nature; however, they did not strictly follow CNPS and CDFW survey protocols since fields were not conducted when most vascular plants (primarily annual species) were detectable and/or identifiable. For the Santa Monica Mountains/Malibu region, botanical surveys are recommended to be conducted during the spring and early summer months.

DMEC conducted a search of CDFW's CNDDB RareFind5 (CDFW 2014) for the Malibu Beach, California USGS Quadrangle (in which the project site is found), and for the five surrounding quadrangles, including Calabasas, Canoga Park, Point Dume, Thousand Oaks, and Topanga. This search was updated by an examination of the current (2014) version of the CNDDB GIS database. DMEC conducted this database search to account for special-status species tracked by CNDDB in the area and with potential to occur at the project site.

DMEC also conducted a search of CNPS's *Inventory of Rare and Endangered Plants of California* (2014 and 2017) to account for CNPS-listed plants not tracked on the CNDDB database with potential to occur in the vicinity of the proposed project site. The CNDDB Special Animals List (CNDDB 2014) was also referenced to account for other listed animal species.

[1] UCSB – Herbarium at the University of California, Santa Barbara, Cheadle Center for Biodiversity and Ecological Restoration.

DMEC examined existing Fire Hazard Severity Zones as mapped by CalFire (2014) and determined the history of wildfire at the project site through examination of the U.S. Forest Service dataset Fire Return Interval Departure (USFS 2012).

PHYSICAL CONDITION

The project site is located at the base of the Malibu foothills, approximately 1,000 feet north of the Pacific Ocean. The project parcel is adjacent to the PCH and situated on the north side of the highway. Puerco Canyon and Puerco Canyon Creek run south and bend eastward just north of the project site, entering the parcel on the northwest corner and exiting on the east end, and passing through the northern section of the parcel. Puerco Canyon Creek bends southward again just east of the project site before passing under the PCH and into the Pacific Ocean.

The project site sits atop the ridge just south of Puerco Canyon Creek, with most of the developed area draining southward towards PCH and the remainder draining into Puerco Canyon. The proposed project footprint is situated directly atop the ridge, in a largely artificially flattened area due to development. Just to the north of the proposed project footprint, a north facing slope of varied steepness and dominated by mixed Oak Woodland drops approximately 20 vertical feet to the creek bottom, which is dominated by riparian vegetation, both native and non-native. North of the creek bottom a south-facing slope that is dominated by Coastal Sage Scrub rises again.

The soils of the project site consist of Calcic Argixerolls (in the creek bottom and north of the creek) and Danville-Urban Land Complex (atop the ridge at and south of the proposed project footprint, NRCS 2014). Calcic Argixerolls are well drained soils with high runoff potential derived from weathered calcareous sandstone. Danville-Urban Land Complex is a complex of urban uses with well drained soils with high runoff potential, derived from metavolcanics and/or sedimentary rock.

The project site exists within a Fire Hazard Severity Zone ranked "Very High", by CalFire (2014). According to the U.S. Forest Service dataset Fire Return Interval Departure (USFS 2012), the project site burned in 1985, 1993, and 1995 in the Piuma, Old Topanga, and Calabasas fires, respectively. During the 2007 Corral Fire the project site remained unburned, approximately 1 mile east of the fire's east most extent. DMEC believes that the dense stand of Giant Reed (*Arundo donax*) present in the creek bottom onsite contributes significantly to fire fuel load and hazard potential.

FLORA

A total of thirty-eight (38) vascular plant species were observed onsite. Of these, twenty-four (24, or 61%) of the vascular plants are native species and fourteen (14, or 39%) are nonnative or exotic species, excluding landscape ornamentals. The proportions of native and nonnative taxa onsite are dissimilar to the 75% native: 25% nonnative for other regions of California and for the entire flora of California (Hickman 1993).

Two (2) special-status species were observed: Southern California Black Walnut (*Juglans californica*, CNPS list 4.2) and Plummer's Baccharis (*Baccharis plummerae* ssp. *plummerae*, CNPS list 4.3). Southern California Black Walnut is also tracked by the CNDDB as a sensitive habitat when occurring in woodlands. The 38 vascular plants that were observed are listed below in Table 1 – Plant Species Observed at the Project Site. Additional plant species are expected to occur onsite but were not detectable during the late summer survey dates. However, since the proposed development is restricted to already developed or previously disturbed areas of the parcel, the project is not likely to displace undetected plants occurring on the north-facing slope above Puerco Canyon Creek.

Table 1 – Plant Species Observed at the Project Site

Scientific Name[2]	Common Name	Habit[3]	WIS[4]	Family[5]
Artemisia californica	California Sagebrush	S	-	Asteraceae
Artemisia douglasiana	Mugwort	PH	FAC	Asteraceae
Arundo donax *	Giant Reed	PG	FACW	Poaceae
Baccharis pilularis ssp. *consanguinea*	Coyote Brush	S	(FAC)	Asteraceae
Baccharis plummerae* ssp. *plummerae	**Plummer's Baccharis**	S	-	Asteraceae
Bromus diandrus ssp. *diandrus**	Ripgut Brome	AG	-	Poaceae
Carpobrotus chilensis *	Sea Fig	PH	FACU	Aizoaceae
Chenopodium album *	Lambsquarters	AH	FACU	Chenopodiaceae
Cortaderia cf. *jubata.* *	Pampas Grass	AG	(FAC)	Poaceae
Distichlis spicata	Saltgrass	PG	FACW	Poaceae
Elymus condensatus	Giant Wildrye	PG	-	Poaceae
Eriogonum cinearum	Coastal Buckwheat	S	-	Polygonaceae
Euphorbia terracina var. *terracina**	False Caper	PH	-	Euphorbiaceae
Foeniculum vulgare *	Sweet Fennel	PH	-	Apiaceae
Hazardia squarrosa var. ?	Sawtooth Goldenbush	S	-	Asteraceae
Heteromeles arbutifolia	Toyon	S/T	-	Rosaceae
Heterotheca grandiflora	Telegraph Weed	AH	-	Asteraceae
Hirschfeldia incana *	Summer Mustard	BH	-	Brassicaceae
Isocoma menziesii var. *vernonioides*	Coastal Goldenbush	S	-	Asteraceae
Juglans californica	**Southern California Black Walnut**	T/S	FAC	Juglandaceae
Malacothrix saxatalis var. *tenuifolia*	Tenuate-leaved Cliff-aster	PH	-	Asteraceae
Malosma laurina	Laurelleaf Sumac	S	-	Anacardiaceae
Malva parviflora *	Cheeseweed	AH	-	Malvaceae
Myoporum laetum *	Lollypop Tree	S/T	FACU	Scrophulariaceae

[2] * = Introduced plant species that have become naturalized. **Bold** typeface indicates special-status species. Scientific names of the plant species follow *The Jepson Manual* 2nd Edition (Baldwin et al. 2012) and Flora of North America Committee (1993+). Brackets [ ] indicate updated nomenclature, with old name in brackets.

[3] Habit definitions: AG = annual graminoid; AH = annual herb; AV = annual vine; PG = perennial graminoid; PH = perennial herb; PV = perennial vine; S = shrub; T = tree.

[4] WIS = Wetland Indicator Status. The following code definitions are according to Lichvar et al. (2014):
OBL = obligate wetland species, occurs almost always in wetlands (>99% probability).
FACW = facultative wetland species, usually found in wetlands (67-99% probability).
FAC = facultative species, equally likely to occur in wetlands or nonwetlands (34-66% probability).
FACU = facultative upland species, usually found in nonwetlands (67-99% probability).
UPL = obligate upland species in this region (99% probability), occurs in wetlands in another region
NI = no indicator status has been assigned due to a lack of information.
+ or - symbols are modifiers that indicate greater or lesser affinity for wetland habitats.
* = tentative assignment to that indicator status by Lichvar et al. (2014).
( ) = Parentheses indicate a wetland status suggested by David L. Magney based on extensive field observations.

[5] Family taxonomy follows Flora of North America Committee (1993+).

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Scientific Name[2]	Common Name	Habit[3]	WIS[4]	Family[5]
Nicotiana glauca *	Tobacco Tree	S/T	FAC	Solanaceae
Pennisetum clandestinum *	Kikuyu Grass	PG	-	Poaceae
Platanus racemosa var. *racemosa*	Western Sycamore	T	FAC	Platanaceae
Quercus agrifolia var. *agrifolia*	Coast Live Oak	T	-	Fagaceae
Rhamnus ilicifolia	Hollyleaf Redberry	S	-	Rhamnaceae
Rhus integrifolia	Lemonade Berry	S	-	Anacardiaceae
Ricinus communis *	Castor Bean	S	FACU	Euphorbiaceae
Rubus ursinus	California Blackberry	V	FAC	Rosaceae
Salix lasiolepis var. *lasiolepis*	Arroyo Willow	S/T	FACW	Salicaceae
Salsola tragus *	Tumbleweed	AH	FACU	Chenopodiaceae
Salvia mellifera	Black Sage	S	-	Lamiaceae
Symphoricarpos cf. *albus* var. *laevigatus*	Snowberry	PH	-	Caprifoliaceae
Stipa miliaceae *	Smilo Grass	PG	(FACU)	Poaceae
Toxicodendron diversilobum	Western Poison Oak	V/S	FACU	Anacardiaceae

FAUNA

A total of sixteen (16) vertebrate wildlife species were observed onsite, including one (1) reptile, ten (10) birds, and five (5) mammals. Twelve (12) invertebrate species were found, including one (1) mollusk and eleven (11) insects, some of which are unidentified. The twenty-eight (28) total species observed are listed below in Table 2 – Wildlife Species Observed at the Project Site.

Table 2 – Wildlife Species Observed at the Project Site

Scientific Name[6]	Common Name	Evidence
Reptiles		
Sceloporus occidentalis	Western Fence Lizard	Observed
Birds		
Calypte anna	Anna's Hummingbird	Observed
Melozone crissalis	California Towhee	Observed
Cathartes aura	Turkey Vulture	Observed
Psaltriparus minimus	Bushtit	Observed
Chamaea fasciata	Wrentit	Detected (Call)
Haemorhous mexicanus	House Finch	Observed
Aphelocoma californica	Western Scrub Jay	Observed
Corvus brachyrhynchos	Common Crow	Observed
Sayornis nigricans	Black Phoebe	Observed
Zenaida macroura	Mourning Dove	Observed
Mammals		
Urocyon littoralis	Gray Fox	Detected (Scat)
Canis latrans	Coyote	Detected (Scat)

[6] An asterisk "*" after the scientific name indicates non-native species.

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Scientific Name[6]	Common Name	Evidence
Thomomys bottae	Botta's Pocket Gopher	Detected (Burrows)
Odocoileus hemionus	Mule Deer	Detected (Scat)
Neotoma fuscipes	Long-eared Woodrat	Detected (Nests)
Invertebrates		
Order Lepidoptera (Butterflies, Moths)		
Paplilio zelicaon	Anise Swallowtail	Observed
Colias sp.	small yellow butterfly	Observed
Synanthedon resplendens	Western Sycamore Borer	Observed
Order Diptera (Flies)		
Andricus quercuscalifornicus [*A. californicus*]	California Oak [Apple] Gall	Detected (gall)
Symphoromyia sp.	Biting Snipe Fly	Observed
Order Hymenoptera (Ants, Wasps, Bees)		
Iridomyrmex humilis *	Argentine Ant	Observed
Family: *Formicidae*	small black ant (not Argentine)	Observed
Euura lasiolepis	Arroyo Willow Stem Sawfly	Detected (gall)
Apis mellifera *	European Honey Bee	Observed
Vespula vespa	Yellowjacket	Observed
Agrilus angelicus	Oak Twig Girdler	Detected
Class Gastropoda (Snails and Slugs)		
Helix aspera *	Garden Snail	Observed (shells)

HABITATS

A total of five (5) habitat and land cover types were identified on the Malibu Jewish Center & Synagogue parcel and adjacent areas, which are listed in the natural vegetation and land cover types present onsite were mapped and are illustrated on Figure 3, Vegetation Communities and Land Cover of the Project Site.

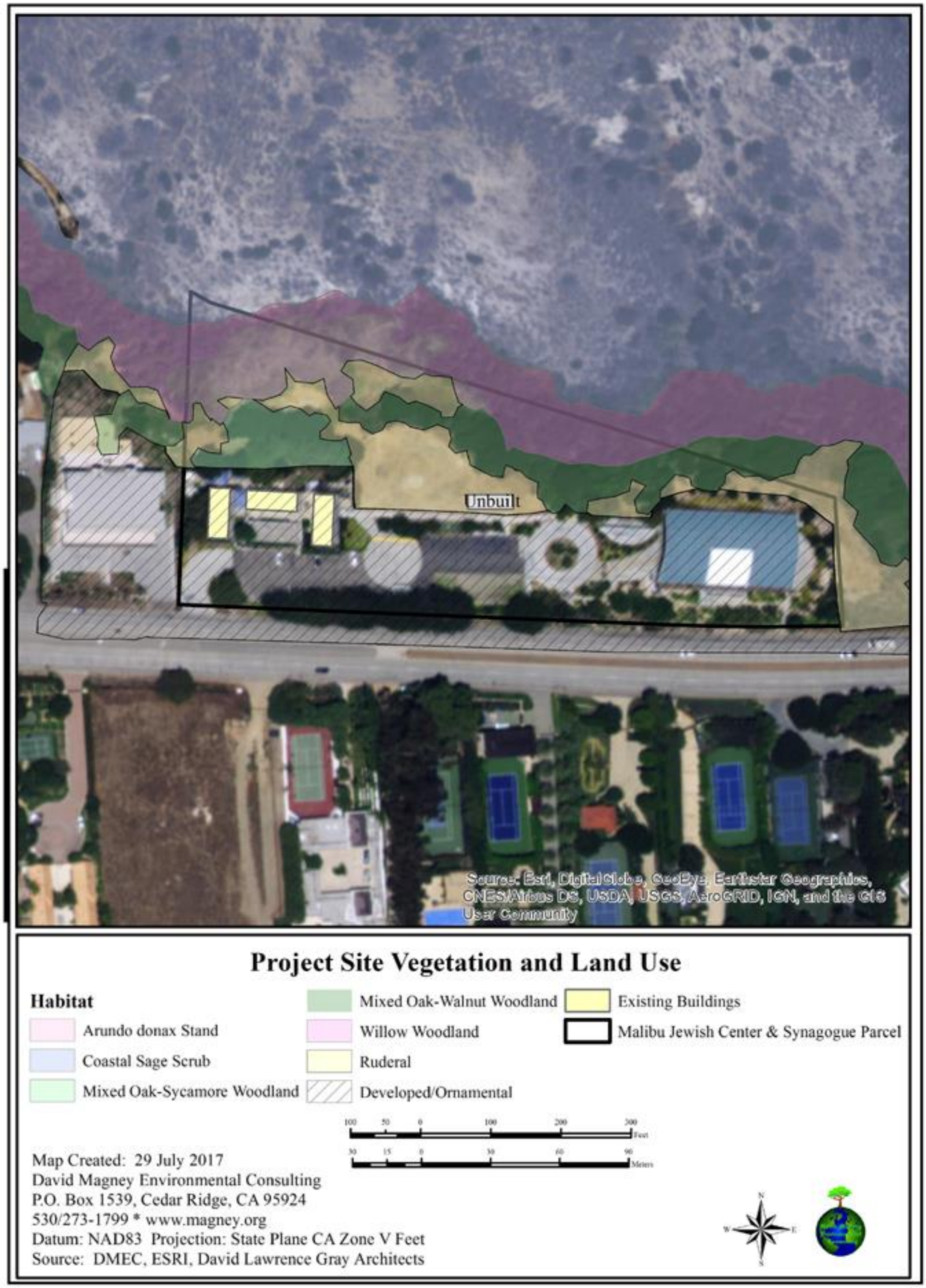
Table 3, Existing Habitats and Land Cover on the Project Site and Expected Impacts, provides the area in acres for each habitat and land cover and the acreage of each habitat that is considered ESHA under CCC guidelines. In addition, the estimated acreage of expected project impacts on the site, within ESHA on the site, and off of the project site (no ESHA is expected to be impacted offsite) is listed. Each habitat and land cover type is described below.

Table 3 – Existing Habitats and Land Cover on the Project Site and Expected Impacts

Existing Habitats and Land Cover Observed	Total Onsite Acres	Onsite ESHA Acres	Construction Impact Acres	ESHA Impact Acres	ESHA Buffer Impact Acres	Fuel Modification Impact Acres[7]	Total Impact Acres
Arundo Stand	0.35	0.35	0	0	0	0.05	0.05
Ruderal Grassland	0.76	0.11	0.13	0	0.13	0.46	0.59
Coastal Sage Scrub	0.03	0.03	0	0	0	0	0
Oak-Walnut Woodland	0.43	0.43	0	0	0	0.19	0.19
Oak-Sycamore Woodland	0.23	0	0	0	0	0.22	0.22
Willow Thicket	0.29	0.29	0	0	0	0.03	0.03
Developed Areas	2.54	0	0.30	0	0.3	0.94	1.24
Acreage Totals	4.64	1.21	0.43	0	0.16	1.9	2.32

[7] In addition to/beyond construction footprint.

Figure 3 – Vegetation Communities and Land Cover of the Project Site



Woodlands

Woodlands are plant communities dominated and characterized by trees. Canopy density and understory composition can vary drastically depending upon the dominant tree species and general location of the woodland (e.g. upland and riparian communities). Woodlands at the project site consist of entirely Oak Woodland, dominated by *Quercus agrifolia* var. *agrifolia* (Coast Live Oak) and including *Platanus racemosa* var. *racemosa* (Western Sycamore) and *Juglans californica* (Southern California Black Walnut) individuals.

Coast Live Oak Woodland

Coast Live Oak Woodland is a plant community dominated or co-dominated by *Quercus agrifolia* var. *agrifolia* (Sawyer et al. 2009). *Q. agrifolia* is a broad-leaved, evergreen, wide-topped tree with furrowed, dark gray bark and spine-toothed, convex, dark green leaves. *Q. agrifolia* is the most widely distributed species of the evergreen oak in California, and it is capable of achieving large size and old age (Zedler et al. 1997). *Quercus agrifolia* Woodland Alliance occurs predominantly in canyons, on steep slopes, and on raised stream banks and terraces at elevations below 1,200 meters. It forms a continuous to open 25-meter-tall canopy, growing over an understory of occasional shrubs and an herbaceous ground layer that is sparse or grassy. *Quercus agrifolia* Woodland Alliance requires >50% relative cover in the tree canopy by *Q. agrifolia.* This alliance occupies deep, sandstone or shale-derived soils on slopes and flats (Sawyer et al. 2009).

Quercus agrifolia Woodland Alliance provides habitat and food for numerous wildlife species, in particular, Acorn Woodpecker, Western Scrub-jay, Western Gray Squirrel, and California Ground Squirrel, and many more. Rarity ranking for this alliance when occurring in riparian systems is G4/S4; however, all woodlands present on the project site were observed to be functioning as upland communities.

Coast Live Oak Woodlands of the project site are represented by the dominance of *Q. agrifolia* var. *a.* Woodlands of the project site are mainly scattered, undeveloped, upland stands to the north and east of the proposed development footprint. *Quercus agrifolia* Woodland Alliance stands are intermingled with individuals of *Platanus racemosa* and *Juglans californica*. A portion of the *Quercus agrifolia* Woodland Alliance on the Malibu Jewish Center & Synagogue parcel has had the understory cleared, presumably for fuel modification. This area exists in the north western section of the parcel, adjacent to the largest stand of *Arundo donax*. The in this cleared area now consists primarily of ruderal grassland. East and West of this cleared area individuals of *Heteromeles arbutifolia* (Toyon), *Toxicodendron diversilobum* (Western Poison Oak), *Rubus ursinus* (California Blackberry), and other native shrubs and herbs dominate the understory. The woodland alliance and associations present on the project site, as described by Sawyer et al. (2009) consist of the following alliances and associations.

Quercus agrifolia Woodland Alliance

Quercus agrifolia Woodland Alliance (Coast Live Oak Woodland) is dominated by *Q. agrifolia* var. *agrifolia*. It is represented onsite by five associations, listed below.

- *Quercus agrifolia*/grass Association

- *Quercus agrifolia/Heteromeles arbutifolia-Toxicodendron diversilobum* Association
- *Quercus agrifolia/Toxicodendron diversilobum*-grass Association
- *Quercus agrifolia-Platanus racemosa* Association
- *Quercus agrifolia-Juglans californica* Association

Coast Live Oak Woodlands with individuals of Southern California Black Walnut were mapped as “Oak-Walnut Woodlands” and areas where individuals of *Platanus racemosa* occurred were mapped as “Oak-Sycamore Woodlands”. Oak-Walnut Woodland occupies approximately 0.43 acre and Oak-Sycamore Woodland occupies approximately 0.23 acre of the Malibu Jewish Center & Synagogue parcel, for a total of 0.66 acre of Coast Live Oak Woodlands.

All areas mapped onsite as Oak-Sycamore Woodlands exist just north of the proposed project footprint. This area has an understory consisting of ruderal grasslands, likely due to fuel modification and previous grading/soil disturbance. Due to the presence of a non-native/altered understory, DMEC does not believe this area qualifies as ESHA. In addition the trees occurring along the perimeter fence of the school play yard were planted.

Coast Live Oak Woodlands containing >30% relative cover of *Juglans californica* qualify as California Walnut Woodland (Sawyer et al. 2009), a CNDDB tracked rare habitat (CDFW 2014). Portions of the woodlands onsite just north east of the proposed development meet this requirement. Several large mature *Juglans californica* individuals make up a significant portion of the tree canopy on the central portion of the parcel, northeast of the proposed development. Boundary delineation protocols and minimum grove-size membership requirements for this alliance are not well described, thus DMEC treats this community as rare; however, no significant impacts are expected.


Photo 1 (left). View westward of mixed Oak-Sycamore Woodland with modified (ruderal) understory.
Photo 2 (right). View eastward of mixed Oak-Walnut Woodland natural understory adjacent to Arundo donax.

Photo 3 (left). View northward of mixed Oak-Walnut Woodland canopy with Coastal Sage Scrub in background.
Photo 4 (right). Juglans californica *individual among mixed Oak-Walnut Woodland.*

Riparian Habitats

Riparian habitats are those plant communities that occur on the banks of perennial, intermittent, and ephemeral streams.

Giant Reed Break (*Arundo donax* Semi-natural)

Giant Reed Break is plant community characterized by the dominance of *Arundo donax* (Giant Reed). *A. donax* is a perennial grass species with alternate, long, tapered, grey-green leaves and hollow stems. *A. donax* generally grows to heights of <8 meters and resembles bamboo. *A. donax* is an aggressive invasive species and one of the fastest growing terrestrial plants in the world (Sawyer et al. 2009). It can form dense mats and clumps that choke stream channels, crowd out native species, increase fire potential, and reduce wildlife habitat. It propagates primarily through rhizomes and the rhizomes of detached clumps.

*Photo 5 (left). View westward of riparian community (*Arundo donax*) below hillside mixed Oak-Walnut Woodland.*
Photo 6 (right). View northward of dense Arundo donax *stand in Puerco Canyon Creek.*

A. donax forms a nearly impenetrably dense stand on the project site. Several individuals of *Salix lasiolepis* exist within the stands of *A. donax*; however, *S. lasiolepis* is the dominant riparian species in areas not containing *A. donax.* This stand dominates the creek bed on the northwest corner of the project parcel and exists in the adjacent parcels to the north and west. This stand of *A, donax* appears to be the only significant stand within Puerco Canyon Creek drainage. Areas on the project site dominated by *A. donax* are mapped as "Arundo Stand". The project site contains approximately 0.35 acre of *A. donax.*

Arroyo Willow Thicket (*Salix lasiolepis* Shrubland Alliance)

Arroyo Willow Thicket is a plant community characterized by the dominance of Arroyo Willow (*Salix lasiolepis* var. *lasiolepis*) and is described by Sawyer et al. (2009) as *Salix lasiolepis* Shrubland Alliance. *S. lasiolepis* is a riparian shrub or tree, growing up to 8 meters in height. It has long strap-shaped to obovate leaves with entire to toothed margins. *S. lasiolepis* grows in seasonally or intermittently flooded areas such as stream beds, banks, and benches and is typically shrubby and many stemmed (Sawyer et al. 2009). It can form an open or continuous canopy and often has a variable herbaceous understory. *S. lasiolepis* is well adapted to flood disturbance and easily colonizes in moist areas where it can become "weedy".

Arroyo Willow Thicket dominates the streambed on the project site in areas where *Arundo donax* does not occur. *S. lasiolepis* and *A. donax* do occur together, but in areas where *A. donax* forms dense stands, *S. lasiolepis* is forced out. Areas of the project site dominated by *S. lasiolepis* are mapped as "Willow Thicket". The project site contains approximately 0.29 acre of Arroyo Willow Thicket.

Photo 7 (left). View eastward (downstream) of creek bed and Arroyo Willow Thicket with understory.
Photo 8 (right). View westward (upstream) of creek bed and Arroyo Willow Thicket with understory.

Scrub Habitats

Scrub Habitats is a general type of vegetation that is dominated by evergreen and deciduous shrubs with small to large, thick, leathery to soft and grayish-green leaves. The shrubs of scrublands are relatively low and open (sometimes dense), and are pre-adapted to periodic wildfires by stump sprouting or by germination from a dormant seed bank. These shrubs are also adapted to drought by deep extensive root systems, while their small thick leaf structure, gray color, waxy or hairy coating, or drought deciduousness prevents permanent damage from moisture loss (Zedler et al. 1997). Many typical chaparral species also grow intermixed as associates with scrubland species. Scrublands typically occurs on moderate to steep slopes with dry, rocky, shallow soils, becoming more abundant with higher elevations where temperatures are lower and moisture supplies are more ample.

Scrublands, as a general category, is a subdominant vegetation type onsite and in the region, occupying only the extreme northwestern corner of the parcel, approximately 1.45 acres. However, the hillsides north of the project site are dominated by scrublands. Scrublands onsite consist of Coastal Sage Scrub and Coastal Sage Scrub – Grassland plant communities.

Coastal Sage Scrub

Coastal Sage Scrub is a shrubland dominated by facultative drought-deciduous, low-growing, soft-leaved, and grayish-green (malacophyllus) shrubs and subshrubs. Coastal Sage Scrub plant series typically exhibit a patchy distribution, often in close association with areas inhabited by chaparral habitats. Due to stand variations, Coastal Sage Scrub is often considered part of a collection of species-specific plant series (Sawyer and Keeler-Wolf 1995).

Southern California's coastline, foothills, and western slopes were once covered by Coastal Sage Scrub, but are now largely developed. Unlike plant relatives found in the mountains and deserts, Coastal Sage Scrub species have adapted to an ecosystem that rarely freezes in the winter and only occasionally experience temperatures over 90°F during the dry California summer. Coastal Sage Scrub plants can store moisture and reduce moisture loss during the prolonged hot, dry months between April and October. The plants either conserve water by specialized leaf structures or dormancy. Tough leathery, wax-covered leaves prevent water from escaping through leaf pores. Minute white hairs keep leaf temperatures down by reflecting sunlight and reduce moisture loss by slowing dry winds. Some leaves are reduced in size, appearing as spines, as on cacti. Other plants drop their leaves during summer months, while other species will dry up and go dormant by middle summer. Root systems can be extensive, sometimes exceeding 30 feet. The roots anchor the plants, hold soil in place, and reduce runoff during winter and spring rains. Fire is also a healthy and necessary component of its life cycle as long as the return frequency is low (over 30 years, Safford and Van de Water 2014). Shrub species respond to recurrent fires by re-sprouting from crown and roots and by producing fire-resistant seeds that are fire-dependent for germination.

Coastal Sage Scrub at the project site occupies only the extreme northwest corner; however, the hillsides north of the project site, outside the parcel boundaries, are dominated by Coastal Sage Scrub. These hillsides are characterized mainly by sparse *Malosma laurina* (Laurel Sumac) and *Eriogonum cinereum* (Coastal Buckwheat) with various annual herbs. Coastal Sage Scrub on the project site was mapped as "Coastal Sage Scrub", and occupies approximately 0.03 acre.

Photo 9. View north with hillside Coastal Sage Scrub in background, Ruderal Grassland in foreground, and mixed Oak-Walnut Woodland in mid-ground.

Grasslands/Herblands

Grasslands/Herblands are plant communities dominated and characterized by herbaceous plants, consisting of grasses and graminoids and wildflowers and herbs, both annual and perennial in duration, depending on the type. Grasslands/Herblands at the project site consists entirely of Ruderal Grassland, which has been disturbed in the recent past by human activities, likely because of required fire fuel modification.

Ruderal Grassland

Ruderal Grassland is an herbaceous plant community dominated by spring-flowering annual grasses and forbs that generally complete their life cycles in one or two seasons, winter and spring, or into early summer, that is/has been modified by anthropomorphic activities.

Ruderal Grassland at the project site consists of a depauperate herbaceous flora dominated by non-native grasses and herbs: *Bromus diandrus* ssp. *diandrus* (Ripgut Grass) dominated the herbaceous areas, with individuals and/or patches of *Stipa miliacea* var. *miliacea*, *Pennisetum clandestinum*, and *Salsola tragus*. Scattered native species such as *Hazardia squarrosa* (Sawtooth Goldenbush) and *Heterotheca grandiflora* (Telegraph Weed) occur within the ruderal communities, particularly on the eastern end of the proposed project footprint.

Areas on the project site where the herbaceous layer is dominated by non-native species with no tree canopy are mapped as "Ruderal Grasslands". Ruderal Grassland occupies approximately 0.76 acre of the project site.

Photo 10 (left). View west of Ruderal Grassland near center of project site parcel and east end of project footprint. Photo 11 (right). View southeastward of Ruderal Grassland near center of project site parcel and east end of project footprint

Disturbed/Developed Areas

Disturbed/Developed areas consist of lands that have been affected by some sort of physical disturbance or improvement, such as grading, brush clearing, landslides, etc., and developed as buildings, roads, and landscaping. While wildfires temporarily change the density and height of natural vegetation, such a disturbance is not included here. Areas immediately south, west, and east of the project site have been developed. Homes, businesses and associated driveways, roads, and landscaping, or remnants of such, occur in these areas. Disturbed/Developed Areas occupy approximately 2.54 acres of the project site and are mapped as "Disturbed/Developed".

SECTION III. SENSITIVE BIOLOGICAL RESOURCES

Sensitive biological resources consist of natural vegetation or habitats that are rare or support rare or sensitive species and special-status species of plants or wildlife. Each of these categories of sensitive biological resources is described in detail below.

SPECIAL-STATUS RESOURCES DEFINITIONS

Special-status habitats are vegetation types, associations, or sub-associations that support concentrations of special-status plant or wildlife species, are of relatively limited distribution, or are of particular value to wildlife. Special-status species are plants and animals that are at least one of the following:

Listed as Endangered or Threatened under Federal or California Endangered Species Acts;

Listed as Rare under the California Native Plant Protection Act; or

Considered rare (but not formally listed) by resource agencies, professional organizations (e.g. Audubon Society, California Native Plant Society [CNPS], The Wildlife Society), and the scientific community.

Listed species are those taxa that are formally listed as Endangered or Threatened by the federal government (e.g. USFWS), pursuant to the Federal Endangered Species Act (ESA) or as Endangered, Threatened, or Tare (for plants only) by the State of California (i.e. California Fish and Game Commission), pursuant to the California Endangered Species Act (CESA) or the California Native Plant Protection Act, or those formally adopted by a local (e.g. county or city government) agency as of local concern or rare, or similar status. Special-status species are defined in Table 4 – Definitions of Special-Status Species.

The CNPS' *Inventory of Rare and Endangered Plants of California* (CNPS 2001, 2007) categorizes rare California plants into one of five ranks or lists (1A, 1B, 2, 3, and 4) representing five levels of species status, one of which is assigned to a sensitive species to indicate its status of rarity or endangerment and distribution. Most taxa also receive a threat code extension following the List (e.g. 1B.1, 2.3), which replaces the R-E-D Code previously used by CNPS. Table 5 – California Native Plant Society Rare Plant Ranks (CNPS Lists), provides a definition for each List code number, and

Table 6 – California Native Plant Society Risk Threat Code Extensions, defines the CNPS List Threat Code Extensions that indicates the level of endangerment within California.

The California Natural Diversity Database (CNDDB) Element Ranking system provides a numeric global and state-ranking system for all special-status species tracked by the CNDDB. The global rank (G-rank) is a reflection of the overall condition of an element (species or natural community) throughout its global range. The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank. This Element Ranking system is defined below in Table 7 – California Natural Diversity Database Element Ranking System.

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Table 4 – Definitions of Special-Status Species

- Plants and animals legally protected under the California and Federal Endangered Species Acts or under other regulations.
- Plants and animals considered sufficiently rare by the scientific community to qualify for such listing; or
- Plants and animals considered to be sensitive because they are unique, declining regionally or locally, or are at the extent of their natural range.

Special-Status Plant Species	Special-Status Animal Species
○ Plants listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.12 for listed plants and various notices in *Federal Register* for proposed species). ○ Plants that are Category 1 or 2 candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (55 CFR 6184, February 21, 1990). ○ Plants that meet the definitions of rare or endangered species under the CEQA (*State CEQA Guidelines*, Section 15380). ○ Plants considered by CNPS to be "rare, threatened, or endangered" in California (Lists 1B and 2 in CNPS 2001). ○ Plants listed by CNPS as plants needing more information and plants of limited distribution (Lists 3 & 4 in CNPS 2001). ○ Plants listed by CNPS as locally rare (Lake 2004, Magney 2007a, Wilken 2003). ○ Plants listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 CCR 670.5). ○ Plants listed under the California Native Plant Protection Act (California Fish and Game Code 1900 et seq.). ○ Plants considered sensitive by other federal agencies (i.e. U.S. Forest Service, Bureau of Land Management) or state and local agencies or jurisdictions. ○ Plants considered sensitive or unique by the scientific community; occurs at natural range limits (*State CEQA Guidelines*, Appendix G).	○ Animals listed/proposed for listing as threatened/endangered under the Federal Endangered Species Act (50 CFR 17.11 for listed animals and various notices in *Federal Register* for proposed species). ○ Animals that are Category 1 or 2 candidates for possible future listing as threatened or endangered under Federal Endangered Species Act (54 CFR 554). ○ Animals that meet the definitions of rare or endangered species under the CEQA (*State CEQA Guidelines*, Section 15380). ○ Animals listed or proposed for listing by the State of California as threatened and endangered under the California Endangered Species Act (14 CCR 670.5). ○ Animal species of special concern (SSC) to the CDFG. ○ Animal species that are fully protected in California (California Fish & Game Code, Sections 3511 [birds], 4700 [mammals], 5050 [reptiles, amphibians]). ○ Animals considered rare or sensitive locally by a local agency or scientific community (*State CEQA Guidelines*, Appendix G)

Table 5 – California Native Plant Society Rare Plant Ranks (CNPS Lists)

CNPS Rank	Definition
1A	Presumed Extinct in California
1B	Rare, Threatened, or Endangered in California and elsewhere
2	Rare, Threatened, or Endangered in California, but more common elsewhere
3	Need more information (a Review List)
4	Plants of Limited Distribution (a Watch List)

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Table 6 – California Native Plant Society Risk Threat Code Extensions

CNPS Threat Code Extension	Definition
x.1	Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
x.2	Fairly endangered in California (20-80% occurrences threatened)
x.3	Not very endangered in California (<20% of occurrences threatened)

Table 7 – California Natural Diversity Database Element Ranking System

Global Ranking (G)	
G1	Less than 6 viable element occurrences (pops for species), OR less than 1,000 individuals, OR <809.4 hectares (ha) (2,000 acres [ac]).
G2	6 to 20 element occurrences OR 809.4 to 4,047 ha (2,000 to 10,000 ac).
G3	21 to 100 element occurrences OR 3,000 to 10,000 individuals OR 4,047 to 20,235 ha (10,000 to 50,000 ac).
G4	Apparently secure; rank lower than G3, factors exist to cause some concern (i.e. there is some threat, or somewhat narrow habitat).
G5	Population, or stand, demonstrably secure to ineradicable due to being commonly found in the world.
GH	All sites are **historic**; the element has not been seen for at least 20 years, but suitable habitat still exists.
GX	All sites are **extirpated;** this element is extinct in the wild.
GXC	Extinct in the wild; exists in cultivation.
G1Q	The element is very rare, but there is a taxonomic question associated with it.
Subspecies Level: Subspecies receive a **T-rank** attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety. **For example:** *Chorizanthe robusta* var. *hartwegii* is ranked G2T1. The G-rank refers to the whole species range (*Chorizanthe robusta*), whereas the T-rank refers only to the global condition of the variety (var. *hartwegii*).	
State Ranking (S)	
S1	Less than 6 element occurrences OR less than 1,000 individuals OR less than 809.4 ha (2,000 ac). S1.1 = very threatened S1.2 = threatened S1.3 = no current threats known
S2	6 to 20 element occurrences OR 3,000 individuals OR 809.4 to 4,047 ha (2,000 to 10,000 ac). S2.1 = very threatened S2.2 = threatened S2.3 = no current threats known..
S3	21 to 100 element occurrences OR 3,000 to 10,000 individuals OR 4,047 to 20,235 ha (10,000 to 50,000 ac). S3.1 = very threatened S3.2 = threatened S3.3 = no current threats known
S4	Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern (i.e. there is some threat, or somewhat narrow habitat). NO THREAT RANK.
S5	Demonstrably secure to ineradicable in California. NO THREAT RANK.

SH	All California sites are **historic**; the element has not been seen for at least 20 years, but suitable habitat still exists.
SX	All California sites are **extirpated;** this element is extinct in the wild.
Notes	
1. Other considerations used when ranking a species or natural community include the pattern of distribution of the element on the landscape, fragmentation of the population/stands, and historical extent as compared to its modern range. It is important to take an aerial view when ranking sensitive elements rather than simply counting element occurrences.	
2. Uncertainty about the rank of an element is expressed in two major ways: by expressing the rank as a range of values (e.g. S2S3 means the rank is somewhere between S2 and S3), and by adding a ? to the rank (e.g. S2?). This represents more certainty than S2S3, but less than S2.	

ENVIRONMENTALLY SENSITIVE HABITAT AREA (ESHA)

The Coastal Act and the Malibu Local Coastal Plan define Environmentally Sensitive Habitat Area (ESHA) as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (Section 30107.5 and Chapter 2, respectively). There are three elements important in defining ESHA:

1) a geographic area can be designated as ESHA either because of the presence of individual species of plants or animals or because of the presence of a particular habitat;
2) in order for an area to be designated as ESHA, the species or habitat must be either rare or it must be especially valuable; and
3) the area must be easily disturbed or degraded by human activities.

The CCC considers the Mediterranean Ecosystem in the Santa Mountains to be rare and especially valuable because of its relatively pristine character, physical complexity, and resultant biological diversity. Therefore, areas of undeveloped native habitat in the Santa Monica Mountains that are large and relatively unfragmented may meet the definition of ESHA by virtue of their valuable roles in that ecosystem, regardless of their relative rarity throughout the state. This is the only place in the coastal zone where the CCC has recognized Chaparral as meeting the definition of ESHA. Due to the essential role that plant communities play in maintaining the biodiversity of the Santa Monica Mountains, the historical losses and current rarity of these habitats in Southern California, and their extreme sensitivity to disturbance, the native Riparian, Coastal Sage Scrub, and Oak Woodland habitats in the Santa Monica Mountains also meet the definition of ESHA under the Coastal Act (Dixon 2003). The City of Malibu Local Coastal Program also considers areas that are within 200 feet of designated ESHA as environmentally sensitive.

Onsite ESHA

The northern portion of the site is just within the southern boundary of 1,498 acres of contiguous ESHA as mapped by the City of Malibu. Figure 4 – City of Malibu ESHA Overlay Zone of the Project Site, shows the extent of the ESHA overlay zone as depicted on the City of Malibu website (City of Malibu 2014).

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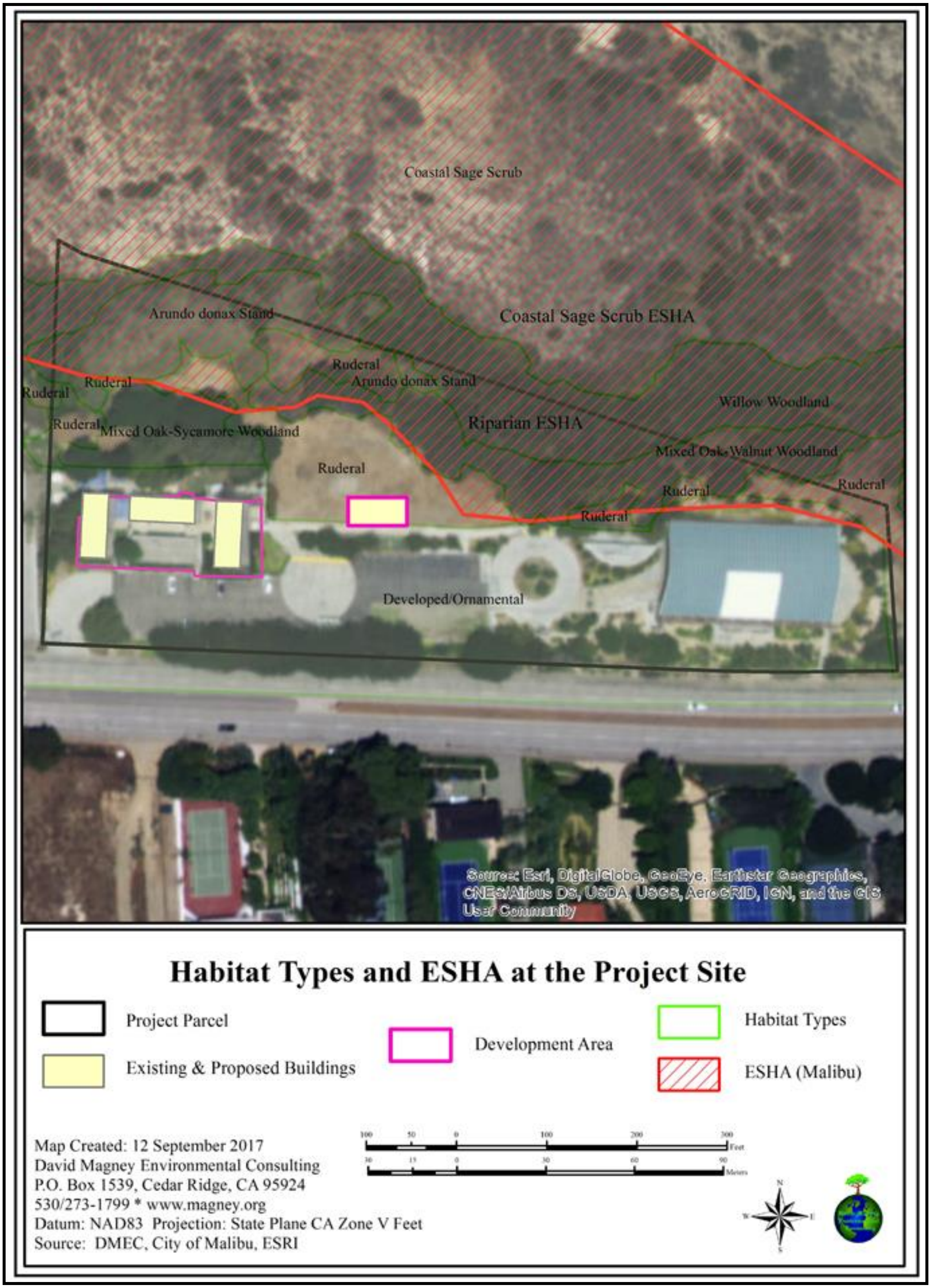
Figure 4 – City of Malibu ESHA Overlay Zone of the Project Site



DMEC delineated ESHA onsite as defined by the CCC (Dixon 2003) during field surveys and using aerial photo interpretation, as shown on Figure 4. DMEC found intact habitats qualifying as ESHA onsite to include: the riparian communities associated with Puerco Canyon Creek, Coastal Sage Scrub on the hillsides north of the creek, and mixed oak woodlands with natural understory on the creek banks and hillsides.

DMEC excludes the ruderal communities onsite as ESHA based on the CCC definition of ESHA in the Santa Monica Mountains (Dixon 2003), illustrated on Figure 4. This includes the area mapped as mixed Oak-Sycamore Woodland just north of the proposed project footprint due to the fact the understory is altered and consists primarily of non-native ruderal species and that these trees were planted in this location. However, DMEC did include the stands of *Arundo donax* as ESHA, as it is functioning as a riparian community. Also, one meadow dominated primarily by ruderal/non-native species was included as ESHA because it is bounded on all sides by natural or riparian habitats and not managed for fuel modification.

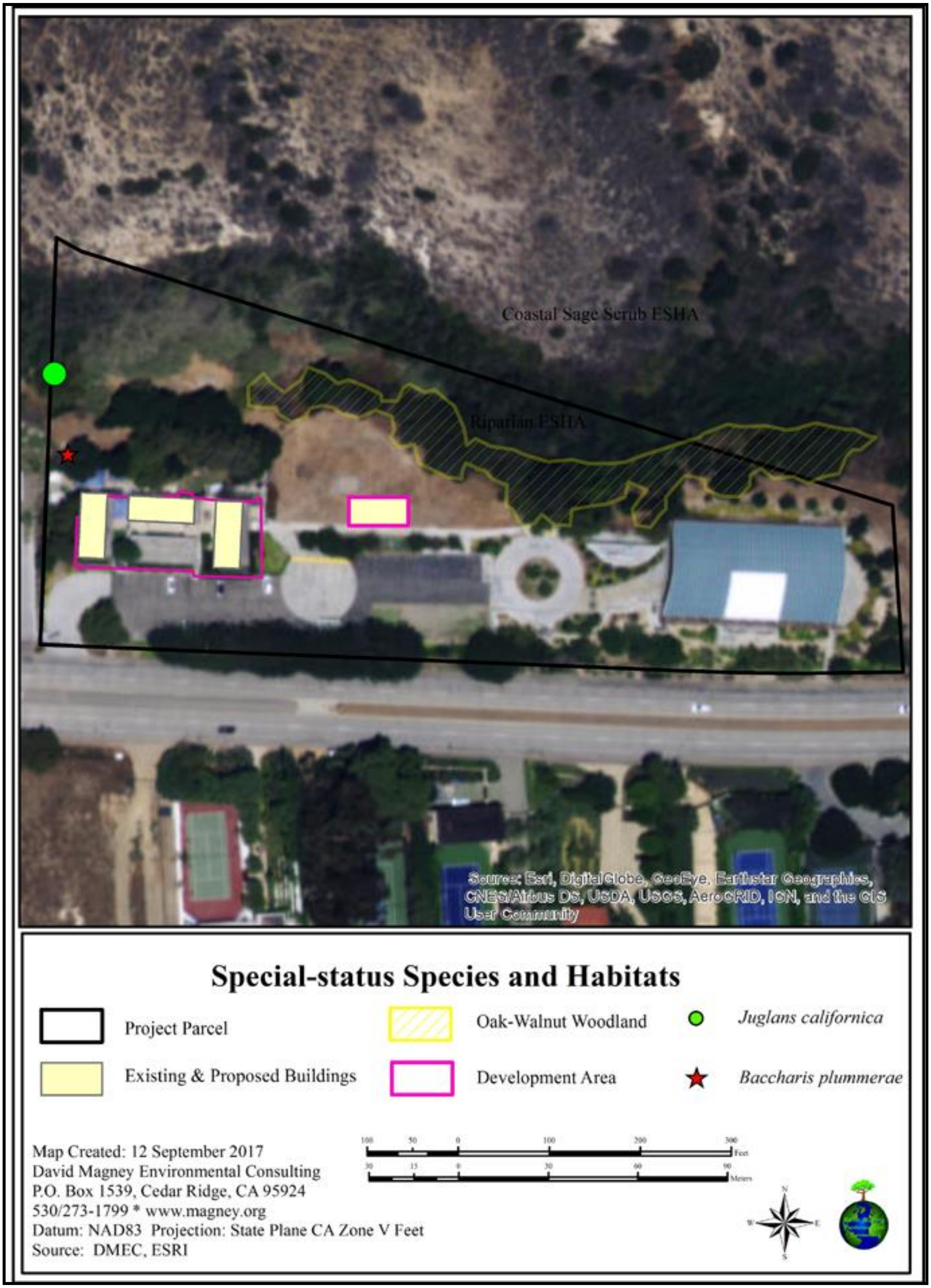
CNDDB SEARCH RESULTS

This section addresses the special-status biological resources observed, reported, or having the potential to occur on the project site. These resources include plant and wildlife species that have been afforded special-status and/or recognition by federal and state resource agencies, as well as private conservation organizations. In general, the principal reason an individual taxon (i.e. species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size, geographic range, and/or distribution resulting in most cases from habitat loss.

DMEC conducted a search of CDFW's CNDDB RareFind5 (CDFW 2014) for the Malibu Beach, California USGS Quadrangle (in which the project site is found), and for the five surrounding quadrangles, including Calabasas, Canoga Park, Point Dume, Thousand Oaks, and Topanga. This search was updated by an examination of the current, 2014, version of the CNDDB GIS database. DMEC conducted this database search to account for special-status species tracked by CNDDB in the area and with potential to occur at the project site. Seventy-nine (79) special-status elements were reported by CNDDB, including thirty-three (33) plant species, forty (40) wildlife species, and six (6) habitats. Figure 5, Special-status Species and Habitats, illustrates the local distribution of each of three categories, plants, wildlife, and habitats, including those species observed onsite or adjacent to the Malibu Jewish Center & Synagogue parcel.

DMEC also conducted a search of CNPS's *Inventory of Rare and Endangered Plants of California* (2014, 2017) to account for CNPS-listed plants not tracked on the CNDDB database with potential to occur in the vicinity of the proposed project site. The CNDDB Special Animals List (CNDDB 2011) was also referenced to account for other listed animal species.

Figure 5 – Special-status Species and Habitats Onsite



Special-status Plants

A total of thirty-three (33) special-status plant species tracked by CNDDB are known or reported in the vicinity of the project site and have the potential to occur onsite. Table 8 – Special-status Plants Potentially Occurring Onsite, summarizes the CNDDB reports for the 33 special-status plant species tracked for the six quads, and provides each species' scientific and common names, status, habitat requirements, and likelihood of occurrence. CNPS's *Inventory of Rare and Endangered Plants of California* lists thirteen (13) additional vascular plants potentially occurring onsite that are shown in Table 9 – Additional CNPS-Listed Plants Potentially Occurring Onsite, summarizes additional CNPS-listed plants potentially occurring onsite.

Two (2) special-status plant species were observed onsite, *Juglans californica* (Southern California Black Walnut) and *Baccharis plummerae* ssp. *plummerae* (Plummer's Baccharis). *J. californica* is CNPS Rank 4.2 species and *B. plummerae* ssp. *plummerae* is a CNPS Rank 4.3 species. *J. californica* is also tracked by the CNDDB as a sensitive habitat when occurring in woodlands. *J. californica* comprises a portion of the hillside woodland just northeast of the proposed development. There is also a single individual tree of sufficient size to warrant protection near the northwestern corner of the proposed development. The locations of special-status species and habitats observed onsite are illustrated on Figure 5 – Special-status Species and Habitats Onsite.

*Photo 12 (left). Southern California Black Walnut (*Juglans californica*) shrub/tree on western parcel boundary, near northwestern corner of proposed development.*
*Photo 13 (right). Southern California Black Walnut (*Juglans californica*) tree among mixed Oak-Walnut Woodland.*

Special-status Wildlife

A total of thirty-three (33) special-status plant species tracked by CNDDB are known or reported in the vicinity of the project site and have the potential to occur onsite. Table 10 – Special-status Wildlife Potentially Occurring Onsite, summarizes the CNDDB reports for the 33 special-status wildlife species tracked for the six quads, and provides each species' scientific and common names, status, habitat requirements, and likelihood of occurrence. In addition to the species listed in Table 10, it should be noted that all raptors, raptor nests (active or inactive), and other active bird nests are protected under Fish and Game Code Section 3503. No special-status wildlife species were observed onsite or in close proximity to the Jewish Center & Synagogue parcel.

Table 8 – Special-status Plants Potentially Occurring Onsite

Scientific Name	Common Name	G Rank[8]	S Rank	Fed	CA	CNPS	Habitat Requirements	Likelihood of Occurrence[9]
Astragalus brauntonii	Braunton's Milkvetch	G2	S2	FE	-	1B.1	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland. Recent burns or disturbed areas; in stiff gravelly clay soils overlying granite or limestone. Elev. 4-640 m. Reported at Malibu Lagoon.	Possible
Astragalus pycnostachyus var. *lanosissimus*	Ventura Marsh Milkvetch	G2T1	S1	FE	CE	1B.1	Coastal salt marsh. Within reach of high tide or protected by barrier beaches, more rarely near seeps on sandy bluffs. Elev. 1-35m.	Unlikely
Astragalus tener var. *titi*	Coastal Dunes Milkvetch	G2T1	S1	FE	CE	1B.1	Coastal bluff scrub, coastal dunes. Moist, sandy depressions of bluffs or dunes along and near the Pacific Ocean; one site on a clay terrace. Elev. 1-50m.	Unlikely
Atriplex coulteri	Coulter's Saltbush	G2	S2	-	-	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland. Ocean bluffs, ridgetops, as well as alkaline low places. Elev. 10-440m.	Unlikely
Atriplex parishii	Parish's Brittlescale	G1G2	S1	-	-	1B.1	Alkali meadows, vernal pools, chenopod scrub, playas. Usually on drying alkali flats with fine soils. Elev. 4-140m.	Unlikely
Atriplex serenana var. *davidsonii*	Davidson's Saltscale	G5T1	S1	-	-	1B.2	Coastal bluff scrub, coastal scrub. Alkaline soil. Elev 10-200 m.	Unlikely

[8] See Tables 4through 7 above for descriptions of rank and status categories. Federal (Fed or F) and State (CA or S) status listings: E = Endangered; SC = Species of Concern.

[9] Likelihood of occurrence based on species' habitat requirements, presence of required habitat onsite, and reported occurrences:

Observed [P] = Species has been observed onsite [Present];

Likely [HP] = Required habitat present onsite and the species has been reported in the vicinity [Habitat Present];

Possible [HP] = Marginal habitat onsite and/or required habitat present nearby, with no reported occurrences nearby [Habitat Present];

Unlikely [HA] = Required habitat not reported onsite, nor is it found nearby [Habitat Absent].

Scientific Name	Common Name	G Rank[8]	S Rank	Fed	CA	CNPS	Habitat Requirements	Likelihood of Occurrence[9]
Baccharis malibuensis	Malibu Baccharis	G1	S1	-	-	1B.1	Coastal scrub, chaparral, cismontane woodland. In Conejo volcanic substrates, often on exposed roadcuts. Sometimes occupies oak woodland habitat. Elev. 150-260 m.	Possible
California macrophylla	Round-leaved Filaree	G2	S2	-	-	1B.1	Cismontane woodland, valley and foothill grassland. Clay soils. 15-1,200 m.	Unlikely
Calochortus clavatus var. *gracilis*	Slender Mariposa Lily	G4T2T3	S2S3	-	-	1B.2	Chaparral, coastal scrub. Shaded foothill canyons; often on grassy slopes within other habitat. Elev. 420-760m	Possible
Calochortus plummerae	Plummer's Mariposa Lily	G4	S4	-	-	4.2	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Occurs on rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. Elev. 90-1,610 m.	Possible
Centromadia parryi ssp. *australis*	Southern Tarplant	G3T2	S2	-	-	1B.1	Marshes and swamps (margins), valley and foothill grassland. Often in disturbed sites near the coast at marsh edges; also in alkaline soils sometimes with Saltgrass.	Unlikely
Chloropyron maritimum ssp. *maritimum*	Salt Marsh Bird's-beak	G4?T1	S1	FE	CE	1B.2	Coastal salt marsh, coastal dunes. Limited to the higher zones of the salt marsh habitat. Elev. 0-30 m.	Unlikely
Chorizanthe parryi var. *fernandina*	San Fernando Valley Spineflower	G2T1	S1	FC	CE	1B.1	Coastal scrub. Sandy soils. Elev. 3-1,035 m.	Unlikely
Chorizanthe parryi var. *parryi*	Parry's Spineflower	G3T3	S3	-	-	1B.1	Coastal scrub, chaparral. Dry slopes and flats, sometimes at interface of 2 vegetation types (e.g. chaparral and oak woodland). Dry, sandy soils. Elev. 40-1,705 m.	Possible
Deinandra minthornii	Santa Susana Tarplant	G2	S2	-	CR	1B.2	Chaparral, coastal scrub. On sandstone outcrops and crevices, in shrubland. Elev. 280-760m.	Unlikely
Delphinium parryi ssp. *blochmaniae*	Dune Larkspur	G4T2	S2	-	-	1B.2	Chaparral, coastal dunes (maritime). On rocky areas and dunes. Elev. 30-375 m.	Unlikely

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Scientific Name	Common Name	G Rank[8]	S Rank	Fed	CA	CNPS	Habitat Requirements	Likelihood of Occurrence[9]
Dithyrea maritima	Beach Spectaclepod	G2	S1	-	CT	1B.1	Coastal dunes, coastal scrub. Formerly more widespread in coastal habitats in So. Calif. Sea shores, on sand dunes, and sandy places near the shore. Elev. 3-50 m.	Unlikely
Dudleya blochmaniae ssp. *blochmaniae*	Blochman's Dudleya	G2T2	S2	-	-	1B.1	Coastal scrub, coastal bluff scrub, valley and foothill grassland. Open, rocky slopes; often in shallow clays over serpentine or in rocky areas w/little soil. Elev. 5-450 m.	Unlikely
Dudleya cymosa ssp. *agourensis*	Agoura Hills Dudleya	G5T1	S2	FT	-	1B.2	Chaparral, cismontane woodland. Rocky, volcanic breccia. Elev. 200-500 m.	Unlikely
Dudleya cymosa ssp. *marcescens*	Marcescent Dudleya	G5T2	S2	FT	CR	1B.2	Chaparral. On sheer rock surfaces and rocky volcanic cliffs. Elev. 180-520 m.	Unlikely
Dudleya cymosa ssp. *ovatifolia*	Santa Monica Dudleya	G5T1	S1	FT	-	1B.1	Chaparral, coastal scrub. In canyons on sedimentary conglomerates; primarily north-facing slopes. Elev. 210-500 m.	Unlikely
Dudleya multicaulis	Many-stemmed Dudleya	G2	S2	-	-	1B.2	Chaparral, coastal scrub, valley and foothill grassland. In heavy, often clayey soils or grassy slopes. Elev. 0-790 m.	Unlikely
Dudleya parva	Conejo Dudleya	G2	S2	FT	-	1B.2	Coastal scrub, valley and foothill grassland. In clayey or volcanic soils on rocky slopes and grassy hillsides. Elev. 60-450 m.	Unlikely
Eriogonum crocatum	Conejo Buckwheat	G1	S1	-	CR	1B.2	Chaparral, coastal scrub, valley and foothill grassland. Conejo volcanic outcrops; rocky sites. Elev. 50-580 m.	Unlikely
Isocoma menziesii var. *decumbens*	Decumbent Goldenbush	G3G5T2T3	S2	-	-	1B.2	Coastal scrub, chaparral. Sandy soils; often in disturbed sites. Elev. 10-135 m.	Unlikely
Lasthenia glabrata ssp. *coulteri*	Coulter's Goldfields	G4T2	S2	-	-	1B.1	Coastal salt marshes, playas, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. Elev. 1-1,200 m.	Unlikely

Scientific Name	Common Name	G Rank[8]	S Rank	Fed	CA	CNPS	Habitat Requirements	Likelihood of Occurrence[9]
Monardella hypoleuca ssp. *hypoleuca*	White-veined Monardella	G4T2T3	S2S3	-	-	1B.3	Chaparral, cismontane woodland. Dry slopes. Elev. 50-1,525 m.	Possible
Nolina cismontana	Chaparral Nolina	G2	S2	-	-	1B.2	Chaparral, coastal scrub. Primarily on sandstone and shale substrates; also known from gabbro. Elev. 140-1,275 m.	Unlikely
Orcuttia californica	California Orcutt Grass	G1	S1	FE	CE	1B.1	Vernal pools. Elev. 15-660 m.	Unlikely
Pentachaeta lyonii	Lyon's Pentachaeta	G2	S2	FE	CE	1B.1	Chaparral, valley and foothill grassland. Edges of clearings in chaparral, usually at the ecotone between grassland and chaparral or edges of firebreaks. Elev. 30-630 m.	Unlikely
Sidalcea neomexicana	Salt Spring Checkerbloom	G4?	S2S3	-	-	2B.2	Alkali playas, brackish marshes, chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub. Alkali springs and marshes. Elev. 0-1,500 m.	Unlikely
Thelypteris puberula var. *sonorensis*	Sonoran Maiden Fern	G5T3	S2	-	-	2B.2	Meadows and seeps. Along streams, seepage areas. Elev. 50-550 m.	Unlikely
Tortula californica	California Screw-moss	G2?	S2	-	-	1B.2	Chenopod scrub, valley and foothill grassland. Moss growing on sandy soil. Elev. 10-1,460 m.	Unlikely

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Table 9 – Additional CNPS-Listed Plants Potentially Occurring Onsite

Scientific Name	Common Name	G Rank[10]	S Rank	Fed	CA	CNPS	Habitat Requirements	Likelihood of Occurrence[11]
Asplenium vespertinum	Western Spleenwort	G3?	S3.2	-	-	4.2	Chaparral, Coastal Sage Scrub, Oak Woodland. Base of overhanging boulders. Elev. 200–1,000 m	Unlikely
Calandrinia breweri	Brewer's Calandrinia	G4	S3.2?	-	-	4.2	Chaparral, Coastal Sage Scrub. Sandy to loamy soil, disturbed sites, burns. Elev. < ,1200 m	Unlikely
Calochortus catalinae	Catalina Mariposa Lily	G3	S3.2	-	-	4.2	Chaparral, Valley Grassland, Foothill Woodland, Coastal Sage Scrub. Heavy soil, open sites. Elev. < 700 m	Possible
Calochortus clavatus var. *clavatus*	Club-haired Mariposa Lily	G4T3	S3	-	-	4.3	Chaparral, Valley Grassland, Foothill Woodland. Generally serpentine soils. Elev. < 1,300 m	Unlikely
Camissoniopsis lewisii	Lewis' Evening-Primrose	G2G3	S1S3	-	-	3	Coastal Strand, Foothill Woodland, Coastal Sage Scrub, Valley Grassland. Sandy or clay soils, coastal. Elev. < 300 m	Unlikely
Cercocarpus betuloides var. *blancheae*	Island Mountain-Mahogany	G5T3	S3.3	-	-	4.3	Chaparral. Elev. <600 m	Unlikely
Convolvulus simulans	Small-flowered Morning-glory	G3	S3.2	-	-	4.2	Valley Grassland, Northern Coastal Scrub, Coastal Sage Scrub. Clay substrates, occasionally serpentine, occasionally near seeps. Elev. 30–875 m	Unlikely
Delphinium parryi ssp. *purpureum*	Mt. Pinos Larkspur	G4T3	S3.3	-	-	4.3	Creosote Bush Scrub, Chaparral, Pinyon-Juniper Woodland. Elev. 1,000–2,600 m	Unlikely

[10] See Table 4 through Table 7 above for descriptions of rank and status categories. Federal (Fed or F) and State (CA or S) status listings: E = Endangered; SC = Species of Concern.

[11] Likelihood of occurrence based on species' habitat requirements, presence of required habitat onsite, and reported occurrences:

Observed = Species has been observed onsite;

Likely = Required habitat present onsite and the species has been reported in the vicinity;

Possible = Marginal habitat onsite and/or required habitat present nearby, with no reported occurrences nearby;

Unlikely = Required habitat not reported onsite, nor is it found nearby.

Scientific Name	Common Name	G Rank[10]	S Rank	Fed	CA	CNPS	Habitat Requirements	Likelihood of Occurrence[11]
Juglans californica	Southern California Black Walnut	G3	S3.2	-	-	4.2	Southern Oak Woodland, wetland-riparian. Hillsides and canyons. Elev. 30–900 m	**Observed**
Lilium humboldtii ssp. *ocellatum*	Ocellated Humboldt Lily	G4T3	S3.2	-	-	4.2	Chaparral, Foothill Woodland, Yellow Pine Forest. Opening and streambanks. Elev. <1,800 m	Possible
Navarretia ojaiensis	Ojai Navarretia	G1	S1	-	-	1B.1	Clay soils. Elev. 300–1,000 m	Unlikely
Phacelia hubbyi	Hubby's Phacelia	G3	S3.2	-	-	4.2	Generally open gravelly or rocky slopes, chaparral, grassland. Elev. < 1,000 m	Possible
Phacelia ramosissima	South Coast Branching Phacelia	G5?T3	S3	-	-	3.2	Diverse habitats, including sand dunes, salt marshes, coastal bluffs, canyons, washes, flats, meadows, conifer forest. Elev. < 3800 m	Possible

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Table 10 – Special-status Wildlife Potentially Occurring Onsite

Scientific Name	Common Name	G Rank[12]	S Rank	Fed	CA	CDFW[13]	Habitat Requirements	Likelihood of Occurrence[14]
Amphibians								
Anaxyrus [*Bufo*] *californicus*	Arroyo Toad	G2G3	S2S3	E	-	SC	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, & sycamores; loose, gravelly areas of streams in drier parts of range.	Unlikely
Rana draytonii	California Red-legged Frog	G2G3	S2S3	T	-	SC	Lowlands & foothills in or near permanent sources of deep water w/dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to aestivation habitat.	Unlikely
Reptiles								
Emys marmorata	Western Pond Turtle	G3G4	S3	-	-	SC	Inhabits permanent or nearly permanent bodies of water in many habitat types; below 1,829 m elev. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks. Need suitable nesting sites.	Unlikely

[12] See Tables 2 through 5 in Section 2.6 above for descriptions of rank and status categories. Federal (Fed or F) and State (CA or S) status listings: E = Endangered; T = Threatened; R = Rare; C = Candidate; SC = Species of Special Concern.

[13] CDFW = California Department of Fish and Wildlife, formerly known as California Department of Fish and Game.

[14] Likelihood of occurrence based on species' habitat requirements, presence of required habitat onsite, and reported occurrences:

Observed [P] = Species has been observed onsite [Present];

Likely [HP] = Required habitat present onsite and the species has been reported in the vicinity [Habitat Present];

Possible [HP] = Marginal habitat onsite and/or required habitat present nearby, with no reported occurrences nearby [Habitat Present];

Unlikely [HA] = Required habitat not reported onsite, nor is it found nearby [Habitat Absent].

Scientific Name	Common Name	G Rank[12]	S Rank	Fed	CA	CDFW[13]	Habitat Requirements	Likelihood of Occurrence[14]
Aspidoscelis tigris ssp. *stejnegeri*	Coastal Whiptail	G5T3T4	S2S3	-	-	-	Found in deserts & semiarid areas w/sparse vegetation & open areas. Also found in woodland & riparian areas. Ground may be firm soil, sandy, or rocky.	Likely
Diadophis punctatus ssp. *modestus*	San Bernardino Ringneck Snake	G5T2T3 Q	S2?	-	-	-	Most common in open, relatively rocky areas. Often in somewhat moist microhabitats near intermittent streams. Avoids moving through open or barren areas by restricting movements to areas of surface litter or herbaceous vegetation.	Possible
Lampropeltis zonata (pulchra)	California Mountain Kingsnake (San Diego Population)	G4G5	S1S2	-	-	SC	Restricted to the San Gabriel and San Jacinto Mountains, of Southern California. Inhabits a variety of habitats, including valley-foothill hardwood, coniferous, chaparral, riparian, & wet meadows. Reported in vicinity at Stunts Ranch & Cold Creek Preserve.	Possible
Phrynosoma blainvillii	Coast Horned Lizard	G3G4	S3S4	-	-	SC	Frequents a wide variety of habitats, most common in lowlands along sandy washes w/scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, & abundant supply of ants & other insects.	Likely
Thamnophis hammondii	Two-striped Garter Snake	G4	S3S4	-	-	SC	Coastal California from vicinity of Salinas to NW Baja California. From sealevel to about 2,134 m elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds & riparian growth.	Unlikely
Anniella stebbinsi [*A. pulchra* ssp. *p.*]	Southern California [Silvery] Legless Lizard	G3G4T3 T4	S3	-	-	SC	Coastal California from vicinity of Salinas to NW Baja California. From sealevel to about 2,134 m elevation. Highly aquatic, found in or near permanent fresh water. Often along streams w/rocky beds & riparian growth.	Unlikely

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Scientific Name	Common Name	G Rank[12]	S Rank	Fed	CA	CDFW[13]	Habitat Requirements	Likelihood of Occurrence[14]
Birds								
Accipiter cooperii	Cooper's Hawk	G5	S3	-	-	WL	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river floodplains; also, live oaks.	Possible
Agelaius tricolor	Tricolored Blackbird	G2G3	S1S2	-	-	SC	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, & foraging area w/insect prey w/in a few km of the colony.	Unlikely
Aimophila ruficeps ssp. *canescens*	Southern California Rufous-crowned Sparrow	G5T3	S2S3	-	-	WL	Resident in Southern California coastal sage scrub & sparse mixed chaparral. Frequents relatively steep, often rocky hillsides w/grass & forb patches.	Possible
Aquila chrysaetos	Golden Eagle	G5	S3	-	-	FP	Rolling foothills, mountain areas, sage-juniper flats, & desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Unlikely
Athene cunicularia	Burrowing Owl	G4	S3	-	-	SC	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California Ground Squirrel.	Unlikely
Polioptila californica ssp. *californica*	Coastal California Gnatcatcher	G3T2	S2	T	-	SC	Obligate, permanent resident of coastal sage scrub below 762 m in Southern California. Low, coastal sage scrub in arid washes, on mesas & slopes. Not all areas classified as coastal sage scrub are occupied.	Unlikely
Riparia riparia	Bank Swallow	G5	S2S3	-	T	SC	Colonial nester; nests primarily in riparian & other lowland habitats west of the desert. Requires vertical banks/cliffs w/fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Unlikely

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Scientific Name	Common Name	G Rank[12]	S Rank	Fed	CA	CDFW[13]	Habitat Requirements	Likelihood of Occurrence[14]
Buteo swainsoni	Swainson's Hawk	G5	S3	-	T	-	Breeds in grasslands w/scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands w/groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Unlikely
Falco peregrinus anatum	American Peregrine Falcon	G4T4	S3S4	D	D	FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Unlikely
Vireo belli ssp. *pusillus*	Least Bell's Vireo	G3T2	S2	E	E	-	Summer resident of so. Calif. in low riparian in vicinity of water or in dry river bottoms; <2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, *Baccharis*, *Prosopis glandulosa*.	Possible
Mammals								
Antrozous pallidus	Pallid Bat	G5	S3	-	-	SC	Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats w/rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Possible
Euderma maculatum	Spotted Bat	G4	S2S3	-	-	SC	Occupies a wide variety of habitats from arid deserts & grasslands through mixed conifer forests. Feeds over water & along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	Possible
Eumops perotis ssp. *californicus*	Western Mastiff Bat	G5T4	S3?	-	-	SC	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral etc. Roosts in crevices in cliff faces, high buildings, trees, & tunnels.	Possible

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Scientific Name	Common Name	G Rank[12]	S Rank	Fed	CA	CDFW[13]	Habitat Requirements	Likelihood of Occurrence[14]
Lasiurus blossevillii	Western Red Bat	G5	S3?	-	-	SC	Roosts primarily in trees, 0.6-12.2 m above ground, from sea level up through mixed conifer forests. Prefers habitat edges & mosaics w/trees that are protected from above & open below w/open areas for foraging.	Possible
Lasiurus cinereus	Hoary Bat	G5	S4?	-	-	-	Prefers open habitats or habitat mosaics, w/access to trees for cover & open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	Possible
Macrotus californicus	California Leaf-Nosed Bat	G4	S2S3	-	-	SC	Desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub & palm oasis habitats. Needs rocky, rugged terrain w/mines or caves for roosting.	Unlikely
Myotis ciliolabrum	Western Small-Footed Myotis	G5	S2S3	-	-	-	Wide range of habitats mostly arid wooded & brushy uplands near water. Seeks cover in caves, buildings, mines & crevices. Prefers open stands in forests & woodlands. Requires drinking water. Feeds on a wide variety of small flying insects.	Possible
Myotis yumanensis	Yuma Myotis	G5	S4?	-	-	-	Optimal habitats are open forests & woodlands w/ sources of water over which to feed. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings, or crevices.	Unlikely
Neotoma lepida ssp. *intermedia*	San Diego Desert Woodrat	G5T3?	S3?	-	-	SC	Coastal scrub of So. Calif. from San Diego to San Luis Obispo Counties. Moderate to dense canopies preferred. They are particularly abundant in rock outcrops & rocky cliffs & slopes.	Possible
Taxidea taxus	American Badger	G5	S4	-	-	SC	Most abundant in drier open stages of most shrub, forest, & herbaceous habitats, w/friable soils. Need sufficient food, friable soils, & open, uncultivated ground. Prey on burrowing rodents. Dig burrows.	Possible

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Scientific Name	Common Name	G Rank[12]	S Rank	Fed	CA	CDFW[13]	Habitat Requirements	Likelihood of Occurrence[14]
Fish								
Eucyclogobius newberryi	Tidewater Goby	G3	S2S3	E	-	SC	Brackish water habitats along the Calif. coast from Agua Hedionda Lagoon, San Diego Co., to the mouth of Smith River. Found in shallow lagoons & lower stream reaches, they need fairly still but not stagnant water & high oxygen levels.	Unlikely
Gila orcuttii	Arroyo Chub	G2	S2	-	-	SC	Los Angeles Basin south coastal streams. Slow water stream sections w/mud or sand bottoms. Feeds heavily on aquatic vegetation & associated invertebrates.	Unlikely
Oncorhynchus mykiss ssp. *irideus*	Southern Steelhead - Southern California DPS	G5T2Q	S2	E	-	SC	Fed listing refers to populations from Santa Maria river south to southern extent of range (San Mateo Creek in San Diego Co.). Southern Steelhead likely have greater physiological tolerances to warmer water & more variable conditions.	Unlikely
Invertebrates								
Helminthoglypta traskii traskii	Transverse Range Shoulderband Snail	G1G2T1	S1	-	-	-	Known from Santa Monica Mountains & Malibu (Magney 2009). Previously found in chaparral scrub/coastal sage scrub on uplands & riparian communities.	Likely
Aglaothorax [*Nebula*] *longipennis*	Santa Monica Shieldback Katydid	G1G2	S1S2	-	-	-	Occur nocturnally in chaparral & canyon stream bottom vegetation, in the Santa Monica Mountains, of So. Calif. Inhabit introduced iceplant and native chaparral plants.	Possible
Cicindela hirticollis ssp. *gravida*	Sandy Beach Tiger Beetle	G5T2	S1	-	-	-	Inhabits areas adjacent to non-brackish water along the coast of Calif. from San Francisco Bay to northern Mexico. Clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.	Unlikely

Scientific Name	Common Name	G Rank[12]	S Rank	Fed	CA	CDFW[13]	Habitat Requirements	Likelihood of Occurrence[14]
Coelus globosus	Globose Dune Beetle	G1G2	S1S2	-	-	-	Inhabitant of coastal sand dune habitat, from Bodega Head in Sonoma County south to Ensenada, Mexico. Inhabits foredunes & sand hummocks; it burrows beneath the sand surface & is most common beneath dune vegetation.	Unlikely
Danaus plexippus	Monarch Butterfly	G5	S3	-	-	-	Winter roost sites extend along the coast from northern Mendocino to Baja Calif. Roosts located in wind-protected tree groves (Eucalyptus, Monterey Pine, Monterey Cypress), w/nectar & water sources nearby.	Unlikely
Socalchemmis gertschi	Gertsch's Socalchemmis Spider	G1	S1	-	-	-	Known from only 2 localities in Los Angeles County: Brentwood (type locality) & Topanga Canyon.	Possible
Trimerotropis occidentiloides	Santa Monica Grasshopper	G1G2	S1S2	-	-	-	Known only from the Santa Monica Mountains. Found on bare hillsides and along dirt trails in chaparral.	Possible

Sensitive Habitats

Sensitive habitats are plant communities that have been identified as rare or declining significantly by the CDFW (CDFW 2014). Table 11 – CNDDB Sensitive Habitats Potentially Occurring Onsite, summarizes the CNDDB search for sensitive habitat types reported for the six quads surrounding and including the project site. Table 11 provides the habitat's name, status, and whether it was observed onsite. One special-status habitat, California Walnut Woodland, was observed on the Malibu Jewish Center & Synagogue site.

Table 11 – CNDDB Sensitive Habitats Potentially Occurring Onsite

CNDDB Sensitive Habitats (CDFW 2014)	**G Rank**[15]	**S Rank**	**Fed**	**CA**	**Presence Onsite**[16]
California Walnut Woodland	G2	S2.1	-	-	**Present**
Southern California Coastal Lagoon	GNR	SNR	-	-	Not observed
Southern California Steelhead Stream	GNR	SNR	-	-	Not observed
Southern Coastal Salt Marsh	G2	S2.1	-	-	Not observed
Valley Needlegrass Grassland	G3	S3.1	-	-	Not observed
Valley Oak Woodland	G3	S2.1	-	-	Not observed

The California Coastal Commission and the City of Malibu have determined that intact habitats in the Santa Monica Mountains Coastal Zone qualify as ESHA when they are part of large contiguous areas. The Riparian and Coastal Sage Scrub communities both onsite and adjacent to the project site are mapped by the City of Malibu as ESHA. Areas within 200 feet of the mapped boundary are also considered environmentally sensitive.

DMEC has refined the mapped boundary of ESHA onsite to exclude a portion containing ruderal habitats. ESHA habitat occupies approximately 1.1 acres of the Malibu Jewish Center & Synagogue parcel/project site. See Figure 4 and 5 above for maps of ESHA and special-status species occurring in the vicinity of the project site.

[15] See Tables 4 through 7 above for descriptions of rank and status categories. Federal (Fed or F) and State (CA or S) status listings: E = Endangered; T = Threatened; R = Rare; C = Candidate; SC = Species of Concern.

[16] Observed [P] = Habitat present onsite [Present]; Not Observed = Habitat not present onsite though some constituents of the habitat may be present as noted; [CH] = Project footprint is within a Critical Habitat unit.

SECTION IV. IMPACTS ANALYSIS

The proposed development of the Malibu Jewish Center & Synagogue parcel will potentially result in significant impacts to biological resources. The proposed project footprint is largely within the footprint of existing structures, but also occupies 0.033 acre of Ruderal Grassland. Construction activities should not result in any permanent direct significant impacts to ESHA. However, any dumping of debris or sediments down the hillside north of the project footprint could result permanent significant impacts to ESHA.

The 200-foot-wide ESHA buffer encompasses 4.54 acres (98%) of the Malibu Jewish Center & Synagogue parcel and all existing and proposed development, as illustrated in Figure 6 – Potential Project Impacts to Vegetation Communities and ESHA. The proposed project footprint is entirely within the footprint of existing buildings and approved in 2006; therefore, no functioning natural habitat will be disturbed by construction activities within the 200-foot ESHA buffer. Construction activities may potentially result in temporary impacts to ESHA such as noise, light, and dust pollution.

Potential impacts to natural vegetation may occur as a result of fuel modification within 100 feet of the proposed structure. The 100-foot fuel modification zone creates a potentially significant conflict with the 200-foot ESHA buffer, potentially resulting in 0.37 acre of potential fuel modification within ESHA and ESHA buffer. The total direct impacts from these activities are summarized in Table 12 – Existing Habitats and Land Cover on the Project Site and Expected Impacts.

Table 12 – Existing Habitats and Land Cover on the Project Site and Expected Impacts

Existing Habitats and Land Cover Observed	Total Onsite Acres	Onsite ESHA Acres	Construction Impact Acres	ESHA Impact Acres	ESHA Buffer Impact Acres	Fuel Modification Impact Acres[17]	Total Impact Acres
Arundo Stand	0.35	0.35	0	0	0	0.05	0.05
Ruderal Grassland	0.76	0.11	0.02	0	0.02	0.40	0.40
Coastal Sage Scrub	0.03	0.03	0	0	0	0	0
Oak-Walnut Woodland	0.43	0.43	0	0	0	0.19	0.19
Oak-Sycamore Woodland	0.23	0	0	0	0	0.22	0.22
Willow Thicket	0.29	0.29	0	0	0	0.03	0.03
Developed Areas	2.54	0	0.30	0	0.3	0.94	1.24
Acreage Totals	4.64	1.21	0.32	0	0.32	0.44	0.76

[17] In addition to/beyond construction footprint.

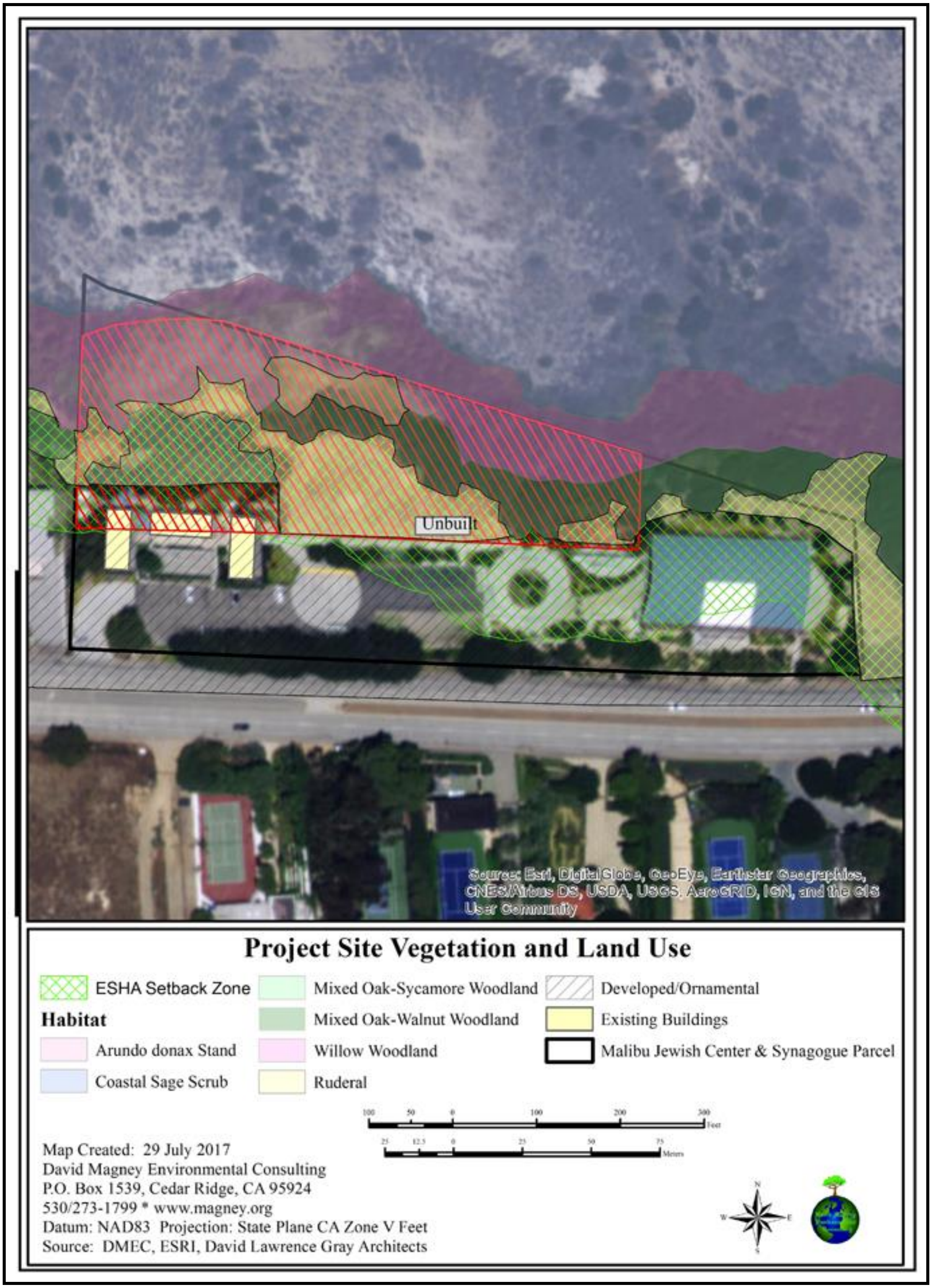
Required fuel modification, 100-foot distance from habitable buildings, covers an area of approximately 2.22 total acres, of this approximately 2.1 acres is developed or dominated by non-native species (including 0.15 acres dominated by *Arundo donax* within the ESHA boundary), as shown on Figure 6 above. The remaining 0.21 acre is ESHA dominated by native vegetation, the majority being Oak-Walnut Woodland (0.19 acre) with a small amount of Willow Thicket (0.03 acre). These Woodlands are within an existing fuel modification zone; however, construction of the proposed structures will expand the fuel modification zone further into ESHA than has been modified to date. Required fuel modification in these areas could alter and reduce habitat quality and functions.

Extensive required modification of the creek bottom understory could potentially result in loss of individuals of *Baccharis plummerae* ssp. *plummerae*. *Baccharis plummerae* ssp. *plummerae* is a CNPS list 4.3 species not mapped by the CNDDB, nor afforded any formal legal protection. However, it is considered uncommon and vulnerable within California. DMEC believes that limiting the required fuel modification within ESHA will avoid or minimize impacts to this uncommon species.

The proposed facility will require removal of two (2) native *Platanus racemosa* trees. Neither of these trees are part of high functioning habitat. The two *Platanus racemosa* trees exist on the far west end of the parcel within the toddler playground. For detailed discussion of potential impacts to native trees onsite, please refer to the Tree Assessment Report (DMEC 2017).

The special-status species with potential to be impacted by the proposed project is the Southern California Black Walnut (*Juglans californica*). Several mature individuals comprise a significant portion of intact habitat qualifying as ESHA northeast of the proposed development footprint. The 100-foot fuel modification zone creates a conflict with this natural community, and the true extent of impacts to these sensitive resources is directly dependent upon the extent of fuel modification required by the city. One mature individual exists on the northwestern corner of the proposed development. The proposed development will potentially occur within this individual's Tree Protection Zone. However, the proposed structures will be constructed almost entirely within the footprint of existing structures; therefore, little modification will occur to the Tree Protection Zone, and no significant impact is expected. Potential impacts to protected trees onsite are covered in detail in the Tree Assessment Report (DMEC 2017).

Figure 6 – Potential Project Impacts to Vegetation Communities and ESHA



SECTION V. CONCLUSIONS

The proposed school and chapel facilities will potentially result significant impacts to ESHA, ESHA buffer, and sensitive species onsite. Actions that could avoid or minimize these potential impacts are discussed below.

The proposed development and construction activities may result in permanent and temporary significant impacts to special-status species and ESHA.

Any dumping of sediments, debris, fluids, or significant runoff down the hillside just north of the project site could result in significant permanent impacts to ESHA. DMEC recommends that temporary fencing be erected prior to construction activities to prevent such impacts. This fencing will be compatible with fencing utilized to minimize impacts to Tree Protection Zones as described in the Tree Assessment Report (DMEC 2017).

The proposed development will not directly result in the loss of special-status species or ESHA; however, the required 100-foot fuel modification zone may result in alteration or degradation of special-status species and habitat functions. DMEC recommends that fuel-modification requirements be limited within ESHA. DMEC recommends that no trees or large shrubs (particularly the special-status species *Juglans californica* present onsite) be required for removal. DMEC further recommends that alteration of the understory within ESHA be limited to the minimum extent possible.

Restoration of areas dominated by *Arundo donax* and control of non-native species within ESHA onsite could serve as mitigation for any direct impacts due to fuel modification.

Construction activities could potentially result in temporary significant impacts to special-status species and ESHA onsite, such as noise, light and dust pollution. DMEC recommends that standard best management practices be used during construction activities (e.g. limiting hours of activity, hooded lighting) to minimize and avoid these impacts to the maximum extent possible.

Construction within 100 feet of active bird nests could disrupt breeding and nesting. Prior to construction, a qualified biologist should survey for active bird nests. If active bird nests are found within 100 feet of the construction zone, the behavior of the breeding/nesting birds should be monitored. If the birds are indirectly disturbed by the construction activities, then corrective measures shall be implemented to eliminate the disturbance factors, such as constructing temporary visual screens and/or sound blankets, or postpone construction activities until the young birds have fledged the nest(s). Some bird species, such as Bushtit, are quite tolerant of human activities and construction noises, and buffer zones as little as 15 feet have been sufficient to avoid harassment.

SECTION VI. ACKNOWLEDGEMENTS

This report was written by Evan Lashly and David Magney. Graphics were created by Mr. Lashly and Vickie Peters. Mr. Magney reviewed and edited this report. Ms. Peters proofread the final version of this report.

Mark Meyer of David Lawrence Gray Architects, provided guidance and assistance with the project description and provided current project plans and drawings.

Adrian Fernandez and Jennifer Brown, City of Malibu Planning Department, provided maps of ESHA for the City of Malibu.

SECTION VII. CITATIONS

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David Magney Environmental Consulting

TREE PROTECTION PLAN FOR THE MALIBU JEWISH CENTER & SYNAGOGUE, 24855 PACIFIC COAST HIGHWAY, MALIBU, CALIFORNIA

Prepared for:

CITY OF MALIBU

On behalf of:

DAVID LAWRENCE GRAY ARCHITECTS

September 2014, Updated September 2017

Mission Statement

To provide quality environmental consulting services with integrity that protect and enhance the human and natural environment

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DMEC

Tree Protection Plan for the Malibu Jewish Center & Synagogue, 24855 Pacific Coast Highway, Malibu, California

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29 September 2014, Updated 17 September 2017

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DMEC

SECTION I. INTRODUCTION

BACKGROUND

David Magney Environmental Consulting (DMEC) was contracted to conduct a tree assessment and impacts analysis with protection plan for the subject property and proposed project at the request of Mark Meyer of David Lawrence Gray Architects, project architect. The project site and grading plans were prepared by David Lawrence Gray Architects, of Los Angeles, California.

PROJECT PURPOSE AND SCOPE

The proposed project involves the demolition of existing structures and construction of a new two-story school with basement garage and chapel facility. The parcel is approximately 4.63 acres in size (Los Angeles County parcel data indicates an area of 202,078 square feet). The total footprint of the structures to be built is approximately 0.43 acre. The school building footprint is almost entirely within the footprint of the existing structures, and the chapel footprint is entirely within a previously graded/disturbed area.

PROJECT LOCATION

The project site is located in the City of Malibu in western Los Angeles County illustrated in Figure 1 – General Project Site Location. The Malibu Jewish Center & Synagogue (project site) is located at 24855 Pacific Coast Highway (PCH), Malibu, Los Angeles County, California (AIN 4458-032-027). The project site is east of Corral Canyon Road, and between PCH and Puerco Canyon Creek, as shown on Figure 1 – General Project Site Location. The site is in the Malibu Beach Quadrangle (USGS 7.5-minute Series) at the approximate geographic coordinates of 34.034°N latitude and -118.717°W longitude, located in the Topanga Malibu Sequit Mexican Land Grant, at the logical location of SW¼ NE¼ Section 1 T3S R18W, San Bernardino Base Line.

The Malibu Jewish Center & Synagogue is partially in the Puerco Canyon watershed at an elevation of approximately 160 feet (50 meters) above mean sea level. The parcel is wedge-shaped trending east-west. The project site, and all of Puerco Canyon, is within the Coastal Zone. The project site and proposed project footprint are illustrated in Figure 2 – Project Site and Project Footprint.

Figure 1 – General Project Site Location

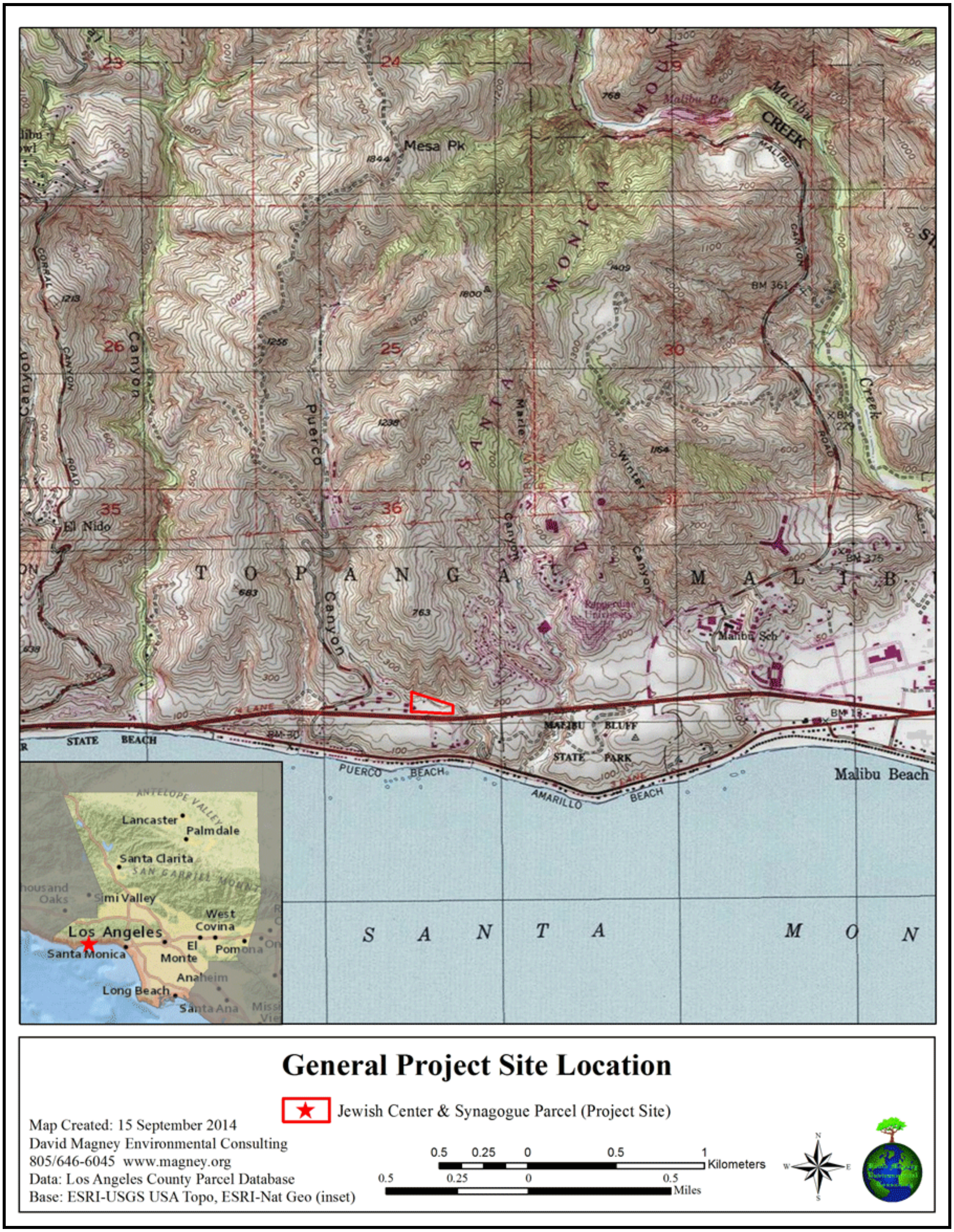

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Figure 2 – Project Site and Project Footprint

SECTION II. METHODS

FIELD ASSESSMENT

Current health conditions were assessed according to direct observations and non-invasive measurements and recorded on DMEC's field tree assessment forms based on International Society of Arboriculture (ISA) assessment guidelines. The field assessment was conducted on 28 August and 3 September 2014. DMEC ISA Certified Arborist (WE-7674A), David Magney, and assistant Evan Lashly conducted the assessments. Mr. Magney visited the project site on 28 February 2017 to determine changes in site conditions but did not re-assess the trees.

DMEC used an in-house field assessment form that is based on ISA assessment guidelines. Each tree's size and health condition were assessed based on direct observations and non-invasive measurements and recorded on DMEC's field assessment forms (included as Appendix A), one form for each tree assessed. DMEC examined the trunk, scaffolding branches, small branches and twigs, foliage, root collar, and roots (where possible) of each individual tree. Photographs were taken of each tree. DMEC has assigned unique numbers and tags to each tree assessed. DMEC has evaluated the health condition of each individual tree and identified potential contributing factors to the condition of each individual tree. A full risk assessment and valuation was **not** performed.

DMEC used field measurements in combination with proposed development plans provided by Mark Meyer of David Gray Architects and ESRI GIS software (ArcMap 10.2 and associated programs) to map the locations of trees onsite and conduct impact analysis.

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SECTION III. EXISTING TREE CONDITIONS

TREES

The project site contains a variety of mature native tree species afforded protection under the City of Malibu Native Tree Protection Ordinance. The City of Malibu LCP Local Implementation Plan (Chapter 5 Section 2) affords protection to several native species of trees that have at least one trunk measuring six inches or more in diameter, or a combination of any two trunks measuring a total of eight inches or more in diameter, measured at four and one-half feet above grade.

DMEC identified 19 trees onsite that meet these criteria and have potential to be impacted by the proposed development. These trees include nine (9) Coast Live Oaks (*Quercus agrifolia* var. *agrifolia*), eight (8) Western Sycamores (*Platanus racemosa* ssp. *racemosa*), and one (1) Southern California Black Walnut (*Juglans californica*). DMEC also identified two (2) Arroyo Willows (*Salix lasiolepis* var. *lasiolepis*) with potential to be impacted by the project. Arroyo Willow is not protected under the City of Malibu Tree Protection Ordinance; however, these trees exist in the same area as many formally protected trees and thus are mentioned and included in this plan.

LOCATION OF TREES

All trees onsite that will potentially be impacted by the proposed development are located on the western half of the project parcel. Two (2) Western Sycamore trees that will be required to be removed for the proposed project exist near the parcels western boundary within a toddler playground (Photo #1). Three (3) Coast Live Oak trees that will be required to be removed or relocated for the proposed project exist in a landscaped area just west of the center of the parcel and north of the current parking lot (Photo #2). The remaining sixteen (16) trees, seven (7) Coast Live Oaks, six (6) Western Sycamores, two (2) Arroyo Willows, and one (1) Southern California Black Walnut exist in a more-or-less linear grove trending east-west, just north of the proposed site of development on a hillside above Puerco Canyon Creek (Photo #3). All approximate species and locations of trees potentially impacted by the proposed project are illustrated in Figure 3 – Locations of Trees on Project Site and with the identification numbers assigned by DMEC in Figure 4 – Assigned Numbers of Trees on Project Site.

A mixed Coast Live Oak and Southern California Walnut Woodland exists on the steep hillside east of the DMEC identified trees and north northeast of the proposed development (Photo #4). DMEC did not map or assess any of the trees within this woodland, as DMEC expects no significant impacts will occur.

DMEC

Figure 3 – Locations of Trees on Project Site

Figure 4 – Assigned Numbers of Trees on Project Site

DMEC

*Photo 1 (left): Trees 1 & 2, Western Sycamore (*Platanus racemosa*) existing in the toddler playground on the west edge of the property, required for removal.*

*Photo 2 (right): Trees 19,20, & 21, Coast Live Oak (*Quercus agrifolia*) existing in a landscaped area and required for removal where planted onsite in 2006.*

Photo3 (left): Mixed Oak-Sycamore Woodland existing north of the proposed project footprint, general location of trees 3 through 18.

Photo 4 (right): Oak-Walnut Woodland northeast of the proposed project footprint existing on a steep north facing hillside.

CONDITION OF TREES

Examination of historic aerial imagery reveals that many of the potentially impacted trees on the project site were planted following development sometime between 1994 and 2002. The area directly north of the project footprint is visibly occupied by trees in 1990 (prior to any development aside from some clearing/grading), then clear in 1994, and then occupied again in 2002. This evidence is supported by the roughly equal size of all trees existing in a relatively straight line directly north of the project footprint. Younger successful recruits also exist in this area, as well as older, larger trees further down slope.

All trees potentially impacted by the proposed project are in moderate-good (2 trees) to good (17 trees) condition, with two (2) exceptions: one Arroyo Willow (Tree DMEC5); and one Western Sycamore (Tree DMEC2).

Tree DMEC5, an Arroyo Willow located north of the proposed development, is a nearly entirely dead tree that has been trimmed back completely to the trunk. The signs of life are several trunk sprouts growing from the north side of the base of the trunk. Tree DMEC2, a Western Sycamore located west of the proposed development, is in overall moderate condition aside from the trunk, which is in poor condition. There is significant damage to the trunk from bark boring insects. Numerous bore holes, insect molts, and substantial buildup of frass (fecal material and/or excavation debris) are visible around the trunk (Photo #5).

The remaining nineteen (19) trees are all in moderate-good to good condition.

Substantial soil compaction has occurred and some impervious surfaces have been installed in the root zones of the 16 trees located just north of the proposed developments. However, these trees have tolerated these conditions for over 10 years and still display healthy vigorous characteristics, indicating they are well adapted to their current surroundings.

The three Coast Live Oak trees existing in a landscaped area were planted in 2006, supported by examining historic aerial imagery between March 2006 and October 2007 and are relative young and small (<20 feet tall). They all appear healthy and vigorous; however, all have densely clustered trunks with some included bark that may develop into a hazardous condition as they continue to grow.

*Photo 5 (left): Tree #13, Western Sycamore (*Platanus racemosa*), in generally good condition with sound trunk but somewhat sparse canopy.*
*Photo 6 (right): Tree #2, Western Sycamore (*Platanus racemosa*), bark borer insect molt and some frass visible on the trunk..*


*Photo 7 (left): Tree #3, Southern California Black Walnut (*Juglans californica*), in generally good condition near the northwest corner of the proposed project footprint.*
*Photo 8 (right): Tree #17, Coast Live Oak (*Quercus agrifolia*), DMEC assigned number tag and trunk with significant new growth visible.*

DMEC

SECTION IV. ASSESSMENT OF IMPACTS TO TREES

PROJECT RELATED IMPACTS

The construction of the proposed project will result in the loss of two (2) trees onsite, two (2) Western Sycamores west of the project footprint in the toddler playground. Three (3) Coast Live Oak trees on the southeast edge of the project footprint occur in a landscaped area. The three (3) planted Coast Live Oaks existing in the landscaped area will not be removed; however, their Tree Protection Zones (TPZs) (the maximum extent of the canopy plus 15 feet) will be encroached upon during construction.

Mark Meyer of David Lawrence Gray Architects indicated that the playground area, lawn, and sandboxed north of the current facilities are to remain in place during construction of the proposed project (Photos # 9 & 10). Retention of these features should provide protection against significant impacts to the remaining sixteen (16) trees existing north of the proposed project footprint. Significant impacts to these trees are only expected if substantial alteration of the surface occurs within the TPZ. These trees are well adapted to their current location and the current extent of impervious surfaces and compacted soils that exist within the playground, lawn, and sandbox areas north of the current facilities.

The mixed Oak-Walnut Woodland existing to the north and northeast of the proposed project footprint is not expected to be impacted. Several large mature Coast Live Oak and Southern California Black Walnut individuals exist on the steep hillside; however, they are far enough removed (horizontally and vertically) from the proposed project footprint to avoid significant impact. Significant impacts to this woodland and riparian community below could occur if significant runoff and/or dumping of debris/sediments/fluids occur on the hillside during construction activities.

The assigned number, species, current condition, and expected impacts of each tree identified onsite by DMEC are summarized in Table 1 – Summary of Trees Onsite.

Photo 9(left): View east from near the northwest corner of the proposed project footprint of playground and sandbox area to be preserved. Photo 10(right): View west from north of the proposed project footprint of playground and sandbox area to be preserved.

DMEC

Table 1 – Summary of Trees Onsite

Number	Scientific Name	Common Name	DBH (inches)	Condition	Expected Significant Impacts
DMEC1	*Platanus racemosa*	Western Sycamore	20.5	Good	Unavoidable
DMEC2	*Platanus racemosa*	Western Sycamore	15.8, 15.5	Moderate (Trunk Poor)	Unavoidable
DMEC3	*Juglans californica*	S. Calif. Black Walnut	5, 5, 4, 3	Good	Potential
DMEC4	*Quercus agrifolia*	Coast Live Oak	5.5, 15.5, 10.5	Moderate-Good	Potential
DMEC5	*Salix lasiolepis*	Arroyo Willow	NA	Dead	None
DMEC6	*Quercus agrifolia*	Coast Live Oak	14.45	Good	Potential
DMEC7	*Platanus racemosa*	Western Sycamore	18	Good	Unlikely
DMEC8	*Quercus agrifolia*	Coast Live Oak	12	Good	Potential
DMEC9	*Platanus racemosa*	Western Sycamore	16.45, 12.05	Good	Potential
DMEC10	*Platanus racemosa*	Western Sycamore	19.2	Good	Unlikely
DMEC11	*Quercus agrifolia*	Coast Live Oak	10.3	Good	Potential
DMEC12	*Platanus racemosa*	Western Sycamore	10.5	Good	Unlikely
DMEC13	*Platanus racemosa*	Western Sycamore	17.1	Good	Potential
DMEC14	*Platanus racemosa*	Western Sycamore	20	Good	Potential
DMEC15	*Salix lasiolepis*	Arroyo Willow	13.7	Poor	Potential
DMEC16	*Quercus agrifolia*	Coast Live Oak	8.75, 12.9	Good	Potential
DMEC17	*Quercus agrifolia*	Coast Live Oak	19	Good	Potential
DMEC18	*Quercus agrifolia*	Coast Live Oak	12.8, 4.6	Moderate-Good	Potential
DMEC19[1]	*Quercus agrifolia*	Coast Live Oak	7.2, 3.7	Good	Unavoidable
DMEC20	*Quercus agrifolia*	Coast Live Oak	8, 3.5, 7.4, 8.1	Good	Unavoidable
DMEC21	*Quercus agrifolia*	Coast Live Oak	7.6, 5.2, 2.7	Good	Unavoidable

[1] Trees 19 through 21 were planted in 2006

SECTION VI. CONCLUSIONS AND RECOMMENDATIONS

The proposed project will result in impacts to native trees regulated under the City of Malibu's Native Tree Protection Ordinance. Twenty-one (21) mature trees occur within or adjacent to the development footprint, nineteen (19) of which are trees regulated by the City of Malibu.

The proposed project will result in the unavoidable removal and loss of two (2) Western Sycamore trees. DMEC recommends that this loss of these two trees be mitigated onsite by planting of Western Sycamore at a ratio of no less than 10-to-1.

In addition, the proposed project may result in the encroachment of the TPZ and potential harm of three (3) planted Coast Live Oak trees. DMEC recommends that these three trees be protected during construction by erecting a temporary fence around the TPZ of these trees to the maximum extent possible and monitored by a Certified Arborist immediately prior to start of construction, as illustrated in Figure 5. Following completion of construction activities, DMEC recommends these trees be managed and monitored annually by a Certified Arborist for a period of no less than five (5) years to determine their health, or decline in health, as a result of construction within their TPZs. In the event that the trees are damaged by/during construction, DMEC recommends that the loss of these three trees be mitigated by onsite planting at a ratio of no less than 10-to-1.

The proposed project will result in potential significant impacts to nineteen (19) trees including one (1) Southern California Walnut, two (2) Arroyo Willows, seven (10) Coast Live Oaks, and six (6) Western Sycamores. These potential impacts can be avoided by retaining the current surface features (e.g. lawn, playground, sandboxes) north of the proposed project footprint, adjacent to the trees, hereafter referred to as the "Tree Protection Zone" or TPZ. Alteration of surface features in the TPZ will likely result in significant impacts to these nineteen (19) trees. While the two (2) Arroyo Willows are not regulated under the City of Malibu's Native Tree Protection Ordinance, they exist in the area occupied by the remaining fourteen (14) regulated trees and will require no additional avoidance or mitigation measures to be preserved.

DMEC further recommends establishment of a temporary fence along the edge of the canopy of these trees, or as close to the footprint of development as possible to limit alteration or activity in the TPZ to the minimum extent possible. The approximate location of this fencing placed to protect the trees' TPZs is illustrated in Figure 5.

The proposed project may result in potential significant impacts to mixed Coast Live Oak-Southern California Black Walnut Woodland located north and northeast of the project footprint. Significant impacts would occur as a result of substantial runoff or dumping of fluids/sediments/debris down the north-facing hillside, upon which the woodland occurs. DMEC recommends establishment of a temporary fence, placed several feet back from the edge of the hillside, to prevent such dumping or runoff. The approximate location of this fencing is illustrated in Figure 5.

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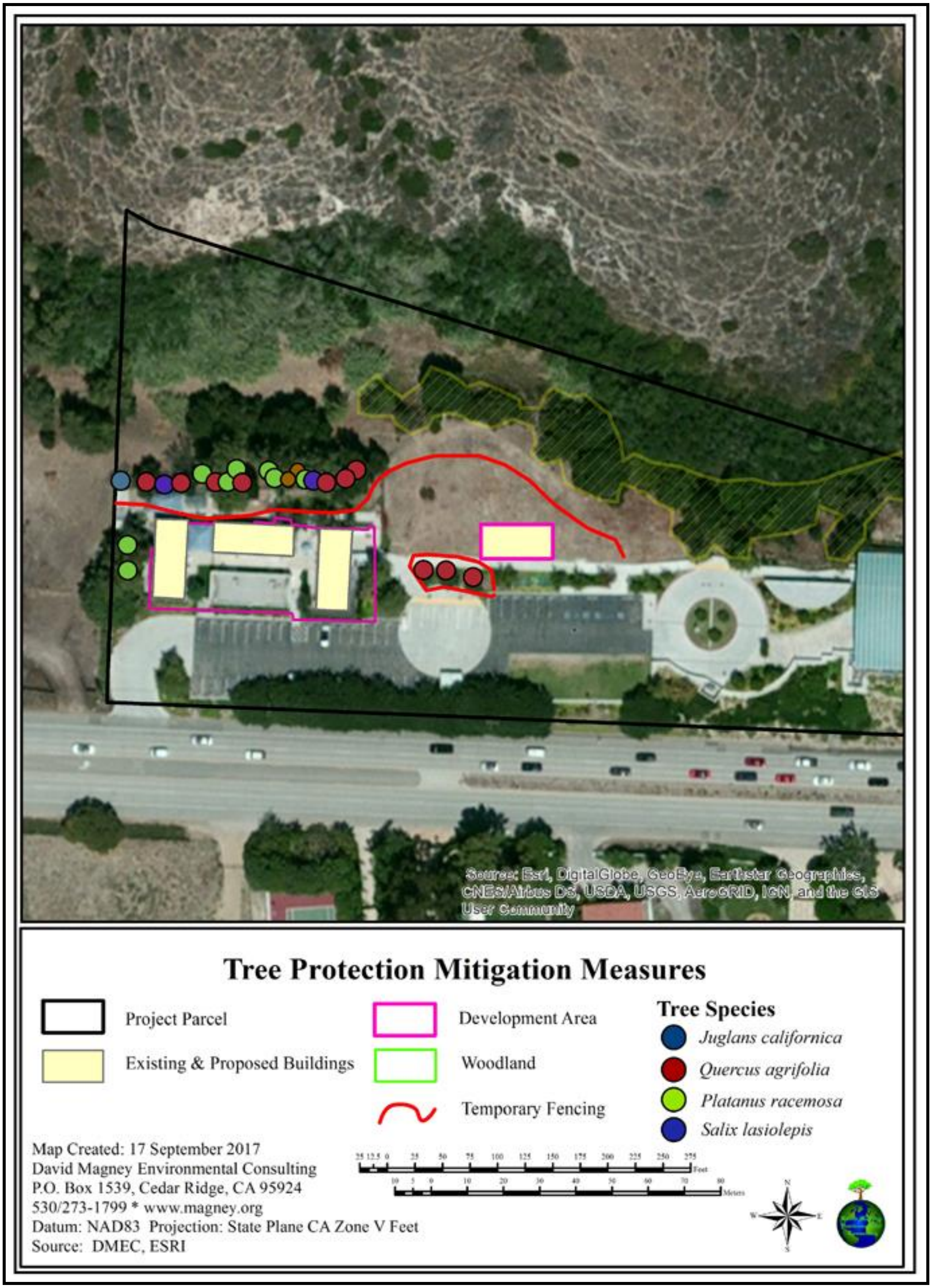
Figure 5 – Mitigation and Avoidance Measures



SECTION VII. ACKNOWLEDGEMENTS

This report was written by Evan Lashly and David Magney. Graphics were created by Mr. Lashly and updated by Mr. Magney. The original report was reviewed and edited by Mr. Magney and proofread by Vickie Peters, with all changes for the updated version performed by Mr. Magney.

Mark Meyer provided guidance and assistance with the project description and providing current project plans and drawings.

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APPENDIX: TREE FIELD EVALUATION FORMS

David Magney Environmental Consulting

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TREE ASSESSMENT FIELD FORM

Client: GRAY - JEWISH COMM. CTR **Location/Site:** JEWISH COMM. CTR **Date:** 8/28/14

Tree No. 1 Photo Nos.: ______ w/Pool

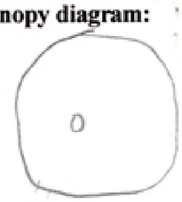
Species: PLATANUS RACEMOSA

Height: 50 ft Height to canopy: 5 ft Canopy Crown diameter: ____ ft

Trunk(s) 1 dbh: Trunk 1: 20.5" 2: ____ 3: ____ 4: ____ 5: ____

Canopy measurements:
North: 30 ft; East: 35 ft;
South: 15 ft; West: 15 ft
Balanced? Yes/No describe: LEANING E
Symmetrical? Yes/No ASIDE FROM LEAN

Canopy diagram:



Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 4; Mechanical injury 4; Girdling/kinked roots 2; Compaction/waterlogged 2; Toxic gases/chemical symptoms 4; Insects/diseases 3 SOME FRASS
Fungal infections 4. Notes: COMPACTION & SIDEWALKS CAUSING KINKING OTHERWISE GOOD

Trunk Condition: Sound bark & wood 4; Cavities 3; Mechanical or fire injury 4; Cracks 3; Swollen or sunken areas 3; Insects or disease 4; Conks 4. Notes: MANY SMALL CRACKS - SHALLOW w/ NEW GROWTH

Scaffold Branches: Strong attachments 3; Smaller dia. Than trunk where attached 3; Vertical branch distribution 4; Free of included bark 3; Free of decay & cavities 4; Well pruned 3; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4.
Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 4. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 3; Nutrient status 3; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 4; Dry buds 4; Insects/disease 3
Notes: SOME LEAVES DISCOLORED POSSIBLY DUE TO SEASON, SPIDER MITE

Pruning Instructions: ______

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ______

Recommendations: REQUIRED FOR REMOVAL FOR PROJECT

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 8/26/14

Tree No. 2 Photo Nos.: WP002

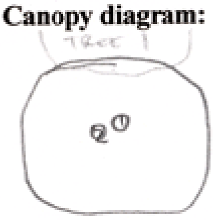
Species: PLATANUS RACEMOSA LONDON PLANE TREE ?

Height: 45 ft Height to canopy: 4.5 ft Canopy Crown diameter: ___ ft

Trunk(s) 2 dbh: Trunk 1: 15.8" 2: 15.5" 3: ___ 4: ___ 5: ___

Canopy measurements:
North: 15 ft; East: 20 ft;
South: 20 ft; West: 20 ft
Balanced? Yes/No: describe: ___
Symmetrical? Yes/No

Canopy diagram:



Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 4; Mechanical injury 4; Girdling/kinked roots 3; Compaction/waterlogged 2; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: COMPACTION & SIDEWALKS, MINOR GIRDLING WALL NEXT DOOR

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 2; Swollen or sunken areas 3; Insects or disease 1; Conks 4. Notes: MAJOR CRACKS & BORING INSECTS CRACKS DARKER & DEEPER

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 3; Free of decay & cavities 4; Well pruned 3; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4.
Notes: ___

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 4. Notes: ___.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 4; Insects/disease 3.
Notes: SOME CURLING FROM INSECTS

Pruning Instructions: ___

General Condition: MODERATE - TRUNK POOR

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ___

Recommendations: REQ REMOVAL FOR PROJECT

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 8/28/14

Tree No. 3 Photo Nos.: ______

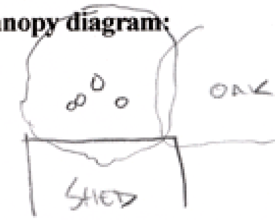
Species: JUGLANS CALIFORNICA WF010

Height: 15 ft Height to canopy: 3 ft Canopy Crown diameter: ____ ft

Trunk(s) 4 dbh: Trunk 1: 5 2: 5 3: 4 4: 3 5: ____

Canopy measurements:
North: 12 ft; East: 4 ft;
South: 6 ft; West: 8 ft
Balanced? Yes/No: describe: ______
Symmetrical? Yes/No

Canopy diagram:



Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 3;
Compaction/waterlogged 3; Toxic gases/chemical symptoms 4; Insects/diseases 4;
Fungal infections 4. Notes: UP AGAINST SHED, COMPACTION & IMPERVIOUS TO S, TRUNKS 1 & 2 TANGLED, RUBBING

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 3; Cracks 4;
Swollen or sunken areas 3; Insects or disease 4; Conks 4. Notes: 1 & 2 TANGLED @ BASE, PRUNING HEALING

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 3; Free of decay & cavities 3; Well pruned 3; Well proportioned/proper taper 3; Wound closure 3; Deadwood or fire injury 4; Insects/disease 4.
Notes: LOTS OF PRUNING DOWN LOW, BUT HEALING OCCURRING

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 4. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 3; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 4; Dry buds 4; Insects/disease 2.
Notes: MANY EATEN LEAVES (PHOTOS)

Pruning Instructions: ______

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No SHED

~~Recommendations~~ NOTES: NW CORNER OF PROPERTY, AREA ALREADY COMPACTED WHERE IMPACT IS POSSIBLY GOING TO OCCUR

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 8/28/14

Tree No. 4 Photo Nos.: ____

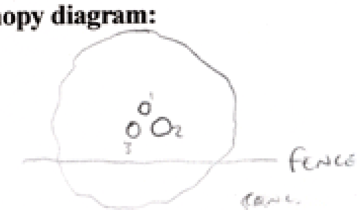
Species: QUERCUS AGRIFOLIA WPO11

Height: 25 ft Height to canopy: 2 ft Canopy Crown diameter: ____ ft

Trunk(s) 3 dbh: Trunk 1: 5.5 2: 15.2 3: 10.5 4: ____ 5: ____

Canopy measurements:
North: 25 ft; East: 15 ft;
South: 15 ft; West: 25 ft
Balanced? Yes/No; describe: ~~[illegible]~~ HEAVY BRANCHES TENDING S.
Symmetrical? Yes/No

Canopy diagram:



Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 3; Compaction/waterlogged 3; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: COLLAR VISIBLE ON N. COMPACTION (SANDBOX) TO S.

Trunk Condition: Sound bark & wood 4 3 → INCL. BARK; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 3; Conks 4. Notes: MINOR SYCAMORE BORER, NEW GROWTH VISIBLE. MUCH INCLUDED BARK

Scaffold Branches: Strong attachments 3; Smaller dia. Than trunk where attached 2; Vertical branch distribution 2; Free of included bark 2; Free of decay & cavities 4; Well pruned 2; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4. Notes: SEVERAL SPOTS W/ SIGNIFICANT RUBBING, BUT MUCH NEW GROWTH VIZ

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 4. Notes: ____.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 4; Dry buds 4; Insects/disease 3. Notes: MINOR GIRDLER

Pruning Instructions: ~~[illegible]~~ MANAGE RUBBING SCAFFOLD

General Condition: MODERATE – GOOD

Hazardous? Yes/No/Maybe ? **Target Present?** Yes/No SANDBOX / YARD → PROPOSED PROJ?

Recommendations: 4 W/ CONTINUED RUBBING (IN DIRECTION OF PROPOSED PROJECT)

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 8/28/14

Tree No. 5 Photo Nos.: ____

Species: SALIX LASIOLEPIS → DEAD WILLOW w/ TRUNK SPROUTS

Height: ____ ft Height to canopy: ____ ft Canopy Crown diameter: ____ ft

Trunk(s) ____ * dbh: Trunk 1: ____ 2: ____ 3: ____ 4: ____ 5: ____

Canopy measurements: **Canopy diagram:**

North: ____ ft; East: ____ ft;

South: ____ ft; West: ____ ft

Balanced? Yes/No: describe: ____

Symmetrical? Yes/No

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems]) Root anchorage ___; Collar/flare soundness ___; Mechanical injury ___; Girdling/kinked roots ___; Compaction/waterlogged ___; Toxic gases/chemical symptoms ___; Insects/diseases ___; Fungal infections ___. Notes: ____

Trunk Condition: Sound bark & wood __; Cavities ___; Mechanical or fire injury __; Cracks ___; Swollen or sunken areas ___; Insects or disease ___; Conks ___. Notes: ____

Scaffold Branches: Strong attachments ____; Smaller dia. Than trunk where attached ___; Vertical branch distribution ___; Free of included bark ___; Free of decay & cavities ___; Well pruned ___; Well proportioned/proper taper ___; Wound closure ___; Deadwood or fire injury ___; Insects/disease ___. Notes: ____

Small Branches and Twigs: Vigor of current shoots (compare previous growth) ___; Well distributed through canopy ___; Appearance of buds (color, shape, size for the species) ___; Insects/disease ___; Weak or dead twigs ___. Notes: ____.

Foliage and/or Buds: Size of foliage/buds ___; Coloration of foliage ___; Nutrient status ___; Herbicide/chemical/pollution injury ___; Wilted or dead leaves ___; Dry buds ___; Insects/disease ___. Notes: ____

Pruning Instructions: ____

General Condition: ____

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ____

Recommendations: LARGELY DEAD → NO IMPACTS.

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 6 Photo Nos.: ______

Species: QUERCUS AGRIFOLIA

Height: 25 ft Height to canopy: 6 ft Canopy Crown diameter: ______ ft

Trunk(s) 1 * dbh: Trunk 1: 14.45 2: ______ 3: ______ 4: ______ 5: ______

Canopy measurements:
North: 15 ft; East: 10 ft;
South: 15 ft; West: 20 ft
Balanced? Yes/No: describe: TENDING SLIGHTLY N
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 3; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 3; Conks 4. Notes: SMALL WEEPING WOUND VISIBLE

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 3; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4.
Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 3. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 4; Insects/disease 4.
Notes: ______

Pruning Instructions: REMOVE DEAD WOOD

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No PLAYGROUND

Recommendations: ______

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Note: Tree DMEC7 is a dead *Salix lasiolepis*, which was not assessed.

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TREE ASSESSMENT FIELD FORM

TREE # 10
DBH 19.2
NOT IMPACT ZONE

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 8 Photo Nos.: ______

Species: QUERCUS AGRIFOLIA

Height: 25 ft Height to canopy: ______ ft Canopy Crown diameter: ______ ft

Trunk(s) 1 *dbh: Trunk 1: 12" 2: ______ 3: ______ 4: ______ 5: ______

Canopy measurements:
North: 3 ft; East: ______ ft;
South: ______ ft; West: ______ ft
Balanced? Yes/No: describe: TENDING S
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 3; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 4; Conks 4. Notes: ______

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 3; Vertical branch distribution 3; Free of included bark 4 3; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 3; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4.
Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 3. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 4; Insects/disease 4.
Notes: ______

Pruning Instructions: REMOVE DEAD WOOD

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ______

Recommendations: ______

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 9 Photo Nos.: ______

Species: PLATANUS RACEMOSA

Height: 35 ft Height to canopy: 5 ft Canopy Crown diameter: ___ ft

Trunk(s) 2 dbh: Trunk 1: 16.45 2: 12.05 3: ___ 4: ___ 5: ___

Canopy measurements:
North: 8 ft; East: 5 ft;
South: 25 ft; West: 30 ft
Balanced? Yes/No: describe: ______
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems]) Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 3; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 4; Insects or disease 4; Conks 4. Notes: ______

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 4; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 3; Insects/disease 4. Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 3. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 4; Insects/disease 4. Notes: ______

Pruning Instructions: ______

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No PLAYGROUND | BUILDING

Recommendations: REMOVED DEADWOOD FROM BRANCH ABOVE PLAYGROUND

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 10 Photo Nos.: ______

Species: PLATANUS RACEMOSA

Height: 40 ft Height to canopy: ______ ft Canopy Crown diameter: ______ ft

Trunk(s) 1 * dbh: Trunk 1: 19.2 2: ______ 3: ______ 4: ______ 5: ______

Canopy measurements:
North: 20 ft; East: 12 ft;
South: 10 ft; West: 12 ft
Balanced? Yes/No: describe: TENDING N
Symmetrical? Yes/No

Canopy diagram:

SAME AS 13

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage ___; Collar/flare soundness ___; Mechanical injury ___; Girdling/kinked roots ___; Compaction/waterlogged ___; Toxic gases/chemical symptoms ___; Insects/diseases ___; Fungal infections ___. Notes: ______

Trunk Condition: Sound bark & wood __; Cavities ____; Mechanical or fire injury __; Cracks ___; Swollen or sunken areas ___; Insects or disease ___; Conks ___. Notes: ______

Scaffold Branches: Strong attachments _____; Smaller dia. Than trunk where attached ___; Vertical branch distribution ___; Free of included bark ___; Free of decay & cavities ___; Well pruned ___; Well proportioned/proper taper ___; Wound closure ___; Deadwood or fire injury ___; Insects/disease ___. Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) ___; Well distributed through canopy ___; Appearance of buds (color, shape, size for the species) ___; Insects/disease ___; Weak or dead twigs ___. Notes: ______.

Foliage and/or Buds: Size of foliage/buds ___; Coloration of foliage ___; Nutrient status ___; Herbicide/chemical/pollution injury ___; Wilted or dead leaves ___; Dry buds ___; Insects/disease ___. Notes: ______

Pruning Instructions: ______

General Condition: SAME CONDITION AS # 13

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ______

Recommendations: ______

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 11 Photo Nos.: ______

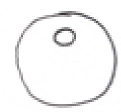
Species: QUERCUS AGRIFOLIA

Height: 20 ft Height to canopy: 8 ft Canopy Crown diameter: ____ ft

Trunk(s) 1 dbh: Trunk 1: 10.3 2: ____ 3: ____ 4: ____ 5: ____

Canopy measurements:
North: 5 ft; East: 8 ft;
South: 15 ft; West: 7 ft
Balanced? Yes/No describe: TENDING S
Symmetrical? Yes/No

Canopy diagram:



Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 3; Compaction/waterlogged 3; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 4; Conks ___. Notes: ______

Scaffold Branches: Strong attachments 3; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 3; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4.
Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 4. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 4; Dry buds 4; Insects/disease 4.
Notes: ______

Pruning Instructions: ______

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No PLAYGROUND

Recommendations: ______

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/13

Tree No. 12 Photo Nos.: ______

Species: PLATANUS RACEMOSA

Height: 40 ft Height to canopy: 15 ft Canopy Crown diameter: ____ ft

Trunk(s) 1 dbh: Trunk 1: 10.5 2: ____ 3: ____ 4: ____ 5: ____

Canopy measurements:
North: 15 ft; East: 6 ft;
South: 12 ft; West: 10 ft
Balanced? Yes/No: describe: TENDING SLIGHT ↱
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems]) Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 4; Conks 4. Notes: ______

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 4; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4. Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 3; Well distributed through canopy 3; Appearance of buds (color, shape, size for the species) 3; Insects/disease 4; Weak or dead twigs 3. Notes: SPARSE.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 3; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 3; Insects/disease 3. Notes: ______

Pruning Instructions: SPARSE

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ______

Recommendations: ______

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 13 Photo Nos.: ____

Species: PLATANUS RACEMOSA

Height: 40 ft Height to canopy: 8 ft Canopy Crown diameter: ____ ft

Trunk(s) 1 dbh: Trunk 1: 17.1 2: ____ 3: ____ 4: ____ 5: ____

Canopy measurements:
North: 12 ft; East: 10 ft;
South: 15 ft; West: 20 ft
Balanced? Yes/No: describe: ____
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems]) Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ____

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 3; Conks 3. Notes: ____

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 3; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4. Notes: ____

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 3; Well distributed through canopy 3; Appearance of buds (color, shape, size for the species) 3; Insects/disease 3; Weak or dead twigs 3. Notes: SPARSE.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 3; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 3; Insects/disease 3. Notes: SPARSE

Pruning Instructions: ~~? to REMOVE~~

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ____

Recommendations: ____

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 14 Photo Nos.: ______

Species: PLATANUS RACEMOSA

Height: 35 ft Height to canopy: 3 ft Canopy Crown diameter: ____ ft

Trunk(s) 1 dbh: Trunk 1: 20 2: ____ 3: ____ 4: ____ 5: ____

Canopy measurements:
North: 20 ft; East: 20 ft;
South: 20 ft; West: 12 ft
Balanced? Yes/No: describe: ______
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 3; Conks 3. Notes: ______

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark ~~4~~3; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4.
Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 3; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 3; Insects/disease 3; Weak or dead twigs 3. Notes: SPARSE.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage ~~4~~3; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 3; Insects/disease 3.
Notes: SPARSE

Pruning Instructions: REMOVE DEAD WOOD (LITTLE)

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No LOW USE LAWN

Recommendations: ______

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 15 Photo Nos.: ____

Species: SALIX LASIOLEPIS

Height: 15 ft Height to canopy: 5 ft Canopy Crown diameter: ____ ft

Trunk(s) 1 dbh: Trunk 1: 13.7 2: ____ 3: ____ 4: ____ 5: ____

Canopy measurements:
North: 0 ft; East: 6 ft;
South: 16 ft; West: 12 ft
Balanced? Yes/No: describe: ____
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ____

Trunk Condition: Sound bark & wood 4; Cavities 3; Mechanical or fire injury 3; Cracks 4; Swollen or sunken areas 3; Insects or disease 3; Conks 3. Notes: SOME FRASS

Scaffold Branches: Strong attachments 3; Smaller dia. Than trunk where attached 2; Vertical branch distribution 2; Free of included bark 3; Free of decay & cavities 2; Well pruned 2; Well proportioned/proper taper 2; Wound closure 2; Deadwood or fire injury 2; Insects/disease 3.
Notes: BAD CONDITION - POORLY PRUNED, MUCH DEAD WOOD

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 2; Well distributed through canopy 2; Appearance of buds (color, shape, size for the species) 2; Insects/disease 3; Weak or dead twigs 2. Notes: ____.

Foliage and/or Buds: Size of foliage/buds 3; Coloration of foliage 3; Nutrient status 3; Herbicide/chemical/pollution injury 2; Wilted or dead leaves 2; Dry buds 2; Insects/disease 3.
Notes: ____

Pruning Instructions: REMOVE DEAD WOOD & PRUNE FOR STRUCTURE

General Condition: POOR

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ____

Recommendations: NOTE POTENTIAL FOR FAILURE, BUT WILL FALL DOWN HILL

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 16 Photo Nos.: ____

Species: QUERCUS AGRIFOLIA

Height: ____ ft Height to canopy: ____ ft Canopy Crown diameter: ____ ft

Trunk(s) 2 dbh: Trunk 1: 8.75 2: 12.9 3: ____ 4: ____ 5: ____

Canopy measurements:
North: 6 ft; East: ____ ft;
South: ____ ft; West: 18 ft

Canopy diagram:

Balanced? Yes/No: describe: TENDING HEAVILY E
Symmetrical? Yes/No

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ____

Trunk Condition: Sound bark & wood 3; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 4; Conks 4. Notes: INCLUDED BARK

Scaffold Branches: Strong attachments 3; Smaller dia. Than trunk where attached 4; Vertical branch distribution 2; Free of included bark 3; Free of decay & cavities 3; Well pruned 4; Well proportioned/proper taper 3; Wound closure 3; Deadwood or fire injury 4; Insects/disease 4.
Notes: CENTRAL SCAFFOLD BRANCH MAY HAVE ~~fungus~~ STRESS WOOD

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 4. Notes: ____.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 4; Dry buds 4; Insects/disease 4.
Notes: ____

Pruning Instructions: CLEAN DEAD WOOD (LITTLE EXISTS)

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No LOW USAGE LAWN

Recommendations: ____

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 17 Photo Nos.: ______

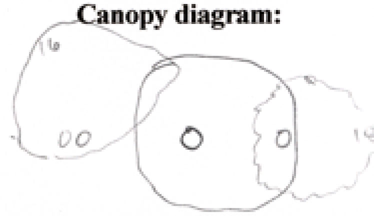
Species: QUERCUS AGRIFOLIA

Height: ______ ft Height to canopy: ______ ft Canopy Crown diameter: ______ ft

Trunk(s) 1 dbh: Trunk 1: 19 2: ______ 3: ______ 4: ______ 5: ______

Canopy measurements:
North: 15 ft; East: 15 ft;
South: 20 ft; West: ~~18~~ 8 ft
Balanced? Yes/No: describe: ______
Symmetrical? Yes/No

Canopy diagram:



Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 4; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 4; Conks 4. Notes: ______

Scaffold Branches: Strong attachments 3; Smaller dia. Than trunk where attached 3; Vertical branch distribution 3; Free of included bark 3; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4. Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 3. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 4; Insects/disease 3. Notes: ______

Pruning Instructions: CLEAN DEAD WOOD (OLD VINE)

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No GRASS LAWN

Recommendations: ______

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TREE ASSESSMENT FIELD FORM

Client: Gray **Location/Site:** Jewish Ctr **Date:** 9/3/14

Tree No. 18 Photo Nos.: ______

Species: Quercus agrifolia

Height: 20 ft Height to canopy: 8" ~~8~~ ft Canopy Crown diameter: ______ ft

Trunk(s) 3 dbh: Trunk 1: 12.8 2: 4.6 3: 3.5 4: ______ 5: ______
← two trunks lateral branch

Canopy measurements:
North: 10 ft; East: 15 ft;
South: 12 ft; West: 6 ft
Balanced? Yes/No: describe: leaning E some in comp w/ DMEC 17
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 3; Mechanical injury 4; Girdling/kinked roots 4;
Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4;
Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 3; Cavities 4; Mechanical or fire injury 4; Cracks 4;
Swollen or sunken areas 3; Insects or disease 3; Conks 3. Notes: sycamore borer

Scaffold Branches: Strong attachments 3; Smaller dia. Than trunk where attached 3; Vertical branch distribution 4; Free of included bark 3; Free of decay & cavities 3; Well pruned 3; Well proportioned/proper taper 4; Wound closure 3; Deadwood or fire injury 3; Insects/disease 3.
Notes: somewhat improper previous pruning

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 3; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 3; Weak or dead twigs 3. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 4; Dry buds 4; Insects/disease 3.
Notes: very minor dieback & girdler

Pruning Instructions: competing w/ tree 17

______

General Condition: Moderate - good

Hazardous? Yes/No/Maybe **Target Present?** Yes/No ______

Recommendations: clean dead wood

______

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TREE ASSESSMENT FIELD FORM

Client: Gray **Location/Site:** Jewish Ctr **Date:** 9/3/14

Tree No. 19 -

Photo Nos.:

Species: Quercus agrifolia WP027

Height: 18 ft Height to canopy: 1 ft Canopy Crown diameter: ___ ft

Trunk(s) 2 *dbh: Trunk 1: 7.2 2: 3.7 3: ___ 4: ___ 5: ___

Canopy measurements:
North: 5 ft; East: 7 ft;
South: 6 ft; West: 6 ft
Balanced? Yes/No: describe:
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 4; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes:

Trunk Condition: Sound bark & wood 4?; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 4; Conks 4. Notes: co-dominant w/ major inc. bark

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 4; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4. Notes:

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 4. Notes: .

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 4; Dry buds 4; Insects/disease 4. Notes:

Pruning Instructions: Prune smaller co dominant trunk

General Condition: Good

Hazardous? Yes/No/Maybe **Target Present?** Yes/No too small

Recommendations:

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 20 Photo Nos.: ______

Species: QUERCUS AGRIFOLIA WP028

Height: 18 ft Height to canopy: ______ ft Canopy Crown diameter: ______ ft

Trunk(s) 4 *dbh: Trunk 1: 8 2: 3.5 3: 7.4 4: 8.1 5: ______

Canopy measurements:
North: 10 ft; East: 10 ft;
South: 10 ft; West: 8 ft
Balanced? Yes/No: describe: ______
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 4; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 3; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 3; Insects or disease 4; Conks 4. Notes: INCL. BARK MAY BECOME PROBLEM

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 4; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4.
Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 4; Weak or dead twigs 4. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 3; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 4; Dry buds 4; Insects/disease 4.
Notes: ______

Pruning Instructions: MONITOR TRUNKS & INCL. BARK

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No TOO SMALL → PARKING LOT

Recommendations: ______

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TREE ASSESSMENT FIELD FORM

Client: GRAY **Location/Site:** JEWISH CTR **Date:** 9/3/14

Tree No. 21 Photo Nos.: ______

Species: QUERCUS AGRIFOLIA WP029

Height: 15 ft Height to canopy: ______ ft Canopy Crown diameter: ______ ft

Trunk(s) ______ *dbh: Trunk 1: 7.6 2: 5.2 3: 2.7 4: ______ 5: ______

Canopy measurements:
North: 6 ft; East: 8 ft;
South: 8 ft; West: 10 ft
Balanced? Yes/No: describe: ______
Symmetrical? Yes/No

Canopy diagram:

Root Conditions: (Ratings: 1 [extreme problems], 2 [major problems], 3 [minor problems], 4 [no apparent problems])
Root anchorage 4; Collar/flare soundness 4; Mechanical injury 4; Girdling/kinked roots 4; Compaction/waterlogged 4; Toxic gases/chemical symptoms 4; Insects/diseases 4; Fungal infections 4. Notes: ______

Trunk Condition: Sound bark & wood 3; Cavities 4; Mechanical or fire injury 4; Cracks 4; Swollen or sunken areas 4; Insects or disease 4; Conks 4. Notes: MONITOR INCL. BARK @ CODOM

Scaffold Branches: Strong attachments 4; Smaller dia. Than trunk where attached 4; Vertical branch distribution 4; Free of included bark 3; Free of decay & cavities 4; Well pruned 4; Well proportioned/proper taper 4; Wound closure 4; Deadwood or fire injury 4; Insects/disease 4.
Notes: ______

Small Branches and Twigs: Vigor of current shoots (compare previous growth) 4; Well distributed through canopy 4; Appearance of buds (color, shape, size for the species) 4; Insects/disease 3; Weak or dead twigs 4. Notes: ______.

Foliage and/or Buds: Size of foliage/buds 4; Coloration of foliage 4; Nutrient status 4; Herbicide/chemical/pollution injury 4; Wilted or dead leaves 3; Dry buds 4; Insects/disease 3.
Notes: MORE INSECT DMG THAN 2 NEIGHBORS

Pruning Instructions: ______

General Condition: GOOD

Hazardous? Yes/No/Maybe **Target Present?** Yes/No PARKING LOT

Recommendations: ______

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MITIGATION PLAN AND MONITORING PROGRAM FOR THE MALIBU JEWISH CENTER & SYNAGOGUE 24855 PACIFIC COAST HIGHWAY MALIBU, CALIFORNIA

Prepared for:

CITY OF MALIBU

On Behalf of:

DAVID LAWRENCE GRAY ARCHITECTS

April 2016, Updated September 2017

DMEC Mission Statement:

To provide quality environmental consulting services, with integrity, that protect and enhance the human and natural environment.

Mitigation Plan and Monitoring Program for the Malibu Jewish Center & Synagogue 24855 Pacific Coast Highway Malibu California

Prepared for:

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Planning Department
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On behalf of:

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22 April 2016, Updated 26 September 2017

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SECTION 1. INTRODUCTION

PROJECT LOCATION

The project site is located in the City of Malibu in western Los Angeles City (Figure 1, General Project Site Location). The Malibu Jewish Center & Synagogue (project site) is located at 24855 Pacific Coast Highway (PCH), Malibu, Los Angeles City, California (AIN 4458-032-027). The project site is east of Corral Canyon Road, and between PCH and Puerco Canyon Creek, as shown on Figure 1. The site is in the Malibu Beach Quadrangle (USGS 7.5-minute Series) at the approximate geographic coordinates of 34.034°N latitude and 118.717°W longitude, located in the Topanga Malibu Sequit Mexican Land Grant, at the logical location of SW¼ NE¼ Section 1 T3S R18W, San Bernardino Base Line, as illustrated on Figure 1.

The Malibu Jewish Center & Synagogue is partially in the Puerco Canyon watershed at an elevation of approximately 160 feet (50 meters) above mean sea level. The parcel is wedge-shaped trending east-west, as illustrated in Figure 1 and Figure 2, Aerial Photograph of the Malibu Jewish Center Property. The project site, and all of Puerco Canyon, is within the Coastal Zone. The project site and the proposed facilities are illustrated on Figure 2.

BACKGROUND

David Magney Environmental Consulting (DMEC) was contracted to conduct this biological resources assessment and impacts analysis for the subject property and proposed project at the request of Mark Meyer of David Lawrence Gray Architects, project architect. The project site and grading plans were prepared by David Lawrence Gray Architects, of Los Angeles, California. DMEC completed the biological assessment in 2014 and updated in 2017 (DMEC 2017a) as well as a tree assessment and protection plan (DMEC 2017b).

PROJECT PURPOSE

The proposed project involves the demolition of existing structures and construction of a new two-story school with basement garage and chapel facility. The parcel is approximately 4.63 acres in size (Los Angeles County parcel data indicates an area of 202,078 square feet). The total footprint of the structures to be built is approximately 0.43 acre. The school building footprint is almost entirely within the footprint of the existing structures, and the chapel footprint is entirely within a previously graded/disturbed area at the location of an unbuilt, but previously permitted (2006) building.

Figure 1 – General Location Map

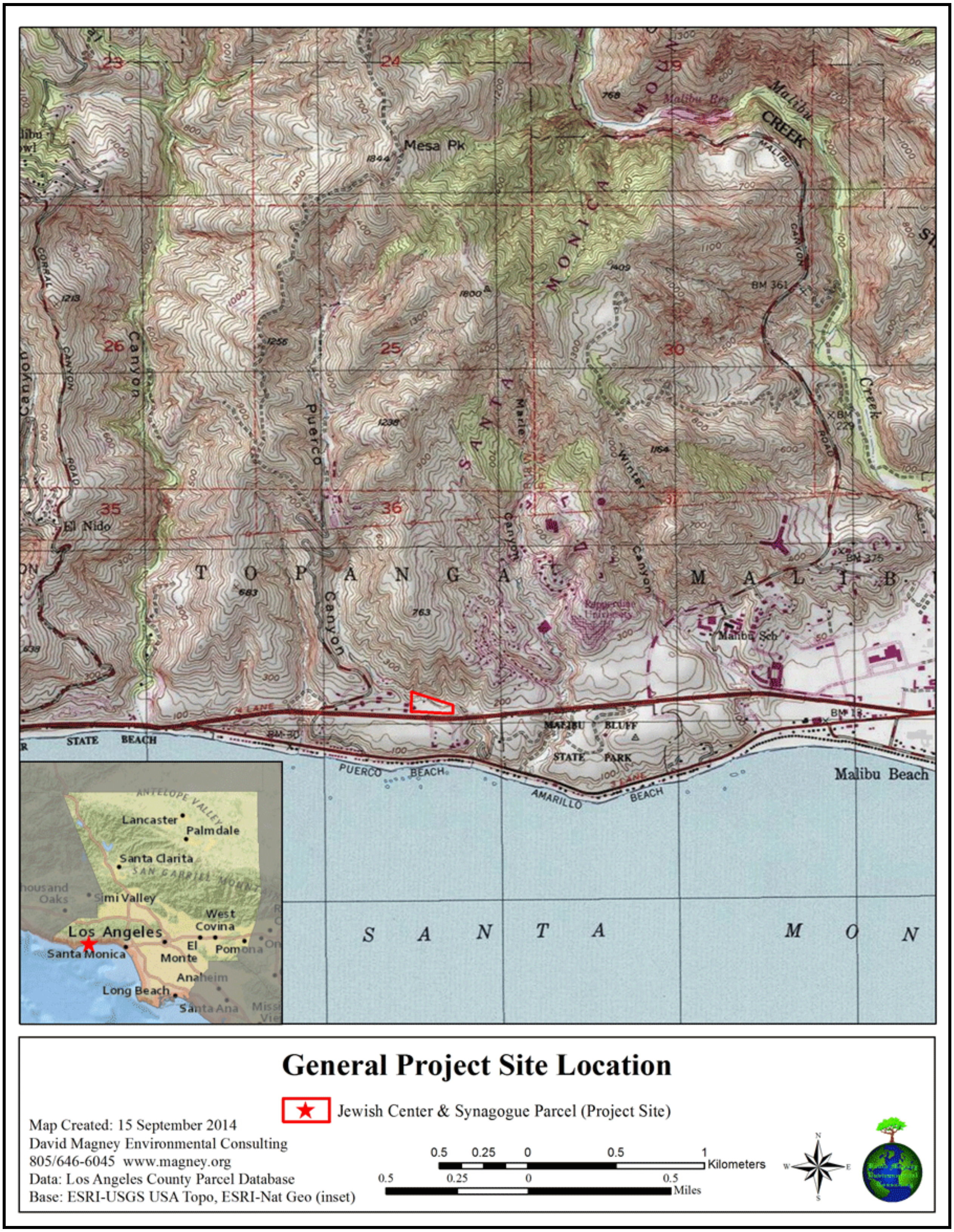


Figure 2 – Aerial Photograph of the Malibu Jewish Center Property

PHYSICAL CONDITION

The project site is located at the base of the Malibu foothills, approximately 1,000 feet north of the Pacific Ocean. The project parcel is adjacent to the PCH and situated on the north side of the highway. Puerco Canyon and Puerco Canyon Creek run south and bend eastward just north of the project site, entering the parcel on the northwest corner and exiting on the east end, and passing through the northern section of the parcel. Puerco Canyon Creek bends southward again just east of the project site before passing under the PCH and into the Pacific Ocean.

The project site sits atop the ridge just south of Puerco Canyon Creek, with most of the developed area draining southward towards PCH and the remainder draining into Puerco Canyon. The proposed project footprint is situated directly atop the ridge, in a largely artificially flattened area due to development. Just to the north of the proposed project footprint, a north facing slope of varied steepness and dominated by mixed Oak Woodland drops approximately 20 vertical feet to the creek bottom, which is dominated by riparian vegetation, both native and non-native. North of the creek bottom a north-facing slope that is dominated by Coastal Sage Scrub rises again.

The soils of the project site consist of Calcic Argixerolls (in the creek bottom and north of the creek) and Danville-Urban Land Complex (atop the ridge at and south of the proposed project footprint, NRCS 2014). Calcic Argixerolls are well drained soils with high runoff potential derived from weathered calcareous sandstone. Danville-Urban Land Complex is a complex of urban uses with well drained soils with high runoff potential, derived from metavolcanics and/or sedimentary rock.

The project site exists within a Fire Hazard Severity Zone ranked “Very High”, by CalFire (2014). According to the U.S. Forest Service dataset Fire Return Interval Departure (USFS 2012), the project site burned in 1985, 1993, and 1995 in the Piuma, Old Topanga, and Calabasas fires, respectively. During the 2007 Corral Fire the project site remained unburned, approximately 1 mile east of the fire’s east most extent. DMEC believes that the dense stand of Giant Reed (*Arundo donax*) present in the creek bottom onsite contributes significantly to fire fuel load and hazard potential.

SECTION 2. BIOLOGICAL RESOURCES

This section discusses the general site characteristics, including the property flora, fauna, and habitats, based on DMEC's 2014 Biological Resources Assessment (DMEC 2017a).

FLORA

A total of thirty-eight (38) vascular plant species were observed onsite. Of these, twenty-four (24, or 61%) of the vascular plants are native species and fourteen (14, or 39%) are nonnative or exotic species, excluding landscape ornamentals. The proportions of native and nonnative taxa onsite are dissimilar to the 75% native: 25% nonnative for other regions of California and for the entire flora of California (Baldwin et al. 2012).

Two (2) special-status species were observed: Southern California Black Walnut (*Juglans californica*, CNPS list 4.2) and Plummer's Baccharis (*Baccharis plummerae* ssp. *plummerae*, CNPS list 4.3). Southern California Black Walnut is also tracked by the CNDDB as a sensitive habitat when occurring in woodlands. The 38 vascular plants that were observed are listed in the biological resources assessment report (DMEC 2017a).

FAUNA

A total of sixteen (16) vertebrate wildlife species were observed onsite, including one (1) reptile, ten (10) birds, and five (5) mammals. Twelve (12) invertebrate species were found, including one (1) mollusk and eleven (11) insects, some of which are unidentified. The twenty-eight (28) total species observed are listed in the biological resources assessment report (DMEC 2017a).

HABITATS

A total of five (5) habitat and land cover types were identified on the Malibu Jewish Center & Synagogue parcel and adjacent areas, which are listed below in Table 1, Existing Habitats and Land Cover on the Project Site and Expected Impacts. Table 1 provides the area in acres for each habitat and land cover and the acreage of each habitat that is considered ESHA under CCC guidelines.

In addition, the estimated acreage of expected project impacts on the site, within ESHA on the site, and off of the project site (no ESHA is expected to be impacted offsite) is listed. Each habitat and land cover type is described below.

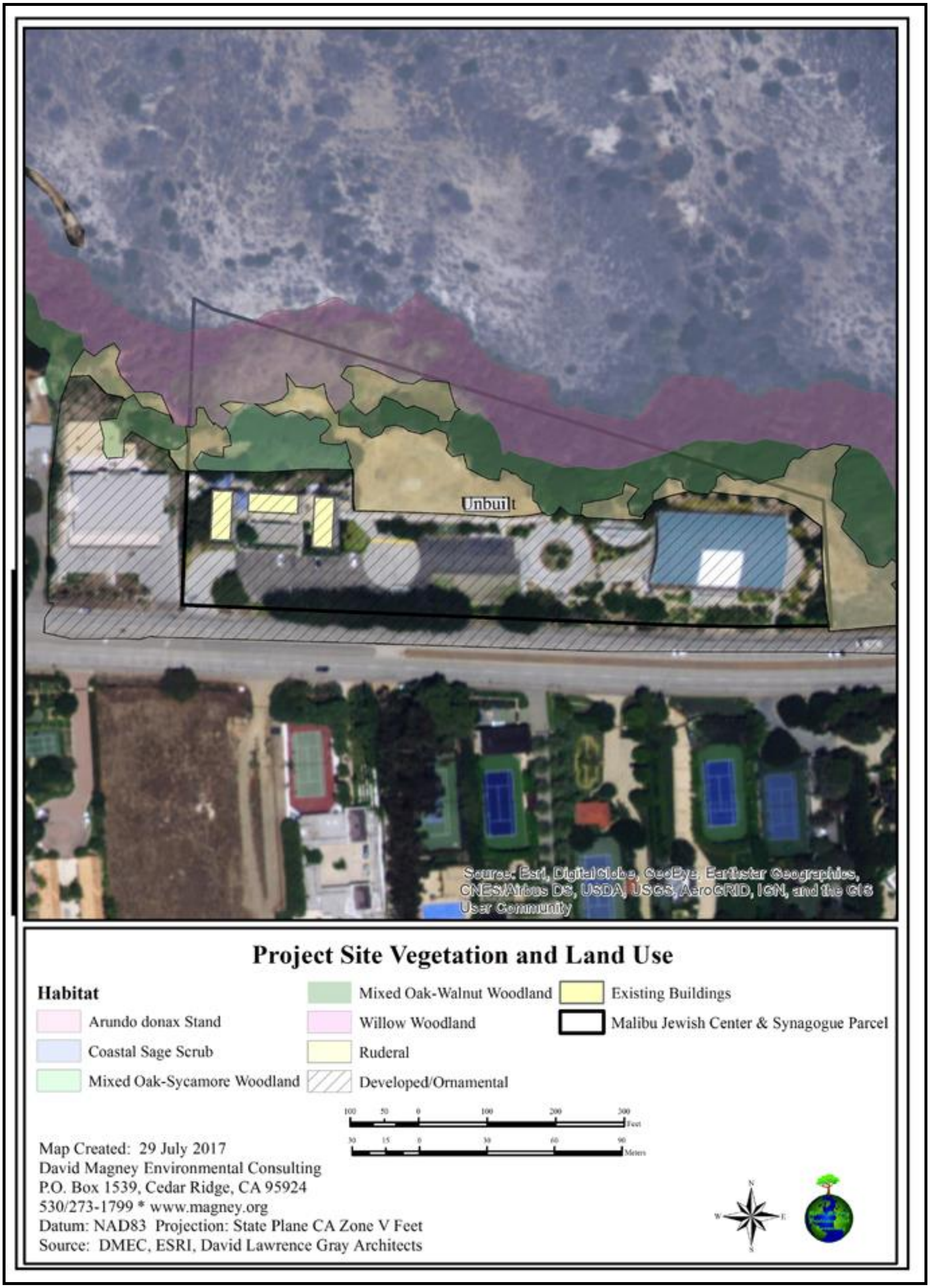
Table 1 – Existing Habitats and Land Cover on the Project Site and Expected Impacts

Existing Habitats and Land Cover Observed	**Total Onsite Acres**	**Onsite ESHA Acres**	**Construction Impact Acres**	**ESHA Impact Acres**	ESHA Buffer Impact Acres	Fuel Modification Impact Acres[1]	**Total Impact Acres**
Arundo Stand	0.35	0.35	0	0	0	0.05	0.05
Ruderal Grassland	0.76	0.11	0.13	0	0.13	0.46	0.59
Coastal Sage Scrub	0.03	0.03	0	0	0	0	0
Oak-Walnut Woodland	0.43	0.43	0	0	0	0.19	0.19
Oak-Sycamore Woodland	0.23	0	0	0	0	0.22	0.22
Willow Thicket	0.29	0.29	0	0	0	0.03	0.03
Developed Areas	2.54	0	0.30	0	0.3	0.94	1.24
Acreage Totals	4.64	1.21	0.43	0	0.16	1.9	2.32

The natural vegetation and land cover types present onsite were mapped and are illustrated below in Figure 3, Vegetation Communities and Land Cover of the Project Site.

[1] In addition to/beyond construction footprint.

Figure 3 – Vegetation Communities and Land Cover of the Project Site



SECTION 3. IMPACT ASSESSMENT

REGULATORY REQUIREMENTS

DMEC was retained by David Lawrence Gray Architects to provide the Malibu Jewish Center a revegetation plan and monitoring program for the impacted areas in order to provide full mitigation of encroachments into ESHA buffer zones. DMEC has prepared this mitigation plan to guide the physical restoration of the currently degraded areas of the ESHA onsite to compensate for expected impacts that encroachment into the ESHA habitat as a result of building within the setback zones and fuel modification activities, as shown on Figure 4, Map of Malibu Jewish Center Property Affected Habitats.

To mitigate for the expected decrease in habitat functions in the ESHA, the Malibu Jewish Center & Synagogue will improve habitat conditions onsite within the designated ESHA. A dense stand of *Arundo donax* is proposed to be removed and replaced with riparian trees and shrubs. Native trees will be planted in and adjacent to the ESHA and landscaping to mitigate the loss of mature *Platanus racemosa* and *Quercus agrifolia* trees at the building site.

The ESHA restoration plantings will generally follow the landscape plans developed by Steven A. Ormenyi & Associates, L-104 dated 22 April 2016 and provided on Figure 5, Habitat Restoration Plans, below; however, please refer to the original landscape plan sheet for implementation.

Figure 4 – Malibu Jewish Center Property Affected Habitats

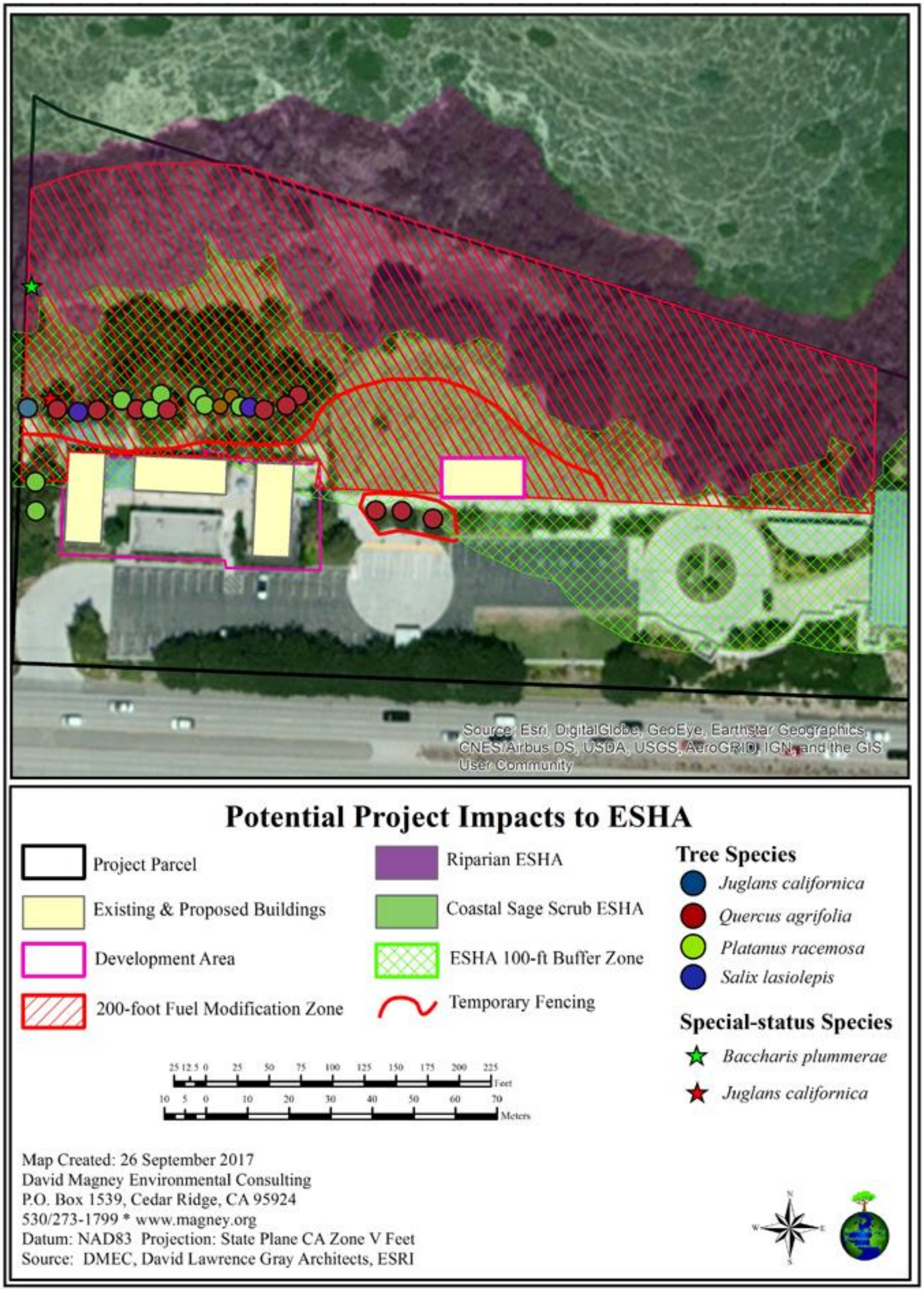
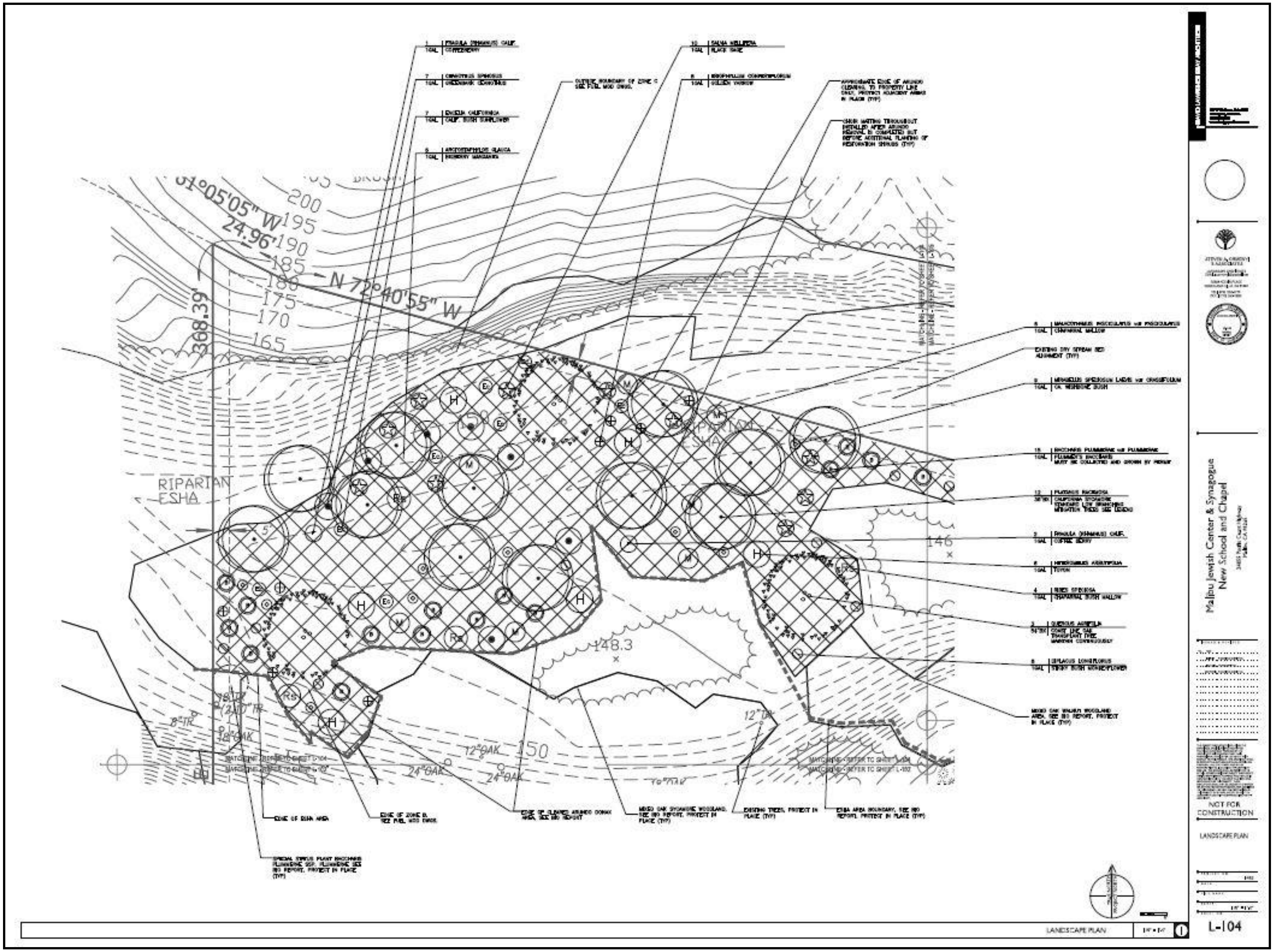


Figure 5 – Habitat Restoration Plans



SECTION 4. REVEGETATION PLAN

This section discusses the general objectives and approach of the revegetation of the property, the possibilities of constraints to revegetation, and revegetation specifications, sequence, and schedule.

OBJECTIVES

The objective of this mitigation plan is to enhance habitat conditions of Puerto Creek onsite to offset expected reductions in habitat functions as a result of encroachment into development setback zones on the south side of the ESHA. This will be accomplished by removing the invasive exotic *Arundo donax* and replacing it with native shrubs and trees indigenous to the area.

Invasive exotic plant species will be eradicated and controlled and native plants planted and encouraged in the treatment area, as detailed in Landscape Plan L-104.

CONSTRAINTS

Native scrub revegetation has been successfully accomplished in Southern California; however, due to natural stresses and other potentially unfavorable conditions, care must be taken in site preparation and planting for a successful revegetation effort in a reasonable amount of time. Design specifications and success criteria should be flexible to allow the natural and physical processes to operate on the property landscape. Prolonged drought or fire must always be considered as a constraint possibility for onsite restoration. Although most of the plant species present onsite are adapted to a Mediterranean climate with relatively low levels of precipitation, the possibility of prolonged drought exists and may occur after restoration planting implementation, which could lead to decreased ground water availability to the intolerable restoration plantings.

REVEGETATION SPECIFICATIONS, SEQUENCE, AND SCHEDULE

The restoration of native riparian and woodland habitats will be implemented to restore the plant communities and functional wildlife habitat back to the impacted areas on the Malibu Jewish Center property. The primary requirements for riparian vegetation establishment are bare, mineral- and mycorrhizal-rich, penetrable soil surfaces with access to groundwater late in the first growing season (late fall to early winter). Seeds and container plants used for the regeneration of riparian communities are dependent upon their tolerance of, and adaptation to, harsh environmental conditions (e.g. drought, fire, and wind erosion).

All impacted areas will be weeded of all invasive plant species currently colonizing the disturbed areas of the site. Appropriate areas may also need to be properly aerated and prepared with mulch where necessary. It is typically recommended that any available duff material be salvaged from the impacted areas and utilized in preparing the restoration areas for planting. This will allow a portion of the pre-existing native and local seed bank, and other existing propagules and mycorrhizae, to be salvaged and replenished onsite.

As a backup to natural succession and regrowth, supplemental planting is recommended when natural revegetation fails. Periodic monitoring of the regrowth will determine which areas, if any, may require remedial restoration actions. These sites will be identified, mapped, and flagged. Then each revegetation site will be prepared as described below.

Once the restoration site is appropriately prepared, the restoration site can then be planted/seeded with a combination of only native indigenous (species with local provenance) seeds or container-grown plants to maintain the local genetic integrity of the restored scrub ecosystems. DMEC recommends that the impacted areas be planted and revegetated by hand sowing at varying densities, with suitable plant species. Specifically, an appropriate seed mix, consisting of native and indigenous scrub and perennial species, should be obtained and sown on properly prepared sites. Approximately 20 pounds of pure live seed per acre including only native indigenous mixed riparian species is recommended (see the Plant Palette subsection below for a list of species). Affected areas will also receive erosion-control treatments, using bioengineering techniques and materials (coir blankets). These treatments will provide greater erosion protection than planting alone.

The following revegetation methods are recommended for implementing the revegetation effort:

- **Natural succession** with control of nonnative species and implementation of erosion control practices. In areas where natural revegetation does not occur satisfactorily, the following methods will be implemented;
- **Hand sowing** where the terrain is suitable, for species that sprout easily from seed, and if native indigenous seed supply is adequate; and
- **Container plantings** for species that will establish better from saplings and where hand sowing is not suitable.

In the initial years of vegetation establishment, emphasis will be placed on control of invasive plants in the restoration site and monitoring natural successional processes. For areas requiring manual revegetation, emphasis will be placed on success monitoring of new plantings. Control of invasive and exotic plants is important to ensure decreased competition levels for the new plantings. The maintenance and control efforts will continue until the new vegetation has matured (for up to five years). Such efforts shall be monitored by restoration biologists to ensure that the success criteria thresholds and City requirements are being met.

Specifically, the approaches recommended for revegetating the Malibu Jewish Center property restoration areas include, but are not necessarily limited to, the following:

- ***Collecting propagules:***
  - Collecting seeds that are of native species locally indigenous to the property (or at least to the Santa Monica Mountains), and have habitat requirements consistent with the existing habitat;
  - Preparing and treating collected seeds for successful germination; and
  - Purchasing seeds of native shrubs, grasses, and herbs to supplement existing seed sources.
- ***Preparing the affected areas for planting:***
  - Removing existing non-native, invasive plant species from the restoration sites;

- Removal or processing, such as by mulching, of excessive vegetative debris from the original brush removal activities in order to expose or create a suitable medium for planting; and
- Stabilizing planting areas using bioengineering erosion control devices (coir blankets) to retain the integrity of the soil during the initial establishment of the plantings.

- ***Planting implementation:***
  - Implementing one or more appropriate planting methods to specific areas of the restoration sites;
  - Planting the collected seeds from the plant species existing at the restoration sites by hand sowing or propagating and planting container plantings; and
  - Facilitating natural succession of riparian habitat by controlling invasive plant species and implementing erosion control practices.

- ***Monitoring the revegetation site to ensure the success of the restoration effort:***
  - Monitoring the work of the restoration contractors during project implementation;
  - Mapping as-built conditions after restoration implementation;
  - Establishing permanent transects and photo-documentation stations to last the duration of the required monitoring period;
  - Providing recommendations for supplemental irrigation and replacement planting; and
  - Monitoring revegetation plantings and restoration site until success thresholds are achieved.

Plant Palette

The predominant native plant species to be planted onsite are listed in Table 2, Revegetation Plant Palette for the Malibu Jewish Center Property. Table 2 lists the twenty-one (21) dominant and associate plant species that are important contributors to establishing functional riparian habitat. Certainly additional, or different, plant species have become, and have the potential of becoming, established since the property flora, which may be captured in any replaced duff material and may naturally succeed into the restoration site. However, many of these species may not become reestablished onsite due to poor seed preparation or poor seed viability. To ensure that the impacted chaparral is revegetated to the pre-clearing condition, DMEC recommends planting the species in Table 2 to promote the establishment of functional riparian to meet revegetation success criteria.

Approximately half of the plantings will consist of planting container-grown plants or pole cuttings (*Baccharis salicifolia* and *Salix lasiolepis*), with seed sowing used to supplement the plantings. The seeds of the project site species listed in Table 2 should be collected and planted onsite at approximately 20 pounds of pure live seed per acre. This seed source will be the primary focus to facilitate the revegetation effort. Supplemental seed purchasing and/or container planting purchasing may be required to meet the needs of this restoration effort. Plant materials from offsite sources should only be used if they can be obtained from a nearby indigenous or semi-indigenous source within the Santa Monica Mountains. All seed stock should be checked by a qualified biologist to ensure the source is at least from the Santa Monica Mountains.

Table 2 – Revegetation Plant Palette for the Malibu Jewish Center Property Impact Areas

Scientific Name	Common Name	Habit
Arctostaphylos glauca	Bigberry Manzanita	Shrub
Artemisia douglasiana	Mugwort	Perennial
Baccharis plummerae ssp. *plummerae*	Plummer's Baccharis	Shrub
Baccharis salicifolia	Mulefat	Shrub
Ceanothus spinosus	Greenbark Ceanothus	Shrub
Diplacus [*Mimulus*] *longiflorus*	Sticky Bush Monkeyflower	Shrub
Elymus condensatus	Giant Wildrye	Perennial
Encelia californica	California Bush Sunflower	Shrub
Eriophyllum confertiflorum ssp. *confertiflorum*	Golden Yarrow	Perennial/Subshrub
Frangula californica	California Coffeeberry	Shrub
Heteromeles arbutifolia	Toyon	Shrub
Juglans californica	So. Calif. Black Walnut	Shrub/Tree
Malacothamnus fasciculatus var. *fasciculatus*	Chaparral Bushmallow	Shrub
Rhamnus ilicifolia	Hollyleaf Redberry	Shrub
Rhus integrifolia	Lemonadeberry	Shrub
Ribes malvaceum var. *malvaceum*	Chaparral Currant	Shrub
Ribes speciosum	Fuchsia-flowered Gooseberry	Shrub
Rubus ursinus	Pacific Blackberry	Vine
Salix lasiolepis var. *lasiolepis*	Arroyo Willow	Tree
Salvia mellifera	Black Sage	Shrub
Sambucus nigra ssp. *caerulea*	Blue Elderberry	Shrub

Activities Prior To Revegetation Implementation

The activities expected prior to the implementation of the revegetation plan include: finalizing a specific planting plan, selecting a qualified landscape contractor, physically delineating planting and enhancement sites, detailing operations for collecting seed, preparing, storing, and propagating seed collected onsite for planting. These activities are discussed in the following paragraphs.

The timing for the restoration planting will depend upon obtaining the necessary permits and approvals from the City.

Grading and Planting Plan

No grading or re-contouring is recommended for this revegetation effort; therefore, no grading plan is necessary for the revegetation project.

Once this restoration and monitoring plan is approved, final planting specifications will be completed prior to implementation, with the formal planting plan (L-104) followed as specified.

Contracting

The Malibu Jewish Center will need to solicit and select a qualified landscape contractor that is experienced with upland scrub restoration and that is approved by City to implement this restoration plan. Either the landscape contractor or a subcontractor will need to be retained for seed collection, or purchase if necessary. If container plantings are utilized it will be necessary to arrange for the growing of the plants from onsite or nearby local seed sources if appropriate locally indigenous plants are not available for purchase. Cleaned and prepared seeds or other plant materials need to be available at the optimal time for planting.

Delineate Planting Areas

All planting areas need to be demarcated with flags or stakes prior to restoration activities. Delineating and marking the planting areas prior to revegetating portions of the property is important to avoid any impacts to additional areas of the property and to designate exactly what areas need to be prepared for revegetation and subsequently planted. All contractors, subcontractors, and equipment operators shall be instructed to remain within or outside the flagged boundaries, as appropriate. Existing, intact vegetation and soils shall not be disturbed outside of the flagged boundaries. Delineating planting areas also protects the plantings from disturbance after the restoration project has been implemented.

Seed Collection Operations

The seeds required for the restoration of the scrub habitats onsite shall be obtained from the property or in the nearby vicinity (within the Santa Monica Mountains). Collecting seeds onsite, and in the vicinity of the property, will ensure that the genetic integrity of the area is maintained with the implementation of the revegetation effort. Collecting seeds onsite will ensure that a sufficient range of genetic diversity will be represented in the property, and will maximize germination rates and the development of native plants onsite. All collected and purchased seeds shall be treated and prepared appropriately to ensure seed viability and optimum seed germination.

Seeds should be collected without causing significant damage to any existing living plants. When seeds are collected in the vicinity of the property, care should be taken to ensure that no existing vegetation is damaged and that no special-status species (if found to be present) are impacted. Seeds should also be collected in areas that are already somewhat disturbed in order to prevent impacts to the more pristine portions of the property chaparral habitat. Every effort should be made to collect only mature disease-free seed from healthy and mature individuals within a given population. The seed collections for each species should include seeds from at least fifty different individuals. In addition, all seeds need to be collected when mature and available, and should be stored and properly treated for manual planting at the restoration site. Recommended supplies for seed collecting include medium to large heavy duty clear to white plastic bags as collection receptacles, surgical tape to wrap thumbs and index fingers for protection, and hand clippers.

All seed collected for the restoration effort shall be separated by species, collection location, and time of collection into separate seed lots. A unique seed lot number and an associated seed collection form will identify each seed lot (refer to Appendix B for an example of a seed collection form). The seed collection form shall identify the species, the seed collector(s), as well as the date and location of the seed lot. The form will allow for the documentation of collection site data, such as the plant community classification, site characteristics, and habitat descriptions. Seed processing, storage, and pre-germination techniques shall be described as well. Duplicates of completed seed collection forms should be kept in a separate file in addition to keeping an original form alongside its given seed lot until the seeds have been planted in the restoration site.

Seeds may also be purchased from professional seed collectors; however, the seeds must be native and indigenous to the Santa Monica Mountains. If purchasing seeds is necessary, or if obtaining seeds from another site is necessary, then the contractor shall provide a list of any new materials (plant propagules) that must be purchased/obtained from other sources other than onsite sources prior to planting. Any unacceptable plant material shall be rejected by DMEC restoration specialists (or other qualified restoration specialists contracted by the Malibu Jewish Center) at the contractor's expense.

Seed Storage and Preparation for Propagation

Immediately after a given seed lot has been collected, the process of cleaning, upgrading, and storing the seed should begin. The purpose of this process is to reduce bulk and weight of the seed, improve storage life, increase germination probability, and make establishment and/or nursery propagation (if necessary) more successful and economical (Lippit et al 1994). A professional seed cleaning facility should assist in the cleaning, storage, and pre-germination treatment of seed.

Seed will be stored following appropriate treatments for each species. The lots will be stored no longer than is necessary; however, seed of certain species require pre-germination treatments in order to break seed dormancy. Other species require little or no pre-germination treatments. For those species, field-establishment or propagation in a nursery should take place at the earliest and most appropriate stage of the restoration project.

Activities During Revegetation Implementation

Preparing soils for planting, eradicating and controlling invasive plants, installing erosion control devices, and planting seeds and/or container plants are the primary activities to be conducted during the implementation of the revegetation effort and to facilitate revegetation success.

Site Preparation

Careful attention is required when preparing and treating soil/substrate surfaces when implementing native scrub restoration. Any debris present, such as wood debris, nonnative gravel, cured or uncured concrete, nonnative rocks, rebar, flagging, trash, and excess soil should be removed from the restoration areas. Excessive vegetative debris from the original brush removal activities should be removed to expose the soil surface, or processed, such as by mulching, to enhance soil conditions for planting. These areas should be properly aerated and prepared with mulch as needed. Any available duff material remaining from previous vegetation clearing should be salvaged from the impacted areas and utilized in preparing the restoration site for planting. This will allow the pre-existing locally native seed bank, and other existing propagules, to be salvaged and replenished onsite.

Invasive Plant Removal and Control

Invasive exotic species are opportunists, and they readily invade open, disturbed sites with nutrient-poor soils. Therefore, invasive plant species need to be removed by hand from the planting areas within one week of planting. Invasive plant species targeted for regular removal include shrub and herb species that were observed on the property. These nonnatives have the potential to become problem species after a significant disturbance, such as the onsite conditions following site preparation and planting.

A list of target invasive exotic plants to be eradicated and controlled onsite is presented in Table 3, Target Invasive Plant Species for Removal. All invasive plants shall be removed from the restoration areas and shall be disposed of in a manner that prevents their re-establishment. Invasive plants shall be removed by hand rather than by chemical means whenever possible.

Removal shall be conducted at least twice annually during spring and summer seasons, and as required over the duration of the monitoring period (until success is achieved). More specifically, DMEC recommends that the Malibu Jewish Center property be maintained free of invasive plant species according to specific plant density thresholds for each targeted invasive plant species. The thresholds are designated to trigger when eradication is necessary for each species. The invasive plant density thresholds are discussed below under Revegetation Maintenance in the Activities After Revegetation Implementation subsection.

Table 3 – Target Invasive Plant Species for Removal

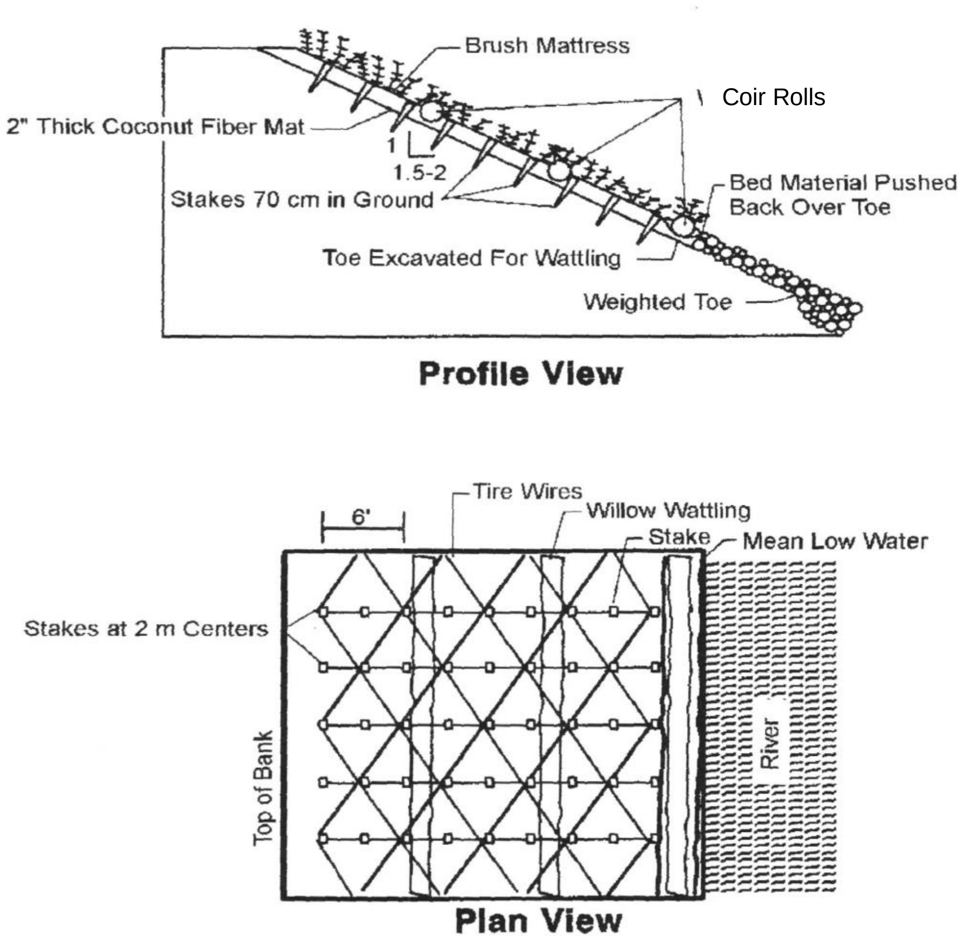
Scientific Name	Common Name	Habit
Arundo donax	Giant Reed	Perennial Grass
Bromus diandrus ssp. *diandrus*	Ripgut Brome	Annual Grass
Carpobrotus chilensis	Sea Fig	Perennial Herb
Chenopodium album	Lamb’s Quarters	Annual Herb
Cordederia jubata	Pampas Grass	Perennial Grass
Euphorbia terracina var. *terracina*	False Caper	Perennial Herb
Foeniculum vulgare	Sweet Fennel	Perennial Herb
Hirschfeldia incana	Summer Mustard	Perennial Herb
Myoporum laetum	Lollypop Tree	Shrub
Nicotiana glauca	Tree Tobacco	Tree/Shrub
Pennisetum clandestinum	Kikuyu Grass	Perennial Grass
Ricinus communis	Castor Bean	Shrub
Salsola tragus	Russian Thistle	Annual Herb
Stipa miliacea	Smilo Grass	Perennial Grass

Erosion Control

Best management practices, with regard to erosion control, will be employed with the revegetation of the impacted areas. In addition, planting areas will be stabilized using a bioengineering technique to retain the integrity of the soil during the initial establishment of the plantings. Several treatments are available, of which rolls are suggested for this restoration plan (Figure 6, General Schematic of Coir Roll and Blanket Detail).

Coir rolls, which create berm-like diversions for water runoff, will be laid down between sections of prepared slope. A row of coir rolls will be laid down every 10 to 20 feet between the sections of treated slope to prevent soil erosion from wind, rain, and trampling, and to protect the newly planted seeds and establishing seedlings. All erosion control devises will be inspected and maintained throughout the restoration effort and the monitoring duration.

Figure 6 – General Schematic of Coir Roll and Blanket Detail



Planting

DMEC recommends hand-sowing seed throughout the revegetation areas onsite, using supplemental randomly spaced container plantings to create a natural planting schematic onsite. Natural succession of native plant species should be encouraged as much as possible, while nonnative invasive plants should be controlled as much as possible. The following subsections discuss these three revegetation methods in further detail:

HAND SOWING

Collected seeds, and any purchased seeds, of chaparral species predominant onsite, should be hand sown into designated prepared areas of the restoration sites. Any purchased seeds shall be native and indigenous to the vicinity of the property (or at least indigenous to the Santa Monica Mountains), and shall be of the species recommended by DMEC in Table 2 (above). Hand sowing involves using a "belly grinder", which is a small bucket with a crank-dispenser. This seed dispersal device is strapped onto the front of a person who cranks the devise, distributing many seeds over the prepared and moistened soil surface. If the restoration areas are somewhat small, the seed mix can be spread by hand as well. The seeds can be raked into the soil, and are then expected to germinate without further aid. Fine seeds are rarely watered directly, as even the most careful treatment would likely dislodge such seeds.

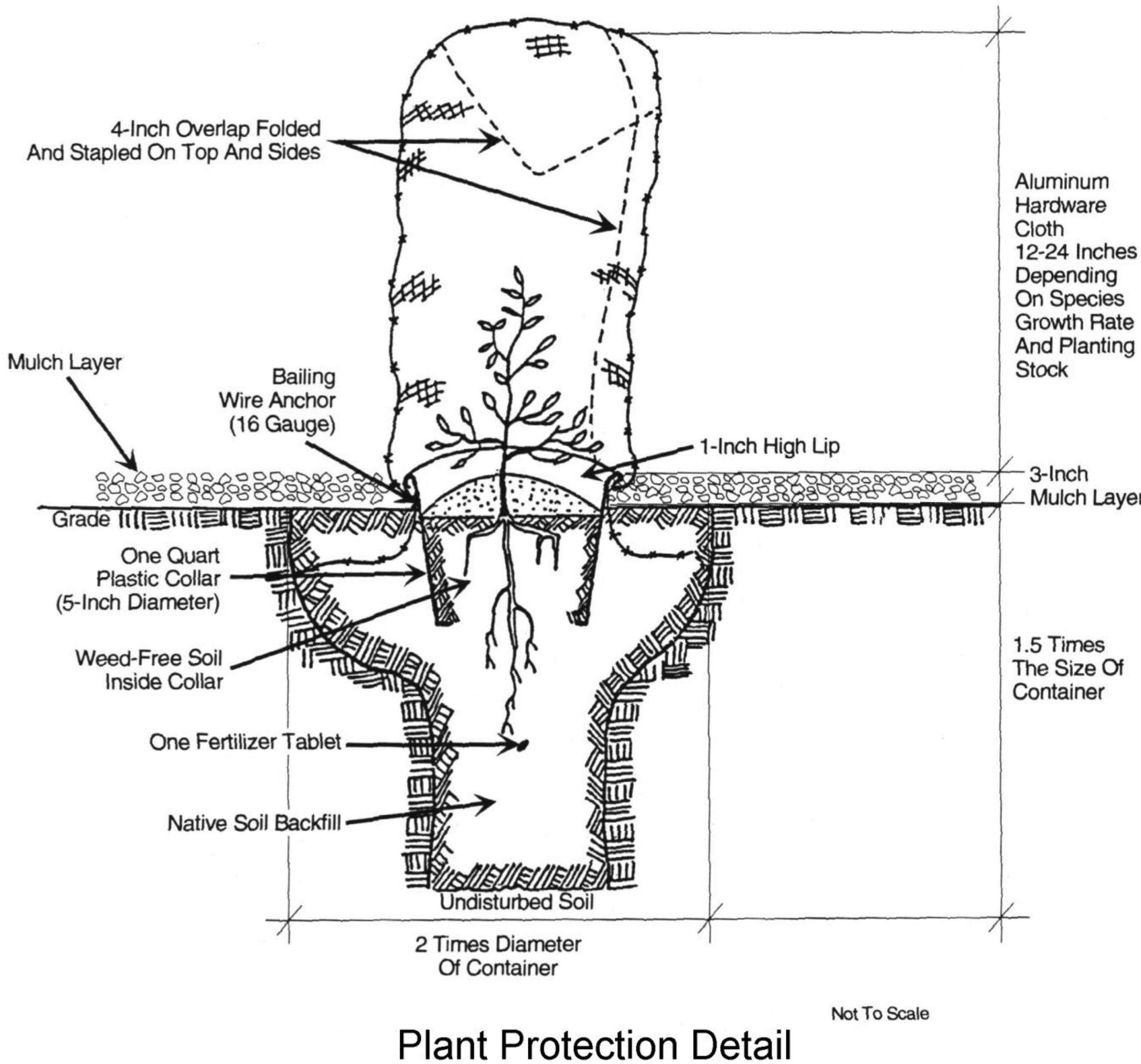
CONTAINER PLANTINGS

Purchased container plantings of native shrub species may be required in areas where hand sowing is not a successful method for reestablishing vegetation onsite. The purchased native container plantings, again, shall be native and indigenous to the vicinity of the property (or at least indigenous to the Santa Monica Mountains), and shall be of the species recommended by DMEC in Table 2 above. Revegetating with container plantings is the best method for upland restoration; however, this method is usually the most expensive. Therefore, this method will only be required in the areas where other means of revegetation do not succeed. Plant protection kits (root collars and screen baskets) will be required for container plantings to ensure their successful establishment and to avoid damage to the plantings due to browsing and foraging by wildlife and illustrated in Figure 7, Example Container Planting with Plant Protection Detail.

NATURAL SUCCESSION

Natural succession is the process through which a disturbed plant community or habitat type gradually reverts to its original state prior to the disturbance. Natural succession is typically slow and typically begins with colonization by invasive plant species that are adapted to disturbance and extreme conditions. Therefore, natural succession in a highly disturbed site requires extensive and constant maintenance and weed control to allow the natural native plant species to establish in a less competitive environment. Natural succession of riparian habitat shall be facilitated in all restoration areas in addition to any other seeding or planting methods used. Natural succession will be the primary revegetation method for areas that will be enhanced (as opposed to replanted).

Figure 7 – Example Container Planting with Plant Protection Detail



Timing of Planting

Planting of seeds and any container plants needs to be conducted at times when environmental conditions are optimal for seed germination and plant establishment. Soil moisture needs to be adequate to allow seedlings and transplants to become established and be sustained through periods of hot, dry conditions. Generally, the optimum time for seeding and planting is just prior to the first fall rains.

Activities After Revegetation Implementation

Post-implementation activities include maintaining the revegetation site to ensure criteria are met for restoration success and evaluating newly established plantings for restoration monitoring. These activities are discussed in more detail in the following subsections.

Revegetation Maintenance

Maintenance of the restoration sites is essential to achieve restoration objectives and performance criteria success. Included maintenance measures are weed control and eradication, trash removal, replanting, erosion control, and protection measures as necessary. The restoration site shall be maintained in good ecological condition, and shall be protected for the duration of the compliance-monitoring period.

Protection measures are designed to safeguard the revegetation areas once they have been established. These protection measures may include:

- Meeting with property owner and contractors to discuss revegetation efforts and identify which areas are to be protected;
- Providing physical protection of existing undisturbed habitats during implementation;
- Fencing or marking the entire restoration area; and
- Posting signs stating that the restoration areas are not to be disturbed.

Ultimately the applicant/property owner is responsible for ensuring that all requirements are met for revegetation compliance; therefore, restoration maintenance and protection measures shall be accomplished by the property owner and a -approved landscape contractor familiar with both native plant materials and techniques described in the following subsections. If native plants are mistaken for non-native plants, and native plants are accidentally removed from the restoration site, the success of the revegetation effort is threatened since success criteria are based on native plant species richness and ground cover by native plant species. The property owner's landscape contractor, assigned to implement this plan, must be approved by the as qualified and experienced with native upland restoration and maintenance.

The maintenance period will be a minimum of five (5) years from the completion date of the restoration planting (or permit approval). If success criteria are not met at the end of five years, the can be expected to offer recommendations and requirements for additional restoration measures. The primary maintenance task is weeding, while additional important maintenance activities to be performed include installing, maintaining, and removing plant protection kits (see Figure 6 above), repair and/or replacement of any faulty erosion control devices, trash removal, replacing dead plants, and reseeding unsuccessful portions of the restoration area.

INVASIVE PLANT SPECIES CONTROL

Initially, invasive exotic plants will be eradicated to prepare for the planting implementation, which will reduce plant competition. Weeding is necessary to encourage the success of planted native species and to discourage nonnative ruderal or weedy species from establishing competitive populations at the restoration site. Weeding will include removal of all non-native plants from the planting areas and may include minor trimming of native plants to increase light and reduce physical contact with neighboring plants, but only if necessary. This process shall be performed by hand wherever possible. Weeding shall only be conducted by persons able to identify native plants and their seedlings, and able to avoid removal of naturally colonizing native plants at the property. See Table 3 above for the list of invasive exotic plants known to occur onsite.

MAINTENANCE SCHEDULE

Maintenance visits, for the establishment of the vegetation, are critical for successful habitat establishment. Maintenance of all habitat restoration plantings shall include:

- Controlling invasive exotics;
- Repairing plant protection kits (if used);
- Repairing and/or replacing any faulty erosion control devices (if installed);
- Removing trash;
- Replacing dead plants and reseeding.

These tasks shall be conducted according to the following schedule; however, the specific timing of maintenance activities may be dependent upon monitoring or other conditions that may require deviation from the schedule.

Seeds and germinating seedlings will be maintained frequently (as required) for the first few months following planting, especially to control invasive plant species. General maintenance should be conducted on a monthly basis for the first six (6) months with a final maintenance visit during month twelve. Maintenance should then be conducted quarterly for the second year during the establishment of the new seedlings and to monitor irrigation levels. Thereafter, two visits per year, one in spring and one in fall, are considered sufficient for the remaining monitoring duration (the final three years). Monitoring shall be conducted for at least five (5) years; however, if success criteria are not met at the end of five years, then monitoring will continue until success is achieved.

Revegetation Success Monitoring

After planting completion, and when the new seedlings can be identified, species locations and plant numbers will be evaluated and will serve as the baseline from which to monitor the establishment and development of the plantings, the general success of the restoration, and the overall revegetation efforts. All plantings shall be monitored at least annually for a minimum of five years. Monitoring shall be conducted for two purposes: (1) to ensure minimum success criteria are met annually and by the end of the monitoring period; and (2) to determine if interim corrective measures or maintenance is required to ensure successful recovery of the chaparral habitat. Annual monitoring reports will be prepared and submitted to . A detailed monitoring program is provided in Section 5 below.

SECTION 5. REVEGETATION MONITORING PROGRAM

Monitoring on a regular basis is necessary to ensure that the site is revegetation according to plan. At least five (5) years of monitoring will be required to ensure the establishment and progress of the revegetation effort, although the time it takes to successfully revegetate may exceed five years. If success is not achieved in five (5) years, the City will likely provide requirements for additional restoration and monitoring.

The following subsections provide the general monitoring approach, monitoring parameters, project standards, and rationale for expecting success.

GENERAL MONITORING APPROACH

The purpose of the restoration planting is to restore the onsite ecosystem functions that were present prior to the disturbance, more specifically, to restore natural chaparral and scrub vegetation in the impacted areas. The intent of this monitoring plan is to provide a reasonable and measurable mechanism to determine that these restoration objectives are met during the monitoring period.

If monitoring indicates that restoration is not progressing toward the stated objectives, an analysis of project conditions shall be conducted to determine if contingency measures need to be implemented. Natural ecosystems are subject to natural perturbations that may affect the restoration efforts substantially. The impacts of natural physical and biological processes on restoration progress will need to be determined and recommendations made that consider these factors.

MONITORING PARAMETERS AND PROJECT STANDARDS

This subsection suggests general recommendations for monitoring parameters and project standards based upon the project purposes and the nature of the property. The focus of the monitoring portion of the overall project is on the restoration of plant and wildlife habitat on the Malibu Jewish Center property.

The monitoring protocol outlined below is focused on the biological attributes and processes of the restored ecosystem. Monitoring parameters and project standards are described qualitatively and quantitatively; however, quantitative measurements will be used to monitor success throughout the five-year period.

Control Sites

Compliance with City requirements will be based on the restoration of the property impact areas back to at least natural conditions (or even into a more enhanced ecosystem). Instead of using artificial plant growth and cover success thresholds, DMEC recommends measuring the restoration effort against similar, adjacent, undisturbed, functioning habitats adjacent to the restoration site. Therefore, it is proposed that monitoring compare restoration site conditions with control site conditions each year of the five-year program. Determining the success of the natural and planted colonization process onsite, when compared to natural control site conditions, is a more valid and fair method of measuring restoration of natural vegetation than using a planting plan with a preset planting number and preset plant species to be planted, with potentially unreasonable success criteria.

A City-approved Qualified Biologist shall determine ecological conditions in similar adjacent habitats to be used as control sites for comparison with the conditions within the restoration site. At least twenty (20) control sites shall be established that are representative of the chaparral and scrub types onsite prior to revegetation implementation and outside of any development areas, and with representative terrain and aspect. The control sites shall consist of areas that have not been disturbed significantly by human activities and are not likely to be disturbed in the foreseeable future.

Revegetation Success Criteria

This section provides performance standards for the revegetation effort, and develops remedial measures for unforeseen problems. The restoration success criteria discussed in the following subsections include:

(1) The thresholds that will be compared to the results of the control site surveys, such as species richness and percent cover; and

(2) Additional success criteria that may provide supplemental and useful information for achieving revegetation success, such as the actual growth and survival rate of individual plantings.

Revegetation Success Criteria Based on Control Sites

Ecological data will be sampled from at least twenty (20) control sites adjacent to the restoration areas. The characteristics surveyed at each control site will include total percent cover by native species, percent cover by native shrub species, plant species richness, shrub species richness, and shrub density. Control site surveys will be conducted at the same time that restoration monitoring will be conducted. (See Appendix C for an example of the Restoration Control Sites Field Monitoring Forms.)

After the control sites are established and surveyed, the restoration areas will be surveyed for the same characteristics surveyed for the control sites. Once the species richness, diversity, density, and cover is determined at the restoration site via transect surveys, the restoration site shall be required to meet minimum overall success thresholds (percentages of success compared to the control sites), which are summarized in Table 4, Overall Success Criteria and Thresholds for Plantings. Milestones will be used that must be met for each year of monitoring. Five years of thresholds are provided in Table 4; however, the monitoring duration may extend past five years if success is not achieved by the end of the fifth year.

Each year, percent cover, species richness, and plant density will be determined and the results will help illustrate the general success or failure of the revegetation effort for that year. If the results are less than the thresholds listed in Table 4 for a particular year, then the revegetation effort within the following year will require remediation to ensure that the revegetation site is comparable in habitat function to the adjacent control sites for the next monitoring survey.

The revegetation effort shall ultimately achieve at least 90% native canopy cover, 80% native shrub cover, 90 percent plant species richness, 100% native shrub species richness, and 80%

shrub density of that which was found for the control sites by the end of the fifth year for the restoration effort to be considered successful. If these thresholds are not met after five years, any requirements for additional remediation and monitoring will be determined by City.

Table 4 – Overall Success Criteria and Thresholds for Plantings Compared to Control Sites

Year After Seeding	Percent Total Native Cover Compared to Control Sites	Percent Native Cover Compared to Control Sites	Plant Species Richness Compared to Control Sites[2]	Native Shrub Species Richness Compared to Control Sites	Density of Plants Compared to Control Sites
1	20%	10%	25%	30%	10%
2	30%	30%	40%	50%	20%
3	50%	40%	60%	70%	40%
4	70%	60%	80%	80%	60%
5	90%	80%	90%	100%	80%

RATIONALE FOR EXPECTING SUCCESS

Success of this habitat restoration plan is dependent on a number of environmental and human factors. Restoring or enhancing natural vegetation requires consideration of existing and future (short-term) environmental conditions at, and surrounding, the property. Site preparation and maintenance activities are important components of success or failure of a habitat restoration effort. This plan is developed with full expectation of success since:

- The original topsoil was not highly disturbed by the vegetation removal or the introduction of foreign materials or propagules.
- Recommended plantings consist of seeds and container-grown plants from locally indigenous native plants that have habitat requirements consistent with the existing habitat and are adapted to onsite conditions.
- Non-native plant removal and control and erosion control measures will be implemented.
- A portion of this revegetation effort is to rely on natural plant recruitment onsite.
- Maintenance activities are included to protect the restoration site, control weeds, and replace any dead plantings by reseeding or replanting.
- Restoration monitoring identifies deficiencies and provides appropriate remedial maintenance actions.

Environmental factors beyond the control of the plan preparers, the property owner, planting contractor, and compliance monitors for this project include abnormal weather and wildfire. The thresholds of success for each restoration planting area will be compared directly with natural conditions in similar habitats adjacent to each restoration site (control sites). If natural environmental events such as fire, extended drought, or episodic precipitation do occur, conditions in the control sites will likely indicate any changes resulting from such events.

[2] Plant species richness and diversity thresholds will be established for vascular plants that are observed at the corresponding habitat type control sites.

If the natural dynamics of weather and other environmental disturbances causes significant changes in the natural vegetation of the control sites, the success criteria for the restoration plantings will be modified accordingly to reflect these natural changes, since the success criteria measurements are a percentage of the control sites. Nevertheless, the restoration site will be required to meet the success threshold criteria.

SECTION 6. ACKNOWLEDGEMENTS

This restoration plan and monitoring program was written by David Magney. Mr. Magney and Evan Lashly conducted the 2014 biological survey onsite and Mr. Magney conducted the subsequent site survey in early 2017. Mr. Magney and Vickie Peters prepared the figures for this report.

Mark Meyer of David Lawrence Gray Architects provided information about the proposed project. Steven Ormenyi, Landscape Architect, provided detailed landscape plans in support of this report.

David Crawford, Biologist with the City of Malibu, provided guidance on assessment and documentation needs.

SECTION 7. CITATIONS

REFERENCES CITED

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APPENDICES

APPENDIX A.
SITE PHOTOGRAPHS

APPENDIX B.
SEED COLLECTION FORM

APPENDIX C.
RESTORATION MONITORING FORMS

APPENDIX A.
MALIBU JEWISH CENTER PROPERTY PHOTOGRAPHS

SITE PHOTOGRAPHS

Left: View northwest of mitigation area along Puerco Canyon. *Arundo donax* dominates a significant portion of the ESHA riparian habitat. Right: View northward of *Arundo donax* dominating Puerco Canyon Creek. This area to be cleared of invasive exotic plants and planted with native riparian species.

Left: Riparian ESHA onsite dominated by native species. Right: View northward of riparian ESHA from near proposed mikvah building site.

APPENDIX B.
SEED COLLECTION FORM

SEED COLLECTION FORM

SEED LOT #:____________________ **INCLUDE THIS FORM WITH EVERY SEED LOT**

PROCESSING INFORMATION

SCIENTIFIC NAME: ____
COMMON NAME: ____
STATUS: ____
COLLECTOR'S NAME: ____
WATERSHED: ____
SUBWATERSHED: ____
GPS LOCATION N:_______________________________ W:_____________________________
LEGAL (T,R,S,S1/4): ____
CREEK OR SITE NAME: ____
AREA RELOCATION DIRECTIONS: ____
____

ATTACH QUAD OR ROAD MAP TO THE BACK OF SHEET MARKING COLLECTION SITE

VOUCHER INCLUDED: ____________________ ID VERIFIED: _________________________
SOIL SAMPLE INCLUDED: ______________ ID OF SOIL TYPE: ________________________
ELEVATION: ___________ PERCENT SLOPE: ___________ ASPECT: ________________
VEGETATION SERIES: ____
ASSOCIATE SPECIES: ____
HABITAT CLASSIFICATION/DESCRIPTION: ____________________________________
____
DATE AND TIME OF COLLECTION: ____
TIME SPENT COLLECTING: ___________________________

PROCESSING INFORMATION

TEMPORARY STORAGE METHOD: ____
START DATE OF PROCESSING: ____
WEIGHT UNPROCESSED: ________________ PROCESSED WEIGHT: _________________
PROCESSING METHOD: ____
PROCESSING TIME: ____
PURITY: ___________ PLS &(METHOD): ___________________/______________________
MOISTURE CONTENT: ____________ SEED/LB: _____________ E./N. Weeds(Y/N): _____
PRETREATMENT DESCRIPTION: ____
COMMENTS (MAKE ADDITIONAL NOTES ON BACK IF NEEDED):

APPENDIX C.
RESTORATION MONITORING FORMS:

Restoration Area Field Monitoring Form (Control Sites)

Restoration Area Field Monitoring Form (General Comments)

Restoration Area Field Monitoring Form (Percent Cover, Shrub Density, Species Richness)

RESTORATION AREA FIELD MONITORING FORM
(Control Sites)

PROJECT NAME: Malibu Jewish Center Property Revegetation, Santa Monica Mountains, Malibu

Observation Date: ___________________ Monitor: ______________________

Control Site Number	Total % Cover (for tree, shrub, & herbaceous layers)	Plant Species Richness (no. of species)	Plant Species Diversity (1, 2, or 3 plant forms)
1			
2			
3			

Additional Comments/Observations:

DMEC

RESTORATION AREA FIELD MONITORING FORM
(General Comments)

PROJECT NAME: Malibu Jewish Center Property Revegetation, Santa Monica Mountains, Malibu

CITY OF MALIBU PROJECT NO.: __________

Observation Date: ___________________ Monitor(s): _________________________

PURPOSE OF THIS MONITORING/OBSERVATION: Periodic report to assess plant growth, survival rates, condition of irrigation system (if applicable), and the progress of site restoration plantings.

GENERAL PROGRESS OF THE RESTORATION PLANTINGS:

____

____

____

____

____

OBSERVATIONS, CORRECTIVE MEASURES, AND RECOMMENDATIONS:

Plantings:

____

____

____

____

____

Irrigation:

____

____

PHOTOGRAPHIC DATA

Photo No(s).: ________________________ View: ______________________________

Notes:____

____

RESTORATION AREA FIELD MONITORING FORM
(Percent Cover, Shrub Density, Species Richness)

PROJECT NAME: Malibu Jewish Center Property Revegetation, Santa Monica Mountains, Malibu

Observation Date: ___________________ Monitor(s): _________________________

Monitoring Site No.: _________________ Monitoring Year: 1 2 3 4 5 (circle one)

PLANT COVER MEASUREMENTS: Species Count –

(Potentially) Planted Species	Percent Cover	Plant Density (No. of shrubs for ea species)	Average Height of Plants (inches)	Average Width of Plants (inches)	Number Dead

Percent of Total Native Cover = ______; Percent Native Shrub/Tree Cover = ______;
Total Native Plant Species Richness = _____; Total Native Shrub/Tree Species Richness = _____;
Density of Shrubs = _______.

David Magney Environmental Consulting

WETLANDS OF THE MALIBU JEWISH CENTER & SYNAGOGUE 24855 PACIFIC COAST HIGHWAY MALIBU, CALIFORNIA

Prepared for:

CITY OF MALIBU

On behalf of:

DAVID LAWRENCE GRAY ARCHITECTS

October 2018

DMEC Mission Statement

To provide quality environmental consulting services with integrity that protect and enhance the human and natural environment

DMEC

Wetlands of the Malibu Jewish Center & Synagogue
24855 Pacific Coast Highway
Malibu, California

Prepared for:

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Planning Department
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16 October 2018

This document should be cited as:

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DMEC

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SECTION I. INTRODUCTION

BACKGROUND

David Magney Environmental Consulting (DMEC) was contracted to delineate, describe, and map the wetland habitats present on the subject property at the request of Mark Meyer of David Lawrence Gray Architects, project architect. The project site and grading plans were prepared by David Lawrence Gray Architects, of Los Angeles, California. DMEC previously prepared a report on the biological resources (DMEC 2017a) and a tree assessment report (DMEC 2017b) for the proposed project.

PROJECT PURPOSE AND SCOPE

The proposed project involves the demolition of existing structures and construction of a new two-story school with basement garage and chapel facility. The parcel is approximately 4.63 acres in size (Los Angeles County parcel data indicates an area of 202,078 square feet). The total footprint of the structures to be built is approximately 11,167 sf (0.256 acre). The school building footprint is almost entirely within the footprint of the existing structures is entirely within a previously approved CDP.

Mitigation proposed in the biological resources assessment report recommended removal of the invasive exotic grass, *Arundo donax* (Giant Reed) from Puerco Canyon Creek. To perform that work, a permit from the California Department of Fish and Wildlife (CDFW) will be required and the City of Malibu has requested that the expected boundary of the riparian habitat under CDFW jurisdiction be delineated and mapped.

PROJECT LOCATION

The project site is located in the City of Malibu in western Los Angeles County (Figure 1 – General Project Site Location). The Malibu Jewish Center & Synagogue (project site) is located at 24855 Pacific Coast Highway (PCH), Malibu, Los Angeles County, California (AIN 4458-032-027). The project site is east of Corral Canyon Road, and between PCH and Puerco Canyon Creek, as shown on Figure 2 – Project Site and Project Footprint. The site is in the Malibu Beach Quadrangle (USGS 7.5-minute Series) at the approximate geographic coordinates of 34.034°N latitude and -118.717°W longitude, located in the Topanga Malibu Sequit Mexican Land Grant, at the logical location of SW¼ NE¼ Section 1 T3S R18W, San Bernardino Base Line, as illustrated on Figure 1.

The Malibu Jewish Center & Synagogue is partially in the Puerco Canyon watershed at an elevation of approximately 160 feet (50 meters) above mean sea level. The parcel is wedge-shaped trending east-west, as illustrated on Figure 1 and Figure 2. The project site, and all of Puerco Canyon, is within the Coastal Zone. The project site and the proposed facilities are illustrated on Figure 2.

Figure 1 – General Project Site Location

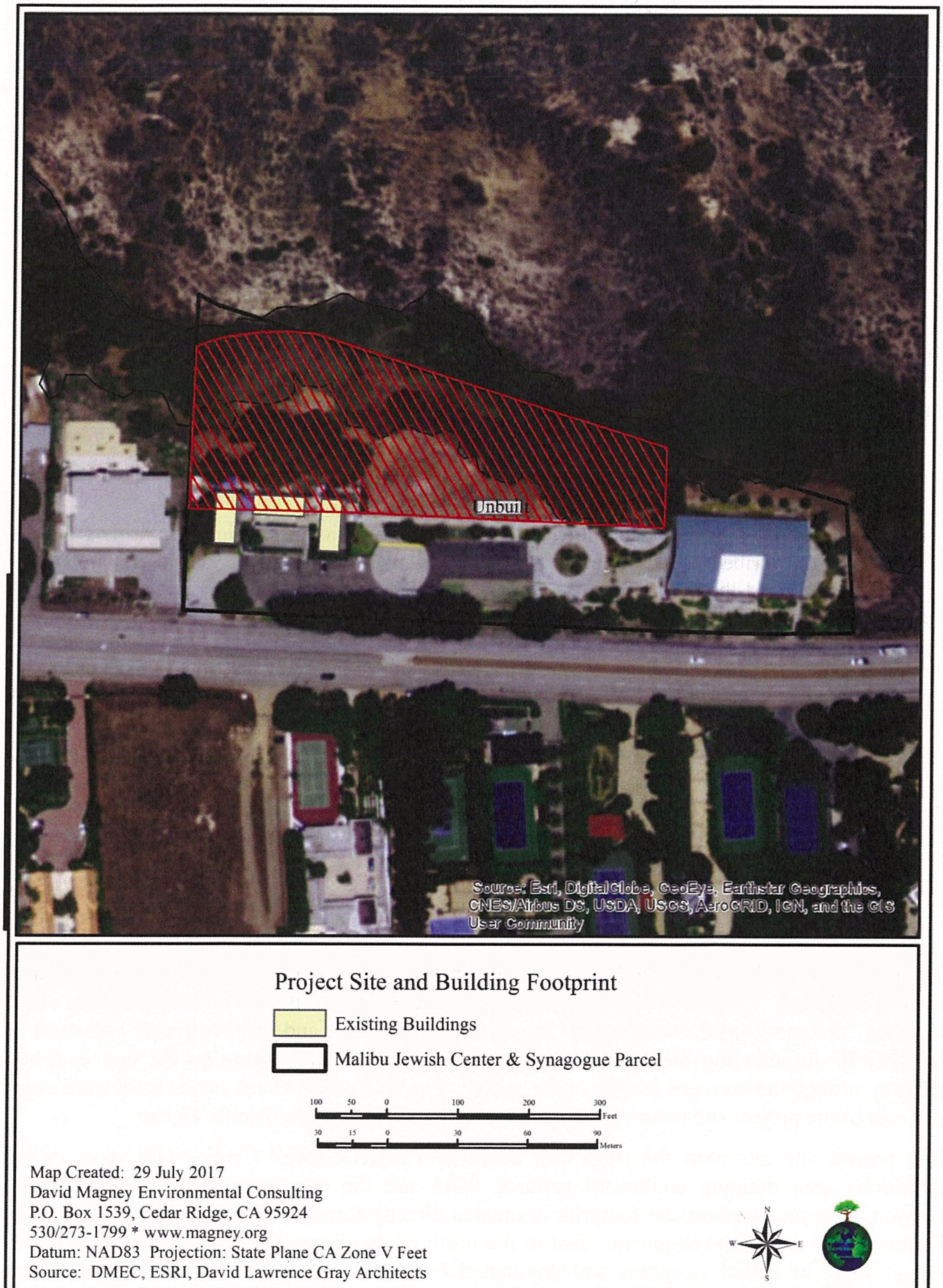
General Project Site Location

Jewish Center & Synagogue Parcel (Project Site)

Map Created: 15 September 2014
David Magney Environmental Consulting
805/646-6045 www.magney.org
Data: Los Angeles County Parcel Database
Base: ESRI-USGS USA Topo, ESRI-Nat Geo (inset)

0.5 0.25 0 0.5 1 Kilometers
0.5 0.25 0 0.5 Miles

Figure 2 – Project Site and Project Footprint



DMEC

SECTION II. EXISTING CONDITIONS

METHODS

DMEC biologist David Magney conducted a survey of the project site on 29 June 2018 to delineate the boundaries of riparian wetland habitat meeting CDFW jurisdiction. DMEC biologists Magney and Evan Lashly previously conducted surveys of the biological and tree resources on the project site on 3 September 2014 and 28 February 2017.

The main objective of survey was to determine the boundaries of CDFW jurisdiction. Mr. Magney walked the southern edge of Puerco Canyon Creek as access through the dense vegetation would allow, avoiding patches of *Toxicodendron diversilobum* (Western Poison Oak), and noting dominant and characteristic plant species. A Global Positioning System (GPS) unit (Garmin GPSMAP 62stc) was carried to track survey paths and to mark waypoints of wetland data points. Photographs were taken of the riparian habitat and conditions at select points using a Canon EOS 4Ti digital camera.

The general methods used to determine wetlands under jurisdiction of the U.S. Army Corps of Engineers, as described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Arid Southwest regional supplement (Corps 2008) in that the evidence of wetland hydrology, hydric soils, and hydrophytic vegetation was examined to characterize onsite conditions. The results where then applied to the CDFW jurisdiction criteria that only requires one of the three parameters. In this case, the presence of a clearly defined bed and bank and a predominance of riparian vegetation dominated by hydrophytes (Lickvar et al. 2016) were sufficient to determine CDFW jurisdiction.

Areas of Puerco Canyon Creek not accessible due to extremely dense vegetation and Toxicodendron diversilobum were mapped as jurisdictional riparian vegetation where wetland hydrophytes dominated the vegetation. The boundaries were mapped on a high-resolution color aerial photograph provided by DigitalGlobe through ESRI.

PHYSICAL CONDITION

The project site is located at the base of the Malibu foothills, approximately 1,000 feet north of the Pacific Ocean. The project parcel is adjacent to the PCH and situated on the north side of the highway. Puerco Canyon and Puerco Canyon Creek run south and bend eastward just north of the project site, entering the parcel on the northwest corner and exiting on the east end, and passing through the northern section of the parcel. Puerco Canyon Creek bends southward again just east of the project site before passing under the PCH and into the Pacific Ocean.

The project site sits atop the ridge just south of Puerco Canyon Creek, with most of the developed area draining southward towards PCH and the remainder draining into Puerco Canyon. The proposed project footprint is situated directly atop the ridge, in a largely artificially flattened area due to development. Just to the north of the proposed project footprint, a north-facing slope of varied steepness and dominated by mixed Coast Live Oak Woodland drops approximately 20 vertical feet to the creek bottom, which is dominated by riparian vegetation, both native and non-native. North of the creek bottom a south-facing slope that is dominated by Coastal Sage Scrub rises again.

The soils of the project site consist of Calcic Argixerolls (in the creek bottom and north of the creek) and Danville-Urban Land Complex (atop the ridge at and south of the proposed project footprint, NRCS 2014). Calcic Argixerolls are well-drained soils with high runoff potential derived from weathered calcareous sandstone. Danville-Urban Land Complex is a complex of urban uses with well drained soils with high runoff potential, derived from metavolcanics and/or sedimentary rock.

FLORA

A total of forty-four (44) vascular plant species were observed onsite. Of these, twenty-four (26, or 59%) of the vascular plants are native species and fourteen (18, or 41%) are nonnative or exotic species, excluding landscape ornamentals. The proportions of native and nonnative taxa onsite are dissimilar to the 75% native: 25% nonnative for other regions of California and for the entire flora of California (Hickman 1993), indicative of the generally disturbed and urban nature to the project site.

The 44 vascular plants that were observed are listed below in Table 1 – Plant Species Observed at the Project Site. Of these, eight species are considered to be hydrophytes, with a Wetland Indicator Status of FAC or FACW (Lichvar et al. 2014). No OBL species were observed onsite. Extensive experience delineating wetlands in California suggest that two additional species should be considered as FAC species. A total of 16 taxa were observed in Puerco Canyon Creek onsite, which are shaded blue in Table 1.

Table 1 – Plant Species Observed at the Project Site

Scientific Name[1]	Common Name	Habit[2]	WIS[3]	Family[4]
Artemisia californica	California Sagebrush	S	-	Asteraceae
Artemisia douglasiana	Mugwort	PH	FAC	Asteraceae
Arundo donax *	Giant Reed	PG	FACW	Poaceae
Baccharis pilularis ssp. *consanguinea*	Coyote Brush	S	(FAC)	Asteraceae
Baccharis plummerae* ssp. *plummerae	**Plummer's Baccharis**	S	-	Asteraceae
Brachypodium distachyon *	Short-pediceled Brome	AG	-	Poaceae
Bromus diandrus ssp. *diandrus**	Ripgut Brome	AG	-	Poaceae
Carpobrotus chilensis *	Sea Fig	PH	FACU	Aizoaceae

[1] * = Introduced plant species that have become naturalized. **Bold** typeface indicates special-status species. Scientific names of the plant species follow *The Jepson Manual* 2nd Edition (Baldwin et al. 2012) and Flora of North America Committee (1993+).

[2] Habit definitions: AG = annual graminoid; AH = annual herb; AV = annual vine; PG = perennial graminoid; PH = perennial herb; PV = perennial vine; S = shrub; T = tree.

[3] WIS = Wetland Indicator Status. The following code definitions are according to Lichvar et al. (2016):
OBL = obligate wetland species, occurs almost always in wetlands (>99% probability).
FACW = facultative wetland species, usually found in wetlands (67-99% probability).
FAC = facultative species, equally likely to occur in wetlands or nonwetlands (34-66% probability).
FACU = facultative upland species, usually found in nonwetlands (67-99% probability).
( ) = Parentheses indicate a wetland status suggested by David L. Magney based on extensive field observations.

[4] Family taxonomy follows Flora of North America Committee (1993+).

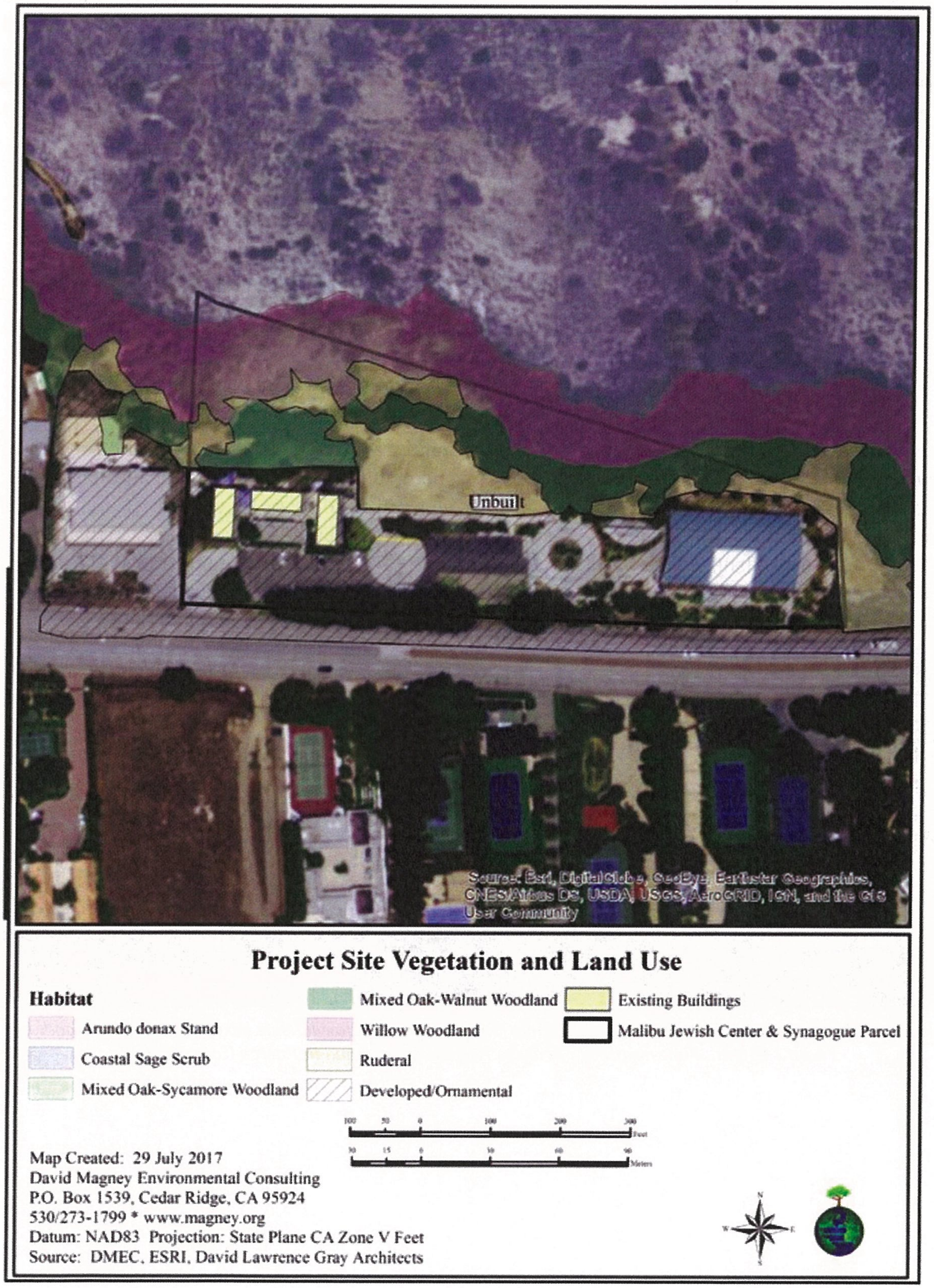
Scientific Name[1]	Common Name	Habit[2]	WIS[3]	Family[4]
Chenopodium album *	Lambsquarters	AH	FACU	Chenopodiaceae
Cortaderia cf. *jubata.* *	Pampas Grass	PG	FACU	Poaceae
Distichlis spicata	Saltgrass	PG	FAC	Poaceae
Elymus condensatus	Giant Wildrye	PG	FACU	Poaceae
Encelia californica	California Bush Sunflower	S	-	Asteraceae
Eriogonum cinereum	Coastal Buckwheat	S	-	Polygonaceae
Euphorbia peplus *	Petty Spurge	AH	-	Euphorbiaceae
Euphorbia terracina var. *terracina**	False Caper	PH	-	Euphorbiaceae
Foeniculum vulgare *	Sweet Fennel	PH	(FACU)	Apiaceae
Hazardia squarrosa var. ?	Sawtooth Goldenbush	S	-	Asteraceae
Heteromeles arbutifolia	Toyon	S/T	-	Rosaceae
Heterotheca grandiflora	Telegraph Weed	AH	-	Asteraceae
Hirschfeldia incana *	Summer Mustard	BH	(FACU)	Brassicaceae
Isocoma menziesii var. *vernonioides*	Coastal Goldenbush	S	FAC	Asteraceae
Juglans californica	**Southern California Black Walnut**	T/S	FACU	Juglandaceae
Malacothrix saxatilis var. *tenuifolia*	Tenuate-leaved Cliff-aster	PH	-	Asteraceae
Malosma laurina	Laurelleaf Sumac	S	-	Anacardiaceae
Malva parviflora *	Cheeseweed	AH	-	Malvaceae
Myoporum laetum *	Lollypop Tree	S/T	FACU	Scrophulariaceae
Nicotiana glauca *	Tobacco Tree	S/T	FAC	Solanaceae
Pennisetum clandestinum *	Kikuyu Grass	PG	-	Poaceae
Platanus racemosa var. *racemosa*	Western Sycamore	T	FAC	Platanaceae
Quercus agrifolia var. *agrifolia*	Coast Live Oak	T	(FACU)	Fagaceae
Rhamnus ilicifolia	Hollyleaf Redberry	S	-	Rhamnaceae
Rhus integrifolia	Lemonade Berry	S	-	Anacardiaceae
Ribes speciosum	Fuchsia-flowered Gooseberry	S	-	Grossulariaceae
Ricinus communis *	Castor Bean	S	FACU	Euphorbiaceae
Rubus ursinus	California Blackberry	V	FAC	Rosaceae
Salix lasiolepis var. *lasiolepis*	Arroyo Willow	S/T	FACW	Salicaceae
Salsola tragus *	Tumbleweed	AH	FACU	Chenopodiaceae
Salvia mellifera	Black Sage	S	-	Lamiaceae
Sonchus oleraceus *	Common Sow-thistle	AH	UPL	Asteraceae
Stipa miliacea *	Smilo Grass	PG	(FACU)	Poaceae
Symphoricarpos cf. *albus* var. *laevigatus*	Snowberry	PH	FACU	Caprifoliaceae
Toxicodendron diversilobum	Western Poison Oak	V/S	FACU	Anacardiaceae
Venegasia carpesioides	Canyon Sunflower	S	-	Asteraceae

HABITATS

A total of five (5) habitat and land cover types were identified on the Malibu Jewish Center & Synagogue parcel and adjacent areas, which are described in detail in the Biological Resources report (DMEC 2017a). The natural vegetation and land cover types present onsite were mapped and are illustrated on Figure 3, Vegetation Communities and Land Cover of the Project Site.

DMEC

Figure 3 – Vegetation Communities and Land Cover of the Project Site



DMEC

The vegetation communities mapped and described previously (DMEC 2017a) includes: *Quercus agrifolia* Woodland Alliance, *Arundo donax* Semi-Natural Alliance, *Salix lasiolepis* Shrubland Alliance, *Eriogonum cinereum* Shrubland Alliance, and *Bromus diandrus* Semi-Natural Herbaceous Alliance. Of these *Arundo donax* Semi-Natural Alliance and *Salix lasiolepis* Shrubland Alliance compose the riparian wetland communities, with *Quercus agrifolia* Woodland Alliance occurring on the periphery of the canyon, occupying approximately 0.729 acre of the parcel.

Riparian Habitats

Riparian habitats are those plant communities that occur on the banks of perennial, intermittent, and ephemeral streams.

Arundo donax Semi-natural Alliance

Arundo donax Semi-natural Alliance is plant community characterized by the dominance of *Arundo donax* (Giant Reed). *Arundo donax* is a perennial grass species with alternate, long, tapered, grey-green leaves and hollow stems. It generally grows to heights of <8 meters and resembles bamboo. *Arundo donax* is an aggressive invasive species and one of the fastest growing terrestrial plants in the world (Sawyer et al. 2009). It can form dense mats and clumps that choke stream channels, crowd out native species, increase fire potential, and reduce wildlife habitat. It propagates primarily through rhizomes and the rhizomes of detached clumps.

*Photo 1 (left). View westward of riparian community (*Arundo donax*) below hillside mixed Oak-Walnut Woodland. Photo 2 (right). View northward of dense* Arundo donax *stand in Puerco Canyon Creek.*


Photo 3 (left). View of dense Arundo donax *dominating Puerco Canyon Creek in June 2018, not significantly changed from 2014. Photo 4 (right). View eastward/downstream adjacent to dense* Arundo donax *showing open herbaceous vegetation just outside of jurisdictional wetlands.*

Arundo donax forms a nearly impenetrably dense stand on the project site. Several individuals of *Salix lasiolepis* exist within the stands of *A. donax*; however, *S. lasiolepis* is the dominant riparian species in areas not containing *A. donax*. This stand dominates the creek bed on the northwest corner of the project parcel and exists in the adjacent parcels to the north and west. This stand of *A. donax* appears to be the only significant stand within Puerco Canyon Creek drainage. Areas on the project site dominated by *A. donax* are mapped as "Arundo Stand". The project site contains approximately 0.35 acre of *A. donax*.

Salix lasiolepis Shrubland Alliance

Salix lasiolepis Shrubland Alliance is a plant community characterized by the dominance of *Salix lasiolepis* var. *lasiolepis* (Arroyo Willow) (Sawyer et al. 2009). *Salix lasiolepis* is a riparian shrub or small tree, growing up to 8 meters in height. It has long strap-shaped to obovate leaves with entire to toothed margins. *Salix lasiolepis* grows in seasonally or intermittently flooded areas such as stream beds, banks, and benches and is typically shrubby and many stemmed (Sawyer et al. 2009). It can form an open or continuous canopy and often has a variable herbaceous understory. *Salix lasiolepis* is well adapted to flood disturbance and easily colonizes in moist areas where it can become "weedy".

Salix lasiolepis Shrubland Alliance dominates the streambed on the project site in areas where *Arundo donax* does not occur. *Salix lasiolepis* and *A. donax* do occur together, but in areas where *A. donax* forms dense stands, *S. lasiolepis* is forced out. Areas of the project site dominated by *S. lasiolepis* are mapped as "Willow Thicket". The project site contains approximately 0.29 acre of Arroyo Willow Thicket.


Photo 5 (left). View eastward (downstream) of creek bed and Arroyo Willow Thicket with understory.
Photo 6 (right). View westward (upstream) of creek bed and Arroyo Willow Thicket with understory.

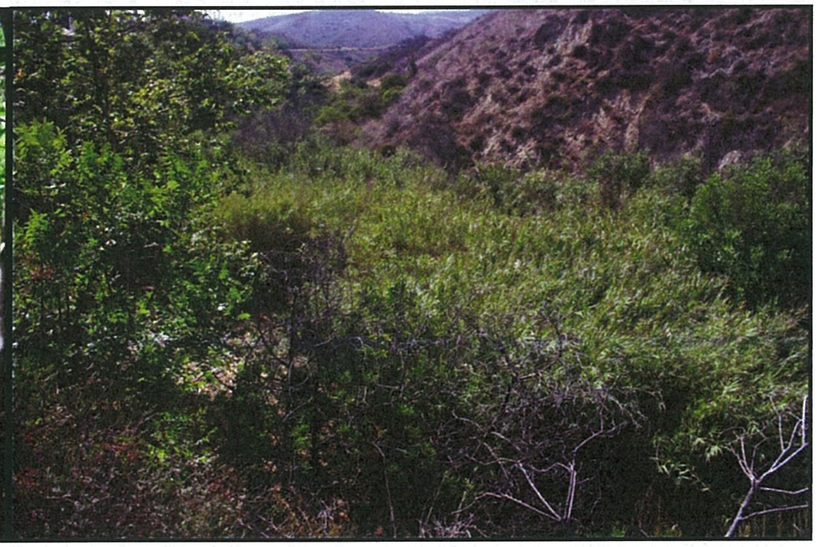



Photo 7(left). View northward across the creek into thick Arroyo Willow Thicket with understory.
Photo 8 (right). View northwestward (upstream) of creek bed and Arroyo Willow Thicket from top of bank.


Photo 9 (left). View westward of mixed Oak-Sycamore Woodland with modified (ruderal) understory.
Photo 10 (right). View eastward of mixed Oak-Walnut Woodland natural understory adjacent to Arundo donax.
These photos show habitats outside of jurisdictional wetlands.

SECTION III. WETLAND JURISDICTION

Wetland habitats are regulated by the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act. The Corps determines its jurisdiction by following specific methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (Corps 2008).

Waters of the State are nearly identical to that for the Corps (U.S.); however, the State of California lacks a formal method to determine its area of jurisdiction other than as described in Section 1600 et seq. of the California Fish and Game Code. The Code identifies jurisdictional streams as areas with a clear bed and bank and adjacent riparian vegetation; however, the Code provides no formal definition of wetlands. Waters (wetlands) of the State are quite similar to that for the nation but can be more expansive in some circumstances. Furthermore, all streams and internally drained depressions are jurisdictional with the State while some such areas are not under Corps jurisdiction.

Many activities occurring in waters of the State are regulated by the CDFW through the California Fish and Game Code Section 1600 et seq., requiring a Streambed Alteration Agreement for impacts to riparian and wetland habitats. CDFW does not have a formal methodology to determine their jurisdictional boundary; however, it generally includes all water courses with a defined bed and bank. Puerto Canyon Creek is such a regulated wetland.

The total area of waters of the state on the project parcel equals approximately 1.411 acres, as shown on Figure 4, Riparian Wetland Jurisdictional Area. Corps jurisdiction is approximately 0.729 acre, entirely within the waters of the state.

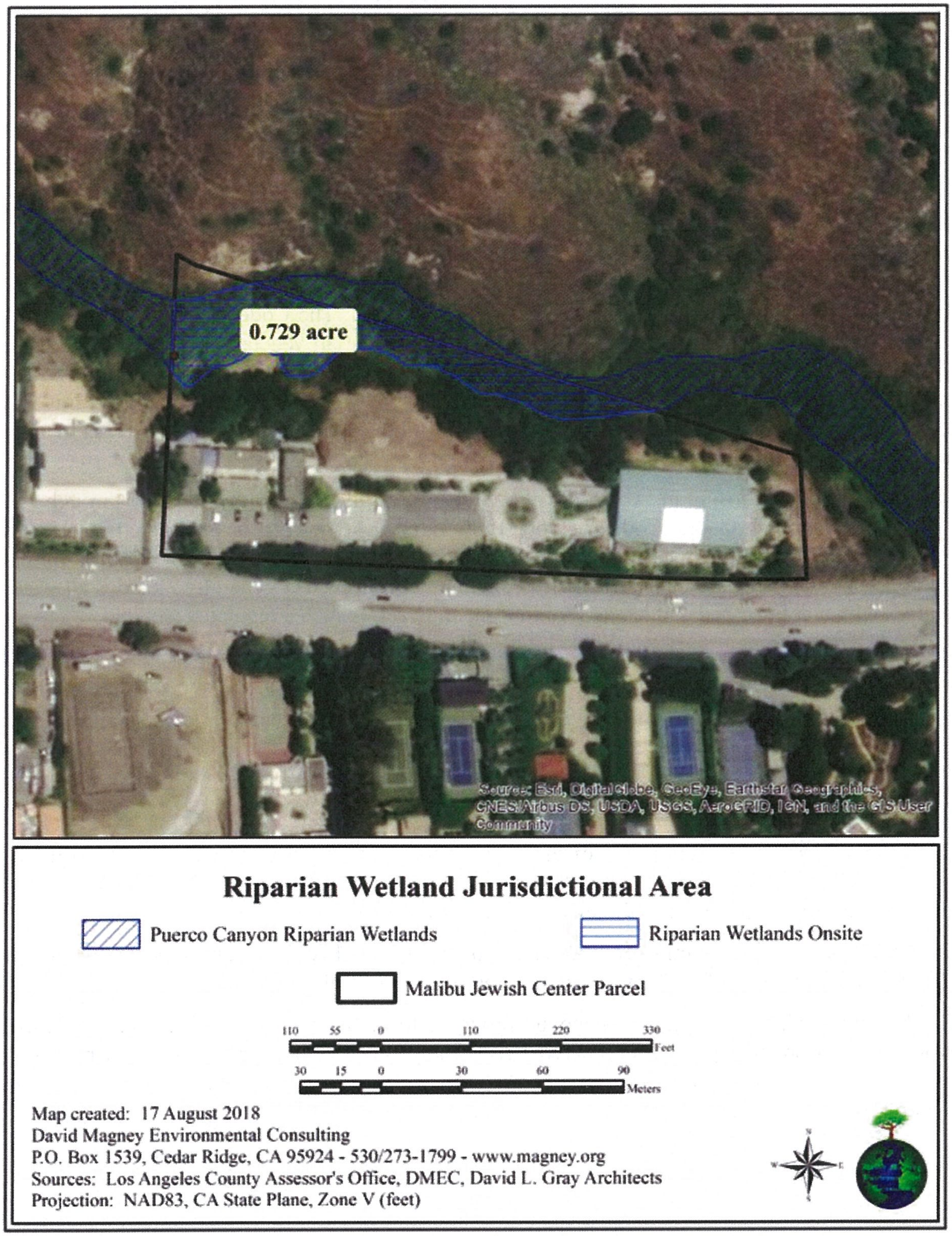
REGULARTORY PERMITTING

The Corps, pursuant to Section 404 of the Clean Water Act, regulates the discharge of fill into waters of the United States. The Corps does not regulate removal of vegetation from jurisdictional waters of the U.S.; therefore, no permit is required from the Corps.

The CDFW, pursuant to Section 1600 et seq. of the California Fish and Game Code, regulates all activities within waters of the State, including removal of natural vegetation.

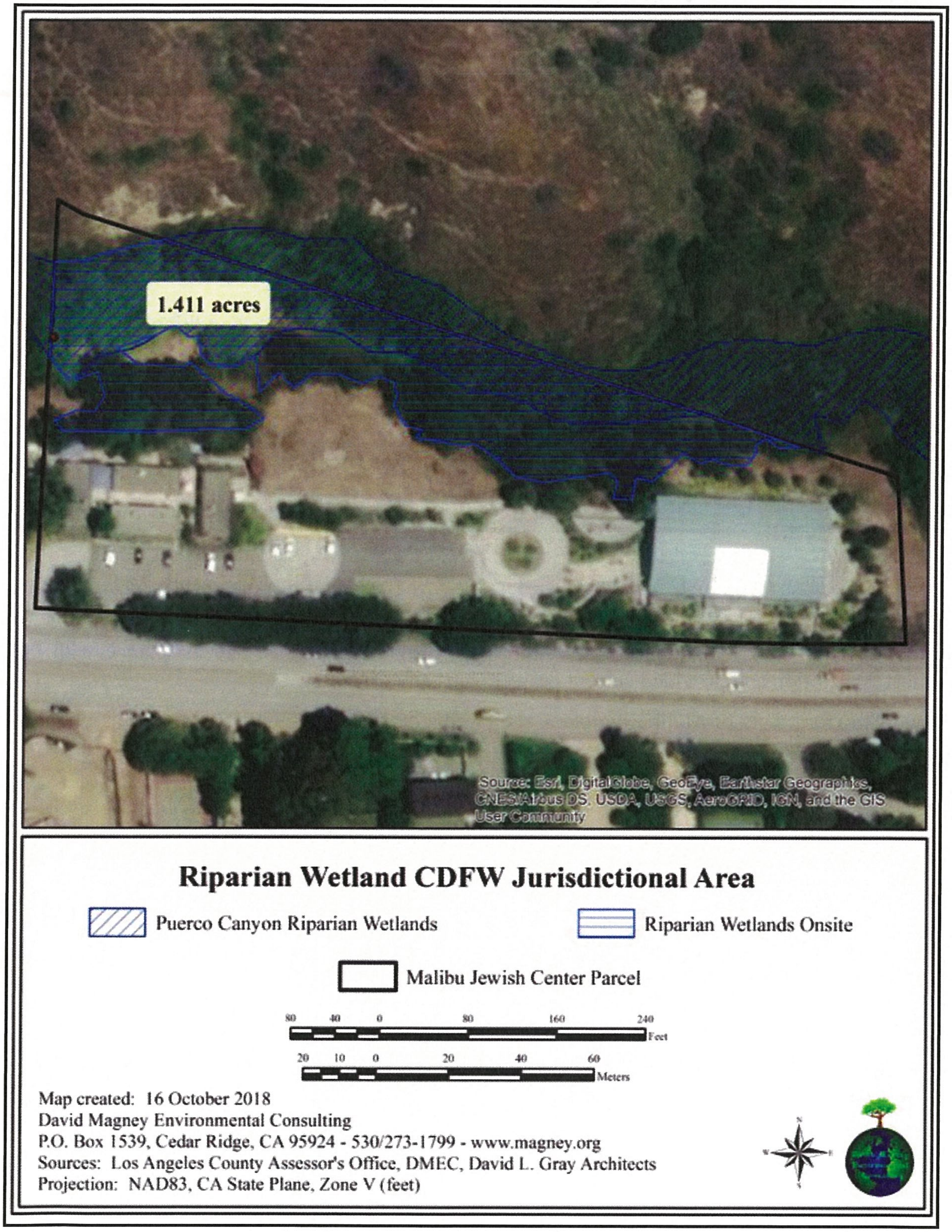
The Malibu Jewish Center and Synagogue proposes to eradicate *Arundo donax*, and invasive exotic grass, from that portion of Puerco Creek Canyon on its property onsite as a means to mitigate encroachment into Riparian ESHA setback buffer, resulting in improving riparian wetland functions onsite.

Figure 4 – Riparian Wetland Corps Jurisdictional Area



DMEC

Figure 5 – Riparian Wetland CDFW Jurisdictional Area



DMEC

SECTION V. CONCLUSIONS

DMEC determined that 0.729 acre of riparian wetland habitat is present onsite that is under the jurisdiction of the Corps, and CDFW jurisdiction is approximately 1.411 acres.

The Corps typically does not take jurisdiction of adjacent riparian habitats upslope of the ordinary high water mark, hence a narrow area of jurisdiction along Puerco Canyon Creek.

Habitat restoration activities such as removal of the invasive exotic grass, *Arundo donax*, occurs within the area considered under CDFW jurisdiction, for which the Malibu Jewish Center and Synagogue will need to obtain a permit to do that work.

This report is intended to provide CDFW with information on site conditions to facilitate issuance of a Streambed Alteration Agreement to remove *Arundo donax* from Puerco Canyon Creek onsite to satisfy City of Malibu permit requirements.

SECTION VI. ACKNOWLEDGEMENTS

This report was written by David Magney. Graphics were created by Mr. Lashly, Vickie Peters, and Mr. Magney.

Mark Meyer of David Lawrence Gray Architects, provided guidance and assistance with the project description and provided current project plans and drawings.

David Crawford, City of Malibu biologist, reviewed a draft of this report and provided guidance on improvements.

SECTION VII. CITATIONS

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City of Malibu

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RECEIVED
OCT 25 2018
PLANNING DEPT.

BIOLOGY REVIEW
REFERRAL SHEET

TO: City of Malibu Biologist **DATE:** ~~11/6/2014~~

FROM: City of Malibu Planning Department

PROJECT NUMBER:	CDP 14-069
JOB ADDRESS:	24855 PACIFIC COAST HWY
APPLICANT / CONTACT:	Mark Meyer
APPLICANT ADDRESS:	353 S Broadway Los Angeles, CA 90013
APPLICANT PHONE #:	(213) 243-5707
APPLICANT FAX #:	
APPLICANT EMAIL:	david@davidgrayarchitects.com
PLANNER:	Adrian Fernandez
PROJECT DESCRIPTION:	Malibu Jewish Center - New 22,902 square foot structure, OWTS, landscape

TO: Malibu Planning Department and/or Applicant

FROM: City Biologist, Dave Crawford

COMPLETE

_____ The project review package is ~~INCOMPLETE~~ and; CANNOT proceed through Final Planning Review until corrections and conditions from Biological Review are incorporated into the proposed project design (See Attached).

_____ The project is APPROVED, consistent with City Goals & Policies associated with the protection of biological resources and CAN proceed through the Planning process.

_____ The project may have the potential to significantly impact the following resources, either individually or cumulatively: Sensitive Species or Habitat, Watersheds, and/or Shoreline Resources and therefore Requires Review by the Environmental Review Board (ERB).

Signature _____ Date 12/11/18

Additional requirements/conditions may be imposed upon review of plan revision

Contact Information:

Dave Crawford, City Biologist, dcrawford@malibucity.org, (310) 456-2489, extension 277

DISCUSSION:

1. The wetlands report was submitted per request of the City Biologist to determine the limits of jurisdiction of regulatory agencies. This limit is necessary in calculating the area altered by removal of non-native/invasive species and re-introducing appropriate native species.

   The report states that there is 0.729 acre of Federal (ACOE) jurisdictional area and 1.411 acres of State jurisdictional area that is part of the restoration project. The report states that ACOE does not regulate removal of vegetation from Waters of the US and indicates the study did not strictly follow ACOE delineation methodology. There is no discussion as to whether a permit is required for planting new vegetation. Further, there is no discussion regarding regulation by the Regional Water Quality Control Board. Typically this state agency closely follows ACOE guidelines, but there are differences and there should be some discussion as to their jurisdiction.

   As discussed in the report, California Department of Fish and Wildlife (CDFW) has a broader jurisdiction and does maintain jurisdiction over the entire riparian area on the project site. As such, the primary agency expected to regulate this activity is CDFW.

   The purpose of this review is not to approve or deny the project, but to verify other state and federal permitting requirements. The requirement was to clarify what agency permits are needed and how much habitat will be restored.

   The submitted report satisfies the City's requirement for determining the area of CDFW jurisdiction. It will be the applicant's responsibility to ensure all necessary federal and state permits are applied for and received prior to any actual work on the site. The City will require copies of notification letters/packages to the appropriate agencies prior to CDP approval. Once regulatory agency permits are received, copies of those permits will be required to be submitted to the City to be maintained in the project planning file.

-o0o-

If you have any questions regarding the above requirements, please contact the City Biologist office at your earliest convenience.

cc: Planning Project file
Planning Department

City of Malibu

Biology • Planning Department
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Phone (310) 456-2489 · Fax (310) 317-1950 · www.malibucity.org

BIOLOGY REVIEW SHEET

PROJECT INFORMATION

Applicant: (name and email address)	Mark Meyer david@davidgrayarchitects.com	
Project Address:	**24855 Pacific Coast Highway** Malibu, CA 90265	
Planning Case No.:	CDP 14-069	
Project Description:	Malibu Jewish Center – New structure, OWTS, landscape	
Date of Review:	December 11, 2018	
Reviewer:	Dave Crawford	Signature:
Contact Information:	Phone: (310) 456-2489 ext. 307	Email: dcrawford@malibucity.org

SUBMITTAL INFORMATION

Site Plans:	
Site Survey:	
Planting Plan:	
Irrigation/Hydrozone/ water budget Plan:	
Grading Plans:	
OWTS Plan:	
Bio Assessment:	
Bio Inventory:	
Native Tree Survey:	
Native Tree Protection Plan	
Other:	Wetland Delineation (Magney, October 2018)
Previous Reviews:	

REVIEW FINDINGS

Review Status:	☐	<u>INCOMPLETE</u>: Additional information and/or a response to the listed review comments is required.
	☒	<u>**COMPLETE**</u> All required information has been received and conformance review shall be completed within the next 30 days.
	☐	<u>**APPROVED**</u> The proposed project
Environmental Review Board:	☐	This project has the potential to impact ESHA and may require review by the Environmental Review Board

Recycled Paper

Appendix C

Transportation Studies

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CRAIN & ASSOCIATES

Transportation Planning / Traffic Engineering

<u>TRANSMITTAL VIA EMAIL</u>

June 24, 2019

Nicole Benyamin
Assistant Civil Engineer
City of Malibu
23825 Stuart Ranch Road
Malibu, CA 90265

RE: Malibu Jewish Center & Synagogue Expansion Project Transportation Analysis -- Response to Traffic-Related Comments on the Project's Application (CDP 14-069)

Dear Nicole,

The Malibu Jewish Center & Synagogue (MJCS) is proposing to upgrade their facilities located at 24855 Pacific Coast Highway in the City of Malibu [the "City"]. The upgrades will include the demolition of on-site structures, erection of a new multi-function building, and expansion of the currently provided educational programs [the "Project"]. Crain & Associates prepared a Project transportation analysis technical letter, dated October 24, 2018, in order to help the City determine if the Project could have potentially significant transportation impacts requiring further analysis. The technical letter was prepared per the City *Traffic Impact Analysis Guidelines* (City of Malibu, 2012) [the "TIA Guidelines"], and a copy of the letter is included in Attachment A. City staff responded to the letter with a series of comments in a Public Works Review for Traffic memorandum dated December 13, 2018 (see Attachment B). Crain & Associates has conducted an assessment of the City comment memorandum and discussed the comments therein with City staff via a January 31, 2019 conference call, during which City staff

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requested specific supplemental transportation analyses. The following are our responses to the traffic-related issues raised in the memorandum, which include the results of the supplemental analyses. The responses have been disaggregated based on the six comments contained in the City memorandum.

It should be noted that the Project description has been modified slightly since the preparation of the October 24, 2018 transportation analysis letter. The projected future Project student enrollment levels for the three educational programs are now: 45 pre-school students, 100 after-school youth religious program students, and 50 adult education program students.

December 13, 2018 – Nicole Benyamin, Assistant Civil Engineer, Public Works Department

1. In this comment, the City has requested that the empirical trip generation rates developed for the Project be based not on the student enrollment levels on the day of the empirical trip generation study, but rather on the student attendance levels for that particular day.

   Student attendance information was provided by the MJCS for the empirical trip generation study date: Tuesday, September 25, 2018. The information is provided in the following table, along with the previously analyzed current student enrollment levels and projected future Project student enrollment levels for the three educational programs:

Educational Program	Student Attendance[1]	Current Student Enrollment[2]	Proposed Student Enrollment
Pre-School Program	14	25	45
After-School Youth Religious Program	52	62	100
Adult Education Program	NA[3]	25	50

Notes:
[1] Actual number of students on-site at the MJCS on September 25, 2018.
[2] Student enrollment provided by MJCS staff around time of September 25, 2018 survey.
[3] Adult education program did not meet on September 25, 2018.

As shown, the student attendance numbers on the trip generation survey date were lower than the student enrollment levels provided by MJCS staff around that time. This discrepancy was due to multiple factors, including expected day-to-day fluctuations in student attendance levels and a distinct drop in student enrollment levels experienced by the MJCS during the fall of 2018. Therefore, in order to determine more accurate and conservative trip generation estimates for the Project, the student attendance numbers were utilized as the independent variables for developing the Project trip generation rates. The resulting trip rates are shown in Table 1.

As in the October 24, 2018 analysis, the AM peak-hour trip generation rate was developed with pre-school students as the independent variable, given that all trip activity during that hour is related to pre-school operation. However, the PM peak-hour trip rate was developed with after-school youth religious students as the independent variable, given that most, if not all, trip activity between 4:00 PM and 6:00 PM is related to the youth religious program. As summarized in Table 1, the existing MJCS was shown to generate AM peak-hour trips at a rate of 0.86 trips per pre-school student (83 percent inbound, 17 percent outbound) and PM peak-hour trips at a rate of 0.27 trips per after-school youth religious student (36 percent inbound, 64 percent outbound) on a typical weekday with both of these educational programs fully active.

2. This comment notes that the empirical trip generation study was performed on the first day of Sukkot, the Jewish holiday, and asks if more or different trips would have occurred at the MJCS site given the holiday. Crain & Associates coordinated with MJCS staff for several weeks in advance of performing the empirical trip generation study, in order to ensure that the survey date represented typical weekday conditions. The September 25, 2018 survey date was selected by MJCS staff specifically for being representative of typical Tuesday operations.

3. This comment requests that Project trip generation estimates for the AM peak hour be based not on trip generation rates for the peak hour of adjacent street (Pacific Coast Highway) traffic between 7:00 AM and 9:00 AM, but rather based on trip generation rates for the peak hour of the generator (MJCS) between 7:00 AM and 9:00 AM. As shown in the October 24, 2018 transportation analysis letter (Attachment A), the peak hour of adjacent street traffic occurred between 7:15 AM and 8:15 AM, when the MJCS site was shown to generate 1 inbound trip and 0 outbound trips. However, later in the AM peak period, the peak hour of the generator occurred between 8:00 AM and 9:00 AM, when the MJCS site experienced 10 inbound trips and 2 outbound trips. The

empirical trip generation rate and directional distribution has been updated in Table 1 to reflect the AM peak hour of the generator (MJCS). As previously described in Comment Response 1, the AM peak-hour trip generation rate has been updated to 0.86 trips per pre-school student (83 percent inbound, 17 percent outbound).

By applying the AM peak-hour trip generation rate derived in Table 1, AM peak-hour trips were calculated for the Project uses. Once completed and operational, the proposed Project is expected to generate approximately 39 AM peak-hour trips (32 inbound, 7 outbound). Thus, the Project will have a net AM peak-hour trip generation of 27 trips (22 inbound, 5 outbound). This net Project trip estimate falls below the City TIA Guidelines threshold requiring the preparation of a formal transportation impact analysis (30 or more peak-hour trips).

4. This comment requests that Project trip generation estimates for the PM peak hour be based not on trip generation rates for the peak hour of adjacent street (Pacific Coast Highway) traffic occurring from 4:00 PM to 5:00 PM, but rather based on trip generation rates for the hour occurring from 5:00 PM to 6:00 PM. The comment erroneously references the MJCS experiencing 40 trips (18 inbound and 22 outbound) during the 5:00 PM to 6:00 PM hour. However, this generation for the MJCS is associated with the 5:30 PM to 6:30 PM hour, which falls partially outside of the City-defined PM peak period of 4:00 PM to 6:00 PM. During the PM peak period of 4:00 PM to 6:00 PM, the peak hour of the generator coincides with the peak hour of adjacent street traffic, from 4:00 PM to 5:00PM. Therefore, as shown in Table 1, the PM peak-hour trip generation rate remains at 0.27 trips per after-school youth religious student (36 percent inbound, 64 percent outbound), as representative of the peak hour of the generator.

   By applying the PM peak-hour trip generation rates shown in Table 1, PM peak-hour trips were calculated for the Project uses. Once completed and operational, the proposed Project is expected to generate approximately 27 PM peak-hour trips (10 inbound, 17 outbound). Thus, the Project will have a net PM peak-hour trip generation of 13 trips (5 inbound, 8 outbound). This net Project trip estimate also falls below the City TIA Guidelines threshold requiring the preparation of a formal transportation impact analysis (30 or more peak-hour trips).

5. This comment relates to the student drop-off and pick-up traffic management plan for the Project, and who will be directing parents to follow the proposed circulation scheme. As described on page 9 of the October 24, 2018 technical letter (Attachment A), the “school shall assign individuals as traffic monitors to facilitate the student drop-off/pick-up circulation plans. The traffic monitors will direct traffic from the MJCS site driveway and through the surface lot, as described above.” It is anticipated that the traffic monitors will consist of MJCS staff members and not volunteers.

6. The final comment is related to safety concerns for Project users making left-turn movements to and from the MJCS site at the MJCS driveway intersection with Pacific Coast Highway. The comment requests that options be explored to prevent or control these left-turn movements, as well as an analysis of the benefits and disadvantages of implementing these left-turn control options. Per a January 31, 2019 conference call to discuss the City’s memorandum, City staff specifically requested that supplemental transportation analyses be performed as part of this comment response. The supplemental efforts include a sight distance analysis of the MJCS driveway intersection with Pacific Coast Highway and a time gap analysis for this location.

   To review, the October 24, 2018 technical letter (Attachment A) included a section on Site Access/Egress and Safety Concerns. Through an analysis of existing vehicle queue lengths for motorists entering and exiting the MJCS site and a review of the most recent available six years of accident data for the segment of Pacific Coast Highway including the MJCS driveway, it was recommended that full access (left- and right-turn movements, both inbound and outbound) be retained at the MJCS driveway intersection with Pacific Coast Highway under future Project conditions.

   Per the request of City staff, Crain & Associates has performed a sight distance analysis at the MJCS driveway intersection with Pacific Coast Highway. The results of the sight distance analysis are presented in Attachment C. Given that Pacific Coast Highway is a State highway (State Route 1), all calculations were performed in accordance with the requirements of the current version of the State of California Department of Transportation [“Caltrans”] Highway Design Manual (HDM). The Caltrans HDM was last updated on December 14, 2018.

Both stopping sight distance (SSD) and corner sight distance (CSD) measurements were performed at the driveway intersection and compared with minimum line-of-sight requirements. In brief, SSD is the distance required by a vehicle traveling along an uncontrolled roadway at the roadway's design speed to stop, on wet pavement, prior to striking an object in its travel path. CSD is the sight distance required by a driver entering or crossing an uncontrolled roadway from an intersecting roadway/driveway to perceive an oncoming vehicle and complete a turning or crossing maneuver without oncoming traffic substantially slowing or stopping. In accordance with Caltrans HDM standards, minimum SSD and CSD are to be provided on State facilities for all roadway intersections.

In order to complete the sight distance analysis, it was necessary to determine first the design speed of Pacific Coast Highway in both the westbound (northbound per State route designation) and eastbound (southbound per State route designation) directions. A speed survey was performed on February 13, 2019, and the results of the survey are included in Attachment D. The survey included speed measurements of 100 vehicles per direction, between the hours of 9:30 AM and 11:00 AM when travel speeds approximated free-flow conditions. As shown in Attachment D, the 95th percentile speeds for vehicles traveling in the westbound and eastbound directions were 58 and 59 miles per hour (MPH), respectively. Therefore, in order to provide a conservative sight distance analysis, a design speed of 60 MPH was used for both directions of travel on Pacific Coast Highway.

Stopping Sight Distance - Per Index 201.1 of the Caltrans HDM, minimum SSD standards must be met on State facilities based on the design speed for roadway motorists. Although there are posted signs indicating a speed limit of 45 MPH along the segment of Pacific Coast Highway that contains the MJCS driveway intersection, a design speed of 60 MPH was selected per the speed survey results. Based on a 60 MPH design speed for Pacific Coast Highway, the required SSD for both westbound and eastbound vehicles approaching the MJCS driveway is 580 feet. As shown in Attachment C, there is a minimal amount of horizontal curvature along Pacific Coast Highway at the MJCS driveway intersection and the available SSD approaching from the east and west were measured to be approximately 900 feet and 1,080 feet, respectively. Therefore, the SSD requirements are met per Caltrans HDM standards.

Corner Sight Distance - As shown in Attachment C, the CSD was also measured for motorists making turning movements from the MJCS driveway. The CSD standards for public and private roadway intersections are outlined in Index 405.1(2) of the Caltrans HDM. For private roadway intersections such as the MJCS driveway intersection with Pacific Coast Highway, the minimum CSD should be equal to the required SSD. Therefore, the CSD looking to the east and west from the MJCS driveway should be equal to or greater than 580 feet. As shown in Attachment C, the measured CSD for motorists looking to the east and west from the driveway is approximately 360 feet and 545 feet, respectively.

The factors limiting the available CSD looking to the east are the slope of the hill located north of Pacific Coast Highway, between the roadway and the MJCS, and the vegetation on that hill. It is estimated that the available CSD looking to the east would be increased to approximately 670 feet if the vegetation on that hill were maintained appropriately. Relandscaping this area to provide the required CSD looking to the east is part of the proposed Project. As such, the trees and vegetation located on the MJCS site, north of Pacific Coast Highway and east of the driveway, will be trimmed/maintained and not impede lines of sight. There is also the potential for vehicles parked on the north shoulder of Pacific Coast Highway, east of the MJCS driveway, to obstruct lines of sight for outbound motorists, depending on the location of the outbound vehicle on the MJCS driveway. As discussed below, outbound motorists have a substantial length of MJCS driveway and north Pacific Coast Highway shoulder to utilize in order to vary the driver's line of sight looking to the east. It is expected that motorists will do so in order to find lines of sight with adequate CSD.

The factors limiting the available CSD looking to the west are the slight hill and vegetation immediately west of the MJCS driveway and potential cars parked along the north shoulder of Pacific Coast Highway, west of the driveway. On the day the sight distance measurements were performed (February 12, 2019), CSD looking to the west was limited by a passenger vehicle parked on the north shoulder of Pacific Coast Highway at the adjacent commercial building (Compass real estate at 24903 Pacific Coast Highway). It should be noted, however, that motorists have available CSD looking to the west that greatly exceeds 580 feet when they are further up the MJCS driveway approach from Pacific Coast Highway, due to the driveway's grade. Further, while it is desirable to have CSD looking to the west from the driveway, this line of sight is not critical for MJCS users due to the presence of the center two-way left-turn lane on Pacific Coast Highway. Outbound motorists wishing to make a left-turn onto Pacific Coast Highway have the ability to turn left into the center two-way left-turn lane and then enter the eastbound Pacific Coast Highway traffic stream via an easier merge maneuver.

Per Section 405.1(2) of the Caltrans HDM, when measuring CSD, the setback for the driver of the vehicle on the minor road should be a minimum of 10 feet plus the shoulder width of the major road. This criterion was used when performing the corner sight distance measurements for the Project; however, it represents a rather conservative condition. As stated previously, the grade change along the MJCS driveway allows outbound motorists to have various, extended lines of site along the driveway approach to Pacific Coast Highway. In addition, Pacific Coast Highway provides a 10-foot wide north shoulder along this segment. As such, the CSD measurements were taken from a driver eye location on the MJCS driveway approximately 20 feet from the edge of the Pacific Coast Highway traveled way (10 feet plus 10 feet).

The results of the sight distance analysis align with the results of the accident analysis contained in the October 24, 2018 technical letter (Attachment A). That accident analysis indicated that the existing MJCS site driveway intersection with Pacific Coast Highway functions safely as a full-access (left- and right-turns in/out) facility. However, City staff also had concerns about the function of this intersection under future conditions with increased traffic volumes associated with the Project. Therefore, a time gap analysis was performed in order to determine if an adequate number and duration of gaps exist in the Pacific Coast Highway westbound and eastbound traffic streams to allow anticipated future Project trips to perform all turning maneuvers into and out of the Project site. The results of the time gap analysis are presented in Attachment E.

All calculations were performed in accordance with the requirements of the Caltrans HDM, per Table 405.1A. Per Table 405.1A, a 6.5-second time gap is necessary for a southbound driver to complete a right-turn movement from the MJCS driveway to westbound Pacific Coast Highway. To make a left-turn movement from the MJCS driveway to the center two-way left-turn lane on Pacific Coast Highway, an 8.0-second gap is required due to the crossing of one additional lane to complete the maneuver. Guidance is not provided in the Caltrans HDM on appropriate time gaps for merge maneuvers from a center two-way left-turn lane to an adjacent through lane. Thus, in order to provide a conservative analysis, it has conservatively been assumed that a 6.5-second time gap is required for the merge maneuver from the center two-way left turn lane into eastbound traffic flow on Pacific Coast Highway (for outbound left-turning motorists). For inbound left-turning traffic from the center two-way left-turn lane, the criteria for left-turns from a stop were assumed along with the crossing of an additional lane; therefore, an inbound left-turn would require an 8.0-second gap.

Time Gap Analysis – Per Index 405.1 of the Caltrans HDM, a minimum time gap of 6.5 seconds is required for a southbound vehicle making a right-turn from the MJCS driveway onto westbound Pacific Coast Highway. The same minimum time gap has conservatively been assumed for eastbound merge maneuvers from the center two-way left-turn lane to the adjacent through lane on Pacific Coast Highway. This minimum time gap acceptable to motorists performing these maneuvers does not vary based on the approach speed of the major roadway. Time gaps between 6.5 and 12.5 seconds were assumed to be acceptable for one vehicle to perform the right-turn or merge maneuver, gaps of 13.0 to 19.0 seconds were assumed to be acceptable for two vehicles, gaps of 19.5 to 25.5 seconds were assumed to be acceptable for three vehicles, and gaps of 26.0 seconds or more were conservatively assumed to be acceptable for four vehicles.

A minimum time gap of 8.0 seconds is required for a southbound vehicle making a left-turn from the MJCS driveway into the center two-way left-turn lane on Pacific Coast Highway and for an eastbound vehicle making a left-turn from the center two-way left turn lane on Pacific Coast Highway to the northbound MJCS driveway. Time gaps between 8.0 and 15.5 seconds were assumed to be acceptable for one vehicle to perform either maneuver, gaps of 16.0 to 23.5 seconds were assumed to be acceptable for two vehicles, and gaps of 24.0 seconds or more were conservatively assumed to be acceptable for three vehicles.

The time gap analysis has been performed for every 15-minute increment within the AM and PM peak periods analyzed as part of the Project trip generation study (7:00 AM to

9:30 AM and 1:30 PM to 7:00 PM, respectively). In order to estimate future Project traffic volumes for particular turning movements at the MJCS driveway intersection with Pacific Coast Highway, a factor of 3.21 (45 future pre-school students ÷ 14 existing attending pre-school students) was applied to MJCS vehicle turning movements observed between the hours of 7:00 AM and 3:30 PM on September 25, 2018. The start and end times for this future trip factoring method were selected because the pre-school operates between the hours of 9:00 AM and 3:00 PM. A factor of 1.92 (100 future after-school youth religious students ÷ 52 existing attending after-school youth religious students) was applied to MJCS vehicle turning movements observed between the hours of 3:30 PM and 7:00 PM, as the after-school youth religious program operates between the hours of 3:45 PM and 6:15 PM. The projected future Project turning movement volumes are illustrated in Attachment E.

Time gaps were recorded for both directions of Pacific Coast Highway traffic adjacent to the MJCS site from 7:00 AM to 9:30 AM and from 1:30 PM to 7:00 PM on Tuesday, September 25, 2018 (the trip generation study date). The traffic volume count/time gap worksheets have also been included as part of Attachment E. As shown in Attachment E, there are sufficient gaps in the directional Pacific Coast Highway traffic streams for anticipated future Project trips to be able to perform the required turning movements:

- Southbound (Outbound) Right-Turns: The anticipated number of southbound right-turning Project trips can be accommodated by the available gaps in westbound Pacific Coast Highway traffic during all 15-minute and hourly periods, including the maximum 15-minute and hourly southbound right-turn volumes of 15 trips (6:15 PM to 6:30 PM) and 29 trips (3:00 PM to 4:00 PM), respectively.

- Eastbound (Outbound) Merge Movements: The anticipated number of southbound left-turning Project trips (which could all conservatively become eastbound merge trips) can be accommodated by the available gaps in eastbound Pacific Coast Highway traffic during all 15-minute and hourly periods, including the maximum 15-minute and hourly eastbound merge volumes of 13 trips (6:15 PM to 6:30 PM) and 23 trips (6:00 PM to 7:00 PM), respectively.

- Southbound (Outbound) Left-Turns & Eastbound (Inbound) Left-Turns: Given that southbound (outbound) left-turn movements from the MJCS driveway to the center two-way left turn lane conflict with eastbound (inbound) left-turn movements from the center two-way left-turn lane to the Project driveway, these Project trips were summed for a combined time gap analysis. The anticipated total number of southbound and eastbound left-turning Project trips can be accommodated by the available gaps in westbound Pacific Coast Highway traffic during all 15-minute and hourly periods, including the maximum 15-minute and hourly combined southbound/eastbound left-turn volumes of 19 trips (9:00 AM to 9:15 AM) and 52 trips (3:00 PM to 4:00 PM).

Based on the above analysis, it appears that all future Project trips will have an adequate number and duration of gaps in the westbound and eastbound Pacific Coast Highway traffic streams to complete inbound and outbound turning/merge maneuvers.

The final component of this comment response relates to potential left-turn movement restrictions at the MJCS driveway intersection with Pacific Coast Highway, and what the ramifications of those restrictions would be to local surface street operations. As a first step of evaluating potential access changes to Pacific Coast Highway at the MJCS driveway, a review was performed of the Pacific Coast Highway Safety Study: Final Report (City of Malibu, approved by City Council on June 22, 2015) [the "PCH Safety Study"], which provided a detailed summary of existing traffic/safety conditions and a list of general and specific improvement recommendations for enhancing roadway safety on Pacific Coast Highway.

The PCH Safety Study includes recommendations for over one hundred safety improvements, ranked based on priority, for Pacific Coast Highway throughout the City. None of these recommendations relates specifically to the MJCS driveway intersection on Pacific Coast Highway or more generally to the site-adjacent segment of Pacific Coast Highway with the center two-way left-turn lane. Therefore, in a complete study of Pacific Coast Highway throughout the City, no safety concerns (of priority) have been identified along the subject portion of the roadway based on existing traffic levels.

The PCH Safety Study identifies vehicles making u-turns at midblock locations (related to parking) as a common collision type at unsignalized locations on Pacific Coast Highway. The institution of inbound and/or outbound left-turn restrictions at the MJCS driveway intersection could result in an increase in u-turn maneuvers on Pacific Coast Highway in the direct vicinity of the MJCS driveway. With an outbound left-turn restriction, a motorist exiting the MJCS wishing to travel eastbound on Pacific Coast Highway would have to turn right onto westbound Pacific Coast Highway and travel approximately 1.5 miles to perform a u-turn legally at a roadway intersection (Corral Canyon Road). With an inbound left-turn restriction, an eastbound motorist destined for the MJCS site would have to continue eastward on Pacific Coast Highway past the MJCS driveway, and by John Tyler Drive and Malibu Canyon Road (where no u-turns are allowed), to perform a legal u-turn maneuver at Webb Way. Webb Way is also approximately 1.5 miles from the MJCS driveway. Thus, for inbound/outbound MJCS motorists wishing to turn left for access/egress, restrictions would add approximately three additional miles of travel on Pacific Coast Highway to the journey. The onerous nature of this added highway travel would make more attractive the option to perform u-turns immediately before entering or after exiting the MJCS driveway via the center two-way left-turn lane. Therefore, left-turn restrictions at the MJCS driveway intersection with Pacific Coast Highway could have potentially adverse secondary impacts on safety related to increased u-turn maneuvers.

The PCH Safety Study also notes the controversial nature of left-turn prohibitions on Pacific Coast Highway, and recommends that (left-turn restricting) raised medians be limited to locations with collision histories, pedestrian benefits, or roadway speeds requiring management. The recent collision history of the MJCS-adjacent segment of Pacific Coast Highway illustrated that there were no reported collisions involved turning movements into or out of the MJCS driveway. Pedestrian volumes on Pacific Coast Highway in the MJCS vicinity are extremely low. Additionally, the design speed of Pacific Coast Highway (58 to 59 MPH) falls within the range of vehicular design speeds expected for Conventional Highways in a Rural setting with Rolling terrain (50-60 MPH) per the Caltrans HDM. Therefore, based on the City-approved PCH Safety Study recommendations, left-turn restricting raised medians would not be appropriate for the MJCS driveway intersection with Pacific Coast Highway.

In summary, the results of the supplemental transportation analyses (sight distance analysis, time gap analysis, left-turn restriction analysis) indicate that continued operation of the MJCS driveway at Pacific Coast Highway as a full-access facility is acceptable. Therefore, no left-turn restrictions are recommended for implementation as part of the Project.

The responses to the City comment memorandum, detailed above, were transmitted to the City via a response letter dated March 25, 2019. City staff responded to this letter with additional comments in a second Public Works Review for Traffic memorandum dated June 11, 2019 (see Attachment F). Crain & Associates has conducted a review of the second City comment memorandum and revised the March 25, 2019 response letter based on the City's comments. The revisions to the response letter are as follows:

June 11, 2019 – Nicole Benyamin, Assistant Civil Engineer, Public Works Department

1. In this comment, the City has requested the preparation of conceptual traffic management plans for pick-up and drop-off activities within the Project's surface parking lot. The conceptual traffic management plans, included as Attachment G, were prepared in accordance with the measures for the student drop-off and pick-up traffic management plan as described in the transportation analysis technical letter dated October, 24, 2018.

2. This comment requests a revision to the narrative regarding corner sight distance provided in the response letter. This response letter has been revised based on the comments provided by the City.

Please let me know if you have any questions or comments.

Sincerely,

Ryan J. Kelly, T.E.
Transportation Engineer
TR 2547

RK:dh
C22487R

TABLE 1

TABLE 1

MALIBU JEWISH CENTER & SYNAGOGUE (24855 PACIFIC COAST HIGHWAY, CITY OF MALIBU)
EMPIRICAL WEEKDAY TRIP GENERATION STUDY RESULTS AND PROPOSED PROJECT TRIP GENERATION ESTIMATES[1]

Land Use	Pre-School Intensity[2]	Youth Religious Intensity[3]	AM Peak Hour[4] In	AM Peak Hour[4] Out	AM Peak Hour[4] Total	PM Peak Hour[5] In	PM Peak Hour[5] Out	PM Peak Hour[5] Total
Trip Generation Rates								
Pre-School and Youth Religious Programs	1 stu	1 stu	83%	17%	0.86	36%	64%	0.27
Trip Generation Summary								
Description	**Size**	**Size**	**AM Peak Hour In**	**AM Peak Hour Out**	**AM Peak Hour Total**	**PM Peak Hour In**	**PM Peak Hour Out**	**PM Peak Hour Total**
PROPOSED USES								
Pre-School and Youth Religious Programs	45 stu	100 stu	32	7	39	10	17	27
Proposed Project Trips			**32**	**7**	**39**	**10**	**17**	**27**
EXISTING USES								
Pre-School and Youth Religious Programs	14 stu	52 stu	10	2	12	5	9	14
Existing Project Trips			**10**	**2**	**12**	**5**	**9**	**14**
Net Project Trips			**22**	**5**	**27**	**5**	**8**	**13**

Notes:
1) Based on traffic volume data collected and student attendance levels at the Project site on Tuesday, September 25, 2018.
2) stu = Pre-School students.
3) stu = After-School Youth Religious students.
4) AM peak hour of generator during 7:00 AM to 9:00 AM period.
5) PM peak hour of generator during 4:00 PM to 6:00 PM period.

ATTACHMENT A

CRAIN & ASSOCIATES
Transportation Planning / Traffic Engineering

EMAIL TRANSMITTED

October 24, 2018

Nicole Benyamin
Assistant Civil Engineer
City of Malibu
23825 Stuart Ranch Road
Malibu, CA 90265

RE: Malibu Jewish Center & Synagogue Expansion Project Transportation Analysis
24855 Pacific Coast Highway, City of Malibu

Dear Nicole,

Background

The Malibu Jewish Center & Synagogue (MJCS) is proposing to upgrade their facilities located at 24855 Pacific Coast Highway in the City of Malibu [the "City"]. The upgrades will include the demolition of on-site structures, erection of a new multi-function building, and expansion of the currently provided educational programs [the "Project"]. Crain & Associates has prepared this technical letter in order to help the City determine if the Project could have potentially significant transportation impacts requiring further analysis. Prepared per the City *Traffic Impact Analysis Guidelines* (City of Malibu, August 2012) [the "TIA Guidelines"] and in coordination with City Public Works/Engineering Department staff, this technical letter provides Project trip generation estimates and an assessment of potential trip-related impacts to the local surface street system, an evaluation of site access/egress and safety concerns, and a discussion of student drop-off and pick-up traffic management.

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Project Description

The existing MJCS uses consist of a 5,305 gross square-foot synagogue (with chapel and ancillary components) and a grouping of four modular structures (5,775 gross square feet) that serve as the school and administrative office space. The site provides 83 parking spaces, which include 55 standard, 12 standard tandem, 12 compact, and 4 ADA-compliant spaces. In conjunction with construction of the Project, the four modular structures will be removed.

The proposed Project will consist of the construction of a new two-story, 23,244 gross square-foot multi-function building composed of administrative offices, pre-school and religious classrooms, and a new chapel. The existing synagogue chapel will remain on the site for occasional special services and events. The Project will provide a future parking supply of 108 marked parking spaces, which was determined to be adequate for the anticipated parking demands of the Project per the *Updated Parking Demand Study for Malibu Jewish Center & Synagogue* (Overland Traffic Consultants, August 24. 2017). The conceptual site plan for the Project is presented in Figure 1. As shown, the Project will continue to take access from Pacific Coast Highway via a single driveway located at the westerly end of the Project site. Under the future scenario, the driveway will provide connections to both the reconfigured surface parking lot and the new subterranean parking structure located in the basement of the multi-function building.

The MJCS synagogue and educational facilities do not operate concurrently and will not do so under future conditions. The synagogue use occurs mainly on Friday evenings and on weekends. In contrast, the educational uses are active throughout the week. The pre-school program currently operates Monday through Friday, between the hours of 9:00 AM and 3:00 PM. The after-school youth religious program operates on Tuesdays, from 3:45 PM to 6:15 PM. The adult education program presently meets once every week or two, between the hours of 7:00 PM and 9:00 PM. Under the future Project condition, the pre-school and youth religious programs will follow the same schedule. The adult education program may be extended to provide classes on two nights per week, Wednesday and Thursday, during the same hours (7:00 PM to 9:00 PM).

The existing MJCS and future Project student enrollment levels for the three educational programs are as follows:

Educational Program	Current Student Enrollment	Proposed Student Enrollment
Pre-School Program	25	70
After-School Youth Religious Program	62	100
Adult Education Program	25	50

Project Trip Generation

Per City TIA Guidelines, there are trip generation thresholds for proposed development projects beyond which a formal transportation impact analysis is required (i.e., 30 or more new trips during the weekday AM or PM peak hour; 300 or more new daily trips). The weekday AM and PM commute peak periods occur from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively, on a typical weekday -- defined as a Tuesday, Wednesday, or Thursday. Per discussions with City staff, the Project trip generation estimates should be based on regular activity occurring on typical weekdays. Per the schedule outlined in the previous section, the Project's educational components that would regularly contribute traffic volumes to the peak periods on typical weekdays are related to the pre-school program and, once a week, the after-school youth religious program.

As a first step in determining the Project's trip generation estimates, land use codes and trip generation rates were reviewed in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition, 2017). The land use code in the manual that would best represent the abovementioned educational components of the Project is ITE Land Use Code (LUC) 565 – Day Care Center. As shown in the manual's LUC 565 description included in Attachment A, the ITE defines a day care center as "a facility where care for pre-school age children is provided, normally during the daytime hours. Day care facilities generally include classrooms, offices, eating areas and playgrounds. Some centers also provide after-school care for school-age children." This description is very similar to the Project's pre-school and youth religious school programs.

However, under the Additional Data section of the LUC 565 description, the manual describes the highest day care center traffic volumes occurring during the weekday AM and PM hours of 7:15 AM to 8:15 AM and 4:45 PM to 5:45 PM, respectively. Each of these peak hours occurs entirely within its respective typical weekday commute peak period. Given the schedules of the MJCS pre-school program (9:00 AM to 3:00 PM) and after-school youth religious program (3:45 PM to 6:15 PM), the Project is not expected to generate its highest traffic volumes during the typical weekday AM and PM commute peak periods of 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. Therefore, in order to determine better the trip-making characteristics of the Project, an empirical trip generation study was performed at the existing MJCS site on a typical Tuesday, when both the pre-school and youth religious school were active.

The study was performed on Tuesday, September 25, 2018, between the hours of 7:00 AM and 9:30 AM and between 1:30 PM and 7:00 PM. As part of the study, all traffic entering and exiting the MJCS site was observed at the site driveway intersection with Pacific Coast Highway. These observation hours include the typical AM and PM commute peak periods and the periods when the MJCS site is expected to be most active. The intersection count data sheets are provided in Attachment B. As shown in Attachment B, the AM peak hour of adjacent street traffic occurred from 7:15 AM to 8:15 AM and the PM peak hour of adjacent street traffic occurred from 4:00 PM to 5:00 PM.

As summarized under the existing uses in Table 1, the existing MJCS pre-school and youth religious programs were shown to generate 1 trip (1 inbound, 0 outbound) and 14 trips (5 inbound, 9 outbound) during the weekday AM and PM peak hours of adjacent street traffic, respectively. The existing uses were shown to generate higher levels of trips during off-peak hours based on the educational program scheduling, with the highest AM site generation occurring from 8:30 AM to 9:30 AM (28 trips), highest afternoon site generation from 3:00 PM to 4:00 PM (48 trips), and highest PM site generation from 5:30 PM to 6:30 PM (40 trips).

The existing use traffic volumes observed during the weekday AM and PM peak hours of adjacent street traffic were used to develop trip generation rates (and directional splits) for the pre-school and youth religious school operations. The AM peak-hour trip rate was developed with pre-school students as the independent variable, given that all trip activity at that hour is related to pre-school operation. However, the PM peak-hour trip rate was developed with after-school youth religious students as the independent variable, given that most, if not all, trip activity after 4:00 PM is related to the youth religious program.

By applying the trip generation rates derived in Table 1, AM and PM peak-hour trips were calculated for the Project uses. Once completed and operational, the Project is expected to generate approximately 3 AM peak-hour trips (3 inbound, 0 outbound) and 23 PM peak-hour trips (8 inbound, 15 outbound). Thus, the Project will have net trip generation estimates of 2 AM peak-hour trips and 9 PM peak-hour trips. These net Project trip estimates fall well below the City TIA Guidelines thresholds requiring the preparation of a formal transportation impact analysis (30 or more peak-hour trips). Therefore, Project-related traffic impacts to neighboring intersections and roadway segments are expected to be less-than-significant.

Site Access/Egress and Safety Concerns

Per the request of the City Public Works/Engineering Department staff, an evaluation of site access/egress and safety was conducted for the Project's driveway intersection with Pacific Coast Highway. As a first step, existing conditions were assessed based on the traffic volume count data and queuing data collected on Tuesday, September 25, 2018 (see Attachment B). The traffic volume count data were reviewed previously. The queuing conditions for all movements entering and exiting the MJCS site are detailed in Tables 2 through 13, with a summary provided below:

	Queue Length (vehicles)					
	Weekday Morning Period[1]		Weekday Afternoon Period[2]		Weekday Evening Period[3]	
Location/Turning Movement	95th %-ile	Max	95th %-ile	Max	95th %-ile	Max
PCH Eastbound Left-Turn Inbound	0	1	1	1	1	1
PCH Westbound Right-Turn Inbound	0	0	0	0	0	0
MJCS Driveway Southbound Outbound	1	1	1	2	1	3
PCH Eastbound Merge from TWLTL[4]	0	0	0	1	0	1

Notes
[1] Weekday morning period from 7:00 AM to 9:30 AM.
[2] Weekday afternoon period from 1:30 PM to 4:00 PM.
[3] Weekday evening period from 4:00 PM to 7:00 PM.
[4] TWLTL = center two-way left-turn lane on PCH.

As shown in the above table, the existing queues for vehicles entering and exiting the MJCS site are minimal. Only the MJCS driveway southbound (outbound) movement exhibited a maximum queue length exceeding one vehicle during any time period, and it still maintained a 95th percentile vehicle queue length of one vehicle during all analyzed time periods. These short queues are likely due to the abundance of gaps in traffic provided along Pacific Coast Highway at the MJCS driveway location. Although Pacific Coast Highway maintains healthy eastbound and westbound traffic volumes in the vicinity of the site, the presence of traffic signals east and west of the MJCS site (at John Tyler Drive, under 0.5 miles east, and at Corral Canyon Road, under 1.5 miles west) allows for the proper platooning of vehicles.

As such, queue-related impacts are not expected under the future Project scenario for eastbound left-turns into the site from PCH, westbound right-turns into the site from PCH, or eastbound merges onto PCH from the center two-way-left-turn lane for outbound motorists. However, as shown in Figure 1, the future Project driveway will provide queue storage for only approximately four vehicles before the driveway meets the Project surface parking lot. Therefore, during periods of highest Project trip activity (i.e., during student drop-off and pick-up), a traffic management plan will have to be implemented. This plan will be discussed further in a later section.

As a second step to evaluating site access/egress and safety, an accident analysis of the portion of Pacific Coast Highway including the MJCS driveway was performed. The recent collision history of Pacific Coast Highway was analyzed from Post Mile 48.92 to Post Mile 49.00, utilizing accident data provided by the State of California Department of Transportation ["Caltrans"]. This evaluation examined whether the existing full-access driveway intersection (with allowed right-turns inbound, left-turns inbound, right-turns outbound, and left-turns outbound utilizing the center two-way left-turn lane before merging with eastbound Pacific Coast Highway traffic) experienced a statistically significant number of collisions with patterns related to the intersection geometrics and allowed turning movements.

Accident data for the aforementioned segment of Pacific Coast Highway were requested and received from the Caltrans Traffic Investigations unit. For this location, accident data were reviewed for the six-year period from January 1, 2011 to December 31, 2016. The six-year accident rate summary table and accident detail summary are provided in Attachment C, along with a more user-friendly summary of the accidents that occurred at this location. The following describes the results of the accident analysis.

As shown in Attachment C, the segment of PCH including the MJCS driveway experienced a total of four accidents during the six-year period. With only four accidents, the fatal, fatal plus injury, and total accident rates for this location (0.000, 0.53, and 0.70 accidents per million vehicle miles, respectively) were all lower than their corresponding State average rates (0.011, 0.60, and 1.41 accidents per million vehicle miles, respectively). Therefore, the MJCS driveway intersection with Pacific Coast Highway would not be considered a high-accident location.

A review of the accident details shows the first accident (June 8, 2011) involved a passenger vehicle entering westbound (northbound) Pacific Coast Highway traffic from the shoulder that broadsided another vehicle traveling westbound (northbound) in the right lane. The second accident (August 6, 2013) involved a bicycle traveling westbound (northbound) within the Pacific Coast Highway right shoulder area that collided with a parked vehicle. The third accident (January 13, 2015) involved a westbound (northbound) passenger vehicle merging into the left lane and rear-ending another westbound (northbound) motorist. The fourth accident (April 4, 2016) involved a passenger vehicle entering eastbound (southbound) Pacific Coast Highway traffic from the shoulder that sideswiped another vehicle traveling eastbound (southbound) in the left lane. As described, none of these collisions involved turning movements in and out of the MJCS driveway. With no collisions at this location over the six-year period, it would appear that the intersection functions safely under a full-access configuration (all left- and right-turn movements in/out). Therefore, based on a review of existing queuing and recent accidents, full access is proposed under the future Project scenario.

Student Drop-Off & Pick-Up Traffic Management

As required by City Public Works/Engineering Department staff, the Project shall provide a well-defined student drop-off and pick-up traffic management plan for the weekday morning and afternoon peak periods. While the existing MJCS operates safely and efficiently during the weekday peak periods without a defined traffic management plan, the pre-school student enrollment will be expanding from 25 to 70 students and the after-school youth religious program student enrollment will be expanding from 62 to 100 students. As discussed in the above queuing analysis, that student enrollment increase will result in longer vehicle queues for vehicles exiting the Project via the site driveway. Implementation of a student drop-off and pick-up traffic management plan, reviewed and approved by City staff, will reduce the likelihood that vehicle queues extending from the Project driveway will affect operations within the Project's surface parking lot (and reduce the likelihood that operations within the Project's surface parking lot will affect operations at the driveway intersection with Pacific Coast Highway). The student drop-off/pick-up traffic management plan will likely include measures such as the following:

- All faculty and staff of the Project, who typically arrive earlier than parents with students, will be directed to park in the 28-space subterranean lot located under the new multi-function building;

- Weekday morning pre-school drop-off: Parents dropping off pre-school age children tend to park their vehicles when arriving on site and walk their children into the school. These vehicles will enter the site via the Project driveway and head east along the drive aisle through the surface parking lot. The vehicles will pass through the surface lot, utilize the cul-de-sac at the easterly end of the lot to turn around, and head west back through the surface lot. Parents will be directed first to utilize parking spaces on the north side of the surface lot, near the entrance to the multi-function building (middle of the surface lot). As more vehicles arrive, parents will be directed to occupy parking spaces on the north side of the surface lot extending easterly from the multi-function building. If all of these north-side parking spaces become occupied, parents will then be directed to utilize parking spaces on the south side of the lot, beginning with the easterly spaces near the cul-de-sac and extending westerly. The purpose of occupying the parking spaces on the east side of the surface lot first is to keep the drive aisle free of potential vehicle conflicts on the west side of the surface lot (to the extent feasible). This will reduce the chance of outbound motorist vehicle queues extending from the site driveway into the surface parking lot and interfering with vehicles utilizing north-side spaces. This will also reduce the chance of vehicles maneuvering in/out of south-side spaces from affecting the inbound flow of vehicles from Pacific Coast Highway.

- Weekday afternoon pre-school pick-up: Parents picking up pre-school age children will follow a similar pattern to their morning drop-off, parking their vehicles within the surface lot and walking into the school to retrieve their children. These vehicles will maneuver through the surface parking lot as described above and utilize parking spaces on the east side of the surface lot, first on the north side and then the south side. This will again limit the probability of interference between vehicles parking within the lot and inbound/outbound traffic from/to Pacific Coast Highway.

- Weekday afternoon after-school youth religious school drop-off: Parents dropping off youth religious school age children tend not to park their vehicles and walk their children into the school. Instead, the drop-offs usually occur at the vehicle. Therefore, these vehicles will enter the site via the Project driveway and head east along the drive aisle through the surface parking lot. The vehicles will pass through the surface lot, utilize the cul-de-sac at the easterly end of the lot to turn around, and head west back through the surface lot to its westerly end (close to the site driveway), stop, and perform the drop-off. Vehicles will stack behind the lead vehicle in the westbound drive aisle lane to drop off, with stopped vehicles extending easterly through lot, around the cul-de-sac, and potentially then along the eastbound drive aisle back toward the site driveway. Given the length of the drive aisle and the radius of the cul-de-sac, there will be adequate storage length to handle all drop-offs associated with the after-school youth religious program. As vehicles at the front of the queue complete their drop-offs, they will then continue forward to the site driveway to exit the MJCS site. With no parents parking their vehicles under this scenario, there is no chance that turning maneuvers in/out of parking spaces will affect inbound/outbound traffic from/to Pacific Coast Highway.

- Weekday evening after-school youth religious school pick-up: Parents picking up youth religious school age children will follow the same pattern as the afternoon drop-off.

- The school shall assign individuals as traffic monitors to facilitate the student drop-off/pick-up circulation plans. The traffic monitors will direct traffic from the MJCS site driveway and through the surface lot, as described above. They will ensure that traffic entering the site does not queue onto or block Pacific Coast Highway, and that traffic moves as smoothly as possible during the drop-off and pick-up periods. In addition, the traffic monitors will assist with the unloading and loading of students from and into personal vehicles (as necessary).

- Prior to the beginning of each fall semester, the MJCS shall contact parents/guardians via mail/email, notifying them of all rules regarding student drop-off/pick-up activities.

Conclusions

Per the above analysis, we recommend that the Project maintain its existing educational program schedule. However, if there must be schedule changes, we recommend that those changes result in fewer Project trips during the weekday AM and PM peak periods (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively). In doing so, the Project will contribute net traffic volumes to the local area street system that fall below the thresholds requiring a formal traffic impact analysis, per City TIA Guidelines. The accident analysis indicated that the existing MJCS site driveway intersection with Pacific Coast Highway functions safely as a full-access (left- and right-turns in/out) facility. Therefore, the same full-access configuration is recommended for the Project. The queuing results indicated that queuing is presently minimal for turning/merging movements from/on Pacific Coast Highway, given the abundance of gaps in the eastbound and westbound traffic streams. However, the presently manageable queuing of outbound motorists using the site driveway will extend further into the MJCS site under the future Project condition. Therefore, it is recommended that a formal student drop-off/pick-up traffic management plan be prepared to ensure that inbound/outbound traffic flows smoothly and site operations do not affect traffic on Pacific Coast Highway.

Please contact me if you have any questions. We look forward to receiving feedback from the City and a determination of what additional transportation analysis will be required for the Project.

Sincerely,

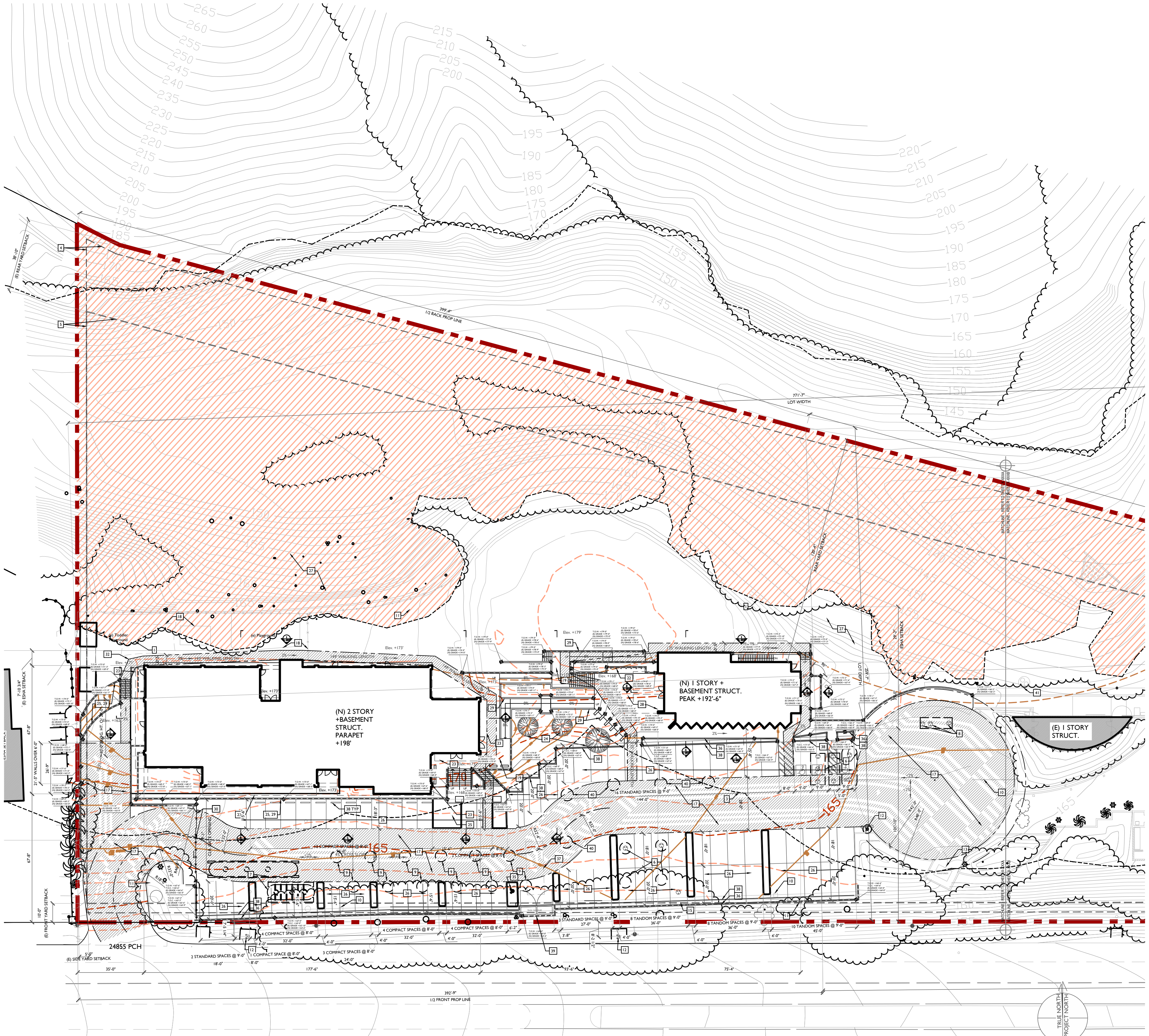
Ryan J. Kelly, T.E.
Senior Transportation Engineer
TR 2547

RK
C22431

FIGURES

Figure 1

Conceptual Project Site Plan



SITE PLAN 1/16" = 1'-0" A

Key

- Property Line
- Utility Easement
- Yard Setback
- ESHA, as described in Bio Resources Assesment, 9/2014
- ESHA Setback
- Existing Structure, to remain
- Above
- Existing, to remain
- Proposed
- Vegetation
- Exisiting Grade
- Existing Grade, to be adjusted
- Proposed Grade
- Proposed Fire Access Lane, MAX 150'
- (E) Fire Access Lane
- Permeable Paving

General Notes

1. SUSTAINABLE FEATURES: PLANTED ROOF: SEE LANDSCAPE DRAWINGS

2. WHERE SECURITY GATES ARE PROVIDED, MAINTAIN A MINIMUM ACCESS WIDTH OF 28 FEET. THE SECURITY GATE SHALL BE PROVIDED WITH AN APPROVED MEANS OF EMERGENCY OPERATION, AND SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES AND REPLACED OR REPAIRED WHEN DEFECTIVE. ELECTRIC GATE OPERATORS, WHERE PROVIDED, SHALL BE LISTED IN ACCORDANCE WITH UL 325. GATES INTENDED FOR AUTOMATIC OPERATION SHALL BE DESIGNED, CONSTRUCTED AND INSTALLED TO COMPLY WITH THE REQUIREMENTS OF ASTM F2200. GATES SHALL BE OF THE SWINGING OR SLIDING TYPE. CONSTRUCTION OF GATES SHALL BE OF MATERIALS THAT ALLOW MANUAL OPERATION BY ONE PERSON. FIRE CODE 503.6

3. THE REQUIRED FIRE FLOW FOR HYDRANTS AT THIS LOCATION IS 2000 GPM, AT 20 PSI RESIDUAL PRESSURE, FOR A DURATION OF 2 HOURS OVER AND ABOVE MAXIMUM DAILY DOMESTIC DEMAND. FIRE CODE 506.3 AND APPENDIX B.
THE REQUIRED FIRE FLOW IS BASED ON THE FOLLOWING CALCULATION:
TYPE OF CONSTRUCTION PER THE BUILDING CODE: TYPE III-A
FIRE FLOW CALCULATION AREA: 36,273 SQ. FT.
FIRE FLOW BASED ON THE FIRE FLOW CALCULATION AREA: 2750 GPM
REDUCTION FOR FIRE SPRINKLERS (MAX. 50%): 750 GPM
TOTAL FIRE FLOW REQUIRED: 2000GPM

3. PROVIDE AN APPROVED AUTOMATIC FIRE SPRINKLER SYSTEM AS SET FORTH BY BUILDING CODE 903 AND FIRE CODE 903. PLANS SHALL BE SUBMITTED TO THE SPRINKLER PLAN CHECK UNIT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. REASON: FIRE CODE 903.1, FIRE FLOW REDUCTION, POSSIBLY BUILDING CODE 903. TYPE OF SPRINKLER SYSTEM PER 903.3.1.1, 903.3.1.2, 903.3.1.3

Keynotes

1. ESHA LINE.
2. X.
3. 100' ESHA SETBACK.
4. UTILITY EASEMENT.
5. YARD SETBACK, SEE CALCULATION, G-001.
6. (E) SUBSURFACE SEPTIC TREATMENT, TO REMAIN.
7. (N) SUBSURFACE SEPTIC TREATMENT.
8. (E) SUBSURFCAE GREASE TRAP, TO REMAIN.
9. (N) SUBSURFACE SEEPAGE PITS.
10. (E) ONSITE SURFACE WATER DRAIN, TO REMAIN.
11. (N) ONSITE SURFACE WATER DRAIN.
12. (E) FIRE HYDRANT 6"X4"X2-1/2".
13. (E) INFRASTRUCTURE, TO REMAIN.
14. (N) UTILITY YARD.
15. (E) LIGHT POLE, TO REMAIN.
16. (N) LIGHT POLE.
17. FIRE LANE.
18. (E) SITE ELEMENTS.
19. (N) WALKWAY, SEE CIVIL, LANDSCAPE.
20. (N) STRUCTURE.
21. DEMO (E) STRUCTURE.
22. WATER FEATURE.
23. ROOF OVERHANG ABOVE.
24. (E) VEGETATION, SEE BIOLOGICAL RESOURCES REPORT, 9-2014.
25. (N) LANDSCAPING, SEE LANDSCAPE.
26. PARKING STRIPING
27. (E) GRADE
28. AREA TO BE REGRADED
29. (N) SITE WALLS
30. (N) AUTOMATIC SWINGING, SLIDING GATE W/ F.D. ACCESS VIA KNOX BOX KEYED ACCESS, AND AUTOMATIC RELEASE/ MANUAL OPERATION WHEN POWER IS INTERRUPTED
31. (N) DRIVEWAY
32. F.D. ACCESS WALKING PATH
33. PEDESTRIAN DROP-OFF
34. POWER POLE. LINE VOLTAGE 16KV TOTAL.
35. RELOCATED ON-SITE FIRE HYDRANT 6"X4"X2-1/2"
ALL FIRE HYDRANTS SHALL MEASURE 6"X4"X2-1/2", BRASS OR BRONZE, CONFORMING TO AMERICAN WATER WORKS ASSOCIATION STANDARD C503, OR APPROVED EQUAL, AND SHALL BE INSTALLED IN ACCORDANCE WITH THE COUNTY OF LOS ANGELES FIRE DEPARTMENT REGULATION 8.
ALL ON-SITE FIRE HYDRANTS SHALL BE INSTALLED, TESTED AND APPROVED PRIOR TO BUILDING OCCUPANCY. FIRE CODE 901.5.1
PLANS SHOWING UNDERGROUND PIPING FOR PRIVATE ON-SITE FIRE HYDRANTS SHALL BE SUBMITTED TO THE SPRINKLER PLAN CHECK UNIT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. FIRE CODE 901.2, COUNTY OF LOS ANGELES FIRE DEPARTMENT REGULATION 7
36. 30" HIGH PARKING LOT SCREEN WALL.
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38. CURB STOP.
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40. STORMWATER TREATMENT/ INFILATRATION PITS.
41. (E) STORMWATER TREATEMENT SYSTEM.

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Malibu Jewish Center & Synagogue
New School and Chapel

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APN: 4458-32-27
ADDRESS: 24855 Pacific Coast Highway
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ISSUED & REVISED

No.	Date	
	10/15/14	PLANNING SUBMITTAL
	09/17/15	LACoFD ACCESS SUBMITTAL
	11/07/16	PLANNING SUBMITTAL
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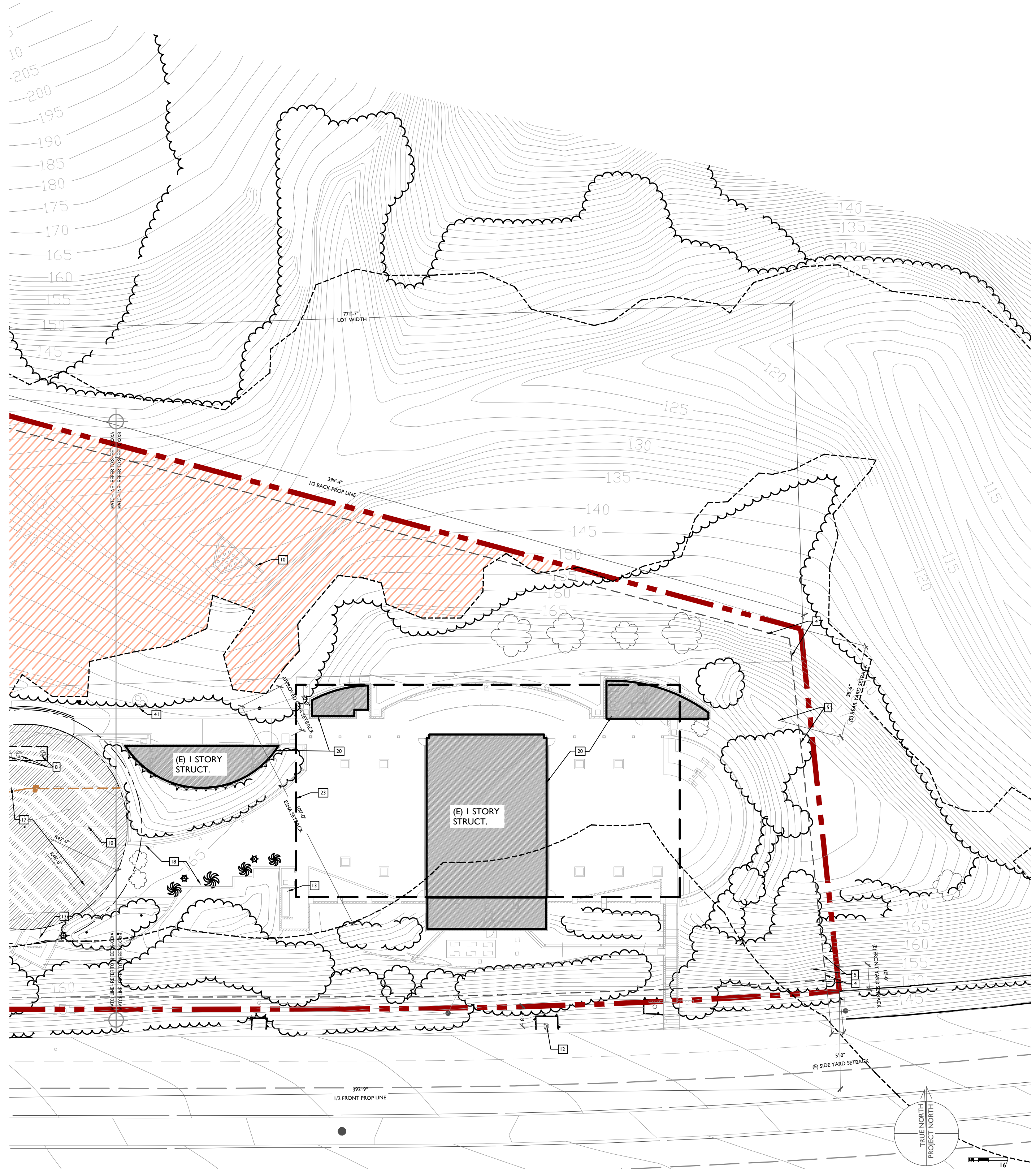
	04/17/18	PLANNING SUBMITTAL

NOT FOR CONSTRUCTION

SITE PLAN

PROJECT NO. 1403
DATE
FILE NAME .DWG
SCALE 1/16" = 1'-0"
SHEET NO.

A-101A



SITE PLAN | 1/16" = 1'-0" | B

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Malibu Jewish Center & Synagogue
New School and Chapel

OWNER: Malibu Jewish Center and Synagogue
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ADDRESS: 24855 Pacific Coast Highway
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ISSUED & REVISED

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NOT FOR CONSTRUCTION

SITE PLAN

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FILE NAME .DWG
SCALE 1/16" = 1'-0"
SHEET NO.

A-101B

TABLES

TABLE 1

MALIBU JEWISH CENTER & SYNAGOGUE (24855 PACIFIC COAST HIGHWAY, CITY OF MALIBU)
EMPIRICAL WEEKDAY TRIP GENERATION STUDY RESULTS AND PROPOSED PROJECT TRIP GENERATION ESTIMATES[1]

Land Use	Pre-School Intensity[2]	Youth Religious Intensity[3]	AM Peak Hour[4]			PM Peak Hour[5]		
			In	Out	Total	In	Out	Total
Trip Generation Rates								
Pre-School and Youth Religious Programs	1 stu	1 stu	100%	0%	0.04	36%	64%	0.23
Trip Generation Summary								
			AM Peak Hour			PM Peak Hour		
Description	**Size**	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
PROPOSED USES								
Pre-School and Youth Religious Programs	70 stu	100 stu	3	0	3	8	15	23
Proposed Project Trips			**3**	**0**	**3**	**8**	**15**	**23**
EXISTING USES								
Pre-School and Youth Religious Programs	25 stu	62 stu	1	0	1	5	9	14
Existing Project Trips			**1**	**0**	**1**	**5**	**9**	**14**
Net Project Trips			**2**	**0**	**2**	**3**	**6**	**9**

Notes:
1) Based on traffic volume data collected at the Project site on Tuesday, September 25, 2018.
2) stu = Pre-School students.
3) stu = After-School Youth Religious students.
4) AM peak hour of adjacent street traffic.
5) PM peak hour of adjacent street traffic.

Table 2

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

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Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 2

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 2

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 2

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	1
146	1
147	1
148	1
149	1
150	1
95th Percentile Queue	0
Maximum Queue	1

Notes

Vehicle queues observed in eastbound direction of center two-way left-turn lane of PCH entering the MJCS driveway during the AM period (7:00 to 9:30 AM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 3

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 3

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 3

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 3

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
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Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 3

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
95th Percentile Queue	0
Maximum Queue	0

Notes

Vehicle queues observed in westbound direction of PCH at the MJCS driveway during the AM period (7:00 to 9:30 AM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 4

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 4

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 4

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 4

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 4

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	1
144	1
145	1
146	1
147	1
148	1
149	1
150	1
95th Percentile Queue	1
Maximum Queue	1

Notes

Vehicle queues observed in southbound direction of the MJCS driveway at PCH during the AM period (7:00 to 9:30 AM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 5

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 5

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 5

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 5

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 5

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Morning Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
95th Percentile Queue	0
Maximum Queue	0

Notes

Vehicle queues observed in eastbound direction of center two-way left-turn lane of PCH having exited the MJCS driveway during the AM period (7:00 to 9:30 AM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 6

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 6

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 6

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 6

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 6

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
137	0
138	0
139	0
140	1
141	1
142	1
143	1
144	1
145	1
146	1
147	1
148	1
149	1
150	1
95th Percentile Queue	1
Maximum Queue	1

Notes

Vehicle queues observed in eastbound direction of center two-way left-turn lane of PCH entering the MJCS driveway during the afternoon period (1:30 to 4:00 PM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 7

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 7

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 7

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 7

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 7

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
95th Percentile Queue	0
Maximum Queue	0

Notes

Vehicle queues observed in westbound direction of PCH at the MJCS driveway during the afternoon period (1:30 to 4:00 PM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 8

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 8

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 8

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 8

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	1
130	1
131	1
132	1
133	1
134	1
135	1
136	1

Table 8

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
137	1
138	1
139	1
140	1
141	1
142	1
143	1
144	1
145	1
146	1
147	1
148	2
149	2
150	2
95th Percentile Queue	1
Maximum Queue	2

Notes

Vehicle queues observed in southbound direction of the MJCS driveway at PCH during the afternoon period (1:30 to 4:00 PM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 9

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 9

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 9

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 9

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 9

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Afternoon Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	1
147	1
148	1
149	1
150	1
95th Percentile Queue	0
Maximum Queue	1

Notes

Vehicle queues observed in eastbound direction of center two-way left-turn lane of PCH having exited the MJCS driveway during the afternoon period (1:30 to 4:00 PM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 10

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 10

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 10

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 10

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 10

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	0
153	0
154	0
155	0
156	0
157	0
158	0
159	0
160	0
161	0
162	0
163	0
164	0
165	0
166	0
167	0
168	1
169	1
170	1

Table 10

Study Location 1 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Left-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Left-Turn Inbound from PCH Center Left-Turn Lane (Vehicles)
171	1
172	1
173	1
174	1
175	1
176	1
177	1
178	1
179	1
180	1
95th Percentile Queue	1
Maximum Queue	1

Notes

Vehicle queues observed in eastbound direction of center two-way left-turn lane of PCH entering the MJCS driveway during the evening period (4:00 to 7:00 PM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 180 number-of-vehicle observations , the 95th percentile queue length is the 171st observation when those data are sorted in ascending order.

Table 11

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 11

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 11

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 11

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 11

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	0
153	0
154	0
155	0
156	0
157	0
158	0
159	0
160	0
161	0
162	0
163	0
164	0
165	0
166	0
167	0
168	0
169	0
170	0

Table 11

Study Location 2 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Westbound Right-Turn Inbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Westbound Right-Turn Inbound from PCH (Vehicles)
171	0
172	0
173	0
174	0
175	0
176	0
177	0
178	0
179	0
180	0
95th Percentile Queue	0
Maximum Queue	0

Notes

Vehicle queues observed in westbound direction of PCH at the MJCS driveway during the evening period (4:00 to 7:00 PM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 12

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 12

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 12

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 12

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 12

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	1
153	1
154	1
155	1
156	1
157	1
158	1
159	1
160	1
161	1
162	1
163	1
164	1
165	1
166	1
167	1
168	1
169	1
170	1

Table 12

Study Location 3 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
MJCS Driveway Southbound Left- and Right-Turns Outbound
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Southbound Outbound from MJCS Driveway (Vehicles)
171	1
172	1
173	1
174	1
175	1
176	2
177	2
178	2
179	2
180	3
95th Percentile Queue	1
Maximum Queue	3

Notes

Vehicle queues observed in southbound direction of the MJCS driveway at PCH during the evening period (4:00 to 7:00 PM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 150 number-of-vehicle observations , the 95th percentile queue length is the 143rd observation when those data are sorted in ascending order.

Table 13

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0

Table 13

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0

Table 13

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0

Table 13

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0

Table 13

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	0
153	0
154	0
155	0
156	0
157	0
158	0
159	0
160	0
161	0
162	0
163	0
164	0
165	0
166	0
167	0
168	0
169	0
170	0

Table 13

Study Location 4 - Pacific Coast Highway and Malibu Jewish Center & Synagogue Driveway
Pacific Coast Highway Eastbound Merge from Two-Way Left-Turn Lane
September 25, 2018 Empirical Queuing Study Results
Weekday Evening Period

Observation	Eastbound Merge from PCH Center Left-Turn Lane (Vehicles)
171	0
172	0
173	0
174	1
175	1
176	1
177	1
178	1
179	1
180	1
95th Percentile Queue	0
Maximum Queue	1

Notes

Vehicle queues observed in eastbound direction of center two-way left-turn lane of PCH having exited the MJCS driveway during the evening period (4:00 to 7:00 PM) on September 25, 2018.

Queue lengths were recorded in terms of number of vehicles every minute.

With 180 number-of-vehicle observations , the 95th percentile queue length is the 171st observation when those data are sorted in ascending order.

ATTACHMENTS

Attachment A

Institute of Transportation Engineers (ITE) *Trip Generation Manual*
Land Use Code 565 – Day Care Center – Description

Land Use: 565
Day Care Center

Description

A day care center is a facility where care for pre-school age children is provided, normally during the daytime hours. Day care facilities generally include classrooms, offices, eating areas and playgrounds. Some centers also provide after-school care for school-age children.

Additional Data

Time-of-day distribution data for this land use are presented in Appendix A. For the 21 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:45 and 5:45 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Florida, Georgia, Maryland, Minnesota, New Hampshire, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Tennessee, Texas, Virginia, and Wisconsin.

Source Numbers

169, 208, 216, 253, 335, 336, 337, 355, 418, 423, 536, 550, 562, 583, 633, 734, 866, 869, 877, 878, 954, 959, 981

Attachment B

Traffic Volume Count & Queuing Data Sheets

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH AM
Site Code : 16618708
Start Date : 9/25/2018
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

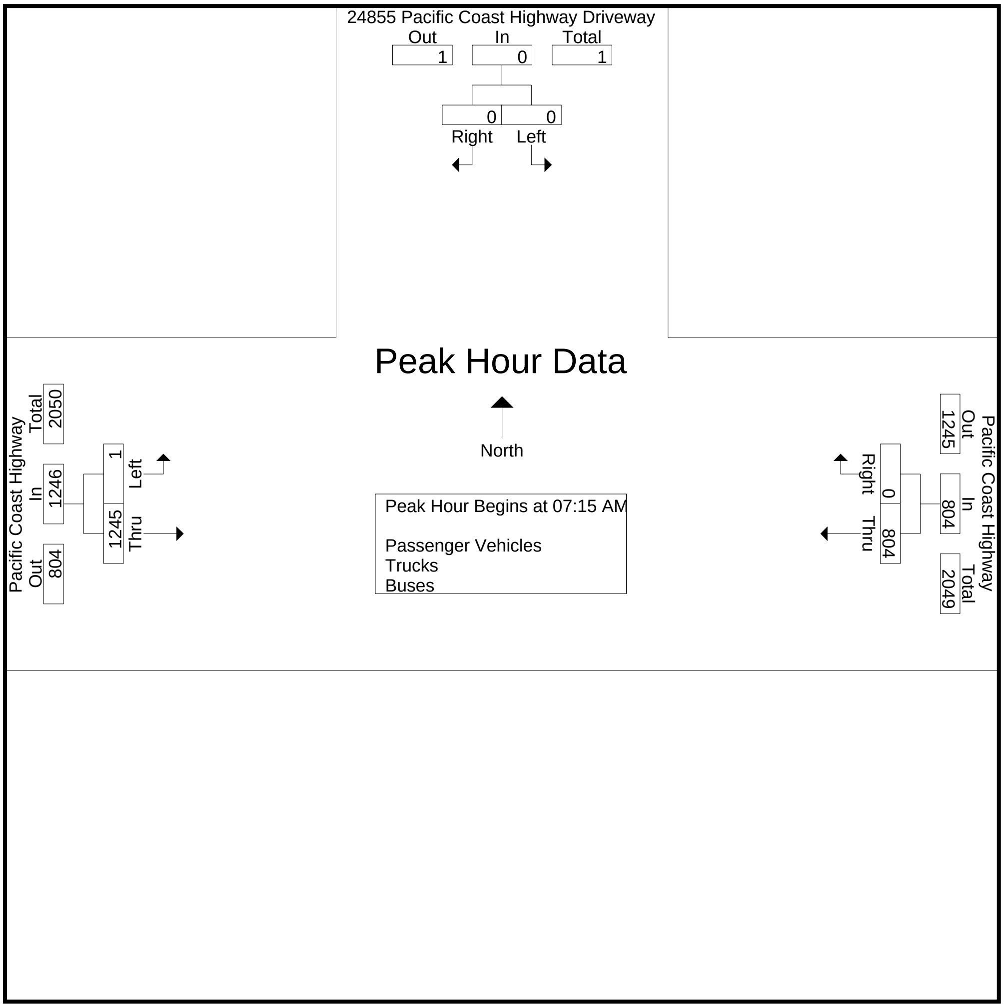
	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	176	0	176	0	309	309	485
07:15 AM	0	0	0	225	0	225	0	288	288	513
07:30 AM	0	0	0	204	0	204	0	295	295	499
07:45 AM	0	0	0	183	0	183	0	314	314	497
Total	0	0	0	788	0	788	0	1206	1206	1994
08:00 AM	0	0	0	192	0	192	1	348	349	541
08:15 AM	0	0	0	158	2	160	0	265	265	425
08:30 AM	0	0	0	235	3	238	0	281	281	519
08:45 AM	1	1	2	206	3	209	1	303	304	515
Total	1	1	2	791	8	799	2	1197	1199	2000
09:00 AM	0	0	0	208	2	210	6	279	285	495
09:15 AM	2	4	6	187	4	191	1	250	251	448
Grand Total	3	5	8	1974	14	1988	9	2932	2941	4937
Apprch %	37.5	62.5		99.3	0.7		0.3	99.7		
Total %	0.1	0.1	0.2	40	0.3	40.3	0.2	59.4	59.6	
Passenger Vehicles	3	5	8	1847	14	1861	9	2795	2804	4673
% Passenger Vehicles	100	100	100	93.6	100	93.6	100	95.3	95.3	94.7
Trucks	0	0	0	112	0	112	0	126	126	238
% Trucks	0	0	0	5.7	0	5.6	0	4.3	4.3	4.8
Buses	0	0	0	15	0	15	0	11	11	26
% Buses	0	0	0	0.8	0	0.8	0	0.4	0.4	0.5

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:15 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**225**		**225**				
07:30 AM	0	0	0	204	0	204	0	295	295	499
07:45 AM	0	0	0	183	0	183	0	314	314	497
08:00 AM	0	0	0	192	0	192	**1**	**348**	**349**	**541**
Total Volume	0	0	0	804	0	804	1	1245	1246	2050
% App. Total	0	0		100	0		0.1	99.9		
PHF	.000	.000	.000	.893	.000	.893	.250	.894	.893	.947

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH AM
Site Code : 16618708
Start Date : 9/25/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 09:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:30 AM			08:30 AM			07:15 AM		
+0 mins.	0	0	0	**235**	3	**238**	0	288	288
+15 mins.	1	1	2	206	3	209	0	295	295
+30 mins.	0	0	0	208	2	210	0	314	314
+45 mins.	**2**	**4**	**6**	187	**4**	191	**1**	**348**	**349**
Total Volume	3	5	8	836	12	848	1	1245	1246
% App. Total	37.5	62.5		98.6	1.4		0.1	99.9	
PHF	.375	.313	.333	.889	.750	.891	.250	.894	.893

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH AM
Site Code : 16618708
Start Date : 9/25/2018

Groups Printed- Passenger Vehicles

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	162	0	162	0	295	295	457
07:15 AM	0	0	0	203	0	203	0	276	276	479
07:30 AM	0	0	0	193	0	193	0	285	285	478
07:45 AM	0	0	0	173	0	173	0	303	303	476
Total	0	0	0	731	0	731	0	1159	1159	1890
08:00 AM	0	0	0	184	0	184	1	336	337	521
08:15 AM	0	0	0	144	2	146	0	256	256	402
08:30 AM	0	0	0	221	3	224	0	268	268	492
08:45 AM	1	1	2	196	3	199	1	277	278	479
Total	1	1	2	745	8	753	2	1137	1139	1894
09:00 AM	0	0	0	199	2	201	6	265	271	472
09:15 AM	2	4	6	172	4	176	1	234	235	417
Grand Total	3	5	8	1847	14	1861	9	2795	2804	4673
Apprch %	37.5	62.5		99.2	0.8		0.3	99.7		
Total %	0.1	0.1	0.2	39.5	0.3	39.8	0.2	59.8	60	

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**203**	0	**203**	0	276	276	479
07:30 AM	0	0	0	193	0	193	0	285	285	478
07:45 AM	0	0	0	173	0	173	0	303	303	476
08:00 AM	0	0	0	184	0	184	**1**	**336**	**337**	**521**
Total Volume	0	0	0	753	0	753	1	1200	1201	1954
% App. Total	0	0		100	0		0.1	99.9		
PHF	.000	.000	.000	.927	.000	.927	.250	.893	.891	.938

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City of Malibu
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH AM
Site Code : 16618708
Start Date : 9/25/2018
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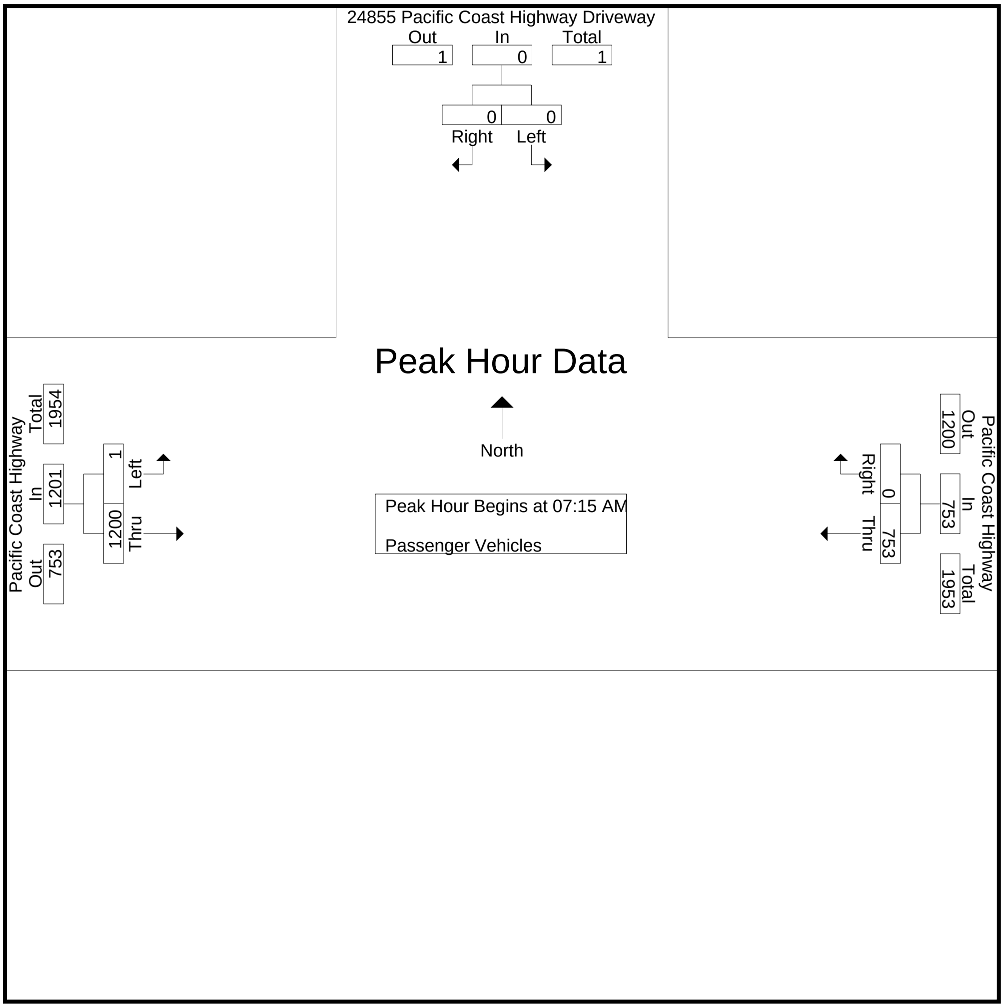

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	0	0	0	**203**	0	**203**	0	276	276
+15 mins.	0	0	0	193	0	193	0	285	285
+30 mins.	0	0	0	173	0	173	0	303	303
+45 mins.	0	0	0	184	0	184	**1**	**336**	**337**
Total Volume	0	0	0	753	0	753	1	1200	1201
% App. Total	0	0		100	0		0.1	99.9	
PHF	.000	.000	.000	.927	.000	.927	.250	.893	.891

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City of Malibu
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

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Groups Printed- Trucks

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	12	0	12	0	11	11	23
07:15 AM	0	0	0	19	0	19	0	12	12	31
07:30 AM	0	0	0	9	0	9	0	9	9	18
07:45 AM	0	0	0	8	0	8	0	9	9	17
Total	0	0	0	48	0	48	0	41	41	89
08:00 AM	0	0	0	8	0	8	0	11	11	19
08:15 AM	0	0	0	12	0	12	0	9	9	21
08:30 AM	0	0	0	13	0	13	0	12	12	25
08:45 AM	0	0	0	10	0	10	0	24	24	34
Total	0	0	0	43	0	43	0	56	56	99
09:00 AM	0	0	0	8	0	8	0	13	13	21
09:15 AM	0	0	0	13	0	13	0	16	16	29
Grand Total	0	0	0	112	0	112	0	126	126	238
Apprch %	0	0		100	0		0	100		
Total %	0	0	0	47.1	0	47.1	0	52.9	52.9	

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**19**	0	**19**	0	**12**	**12**	**31**
07:30 AM	0	0	0	9	0	9	0	9	9	18
07:45 AM	0	0	0	8	0	8	0	9	9	17
08:00 AM	0	0	0	8	0	8	0	11	11	19
Total Volume	0	0	0	44	0	44	0	41	41	85
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.579	.000	.579	.000	.854	.854	.685

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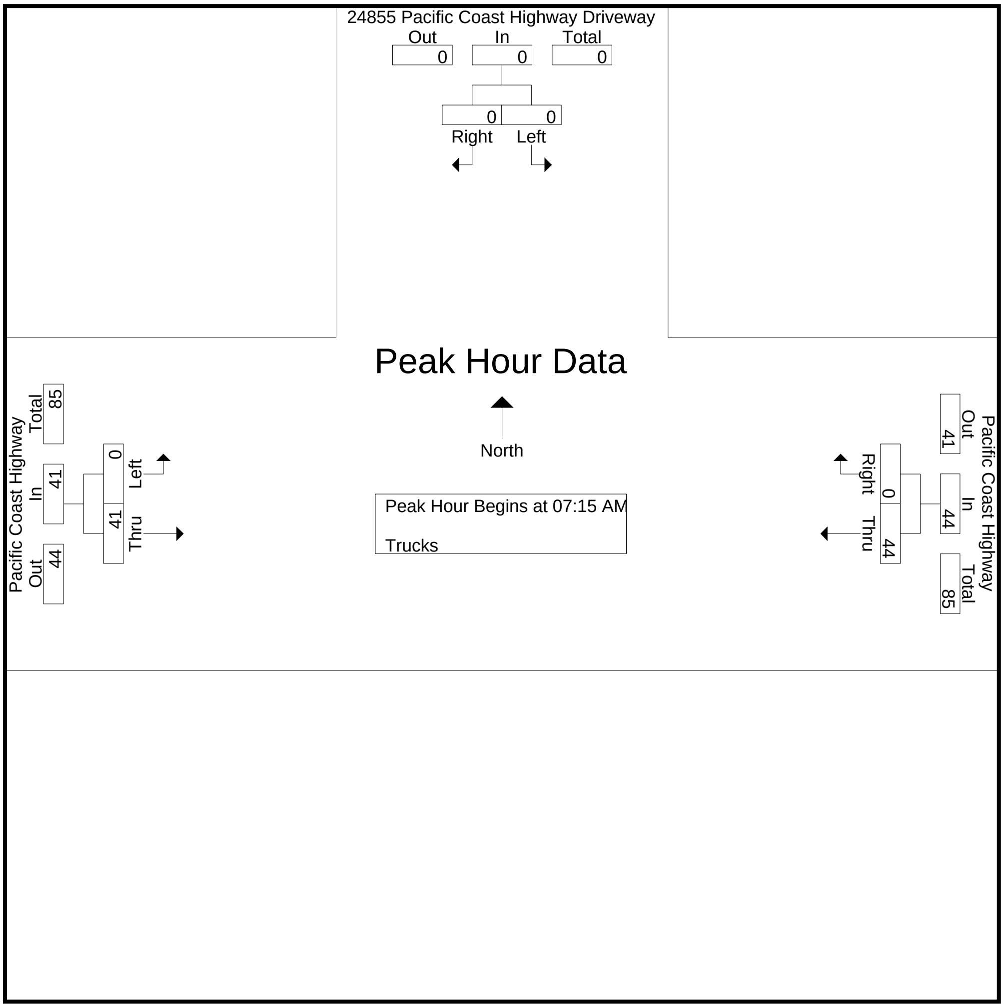
File Name : MAL_24885 PCH AM
Site Code : 16618708
Start Date : 9/25/2018



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	0	0	0	**19**	0	**19**	0	**12**	**12**
+15 mins.	0	0	0	9	0	9	0	9	9
+30 mins.	0	0	0	8	0	8	0	9	9
+45 mins.	0	0	0	8	0	8	0	11	11
Total Volume	0	0	0	44	0	44	0	41	41
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.579	.000	.579	.000	.854	.854

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Weather: Clear

File Name : MAL_24885 PCH AM
Site Code : 16618708
Start Date : 9/25/2018

Groups Printed- Buses

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	2	0	2	0	3	3	5
07:15 AM	0	0	0	3	0	3	0	0	0	3
07:30 AM	0	0	0	2	0	2	0	1	1	3
07:45 AM	0	0	0	2	0	2	0	2	2	4
Total	0	0	0	9	0	9	0	6	6	15
08:00 AM	0	0	0	0	0	0	0	1	1	1
08:15 AM	0	0	0	2	0	2	0	0	0	2
08:30 AM	0	0	0	1	0	1	0	1	1	2
08:45 AM	0	0	0	0	0	0	0	2	2	2
Total	0	0	0	3	0	3	0	4	4	7
09:00 AM	0	0	0	1	0	1	0	1	1	2
09:15 AM	0	0	0	2	0	2	0	0	0	2
Grand Total	0	0	0	15	0	15	0	11	11	26
Apprch %	0	0		100	0		0	100		
Total %	0	0	0	57.7	0	57.7	0	42.3	42.3	

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**3**	0	**3**	0	0	0	3
07:30 AM	0	0	0	2	0	2	0	1	1	3
07:45 AM	0	0	0	2	0	2	0	**2**	**2**	**4**
08:00 AM	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	7	0	7	0	4	4	11
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.583	.000	.583	.000	.500	.500	.688

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File Name : MAL_24885 PCH AM
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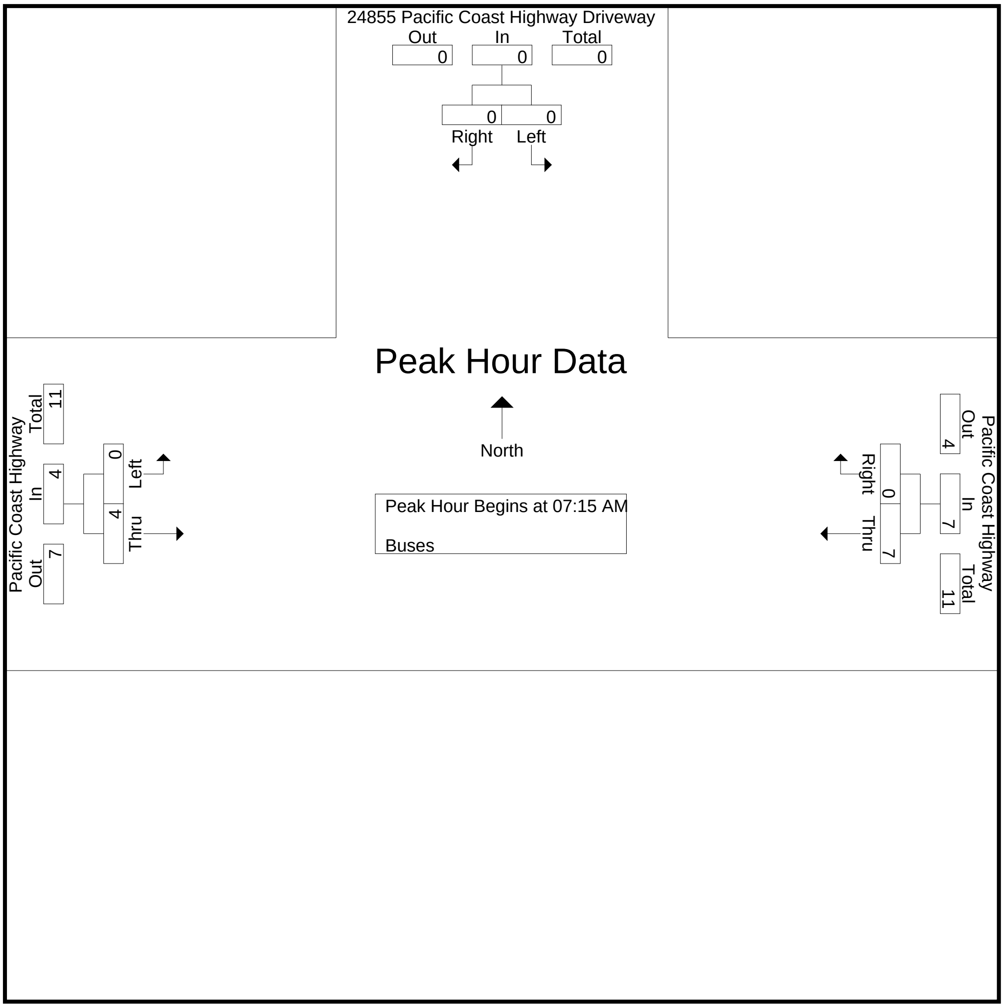

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	0	0	0	**3**	0	**3**	0	0	0
+15 mins.	0	0	0	2	0	2	0	1	1
+30 mins.	0	0	0	2	0	2	0	**2**	**2**
+45 mins.	0	0	0	0	0	0	0	1	1
Total Volume	0	0	0	7	0	7	0	4	4
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.583	.000	.583	.000	.500	.500

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City of Malibu
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E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH PM
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Groups Printed- Passenger Vehicles - Trucks - Buses

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
01:30 PM	0	0	0	209	0	209	0	289	289	498
01:45 PM	0	0	0	232	3	235	0	231	231	466
Total	0	0	0	441	3	444	0	520	520	964
02:00 PM	0	3	3	240	1	241	1	219	220	464
02:15 PM	0	0	0	297	0	297	0	265	265	562
02:30 PM	0	1	1	269	2	271	0	267	267	539
02:45 PM	2	1	3	309	1	310	1	277	278	591
Total	2	5	7	1115	4	1119	2	1028	1030	2156
03:00 PM	1	4	5	308	4	312	3	382	385	702
03:15 PM	1	0	1	326	2	328	3	383	386	715
03:30 PM	4	4	8	324	4	328	2	340	342	678
03:45 PM	3	4	7	351	5	356	4	319	323	686
Total	9	12	21	1309	15	1324	12	1424	1436	2781
04:00 PM	2	3	5	355	1	356	2	312	314	675
04:15 PM	0	0	0	344	0	344	0	322	322	666
04:30 PM	1	1	2	338	2	340	0	274	274	616
04:45 PM	0	2	2	323	0	323	0	258	258	583
Total	3	6	9	1360	3	1363	2	1166	1168	2540
05:00 PM	0	1	1	331	1	332	0	291	291	624
05:15 PM	0	0	0	357	0	357	0	258	258	615
05:30 PM	0	2	2	280	0	280	4	278	282	564
05:45 PM	1	0	1	294	1	295	2	226	228	524
Total	1	3	4	1262	2	1264	6	1053	1059	2327
06:00 PM	2	2	4	281	6	287	4	238	242	533
06:15 PM	7	8	15	260	0	260	1	221	222	497
06:30 PM	1	2	3	220	0	220	0	215	215	438
06:45 PM	2	0	2	224	0	224	0	194	194	420
Total	12	12	24	985	6	991	5	868	873	1888
Grand Total	27	38	65	6472	33	6505	27	6059	6086	12656
Apprch %	41.5	58.5		99.5	0.5		0.4	99.6		
Total %	0.2	0.3	0.5	51.1	0.3	51.4	0.2	47.9	48.1	
Passenger Vehicles	26	38	64	6296	32	6328	27	5866	5893	12285
% Passenger Vehicles	96.3	100	98.5	97.3	97	97.3	100	96.8	96.8	97.1
Trucks	1	0	1	148	1	149	0	162	162	312
% Trucks	3.7	0	1.5	2.3	3	2.3	0	2.7	2.7	2.5
Buses	0	0	0	28	0	28	0	31	31	59
% Buses	0	0	0	0.4	0	0.4	0	0.5	0.5	0.5

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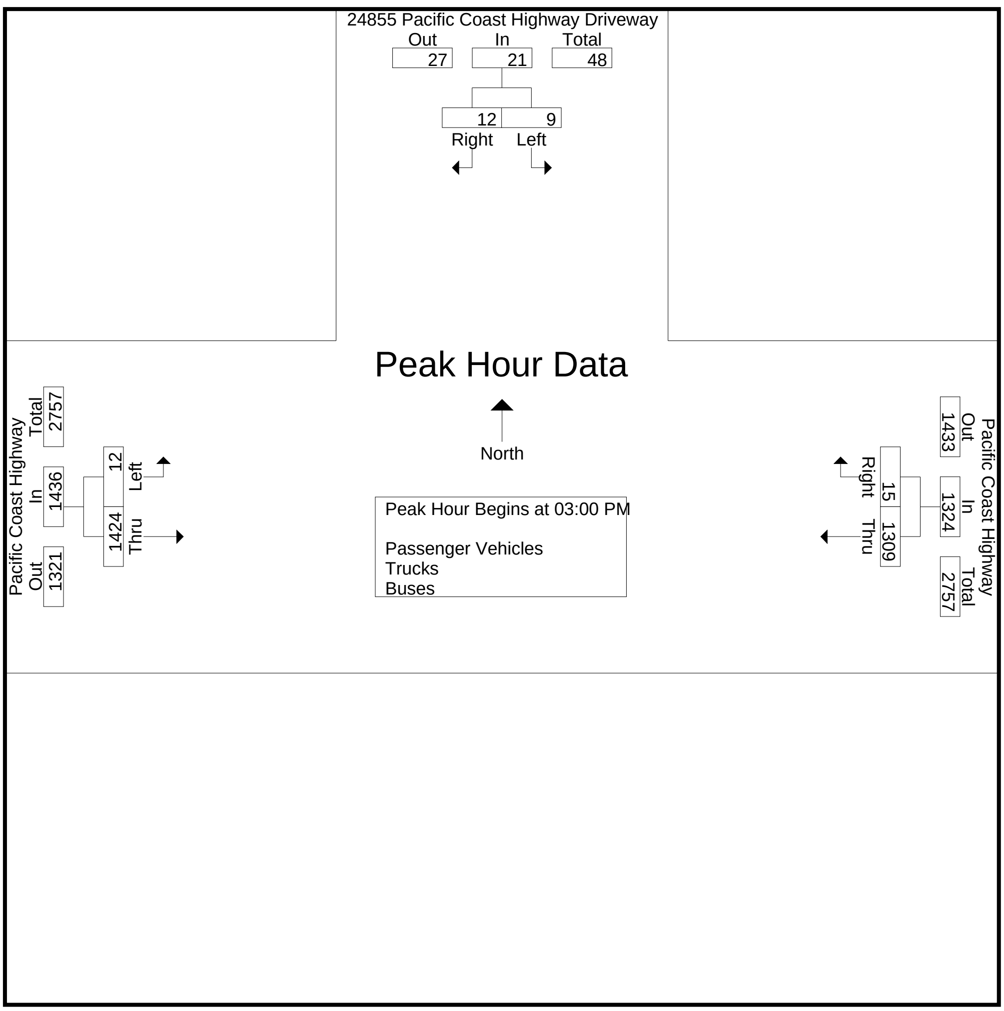
	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 01:30 PM to 06:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	1	**4**	5	308	4	312	3	382	385	702
03:15 PM	1	0	1	326	2	328	3	**383**	**386**	**715**
03:30 PM	**4**	4	**8**	324	4	328	2	340	342	678
03:45 PM	3	4	7	**351**	**5**	**356**	**4**	319	323	686
Total Volume	9	12	21	1309	15	1324	12	1424	1436	2781
% App. Total	42.9	57.1		98.9	1.1		0.8	99.2		
PHF	.563	.750	.656	.932	.750	.930	.750	.930	.930	.972



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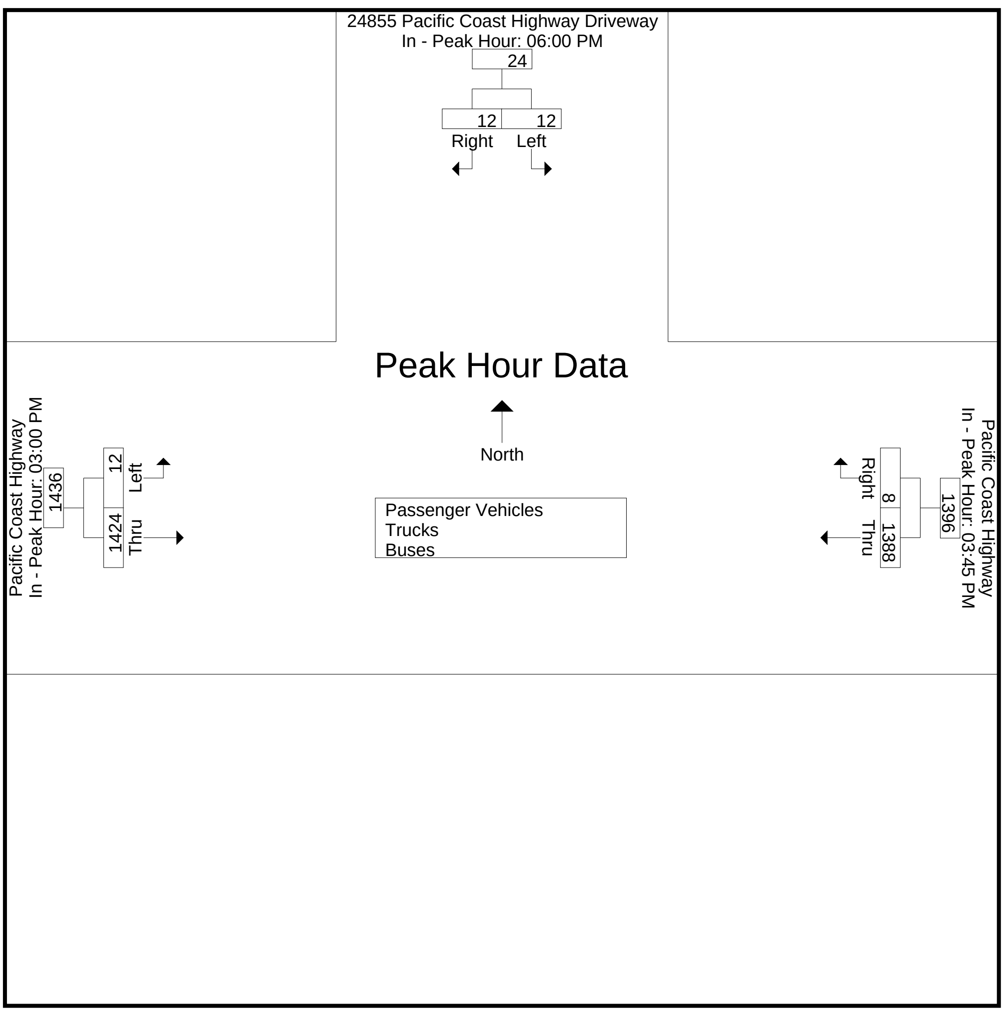
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH PM
Site Code : 16618708
Start Date : 9/25/2018

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 01:30 PM to 06:45 PM - Peak 1 of 1										
Peak Hour for Each Approach Begins at:										
	06:00 PM			03:45 PM			03:00 PM			
+0 mins.	2	2	4	351	**5**	**356**	3	382	385	
+15 mins.	**7**	**8**	**15**	**355**	1	356	3	**383**	**386**	
+30 mins.	1	2	3	344	0	344	2	340	342	
+45 mins.	2	0	2	338	2	340	**4**	319	323	
Total Volume	12	12	24	1388	8	1396	12	1424	1436	
% App. Total	50	50		99.4	0.6		0.8	99.2		
PHF	.429	.375	.400	.977	.400	.980	.750	.930	.930	



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City of Malibu
N/S: 24855 Pacific Coast Highway DW
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Weather: Clear

File Name : MAL_24885 PCH PM
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Groups Printed- Passenger Vehicles

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
01:30 PM	0	0	0	205	0	205	0	273	273	478
01:45 PM	0	0	0	224	3	227	0	223	223	450
Total	0	0	0	429	3	432	0	496	496	928
02:00 PM	0	3	3	234	1	235	1	206	207	445
02:15 PM	0	0	0	283	0	283	0	253	253	536
02:30 PM	0	1	1	261	1	262	0	263	263	526
02:45 PM	1	1	2	300	1	301	1	265	266	569
Total	1	5	6	1078	3	1081	2	987	989	2076
03:00 PM	1	4	5	299	4	303	3	369	372	680
03:15 PM	1	0	1	319	2	321	3	368	371	693
03:30 PM	4	4	8	313	4	317	2	325	327	652
03:45 PM	3	4	7	346	5	351	4	305	309	667
Total	9	12	21	1277	15	1292	12	1367	1379	2692
04:00 PM	2	3	5	349	1	350	2	304	306	661
04:15 PM	0	0	0	332	0	332	0	313	313	645
04:30 PM	1	1	2	319	2	321	0	264	264	587
04:45 PM	0	2	2	313	0	313	0	250	250	565
Total	3	6	9	1313	3	1316	2	1131	1133	2458
05:00 PM	0	1	1	319	1	320	0	279	279	600
05:15 PM	0	0	0	351	0	351	0	254	254	605
05:30 PM	0	2	2	273	0	273	4	274	278	553
05:45 PM	1	0	1	288	1	289	2	222	224	514
Total	1	3	4	1231	2	1233	6	1029	1035	2272
06:00 PM	2	2	4	277	6	283	4	236	240	527
06:15 PM	7	8	15	254	0	254	1	218	219	488
06:30 PM	1	2	3	218	0	218	0	211	211	432
06:45 PM	2	0	2	219	0	219	0	191	191	412
Total	12	12	24	968	6	974	5	856	861	1859
Grand Total	26	38	64	6296	32	6328	27	5866	5893	12285
Apprch %	40.6	59.4		99.5	0.5		0.5	99.5		
Total %	0.2	0.3	0.5	51.2	0.3	51.5	0.2	47.7	48	

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	1	**4**	5	299	4	303	3	**369**	**372**	680
03:15 PM	1	0	1	319	2	321	3	368	371	**693**
03:30 PM	**4**	4	**8**	313	4	317	2	325	327	652
03:45 PM	3	4	7	**346**	**5**	**351**	**4**	305	309	667
Total Volume	9	12	21	1277	15	1292	12	1367	1379	2692
% App. Total	42.9	57.1		98.8	1.2		0.9	99.1		
PHF	.563	.750	.656	.923	.750	.920	.750	.926	.927	.971

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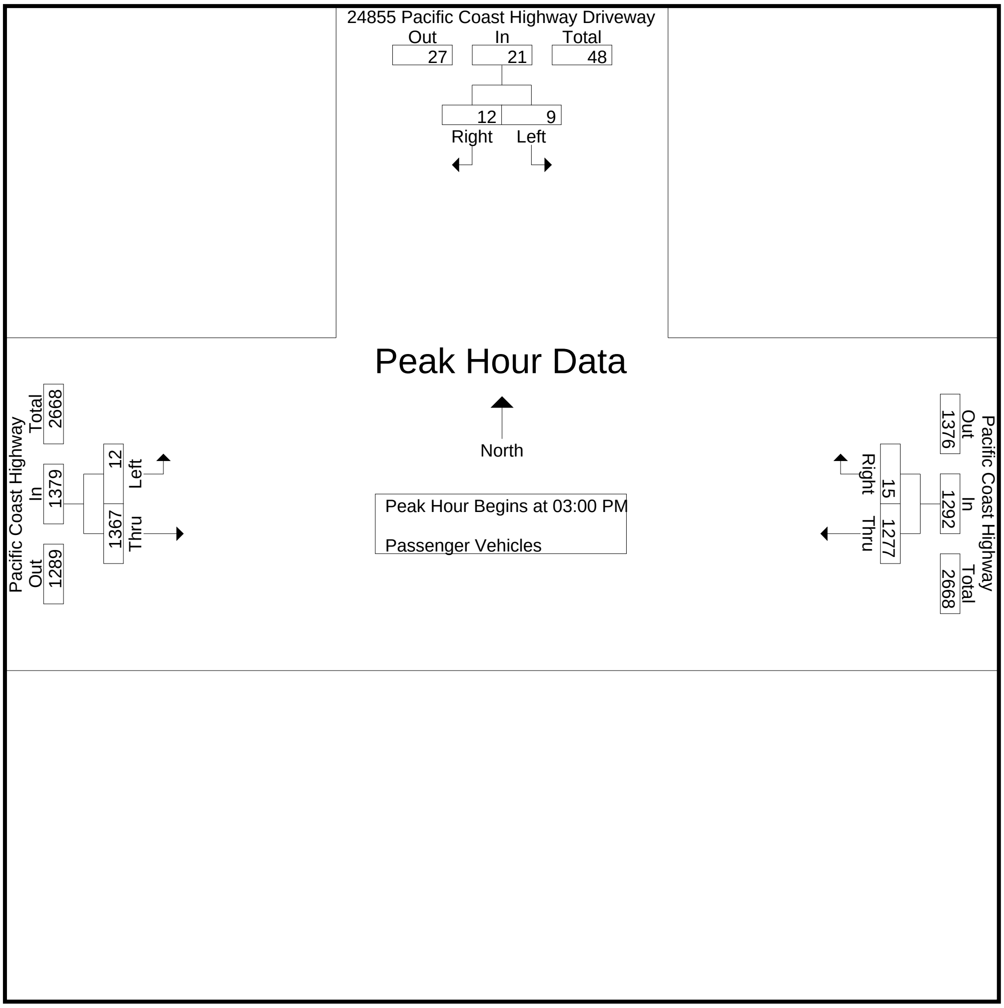

Peak Hour Analysis From 03:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM			03:00 PM			03:00 PM		
+0 mins.	1	**4**	5	299	4	303	3	**369**	**372**
+15 mins.	1	0	1	319	2	321	3	368	371
+30 mins.	**4**	4	**8**	313	4	317	2	325	327
+45 mins.	3	4	7	**346**	**5**	**351**	**4**	305	309
Total Volume	9	12	21	1277	15	1292	12	1367	1379
% App. Total	42.9	57.1		98.8	1.2		0.9	99.1	
PHF	.563	.750	.656	.923	.750	.920	.750	.926	.927

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File Name : MAL_24885 PCH PM
Site Code : 16618708
Start Date : 9/25/2018

Groups Printed- Trucks

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
01:30 PM	0	0	0	4	0	4	0	16	16	20
01:45 PM	0	0	0	7	0	7	0	7	7	14
Total	0	0	0	11	0	11	0	23	23	34
02:00 PM	0	0	0	4	0	4	0	10	10	14
02:15 PM	0	0	0	11	0	11	0	12	12	23
02:30 PM	0	0	0	8	1	9	0	4	4	13
02:45 PM	1	0	1	7	0	7	0	10	10	18
Total	1	0	1	30	1	31	0	36	36	68
03:00 PM	0	0	0	9	0	9	0	12	12	21
03:15 PM	0	0	0	6	0	6	0	9	9	15
03:30 PM	0	0	0	7	0	7	0	12	12	19
03:45 PM	0	0	0	3	0	3	0	12	12	15
Total	0	0	0	25	0	25	0	45	45	70
04:00 PM	0	0	0	4	0	4	0	6	6	10
04:15 PM	0	0	0	11	0	11	0	8	8	19
04:30 PM	0	0	0	16	0	16	0	9	9	25
04:45 PM	0	0	0	9	0	9	0	7	7	16
Total	0	0	0	40	0	40	0	30	30	70
05:00 PM	0	0	0	10	0	10	0	11	11	21
05:15 PM	0	0	0	6	0	6	0	3	3	9
05:30 PM	0	0	0	6	0	6	0	3	3	9
05:45 PM	0	0	0	5	0	5	0	2	2	7
Total	0	0	0	27	0	27	0	19	19	46
06:00 PM	0	0	0	3	0	3	0	2	2	5
06:15 PM	0	0	0	6	0	6	0	2	2	8
06:30 PM	0	0	0	2	0	2	0	3	3	5
06:45 PM	0	0	0	4	0	4	0	2	2	6
Total	0	0	0	15	0	15	0	9	9	24
Grand Total	1	0	1	148	1	149	0	162	162	312
Apprch %	100	0		99.3	0.7		0	100		
Total %	0.3	0	0.3	47.4	0.3	47.8	0	51.9	51.9	

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	0	0	0	**9**	0	**9**	0	**12**	**12**	**21**
03:15 PM	0	0	0	6	0	6	0	9	9	15
03:30 PM	0	0	0	7	0	7	0	12	12	19
03:45 PM	0	0	0	3	0	3	0	12	12	15
Total Volume	0	0	0	25	0	25	0	45	45	70
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.694	.000	.694	.000	.938	.938	.833

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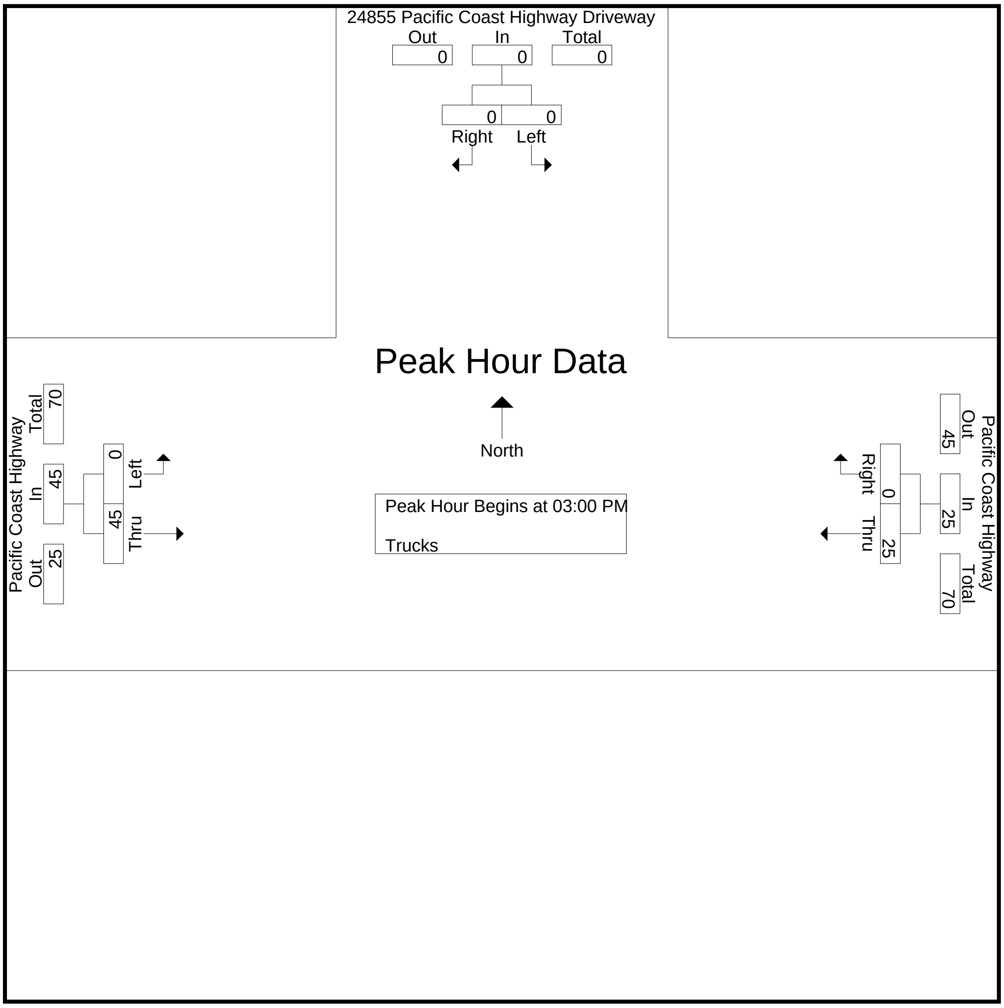
City of Malibu
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH PM
Site Code : 16618708
Start Date : 9/25/2018
Page No : 2



Peak Hour Analysis From 03:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM			03:00 PM			03:00 PM		
+0 mins.	0	0	0	**9**	0	**9**	0	**12**	**12**
+15 mins.	0	0	0	6	0	6	0	9	9
+30 mins.	0	0	0	7	0	7	0	12	12
+45 mins.	0	0	0	3	0	3	0	12	12
Total Volume	0	0	0	25	0	25	0	45	45
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.694	.000	.694	.000	.938	.938

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City of Malibu
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH PM
Site Code : 16618708
Start Date : 9/25/2018
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Groups Printed- Buses

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
01:30 PM	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	1	0	1	0	1	1	2
Total	0	0	0	1	0	1	0	1	1	2
02:00 PM	0	0	0	2	0	2	0	3	3	5
02:15 PM	0	0	0	3	0	3	0	0	0	3
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	2	0	2	0	2	2	4
Total	0	0	0	7	0	7	0	5	5	12
03:00 PM	0	0	0	0	0	0	0	1	1	1
03:15 PM	0	0	0	1	0	1	0	6	6	7
03:30 PM	0	0	0	4	0	4	0	3	3	7
03:45 PM	0	0	0	2	0	2	0	2	2	4
Total	0	0	0	7	0	7	0	12	12	19
04:00 PM	0	0	0	2	0	2	0	2	2	4
04:15 PM	0	0	0	1	0	1	0	1	1	2
04:30 PM	0	0	0	3	0	3	0	1	1	4
04:45 PM	0	0	0	1	0	1	0	1	1	2
Total	0	0	0	7	0	7	0	5	5	12
05:00 PM	0	0	0	2	0	2	0	1	1	3
05:15 PM	0	0	0	0	0	0	0	1	1	1
05:30 PM	0	0	0	1	0	1	0	1	1	2
05:45 PM	0	0	0	1	0	1	0	2	2	3
Total	0	0	0	4	0	4	0	5	5	9
06:00 PM	0	0	0	1	0	1	0	0	0	1
06:15 PM	0	0	0	0	0	0	0	1	1	1
06:30 PM	0	0	0	0	0	0	0	1	1	1
06:45 PM	0	0	0	1	0	1	0	1	1	2
Total	0	0	0	2	0	2	0	3	3	5
Grand Total	0	0	0	28	0	28	0	31	31	59
Apprch %	0	0		100	0		0	100		
Total %	0	0	0	47.5	0	47.5	0	52.5	52.5	

	24855 Pacific Coast Highway Driveway Southbound			Pacific Coast Highway Westbound			Pacific Coast Highway Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	0	0	0	0	0	0	0	1	1	1
03:15 PM	0	0	0	1	0	1	0	**6**	**6**	**7**
03:30 PM	0	0	0	**4**	0	**4**	0	3	3	7
03:45 PM	0	0	0	2	0	2	0	2	2	4
Total Volume	0	0	0	7	0	7	0	12	12	19
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.438	.000	.438	.000	.500	.500	.679

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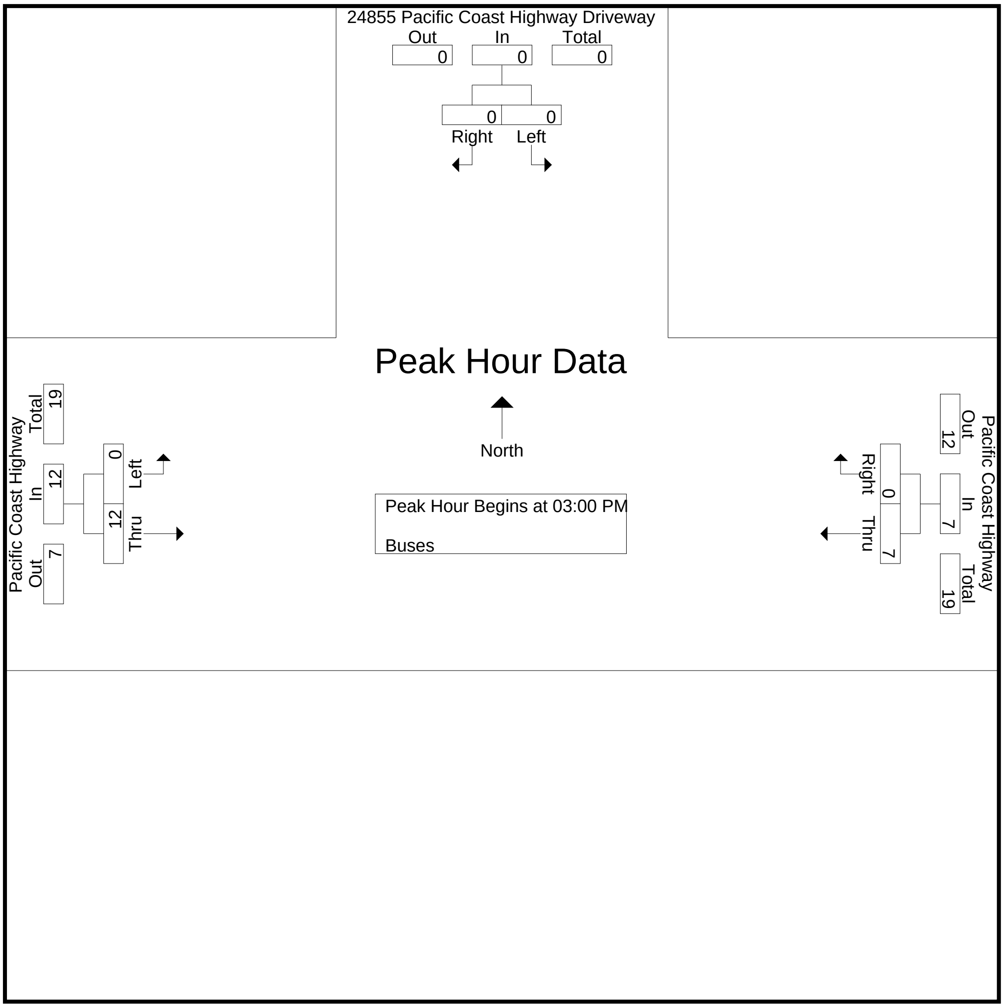
City of Malibu
N/S: 24855 Pacific Coast Highway DW
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24885 PCH PM
Site Code : 16618708
Start Date : 9/25/2018
Page No : 2



Peak Hour Analysis From 03:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM			03:00 PM			03:00 PM		
+0 mins.	0	0	0	0	0	0	0	1	1
+15 mins.	0	0	0	1	0	1	0	**6**	**6**
+30 mins.	0	0	0	**4**	0	**4**	0	3	3
+45 mins.	0	0	0	2	0	2	0	2	2
Total Volume	0	0	0	7	0	7	0	12	12
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.438	.000	.438	.000	.500	.500

Location: Malibu
N/S: 24855 PCH Driveway
E/W: Pacific Coast Highway

Date: 9/25/2018
Day: Tuesday

PEDESTRIANS

	North Leg 24855 PCH Driveway	East Leg Pacific Coast Highway	South Leg Dead End	West Leg Pacific Coast Highway	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	1	0	0	0	1
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
9:00 AM	1	0	0	0	1
9:15 AM	0	0	0	0	0
TOTAL VOLUMES:	2	0	0	0	2

	North Leg 24855 PCH Driveway	East Leg Pacific Coast Highway	South Leg Dead End	West Leg Pacific Coast Highway	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
1:30 PM	0	0	1	0	1
1:45 PM	0	0	1	0	1
2:00 PM	0	0	1	0	1
2:15 PM	0	0	2	0	2
2:30 PM	0	0	2	0	2
2:45 PM	0	0	6	0	6
3:00 PM	0	0	4	1	5
3:15 PM	0	0	3	0	3
3:30 PM	0	0	0	0	0
3:45 PM	1	0	0	0	1
4:00 PM	0	0	0	0	0
4:15 PM	0	0	1	0	1
4:30 PM	0	0	1	0	1
4:45 PM	0	0	1	0	1
5:00 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1
5:30 PM	0	0	1	0	1
5:45 PM	0	0	0	0	0
6:00 PM	0	0	0	0	0
6:15 PM	0	0	1	0	1
6:30 PM	0	0	1	0	1
6:45 PM	0	0	0	0	0
TOTAL VOLUMES:	2	0	26	1	29

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Location: Malibu
N/S: 24855 PCH Driveway
E/W: Pacific Coast Highway

Date: 9/25/2018
Day: Tuesday

BICYCLES

	Southbound 24855 PCH Driveway			Westbound Pacific Coast Highway			Northbound Dead End			Eastbound Pacific Coast Highway			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
9:15 AM	0	0	0	0	2	0	0	0	0	0	1	0	3
TOTAL VOLUMES:	0	0	0	0	9	0	0	0	0	0	1	0	10

	Southbound 24855 PCH Driveway			Westbound Pacific Coast Highway			Northbound Dead End			Eastbound Pacific Coast Highway			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
3:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
3:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	3	0	0	0	0	0	6	0	9

Date 9/25/2018
Location Malibu Jewish Center & Synagogue - 24855 Pacific Coast Highway
Movement Eastbound Left Turn In - Queue Length

Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles
7:00	0	8:00	0	9:00	0	13:00	/	14:00	0	15:00	0	16:00	0	17:00	0	18:00	0
7:01	0	8:01	0	9:01	0	13:01	/	14:01	0	15:01	0	16:01	1	17:01	0	18:01	0
7:02	0	8:02	0	9:02	0	13:02	/	14:02	0	15:02	0	16:02	0	17:02	0	18:02	1
7:03	0	8:03	0	9:03	0	13:03	/	14:03	0	15:03	0	16:03	0	17:03	0	18:03	0
7:04	0	8:04	0	9:04	0	13:04	/	14:04	0	15:04	0	16:04	0	17:04	0	18:04	0
7:05	0	8:05	0	9:05	0	13:05	/	14:05	0	15:05	1	16:05	0	17:05	0	18:05	0
7:06	0	8:06	0	9:06	1	13:06	/	14:06	0	15:06	0	16:06	0	17:06	0	18:06	0
7:07	0	8:07	0	9:07	1	13:07	/	14:07	0	15:07	0	16:07	0	17:07	0	18:07	0
7:08	0	8:08	0	9:08	1	13:08	/	14:08	0	15:08	0	16:08	0	17:08	0	18:08	0
7:09	0	8:09	0	9:09	1	13:09	/	14:09	0	15:09	0	16:09	0	17:09	0	18:09	0
7:10	0	8:10	0	9:10	0	13:10	/	14:10	0	15:10	0	16:10	0	17:10	0	18:10	0
7:11	0	8:11	0	9:11	0	13:11	/	14:11	0	15:11	0	16:11	1	17:11	0	18:11	1
7:12	0	8:12	0	9:12	0	13:12	/	14:12	0	15:12	0	16:12	0	17:12	0	18:12	0
7:13	0	8:13	0	9:13	0	13:13	/	14:13	0	15:13	0	16:13	0	17:13	0	18:13	1
7:14	0	8:14	0	9:14	0	13:14	/	14:14	0	15:14	0	16:14	0	17:14	0	18:14	0
7:15	0	8:15	0	9:15	0	13:15	/	14:15	0	15:15	0	16:15	0	17:15	0	18:15	0
7:16	0	8:16	0	9:16	0	13:16	/	14:16	0	15:16	0	16:16	0	17:16	0	18:16	0
7:17	0	8:17	0	9:17	0	13:17	/	14:17	0	15:17	0	16:17	0	17:17	0	18:17	0
7:18	0	8:18	0	9:18	0	13:18	/	14:18	0	15:18	0	16:18	0	17:18	0	18:18	0
7:19	0	8:19	0	9:19	0	13:19	/	14:19	0	15:19	0	16:19	0	17:19	0	18:19	0
7:20	0	8:20	0	9:20	0	13:20	/	14:20	0	15:20	0	16:20	0	17:20	0	18:20	0
7:21	0	8:21	0	9:21	0	13:21	/	14:21	0	15:21	0	16:21	0	17:21	0	18:21	0
7:22	0	8:22	0	9:22	0	13:22	/	14:22	0	15:22	0	16:22	0	17:22	0	18:22	0
7:23	0	8:23	0	9:23	0	13:23	/	14:23	0	15:23	0	16:23	0	17:23	0	18:23	0
7:24	0	8:24	0	9:24	0	13:24	/	14:24	0	15:24	0	16:24	0	17:24	0	18:24	1
7:25	0	8:25	0	9:25	0	13:25	/	14:25	0	15:25	1	16:25	0	17:25	0	18:25	0
7:26	0	8:26	0	9:26	0	13:26	/	14:26	0	15:26	1	16:26	0	17:26	0	18:26	0
7:27	0	8:27	0	9:27	0	13:27	/	14:27	0	15:27	0	16:27	0	17:27	0	18:27	0
7:28	0	8:28	0	9:28	0	13:28	/	14:28	0	15:28	0	16:28	0	17:28	0	18:28	0
7:29	0	8:29	0	9:29	1	13:29	/	14:29	0	15:29	0	16:29	0	17:29	0	18:29	0
7:30	0	8:30	0	9:30	/	13:30	0	14:30	0	15:30	0	16:30	0	17:30	0	18:30	0
7:31	0	8:31	0	9:31	/	13:31	0	14:31	0	15:31	0	16:31	0	17:31	0	18:31	0
7:32	0	8:32	0	9:32	/	13:32	0	14:32	0	15:32	0	16:32	0	17:32	0	18:32	0
7:33	0	8:33	0	9:33	/	13:33	0	14:33	0	15:33	0	16:33	0	17:33	0	18:33	0
7:34	0	8:34	0	9:34	/	13:34	0	14:34	0	15:34	0	16:34	0	17:34	0	18:34	0
7:35	0	8:35	0	9:35	/	13:35	0	14:35	0	15:35	0	16:35	0	17:35	0	18:35	0
7:36	0	8:36	0	9:36	/	13:36	0	14:36	0	15:36	0	16:36	0	17:36	1	18:36	0
7:37	0	8:37	0	9:37	/	13:37	0	14:37	0	15:37	0	16:37	0	17:37	1	18:37	0
7:38	0	8:38	0	9:38	/	13:38	0	14:38	0	15:38	0	16:38	0	17:38	0	18:38	0
7:39	0	8:39	0	9:39	/	13:39	0	14:39	0	15:39	0	16:39	0	17:39	1	18:39	0
7:40	0	8:40	0	9:40	/	13:40	0	14:40	0	15:40	1	16:40	0	17:40	0	18:40	0
7:41	0	8:41	0	9:41	/	13:41	0	14:41	0	15:41	0	16:41	0	17:41	0	18:41	0
7:42	0	8:42	0	9:42	/	13:42	0	14:42	0	15:42	1	16:42	0	17:42	0	18:42	0
7:43	0	8:43	0	9:43	/	13:43	0	14:43	0	15:43	0	16:43	0	17:43	1	18:43	0
7:44	0	8:44	0	9:44	/	13:44	0	14:44	0	15:44	1	16:44	0	17:44	1	18:44	0
7:45	0	8:45	0	9:45	/	13:45	0	14:45	0	15:45	0	16:45	0	17:45	0	18:45	0
7:46	0	8:46	0	9:46	/	13:46	0	14:46	0	15:46	0	16:46	0	17:46	0	18:46	0
7:47	0	8:47	0	9:47	/	13:47	0	14:47	0	15:47	0	16:47	0	17:47	0	18:47	0
7:48	0	8:48	0	9:48	/	13:48	0	14:48	0	15:48	0	16:48	0	17:48	0	18:48	0
7:49	0	8:49	0	9:49	/	13:49	0	14:49	0	15:49	0	16:49	0	17:49	0	18:49	0
7:50	0	8:50	0	9:50	/	13:50	0	14:50	0	15:50	0	16:50	0	17:50	0	18:50	0
7:51	0	8:51	0	9:51	/	13:51	0	14:51	0	15:51	1	16:51	0	17:51	0	18:51	0
7:52	0	8:52	0	9:52	/	13:52	0	14:52	0	15:52	1	16:52	0	17:52	0	18:52	0
7:53	0	8:53	0	9:53	/	13:53	0	14:53	0	15:53	0	16:53	0	17:53	0	18:53	0
7:54	0	8:54	0	9:54	/	13:54	0	14:54	0	15:54	0	16:54	0	17:54	0	18:54	0
7:55	0	8:55	0	9:55	/	13:55	0	14:55	0	15:55	1	16:55	0	17:55	0	18:55	0
7:56	0	8:56	0	9:56	/	13:56	0	14:56	0	15:56	0	16:56	0	17:56	1	18:56	0
7:57	0	8:57	1	9:57	/	13:57	0	14:57	0	15:57	0	16:57	0	17:57	0	18:57	0
7:58	0	8:58	0	9:58	/	13:58	0	14:58	1	15:58	0	16:58	0	17:58	0	18:58	0
7:59	0	8:59	0	9:59	/	13:59	0	14:59	1	15:59	0	16:59	0	17:59	1	18:59	0

Date 9/25/2018
Location Malibu Jewish Center & Synagogue - 24855 Pacific Coast Highway
Movement Westbound Right Turn In - Queue Length

Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles
7:00	0	8:00	0	9:00	0	13:00	/	14:00	0	15:00	0	16:00	0	17:00	0	18:00	0
7:01	0	8:01	0	9:01	0	13:01	/	14:01	0	15:01	0	16:01	0	17:01	0	18:01	0
7:02	0	8:02	0	9:02	0	13:02	/	14:02	0	15:02	0	16:02	0	17:02	0	18:02	0
7:03	0	8:03	0	9:03	0	13:03	/	14:03	0	15:03	0	16:03	0	17:03	0	18:03	0
7:04	0	8:04	0	9:04	0	13:04	/	14:04	0	15:04	0	16:04	0	17:04	0	18:04	0
7:05	0	8:05	0	9:05	0	13:05	/	14:05	0	15:05	0	16:05	0	17:05	0	18:05	0
7:06	0	8:06	0	9:06	0	13:06	/	14:06	0	15:06	0	16:06	0	17:06	0	18:06	0
7:07	0	8:07	0	9:07	0	13:07	/	14:07	0	15:07	0	16:07	0	17:07	0	18:07	0
7:08	0	8:08	0	9:08	0	13:08	/	14:08	0	15:08	0	16:08	0	17:08	0	18:08	0
7:09	0	8:09	0	9:09	0	13:09	/	14:09	0	15:09	0	16:09	0	17:09	0	18:09	0
7:10	0	8:10	0	9:10	0	13:10	/	14:10	0	15:10	0	16:10	0	17:10	0	18:10	0
7:11	0	8:11	0	9:11	0	13:11	/	14:11	0	15:11	0	16:11	0	17:11	0	18:11	0
7:12	0	8:12	0	9:12	0	13:12	/	14:12	0	15:12	0	16:12	0	17:12	0	18:12	0
7:13	0	8:13	0	9:13	0	13:13	/	14:13	0	15:13	0	16:13	0	17:13	0	18:13	0
7:14	0	8:14	0	9:14	0	13:14	/	14:14	0	15:14	0	16:14	0	17:14	0	18:14	0
7:15	0	8:15	0	9:15	0	13:15	/	14:15	0	15:15	0	16:15	0	17:15	0	18:15	0
7:16	0	8:16	0	9:16	0	13:16	/	14:16	0	15:16	0	16:16	0	17:16	0	18:16	0
7:17	0	8:17	0	9:17	0	13:17	/	14:17	0	15:17	0	16:17	0	17:17	0	18:17	0
7:18	0	8:18	0	9:18	0	13:18	/	14:18	0	15:18	0	16:18	0	17:18	0	18:18	0
7:19	0	8:19	0	9:19	0	13:19	/	14:19	0	15:19	0	16:19	0	17:19	0	18:19	0
7:20	0	8:20	0	9:20	0	13:20	/	14:20	0	15:20	0	16:20	0	17:20	0	18:20	0
7:21	0	8:21	0	9:21	0	13:21	/	14:21	0	15:21	0	16:21	0	17:21	0	18:21	0
7:22	0	8:22	0	9:22	0	13:22	/	14:22	0	15:22	0	16:22	0	17:22	0	18:22	0
7:23	0	8:23	0	9:23	0	13:23	/	14:23	0	15:23	0	16:23	0	17:23	0	18:23	0
7:24	0	8:24	0	9:24	0	13:24	/	14:24	0	15:24	0	16:24	0	17:24	0	18:24	0
7:25	0	8:25	0	9:25	0	13:25	/	14:25	0	15:25	0	16:25	0	17:25	0	18:25	0
7:26	0	8:26	0	9:26	0	13:26	/	14:26	0	15:26	0	16:26	0	17:26	0	18:26	0
7:27	0	8:27	0	9:27	0	13:27	/	14:27	0	15:27	0	16:27	0	17:27	0	18:27	0
7:28	0	8:28	0	9:28	0	13:28	/	14:28	0	15:28	0	16:28	0	17:28	0	18:28	0
7:29	0	8:29	0	9:29	0	13:29	/	14:29	0	15:29	0	16:29	0	17:29	0	18:29	0
7:30	0	8:30	0	9:30	/	13:30	0	14:30	0	15:30	0	16:30	0	17:30	0	18:30	0
7:31	0	8:31	0	9:31	/	13:31	0	14:31	0	15:31	0	16:31	0	17:31	0	18:31	0
7:32	0	8:32	0	9:32	/	13:32	0	14:32	0	15:32	0	16:32	0	17:32	0	18:32	0
7:33	0	8:33	0	9:33	/	13:33	0	14:33	0	15:33	0	16:33	0	17:33	0	18:33	0
7:34	0	8:34	0	9:34	/	13:34	0	14:34	0	15:34	0	16:34	0	17:34	0	18:34	0
7:35	0	8:35	0	9:35	/	13:35	0	14:35	0	15:35	0	16:35	0	17:35	0	18:35	0
7:36	0	8:36	0	9:36	/	13:36	0	14:36	0	15:36	0	16:36	0	17:36	0	18:36	0
7:37	0	8:37	0	9:37	/	13:37	0	14:37	0	15:37	0	16:37	0	17:37	0	18:37	0
7:38	0	8:38	0	9:38	/	13:38	0	14:38	0	15:38	0	16:38	0	17:38	0	18:38	0
7:39	0	8:39	0	9:39	/	13:39	0	14:39	0	15:39	0	16:39	0	17:39	0	18:39	0
7:40	0	8:40	0	9:40	/	13:40	0	14:40	0	15:40	0	16:40	0	17:40	0	18:40	0
7:41	0	8:41	0	9:41	/	13:41	0	14:41	0	15:41	0	16:41	0	17:41	0	18:41	0
7:42	0	8:42	0	9:42	/	13:42	0	14:42	0	15:42	0	16:42	0	17:42	0	18:42	0
7:43	0	8:43	0	9:43	/	13:43	0	14:43	0	15:43	0	16:43	0	17:43	0	18:43	0
7:44	0	8:44	0	9:44	/	13:44	0	14:44	0	15:44	0	16:44	0	17:44	0	18:44	0
7:45	0	8:45	0	9:45	/	13:45	0	14:45	0	15:45	0	16:45	0	17:45	0	18:45	0
7:46	0	8:46	0	9:46	/	13:46	0	14:46	0	15:46	0	16:46	0	17:46	0	18:46	0
7:47	0	8:47	0	9:47	/	13:47	0	14:47	0	15:47	0	16:47	0	17:47	0	18:47	0
7:48	0	8:48	0	9:48	/	13:48	0	14:48	0	15:48	0	16:48	0	17:48	0	18:48	0
7:49	0	8:49	0	9:49	/	13:49	0	14:49	0	15:49	0	16:49	0	17:49	0	18:49	0
7:50	0	8:50	0	9:50	/	13:50	0	14:50	0	15:50	0	16:50	0	17:50	0	18:50	0
7:51	0	8:51	0	9:51	/	13:51	0	14:51	0	15:51	0	16:51	0	17:51	0	18:51	0
7:52	0	8:52	0	9:52	/	13:52	0	14:52	0	15:52	0	16:52	0	17:52	0	18:52	0
7:53	0	8:53	0	9:53	/	13:53	0	14:53	0	15:53	0	16:53	0	17:53	0	18:53	0
7:54	0	8:54	0	9:54	/	13:54	0	14:54	0	15:54	0	16:54	0	17:54	0	18:54	0
7:55	0	8:55	0	9:55	/	13:55	0	14:55	0	15:55	0	16:55	0	17:55	0	18:55	0
7:56	0	8:56	0	9:56	/	13:56	0	14:56	0	15:56	0	16:56	0	17:56	0	18:56	0
7:57	0	8:57	0	9:57	/	13:57	0	14:57	0	15:57	0	16:57	0	17:57	0	18:57	0
7:58	0	8:58	0	9:58	/	13:58	0	14:58	0	15:58	0	16:58	0	17:58	0	18:58	0
7:59	0	8:59	0	9:59	/	13:59	0	14:59	0	15:59	0	16:59	0	17:59	0	18:59	0

Date 9/25/2018
Location Malibu Jewish Center & Synagogue - 24855 Pacific Coast Highway
Movement Southbound Out - Queue Length

Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles
7:00	0	8:00	0	9:00	0	13:00	/	14:00	0	15:00	0	16:00	0	17:00	0	18:00	0
7:01	0	8:01	0	9:01	0	13:01	/	14:01	0	15:01	0	16:01	0	17:01	0	18:01	0
7:02	0	8:02	0	9:02	0	13:02	/	14:02	0	15:02	0	16:02	0	17:02	0	18:02	0
7:03	0	8:03	0	9:03	0	13:03	/	14:03	1	15:03	0	16:03	0	17:03	0	18:03	0
7:04	0	8:04	0	9:04	0	13:04	/	14:04	0	15:04	0	16:04	0	17:04	0	18:04	0
7:05	0	8:05	0	9:05	0	13:05	/	14:05	0	15:05	0	16:05	0	17:05	0	18:05	0
7:06	0	8:06	0	9:06	0	13:06	/	14:06	1	15:06	1	16:06	0	17:06	0	18:06	0
7:07	0	8:07	0	9:07	0	13:07	/	14:07	0	15:07	0	16:07	0	17:07	0	18:07	0
7:08	0	8:08	0	9:08	0	13:08	/	14:08	0	15:08	0	16:08	1	17:08	0	18:08	1
7:09	0	8:09	0	9:09	0	13:09	/	14:09	0	15:09	1	16:09	0	17:09	0	18:09	2
7:10	0	8:10	0	9:10	0	13:10	/	14:10	1	15:10	2	16:10	0	17:10	0	18:10	1
7:11	0	8:11	0	9:11	0	13:11	/	14:11	0	15:11	0	16:11	0	17:11	0	18:11	0
7:12	0	8:12	0	9:12	0	13:12	/	14:12	0	15:12	0	16:12	2	17:12	1	18:12	1
7:13	0	8:13	0	9:13	0	13:13	/	14:13	0	15:13	0	16:13	2	17:13	0	18:13	0
7:14	0	8:14	0	9:14	0	13:14	/	14:14	0	15:14	0	16:14	0	17:14	0	18:14	1
7:15	0	8:15	0	9:15	0	13:15	/	14:15	0	15:15	0	16:15	0	17:15	0	18:15	0
7:16	0	8:16	0	9:16	0	13:16	/	14:16	0	15:16	0	16:16	0	17:16	0	18:16	1
7:17	0	8:17	0	9:17	0	13:17	/	14:17	0	15:17	0	16:17	0	17:17	0	18:17	3
7:18	0	8:18	0	9:18	1	13:18	/	14:18	0	15:18	0	16:18	0	17:18	0	18:18	1
7:19	0	8:19	0	9:19	1	13:19	/	14:19	0	15:19	0	16:19	0	17:19	0	18:19	1
7:20	0	8:20	0	9:20	0	13:20	/	14:20	0	15:20	0	16:20	0	17:20	0	18:20	0
7:21	0	8:21	0	9:21	0	13:21	/	14:21	0	15:21	0	16:21	0	17:21	0	18:21	2
7:22	0	8:22	0	9:22	0	13:22	/	14:22	0	15:22	0	16:22	0	17:22	0	18:22	0
7:23	0	8:23	0	9:23	0	13:23	/	14:23	0	15:23	0	16:23	0	17:23	0	18:23	0
7:24	0	8:24	0	9:24	1	13:24	/	14:24	0	15:24	0	16:24	0	17:24	0	18:24	1
7:25	0	8:25	0	9:25	1	13:25	/	14:25	0	15:25	1	16:25	0	17:25	0	18:25	1
7:26	0	8:26	0	9:26	1	13:26	/	14:26	0	15:26	0	16:26	0	17:26	0	18:26	0
7:27	0	8:27	0	9:27	0	13:27	/	14:27	0	15:27	0	16:27	0	17:27	0	18:27	0
7:28	0	8:28	0	9:28	1	13:28	/	14:28	0	15:28	0	16:28	0	17:28	0	18:28	0
7:29	0	8:29	0	9:29	0	13:29	/	14:29	0	15:29	0	16:29	0	17:29	0	18:29	0
7:30	0	8:30	0	9:30	/	13:30	0	14:30	0	15:30	0	16:30	0	17:30	0	18:30	0
7:31	0	8:31	0	9:31	/	13:31	0	14:31	0	15:31	1	16:31	1	17:31	0	18:31	0
7:32	0	8:32	0	9:32	/	13:32	0	14:32	0	15:32	0	16:32	0	17:32	0	18:32	0
7:33	0	8:33	0	9:33	/	13:33	0	14:33	0	15:33	0	16:33	0	17:33	0	18:33	1
7:34	0	8:34	0	9:34	/	13:34	0	14:34	0	15:34	0	16:34	0	17:34	0	18:34	1
7:35	0	8:35	0	9:35	/	13:35	0	14:35	0	15:35	1	16:35	0	17:35	0	18:35	1
7:36	0	8:36	0	9:36	/	13:36	0	14:36	1	15:36	0	16:36	0	17:36	0	18:36	0
7:37	0	8:37	0	9:37	/	13:37	0	14:37	0	15:37	1	16:37	0	17:37	0	18:37	0
7:38	0	8:38	0	9:38	/	13:38	0	14:38	0	15:38	1	16:38	0	17:38	0	18:38	0
7:39	0	8:39	0	9:39	/	13:39	0	14:39	0	15:39	1	16:39	0	17:39	0	18:39	0
7:40	0	8:40	0	9:40	/	13:40	0	14:40	0	15:40	0	16:40	0	17:40	0	18:40	0
7:41	0	8:41	0	9:41	/	13:41	0	14:41	0	15:41	0	16:41	0	17:41	1	18:41	0
7:42	0	8:42	0	9:42	/	13:42	0	14:42	0	15:42	1	16:42	0	17:42	0	18:42	0
7:43	0	8:43	0	9:43	/	13:43	0	14:43	0	15:43	0	16:43	0	17:43	0	18:43	0
7:44	0	8:44	0	9:44	/	13:44	0	14:44	0	15:44	1	16:44	1	17:44	1	18:44	0
7:45	0	8:45	0	9:45	/	13:45	0	14:45	2	15:45	2	16:45	1	17:45	0	18:45	0
7:46	0	8:46	0	9:46	/	13:46	0	14:46	0	15:46	0	16:46	0	17:46	0	18:46	0
7:47	0	8:47	0	9:47	/	13:47	0	14:47	0	15:47	0	16:47	0	17:47	0	18:47	1
7:48	0	8:48	0	9:48	/	13:48	0	14:48	0	15:48	0	16:48	0	17:48	0	18:48	0
7:49	0	8:49	0	9:49	/	13:49	0	14:49	1	15:49	0	16:49	0	17:49	0	18:49	0
7:50	0	8:50	0	9:50	/	13:50	0	14:50	0	15:50	0	16:50	1	17:50	0	18:50	0
7:51	0	8:51	0	9:51	/	13:51	0	14:51	0	15:51	0	16:51	0	17:51	0	18:51	0
7:52	0	8:52	0	9:52	/	13:52	0	14:52	0	15:52	0	16:52	0	17:52	0	18:52	0
7:53	0	8:53	0	9:53	/	13:53	0	14:53	0	15:53	1	16:53	0	17:53	0	18:53	0
7:54	0	8:54	1	9:54	/	13:54	0	14:54	0	15:54	1	16:54	0	17:54	0	18:54	0
7:55	0	8:55	0	9:55	/	13:55	0	14:55	0	15:55	0	16:55	0	17:55	0	18:55	0
7:56	0	8:56	0	9:56	/	13:56	0	14:56	0	15:56	0	16:56	0	17:56	0	18:56	0
7:57	0	8:57	0	9:57	/	13:57	0	14:57	0	15:57	1	16:57	0	17:57	1	18:57	1
7:58	0	8:58	0	9:58	/	13:58	0	14:58	0	15:58	1	16:58	0	17:58	0	18:58	0
7:59	0	8:59	1	9:59	/	13:59	0	14:59	0	15:59	0	16:59	0	17:59	0	18:59	1

Date 9/25/2018
Location Malibu Jewish Center & Synagogue - 24855 Pacific Coast Highway
Movement Eastbound Merge - Queue Length

Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles	Time	# vehicles
7:00	0	8:00	0	9:00	0	13:00	/	14:00	0	15:00	0	16:00	0	17:00	0	18:00	0
7:01	0	8:01	0	9:01	0	13:01	/	14:01	0	15:01	0	16:01	0	17:01	0	18:01	0
7:02	0	8:02	0	9:02	0	13:02	/	14:02	0	15:02	0	16:02	0	17:02	0	18:02	0
7:03	0	8:03	0	9:03	0	13:03	/	14:03	0	15:03	0	16:03	0	17:03	0	18:03	0
7:04	0	8:04	0	9:04	0	13:04	/	14:04	0	15:04	0	16:04	0	17:04	0	18:04	0
7:05	0	8:05	0	9:05	0	13:05	/	14:05	0	15:05	0	16:05	0	17:05	0	18:05	0
7:06	0	8:06	0	9:06	0	13:06	/	14:06	0	15:06	0	16:06	0	17:06	0	18:06	0
7:07	0	8:07	0	9:07	0	13:07	/	14:07	0	15:07	0	16:07	0	17:07	0	18:07	0
7:08	0	8:08	0	9:08	0	13:08	/	14:08	0	15:08	0	16:08	0	17:08	0	18:08	0
7:09	0	8:09	0	9:09	0	13:09	/	14:09	0	15:09	0	16:09	0	17:09	0	18:09	0
7:10	0	8:10	0	9:10	0	13:10	/	14:10	0	15:10	0	16:10	0	17:10	0	18:10	0
7:11	0	8:11	0	9:11	0	13:11	/	14:11	0	15:11	0	16:11	0	17:11	0	18:11	0
7:12	0	8:12	0	9:12	0	13:12	/	14:12	0	15:12	0	16:12	0	17:12	0	18:12	0
7:13	0	8:13	0	9:13	0	13:13	/	14:13	0	15:13	0	16:13	1	17:13	0	18:13	0
7:14	0	8:14	0	9:14	0	13:14	/	14:14	0	15:14	0	16:14	0	17:14	0	18:14	0
7:15	0	8:15	0	9:15	0	13:15	/	14:15	0	15:15	0	16:15	0	17:15	0	18:15	0
7:16	0	8:16	0	9:16	0	13:16	/	14:16	0	15:16	0	16:16	0	17:16	0	18:16	0
7:17	0	8:17	0	9:17	0	13:17	/	14:17	0	15:17	0	16:17	0	17:17	0	18:17	0
7:18	0	8:18	0	9:18	0	13:18	/	14:18	0	15:18	0	16:18	0	17:18	0	18:18	1
7:19	0	8:19	0	9:19	0	13:19	/	14:19	0	15:19	0	16:19	0	17:19	0	18:19	0
7:20	0	8:20	0	9:20	0	13:20	/	14:20	0	15:20	0	16:20	0	17:20	0	18:20	0
7:21	0	8:21	0	9:21	0	13:21	/	14:21	0	15:21	0	16:21	0	17:21	0	18:21	1
7:22	0	8:22	0	9:22	0	13:22	/	14:22	0	15:22	0	16:22	0	17:22	0	18:22	0
7:23	0	8:23	0	9:23	0	13:23	/	14:23	0	15:23	0	16:23	0	17:23	0	18:23	0
7:24	0	8:24	0	9:24	0	13:24	/	14:24	0	15:24	0	16:24	0	17:24	0	18:24	0
7:25	0	8:25	0	9:25	0	13:25	/	14:25	0	15:25	0	16:25	0	17:25	0	18:25	0
7:26	0	8:26	0	9:26	0	13:26	/	14:26	0	15:26	0	16:26	0	17:26	0	18:26	0
7:27	0	8:27	0	9:27	0	13:27	/	14:27	0	15:27	0	16:27	0	17:27	0	18:27	0
7:28	0	8:28	0	9:28	0	13:28	/	14:28	0	15:28	0	16:28	0	17:28	0	18:28	0
7:29	0	8:29	0	9:29	0	13:29	/	14:29	0	15:29	0	16:29	0	17:29	0	18:29	0
7:30	0	8:30	0	9:30	/	13:30	0	14:30	0	15:30	0	16:30	0	17:30	0	18:30	0
7:31	0	8:31	0	9:31	/	13:31	0	14:31	0	15:31	1	16:31	1	17:31	0	18:31	0
7:32	0	8:32	0	9:32	/	13:32	0	14:32	0	15:32	0	16:32	0	17:32	0	18:32	0
7:33	0	8:33	0	9:33	/	13:33	0	14:33	0	15:33	0	16:33	0	17:33	0	18:33	0
7:34	0	8:34	0	9:34	/	13:34	0	14:34	0	15:34	0	16:34	0	17:34	0	18:34	0
7:35	0	8:35	0	9:35	/	13:35	0	14:35	0	15:35	0	16:35	0	17:35	0	18:35	1
7:36	0	8:36	0	9:36	/	13:36	0	14:36	0	15:36	0	16:36	0	17:36	0	18:36	0
7:37	0	8:37	0	9:37	/	13:37	0	14:37	0	15:37	1	16:37	0	17:37	0	18:37	0
7:38	0	8:38	0	9:38	/	13:38	0	14:38	0	15:38	0	16:38	0	17:38	0	18:38	0
7:39	0	8:39	0	9:39	/	13:39	0	14:39	0	15:39	0	16:39	0	17:39	0	18:39	0
7:40	0	8:40	0	9:40	/	13:40	0	14:40	0	15:40	0	16:40	0	17:40	0	18:40	0
7:41	0	8:41	0	9:41	/	13:41	0	14:41	0	15:41	0	16:41	0	17:41	0	18:41	0
7:42	0	8:42	0	9:42	/	13:42	0	14:42	0	15:42	0	16:42	0	17:42	0	18:42	0
7:43	0	8:43	0	9:43	/	13:43	0	14:43	0	15:43	0	16:43	0	17:43	0	18:43	0
7:44	0	8:44	0	9:44	/	13:44	0	14:44	0	15:44	0	16:44	0	17:44	0	18:44	0
7:45	0	8:45	0	9:45	/	13:45	0	14:45	0	15:45	1	16:45	0	17:45	0	18:45	0
7:46	0	8:46	0	9:46	/	13:46	0	14:46	0	15:46	1	16:46	0	17:46	0	18:46	0
7:47	0	8:47	0	9:47	/	13:47	0	14:47	0	15:47	0	16:47	0	17:47	0	18:47	1
7:48	0	8:48	0	9:48	/	13:48	0	14:48	0	15:48	0	16:48	0	17:48	0	18:48	0
7:49	0	8:49	0	9:49	/	13:49	0	14:49	0	15:49	0	16:49	0	17:49	0	18:49	0
7:50	0	8:50	0	9:50	/	13:50	0	14:50	0	15:50	0	16:50	0	17:50	0	18:50	0
7:51	0	8:51	0	9:51	/	13:51	0	14:51	0	15:51	0	16:51	0	17:51	0	18:51	0
7:52	0	8:52	0	9:52	/	13:52	0	14:52	0	15:52	0	16:52	0	17:52	0	18:52	0
7:53	0	8:53	0	9:53	/	13:53	0	14:53	0	15:53	1	16:53	0	17:53	0	18:53	0
7:54	0	8:54	0	9:54	/	13:54	0	14:54	0	15:54	0	16:54	0	17:54	0	18:54	0
7:55	0	8:55	0	9:55	/	13:55	0	14:55	0	15:55	0	16:55	0	17:55	0	18:55	0
7:56	0	8:56	0	9:56	/	13:56	0	14:56	0	15:56	0	16:56	0	17:56	0	18:56	0
7:57	0	8:57	0	9:57	/	13:57	0	14:57	0	15:57	0	16:57	0	17:57	0	18:57	1
7:58	0	8:58	0	9:58	/	13:58	0	14:58	0	15:58	0	16:58	0	17:58	0	18:58	0
7:59	0	8:59	0	9:59	/	13:59	0	14:59	0	15:59	0	16:59	0	17:59	0	18:59	0

Attachment C

Caltrans Accident Rate and Summary Information
Pacific Coast Highway, Mile Post 48.92 to Mile Post 49.00 (1/1/11 to 12/31/16)

California Department of Transportation

OTM22130

Table B - Selective Accident Rate Calculation

Policy controlling the use of Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

1. TASAS - TSN has officially replaced the TASAS - "Legacy" database.

2. Reports from TSN are to be used and interpreted by the California Department of Transportation (Caltrans) officials or authorized representative.

3. Electronic versions of these reports may be emailed between Caltrans' employees only using the State computer system.

4. The contents of these reports shall be considered confidential and may be privileged pursuant to 23 U.S.C. Section 409, and are for the sole use of the intended recipient(s). Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message. Do not print, copy or forward.

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 4041607

Request Name: TAMAYO1375

Ref Date: 09/10/2018

Request-& Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates: Rate	Inj%	Fat%	Override ADT: Main	Cross	Req. Type	Com-bine?	Excl Ramp?
1 1	H	T	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-11	31-DEC-16	N	L						N	N	N
1 2	H	N	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-11	31-DEC-16	N	L						N	N	N
1 3	H	N	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-11	31-DEC-11	N	L						N	N	N
1 4	H	N	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-12	31-DEC-12	N	L						N	N	N
1 5	H	N	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-13	31-DEC-13	N	L						N	N	N
1 6	H	N	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-14	31-DEC-14	N	L						N	N	N
1 7	H	N	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-15	31-DEC-15	N	L						N	N	N
1 9	H	N	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-16	31-DEC-16	N	L						N	N	N
1 10	H	S	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-11	31-DEC-16	N	L						N	N	N
1 11	H	S	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-11	31-DEC-11	N	L						N	N	N
1 12	H	S	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-12	31-DEC-12	N	L						N	N	N
1 13	H	S	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-13	31-DEC-13	N	L						N	N	N
1 14	H	S	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-14	31-DEC-14	N	L						N	N	N
1 15	H	S	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-15	31-DEC-15	N	L						N	N	N
1 16	H	S	I	07 LA 001 048.920 - 07 LA 001 049.001	01-JAN-16	31-DEC-16	N	L						N	N	N

Event Log:

Job id is : 44945 Accidents Table B Request TAMAYO1375 Submitted by T7MKIAN
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2011 TO 12/31/2016
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2011 TO 12/31/2016
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2011 TO 12/31/2011
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2012 TO 12/31/2012

07 LA 001 48.92 - 07 LA 001 49.001 01/01/2013 TO 12/31/2013
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2014 TO 12/31/2014
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2015 TO 12/31/2015
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2016 TO 12/31/2016
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2011 TO 12/31/2016
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2011 TO 12/31/2011
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2012 TO 12/31/2012
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2013 TO 12/31/2013
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2014 TO 12/31/2014
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2015 TO 12/31/2015
07 LA 001 48.92 - 07 LA 001 49.001 01/01/2016 TO 12/31/2016

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description		Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	Actual F+I	Actual Tot	Average Fat	Average F+I	Average Tot
07 LA 001 048.920 - 07 LA 001 049.000 0001-0001 2011-01-01 2016-12-31	72 mo.	.081 MI H 38 U	4	0	3	3	3	0	1	0 5	32.1	5.70	0.000	.53	.70	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0002 2011-01-01 2016-12-31	72 mo.	.081 MI H 38 NORTH U	3	0	3	3	2	0	1	0 5	16.1	2.85	0.000	1.05	1.05	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0003 2011-01-01 2011-12-31	12 mo.	.081 MI H 38 NORTH U	1	0	1	1	1	0	0	0 2	16.8	.50	0.000	2.00	2.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0004 2012-01-01 2012-12-31	12 mo.	.081 MI H 38 NORTH U	0	0	0	0	0	0	0	0 0	16.8	.50	0.000	.00	.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0005 2013-01-01 2013-12-31	12 mo.	.081 MI H 38 NORTH U	1	0	1	1	0	0	0	0 1	16.8	.50	0.000	2.00	2.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0006 2014-01-01 2014-12-31	12 mo.	.081 MI H 38 NORTH U	0	0	0	0	0	0	0	0 0	16.0	.47	0.000	.00	.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0007 2015-01-01 2015-12-31	12 mo.	.081 MI H 38 NORTH U	1	0	1	1	1	0	1	0 2	15.3	.45	0.000	2.22	2.22	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0009 2016-01-01 2016-12-31	12 mo.	.081 MI H 38 NORTH U	0	0	0	0	0	0	0	0 0	14.7	.43	0.000	.00	.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0010 2011-01-01 2016-12-31	72 mo.	.081 MI H 38 SOUTH U	1	0	0	0	1	0	0	0 0	16.1	2.85	0.000	.00	.35	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0011 2011-01-01 2011-12-31	12 mo.	.081 MI H 38 SOUTH U	0	0	0	0	0	0	0	0 0	16.8	.50	0.000	.00	.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0012 2012-01-01 2012-12-31	12 mo.	.081 MI H 38 SOUTH U	0	0	0	0	0	0	0	0 0	16.8	.50	0.000	.00	.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0013 2013-01-01 2013-12-31	12 mo.	.081 MI H 38 SOUTH U	0	0	0	0	0	0	0	0 0	16.8	.50	0.000	.00	.00	0.011	.60	1.41

Accident Rates expressed as: **# of accidents / Million vehicle miles**

+ denotes that **Million Vehicles** (MV) used in accident rates instead (for intersections and ramps).

For Ramps RUS only considers R(Rural) U(Urban)

Location Description				Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	Actual F+I	Actual Tot	Average Fat	Average F+I	Average Tot
07 LA 001 048.920 - 07 LA 001 049.000 0001-0014	2014-01-01	2014-12-31	12 mo.	.081 MI H 38 SOUTH U	0	0	0	0	0	0	0	0 0	16.0	.47	0.000	.00	.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0015	2015-01-01	2015-12-31	12 mo.	.081 MI H 38 SOUTH U	0	0	0	0	0	0	0	0 0	15.3	.45	0.000	.00	.00	0.011	.60	1.41
07 LA 001 048.920 - 07 LA 001 049.000 0001-0016	2016-01-01	2016-12-31	12 mo.	.081 MI H 38 SOUTH U	1	0	0	0	1	0	0	0 0	14.7	.43	0.000	.00	2.33	0.011	.60	1.41

Accident Rates expressed as: **# of accidents / Million vehicle miles**

\+ denotes that **Million Vehicles** (MV) used in accident rates instead (for intersections and ramps).

For Ramps RUS only considers R(Rural) U(Urban)

California Department of Transportation

OTM22200

TSAR - ACCIDENT DETAIL

Policy controlling the use of Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

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4. The contents of these reports shall be considered confidential and may be privileged pursuant to 23 U.S.C. Section 409, and are for the sole use of the intended recipient(s). Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message. Do not print, copy or forward.

California Department of Transportation

OTM22200

TSAR - ACCIDENT DETAIL

REPORT PARAMETERS:

Total Accidents Retrieved: 4

REPORT DATE	:	09/10/2018
REFERENCE DATE	:	09/10/2018
SUBMITTOR	:	T7MKIAN
REPORT TITLE	:	' ALL ACCIDENTS, 07-LA-001, PM 48.92-49.00, 1/1/11-12/31/16, TAMAYO1375 '
EVENT ID	:	4041613

LOCATION CRITERIA:

FROM: 07-LA-001 048.920 TO: 07-LA-001 049.001

SELECTION CRITERIA:

Accidents Date Range:

From -- 01/01/2011 To -- 12/31/2016

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT DETAIL
' ALL ACCIDENTS, 07-LA-001, PM 48.92-49.00, 1/1/11-12/31/16, TAMAYO1375 '

DI	RTE NO	SUF	CO	PRE	POST MILE	HG	AC	MT	BA	LANES LT	LANES RT	RU	FT	IRL	SOH	DAY	ACCIDENT DATE MM-DD-YY	TIME HHMM	COMMON ACCIDENT NUMBER	PCF	ENVIR COND W	L	S	RC	RWC	TOC	NO MTR VEH	PT	DIR	VHI	SI	PERSON K	PERSON I	OSP	LOC	OSO LOC	OSO LOC	OSO LOC	OAF 12	MOV	SDP 12
07	001		LA		048.990	D	C	H	Z	02	02	U	H		N	4	06-08-11	1100	190058432	3	B	A	A	H	D	D	02	A	S	1	C	00	01	V2	A	----	----	----	N<	L	A<
																												D	N	1	C	00	01	V1	F	----	----	----	N<	B	A<
07	001		LA		048.990	D	C	H	Z	02	02	U	H		N	3	08-06-13	1135	190029688	6	A	A	A	H	D	H	01	L	N	1	C	00	01	V2	G	----	----	----	N<	B	H<
																												A	N	1	C	00	00	V1	G	----	----	----	N<	O	H<
07	001		LA		048.990	D	C	H	Z	02	02	U	H		N	3	01-13-15	2130	190005175	6	A	D	A	H	D	C	02	A	N	1	C	00	01	V2	D	----	----	----	N<	P	A<
																												A	N	1	C	00	01	V1	D	----	----	----	N<	B	A<
07	001		LA		048.990	D	C	H	Z	02	02	U	H		S	2	04-04-16	1720	190025042	5	A	A	A	H	D	B	02	A	N	2	C	00	00	V2	F	----	----	----	F<	L	A<
																												A	S	1	C	00	00	V1	D	----	----	----	N<	B	A<

Total Accidents: 4

California Department of Transportation

OTM22215

TSAR - ACCIDENT SUMMARY

REPORT PARAMETERS:

REPORT DATE	:	09/10/2018
REFERENCE DATE	:	09/10/2018
SUBMITTOR	:	T7MKIAN
REPORT TITLE	:	' ALL ACCIDENTS, 07-LA-001, PM 48.92-49.00, 1/1/11-12/31/16, TAMAYO1375 '
EVENT ID	:	4041613

LOCATION CRITERIA:

FROM: 07-LA-001 048.920 TO: 07-LA-001 049.001

SELECTION CRITERIA:

Accidents Date Range:

From -- 01/01/2011 To -- 12/31/2016

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT SUMMARY
' ALL ACCIDENTS, 07-LA-001, PM 48.92-49.00, 1/1/11-12/31/16, TAMAYO1375 '

TOTAL ACCIDENTS	FATAL	INJURY	PDO	PERSONS KILLED	PERSONS INJURED
4	0	3	1	0	5

MOTOR VEHICLES INVOLVED

NUMBER	PCT	CODE
1	25.0	1
3	75.0	2
0	0.0	3
0	0.0	>3

<---LINES CODED--->

NUMBER	PCT	CODE
0	0.0	1
4	100.0	2
0	0.0	3
0	0.0	4
0	0.0	5
0	0.0	6
0	0.0	7
0	0.0	8
0	0.0	9

<---- HOUR OF DAY ---->

NUMBER	PCT	CODE
0	0.0	00- 12 MID.
0	0.0	01- 1 A.M.
0	0.0	02- 2 A.M.
0	0.0	03- 3 A.M.
0	0.0	04- 4 A.M.
0	0.0	05- 5 A.M.
0	0.0	06- 6 A.M.
0	0.0	07- 7 A.M.
0	0.0	08- 8 A.M.
0	0.0	09- 9 A.M.
0	0.0	10- 10 A.M.
2	50.0	11- 11 A.M.
0	0.0	12- 12 NOON
0	0.0	13- 1 P.M.
0	0.0	14- 2 P.M.
0	0.0	15- 3 P.M.
0	0.0	16- 4 P.M.
1	25.0	17- 5 P.M.
0	0.0	18- 6 P.M.
0	0.0	19- 7 P.M.
0	0.0	20- 8 P.M.
1	25.0	21- 9 P.M.
0	0.0	22- 10 P.M.
0	0.0	23- 11 P.M.
0	0.0	25- UNKNOWN

<--- ACCESS CONTROL --->

NUMBER	PCT	CODE
4	100.0	C-CONVENTIONAL
0	0.0	E-EXPRESSWAY
0	0.0	F-FREEWAY
0	0.0	S-1-WAY CITY ST
0	0.0	--INVALID DATA
0	0.0	+-NO DATA

<--- SIDE OF HIGHWAY --->

NUMBER	PCT	CODE
3	75.0	N-NORTHBOUND
1	25.0	S-SOUTHBOUND
0	0.0	E-EASTBOUND
0	0.0	W-WESTBOUND

<----- YEAR ----->

NUMBER	PCT	CODE
0	0.0	2006
0	0.0	2007
0	0.0	2008
0	0.0	2009
0	0.0	2010
1	25.0	2011
0	0.0	2012
1	25.0	2013
0	0.0	2014
1	25.0	2015
1	25.0	2016
0	0.0	2017

<----- MONTH ----->

NUMBER	PCT	CODE
1	25.0	01-JANUARY
0	0.0	02-FEBRUARY
0	0.0	03-MARCH
1	25.0	04-APRIL
0	0.0	05-MAY
1	25.0	06-JUNE
0	0.0	07-JULY
1	25.0	08-AUGUST
0	0.0	09-SEPTEMBER
0	0.0	10-OCTOBER
0	0.0	11-NOVEMBER
0	0.0	12-DECEMBER

<---- DAY OF WEEK ---->

NUMBER	PCT	CODE
0	0.0	1-SUNDAY
1	25.0	2-MONDAY
2	50.0	3-TUESDAY
1	25.0	4-WEDNESDAY
0	0.0	5-THURSDAY
0	0.0	6-FRIDAY
0	0.0	7-SATURDAY

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT SUMMARY
' ALL ACCIDENTS, 07-LA-001, PM 48.92-49.00, 1/1/11-12/31/16, TAMAYO1375 '

<-- PRIMARY COLLISION FACTOR -->

NUMBER	PCT	CODE
0	0.0	1-INFLUENCE ALCOHOL
0	0.0	2-FOLLOW TOO CLOSE
1	25.0	3-FAILURE TO YIELD
0	0.0	4-IMPROPER TURN
1	25.0	5-SPEEDING
2	50.0	6-OTHER VIOLATIONS
0	0.0	B-IMPROPER DRIVING
0	0.0	C-OTHER THAN DRIVER
0	0.0	D-UNKNOWN
0	0.0	E-FELL SLEEP
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--- TYPE OF COLLISION --->

NUMBER	PCT	CODE
0	0.0	A-HEAD-ON
1	25.0	B-SIDESWIPE
1	25.0	C-REAR END
1	25.0	D-BROADSIDE
0	0.0	E-HIT OBJECT
0	0.0	F-OVERTURN
0	0.0	G-AUTO-PEDESTRIAN
1	25.0	H-OTHER
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--- ROADWAY CONDITION --->

NUMBER	PCT	CODE
0	0.0	A-HOLES, RUTS
0	0.0	B-LOOSE MATERIAL
0	0.0	C-OBSTRUCTION ON ROAD
0	0.0	D-CONSTRUCT-REPAIR-ZONE
0	0.0	E-REDUCED ROAD WIDTH
0	0.0	F-FLOODED
0	0.0	G-OTHER
4	100.0	H-NO UNUSUAL CONDITION
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--------- WEATHER --------->

NUMBER	PCT	CODE
3	75.0	A-CLEAR
1	25.0	B-CLOUDY
0	0.0	C-RAINING
0	0.0	D-SNOWING
0	0.0	E-FOG
0	0.0	F-OTHER
0	0.0	G-WIND
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<------------ LIGHTING ------------>

NUMBER	PCT	CODE
3	75.0	A-DAY LIGHT
0	0.0	B-DUSK/DAWN
0	0.0	C-DARK-STREET LIGHT
1	25.0	D-DARK-NO STREET LIGHT
0	0.0	E-DARK-INOPR STREET LIGHT
0	0.0	F-DARK-NOT STATED
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<----- ROAD SURFACE ----->

NUMBER	PCT	CODE
4	100.0	A-DRY
0	0.0	B-WET
0	0.0	C-SNOWY, ICY
0	0.0	D-SLIPPERY
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<------ RIGHT OF WAY CONTROL ------>

NUMBER	PCT	CODE
0	0.0	A-CONTROL FUNCTIONING
0	0.0	B-CONTROL NOT FUNCTIONING
0	0.0	C-CONTROLS OBSCURED
4	100.0	D-NO CONTROLS PRESENT
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<-------- HIGHWAY GROUP -------->

NUMBER	PCT	CODE
0	0.0	R-IND. ALIGN RIGHT
0	0.0	L-IND. ALIGN LEFT
4	100.0	D-DIVIDED
0	0.0	U-UNDIVIDED

<- INTERSECTION/RAMP ACCIDENT LOCATION ->

NUMBER	PCT	CODE
0	0.0	1-RAMP INTERSECTION (EXIT)
0	0.0	2-RAMP
0	0.0	3-RAMP ENTRY
0	0.0	4-RAMP AREA, INTERSECTION STREET
0	0.0	5-IN INTERSECTION
0	0.0	6-OUTSIDE INTRSCT-NONSTATE RTE
4	100.0	--DOES NOT APPLY

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - PARTY SUMMARY
' ALL ACCIDENTS, 07-LA-001, PM 48.92-49.00, 1/1/11-12/31/16, TAMAYO1375 '

<------------ PARTY TYPE ------------>

NUMBER	PCT	CODE
4	100.0	A-PASNGR CAR/STA WAGON
0	0.0	B-PASNGR CAR W/TRAILER
0	0.0	C-MOTORCYCLE
1	25.0	D-PICKUP/PANEL TRUCK
0	0.0	E-PICKUP/PANEL W/TRAILER
0	0.0	F-TRUCK/TRUCK TRACTOR
0	0.0	G-TRUCK/TRACTOR & 1 TRAILER
0	0.0	2-TRUCK/TRACTOR & 2 TRAILER
0	0.0	3-TRUCK/TRACTOR & 3 TRAILER
0	0.0	4-SINGLE UNIT TANKER
0	0.0	5-TRUCK/TRA & 1 TANK TRALR
0	0.0	6-TRUCK/TRA & 2 TANK TRALR
0	0.0	H-SCHOOL BUS
0	0.0	I-OTHER BUS
0	0.0	J-EMERGENCY VEHICLE
0	0.0	K-HIGHWAY CONST EQUP.**
1	25.0	L-BICYCLE
0	0.0	M-OTHER-MOTOR VEH
0	0.0	N-OTHER-NON-MOTOR VEH
0	0.0	O-SPILLED LOADS
0	0.0	P-DISENGAGED TOW
0	0.0	Q-UNINVOLVED VEHICLE
0	0.0	R-MOPED
0	0.0	T-TRAIN
0	0.0	U-PEDESTRIAN
0	0.0	V-DISMOUNT PEDESTRIAN
0	0.0	W-ANIMAL - LIVESTOCK
0	0.0	X-ANIMAL - DEER
0	0.0	Z-ANIMAL - OTHER

<- MOVEMENT PRECEDING COLLISION ->

NUMBER	PCT	CODE
0	0.0	A-STOPPED
4	100.0	B-PROCEDED STRAIGHT
0	0.0	C-RAN OFF ROAD
0	0.0	D-MAKING RIGHT TURN
0	0.0	E-MAKING LEFT TURN
0	0.0	F-MAKING U TURN
0	0.0	G-BACKING
0	0.0	H-SLOWING, STOPPING
0	0.0	I-PASS OTHER VEHICLE
0	0.0	J-CHANGING LANES
0	0.0	K-PARKING
2	50.0	L-ENTER FROM SHLDR
0	0.0	M-OTHER UNSAFE TURN
0	0.0	N-CROSS INTO OPP LN
1	25.0	O-PARKED
1	25.0	P-MERGING
0	0.0	Q-TRAVEL WRONG WAY
0	0.0	R-OTHER
0	0.0	<-NOT STATED

PEDESTRIAN

NUMBER	PCT	CODE
0	0.0	2- XING XWALK - INTRST
0	0.0	3- XING XWALK - NOT INTR
0	0.0	4- XING NOT XWALK
0	0.0	5- ROADWAY - INCL SHLDR
0	0.0	6- NOT IN ROADWAY
0	0.0	7- APRH-LEAVE SCHL BUS
0	0.0	- INVALID CODES

<---- OTHER ASSOCIATED FACTORS ---->

#1 NUMBER	PCT	#2 NUMBER	PCT	CODE
0	0.0	0	0.0	1-INFLUENCE ALCOHOL
0	0.0	0	0.0	2-FOLLOW TOO CLOSE
0	0.0	0	0.0	3-FAILURE TO YIELD
0	0.0	0	0.0	4-IMPROPER TURN
0	0.0	0	0.0	5-SPEEDING
0	0.0	0	0.0	6-OTHER VIOLATIONS
0	0.0	0	0.0	A-CELL PHONE* (INATTN)
0	0.0	0	0.0	B-ELECTRC EQUIP*(INATTN)
0	0.0	0	0.0	C-RADIO/CD/HDPHN*(INATTN)
0	0.0	0	0.0	D-SMOKING* (INATTN)
0	0.0	0	0.0	E-VISION OBSCUREMENT
1	25.0	0	0.0	F-INATTENTION - OTHER
0	0.0	0	0.0	G-STOP & GO TRAFFIC
0	0.0	0	0.0	H-ENTER/LEAVE RAMP
0	0.0	0	0.0	I-PREVIOUS COLLISION
0	0.0	0	0.0	J-UNFAMILIAR WITH ROAD
0	0.0	0	0.0	K-DEFECT VEHICLE EQUIP
0	0.0	0	0.0	L-UNINVOLVED VEHICLE
0	0.0	0	0.0	M-OTHER
4	100.0	0	0.0	N-NONE APPARENT
0	0.0	0	0.0	P-WIND
0	0.0	0	0.0	R-RAMP ACCIDENT
0	0.0	0	0.0	S-RUNAWAY VEHICLE
0	0.0	0	0.0	T-EATING* (INATTN)
0	0.0	0	0.0	U-CHILDREN* (INATTN)
0	0.0	0	0.0	V-ANIMALS* (INATTN)
0	0.0	0	0.0	W-PERSNL HYGIENE*(INATTN)
0	0.0	0	0.0	X-READING* (INATTN)
0	0.0	4	100.0	<-NOT STATED
0	0.0	0	0.0	--DOES NOT APPLY

* INATTENTION CODES EFF. 01-01-01

<---- DIRECTION OF TRAVEL ---->

NUMBER	PCT	CODE
4	100.0	N-N, NE, NW BOUND
2	50.0	S-S, SE, SW BOUND
0	0.0	E-EASTBOUND
0	0.0	W-WESTBOUND
0	0.0	<-NOT STATED
0	0.0	--DOES NOT APPLY
0	0.0	-INVALID CODES

** INCLUDES EQUIPMENT ENGAGED IN CONST/MAINT ACTIVITIES AS OF 00-02-22

<---- SPECIAL INFORMATION ---->

NUMBER	PCT	CODE
0	0.0	A-HAZARDOUS MATERIALS
0	0.0	B-CELL PHONE IN USE*
4	100.0	C-CELL PHONE NOT IN USE*
0	0.0	D-CELL PHONE NONE/UNKNOWN*
0	0.0	<-NOT STATED
0	0.0	--DOES NOT APPLY
0	0.0	-INVALID CODES

* SPECIAL INFORMATION CODES EFF. 04-01-01

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - PARTY SUMMARY
' ALL ACCIDENTS, 07-LA-001, PM 48.92-49.00, 1/1/11-12/31/16, TAMAYO1375 '

<------------------- OBJECT STRUCT ------------------->

PRIMARY NUMBER	PRIMARY PCT	OTHERS NUMBER	OTHERS PCT	CODE
0	0.0	0	0.0	01-SIDE OF BRIDGE RAILING
0	0.0	0	0.0	02-END OF BRIDGE RAILING
0	0.0	0	0.0	03-PIER, COLUMN, ABUTMENT
0	0.0	0	0.0	04-BOTTOM OF STRUCTURE
0	0.0	0	0.0	05-BRIDGE END POST IN GORE
0	0.0	0	0.0	06-END OF GUARD RAIL
0	0.0	0	0.0	07-BRIDGE APPROACH GUARD RAIL
0	0.0	0	0.0	10-LIGHT OR SIGNAL POLE
0	0.0	0	0.0	11-UTILITY POLE
0	0.0	0	0.0	12-POLE (TYPE NOT STATED)
0	0.0	0	0.0	13-TRAFFIC SIGN/SIGN POST
0	0.0	0	0.0	14-OTHER SIGNS NOT TRAFFIC
0	0.0	0	0.0	15-GUARDRAIL
0	0.0	0	0.0	16-MEDIAN BARRIER
0	0.0	0	0.0	17-WALL (EXCEPT SOUND WALL)
0	0.0	0	0.0	18-DIKE OR CURB
0	0.0	0	0.0	19-TRAFFIC ISLAND
0	0.0	0	0.0	20-RAISED BARS
0	0.0	0	0.0	21-CONCRETE OBJ (HDWL, D.I.)
0	0.0	0	0.0	22-GUIDEPOST, CULVERT, PM
0	0.0	0	0.0	23-CUT SLOPE OR EMBANKMENT
0	0.0	0	0.0	24-OVER EMBANKMENT
0	0.0	0	0.0	25-IN WATER
0	0.0	0	0.0	26-DRAINAGE DITCH
0	0.0	0	0.0	27-FENCE
0	0.0	0	0.0	28-TREES
0	0.0	0	0.0	29-PLANTS
0	0.0	0	0.0	30-SOUND WALL
0	0.0	0	0.0	40-NATURAL MATRL ON ROAD
0	0.0	0	0.0	41-TEMP BARRICADES, CONES
0	0.0	0	0.0	42-OTHER OBJECT ON ROAD
0	0.0	0	0.0	43-OTHER OBJECT OFF ROAD
0	0.0	0	0.0	44-OVERTURNED
0	0.0	0	0.0	45-CRASH CUSHION (SAND)
0	0.0	0	0.0	46-CRASH CUSHION (OTHER)
0	0.0	0	0.0	51-CALL BOX
0	0.0	0	0.0	98-UNKNOWN OBJECT STRUCK
0	0.0	0	0.0	99- NO OBJECT INVOLVED
4	100.0	0	0.0	V1 THRU V9 VEHICLE 1 TO 9
0	0.0	0	0.0	<< NOT STATED
0	0.0	4	100.0	-- DOES NOT APPLY
0	0.0	0	0.0	- INVALID CODES

<------ LOCATION OF COLLISION ------>

PRIMARY NUMBER	PRIMARY PCT	OTHERS NUMBER	OTHERS PCT	CODE
1	25.0	0	0.0	A-BEYOND MEDIAN OR STRIPE-LEFT
0	0.0	0	0.0	B-BEYOND SHLDER DRIVERS LEFT
0	0.0	0	0.0	C-LEFT SHOULDER AREA
2	50.0	0	0.0	D-LEFT LANE
0	0.0	0	0.0	E-INTERIOR LANES
2	50.0	0	0.0	F-RIGHT LANE
1	25.0	0	0.0	G-RIGHT SHOULDER AREA
0	0.0	0	0.0	H-BEYOND SHLDER DRIVERS RIGHT
0	0.0	0	0.0	I-GORE AREA
0	0.0	0	0.0	J-OTHER
0	0.0	0	0.0	V-HOV LANE(S)
0	0.0	0	0.0	W-HOV LANE BUFFER AREA
0	0.0	0	0.0	<-NOT STATED
0	0.0	4	100.0	--DOES NOT APPLY
0	0.0	0	0.0	-INVALID CODES

<------ DRUG/PHYSICAL ------>

PRIMARY NUMBER	PRIMARY PCT	OTHERS NUMBER	OTHERS PCT	CODE
3	75.0	0	0.0	A-HAD NOT BEEN DRINKING
0	0.0	0	0.0	B-HBD - UNDER INFLUENCE
0	0.0	0	0.0	C-HBD - NOT UNDER INFLUENCE
0	0.0	0	0.0	D-HBD - IMPAIRMENT UNKNOWN
0	0.0	0	0.0	E-UNDER DRUG INFLUENCE
0	0.0	0	0.0	F-OTHER PHYSICAL IMPAIRMENT
0	0.0	0	0.0	G-IMPAIRMENT NOT KNOWN
1	25.0	0	0.0	H-NOT APPLICABLE
0	0.0	0	0.0	I-FATIGUE
0	0.0	4	100.0	< NOT STATED
0	0.0	0	0.0	--DOES NOT APPLY
0	0.0	0	0.0	-INVALID CODES

Pacific Coast Highway and Malibu Jewish Center & Synagogue Project Driveway (Post Mile 48.92 to Post Mile 49.00) - Six-Year Accident Detail Summary

																		Other Associated Factors				Primary		Other		Persons		Drug/Physical	
Date	Time	Day of Week	Motor Vehicles Involved	Access Control	Side of Highway	Primary Collision Factor	Collision Type	Roadway Condition	Weather	Lighting	Road Surface	ROW Control	Highway Group	Int/Ramp Accident Location	Involved Number	Party Type	Movement Preceding Collision	Factor #1	Factor #2	Direction of Travel	Special Information	Object Struck	Location of Collision	Object Struck	Location of Collision	Killed	Injured	Primary	Others
6/8/11	11:00	Wed	2	Conventional	NB	Failure to Yield	Broadside	No Unusual	Cloudy	Daylight	Dry	No Controls Present	Divided	Does Not Apply	1	PC/Station Wagon	Enter from Shoulder	None Apparent	Not Stated	SB	Cell Phone Not in Use	V2	Beyond Median or Stripe-Left	Does Not Apply	Does Not Apply	0	1	Had Not Been Drinking	Not Stated
															2	Pickup/ Panel Truck	Proceeded Straight	None Apparent	Not Stated	NB	Cell Phone Not in Use	V1	Right Lane	Does Not Apply	Does Not Apply	0	1	Had Not Been Drinking	Not Stated
8/6/13	11:35	Tue	1	Conventional	NB	Other Violations	Other	No Unusual	Clear	Daylight	Dry	No Controls Present	Divided	Does Not Apply	1	Bicycle	Proceeded Straight	None Apparent	Not Stated	NB	Cell Phone Not in Use	V2	Right Shoulder Area	Does Not Apply	Does Not Apply	0	1	Not Applicable	Not Stated
															2	PC/Station Wagon	Parked	None Apparent	Not Stated	NB	Cell Phone Not in Use	V1	Right Shoulder Area	Does Not Apply	Does Not Apply	0	0	Not Applicable	Not Stated
1/13/15	21:30	Tue	2	Conventional	NB	Other Violations	Rear End	No Unusual	Clear	Dark-No Street Light	Dry	No Controls Present	Divided	Does Not Apply	1	PC/Station Wagon	Merging	None Apparent	Not Stated	NB	Cell Phone Not in Use	V2	Left Lane	Does Not Apply	Does Not Apply	0	1	Had Not Been Drinking	Not Stated
															2	PC/Station Wagon	Proceeded Straight	None Apparent	Not Stated	NB	Cell Phone Not in Use	V1	Left Lane	Does Not Apply	Does Not Apply	0	1	Had Not Been Drinking	Not Stated
4/4/16	17:20	Mon	2	Conventional	SB	Speeding	Sideswipe	No Unusual	Clear	Daylight	Dry	No Controls Present	Divided	Does Not Apply	1	PC/Station Wagon	Enter from Shoulder	Inattention - Other	Not Stated	NB	Cell Phone Not in Use	V2	Right Lane	Does Not Apply	Does Not Apply	0	0	Had Not Been Drinking	Not Stated
															2	PC/Station Wagon	Proceeded Straight	None Apparent	Not Stated	SB	Cell Phone Not in Use	V1	Left Lane	Does Not Apply	Does Not Apply	0	0	Had Not Been Drinking	Not Stated

ATTACHMENT B

City of Malibu

23825 Stuart Ranch Rd., Malibu, California CA 90265-4804
(310) 456-2489 FAX (310) 456-7650

PUBLIC WORKS REVIEW FOR TRAFFIC
REFERRAL SHEET

TO: Public Works Department DATE: 11/6/2014

FROM: Planning Division

PROJECT NUMBER: CDP 14-069

JOB ADDRESS: 24855 PACIFIC COAST HWY

APPLICANT / CONTACT: Mark Meyer

APPLICANT ADDRESS: 353 S Broadway
Los Angeles, CA 90013

APPLICANT PHONE #: (213) 243-5707

APPLICANT FAX #:

PROJECT DESCRIPTION: Malibu Jewish Center - New 22,902 square foot structure, OWTS, landscape

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TO: Planning Division and/or Applicant

FROM: Public Works Department Traffic Engineering

✓ The following items described on the attached memorandum shall be addressed and resubmitted.

____ The project was reviewed and found to be in conformance with the City's Public Works and LCP policies and CAN proceed through the planning process

____ The project does require a parking study.

____ The project does not require a parking study.

____ The project requires a traffic impact analysis.

____ A site circulation plan is required.

____ A parking plan is required.

SIGNATURE

DATE 12/13/18

City of Malibu
MEMORANDUM

To: Mark Meyer

From: Public Works Department
Nicole Benyamin, Assistant Civil Engineer NB

Date: December 13, 2018

Re: 24855 Pacific Coast Highway CDP 14-069 Memo #1

The Public Works Department has begun its review of this application and cannot recommend approval at this time.

1. Because the report generated future demand by increasing the number of trips in proportion to the increased number of students, the report must include the number of students actually attending the Pre-School Program, the After-School Youth Religious Program, and the Adult Education Program on the study day.

2. Noting that September 25, 2018 was the first day of Sukkot, were attendance patterns different than a typical Tuesday? Were additional trips made to the Synagogue that would not be made on a typical Tuesday?

3. The project is not expected to generate its maximum number of trips during the peak hour of adjacent street traffic in the AM and PM peak periods. However, it is still expected to generate a significant number of trips during nearly peak hours of adjacent street traffic. Since the driveway counts showed negligible numbers of trips from 7:15 AM to 8:15 AM, the project should instead be analyzed from 8:00 AM to 9:00 AM when there are still heavy volumes on Pacific Coast Highway.

4. For the PM peak, trip generation analysis should be conducted from 5:00 PM to 6:00 PM (when 40 trips were counted in the driveway counts) rather than from 4:00 PM to 5:00 PM (when 14 trips were counted in the driveway counts).

5. The pick-up and drop-off traffic management plans during mornings and afternoons states that parents will be directed to occupy spaces on the north side before the south side. Will there be school administrators or volunteers directing parents?

6. The report must expand its analysis on visitors making left turns into and out of the property. Critical movements such as these are a safety concern for all travelers on PCH. Explore mitigation options to prevent or control these critical movements. Analyze the benefits and disadvantages of implementing as well as not implementing these mitigations.

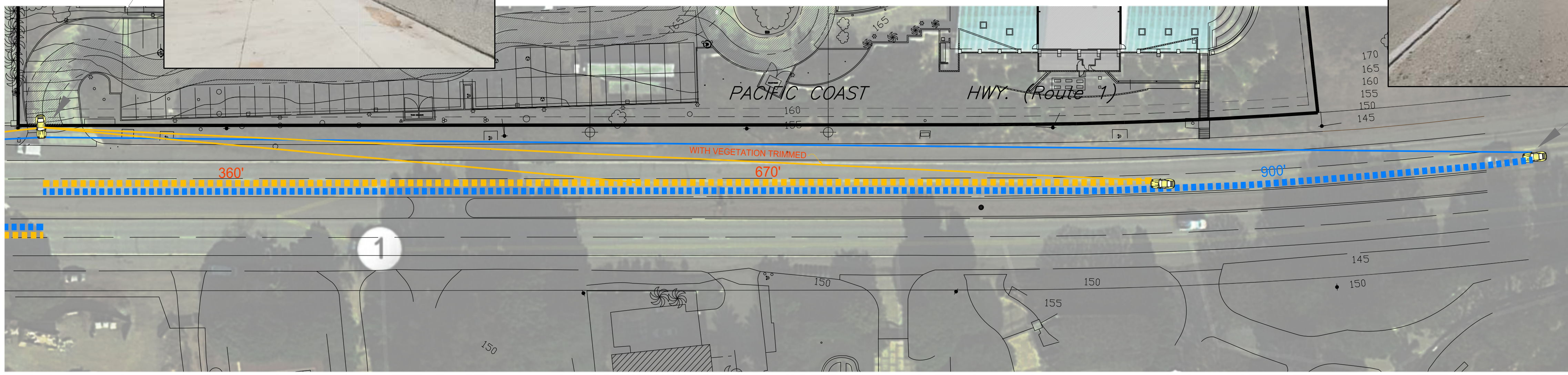
Until these issues are revised the Public Works Department cannot recommend approval for the project.

ATTACHMENT C

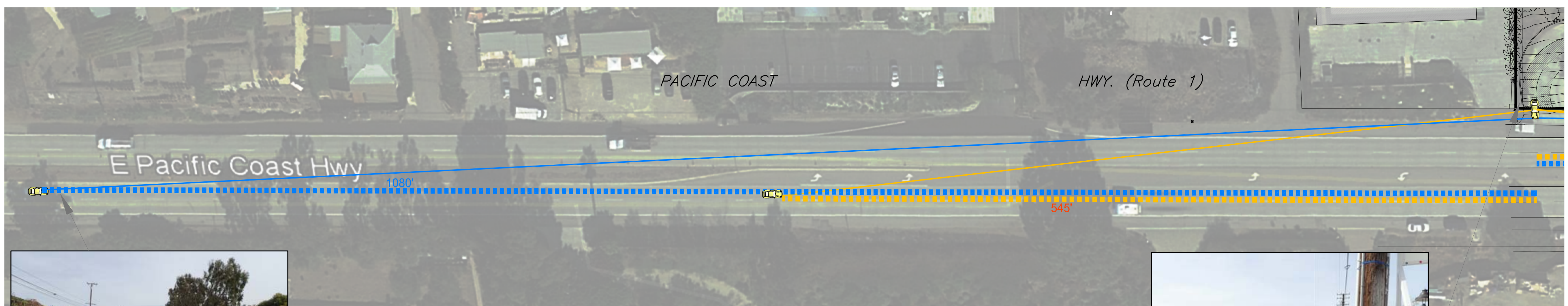
WESTBOUND

Looking to the east along PCH from project driveway.

Approaching the project driveway from the east along PCH.



EASTBOUND



Approaching the project driveway from the west along PCH.

Looking to the west along PCH from project driveway.

LEGEND

- STOPPING SIGHT DISTANCE
- INTERSECTION SIGHT DISTANCE

ATTACHMENT C

3/15/2019

FN: MalibuJewishCenter\SightDisAnalysis\SIGHT_DISTANCE

CRAIN & ASSOCIATES

Transportation Planning
Traffic Engineering

300 Corporate Pointe, Suite 470
Culver City, California 90230
PH (310) 473 6508 F (310) 444 9771
www.crainandassociates.com

SIGHT DISTANCE ANALYSIS

ATTACHMENT D

City of Malibu

Radar Speed Survey

Speed	EB	WB	MPH	Vehicles Surveyed: Eastbound	Vehicles Surveyed: Westbound	TOT. VEH.	
75	0	0	75			0	
74	0	0	74			0	
73	0	0	73			0	
72	0	0	72			0	
71	0	0	71			0	
70	0	0	70			0	
69	0	0	69			0	
68	0	0	68			0	
67	0	0	67			0	
66	1	0	66	X		1	
65	0	0	65			0	
64	0	1	64		X	1	
63	1	0	63	X		1	
62	3	4	62	X X X	X X X X	7	
61	3	1	61	X X X	X	4	
60	3	4	60	X X X	X X X X	7	
59	5	1	59	X X X X X	X	6	
58	3	5	58	X X X	X X X X X	8	
57	6	6	57	X X X X X X	X X X X X X	12	*
56	7	6	56	X X X X X X X	X X X X X X	13	*
55	7	6	55	X X X X X X X	X X X X X X	13	*
54	11	10	54	X X X X X X X X X X X	X X X X X X X X X X	21	P
53	9	8	53	X X X X X X X X X	X X X X X X X X	17	A
52	11	5	52	X X X X X X X X X X X	X X X X X	16	C
51	8	13	51	X X X X X X X X	X X X X X X X X X X X X X	21	E
50	10	7	50	X X X X X X X X X X	X X X X X X X	17	*
49	4	8	49	X X X X	X X X X X X X X	12	*
48	3	6	48	X X X	X X X X X X	9	*
47	1	4	47	X	X X X X	5	
46	2	2	46	X X	X X	4	
45	0	3	45		X X X	3	
44	1	0	44	X		1	
43	0	0	43			0	
42	0	0	42			0	
41	0	0	41			0	
40	0	0	40			0	
39	1	0	39	X		1	
38	0	0	38			0	
37	0	0	37			0	
36	0	0	36			0	
35	0	0	35			0	
34	0	0	34			0	
33	0	0	33			0	
32	0	0	32			0	
31	0	0	31			0	
30	0	0	30			0	
29	0	0	29			0	
28	0	0	28			0	
27	0	0	27			0	
26	0	0	26			0	
25	0	0	25			0	
Total	100	100			GRAND TOTALS	200	

Location: Pacific Coast Highway

Between: at 24855 Pacific Coast Highway

Weather: Overcast

Date: 2/13/19

Time From: 9:30

Time To: 11:00

Existing Speed Limit: 45 MPH

	Eastbound Statistics	Westbound Statistics	Combined Statistics
% Over Pace:	11%	16%	18%
% In Pace:	77%	75%	76%
% Under Pace:	12%	9%	7%
Average Speed:	54 MPH	53 MPH	53 MPH
Pace Speed:	50 - 59 MPH	48 - 57 MPH	48 - 57 MPH
15th Percentile / Critical Speed:	50 MPH	48 MPH	49 MPH
50th Percentile / Critical Speed:	53 MPH	53 MPH	53 MPH
85th Percentile / Critical Speed:	59 MPH	58 MPH	58 MPH

Radar Survey Conducted By:

Counts Unlimited, Inc.

PO Box 1178

Corona, CA 92880

T 951-268-6268 F 951-268-6267

ATTACHMENT E

Malibu Jewish Center & Synagogue Crain & Associates
Project Driveway Intersection with Pacific Coast Highway 3/21/2019
Time Gap Analysis - Southbound (Outbound) Right-Turns

Min Gap per Veh = 6.5 sec (per Index 405.1 of Caltrans Highway Design Manual)

PROJECT VOLUMES:	Existing SBR	Proposed SBR	Hourly SBR
7:00 - 7:15 AM	0	0	0
7:15 - 7:30 AM	0	0	0
7:30 - 7:45 AM	0	0	0
7:45 - 8:00 AM	0	0	0
8:00 - 8:15 AM	0	0	3
8:15 - 8:30 AM	0	0	3
8:30 - 8:45 AM	0	0	16
8:45 - 9:00 AM	1	3	
9:00 - 9:15 AM	0	0	
9:15 - 9:30 AM	4	13	
1:30 - 1:45 PM	0	0	10
1:45 - 2:00 PM	0	0	13
2:00 - 2:15 PM	3	10	16
2:15 - 2:30 PM	0	0	19
2:30 - 2:45 PM	1	3	19
2:45 - 3:00 PM	1	3	24
3:00 - 3:15 PM	4	13	29
3:15 - 3:30 PM	0	0	22
3:30 - 3:45 PM	4	8	22
3:45 - 4:00 PM	4	8	16
4:00 - 4:15 PM	3	6	12
4:15 - 4:30 PM	0	0	8
4:30 - 4:45 PM	1	2	8
4:45 - 5:00 PM	2	4	10
5:00 - 5:15 PM	1	2	6
5:15 - 5:30 PM	0	0	8
5:30 - 5:45 PM	2	4	23
5:45 - 6:00 PM	0	0	23
6:00 - 6:15 PM	2	4	23
6:15 - 6:30 PM	8	15	
6:30 - 6:45 PM	2	4	
6:45 - 7:00 PM	0	0	

	Westbound Pacific Coast Highway Traffic								
Gaps (sec):	**6.5-12.5**	**13.0-19.0**	**19.5-25.5**	**≥ 26.0**	**Allowable Vehicles**	**Adequate Gaps?**	**1-Hour Gap Totals**		**Adequate Gaps?**
7:00 - 7:15 AM	16	7	0	6	54	Yes	7:00 AM	224	Yes
7:15 - 7:30 AM	23	5	5	2	56	Yes	7:15 AM	233	Yes
7:30 - 7:45 AM	20	9	1	3	53	Yes	7:30 AM	236	Yes
7:45 - 8:00 AM	22	8	1	5	61	Yes	7:45 AM	240	Yes
8:00 - 8:15 AM	20	5	3	6	63	Yes	8:00 AM	223	Yes
8:15 - 8:30 AM	24	7	3	3	59	Yes	8:15 AM	220	Yes
8:30 - 8:45 AM	20	9	1	4	57	Yes	8:30 AM	227	Yes
8:45 - 9:00 AM	26	4	2	1	44	Yes			
9:00 - 9:15 AM	20	6	4	4	60	Yes			
9:15 - 9:30 AM	24	9	4	3	66	Yes			
1:30 - 1:45 PM	21	6	2	5	59	Yes	1:30 PM	220	Yes
1:45 - 2:00 PM	14	3	4	6	56	Yes	1:45 PM	203	Yes
2:00 - 2:15 PM	25	4	3	5	62	Yes	2:00 PM	195	Yes
2:15 - 2:30 PM	22	2	3	2	43	Yes	2:15 PM	173	Yes
2:30 - 2:45 PM	12	5	0	5	42	Yes	2:30 PM	159	Yes
2:45 - 3:00 PM	13	6	1	5	48	Yes	2:45 PM	160	Yes
3:00 - 3:15 PM	18	6	2	1	40	Yes	3:00 PM	153	Yes
3:15 - 3:30 PM	19	3	0	1	29	Yes	3:15 PM	157	Yes
3:30 - 3:45 PM	13	3	4	3	43	Yes	3:30 PM	162	Yes
3:45 - 4:00 PM	18	4	1	3	41	Yes	3:45 PM	165	Yes
4:00 - 4:15 PM	10	3	4	4	44	Yes	4:00 PM	152	Yes
4:15 - 4:30 PM	11	3	3	2	34	Yes	4:15 PM	140	Yes
4:30 - 4:45 PM	12	5	4	3	46	Yes	4:30 PM	132	Yes
4:45 - 5:00 PM	9	3	3	1	28	Yes	4:45 PM	126	Yes
5:00 - 5:15 PM	16	4	0	2	32	Yes	5:00 PM	143	Yes
5:15 - 5:30 PM	12	1	0	3	26	Yes	5:15 PM	152	Yes
5:30 - 5:45 PM	16	6	4	0	40	Yes	5:30 PM	159	Yes
5:45 - 6:00 PM	19	6	2	2	45	Yes	5:45 PM	177	Yes
6:00 - 6:15 PM	8	3	1	6	41	Yes	6:00 PM	189	Yes
6:15 - 6:30 PM	18	2	1	2	33	Yes			
6:30 - 6:45 PM	18	5	2	6	58	Yes			
6:45 - 7:00 PM	22	7	3	3	57	Yes			

Malibu Jewish Center & Synagogue Crain & Associates

Project Driveway Intersection with Pacific Coast Highway 3/21/2019

Time Gap Analysis - Eastbound Merge from Center Two-Way Left-Turn Lane

Min Gap per Veh = 6.5 sec (per Index 405.1 of Caltrans Highway Design Manual)

PROJECT VOLUMES:	Existing SBL	Proposed SBL	Hourly SBL
7:00 - 7:15 AM	0	0	0
7:15 - 7:30 AM	0	0	0
7:30 - 7:45 AM	0	0	0
7:45 - 8:00 AM	0	0	0
8:00 - 8:15 AM	0	0	3
8:15 - 8:30 AM	0	0	3
8:30 - 8:45 AM	0	0	9
8:45 - 9:00 AM	1	3	
9:00 - 9:15 AM	0	0	
9:15 - 9:30 AM	2	6	
1:30 - 1:45 PM	0	0	0
1:45 - 2:00 PM	0	0	0
2:00 - 2:15 PM	0	0	6
2:15 - 2:30 PM	0	0	9
2:30 - 2:45 PM	0	0	12
2:45 - 3:00 PM	2	6	20
3:00 - 3:15 PM	1	3	20
3:15 - 3:30 PM	1	3	21
3:30 - 3:45 PM	4	8	18
3:45 - 4:00 PM	3	6	12
4:00 - 4:15 PM	2	4	6
4:15 - 4:30 PM	0	0	2
4:30 - 4:45 PM	1	2	2
4:45 - 5:00 PM	0	0	0
5:00 - 5:15 PM	0	0	2
5:15 - 5:30 PM	0	0	6
5:30 - 5:45 PM	0	0	19
5:45 - 6:00 PM	1	2	21
6:00 - 6:15 PM	2	4	23
6:15 - 6:30 PM	7	13	
6:30 - 6:45 PM	1	2	
6:45 - 7:00 PM	2	4	

	Eastbound Pacific Coast Highway Traffic								
Gaps (sec):	**6.5-12.5**	**13.0-19.0**	**19.5-25.5**	**≥ 26.0**	**Allowable Vehicles**	**Adequate Gaps?**	**1-Hour Gap Totals**		**Adequate Gaps?**
7:00 - 7:15 AM	23	2	3	1	40	Yes	7:00 AM	172	Yes
7:15 - 7:30 AM	23	7	0	2	45	Yes	7:15 AM	168	Yes
7:30 - 7:45 AM	27	5	2	1	47	Yes	7:30 AM	168	Yes
7:45 - 8:00 AM	21	5	3	0	40	Yes	7:45 AM	161	Yes
8:00 - 8:15 AM	25	4	1	0	36	Yes	8:00 AM	161	Yes
8:15 - 8:30 AM	25	7	2	0	45	Yes	8:15 AM	167	Yes
8:30 - 8:45 AM	28	3	2	0	40	Yes	8:30 AM	163	Yes
8:45 - 9:00 AM	28	1	2	1	40	Yes			
9:00 - 9:15 AM	27	4	1	1	42	Yes			
9:15 - 9:30 AM	20	7	1	1	41	Yes			
1:30 - 1:45 PM	29	2	2	0	39	Yes	1:30 PM	170	Yes
1:45 - 2:00 PM	34	4	2	0	48	Yes	1:45 PM	163	Yes
2:00 - 2:15 PM	29	4	2	0	43	Yes	2:00 PM	158	Yes
2:15 - 2:30 PM	27	5	1	0	40	Yes	2:15 PM	145	Yes
2:30 - 2:45 PM	24	4	0	0	32	Yes	2:30 PM	125	Yes
2:45 - 3:00 PM	30	1	1	2	43	Yes	2:45 PM	125	Yes
3:00 - 3:15 PM	20	5	0	0	30	Yes	3:00 PM	110	Yes
3:15 - 3:30 PM	20	0	0	0	20	Yes	3:15 PM	117	Yes
3:30 - 3:45 PM	22	2	2	0	32	Yes	3:30 PM	112	Yes
3:45 - 4:00 PM	22	3	0	0	28	Yes	3:45 PM	116	Yes
4:00 - 4:15 PM	24	1	1	2	37	Yes	4:00 PM	114	Yes
4:15 - 4:30 PM	13	1	0	0	15	Yes	4:15 PM	106	Yes
4:30 - 4:45 PM	16	3	2	2	36	Yes	4:30 PM	112	Yes
4:45 - 5:00 PM	17	3	1	0	26	Yes	4:45 PM	100	Yes
5:00 - 5:15 PM	21	2	0	1	29	Yes	5:00 PM	112	Yes
5:15 - 5:30 PM	12	3	1	0	21	Yes	5:15 PM	121	Yes
5:30 - 5:45 PM	18	3	0	0	24	Yes	5:30 PM	135	Yes
5:45 - 6:00 PM	21	7	1	0	38	Yes	5:45 PM	149	Yes
6:00 - 6:15 PM	14	5	2	2	38	Yes	6:00 PM	163	Yes
6:15 - 6:30 PM	18	4	3	0	35	Yes			
6:30 - 6:45 PM	30	4	0	0	38	Yes			
6:45 - 7:00 PM	28	5	2	2	52	Yes			

Malibu Jewish Center & Synagogue Crain & Associates
Project Driveway Intersection with Pacific Coast Highway 3/21/2019
Time Gap Analysis - Southbound (Outbound) & Eastbound (Inbound) Left-Turns

Min Gap per Veh = 8.0 sec (per Index 405.1 of Caltrans Highway Design Manual)

PROJECT VOLUMES:	Existing SBL	Existing EBL	Proposed SBL	Proposed EBL	Total Lefts	Hourly Total Lefts
7:00 - 7:15 AM	0	0	0	0	0	0
7:15 - 7:30 AM	0	0	0	0	0	3
7:30 - 7:45 AM	0	0	0	0	0	3
7:45 - 8:00 AM	0	0	0	0	0	3
8:00 - 8:15 AM	0	1	0	3	3	9
8:15 - 8:30 AM	0	0	0	0	0	25
8:30 - 8:45 AM	0	0	0	0	0	34
8:45 - 9:00 AM	1	1	3	3	6	
9:00 - 9:15 AM	0	6	0	19	19	
9:15 - 9:30 AM	2	1	6	3	9	
1:30 - 1:45 PM	0	0	0	0	0	3
1:45 - 2:00 PM	0	0	0	0	0	3
2:00 - 2:15 PM	0	1	0	3	3	12
2:15 - 2:30 PM	0	0	0	0	0	22
2:30 - 2:45 PM	0	0	0	0	0	35
2:45 - 3:00 PM	2	1	6	3	9	47
3:00 - 3:15 PM	1	3	3	10	13	52
3:15 - 3:30 PM	1	3	3	10	13	47
3:30 - 3:45 PM	4	2	8	4	12	34
3:45 - 4:00 PM	3	4	6	8	14	24
4:00 - 4:15 PM	2	2	4	4	8	10
4:15 - 4:30 PM	0	0	0	0	0	2
4:30 - 4:45 PM	1	0	2	0	2	2
4:45 - 5:00 PM	0	0	0	0	0	8
5:00 - 5:15 PM	0	0	0	0	0	14
5:15 - 5:30 PM	0	0	0	0	0	26
5:30 - 5:45 PM	0	4	0	8	8	41
5:45 - 6:00 PM	1	2	2	4	6	35
6:00 - 6:15 PM	2	4	4	8	12	33
6:15 - 6:30 PM	7	1	13	2	15	
6:30 - 6:45 PM	1	0	2	0	2	
6:45 - 7:00 PM	2	0	4	0	4	

	Westbound Pacific Coast Highway Traffic							
Gaps (sec):	**8.0-15.5**	**16.0-23.5**	**≥ 24.0**	**Allowable Vehicles**	**Adequate Gaps?**	**1-Hour Gap Totals**		**Adequate Gaps?**
7:00 - 7:15 AM	12	2	6	34	Yes	7:00 AM	150	Yes
7:15 - 7:30 AM	14	9	2	38	Yes	7:15 AM	158	Yes
7:30 - 7:45 AM	19	6	3	40	Yes	7:30 AM	159	Yes
7:45 - 8:00 AM	15	4	5	38	Yes	7:45 AM	157	Yes
8:00 - 8:15 AM	9	6	7	42	Yes	8:00 AM	156	Yes
8:15 - 8:30 AM	16	4	5	39	Yes	8:15 AM	158	Yes
8:30 - 8:45 AM	12	7	4	38	Yes	8:30 AM	164	Yes
8:45 - 9:00 AM	20	4	3	37	Yes			
9:00 - 9:15 AM	13	8	5	44	Yes			
9:15 - 9:30 AM	16	10	3	45	Yes			
1:30 - 1:45 PM	17	5	5	42	Yes	1:30 PM	155	Yes
1:45 - 2:00 PM	10	5	7	41	Yes	1:45 PM	145	Yes
2:00 - 2:15 PM	18	4	5	41	Yes	2:00 PM	138	Yes
2:15 - 2:30 PM	12	2	5	31	Yes	2:15 PM	125	Yes
2:30 - 2:45 PM	9	4	5	32	Yes	2:30 PM	116	Yes
2:45 - 3:00 PM	10	3	6	34	Yes	2:45 PM	114	Yes
3:00 - 3:15 PM	10	6	2	28	Yes	3:00 PM	106	Yes
3:15 - 3:30 PM	13	3	1	22	Yes	3:15 PM	111	Yes
3:30 - 3:45 PM	10	4	4	30	Yes	3:30 PM	116	Yes
3:45 - 4:00 PM	11	3	3	26	Yes	3:45 PM	121	Yes
4:00 - 4:15 PM	8	5	5	33	Yes	4:00 PM	115	Yes
4:15 - 4:30 PM	9	3	4	27	Yes	4:15 PM	103	Yes
4:30 - 4:45 PM	9	7	4	35	Yes	4:30 PM	94	Yes
4:45 - 5:00 PM	7	5	1	20	Yes	4:45 PM	86	Yes
5:00 - 5:15 PM	7	4	2	21	Yes	5:00 PM	95	Yes
5:15 - 5:30 PM	9	0	3	18	Yes	5:15 PM	104	Yes
5:30 - 5:45 PM	12	6	1	27	Yes	5:30 PM	109	Yes
5:45 - 6:00 PM	9	7	2	29	Yes	5:45 PM	118	Yes
6:00 - 6:15 PM	6	3	6	30	Yes	6:00 PM	127	Yes
6:15 - 6:30 PM	11	3	2	23	Yes			
6:30 - 6:45 PM	10	4	6	36	Yes			
6:45 - 7:00 PM	18	4	4	38	Yes			

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway Dwy
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24855 PCH DW_PCH_AM Gap
Site Code : 16618708
Start Date : 9/25/2018

Directions Printed: Eastbound

Start Time	Volume	2 - 3	4 - 5	6 - 7	8 - 9	10 - 11	12 - 13	14 - 15	16 - 17	18 - 19	20 - 21	22 - 23	24 - 25	26 - 27	28 - 29	>29	Int. Total	Average
07:00 AM	314	45	22	11	7	4	1	1	1	0	0	2	1	0	0	1	96	4 - 5
07:15 AM	293	39	11	8	11	4	0	2	4	1	0	0	0	0	0	2	82	4 - 5
07:30 AM	280	29	14	14	4	5	4	3	0	2	0	2	0	1	0	0	78	4 - 5
07:45 AM	303	34	21	11	1	6	3	3	2	0	0	2	1	0	0	0	84	4 - 5
Total	1190	147	68	44	23	19	8	9	7	3	0	6	2	1	0	3	340	4 - 5
08:00 AM	324	36	17	8	5	8	4	1	2	1	1	0	0	0	0	0	83	4 - 5
08:15 AM	283	42	17	14	5	2	4	4	1	2	0	0	2	0	0	0	93	4 - 5
08:30 AM	284	39	20	8	11	5	4	0	2	1	2	0	0	0	0	0	92	4 - 5
08:45 AM	294	42	24	13	11	4	0	1	0	0	1	1	0	1	0	0	98	4 - 5
Total	1185	159	78	43	32	19	12	6	5	4	4	1	2	1	0	0	366	4 - 5
09:00 AM	268	38	21	8	9	6	4	1	1	2	1	0	0	0	1	0	92	4 - 5
09:15 AM	272	57	18	10	4	3	3	5	1	1	0	1	0	0	0	1	104	2 - 3
Grand Total	2915	401	185	105	68	47	27	21	14	10	5	8	4	2	1	4	902	4 - 5
Total %		44.5	20.5	11.6	7.5	5.2	3.0	2.3	1.6	1.1	0.6	0.9	0.4	0.2	0.1	0.4		

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Occurred:	07:15 AM
Volume	1200
High Int.	08:00 AM
Volume	324
PHF	0.926

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway Dwy
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24855 PCH DW_PCH_AM Gap
Site Code : 16618708
Start Date : 9/25/2018

Directions Printed: Westbound

Start Time	Volume	2 - 3	4 - 5	6 - 7	8 - 9	10 - 11	12 - 13	14 - 15	16 - 17	18 - 19	20 - 21	22 - 23	24 - 25	26 - 27	28 - 29	>29	Int. Total	Average
07:00 AM	171	20	13	9	2	5	0	5	0	2	0	0	0	1	0	5	62	4 - 5
07:15 AM	237	25	16	10	7	3	3	1	2	2	2	3	0	1	1	0	76	4 - 5
07:30 AM	200	31	20	5	7	5	3	4	2	3	0	1	0	1	0	2	84	4 - 5
07:45 AM	175	25	13	12	6	2	2	5	2	1	0	1	0	0	2	3	74	4 - 5
Total	783	101	62	36	22	15	8	15	6	8	2	5	0	3	3	10	296	4 - 5
08:00 AM	181	21	11	12	2	3	3	1	1	3	2	0	1	1	1	4	66	6 - 7
08:15 AM	181	24	16	12	4	6	2	4	2	1	0	1	2	0	0	3	77	4 - 5
08:30 AM	218	24	6	11	4	2	3	3	4	2	1	0	0	0	1	3	64	6 - 7
08:45 AM	205	33	17	6	11	7	2	0	2	2	0	0	2	0	0	1	83	4 - 5
Total	785	102	50	41	21	18	10	8	9	8	3	1	5	1	2	11	290	4 - 5
09:00 AM	202	29	11	8	5	5	2	1	1	4	0	3	1	1	0	3	74	4 - 5
09:15 AM	180	21	12	11	4	7	2	3	6	0	1	3	0	0	1	2	73	6 - 7
Grand Total	1950	253	135	96	52	45	22	27	22	20	6	12	6	5	6	26	733	4 - 5
Total %		34.5	18.4	13.1	7.1	6.1	3.0	3.7	3.0	2.7	0.8	1.6	0.8	0.7	0.8	3.5		

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Occurred:	07:15 AM
Volume	793
High Int.	07:15 AM
Volume	237
PHF	0.836

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway Dwy
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24855 PCH DW_PCH_AM Gap
Site Code : 16618708
Start Date : 9/25/2018
Page No : 1

Directions Printed: Combined

Start Time	Volume	2 - 3	4 - 5	6 - 7	8 - 9	10 - 11	12 - 13	14 - 15	16 - 17	18 - 19	20 - 21	22 - 23	24 - 25	26 - 27	28 - 29	>29	Int. Total	Average
07:00 AM	485	54	16	10	1	0	0	0	0	1	0	0	1	0	0	1	84	2 - 3
07:15 AM	530	45	10	9	6	2	0	0	2	0	0	0	0	0	0	0	74	2 - 3
07:30 AM	480	42	14	6	3	4	1	2	0	0	0	1	0	0	0	0	73	2 - 3
07:45 AM	478	44	17	9	2	4	0	2	0	0	0	1	0	0	0	0	79	2 - 3
Total	1973	185	57	34	12	10	1	4	2	1	0	2	1	0	0	1	310	2 - 3
08:00 AM	505	38	15	7	8	3	2	0	1	0	0	0	0	0	0	0	74	2 - 3
08:15 AM	464	58	23	9	2	2	0	0	0	0	1	0	1	0	0	0	96	2 - 3
08:30 AM	502	45	18	9	3	1	0	2	2	0	0	0	0	0	0	0	80	2 - 3
08:45 AM	499	55	20	3	5	0	1	0	0	0	1	0	0	0	0	0	85	2 - 3
Total	1970	196	76	28	18	6	3	2	3	0	2	0	1	0	0	0	335	2 - 3
09:00 AM	470	47	17	15	7	2	0	0	0	1	0	0	0	0	0	0	89	2 - 3
09:15 AM	452	48	21	12	4	3	3	0	0	0	0	0	0	0	0	0	91	2 - 3
Grand Total	4865	476	171	89	41	21	7	6	5	2	2	2	2	0	0	1	825	2 - 3
Total %		57.7	20.7	10.8	5.0	2.5	0.8	0.7	0.6	0.2	0.2	0.2	0.2	0.0	0.0	0.1		

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Occurred:	07:15 AM
Volume	1993
High Int.	07:15 AM
Volume	530
PHF	0.940

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway Dwy
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24855 PCH DW_PCH_PM Gap
Site Code : 16618708
Start Date : 9/28/2018

Directions Printed: Eastbound

Start Time	Volume	2 - 3	4 - 5	6 - 7	8 - 9	10 - 11	12 - 13	14 - 15	16 - 17	18 - 19	20 - 21	22 - 23	24 - 25	26 - 27	28 - 29	>29	Int. Total	Average
01:30 PM	278	52	19	12	6	7	4	1	1	0	1	1	0	0	0	0	104	4 - 5
01:45 PM	233	29	22	17	11	4	2	1	1	2	0	2	0	0	0	0	91	4 - 5
Total	511	81	41	29	17	11	6	2	2	2	1	3	0	0	0	0	195	4 - 5
02:00 PM	236	41	17	8	13	5	3	3	1	0	1	0	1	0	0	0	93	4 - 5
02:15 PM	227	36	27	8	8	8	3	3	2	0	0	1	0	0	0	0	96	4 - 5
02:30 PM	263	55	24	17	2	2	3	1	3	0	0	0	0	0	0	0	107	2 - 3
02:45 PM	296	34	14	12	13	3	2	0	0	1	1	0	0	1	1	0	82	4 - 5
Total	1022	166	82	45	36	18	11	7	6	1	2	1	1	1	1	0	378	4 - 5
03:00 PM	349	55	26	12	5	3	0	2	3	0	0	0	0	0	0	0	106	2 - 3
03:15 PM	368	48	21	9	4	4	3	0	0	0	0	0	0	0	0	0	89	2 - 3
03:30 PM	348	43	19	13	2	2	5	1	0	1	0	1	1	0	0	0	88	4 - 5
03:45 PM	318	43	21	13	5	3	1	3	0	0	0	0	0	0	0	0	89	4 - 5
Total	1383	189	87	47	16	12	9	6	3	1	0	1	1	0	0	0	372	2 - 3
04:00 PM	316	30	19	10	8	5	1	0	1	0	0	1	0	1	1	0	77	4 - 5
04:15 PM	317	30	22	5	5	2	1	1	0	0	0	0	0	0	0	0	66	4 - 5
04:30 PM	264	31	18	9	3	4	0	1	1	1	0	0	2	0	1	1	72	4 - 5
04:45 PM	258	14	16	9	6	0	2	2	1	0	0	1	0	0	0	0	51	4 - 5
Total	1155	105	75	33	22	11	4	4	3	1	0	2	2	1	2	1	266	4 - 5
05:00 PM	258	38	9	12	4	4	1	1	1	0	0	0	0	0	1	0	71	2 - 3
05:15 PM	277	29	7	7	2	2	1	2	0	1	0	0	1	0	0	0	52	2 - 3
05:30 PM	281	31	15	6	3	7	2	2	1	0	0	0	0	0	0	0	67	4 - 5
05:45 PM	233	18	12	10	7	3	1	2	3	2	0	0	1	0	0	0	59	4 - 5
Total	1049	116	43	35	16	16	5	7	5	3	0	0	2	0	1	0	249	4 - 5
06:00 PM	238	25	15	6	4	3	1	2	1	2	0	1	1	2	0	0	63	4 - 5
06:15 PM	209	32	9	6	5	5	2	2	1	1	1	2	0	0	0	0	66	4 - 5
06:30 PM	196	29	16	14	6	3	7	3	1	0	0	0	0	0	0	0	79	4 - 5
06:45 PM	188	29	26	9	6	7	6	3	0	2	1	1	0	0	0	2	92	4 - 5
Total	831	115	66	35	21	18	16	10	3	5	2	4	1	2	0	2	300	4 - 5
Grand Total	5951	772	394	224	128	86	51	36	22	13	5	11	7	4	4	3	1760	4 - 5
Total %		43.9	22.4	12.7	7.3	4.9	2.9	2.0	1.3	0.7	0.3	0.6	0.4	0.2	0.2	0.2		

Peak Hour Analysis From 01:30 PM to 06:45 PM - Peak 1 of 1

Peak Occurred:	03:00 PM
Volume	1383
High Int.	03:15 PM
Volume	368
PHF	0.940

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway Dwy
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24855 PCH DW_PCH_PM Gap
Site Code : 16618708
Start Date : 9/28/2018

Directions Printed: Westbound

Start Time	Volume	2 - 3	4 - 5	6 - 7	8 - 9	10 - 11	12 - 13	14 - 15	16 - 17	18 - 19	20 - 21	22 - 23	24 - 25	26 - 27	28 - 29	>29	Int. Total	Average
01:30 PM	222	18	10	7	4	8	2	3	2	1	0	2	0	3	0	2	62	6 - 7
01:45 PM	240	18	5	5	1	5	3	1	2	0	0	3	1	0	1	5	50	6 - 7
Total	462	36	15	12	5	13	5	4	4	1	0	5	1	3	1	7	112	6 - 7
02:00 PM	221	16	11	10	6	5	4	3	0	1	2	1	0	3	0	2	64	6 - 7
02:15 PM	305	21	8	10	7	1	4	0	2	0	0	0	3	0	0	2	58	6 - 7
02:30 PM	268	25	13	4	1	6	1	1	2	2	0	0	0	1	0	4	60	4 - 5
02:45 PM	295	20	8	6	4	3	0	3	3	0	0	0	1	0	0	5	53	4 - 5
Total	1089	82	40	30	18	15	9	7	7	3	2	1	4	4	0	13	235	4 - 5
03:00 PM	314	49	14	9	5	2	2	1	5	0	0	1	1	0	0	1	90	2 - 3
03:15 PM	324	36	21	6	3	8	2	0	2	1	0	0	0	1	0	0	80	4 - 5
03:30 PM	345	33	5	5	3	3	2	2	0	1	2	1	1	1	0	2	61	2 - 3
03:45 PM	342	24	14	9	7	1	1	2	2	0	0	1	0	1	0	2	64	4 - 5
Total	1325	142	54	29	18	14	7	5	9	2	2	3	2	3	0	5	295	4 - 5
04:00 PM	351	31	13	3	4	3	0	1	0	2	2	1	1	0	2	2	65	4 - 5
04:15 PM	360	17	9	3	2	1	5	1	0	2	1	0	2	0	0	2	45	4 - 5
04:30 PM	317	21	8	4	3	3	2	1	0	4	2	1	1	1	1	1	53	4 - 5
04:45 PM	352	7	7	3	1	1	4	1	1	1	3	0	0	0	0	1	30	6 - 7
Total	1380	76	37	13	10	8	11	4	1	9	8	2	4	1	3	6	193	4 - 5
05:00 PM	317	20	12	9	3	1	3	0	2	2	0	0	0	1	0	1	54	4 - 5
05:15 PM	404	10	8	4	3	3	2	1	0	0	0	0	0	1	1	1	34	4 - 5
05:30 PM	289	10	12	7	3	3	3	3	1	2	2	1	1	0	0	0	48	6 - 7
05:45 PM	314	16	8	11	5	1	2	1	2	3	2	0	0	0	2	0	53	6 - 7
Total	1324	56	40	31	14	8	10	5	5	7	4	1	1	2	3	2	189	4 - 5
06:00 PM	302	27	6	3	2	0	3	1	1	1	0	1	0	2	0	4	51	2 - 3
06:15 PM	265	19	14	7	5	5	1	0	2	0	1	0	0	0	0	2	56	4 - 5
06:30 PM	220	19	3	11	5	1	1	3	1	1	1	1	0	1	1	4	53	6 - 7
06:45 PM	225	28	11	9	7	2	4	5	1	1	1	1	1	0	0	3	74	4 - 5
Total	1012	93	34	30	19	8	9	9	5	3	3	3	1	3	1	13	234	4 - 5
Grand Total	6592	485	220	145	84	66	51	34	31	25	19	15	13	16	8	46	1258	4 - 5
Total %		38.6	17.5	11.5	6.7	5.2	4.1	2.7	2.5	2.0	1.5	1.2	1.0	1.3	0.6	3.7		

Peak Hour Analysis From 01:30 PM to 06:45 PM - Peak 1 of 1

Peak Occurred:	03:30 PM
Volume	1398
High Int.	04:15 PM
Volume	360
PHF	0.971

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Malibu
N/S: 24855 Pacific Coast Highway Dwy
E/W: Pacific Coast Highway
Weather: Clear

File Name : MAL_24855 PCH DW_PCH_PM Gap
Site Code : 16618708
Start Date : 9/28/2018

Directions Printed: Combined

Start Time	Volume	2 - 3	4 - 5	6 - 7	8 - 9	10 - 11	12 - 13	14 - 15	16 - 17	18 - 19	20 - 21	22 - 23	24 - 25	26 - 27	28 - 29	>29	Int. Total	Average
01:30 PM	500	50	10	14	2	2	2	2	0	0	0	0	0	0	0	0	82	2 - 3
01:45 PM	473	39	19	10	4	2	3	0	1	1	0	0	0	0	0	0	79	4 - 5
Total	973	89	29	24	6	4	5	2	1	1	0	0	0	0	0	0	161	2 - 3
02:00 PM	457	47	14	7	10	4	1	0	0	0	0	0	0	0	0	0	83	2 - 3
02:15 PM	532	37	19	6	0	4	1	1	1	0	0	0	0	0	0	0	69	2 - 3
02:30 PM	531	52	14	8	2	0	1	1	1	0	0	0	0	0	0	0	79	2 - 3
02:45 PM	591	43	11	8	8	0	1	0	1	0	0	0	0	0	0	0	72	2 - 3
Total	2111	179	58	29	20	8	4	2	3	0	0	0	0	0	0	0	303	2 - 3
03:00 PM	663	51	12	7	1	1	0	1	0	0	0	0	0	0	0	0	73	2 - 3
03:15 PM	692	43	16	2	0	0	0	0	0	0	0	0	0	0	0	0	61	2 - 3
03:30 PM	693	31	14	5	4	1	1	0	0	0	0	1	0	0	0	0	57	2 - 3
03:45 PM	660	37	14	7	2	1	0	0	0	0	0	0	0	0	0	0	61	2 - 3
Total	2708	162	56	21	7	3	1	1	0	0	0	1	0	0	0	0	252	2 - 3
04:00 PM	667	36	13	4	3	3	0	0	2	0	0	0	0	0	0	0	61	2 - 3
04:15 PM	677	27	17	4	1	0	0	1	0	0	0	0	0	0	0	0	50	2 - 3
04:30 PM	581	40	13	7	2	4	1	2	0	0	0	0	0	0	0	0	69	2 - 3
04:45 PM	610	19	11	2	3	0	2	1	0	0	0	0	0	0	0	0	38	4 - 5
Total	2535	122	54	17	9	7	3	4	2	0	0	0	0	0	0	0	218	2 - 3
05:00 PM	575	37	9	4	1	1	1	1	0	0	0	0	0	0	0	0	54	2 - 3
05:15 PM	681	29	10	3	0	2	0	0	0	0	0	0	0	0	0	0	44	2 - 3
05:30 PM	570	20	14	3	3	2	2	1	0	0	0	0	0	0	0	0	45	4 - 5
05:45 PM	547	29	15	10	6	2	0	1	0	0	0	0	0	0	0	0	63	4 - 5
Total	2373	115	48	20	10	7	3	3	0	0	0	0	0	0	0	0	206	2 - 3
06:00 PM	540	31	16	1	1	1	2	1	2	0	0	1	0	0	0	0	56	2 - 3
06:15 PM	474	38	9	9	5	1	0	0	0	0	0	0	0	0	0	0	62	2 - 3
06:30 PM	416	40	13	14	6	3	1	0	0	0	0	0	0	0	0	0	77	2 - 3
06:45 PM	413	45	23	12	6	3	1	0	0	0	0	0	0	1	0	0	91	4 - 5
Total	1843	154	61	36	18	8	4	1	2	0	0	1	0	1	0	0	286	2 - 3
Grand Total	12543	821	306	147	70	37	20	13	8	1	0	2	0	1	0	0	1426	2 - 3
Total %		57.6	21.5	10.3	4.9	2.6	1.4	0.9	0.6	0.1	0.0	0.1	0.0	0.1	0.0	0.0		

Peak Hour Analysis From 01:30 PM to 06:45 PM - Peak 1 of 1

Peak Occurred:	03:15 PM
Volume	2712
High Int.	03:30 PM
Volume	693
PHF	0.978

ATTACHMENT F

City of Malibu

23825 Stuart Ranch Rd., Malibu, California CA 90265-4804
(310) 456-2489 FAX (310) 456-7650

PUBLIC WORKS REVIEW FOR TRAFFIC
REFERRAL SHEET

TO: Public Works Department DATE: 11/6/2014

FROM: Planning Division

PROJECT NUMBER:	CDP 14-069
JOB ADDRESS:	24855 PACIFIC COAST HWY
APPLICANT / CONTACT:	Mark Meyer, David Gray Architects
APPLICANT ADDRESS:	353 S Broadway Los Angeles, CA 90013
APPLICANT PHONE #:	(213) 243-5707
APPLICANT FAX #:	
PROJECT DESCRIPTION:	Malibu Jewish Center - New 22,902 square foot structure, OWTS, landscape

TO: Planning Division and/or Applicant

FROM: Public Works Department Traffic Engineering

- ✓ The following items described on the attached memorandum shall be addressed and resubmitted.
- ____ The project was reviewed and found to be in conformance with the City's Public Works and LCP policies and CAN proceed through the planning process
- ____ The project does require a parking study.
- ____ The project does not require a parking study.
- ____ The project requires a traffic impact analysis.
- ____ A site circulation plan is required.
- ____ A parking plan is required.

SIGNATURE

DATE 6/11/19

Rev 101014

City of Malibu
MEMORANDUM

To: Mark Meyer

From: Public Works Department
Nicole Benyamin, Assistant Civil Engineer NB

Date: June 11, 2019

Re: 24855 Pacific Coast Highway CDP 14-069 Memo #2 Revised

The Public Works Department has begun its review of this application and cannot recommend approval at this time.

Based on conversations with the applicant on June 11, 2019, the May 16, 2019 Memo #2 has been revised to the following:

Please make the following corrections to the transportation analysis:

1. Prepare and submit concept plans to show how traffic will be managed during pick-up and drop-off.
2. Regarding Corner Sight Distances (CSD), on page 8, the report says that "it is expected that outbound motorists will utilize the remainder of the driveway approach and northbound shoulder to roll forward and reposition their vehicle for better sight lines of sight prior to performing an outbound turning maneuver…thus adequate CSD can be provided…" This statement shall be removed from the report.

Until these issues are revised the Public Works Department cannot recommend approval for the project.

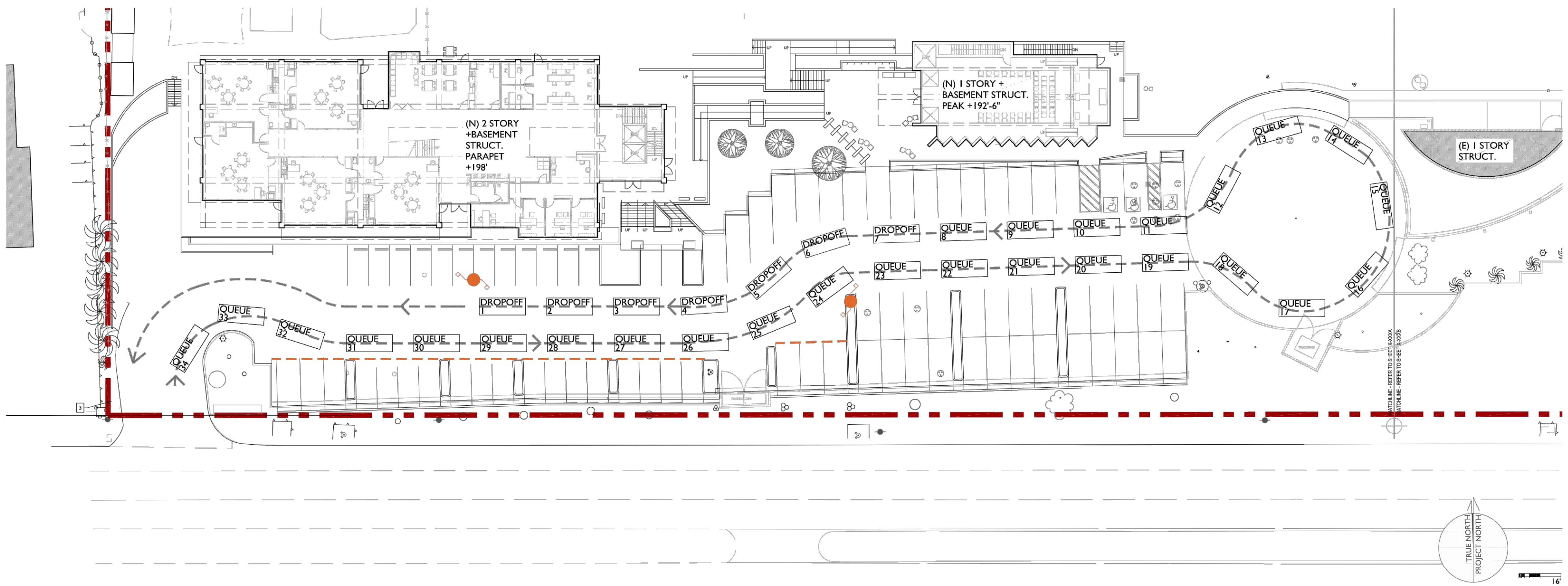
ATTACHMENT G

Key

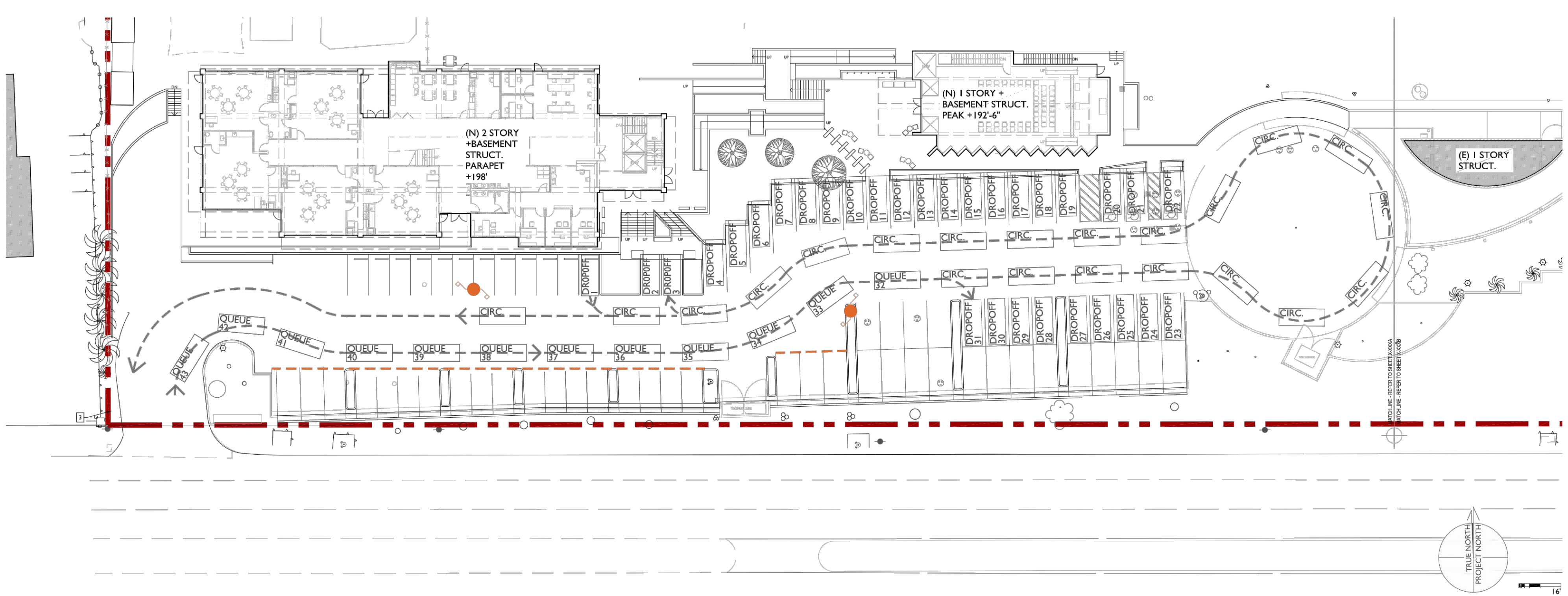
- Property Line
- Cone Zone
- Flag Person (Direct traffic to cul-de-sac)
- Structure
- Above
- Existing, to remain
- Proposed
- Vegetation

General Notes

1. PER PARKING MANAGEMENT PLAN



AFTERSCHOOL PROGRAM AFTERNOON AND EVENING DROPOFF AND TRAFFIC MANAGEMENT PLAN 1/16" = 1'-0" 2



PRESCHOOL AM AND PM DROPOFF AND TRAFFIC MANAGEMENT PLAN 1/16" = 1'-0" 1

ATTACHMENT G

Prepared by David Lawrence Gray Architects, AIA

CRAIN & ASSOCIATES
Transportation Planning
Traffic Engineering
300 Corporate Pointe, Suite 470
Culver City, California 90230
PH (310) 473 6508 F (310) 444 9771
www.crainandassociates.com

CONCEPTUAL TRAFFIC MANAGEMENT PLANS

City of Malibu

23825 Stuart Ranch Rd., Malibu, California CA 90265-4804
(310) 456-2489 FAX (310) 456-7650

PUBLIC WORKS REVIEW FOR TRAFFIC
REFERRAL SHEET

TO: Public Works Department DATE: 11/6/2014

FROM: Planning Division

PROJECT NUMBER:	CDP 14-069
JOB ADDRESS:	24855 PACIFIC COAST HWY
APPLICANT / CONTACT:	Mark Meyer, David Gray Architects
APPLICANT ADDRESS:	353 S Broadway Los Angeles, CA 90013
APPLICANT PHONE #:	(213) 243-5707
APPLICANT FAX #:	
PROJECT DESCRIPTION:	Malibu Jewish Center - New 22,902 square foot structure, OWTS, landscape

---

TO: Planning Division and/or Applicant

FROM: Public Works Department Traffic Engineering

- [ ] The following items described on the attached memorandum shall be addressed and resubmitted.
- [x] The project was reviewed and found to be in conformance with the City's Public Works and LCP policies and CAN proceed through the planning process
- [ ] The project does require a parking study.
- [ ] The project does not require a parking study.
- [ ] The project requires a traffic impact analysis.
- [ ] A site circulation plan is required.
- [ ] A parking plan is required.

[signature]
SIGNATURE

7/8/19
DATE

Rev 101014

Overland Traffic Consultants, Inc.

Overland Traffic Consultants
24325 Main Street, # 202
Santa Clarita, CA 91321
Phone (661) 799 - 8423
E-mail: otc@overlandtraffic.com

RECEIVED
APR 28 2016
PLANNING DEPT.

April 26, 2016

Malibu Jewish Center & Synagogue
C/o Mr. Mark Meyer
David Lawrence Gray Architects, AIA
527 W. 7th Street, Suite 1001
Los Angeles, CA 90014

RE: Updated Parking Demand Study for Malibu Jewish Center & Synagogue (24855 Pacific Coast Highway)

Dear Mr. Meyer,

Overland Traffic Consultants has completed an updated parking study for the Malibu Jewish Center & Synagogue as part of the City's review of the project's planning application for Site Plan Review and Coastal Development Permit.

The purpose of this study is to evaluate the hourly parking demand for the proposed Malibu Jewish Center & Synagogue expansion Project. The parking study documents the existing parking demand and parking requirements for the current synagogue and school facilities, and provides an updated analysis of the future parking demand to evaluate the multi - use functions of the proposed expansion Project.

The focus of this parking demand study is to document the Project's code compliant parking requirements based on the sum of the individual uses and to estimate the peak hour parking demand using the shared parking demand concept.

The concept for shared parking is that a single parking space can be used to serve two or more individual uses at different times of the day without conflict. In other words, hourly parking demand differs between uses so that one parking space may provide parking for several uses at different times of the day. For example, parking spaces can be shared between the Project's pre - school program and the evening adult education program, or between the proposed or existing chapel.

Project Description – The Malibu Jewish Center & Synagogue is located at 24855 Pacific Coast Highway in the City of Malibu, as shown in Figure 1.

- Existing Use - The existing pre - school and synagogue consists of approximately 11,198 square feet with 5,775 square feet devoted to the school (presently 45 pre-school students) and administrative complex. The existing temple is approximately 5,423 square feet. The site provides eighty three (83) parking spaces consisting of: 55 standard, 4 handicap accessible, 12 compact and 12 tandem parking spaces. Access to the site is provided by one driveway on Pacific Coast Highway near the west end of the site.

- Proposed Project - The Project consists of demolition of the one story modular school / administrative office buildings and construction of a new 2 story multi – function building with pre-school and administrative offices, religious classrooms and offices, a new chapel for typical Friday and Saturday services, and a community room. The existing synagogue chapel will remain on the site for special services. The vehicular entrance / exit from Pacific Coast Highway will remain but the parking layout and internal circulation will be modified to accommodate fire truck access. A total of 100 parking spaces will be marked (74 code compliant) for the Malibu Jewish Center and Synagogue upon completion of the project.

The proposed use and floor areas for the new and existing buildings are provided below in Table 1. Figure 2 illustrates the existing and proposed site plans.

Table 1
Malibu Jewish Center & Synagogue

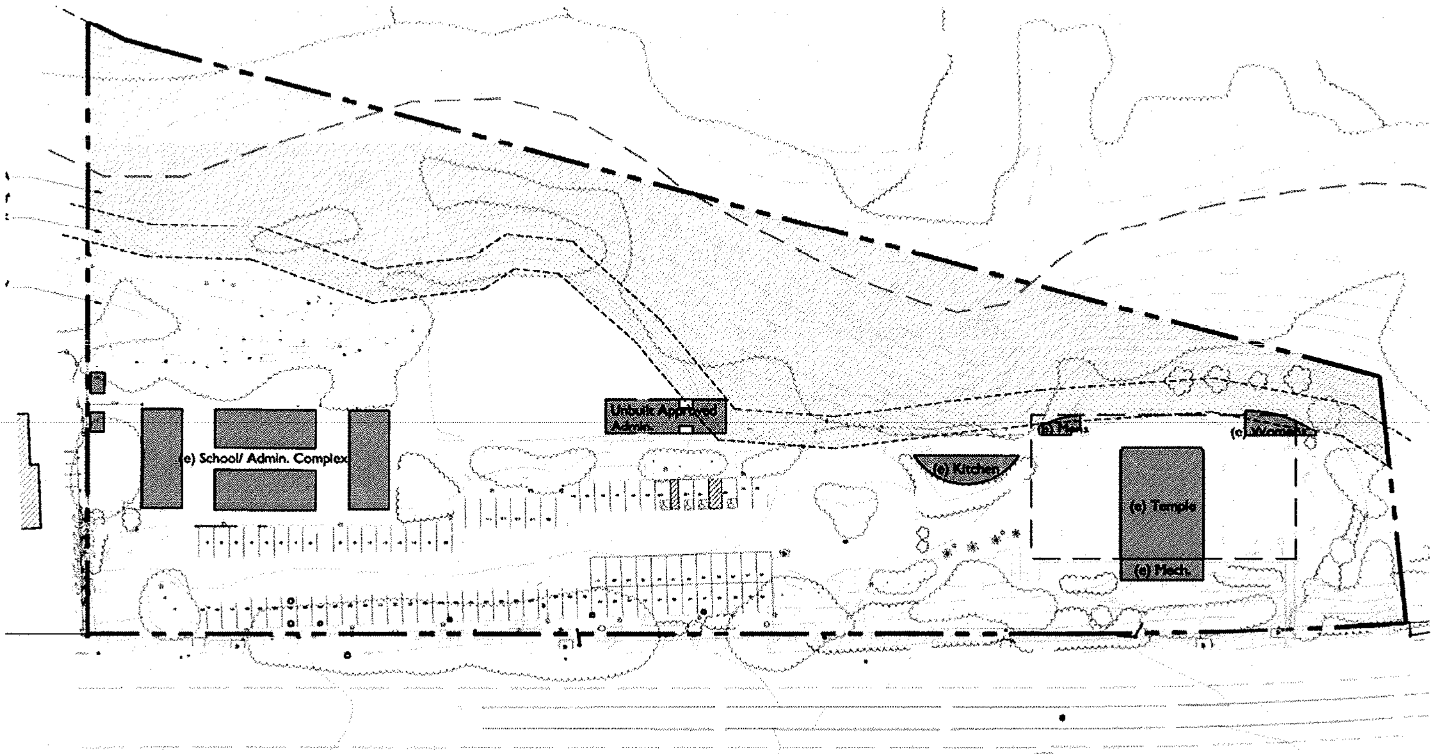
	Pre-School	Religious School	Office	Chapel Inside seating	Chapel Non-seating	Gross Floor Area
Pre-School					3,934	3,934
Adult Education	6,552		2,770	609	2,456	12,387
Junior High		5,525	1,868			7,393
Office	6,552	5,525	4,638	609	6,390	23,714
Chapel Inside seating				1,428	3,877	5,305
Chapel Non-Seating	6,552	5,525	4,638	2,037	10,267	29,019

FIGURE 1

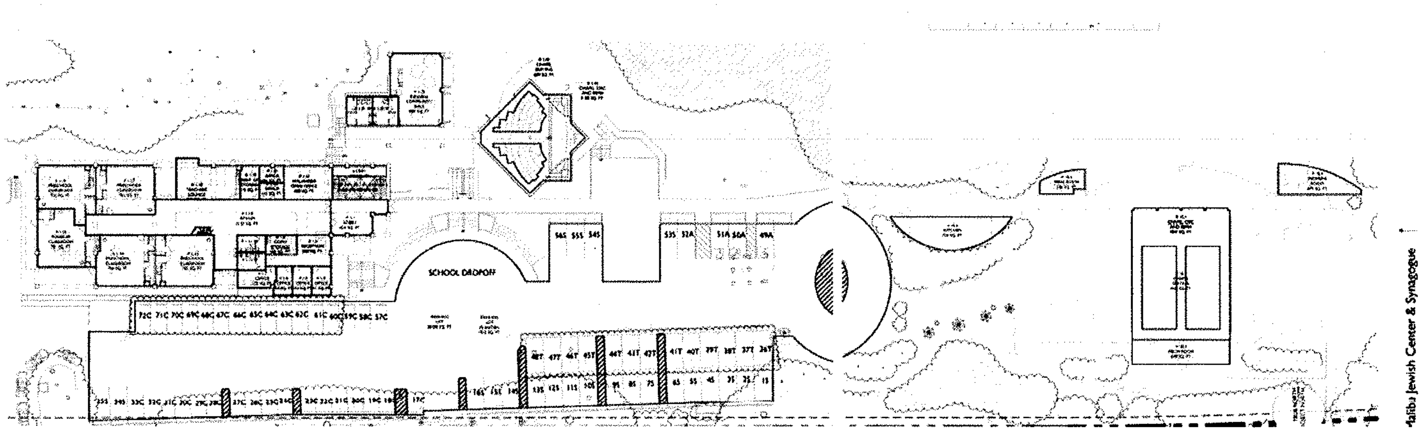
10/2014

LOCATION MAP

Overland Traffic Consultants, Inc.
24325 Main Street #202, Santa Clarita, CA 91321
(661) 799 - 8423, OTC@overlandtraffic.com



EXISTING SITE



AFTER CONSTRUCTION

FIGURE 2

4/2016

MALIBU JEWISH CENTER & SYNAGOGUE
EXISITING AND AFTER CONSTRUCTION

Overland Traffic Consultants, Inc.
24325 Main Street #202, Santa Clarita, CA 91321
(661) 799 - 8423, OTC@overlandtraffic.com

Malibu Local Coastal Program (LCP) Local Implementation Plan (LIP) Parking Requirements

Most zoning codes provide peak parking ratios for individual uses and sum the uses to determine the total parking requirement. While this appropriately recognizes that separate land uses generate different parking demands, it does not reflect that the combined peak parking demand for a multiple use facility that generates parking at different times of the day, which can be substantially less than the sum of the individual demands. Simply adding the peak parking demand for each individual use may produce an overall parking requirement that is too high.

Assuming all new uses the application of the LIP parking rates for the Project's individual uses yields a parking requirement of 210 spaces for the Project, as shown in Table 2.

Table 2
Malibu Local Coastal Program (LCP) Local Implementation Plan (LIP)
Parking Requirements

Use	Total	Parking Ratio	Total Number of Spaces Required
Chapel Seating (e)	1,428 s.f.	1 space / 21 s.f.	68
Chapel – Non-seating (e)	3,877 s.f.	1 space / 350 s.f.	12
Proposed Chapel seating	609 s.f.	1 space / 21 s.f.	29
Proposed Chapel non-seating	6,390	1 space / 350 s.f.	19
Pre-School Students	75 students	1 space / 10 students With drop off	8
Pre-school Employees	5 employees	1 space / employee	5
Office	4,638 s.f.	1 space / 250 s.f.	19
Adult School *	150 adults	1 space / 3 adults	50 (or)
Youth School *	5 Classrooms	2 spaces / classroom	10
Total			210 Max.

* Adult school and Youth school programs share the same classrooms and do not overlap.

Jewish Center & Synagogue Parking Demand Characteristics

The parking demand at the Jewish Center & Synagogue varies throughout the week and by time of day based on the activities schedule for that particular day. A typical week is described below:

Education - A typical weekday starts with the pre - school program from 8 am until 5 pm. On Tuesdays, a youth after - school program for religious classes begins at 4:00 pm until 6:00 pm, and on Wednesdays and Thursdays, an adult education program is offered from 7:00 pm until 9:00 pm.

Synagogue - Weekly Shabbat services begin on Friday evenings at 6:00 pm until 8:00 pm (July and August Shabbat services are off - site) and on Saturdays mornings from 9:30 am until 1:00 pm.

Jewish Center & Synagogue Parking Survey

To show the current peak parking demand generated by the different activities on – site, several parking occupancy surveys were conducted at different times during the day for different days of the week. The parking occupancy counts were conducted every 20 minutes during the pre - school arrival hours from 7:00 am to 9:00 am, between 2:00 pm until 4:00 pm during the peak dismissal of the pre - school and the arrival of the youth educational classes, and again between 7:00 pm until 9:00 pm to capture the adult education parking demand. A total of 7 days of data have been collected: 3 days in 2014 and updated with 4 days in 2016. Counts were conducted on a Tuesday (2), Wednesday, Thursday, Friday and Saturday (2).

The observed parking demand per hour from the survey periods are shown below in Table 3. This data shows a peak usage of approximately 20 - 25 parked vehicles during a typical day. This is much lower than the 83 current parking spaces required for the existing uses, of which 67 spaces are required for the existing synagogue chapel. The survey data is provided in Attachment 1.

Table 3
Maximum Observed Parking Demand
Malibu Jewish Center & Synagogue

Date	Day	7:00 - 8:00 am	8:00 - 9:00 am	2:00 - 3:00 pm	3:00 - 4:00 pm	7:00 - 8:00 pm	8:00 - 9:00 pm
9/9/2014	Tuesday	0	17	17	19	24	22
9/11/2014	Thursday	0	15	11	9	5	4
9/13/2014	Saturday	0	19	17	16	2	1
3/19/2016	Saturday	0	1	2	3	0	0
4/5/2016	Tuesday	0	9	18	21	4	3
4/6/2016	Wednesday	2	18	23	22	1	1
4/8/2016	Friday	0	12	23	9	11	1
	Max.	2	19	23	22	24	22

Shared Parking

Hourly shared parking demand parking profiles have been created to show the variation in the daily parking demand on site to more accurately estimate the peak parking demand. The LIP parking requirements per use as shown in Table 2 have been plotted by time of day.

Weekday plots for the office and school uses are shown in Chart 1 which indicates the peak parking demand of 50 parking spaces which occurs during the adult evening educational program.

Chart 2 shows the typical Friday evening and Saturday morning parking requirements for the proposed chapel using the indoor seating (29 spaces) and non - seating requirements (19 spaces). This chart shows peak demand of 48 parking spaces for a typical Friday evening or Saturday morning services at the proposed chapel.

The existing chapel will not be utilized at the same time during any typical Friday night or Saturday morning service but rather for Holiday services. The existing Synagogue chapel has a current parking requirement of 67 parking spaces.

Conclusions

1. The proposed 100 parking spaces would adequately accommodate the parking demands for the proposed Malibu Jewish Center & Synagogue expansion Project.
2. The observed parking occupancy at the Project site (20 – 25 spaces) is significantly lower than the current parking requirements for the site (83 spaces).
3. The future typical weekday peak parking demand would be approximately 50 parking spaces occurring during the evening adult educational program.
4. The future peak parking demand for the religious services held in the proposed chapel on Friday evenings and Saturday mornings would peak at 48 parking spaces, less than half of the 100 parking spaces being provided.
5. The existing Synagogue chapel currently requires 67 parking spaces. It is proposed that the existing chapel would be used for Holiday services. The Malibu Jewish Center & Synagogue currently implements an off – site valet program and would continue to implement off - site parking valet program to alleviate any potential overflow when necessary for Holiday services.

Please call me if you have questions.

Sincerely,

Jerry T. Overland

Jerry T. Overland

Chart 1
Malibu Jewish Center & Synagogue
Typical Weekday Peak-Hour Parking Demand Per Code
With Shared Parking

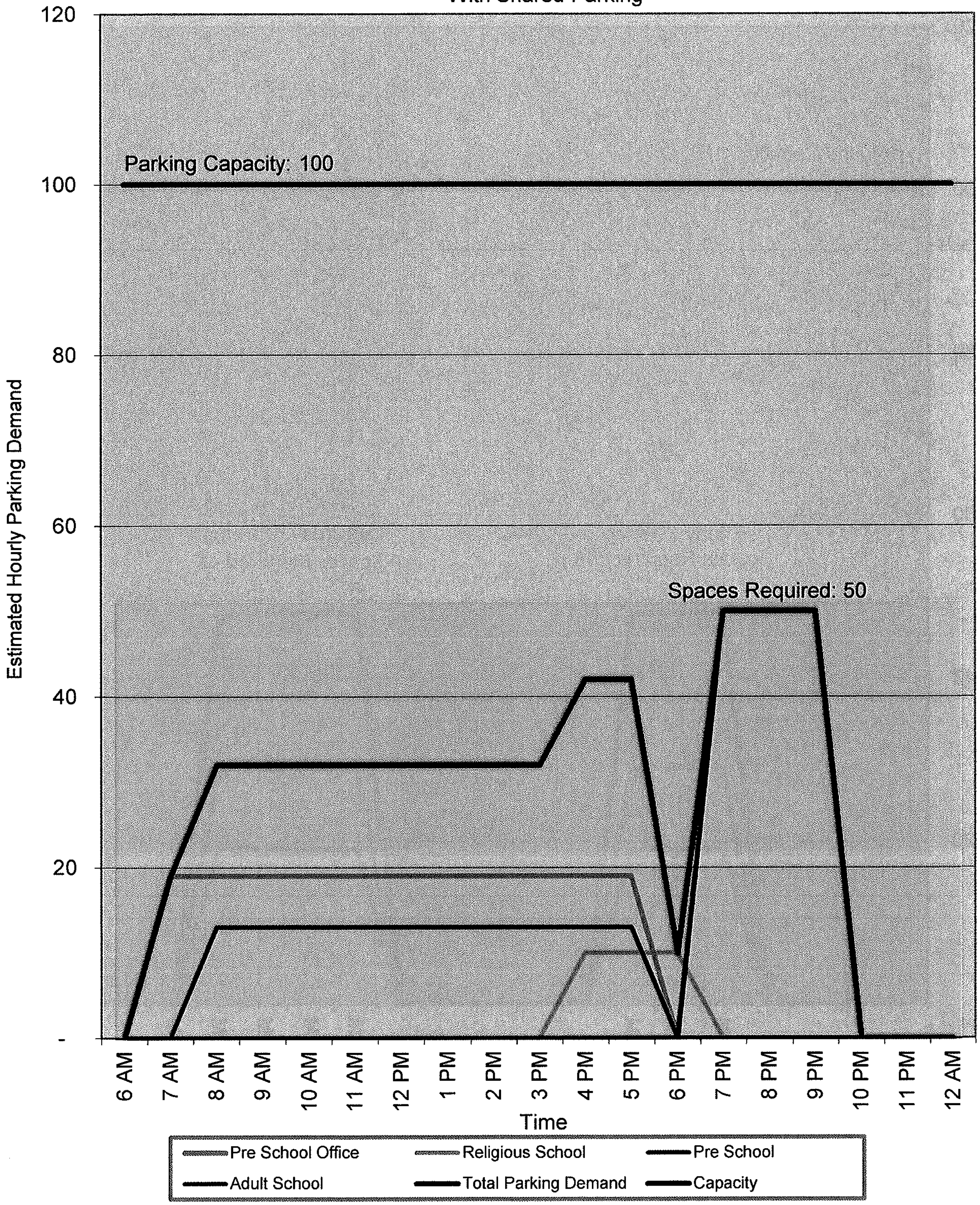
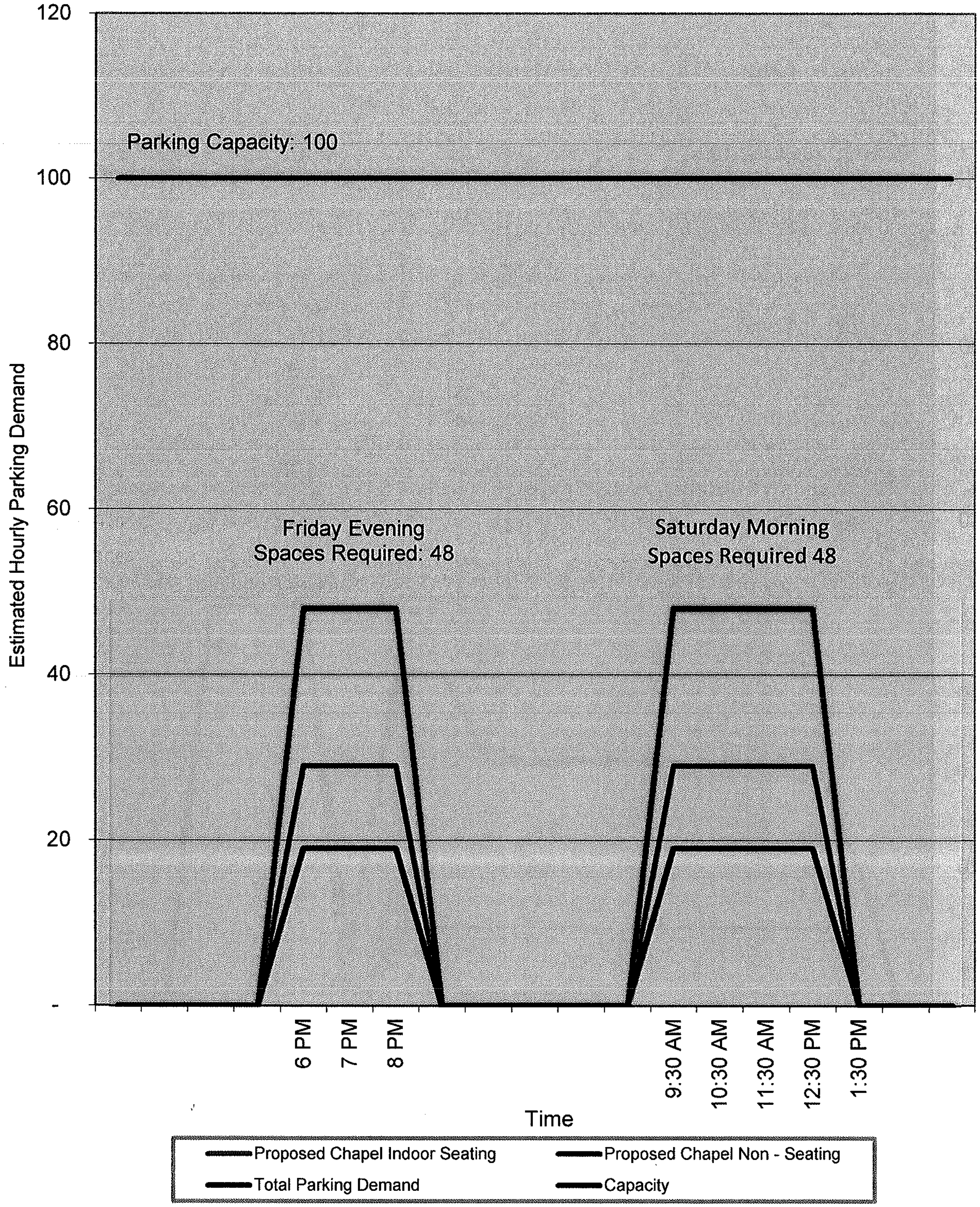


Chart 2
Malibu Jewish Center & Synagogue
Typical Friday Evening and Saturday Morning Peak-Hour Parking Demand Per Code
With Shared Parking



Attachment 1

MJC&S Parking Survey Data

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: FRIDAY, APRIL 08, 2016

PERIOD: 07:00 AM TO 09:00 AM

02:00 PM TO 04:00 PM

07:00 PM TO 09:00 PM

FILE: 1-FRI

20-MIN PERIOD	PARKING OCCUPANCY			
	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	7	0	0	7
0840-0900	12	0	0	12
0200-0220	22	1	0	23
0220-0240	18	1	0	19
0240-0300	17	1	0	18
0300-0320	8	1	0	9
0320-0340	5	1	0	6
0340-0400	3	1	0	4
0700-0720	8	2	0	10
0720-0740	9	2	0	11
0740-0800	7	0	0	7
0800-0820	1	0	0	1
0820-0840	1	0	0	1
0840-0900	1	0	0	1

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: WEDNESDAY, APRIL 06, 2016

PERIOD: 07:00 AM TO 09:00 AM

02:00 PM TO 04:00 PM

07:00 PM TO 09:00 PM

FILE: 1-WED

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	2	0	0	2
0800-0820	10	1	0	11
0820-0840	12	1	0	13
0840-0900	17	1	0	18
0200-0220	22	1	0	23
0220-0240	17	1	0	18
0240-0300	18	2	0	20
0300-0320	20	2	0	22
0320-0340	14	2	0	16
0340-0400	12	2	0	14
0700-0720	1	0	0	1
0720-0740	1	0	0	1
0740-0800	1	0	0	1
0800-0820	1	0	0	1
0820-0840	1	0	0	1
0840-0900	1	0	0	1

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PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: TUESDAY, APRIL 05, 2016

PERIOD: 07:00 AM TO 09:00 AM

02:00 PM TO 04:00 PM

07:00 PM TO 09:00 PM

FILE: 1-TUES

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	5	1	0	6
0820-0840	7	1	0	8
0840-0900	8	1	0	9
0200-0220	17	1	0	18
0220-0240	10	1	0	11
0240-0300	10	1	0	11
0300-0320	10	1	0	11
0320-0340	11	3	0	14
0340-0400	18	3	0	21
0700-0720	4	0	0	4
0720-0740	4	0	0	4
0740-0800	3	0	0	3
0800-0820	3	0	0	3
0820-0840	1	0	0	1
0840-0900	1	0	0	1

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PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: SATURDAY, MARCH 19, 2016

PERIOD: 07:00 AM TO 09:00 AM
02:00 PM TO 04:00 PM
07:00 PM TO 09:00 PM

FILE: 1-SAT

20-MIN PERIOD	PARKING OCCUPANCY REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	1	0	0	1
0820-0840	1	0	0	1
0840-0900	1	0	0	1
0200-0220	1	1	0	2
0220-0240	1	1	0	2
0240-0300	1	1	0	2
0300-0320	2	1	0	3
0320-0340	2	1	0	3
0340-0400	2	1	0	3
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	0	0	0	0
0840-0900	0	0	0	0

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALFORNIA 91006
626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: SATURDAY, SEPTEMBER 13, 2014

PERIOD: 07:00 AM TO 09:00 AM
02:00 PM TO 04:00 PM
07:00 PM TO 09:00 PM

FILE: 1-SAT

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	6	0	0	6
0840-0900	19	0	0	19
0200-0220	17	0	0	17
0220-0240	15	0	0	15
0240-0300	15	0	0	15
0300-0320	13	0	0	13
0320-0340	16	0	0	16
0340-0400	12	0	0	12
0700-0720	2	0	0	2
0720-0740	1	0	0	1
0740-0800	1	0	0	1
0800-0820	1	0	0	1
0820-0840	1	0	0	1
0840-0900	0	0	0	0

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626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: THURSDAY, SEPTEMBER 11, 2014

PERIOD: 07:00 AM TO 09:00 AM
02:00 PM TO 04:00 PM
07:00 PM TO 09:00 PM

FILE: 1-THURS

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	5	0	0	5
0840-0900	15	0	0	15
0200-0220	11	0	0	11
0220-0240	9	0	0	9
0240-0300	10	0	0	10
0300-0320	9	0	0	9
0320-0340	9	0	0	9
0340-0400	8	0	0	8
0700-0720	5	0	0	5
0720-0740	5	0	0	5
0740-0800	5	0	0	5
0800-0820	4	0	0	4
0820-0840	3	0	0	3
0840-0900	3	0	0	3

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ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: TUESDAY, SEPTEMBER 09, 2014

PERIOD: 07:00 AM TO 09:00 AM
02:00 PM TO 04:00 PM
07:00 PM TO 09:00 PM

FILE: 1-TUES

20-MIN PERIOD	PARKING OCCUPANCY			
	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	4	0	0	4
0840-0900	17	0	0	17
0200-0220	15	2	0	17
0220-0240	12	1	0	13
0240-0300	13	1	0	14
0300-0320	10	1	0	11
0320-0340	14	1	0	15
0340-0400	17	2	0	19
0700-0720	15	2	0	17
0720-0740	18	2	0	20
0740-0800	22	2	0	24
0800-0820	20	2	0	22
0820-0840	17	1	0	18
0840-0900	11	0	0	11

ASSOCIATED TRANSPORTATION ENGINEERS
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May 30, 2018 18038L02

Daniel Gira
Wood Environmental and Infrastructure Solutions
104 West Anapamu Street, Suite 204A
Santa Barbara, CA 93101

TRAFFIC STUDY FOR THE MALIBU JEWISH CENTER & SYNAGOGUE PROJECT, CITY OF MALIBU

Associated Transportation Engineers (ATE) is submitting the following traffic study for the Malibu Jewish Center & Synagogue Project (the "Project") proposed in the City of Malibu. It is understood that the impact study will be used by Wood Environmental & Infrastructure Solutions (Wood) in preparing the MND for the Project. The analysis focuses on the operation of the Project driveway on PCH.

PROJECT DESCRIPTION

The existing Malibu Jewish Center Synagogue facility is located at 24855 Pacific Coast Highway (PCH) in the City of Malibu. Figure 1 illustrates the location of the Project site in the City. The existing facilities on site include a 5,305 SF temple building and four modular buildings totaling 5,775 SF. The modular buildings house the existing pre-school, after-school and adult education classes; as well as the administration offices and additional temple assembly space.

Figure 2 shows the Project site plan. The Project is proposing to remove the four modular buildings and construct a two-story, 16,410 SF classroom/administration building with two subterranean levels, one for parking and the second for storage. A new 2,013 SF temple with a basement would be developed immediately east of the proposed two-story building. The new facilities would house an expanded preschool program during the day, after school classes in the afternoons, and adult education classes in the evenings. The parking supply for the Project would be expanded from the existing 83 spaces to 113 spaces. Access to the

Project site is proposed via the existing driveway, located on the west side of the site, that connects to PCH (see Figure 2 - Project Site Plan).

EXISTING CONDITIONS

Existing AM and PM peak hour traffic volumes were collected for the PCH/Project Driveway intersection in April of 2018. Existing weekday traffic volumes for the study-area roadway were obtained through data published by Caltrans[1]. Existing conditions were developed for the Project from the existing counts and operational data provided by the applicant. Figure 3 shows existing traffic volumes at the Project site.

PROJECT TRIP GENERATION ESTIMATES

Trip generation estimates were calculated for the Project using the operational data provided by the applicant for the various activities that are proposed (operational data attached for reference). The weekday activities that would increase as a result of the Project include the pre-school operations, the after-school programs, and the evening adult education classes. It is noted that the adult classes and after-school programs occur on different days. The trip generation analysis is based on the day with the highest uses (after-school program) and thus presents a "worst-case" scenario for the impact analysis.

The rates presented in the Institute of Transportation Engineers (ITE) *Trip Generation* manual[2] were used to develop the trip generation estimates for the preschool facility based on the number of new students anticipated. The operational data provided for the after-school program and the adult education classes were used to develop trip estimates for those functions. Table 1 presents the trip generation estimates developed for the increased activities that would occur at the site as a result of the Project (worksheets showing the detailed calculations for each activity day are attached). These are "new" trips that will be added to the existing volumes at the PCH/Project Driveway intersection.

Table 1
Project Trip Generation Estimates

		ADT		AM Peak Hour		PM Peak Hour	
Land Use	**Size**	**Rate**	**Trips**	**Rate**	**Trips**	**Rate**	**Trips**
Pre-School(a)	+30 Students	4.11	123	0.91	27	0.26	8
After-School(b)	+139 Students	NA	445	NA	0	NA	22
	+ 2 Teachers	NA	4	NA	0	NA	0
Totals			**572**		**27**		**30**

(a) Trip estimates developed based on ITE rates for private schools.
(b) Trip estimates developed based on operational data – after-school program operates from 4-6 PM.

[1] 2016 Traffic Volumes on California State Highways, State of California Department of Transportation, 2018.
[2] Trip Generation, Institute of Transportation Engineers, 9th Edition, 2012.

The trip generation estimates presented in Table 1 show that the Project would generate 572 average daily trips (ADT), with 27 trips occurring during the AM peak hour and 30 trips occurring during the PM peak hour on the peak activity day. The traffic generated at the site would be lower on other days of the week when there would be less activities occurring at the site. For instance, the after-school youth program and adult education program are not scheduled on Mondays and Fridays. The Project- generated trips are added to the Existing conditions to determine impacts under Existing + Project and Cumulative + Project conditions.

SITE ACCESS

Driveway Operations

Access to the Project site is proposed via the existing driveway located on the west side of the site that connects to PCH (see Figure 4). The driveway is approximately 34 feet wide and accommodates 2-way traffic. PCH contains 2 travel lanes in each direction and a center two-way left-turn lane adjacent to the Project site. This segment of PCH also contains shoulders which are used for parking. The posted speed limit in the area is 50 MPH.

Vehicle delays and levels of service were calculated for the PCH/Project Driveway using the operations methodologies for Stop sign controlled intersections that are outlined in the Highway Capacity Manual (HCM).[3] Each movement required to yield (eastbound left-turn from PCH) or stop (left and right turns from the Project driveway) has an average delay per vehicle and a level of service rating. There is also average delay per vehicle and level of service rating presented for all movements that are required to yield or stop (i.e. overall intersection). For reference, traffic operations are expressed in terms of "Levels of Service" (LOS). LOS A through F are used to rate traffic operations, with LOS A indicating very good operations and low delays and LOS F indicating poor operations and high delays.

Existing + Project Conditions. Operations at the PCH/Project Driveway were evaluated for the AM and PM peak hour commuter periods using the Existing and Existing + Project traffic volumes illustrated on Figures 3 and 5 (LOS worksheets attached). Table 2 compares the vehicle delays and levels of service for the Existing and Existing + Project scenarios.

---

[3] Highway Capacity Manual, Transportation Research Board, 6th Edition, 2016.

Table 2
PCH/Project Driveway Operations – Existing + Project

Intersection / Movement	Delay/LOS(a)			
	AM Peak Hour		PM Peak Hour	
	Existing	Existing + Project	Existing	Existing + Project
PCH/Project Driveway:				
Eastbound Left Turn	10.5 Sec/LOS B	10.6 Sec/LOS B	14.9 Sec/LOS B	15.5 Sec/LOS C
Southbound Left + Right Turn	16.6 Sec/LOS C	17.2 Sec/LOS C	26.5 Sec/LOS D	26.7 Sec/LOS D
Overall Intersection	**14.2 Sec/LOS B**	**14.7 Sec/LOS B**	**20.3 Sec/LOS C**	**19.5 Sec/LOS C**

(a) LOS based on average seconds of delay per vehicle pursuant to HCM.

As shown in Table 2, delays for turning into the Project driveway from PCH (eastbound left turns) are forecast at LOS B-C during the AM/PM peak hour periods assuming Existing + Project conditions. Delays for turning from the Project driveway onto PCH (southbound left and right turns) are forecast at LOS C-D during the AM/PM peak hour periods. The delays for turning onto PCH during the PM peak commuter period (LOS D) are common for driveways along PCH. The data indicate that the driveway would operate acceptably with the addition of Project traffic.

Cumulative + Project Conditions. Future operations at the PCH/Project Driveway were evaluated using the Cumulative and Cumulative + Project traffic volumes illustrated on Figures 6 and 7. The Cumulative traffic forecasts were developed based on a list of approved and pending projects provided by the City (project list attached). Table 3 compares the vehicle delays and levels of service for the cumulative scenarios.

Table 3
PCH/Project Driveway Operations – Cumulative + Project

Intersection / Movement	Delay/LOS(a)			
	AM Peak Hour		PM Peak Hour	
	Cumulative	Cumulative + Project	Cumulative	Cumulative + Project
PCH/Project Driveway:				
Eastbound Left Turn	10.7 Sec/LOS B	10.8 Sec/LOS B	16.5 Sec/LOS B	17.2 Sec/LOS C
Southbound Left + Right Turn	17.3 Sec/LOS C	17.9 Sec/LOS C	30.8 Sec/LOS D	31.0 Sec/LOS D
Overall Intersection	**14.7 Sec/LOS B**	**15.2 Sec/LOS C**	**23.2 Sec/LOS C**	**22.1 Sec/LOS C**

(a) LOS based on average seconds of delay per vehicle pursuant to HCM.

As shown in Table 3, delays for turning into the Project driveway from PCH (eastbound left turns) are forecast at LOS B-C during the AM/PM peak hour periods assuming Cumulative + Project conditions. Delays for turning from the Project driveway onto PCH (southbound left and right turns) are forecast at LOS C-D during the AM/PM peak hour periods. The delays for turning onto PCH during the PM peak commuter period (LOS D) are common for driveways along PCH.

Vehicle Queues. The HCM operations method for Stop sign controlled intersections also produce vehicle queue forecasts. The results show a maximum queue (95^{th} percentile queue) of 1-2 vehicles for turning left from PCH into the Project driveway and 1-2 vehicles for turning onto PCH from the Project driveway.

Sight Distance

Drivers of vehicles turning from the Project driveway should have unobstructed view along PCH sufficient in length to anticipate and avoid potential collisions. PCH is posted with 50 MPH signs in the vicinity of Project site. Floating vehicle speeds surveys found that vehicles travel at 50-60 MPH adjacent to driveway. The Caltrans minimum corner sight distance standard for public roads with 60 MPH speeds is 660 feet and the minimum stopping sight distance for private driveways is 580 feet. Figure 8 shows the sight distances looking to the east and west along PCH from Project driveway. As shown, the sight distance looking to the east is about 1,030 feet and is limited by a horizontal curve in the roadway alignment. The sight distance looking to the west is about 1,600 feet and is limited by a vertical curve in the roadway alignment. These sight distances exceed the Caltrans 580-foot to 660-foot minimum requirement for roads with 60 MPH speeds. As noted previously, on-street parking is allowed on the shoulder of PCH adjacent to the site. Although there is adequate sightline distance and impacts would be less than significant, driveway operations and sightline distances looking west from the driveway could be further enhanced by restricting parking along the Project frontage adjacent to the driveway (see Recommended Improvements section for more detail).

Accident Data

The City of Malibu commissioned a study that evaluated safety along PCH.[4] That safety analysis included review of accident data for the 2012, 2013, and 2014 time period. The safety study found that there were 2 accidents near the PCH/Project driveway intersection during the 3-year period. The accidents included a sideswipe with a parked motor vehicle and an accident involving a bicyclist and a parked motor vehicle.

The City also issued a final PCH parking study in May 2017.[5] The study found 4 parking-related collisions between 2011-2015 within 400 feet of the Project site driveway entrance. Three of

[4] Pacific Coast Highway Safety Study, Final Report, Stantec, May 2015.

[5] Pacific Coast Highway Parking Study, Stantec, May 2017.

the accidents occurred at a driveway 200 feet west of the Project driveway and include a collision involving a parked vehicle, a vehicle struck while entering/exiting shoulder parking, and a bicyclist hitting a parked car door that was opening. One collision occurred 350 east of the Project driveway and was a collision involving a parked vehicle.

OFF-SITE TRAFFIC IMPACTS

Impact Criteria

The Project's potential to generate significant traffic impacts to off-site intersections were evaluated using the City of Malibu impact criteria. Table 4 lists the City's traffic impact criteria for signalized intersections.

Table 4
City of Malibu Significant Impact Criteria (Signalized Intersections)

Level of Service (LOS)	Final V/C Value	Increase in V/C Value
LOS C	>0.710-0.800	+0.040 or more
LOS D	>0.810-0.900	+0.020 or more
LOS E, F	0.91 or more	+0.010 or more
V/C Value = Volume-to-Capacity Ratio		

Potential Intersection Impacts

As shown in Table 1, the Project is forecast to generate 27 AM peak hour trips and 30 PM peak hour trips. Once distributed from the site, the Project's trip additions to the nearest signalized intersections would be 15 peak hour trips or less. These trip additions would increase the Volume-to-Capacity (V/C) ratios at the off-site intersections by less than 0.010, which is the City's minimum threshold for determining significant impacts. The Project would therefore not significantly impact the study-area intersections based on the City of Malibu's thresholds.

CONGESTION MANAGEMENT PROGRAM ANALYSIS

Impact Criteria

The following section reviews the potential impacts of the project to the Los Angeles County Congestion Management Program (CMP) system. This analysis was completed using the procedures and impact criteria outlined in Appendix D of the Los Angeles County CMP[6].

[6] 2010 Draft Congestion Management Program for Los Angeles County, County of Los Angeles Metropolitan Transportation Authority, 2010.

Potential Intersection Impacts

The CMP guidelines require that intersection monitoring locations included in the CMP be examined if the proposed project would add 50 peak hour trips (PHT) or more during the A.M. or P.M. peak hours. The proposed project is forecast to add 27 AM and 30 PM PHT to PCH, which is less than 50 PHT. Based on CMP criteria, the Project would not generate a significant impact to intersections located within the study-area.

RECOMMENDED IMPROVEMENTS

The following improvement is recommended to enhance operations at the Project driveway on PCH.

Install "No Parking" Signs West of Project Driveway. On-street parking is currently allowed on the shoulder of PCH west of the Project driveway. Although there is adequate sightline distance and impacts would be less than significant, driveway operations could be enhanced by restricting parking along the project frontage for approximately 50 feet (see Figure 9). This would result in the loss of approximately 1 on-street parking space as there is an existing fire hydrant within the proposed restricted parking zone. The restricted parking area would provide a shoulder for westbound vehicles turning right into the driveway and would enhance sight distances for vehicles turning left and right from of the driveway onto PCH.

SPECIAL EVENTS

Special events are currently held onsite in the existing modular buildings and in the existing temple/event building. Typical special events at the MJCS include weddings, B'nai Mitzvahs, parties, corporate events, and other religious services. Special events are permitted between 10:00 A.M. and 11:00 P.M.; no outdoor music is permitted after 10:00 P.M. Traffic generated from the Special Events generally occurs during off-peak periods or on weekends, when there is less traffic along PCH.

Table 5 provides a summary of the special events that occur at the MJCS, including associated parking and attendee information. As shown, offsite parking and shuttle service are typically provided for special events with at least 200 attendees. There are approximately 24 events per year that require offsite parking, which is provided at the Malibu City Hall parking lot under permit with the City. The typical special event requires about 140 parking spaces from City Hall. A shuttle service between City Hall and the MJCS is provided. Offsite parking also occurs along PCH.

Table 5
Special Event Types at the MJCS

Event	Attendees	Day of Week	Frequency (per year)	Location	Offsite Parking with Shuttle
Rosh Hashanah Eve	500	Varies	1	Synagogue	Yes
Rosh Hashanah Day	500	Varies	1	Synagogue	Yes
Yom Kippur Eve	500	Varies	1	Synagogue	Yes
Yom Kippur Day	500	Varies	1	Synagogue	Yes
Weddings (Saturday)	200	Saturday	10	Synagogue	Yes
Weddings (Sunday)	200	Sunday	10	Synagogue	Yes
B'nai Mitzvah	100	Saturday	18	Synagogue[1]	No
Other Parties/ Fundraisers	100	Weekends	6	Synagogue	No
Purim Carnival	100	Weekends	1	Parking Lot	No
Malibu Film Society	70	Varies	25	Synagogue	No
Passover Community Seder	50	Varies	1	Synagogue	No

[1] Bat Mitzvahs would be conducted in the new temple alongside Saturday Service upon completion of the project.
Source: Overland Traffic Consultants 2017.

Mitigation measures have been developed by MJCS to manage parking during high volume special events that require offsite parking. The Special Event Parking Program includes the following items:

- Informational outreach shall occur ahead of events by publishing parking procedures directing the attendees to the offsite lot rather than parking along PCH.

- MJCS staff shall monitor the driveway operations during high-volume special events to avoid potential vehicle queuing both on- and offsite.

    - Each high-volume special event shall have an individual dedicated as a parking monitor prior to the event's scheduled start time.
    - The parking monitor shall be visible from within the parking lot during the beginning and end of each high-volume special event.

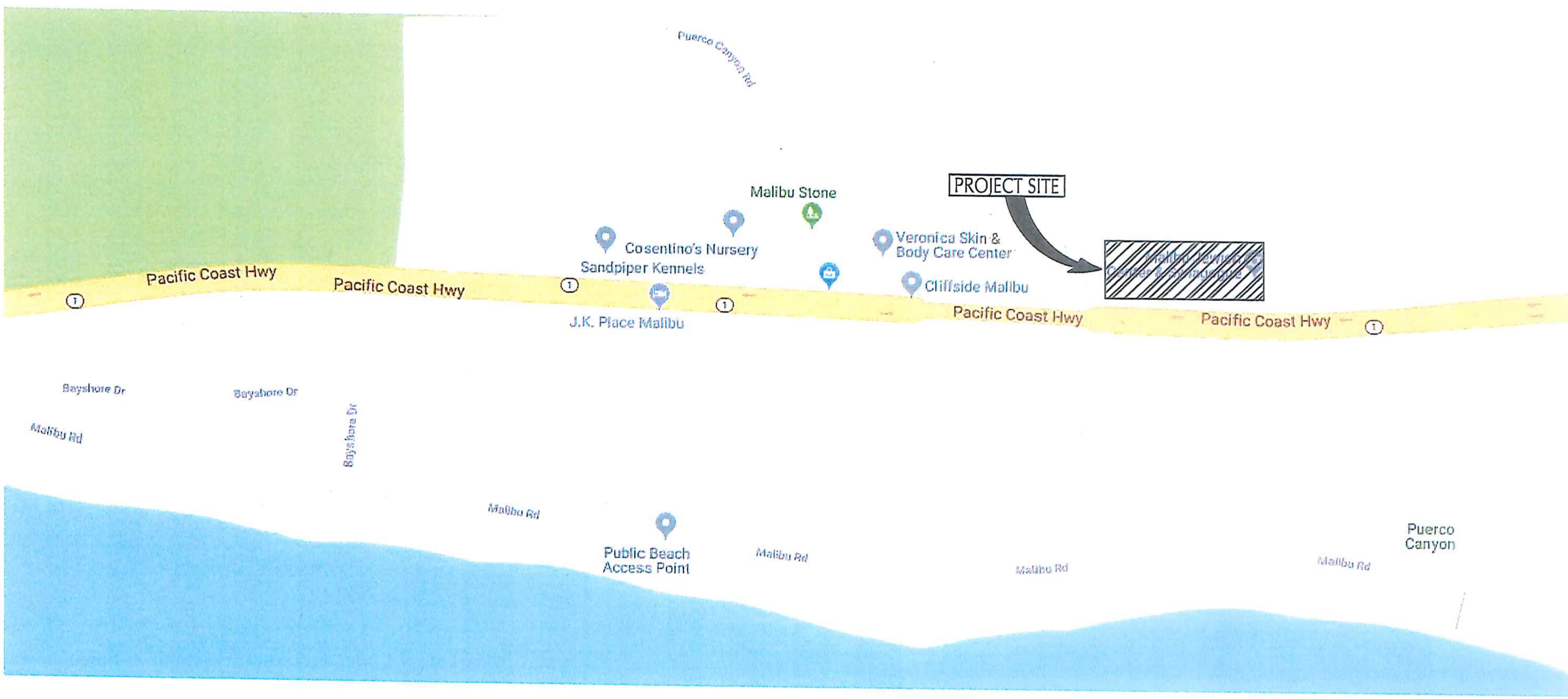
This concludes our traffic impact analysis for the Malibu Jewish Center & Synagogue Project proposed in the City of Malibu.

Associated Transportation Engineers

Scott A. Schell, AICP, PTP
Principal Transportation Planner

SAS/DLD

Attachments

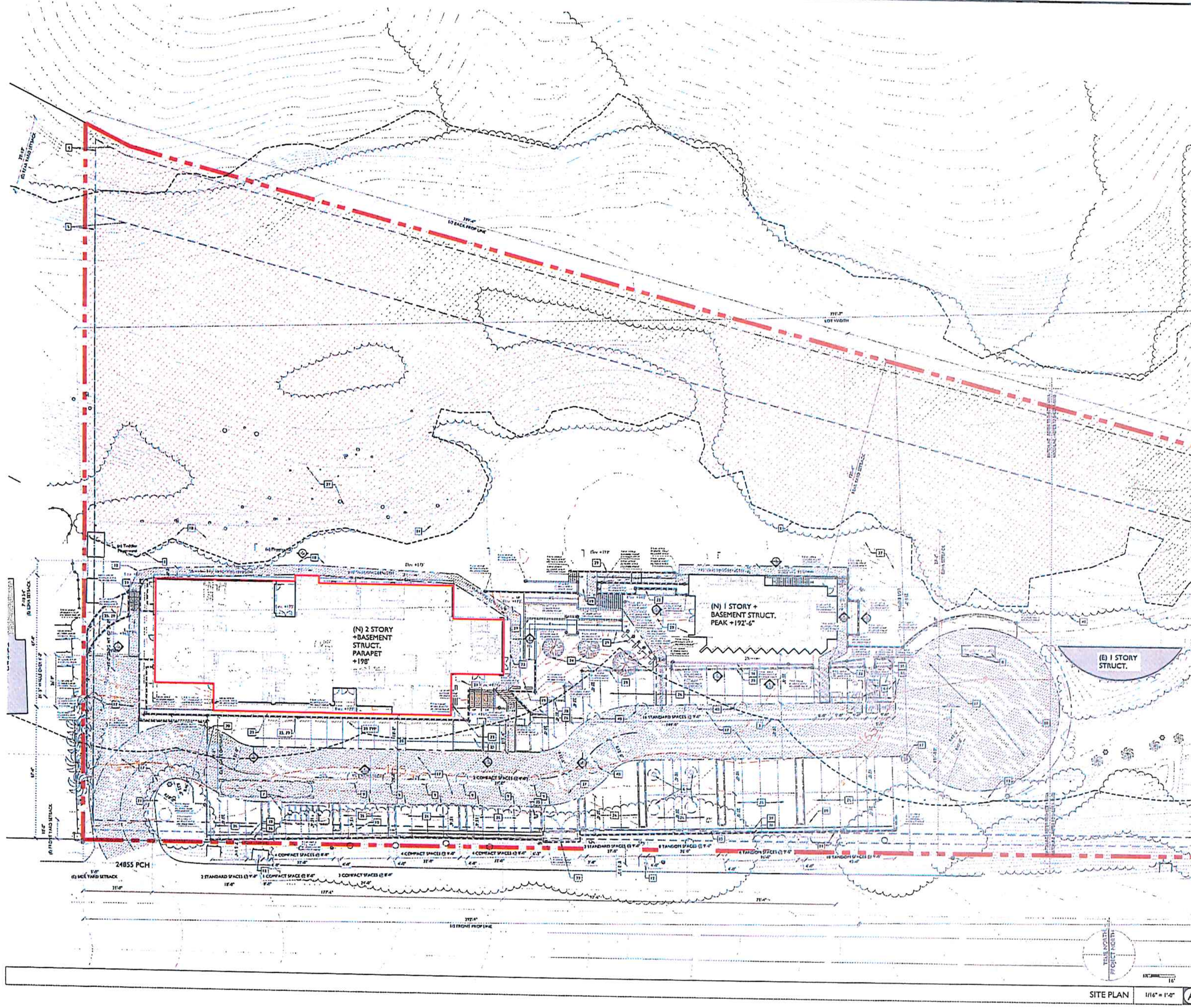


ASSOCIATED
TRANSPORTATION
ENGINEERS

PROJECT SITE LOCATION

FIGURE 1

EKM - ATE#18038

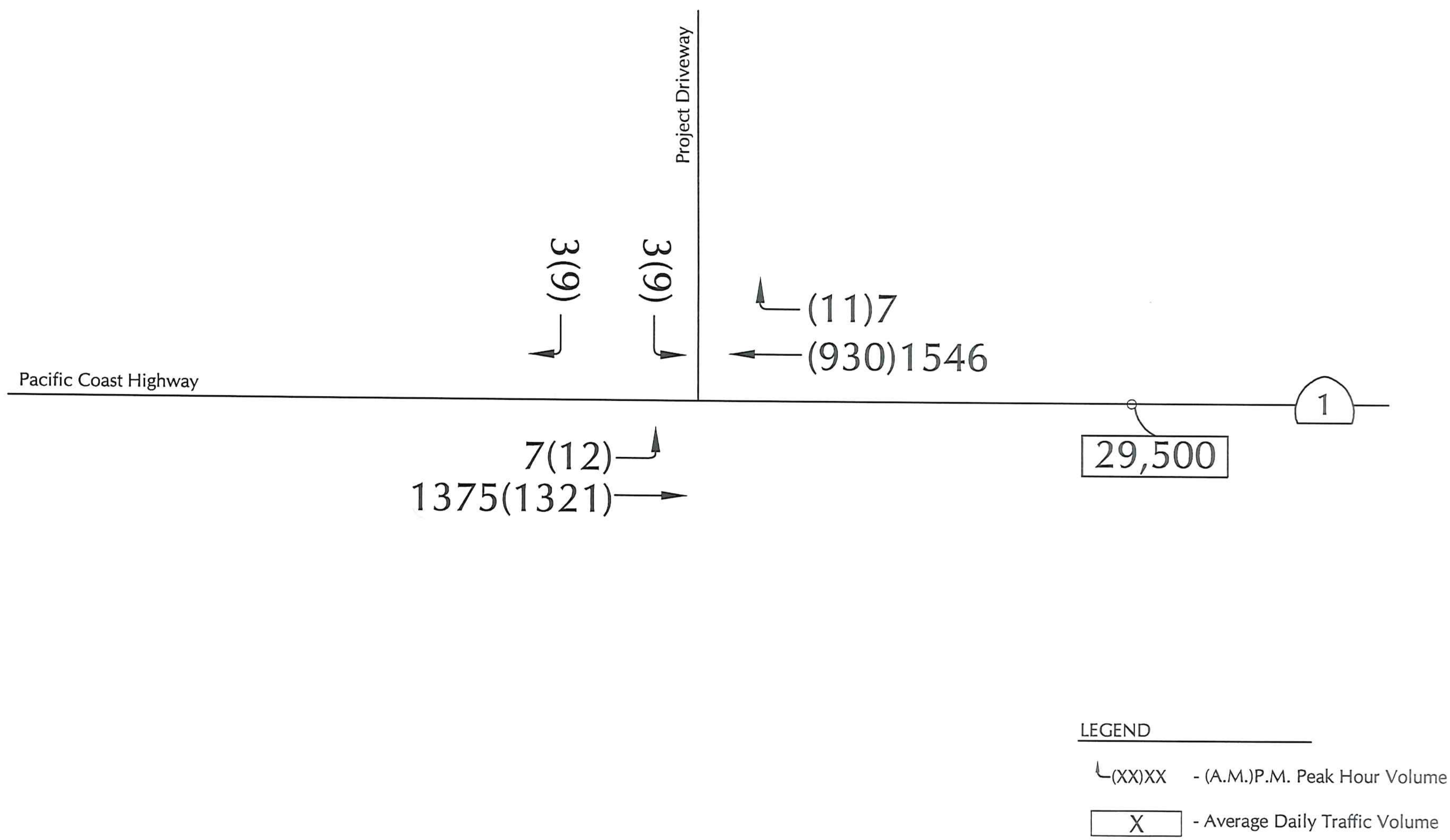


ASSOCIATED TRANSPORTATION ENGINEERS

PROJECT SITE PLAN

FIGURE 2

EKM - ATE #18038

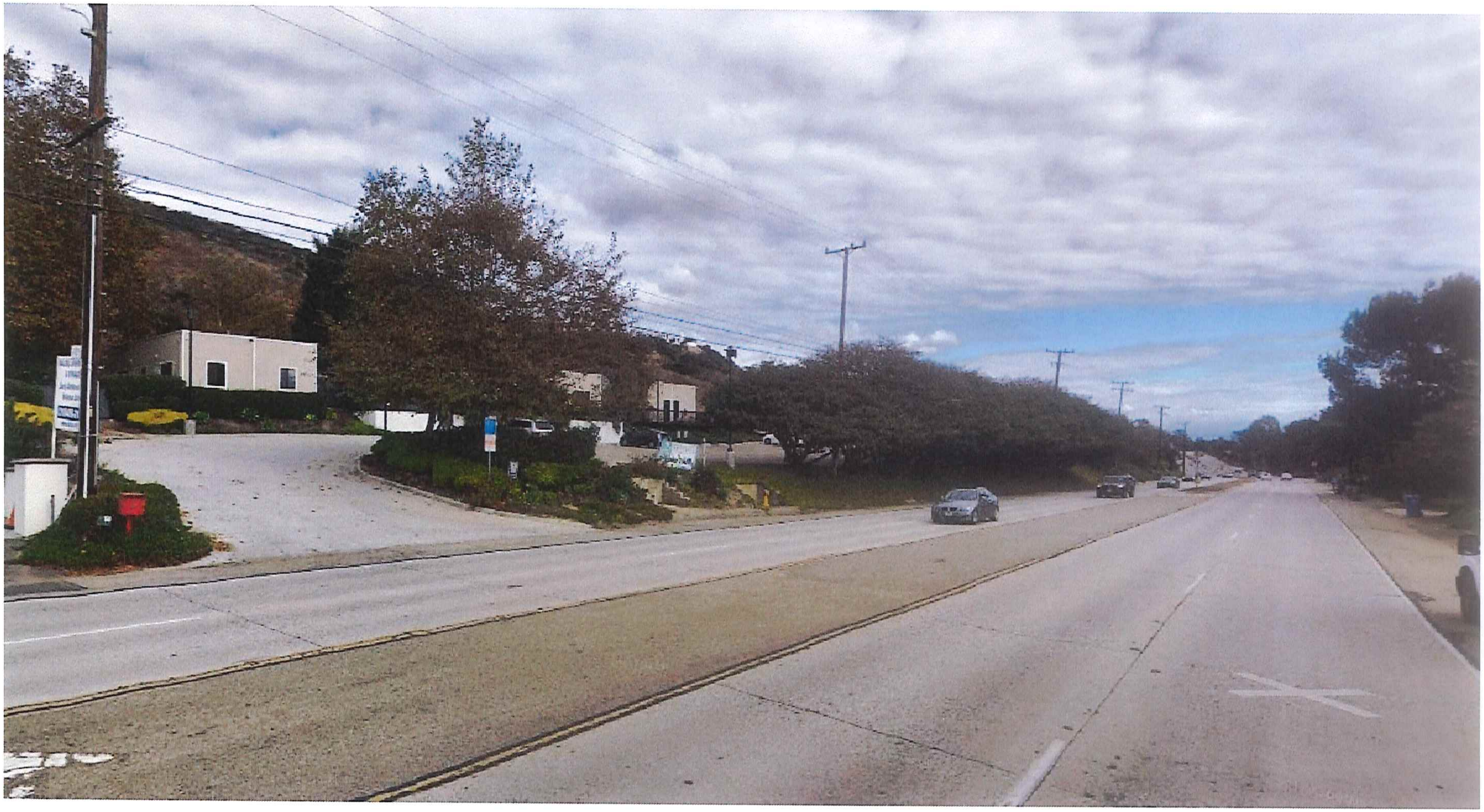


ASSOCIATED TRANSPORTATION ENGINEERS

EXISTING DRIVEWAY VOLUMES

FIGURE 3

EKM - ATE#18038

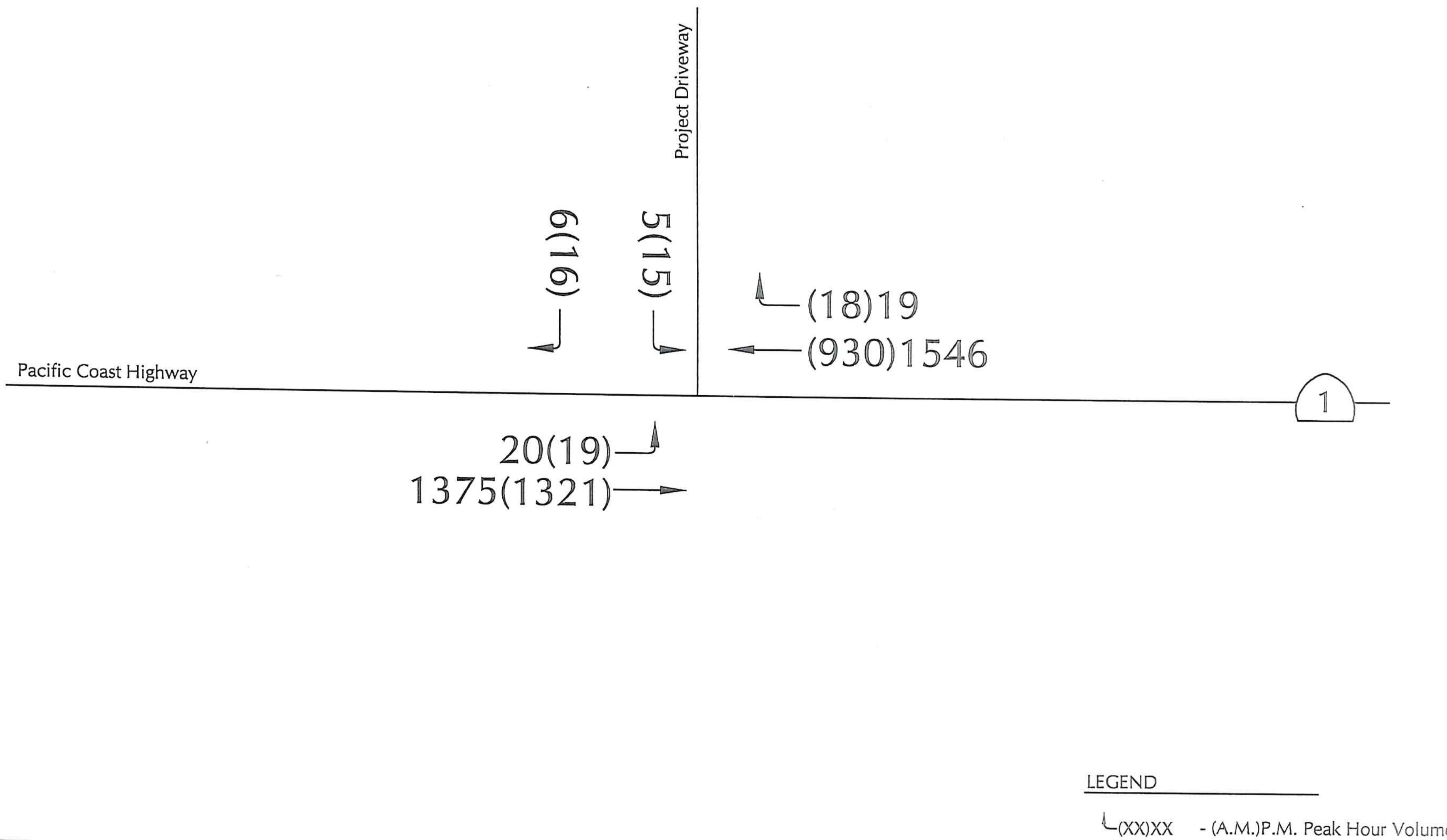


ASSOCIATED
TRANSPORTATION
ENGINEERS

EXISTING DRIVEWAY CONFIGURATION

FIGURE 4

EKM - ATE #18038

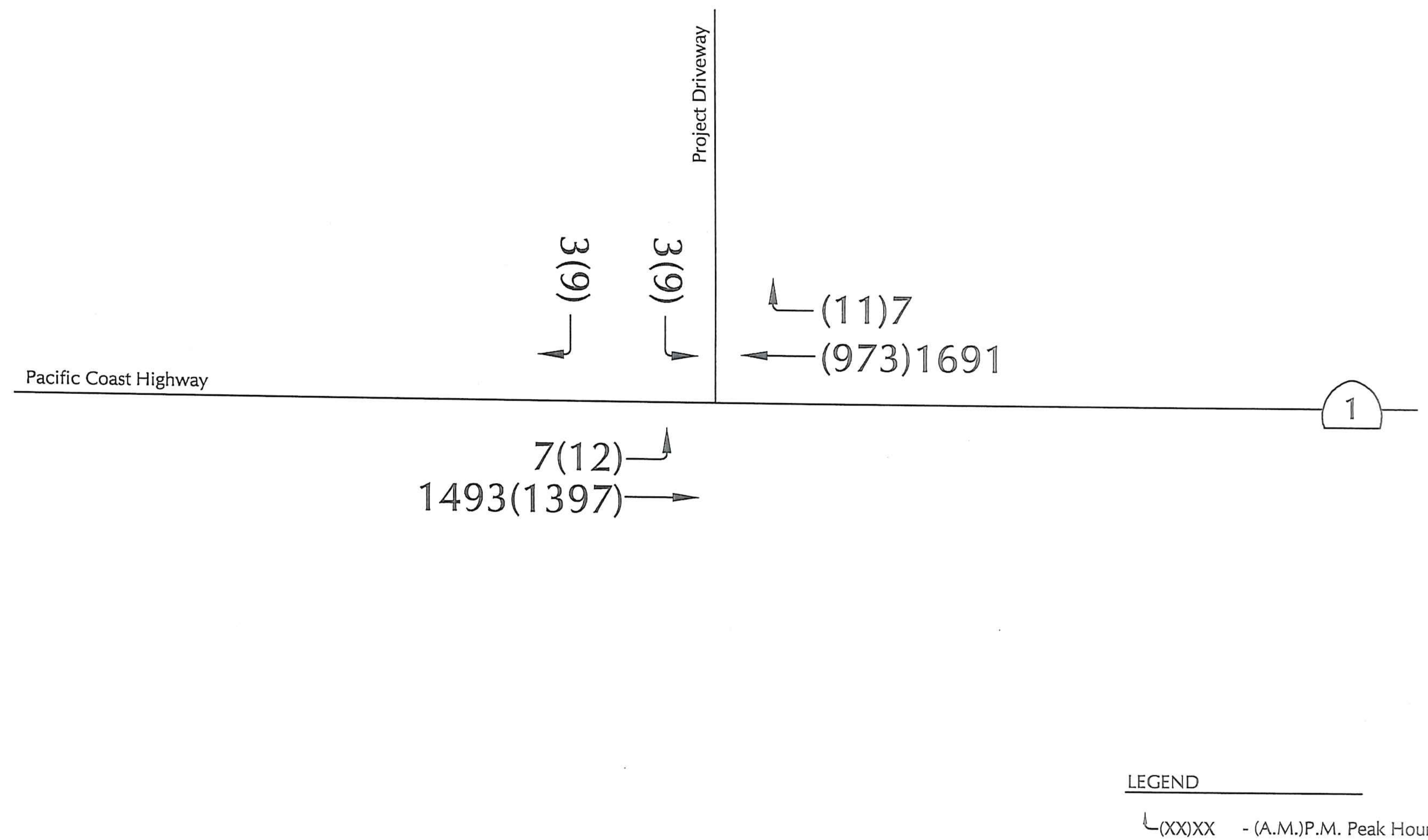


ASSOCIATED
TRANSPORTATION
ENGINEERS

EXISTING + PROJECT DRIVEWAY VOLUMES

FIGURE 5

EKM - ATE#18038

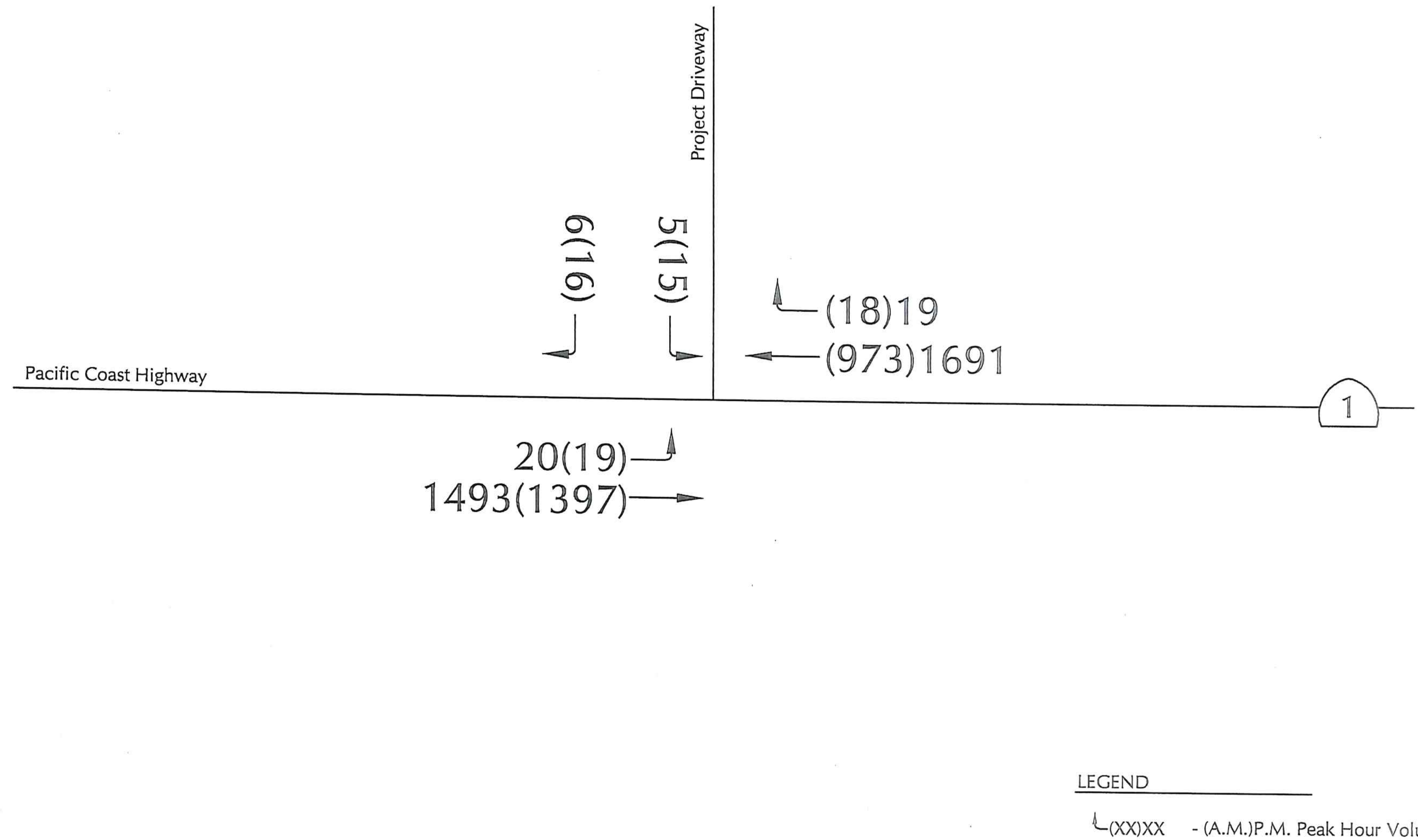


ASSOCIATED TRANSPORTATION ENGINEERS

CUMULATIVE DRIVEWAY VOLUMES

FIGURE 6

EKM - ATE#18038



Associated Transportation Engineers

CUMULATIVE + PROJECT DRIVEWAY TRAFFIC VOLUMES

FIGURE 7

EKM - ATE#18038

DRIVEWAY SIGHT DISTANCE TO EAST: 1,030 FEET

DRIVEWAY SIGHT DISTANCE TO WEST: 1,600 FEET

Associated
Transportation
Engineers

RECOMMENDED NO PARKING SIGN LOCATIONS

FIGURE 9

EKM - ATE #18038

TRAFFIC STUDY – TRIP GENERATION DATA REQUEST

MALIBU JEWISH CENTER & SYNAGOGUE PROJECT MND
APRIL 2018

School Statistics	Unit
Existing Conditions	
Area	
School Use	1,925 sf
No. of Students	
Pre-School	45 students
After-School Youth Program	50 students
Adult Education Program	15 students
No. of Teachers	
Pre-school	4 employees/teachers
After-School Youth Program	6 teachers
Adult Education Program	1 teachers
Schedule/Hours of Operation	
Pre-School	Mon – Fri, 8 A.M. – 5 P.M.
After-School Youth Program	Tue, 4 P.M. – 6 P.M.
Adult Education Program	Wed & Thu, 7 P.M. – 9 P.M.
Proposed Conditions	
Area	
School Use	12,082 sf
# of Students	
Pre-School	75 students
After-School Youth Program	189 students
Adult Education Program	150 students
# of Teachers	
Pre-School	7 employees/teachers
After-School Youth Program	8 teachers
Adult Education Program	2 teachers
Schedule/Hours of Operation	
Pre-School	Mon – Fri, 8 A.M. – 5 P.M.
After-School Youth Program	Tue, 4 P.M. – 6 P.M.
Adult Education Program	Wed & Thu, 7 P.M. – 9 P.M.

Associated Transportation Engineers
Trip Generation Worksheet - Tuesday Schedule

MALIBU JEWISH CENTER PROJECT (#18038)																
			ADT		AM Peak Hour						PM PEAK HOUR					
Land-Use	Size	AVO	Rate (a)	Trips	Rate	Trips	In %	Trips	Out %	Trips	Rate	Trips	In %	Trips	Out %	Trips
Existing Conditions																
Pre-School (a)																
Pre-School	45	1.00	4.11	185	0.91	41	55%	23	45%	18	0.26	12	46%	6	54%	6
After-School (b)																
Students	50	1.25	4.00	160	0.00	0	100%	0	0%	0	0.20	8	100%	8	0%	0
Teachers	6	1.00	2.00	12	0.00	0	100%	0	0%	0	0.00	0	0%	0	100%	0
Sub Total				**357**		**41**		**23**		**18**		**20**		**14**		**6**
Proposed Conditions																
Pre-School (a)																
Pre-School	75	1.00	4.11	308	0.91	68	55%	37	45%	31	0.26	20	46%	9	54%	11
After-School (b)																
Students	189	1.25	4.00	605	0.00	0	100%	0	0%	0	0.20	30	100%	30	0%	0
Teachers	8	1.00	2.00	16	0.00	0	100%	0	0%	0	0.00	0	50%	0	50%	0
Sub Total				**929**		**68**		**37**		**31**		**50**		**39**		**11**
Net Total				**572**		**27**		**14**		**13**		**30**		**25**		**5**

Tuesday Schedule
Pre-School : 8 AM - 5 PM
After-School Youth Program : 4 P.M. - 6 P.M.

(a) ITE trip generation rates for Private School K-8 (#534)
(b) Assumes 1.25 AVO & 20% early pick-up arrival

Associated Transportation Engineers
Trip Generation Worksheet - Monday/Friday Schedule

MALIBU JEWISH CENTER PROJECT (#18038)																
Land-Use	Size	AVO	Rate	ADT	AM PEAK HOUR						PM PEAK HOUR					
				Trips	Rate	Trips	In %	Trips	Out %	Trips	Rate	Trips	In %	Trips	Out %	Trips
Existing Conditions																
Pre-School																
Students	45	1.00	4.11	185	0.91	41	55%	23	45%	18	0.26	12	46%	6	54%	6
Sub-Total				**185**	**1**	**41**	**1**	**23**	**0**	**18**	**0**	**12**	**0**	**6**	**1**	**6**
Proposed Conditions																
Pre-School																
Students	75	1.00	4.11	308	0.91	68	55%	37	45%	31	0.26	20	46%	9	54%	11
Sub-Total				**308**		**68**		**37**		**31**		**20**		**9**		**11**
Net Total				**123**		**27**		**14**		**13**		8		3		5

Monday / Friday Schedule

Pre-School : 8 AM - 5 PM

(a) ITE trip generation rates for Private School K-8 (#534)

Associated Transportation Engineers
Trip Generation Worksheet - Wednesday/Thursday Schedule

MALIBU JEWISH CENTER PROJECT (#18038)																
Land-Use	Size	AVO	ADT		AM Peak Hour						PM PEAK HOUR					
			Rate (a)	Trips	Rate	Trips	In %	Trips	Out %	Trips	Rate	Trips	In %	Trips	Out %	Trips
Existing Conditions																
Pre-School (a)																
Students	45	1.00	4.11	185	0.91	41	55%	23	45%	18	0.26	12	46%	6	54%	6
Adult Education																
Students	15	1.00	2.00	30	0.00	0	100%	0	0%	0	0.00	0	0%	0	100%	0
Teachers	1	1.00	2.00	2	0.00	0	36%	0	64%	0	0.00	0	100%	0	0%	0
Sub-total				**217**		**41**		**23**		**18**		**12**		**6**		**6**
Proposed Conditions																
Pre-School (a)																
Students	75	1.00	4.11	308	0.91	68	55%	37	45%	31	0.26	20	46%	9	54%	11
Adult Education																
Students	150	1.00	2.00	300	0.00	0	36%	0	64%	0	0.00	0	65%	0	35%	0
Teachers	2	1.00	2.00	4	0.00	0	36%	0	64%	0	0.00	0	100%	0	0%	0
Sub-total				**612**		**68**		**37**		**31**		**20**		**9**		**11**
NET TOTAL				**395**		**27**		**14**		**13**		**8**		**3**		**5**

<u>Wednesday / Thursday Schedule</u>
Pre-School : 8 AM - 5 PM
Adult Education Program : 7 P.M. - 9 P.M.

(a) ITE trip generation rates for Private School K-8 (#534)

City of Malibu Cumulative Projects Listing
Updated March 20, 2018

Acronyms
CCC = California Coastal Commission
CDP = coastal development permit
LLA = Lot Line Adjustment
MCR = Malibu Canyon Road
NSFR = New single-family residence
PCH = Pacific Coast Highway
SF = square feet
TDSF = Total Development Square Footage

West Malibu

Project Name	Brief Description	Location	Status	Size	Planner
SMMC Lechuza Beach Public Access Improvements	Several public access improvements along the areas of East Sea Level, West Sea Level and Bunnie Lane, including stairways	31720.5 PCH	Under Planning Review	Beach access stairways, view platforms, public restroom and 4 ADA parking spaces	A. Fernandez
Sea Star Estates	6 NSFRs (infill)	6282, 6285, 6380, and 6333 Sea Star Dr	Under Planning Review	4 NSFRs on 4 existing parcels	L. Rudolph, C. Contreras, and R. Mollica
Malibu High and Middle School Campus Improvement Project	New admin building, remodel existing buildings, new parking area and site improvements	30215 Morning View Drive	Under Construction	35,315 sf of new construction, 12,509 sf of renovation/modernization of existing buildings, new 150 space parking lot, various parking and site improvements	Pending Assignment
Broad Beach Restoration Project	Beachwide rock revetment, off-shore sand dredging, sand nourishment, dune restoration; extensive sand import via truck possible	Broad Beach Road (addressed as 30710.5 Broad Beach Road)	Permit not issued	Westward terminus of Zuma Beach to 6525 Point Lechuza	CA State Lands Commission / Coastal Commission; R. Mollica
28811 PCH Subdivision	3 lot subdivision	28811 PCH	Planning Approval Issued; Final Map Process	Potential development for each lot equals a maximum TDSF of 8,620 sf; 8,342 sf; and 8,470 sf	A. Fernandez
Galahad Subdivision	5 lot subdivision; 4 buildable lots and 1 open space lot	6061 Galahad Rd	Final Map recorded; Development is pending	Potential development for each lot equals a maximum TDSF of 7,044 sf, 7,142 sf, 7,234 sf, and 8,414 sf	A. Fernandez
Trancas Highlands Water Assessment District	Water tank/line, booster pump station and NSFR	31537 Anacapa View Dr, Anacapa View Dr and Trancas Canyon Road	Planning Approval Issued	500,000 gallon water tank, +/- 12,400 linear feet of trenching, assessment district (+/- 66 existing lots), one NSFR +/- 11,000 sf	B. Blue
Sea Level	2 NSFR (infill)	31864 and 31866 Sea Level Dr	Under Planning Review	2,185 sf and 1,925 sf	A. Fernandez
N/A	2-lot LLA and 2 NSFR	5905 and 5909 Latigo Canyon Rd	Under Planning Review	Lot line adjustment and construction of 2 NSFR - 8,223 sf and 5,935 sq. respectively	A. Fernandez
Puerco Canyon Road Extension	Road extension	3500 Puerco Canyon Rd	Under Planning Review	3,500 linear feet of road extension to provide access to 7 residentially zoned lots (1 City lot/6 County lots)	Pending Assignment
Broad Beach/Sea Level Access	Widen access to W Sea Level Dr to 20' to meet Emergency Ingress and Egress requirements (with property at 31885 W Sea Level Drive)	31848 Broad Bach	Under Planning Review	130 linear feet of road widening (Sea Level Dr) provides fire dept. excess for 5 vacant lots	A. Fernandez

Civic Center Area

Project Name	Brief Description	Location	Status	Size	Planner
The Case (aka Crummer Site)	7 lot subdivision (5 for residential)	24120 PCH	Under Construction	(Preliminary) 5 NSFRs; expanded parking for Bluffs Park; 1.74 acre dedication to City for recreation use	A. Fernandez
Towing Subdivision	7 lot subdivision (4 for residential)	23915 Malibu Rd	Under Construction	4 NSFRs	R. Mollica
Rancho Malibu Memorial Park	Chapel and memorial park	4000 Malibu Canyon Rd	Planning Approval Issued	6,000 square foot chapel, basement, subterranean and surface parking spaces and memorial park on approximately 21 acres	A. Fernandez
La Paz Shopping Center	New retail, office and institutional development	23465 Civic Center Way	Planning Approval Issued. Under Substantial Conformance Review	112,058 sf retail and office; 20,000 sf institutional; 543 parking spaces	R. Mollica
Whole Foods Shopping Center	New retail development	23401 Civic Center Way	Under Construction	25,000 sf grocery; 14,839 sf retail/commercial (up to 4,000 sf restaurant)); 220 parking spaces	L. Rudolph

City of Malibu Civic Center Wastewater Treatment Facility	Wastewater treatment and treated water recycling facility	24000 Civic Center Way	Under Construction; operations in November 2018	Under construction to serve first phase of Civic Center (commercial parcels)	B. Blue
Santa Monica College	New satellite campus on 2.94 acre ground lease site out of 9.18 acre County Civic Center parcel	23525 Civic Center Way (APN 4458-022-904, lease area addressed as 23555 by County)	Planning Approval Issued	+/- 25,000 sf building to replace vacant County Sheriff facility; will serve +/- 200 FTE; 2 classrooms, 3 lab/studios, multipurpose room, 2,100 sf lecture hall, 5,700 sf sheriff substation, interpretive center	Pending Assignment
Housing Element Overlay	Overlay to allow up to 20 dwelling units per acre on three sites	28455 PCH, 28401 Pacific Coast Highway, 3700 La Paz Lane (APNs 4458-022-023 and 4458-022-024)	Pending LCPA certification by the CCC	5.12, 3.25 and 2.3 ac sites -> change from allowing 6 units per ac up to 20 units per ac	R. Mollica
Malibu Sycamore Village	New non-residential mixed use commercial project	23575 Civic Center Way (APN 4458-022-011); addressed as 23789 Stuart Ranch Rd per LA County Assessor	Under Planning Review	Two project alternatives submitted: 1) 76,000 sf retail, restaurant, and office space with a public benefit of a 5,000 sf urgent care facility, and 380 parking spaces ; 2) 60,000 sf of retail, restaurant, and office space with 300 parking spaces; project site is a 10 acre commercial parcel and both alternatives include outdoor exhibition space.	Pending Assignment
Malibu Jewish Center & Synagogue	Removal of 4 modular buildings and construction of a new religious school, office, chapel and subterranean parking	24855 PCH	Under Planning Review	16,410 sf school and administration building with a 2,685 sf 1st and 2nd level basement and 9,777 sf subterranean parking, and 2,013 sf chapel building with a 2,134 sf basement	A. Fernandez

Los Angeles County

LA County Waterworks District No. 29 Capital Improvement Projects	The project includes the demolition and construction of tank reservoirs in unincorporated area of Topanaga and	Citywide	NOP issued for EIR for priority projects	The demolition of 2 water tanks and construction of 1 tank reservoir in the unincorporated area of Topanga and in the City of Malibu; the	LA County Waterworks District No. 29
Lunch Properties	5 NSFRs	2930 Sweetwater Mesa	Approved by CCC	5 NSFRs ranging from 7,540 to 14,343 sf, on reconfigured existing lots ranging from 14 to 48 acres, each limited to a 10,000 sf development area; and a new 2,000 ft. access road that will connect to a 1,700 new access road that goes through City (lots are in County).	County of Los Angeles Regional Planning; A. Fernandez
Pepperdine Campus	Project would develop and re-develop property within an existing approximately 365 acre area on the Pepperdine campus through a two-phase development program that will take 12 years	24255 PCH	Under Construction	Six components of proposed development include approximately 394,137 sf of net new development comprised of the following: 1) Student Housing Rehabilitation; 2) Athletics and Events Center and Parking Structure; 3) Upgraded NCAA Soccer Field and Maintenance Facilities; 4) Town Square and Welcome Center over Subterranean Parking; 5) Enhanced Recreation Center Area; and 6) School of Law Parking Structure.	County of Los Angeles Regional Planning; Pending Assignment

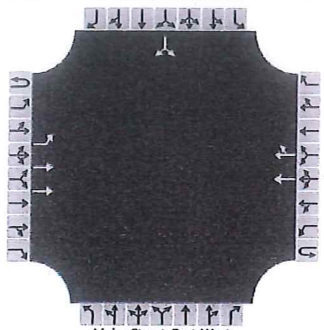
East Malibu

Project Name	Brief Description	Location	Status	Size	Planner
Surfrider Plaza	New office and retail	22959 PCH	Under Planning Review	2,630 sf office; 4,517 sf retail; 31 parking spaces	A. Fernandez
N/A	New office	22729 PCH	Permit Expired; Time Extension Appealed	2,499 sf office with 32 parking spaces	L. Rudolph
N/A	Parcel rezone and new hotel	22729 PCH	Under Planning Review	Zone Change from Community Commercial to Commercial Visitor Serving (CV-2) and new 36-room hotel	L. Rudolph
N/A	Existing office building	22741 PCH	Under Planning Review	Zone Change from Community Commercial to Commercial Visitor Serving (CV-2) and new 36-room hotel	L. Rudolph
N/A	Rezone	5603 Tuna Canyon	Under Litigation	Rezone 4 Public Open Spaces (POS) lots to Rural Residential (RR)	R. Mollica
N/A	LLA and 3 NSFRs	18805, 18807 & 18809 PCH	Under Construction	9,559 sf, 9,141 sf, and 7,429 sf	R. Mollica
N/A	LLA and 2 NSFRs	21997 and 22003 PCH	Under Planning Review	9,818 sf and 8,542 sf	A. Fernandez
N/A	2 NSFR	20624 and 20630 PCH	Under Construction	2,911 sf and 2,911 sf	R. Mollica
Seaboard	4 lot LLA and 1 NSFR, and 1 NSFR and 1 Detached Second Residential Unit	21100 and 21298 Seaboard Rd	Under Planning Review	10,517 sf and 11059 sf NSFRs and improve 3,200 linear feet of roadway (including 610 liner feet for 21298 Seaboard Rd). Proposed lot sizes for the lots involved in the lot line adjustment are 7.6, 1.3, 20 and 2.6 acres.	A. Fernandez

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	PCH/PROJECT DRIVEWAY
Agency/Co.	ATE	Jurisdiction	CITY OF MALIBU
Date Performed	5/17/2018	East/West Street	PCH
Analysis Year	2018	North/South Street	PROJECT DRIVEWAY
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	12	1321				930	11						9		9
Percent Heavy Vehicles (%)	3	3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Left Only								2							

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.16												6.86		6.96
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)		13													20	
Capacity, c (veh/h)		668													329	
v/c Ratio		0.02													0.06	
95% Queue Length, Q_{95} (veh)		0.1													0.2	
Control Delay (s/veh)		10.5													16.6	
Level of Service (LOS)		B													C	
Approach Delay (s/veh)	0.1												16.6			
Approach LOS													C			

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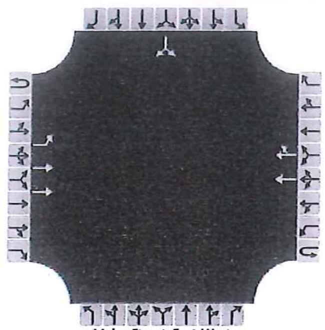
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	PCH/PROJECT DRIVEWAY
Agency/Co.	ATE	Jurisdiction	CITY OF MALIBU
Date Performed	5/17/2018	East/West Street	PCH
Analysis Year	2018	North/South Street	PROJECT DRIVEWAY
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	7	1375				1546	7						3		3
Percent Heavy Vehicles (%)	3	3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Left Only								2							

Critical and Follow-up Headways

	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.16												6.86		6.96
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Flow Rate, v (veh/h)		8													7	
Capacity, c (veh/h)		370													174	
v/c Ratio		0.02													0.04	
95% Queue Length, Q_{95} (veh)		0.1													0.1	
Control Delay (s/veh)		14.9													26.5	
Level of Service (LOS)		B													D	
Approach Delay (s/veh)	0.1												26.5			
Approach LOS													D			

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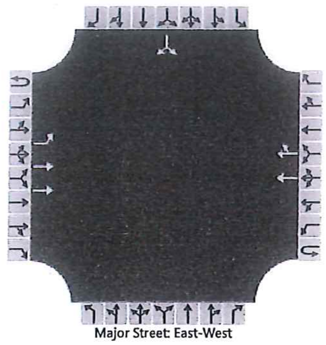
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	PCH/PROJECT DRIVEWAY
Agency/Co.	ATE	Jurisdiction	CITY OF MALIBU
Date Performed	5/17/2018	East/West Street	PCH
Analysis Year	2018	North/South Street	PROJECT DRIVEWAY
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING + PROJECT		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	19	1321				930	18						15		16
Percent Heavy Vehicles (%)	3	3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Left Only								2							

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.16												6.86		6.96
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)		21													34	
Capacity, c (veh/h)		664													329	
v/c Ratio		0.03													0.10	
95% Queue Length, Q_{95} (veh)		0.1													0.3	
Control Delay (s/veh)		10.6													17.2	
Level of Service (LOS)		B													C	
Approach Delay (s/veh)	0.2												17.2			
Approach LOS													C			

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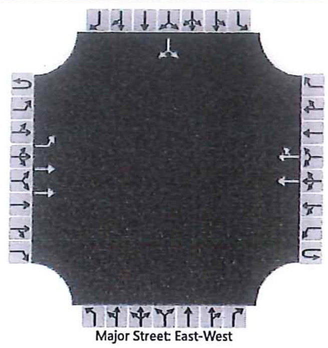
AWD: 14.7 SEC = LOS B

HCS7 Two-Way Stop-Control Report

General Information / Site Information

General Information		Site Information	
Analyst	DLD	Intersection	PCH/PROJECT DRIVEWAY
Agency/Co.	ATE	Jurisdiction	CITY OF MALIBU
Date Performed	5/17/2018	East/West Street	PCH
Analysis Year	2018	North/South Street	PROJECT DRIVEWAY
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING + PROJECT		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	20	1375				1546	19						5		6
Percent Heavy Vehicles (%)	3	3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Left Only								2							

Critical and Follow-up Headways

	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.16												6.86		6.96
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

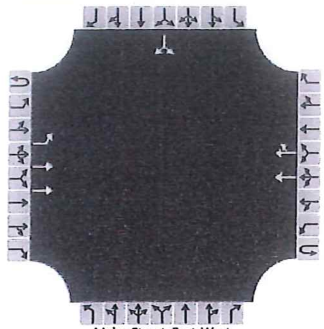
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Flow Rate, v (veh/h)		22													12	
Capacity, c (veh/h)		366													178	
v/c Ratio		0.06													0.07	
95% Queue Length, Q_{95} (veh)		0.2													0.2	
Control Delay (s/veh)		15.5													26.7	
Level of Service (LOS)		C													D	
Approach Delay (s/veh)	0.2												26.7			
Approach LOS													D			

AWD: 19.5 SEC = LOS C

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	PCH/PROJECT DRIVEWAY
Agency/Co.	ATE	Jurisdiction	CITY OF MALIBU
Date Performed	5/17/2018	East/West Street	PCH
Analysis Year	2018	North/South Street	PROJECT DRIVEWAY
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	CUMULATIVE		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	12	1397				973	11						9		9
Percent Heavy Vehicles (%)	3	3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Left Only								2							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.16												6.86		6.96
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		13													20	
Capacity, c (veh/h)		641													312	
v/c Ratio		0.02													0.06	
95% Queue Length, Q_{95} (veh)		0.1													0.2	
Control Delay (s/veh)		10.7													17.3	
Level of Service (LOS)		B													C	
Approach Delay (s/veh)	0.1												17.3			
Approach LOS													C			

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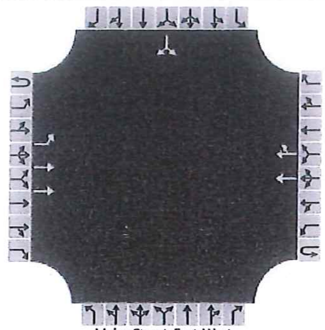
AWD: 14.7 SEC = LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	PCH/PROJECT DRIVEWAY
Agency/Co.	ATE	Jurisdiction	CITY OF MALIBU
Date Performed	5/17/2018	East/West Street	PCH
Analysis Year	2018	North/South Street	PROJECT DRIVEWAY
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	CUMULATIVE		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	7	1493				1691	7						3		3
Percent Heavy Vehicles (%)	3	3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Left Only								2							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.16												6.86		6.96
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8													7	
Capacity, c (veh/h)		321													146	
v/c Ratio		0.02													0.04	
95% Queue Length, Q_{95} (veh)		0.1													0.1	
Control Delay (s/veh)		16.5													30.8	
Level of Service (LOS)		C													D	
Approach Delay (s/veh)	0.1												30.8			
Approach LOS													D			

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CUMULATIVE PM.xtw

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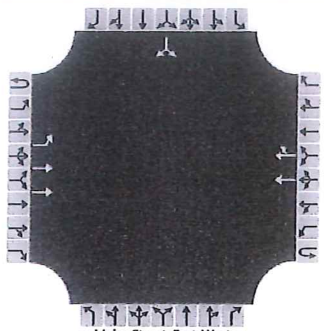
AWD: 23.2 SEC = LOS C

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	PCH/PROJECT DRIVEWAY
Agency/Co.	ATE	Jurisdiction	CITY OF MALIBU
Date Performed	5/17/2018	East/West Street	PCH
Analysis Year	2018	North/South Street	PROJECT DRIVEWAY
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	CUMULATIVE+PROJECT		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	19	1397				973	18						15		16
Percent Heavy Vehicles (%)	3	3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Left Only								2							

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.16												6.86		6.96
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)		21													34	
Capacity, c (veh/h)		637													312	
v/c Ratio		0.03													0.11	
95% Queue Length, Q_{95} (veh)		0.1													0.4	
Control Delay (s/veh)		10.8													17.9	
Level of Service (LOS)		B													C	
Approach Delay (s/veh)	0.1												17.9			
Approach LOS													C			

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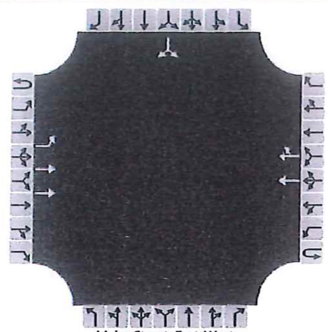
AWD: 15.2 SEC = LOS C

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	PCH/PROJECT DRIVEWAY
Agency/Co.	ATE	Jurisdiction	CITY OF MALIBU
Date Performed	5/17/2018	East/West Street	PCH
Analysis Year	2018	North/South Street	PROJECT DRIVEWAY
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	CUMULATIVE+PROJECT		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	20	1493				1691	19						5		6
Percent Heavy Vehicles (%)	3	3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Left Only								2							

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.16												6.86		6.96
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)		22													12	
Capacity, c (veh/h)		317													150	
v/c Ratio		0.07													0.08	
95% Queue Length, Q_{95} (veh)		0.2													0.3	
Control Delay (s/veh)		17.2													31.0	
Level of Service (LOS)		C													D	
Approach Delay (s/veh)	0.2												31.0			
Approach LOS													D			

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AWD: 22.1 SEC = LOS C

Overland Traffic Consultants, Inc.

Overland Traffic Consultants
South Office
952 Manhattan Beach Bl, #100
Manhattan Beach, CA 90266
Phone (310) 930 - 3303
E-mail: otc@overlandtraffic.com

August 24, 2017

Malibu Jewish Center & Synagogue
C/o Mr. Mark Meyer
David Lawrence Gray Architects, AIA
527 W. 7th Street, Suite 1001
Los Angeles, CA 90014

RE: Updated Parking Demand Study for Malibu Jewish Center & Synagogue (24855 Pacific Coast Highway)

Dear Mr. Meyer,

Overland Traffic Consultants has prepared this parking study to document the existing and expected parking demands associated with the proposed Malibu Jewish Center & Synagogue (MJCS) application for a Parking Variance (No. 14-050) and Coastal Development Permit (No. 14-069).

The purpose of this study is to document the current usage of the facility, estimate the peak hour parking demand after completion of the project and calculate the project's code compliant parking requirements based on the sum of the individual uses. This update includes the most current site plan and MJCS special event information requested by City staff.

The following information shows that the proposed 108 marked parking spaces would adequately accommodate the typical weekday and weekend parking demands for the proposed MJCS Expansion Project. However, MJCS special events would continue to rely on off – site parking and valet programs to manage the parking demand.

Background Justification

The Malibu Jewish Center & Synagogue (MJCS) understands that concurrent use of all the on - site facilities is not feasible and therefore they do not currently operate the site in that manner or will they in the future.

Activities associated with the MJCS operation allows for parking spaces to be shared between the Synagogue use and the educational uses. The Synagogue use occurs mainly on Friday evenings and on weekends with the pre – school occurring Monday through Friday during normal school hours. The after - school youth religious school program is scheduled for Tuesday in the late afternoon with the adult educational classes scheduled for Wednesday and Thursday during the evening hours.

The application for a parking variance recognizes that these different schedules do not generate peak parking demands at the same time which allows for parking spaces to serve several uses without conflict.

Project Description

The Malibu Jewish Center & Synagogue is located at 24855 Pacific Coast Highway in the City of Malibu. Figure 1 shows the location of the existing facility and project site.

Existing Use - The existing pre - school and synagogue consists of approximately 11,080 square feet with 5,775 square feet devoted to the pre - school (presently 45 pre - school students) and administrative complex. The existing temple is approximately 5,305 square feet in size.

The site provides eighty - three (83) parking spaces consisting of: 55 standard, 12 standard tandem, 12 compact and 4 handicap accessible parking spaces (71 code compliant spaces). Access to the site is provided by one driveway on Pacific Coast Highway near the west end of the site.

Proposed Project - The project consists of demolition of the one story modular school / administrative office buildings and construction of a new 2 story multi – function building (approximately 23,244 square feet) with administrative offices, pre – school and religious school classrooms, and a new chapel for typical Friday and Saturday services. The existing synagogue chapel will remain on the site for special services.

The site proposes one hundred eight (108) parking spaces consisting of 80 at - grade parking spaces and 28 parking spaces located in a basement parking garage. The new parking layout and structured parking will increase the MJCS parking supply by 25 parking spaces. The proposed parking supply includes 60 standard, 13 standard tandem, 30 compact and 5 handicap accessible parking spaces (87 code compliant spaces). The vehicular entrance / exit from Pacific Coast Highway will remain but the parking layout and internal circulation will be modified to better accommodate fire truck access.

Figure 2 illustrates the existing site layout and proposed site plan for the MJCS project.

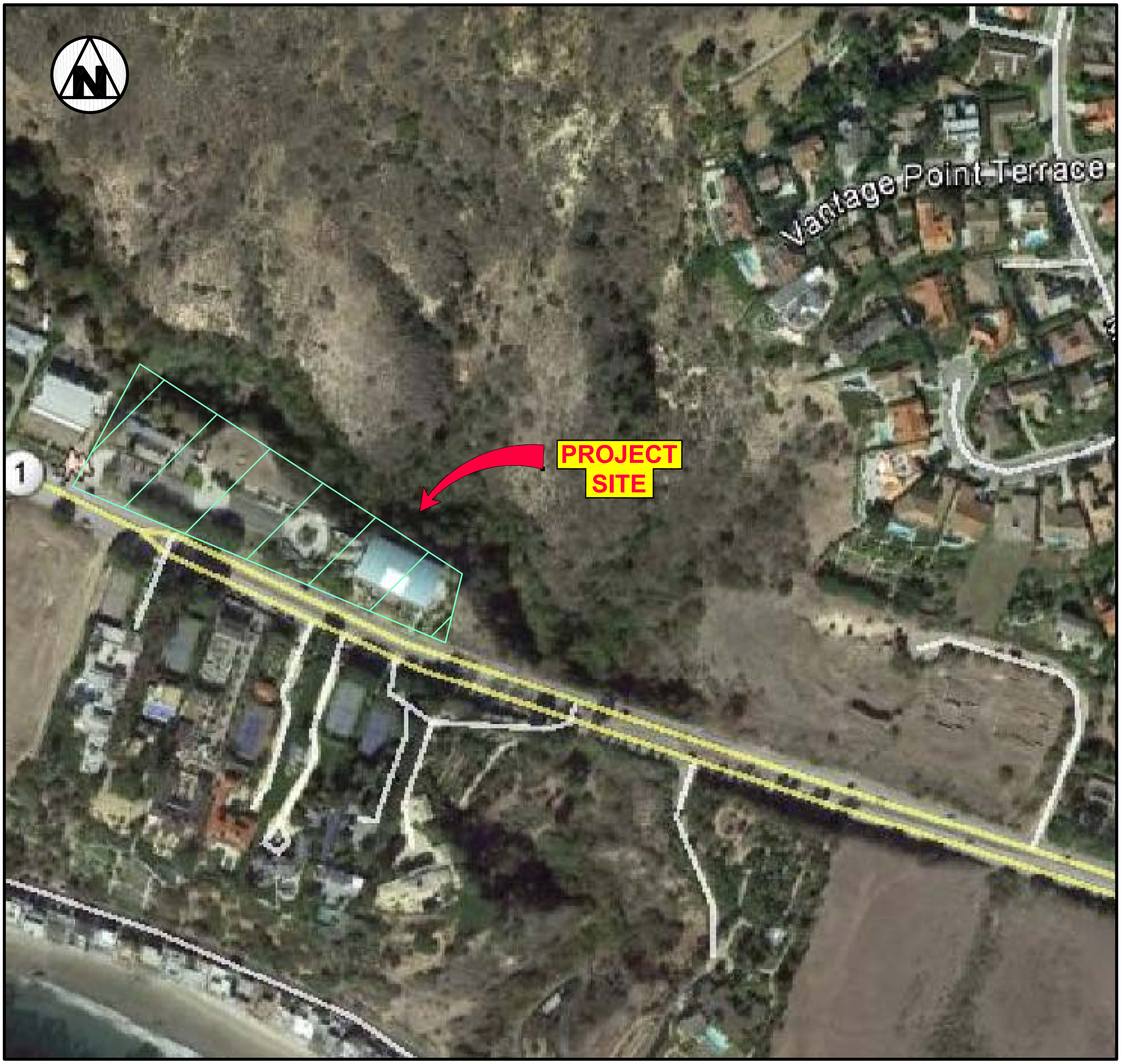
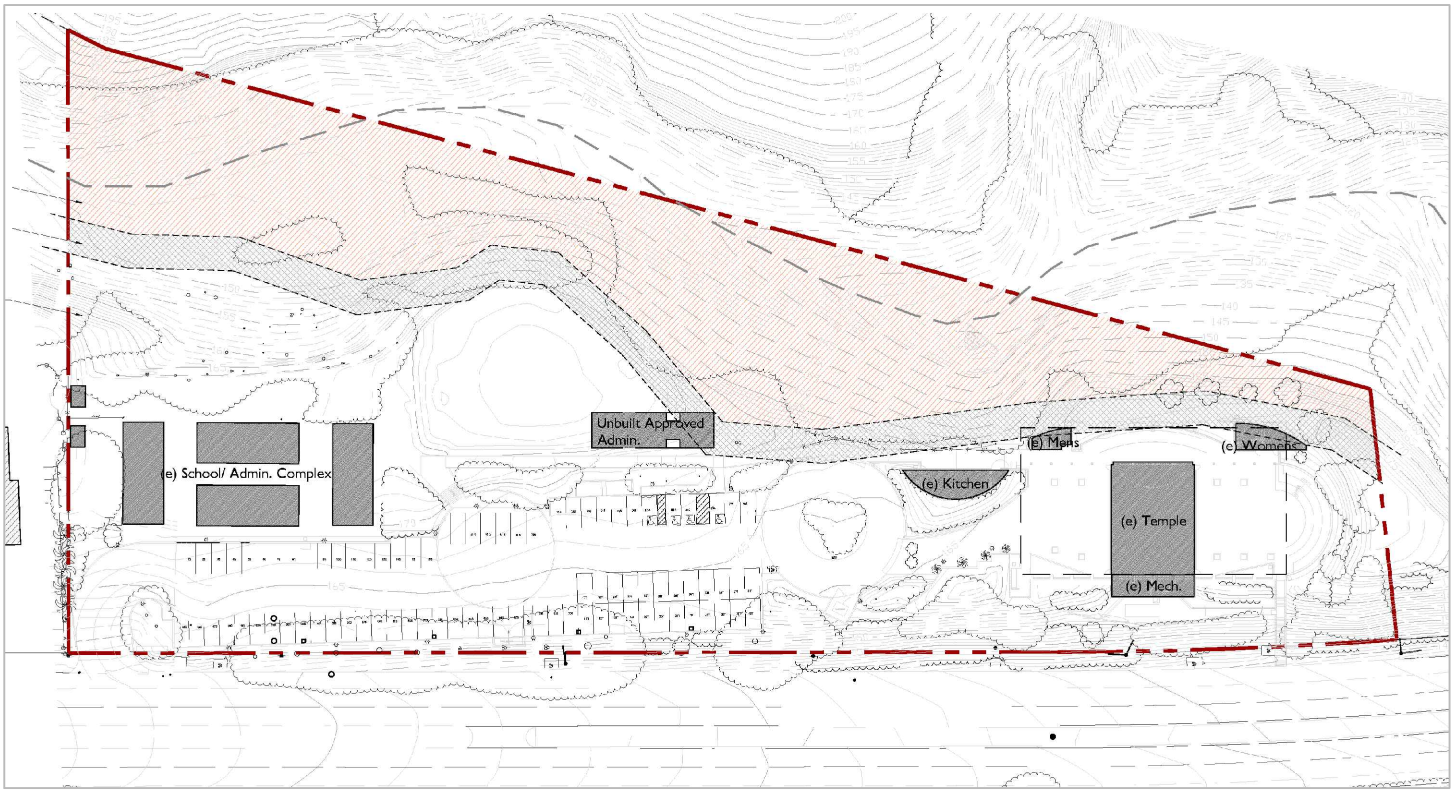


FIGURE 1

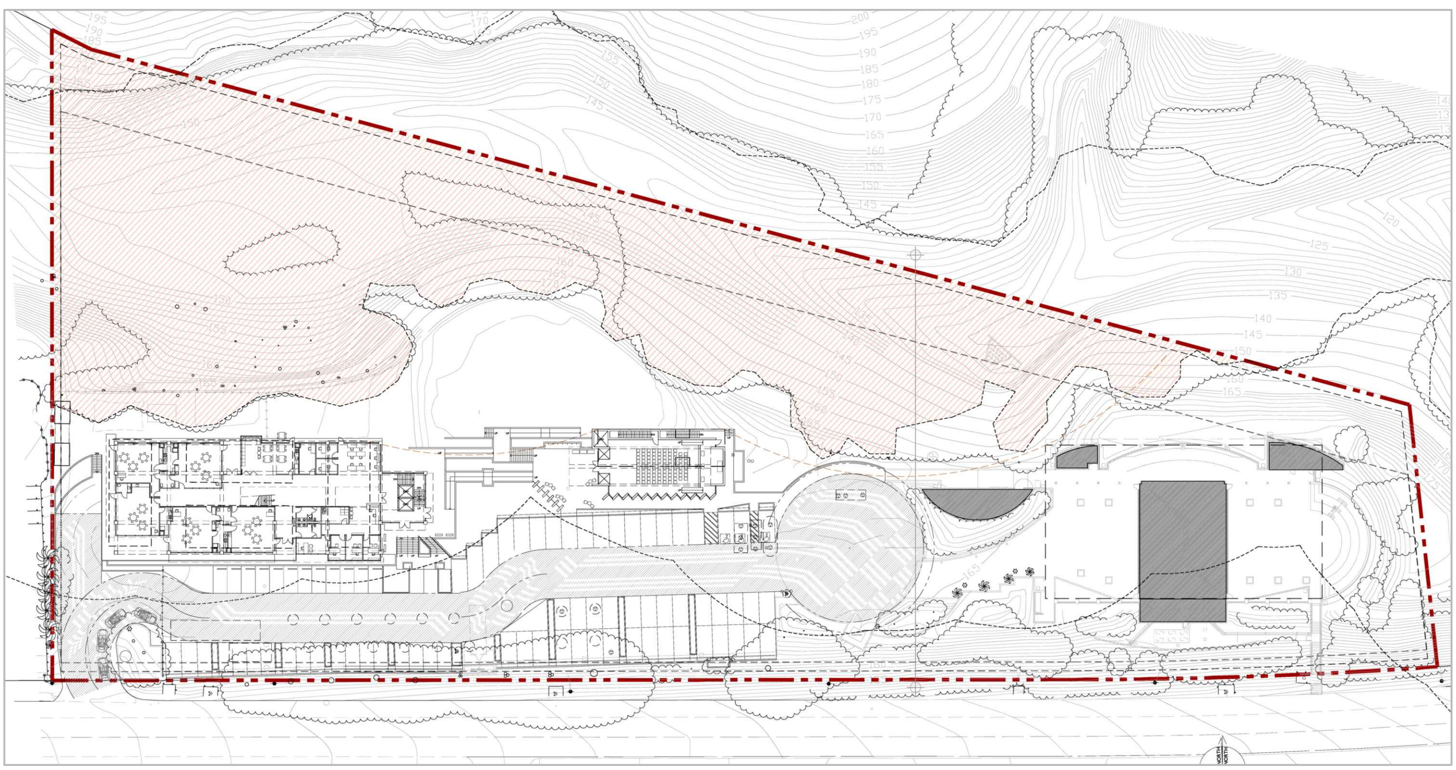
10/2014

LOCATION MAP

Overland Traffic Consultants, Inc.
24325 Main Street #202, Santa Clarita, CA 91321
(661) 799 - 8423, OTC@overlandtraffic.com



EXISTING SITE



AFTER CONSTRUCTION

FIGURE 2

8/2017

MALIBU JEWISH CENTER & SYNAGOGUE
EXISITING AND AFTER CONSTRUCTION

Overland Traffic Consultants, Inc.
24325 Main Street #202, Santa Clarita, CA 91321
(661) 799 - 8423, OTC@ overlandtraffic.com

The proposed use and floor areas for MJCS site are summarized below in Table 1.

Table 1
Proposed Malibu Jewish Center & Synagogue

	Pre-School	Religious School	Office	Chapel Inside seating	Chapel Non-seating	Gross Floor Area
Basement Level 2			2,318.3			2,318.3
Basement Level 1			367.1		2,134.3	2,501.4
First Floor	6,552.4		2,601.3	580.0	1,433.4	11,167.1
Second Floor		5,529.7	1,727.5			7,257.2
Totals (s.f.)	6,552.4	5,529.7	7,014.2	580.0	3,567.7	23,244.0
Existing Synagogue				1,427.7	3,877.2	5,304.9
Totals (s.f.)	6,552.4	5,529.7	7,014.2	2,007.7	7,444.9	28,548.9

Malibu Local Coastal Program (LCP) Local Implementation Plan (LIP) Parking Requirements

Most zoning codes provide peak parking ratios for individual uses and sum the uses to determine the total parking requirement. While this appropriately recognizes that separate land uses generate different parking demands, it does not reflect that the combined peak parking demand for a multiple use facility that generates parking at different times of the day can be substantially less than the sum of the individual parking demands.

Applying the Local Implementation Plan (LIP) parking rates for the Project's individual uses yields a parking requirement of 180 spaces as shown in Table 2 below.

Table 2
Malibu Local Coastal Program (LCP) Local Implementation Plan (LIP)
Parking Requirements

Use	Size	Parking Ratio	Total Spaces Required
Chapel Seating (e)	1,428 s.f.	Approved permit	67
Chapel – Non-seating (e)	3,877 s.f.	Approved permit	Included above
Proposed Chapel seating	96 seats.	1 space / 3 seats	32
Proposed Chapel non-seating	3, 568 s.f.	1 space / 350 s.f.	11
Pre-School Students	75 students	1 space / 5 students	15
Pre-school Employees	5 employees	1 space / employee	5
Adult School *	150 adults	1 space / 3 adults	50 (or)
Youth School *	5 Classrooms	2 spaces / classroom	10
Total			180 Max.

* Adult school and Youth school programs share the same classrooms and do not overlap. Office space included with the school use.

Jewish Center & Synagogue Parking Demand Characteristics

Parking demand at the Malibu Jewish Center & Synagogue will vary throughout the week and by time of day based on the daily activities scheduled at the site, a typical usage schedule is described below:

Education - A typical weekday begins with the pre - school program starting at 8 am providing daycare until 5 pm (max. 75 future students) on Monday through Friday. On Tuesdays, a youth after - school program for religious classes begins at 4:00 pm ending at 6:00 pm (max. 189 future students). Lastly, an adult education program is offered on Wednesday and Thursday evenings from 7:00 pm until 9:00 pm (max 150 future attendees).

Synagogue - Weekly Shabbat services on Friday evenings start at 6:00 pm and end at 8:00 pm with Saturday morning service beginning at 9:30 and ending at 1:00 pm. July and August Shabbat services are off – site.

Utilizing the daily MJCS schedule, an hourly parking demand table listing the parking requirements per use has been developed. Two parking rates have been used to illustrate the potential hourly parking demand on the site per hour and day of the week. In addition to the LIP parking requirements, data from the Institute of Transportation Engineers (ITE) parking studies has been added to provide a second reference set of parking demand values.

Table 3 contains the hourly parking demand estimates using these parking rates per use per day. A summary of the MJCS parking demand for each use is provided below.

Pre – school program - It is estimated that between 13 – 18 parking spaces will be necessary for the pre – school program on Monday through Friday.

Youth Religious School - It is estimated that between 10 - 17 parking spaces will be necessary for the youth religious school program on Tuesdays. Since the pre – school hours and youth school hours overlap, the potential parking demand between 4:00 pm and 5:00 pm is estimated at 23 – 35 parking spaces.

<u>Adult Education</u> - It is estimated that between 50 - 59 parking spaces will be necessary for the adult education program on Wednesdays and Thursdays. This parking demand represents a typical daily peak parking demand for the site.

<u>New Synagogue Chapel</u> – Assuming full occupancy of the 96 seats, it estimated that the potential peak parking demand would between 32 - 39 parking spaces using the rates shown below Table 3; Notwithstanding that the current average attendance is 45 – 50 people for the typically Friday evening / Saturday morning services.

It is important to note that the existing chapel will not be utilized at the same time during any Friday night or Saturday morning service but rather for Holiday services and its use is supplemented with parking management practices, i.e., off - site parking and valet/assisted parking.

Table 3
Hourly Parking Requirements

Weekday	Rate	Size	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM
Monday - Friday																
Pre School		75 students														
Code Parking	*Table 2*		*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*				
ITE Parking	0.24	per student	18	18	18	18	18	18	18	18	18	18				
Tuesday																
Religious School		189 students														
Code Parking	*Table 2*										*10*	*10*	*10*			
ITE Parking	0.09	per student									17	17	17			
Wed. & Thursday																
Adult School		150 students														
Code Parking	*Table 2*													*50*	*50*	*50*
ITE Parking	0.39	per student												59	59	59
Friday Evening																
Synagogue		96 seats														
Code Parking	*Table 2*												*32*	*32*	*32*	
ITE Parking	0.41	per attendee											39	39	39	
Max. Code Parking			*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*	*23*	*23*	*32*	*50*	*50*	*50*
Max. ITE Parking			18	18	18	18	18	18	18	18	35	35	39	59	59	59

Jewish Center & Synagogue Parking Survey Results

Parking occupancy surveys were conducted at different times during the day for different days of the week to show the current peak parking demand generated by the different activities on – site. The parking occupancy counts were conducted every 20 minutes during the pre - school arrival hours from 7:00 am to 9:00 am, between 2:00 pm until 4:00 pm during the peak dismissal of the pre - school and the arrival of the youth educational classes, and again between 7:00 pm until 9:00 pm to capture the adult education parking demand and Friday Synagogue services. Saturday counts were also conducted to gather parking demands for the weekend Synagogue services. A total of 7 days of data have been collected: 3 days in 2014 and updated with 4 days in 2016. Counts were conducted on Tuesday, Wednesday, Thursday, Friday and Saturday.

The observed parking demand from the survey periods are shown below in Table 4. This data shows a peak usage of approximately 20 - 25 parked vehicles during a typical day. The survey data is provided in Attachment 1.

Table 4
Observed Parking Demand

Date	Day	7:00 - 8:00 am	8:00 - 9:00 am	2:00 - 3:00 pm	3:00 - 4:00 pm	7:00 - 8:00 pm	8:00 - 9:00 pm
9/9/2014	Tuesday	0	17	17	19	24	22
9/11/2014	Thursday	0	15	11	9	5	4
9/13/2014	Saturday	0	19	17	16	2	1
3/19/2016	Saturday	0	1	2	3	0	0
4/5/2016	Tuesday	0	9	18	21	4	3
4/6/2016	Wednesday	2	18	23	22	1	1
4/8/2016	Friday	0	12	23	9	11	1
	Max.	2	19	23	22	24	22

MJCS Special Events

Per the request of city staff, Table 5 below lists the type of events that are expected for the MJCS site. The list contains typical events that are currently taking place on site: weddings, B'nai Mitzvah and religious holidays. This list also provides a summary of the number of events expected, time of day by location and estimated number of attendees.

Off – site parking along with shuttle service to and from the MJCS will be provided to address on – site events when the parking demand is expected to exceed the 108 space parking supply. This off – site parking program is currently utilized by MJCS to control and mitigate existing events, see Attachment 2. Approximately 140 parking spaces located within the Malibu City Hall parking lot are typically used to accommodate the parking demand for events larger than can be accommodated on – site.

Table 5
MJCS Special Event Information

Event Name	Frequency (per Year)	Day of the week	Start time	End time	Overlaps with another event	Where onsite	# of Attendees	Non-standard parking required?	Onsite Valet Parking	Offsite Parking w/ Shuttle
Wedding (Saturday)	10	Saturday	4pm	12am	No	Synagogue	200	Yes	Yes	Yes
Wedding (Sunday)	10	Sunday	12pm	4pm	No	Synagogue	200	Yes	Yes	Yes
B'nai Mitvah	18	Saturday	10am	1pm	Saturday Service is included	New Chapel	100	No	No	No
Malibu Film Society	25	Varies	6pm	10pm	No	Synagogue	70	No	No	No
Other Party/Fundraisers	6	Weekends	4pm	10pm	No	Synagogue	100	No	Yes	No
Rosh Hashanah Eve	1	Varies by Religious Calendar	6pm	10pm	No	Synagogue	500	Yes	Yes	Yes
Rosh Hashanah Day	1	Varies by Religious Calendar	9:30am	2pm	No	Synagogue	500	Yes	Yes	Yes
Yom Kippur Eve	1	Varies by Religious Calendar	6:30pm	9:30pm	No	Synagogue	500	Yes	Yes	Yes
Yom Kippur Day	1	Varies by Religious Calendar	9:30am	7:30pm	No	synagogue	500	Yes	Yes	Yes
Purim Carnival	1	Weekends	11am	3pm	No	Parking Lot	100	Yes	Yes	No
Passover Community Seder	1	Varies	6pm	9pm	No	Synagogue	50	No	No	No

Conclusions

1. The current parking demand of MJCS is 20 – 25 parking spaces per the parking occupancy surveys conducted at the site.
2. The existing Synagogue Chapel and School uses require 67 parking spaces per approved permit.
3. Applying the Local Implementation Plan (LIP) parking rates for the MJCS project's individual uses shows a parking requirement of 180 parking spaces.
4. Using the schedule of operations provided by the applicant for the various facilities, it is shown that the number of LIP required parking spaces for the site at any one time does not exceed 59 parking spaces, which occurs during the evening adult educational program.
5. The peak parking demand for the religious services held in the proposed chapel on a typical Friday evening and Saturday morning could peak at 39 parking spaces, approximately 36 % of the 108 parking spaces being provided.
6. MJCS agrees to not schedule overlapping special events and will secure off – site parking for events that have a parking demand that exceeds the site's parking supply.
7. Event parking would be accommodated by implementing an off – site valet program. The Malibu Jewish Center & Synagogue currently implements an off – site valet program and would continue to implement off - site parking to alleviate overflow parking for Holiday services in the existing Chapel. The estimated peak number of attendees for the special holiday events at the main synagogue is up to 500 attendees. Attached are copies of a previous permit to park off – site at the City of Malibu City Hall.
8. An informational program will be implemented ahead of events by publishing parking procedures directing the attendees to the off - site lot rather than parking along Pacific Coast Highway.
9. A median left turn lane exists on Pacific Coasts Highway which provides adequate storage for left turning traffic and a left turn refuge lane for exiting traffic to merge with

Pacific Coast Highway traffic. However, it is recommended that MJCS staff monitor the driveway operations during high volume special events to avoid potential vehicle queuing on – site and on Pacific Coast Highway.

10. Implement an off - site parking and corresponding shuttle service to and from the project site to reduce vehicle trips and mitigate traffic impacts which result in less than significant traffic impacts during high volume special events.

Please call me if you have questions.

Sincerely,

Jerry T. Overland

Jerry T. Overland

Attachments

Attachment 1

MJCS Parking Survey Data

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: FRIDAY, APRIL 08, 2016

PERIOD: 07:00 AM TO 09:00 AM

02:00 PM TO 04:00 PM

07:00 PM TO 09:00 PM

FILE: 1-FRI

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	7	0	0	7
0840-0900	12	0	0	12
0200-0220	22	1	0	23
0220-0240	18	1	0	19
0240-0300	17	1	0	18
0300-0320	8	1	0	9
0320-0340	5	1	0	6
0340-0400	3	1	0	4
0700-0720	8	2	0	10
0720-0740	9	2	0	11
0740-0800	7	0	0	7
0800-0820	1	0	0	1
0820-0840	1	0	0	1
0840-0900	1	0	0	1

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: WEDNESDAY, APRIL 06, 2016

PERIOD: 07:00 AM TO 09:00 AM
02:00 PM TO 04:00 PM
07:00 PM TO 09:00 PM

FILE: 1-WED

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	2	0	0	2
0800-0820	10	1	0	11
0820-0840	12	1	0	13
0840-0900	17	1	0	18
0200-0220	22	1	0	23
0220-0240	17	1	0	18
0240-0300	18	2	0	20
0300-0320	20	2	0	22
0320-0340	14	2	0	16
0340-0400	12	2	0	14
0700-0720	1	0	0	1
0720-0740	1	0	0	1
0740-0800	1	0	0	1
0800-0820	1	0	0	1
0820-0840	1	0	0	1
0840-0900	1	0	0	1

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: TUESDAY, APRIL 05, 2016

PERIOD: 07:00 AM TO 09:00 AM

02:00 PM TO 04:00 PM

07:00 PM TO 09:00 PM

FILE: 1-TUES

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	5	1	0	6
0820-0840	7	1	0	8
0840-0900	8	1	0	9
0200-0220	17	1	0	18
0220-0240	10	1	0	11
0240-0300	10	1	0	11
0300-0320	10	1	0	11
0320-0340	11	3	0	14
0340-0400	18	3	0	21
0700-0720	4	0	0	4
0720-0740	4	0	0	4
0740-0800	3	0	0	3
0800-0820	3	0	0	3
0820-0840	1	0	0	1
0840-0900	1	0	0	1

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALFORNIA 91006
626.446.7978 PHONE

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: SATURDAY, MARCH 19, 2016

PERIOD: 07:00 AM TO 09:00 AM
02:00 PM TO 04:00 PM
07:00 PM TO 09:00 PM

FILE: 1-SAT

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	1	0	0	1
0820-0840	1	0	0	1
0840-0900	1	0	0	1
0200-0220	1	1	0	2
0220-0240	1	1	0	2
0240-0300	1	1	0	2
0300-0320	2	1	0	3
0320-0340	2	1	0	3
0340-0400	2	1	0	3
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	0	0	0	0
0840-0900	0	0	0	0

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: SATURDAY, SEPTEMBER 13, 2014

PERIOD: 07:00 AM TO 09:00 AM

02:00 PM TO 04:00 PM

07:00 PM TO 09:00 PM

FILE: 1-SAT

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	6	0	0	6
0840-0900	19	0	0	19
0200-0220	17	0	0	17
0220-0240	15	0	0	15
0240-0300	15	0	0	15
0300-0320	13	0	0	13
0320-0340	16	0	0	16
0340-0400	12	0	0	12
0700-0720	2	0	0	2
0720-0740	1	0	0	1
0740-0800	1	0	0	1
0800-0820	1	0	0	1
0820-0840	1	0	0	1
0840-0900	0	0	0	0

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: THURSDAY, SEPTEMBER 11, 2014

PERIOD: 07:00 AM TO 09:00 AM
02:00 PM TO 04:00 PM
07:00 PM TO 09:00 PM

FILE: 1-THURS

20-MIN PERIOD	PARKING OCCUPANCY			
	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	5	0	0	5
0840-0900	15	0	0	15
0200-0220	11	0	0	11
0220-0240	9	0	0	9
0240-0300	10	0	0	10
0300-0320	9	0	0	9
0320-0340	9	0	0	9
0340-0400	8	0	0	8
0700-0720	5	0	0	5
0720-0740	5	0	0	5
0740-0800	5	0	0	5
0800-0820	4	0	0	4
0820-0840	3	0	0	3
0840-0900	3	0	0	3

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

PARKING OCCUPANCY SUMMARY

CLIENT: OVERLAND TRAFFIC CONSULTANTS, INC

PROJECT: MALIBU JEWISH CENTER - 24855 PCH - MALIBU

DATE: TUESDAY, SEPTEMBER 09, 2014

PERIOD: 07:00 AM TO 09:00 AM
02:00 PM TO 04:00 PM
07:00 PM TO 09:00 PM

FILE: 1-TUES

	PARKING OCCUPANCY			
20-MIN PERIOD	REGULAR 49 SPACES	RESERVED 4 SPACES	HANDI 4 SPACES	TOTAL 57 SPACES
0700-0720	0	0	0	0
0720-0740	0	0	0	0
0740-0800	0	0	0	0
0800-0820	0	0	0	0
0820-0840	4	0	0	4
0840-0900	17	0	0	17
0200-0220	15	2	0	17
0220-0240	12	1	0	13
0240-0300	13	1	0	14
0300-0320	10	1	0	11
0320-0340	14	1	0	15
0340-0400	17	2	0	19
0700-0720	15	2	0	17
0720-0740	18	2	0	20
0740-0800	22	2	0	24
0800-0820	20	2	0	22
0820-0840	17	1	0	18
0840-0900	11	0	0	11

Attachment 2

MJCS Off – Site Parking Permits

Application for Facility Use

City of Malibu Parks & Recreation Department- 23825 Stuart Ranch Road Malibu, CA 90265
Contact: (310) 456-2489 x363 Fax: (310) 456-3356 or (310) 494-4205

APPLICANT INFORMATION

Name of individual or organization (if applicable): Malibu Jewish Center and Synagogue

Name of contact person: Lauren Abramowitz Street Address: 24855 PCH

City/ Zip: Malibu 90265 E-mail address: lauren@mjcs.org

Phone # (310) 456-2178 310-456-0244 Cell # (818) 601-7369 Fax # (310) 456-6578

DATES & TIMES REQUESTED

Date(s): Sept 13, 2015 Day(s) of Week: Sunday Set-Up Start Time: 4pm Event Start Time: 5pm

Event End Time: 9pm Clean Up End Time: 10pm

FACILITY REQUESTED

☐ Malibu Bluffs Park: Major Field ☐ Pony Field ☐ Multi-Purpose Field ☐ Michael Landon Center ☐ Bluffs Bases ☐
Ocean Garden Picnic Tables ☐ Ocean View Picnic Tables ☐ Major Field Picnic Tables ☐ Parking Lot ☐

☐ Malibu High School: Baseball Field ☐ Softball Field ☐ Auxiliary Field ☐ Upper Field ☐
Swimming Pool ☐ Small Gymnasium ☐

■ Malibu City Hall: Zuma Room ☐ Multi-Purpose Room ☐ Senior Center ☐ Backstage Room ☐ Theater ☐ Parking Lot ■ (140)

☐ Legacy Park	☐ Equestrian Park: Picnic Tables ☐ Parking Lot ☐ Arena ☐
☐ Webster Elementary School: Field ☐	☐ Point Dume Elementary School: Picnic Tables ☐ Field ☐
☐ Juan Cabrillo Elementary School: Field ☐	

ACTIVITY INFORMATION

1. Open to the Public Yes ☑ No ☐
2. Admission Charged Yes ☐ No ☑
3. Non-Profit (501c3) Yes ☑ No ☐
4. Food & Beverage Yes ☐ No ☑
5. Attendance: Adults ___ Children ___
6. Amplified Sound Yes ☐ No ☑
7. Tents or Canopies Yes ☐ No ☑
8. Alcoholic Beverages Yes ☐ No ☑
9. Moonbounce Yes ☐ No ☑

Describe Activity/ Program and any items to be brought in (Ex: Special Attractions, Canopies, Tables, Chairs, Caterer etc.)
Parking lot for guest coming to services at the Malibu Jewish Center & Synagogue

An endorsement of Insurance is required prior to the rental. The City of Malibu must be named as additionally insured.

Applicant hereby agrees to hold the City of Malibu, the Santa Monica-Malibu Unified School District, the State of California, the individual members and all officers, agents, and employees of the City, District and State, free and harmless from any loss, damage, liability, cost or expense that may arise during or be caused in any way by such use or occupancy of City or school property. The applicant agrees to furnish such liability or other insurance for the protection of the public, the City, the District, and the State as may be required. I the undersigned, hereby certify that I will be personally responsible on behalf of the applicant for any damages sustained by the park building, furniture, equipment, or grounds accruing through the occupancy or use of said building and/or grounds by applicant. I hereby certify that I have read the rules, regulations, conditions, and terms of this application and that I, and the applicant which I represent, will abide by them and will conform to all applicable provisions of the Constitution and laws of California and to all other directives of the City, District and the State and their authorized agents. I further certify that I, and the organization I represent, will comply with all the provisions of the Americans with Disabilities Act during that period of time when authorized to use the buildings/grounds of the City of Malibu, and/ or the Santa Monica-Malibu Unified School District. I certify that all statements on this application are complete and correct.

Signature _______ Date Sept 13, 2015

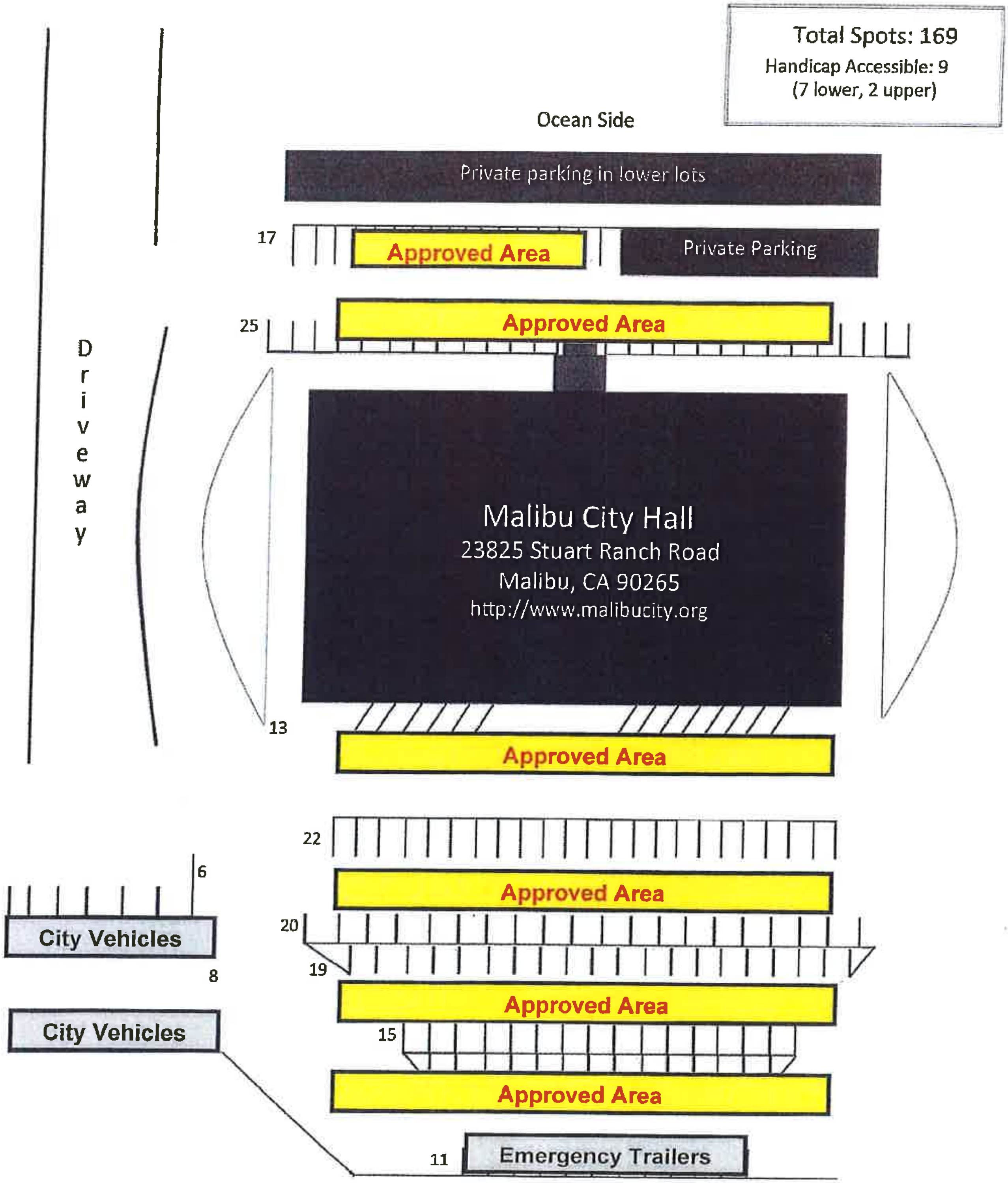
FOR CITY OF MALIBU PARKS & RECREATION USE ONLY

Facility Fee $ 1300 Insurance Fee $ ______ Deposit $ 250 pd · #3323
Staffing Fee $ ______ Alcohol Insurance Fee $ ______
Additional Fee $ ______ Specify ______ TOTAL: $ 1300. pd · #3352

Application Approved By: Director of Parks & Recreation ______ ☑ Approved ☐ Denied
Date 5/19/15 Supervisor ______ Maintenance ______ Facility Supervisor ______

APPROVED

ins - 4/15/16



September 13, 2015, MJCS Services, 4PM-10PM

**Do not park in any other areas other than the designated areas. Spots that are stated as "Private Parking" are not owned by the City and vehicles can be towed from those areas. Please contact 310-317-1364 (Malibu Bluffs Park Office) the day of your rental should you have any questions.

Lauren Abramowitz

From: Lauren Abramowitz
Sent: Friday, May 22, 2015 2:50 PM
To: Maya Bienenfeld
Subject: FW: Invoice for Parking 9.13.15
Attachments: MJCS 9.13.pdf

From: Katie Gallo [mailto:KGallo@malibucity.org]
Sent: Friday, May 22, 2015 2:45 PM
To: Lauren Abramowitz
Subject: Invoice for Parking 9.13.15

Lauren-

Invoice is attached. The only check needed for now to continue to hold the date is the refundable security deposit of $250. There are appx. 140 space available that day. Let me know if you have any questions. Thank you.

Katie Gallo | Recreation Coordinator
City of Malibu
23825 Stuart Ranch Road
Malibu, CA 90265
Phone- 310.456.2489 ext. 363
Fax- 310.494.4205

City of Malibu Parks & Recreation Dept.
23825 Stuart Ranch Rd.
Malibu, CA 90265
Ph: (310) 456-2489 Fax: (310) 494-4205
www.malibucity.org
Email: bafusla@malibucity.org

Sales Receipt

Receipt ID: 75920
Receipt Date: 06/29/2015
Receipt Total: $1300.00
Paid By: Lauren Abramowitz
Registrar: KG
Pay Method: Check# 3352 $1300.00

Primary Phone: (310) 456-2178

Customer
Malibu Jewish Center Synagogue
Lauren Abramowitz
24855 Pacific Coast Highway
Malibu, CA 90265

Season/Year	Number	Item Description	Quantity	Price Ea	Total
		Facility Rental Fee City Hall Parking Lot	1	$1300.00	$1300.00

9.13.15 Malibu City Hall Parking Lot, 4pm-10pm

Receipt Total $1,300.00

Thank you for your payment.

Lauren Abramowitz

From: Katie Gallo <KGallo@malibucity.org>
Sent: Monday, June 29, 2015 2:59 PM
To: Lauren Abramowitz
Subject: Check

Follow Up Flag: Follow up
Flag Status: Flagged

Lauren-

The check was received today. Thank you.

Katie Gallo | Recreation Coordinator
City of Malibu
23825 Stuart Ranch Road
Malibu, CA 90265
Phone- 310.456.2489 ext. 363
Fax- 310.494.4205

City of Malibu

23825 Stuart Ranch Rd. Malibu, California 90265-4804
(310) 456-2489 fax (310) 456-3356

Malibu City Hall

The following is needed for general events:

_____ Permit Application
__X__ Permit Deposit
__X__ Permit Fees
__X__ Facility Insurance*

Parking
Contact: MJCS, Lauren Abramowitz
Date: Sunday, 9/13/15
Place: Malibu City Hall Parking Lot
Time: 4-10pm
Phone: 310-456-2178

To hold the date for your event, the deposit payment and completed permit application must be submitted the City of Malibu Parks and Recreation Department.

FEES:		**TOTAL FEES:**
Sunday, September 13, 2015 Parking Lot	Daily Rate	$1300.00

TOTAL RENTAL FEES: $1300.00

INSURANCE:

Proof of general liability insurance coverage through a private company with an endorsement of insurance naming the City of Malibu as additionally insured is required with a minimum coverage of $1,000,000 per occurrence.

PAYMENT:

Please provide 2 checks.

1. $250.00 refundable security deposit fee
2. $1300.00 facility rental fee

Please make check payable to "City of Malibu"
Send payment to:
City of Malibu
Attn: Facility Rentals
23825 Stuart Ranch Rd
Malibu, CA 90265

STATEMENT OF PROCEEDINGS FOR THE

REGULAR MEETING OF THE BOARD OF SUPERVISORS

OF THE COUNTY OF LOS ANGELES HELD IN ROOM 381B

OF THE KENNETH HAHN HALL OF ADMINISTRATION

500 WEST TEMPLE STREET, LOS ANGELES, CALIFORNIA 90012

Tuesday, September 8, 2015

1:00 PM

7. Recommendation as submitted by Supervisor Kuehl: Waive the $525 permit fee at the County Malibu Civic Center parking lot, excluding the cost of liability insurance, for the Malibu Jewish Center and Synagogue's High Holy Days services, to be held on the following days:

Rosh Hashanah: September 14, 2015 from 8:00 a.m. to 3:00 p.m.; and

Kol Nidre and Yom Kippur: September 22, 2015 from 5:00 p.m. to 10:00 p.m. and September 23, 2015 from 7:30 a.m. to 10:00 p.m. (15-4179)

On motion of Supervisor Kuehl, seconded by Supervisor Antonovich, this item was approved.

Ayes:	4 -	Supervisor Solis, Supervisor Kuehl, Supervisor Knabe and Supervisor Antonovich
Absent:	1 -	Supervisor Ridley-Thomas

Attachments: Motion by Supervisor Kuehl

The foregoing is a fair statement of the proceedings of the regular meeting held September 8, 2015, by the Board of Supervisors of the County of Los Angeles and ex officio the governing body of all other special assessment and taxing districts, agencies and authorities for which said Board so acts.

Patrick Ogawa, Acting Executive
Officer
Executive Officer-Clerk
of the Board of Supervisors

By Patrick Ogawa

Appendix D

Geotechnical Reports

D-1 Preliminary Geotechnical Engineering Report; Addendums No.1, No.2, & No.3

Prepared by: Earth Systems Southern California

September 2017

D-2 Drainage Calculations

Prepared by: Peak Surveys, Inc.

November 2016

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PRELIMINARY GEOLOGIC AND PERCOLATION REPORT

Proposed Advanced On-Site Wastewater Treatment Systems (AOWTS)
APN 4458-032-027
24855 Pacific Coast Highway
Malibu, California
LA-01576-02

Prepared For

DAVID GRAY ARCHITECTS

January 6, 2015

Prepared By

Earth Systems Southern California
2114 East Walnut Street
Pasadena, California 91107

(626) 356-0955
FAX (626) 356-0956

Earth Systems
Southern California

2114 East Walnut Street
Pasadena, California 91107
(626) 356-0955
Fax (626) 356-0956
www.earthsystems.com

January 6, 2015 LA-01576-02

David Gray Architects
C/O Mr. Mark Meyer
527 West 7th Street, Suite 1001
Los Angeles, California 90014

Subject: **Preliminary Geologic and Percolation Report**
Proposed Advanced On-Site Wastewater Treatment Systems (AOWTS)
APN 4458-032-027
24855 Pacific Coast Highway, Malibu, California

Presented herewith is the percolation test data and geologic report for the proposed advanced on-site wastewater treatment system (AOWTS); a design level report will be prepared by others under a separate cover. Earth Systems strives to provide analyses and recommendations in accordance with the applicable standards of care for the geotechnical engineering profession at the time the study is conducted.

The submittal of this report marks the completion of the scope of geotechnical engineering services described in Earth Systems' proposal dated August 24, 2014 and authorized on October 14, 2014. Other services which may be required, such as consultation and plan review, are additional services that will be billed according to the Fee Schedule in effect at the time such services are provided. Budgets for these services, which are dependent upon design and construction schedules, can be provided when requested. Earth Systems appreciates this opportunity to provide professional geotechnical engineering services for this project. If you need clarification of the information contained in this report, or if Earth Systems can be of additional service, please contact the undersigned.

Respectfully submitted,

Earth Systems

Christopher F. Allen, P.G.
Project Geologist

Distribution:
3 – Addressee
1 – Addressee (CD, pdf copy)
1 – Ensitu c/o John Yaroslaski

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January 6, 2015 LA-01576-02

PRELIMINARY GEOLOGIC AND PERCOLATION REPORT
PROPOSED ADVANCED ON-SITE WASTEWATER TREATMENT SYSTEM (OWTS)
APN 4458-032-027
MALIBU JEWISH CENTER
MALIBU, CALIFORNIA

INTRODUCTION

This Preliminary Geologic and Percolation Report has been prepared to provide the information required by the City of Malibu Environmental Health Department for design of the proposed advance on-site wastewater treatment system (OWTS) that will serve the proposed residential development.

This report includes:

1. Descriptions of the field exploration and percolation tests performed.
2. Geologic evaluation of subject area with respect to the proposed AOWTS.

SITE DESCRIPTION

The approximate 4.75-acre site is at located on the north side on Pacific Coast Highway (PCH) in the City of Malibu, Los Angeles County, California. The site is approximately 4,000 feet west of Malibu Canyon Road and approximately 2,000 feet east of Puerco Canyon Road (see Plates I and II).

The site is situated on an east-west trending ridge, which is defined by the cut slope adjacent to Pacific Coast Highway on the south side, and the incised drainage of Puerco Canyon on the north side of the site. On the westerly portion of the site, the subject of this study, there are existing modular classrooms and offices, play yards, and a parking lot. The easterly portion of the site is occupied by a synagogue structure and parking lot, constructed circa 2005. An existing on-site sewage disposal system serves the existing facilities at the site and is located in the existing driveway.

Along the south side of the site, a five- to ten-foot tall cut slope ascends from PCH at an approximate gradient of one and a half horizontal to one vertical (1.5H:1V) gradient to the existing parking lot at an elevation of approximately 165 feet above mean sea level. The gently sloping parking lot extends 60 to 80 feet north to a two-foot to five-foot tall retaining wall. Above and behind the retaining wall are the existing school facilities, at an elevation of 171 feet, with an open field to the east at an elevation of roughly 178 feet. Beyond the school facilities a natural slope descends approximately 35 feet to the Puerco Canyon drainage, with slope gradients ranging from 1H:1V to 4H:1V.

The developed easterly portion of the site has been landscaped with various grasses, trees and shrubs. Native trees and shrubs are located within the Puerco Canyon drainage and surrounding slopes. The above-cited descriptions are intended to be illustrative, and are specifically not intended for use as a legal description of the subject property.

PROJECT DESCRIPTION

Based on discussions with the project AOWTS designer and review of the preliminary plans provided, Earth Systems understands that a new AOWTS system will service the proposed new private school facilities. The proposed system will consist of several new seepage pits and a new septic tank to be located in the existing driveway and parking lot. Existing seepage pits may supplement the new system.

PURPOSE AND SCOPE OF SERVICES

The purpose of Earth Systems' services was to provide a Geologic and Percolation Report for the express purpose of providing information to be used for design of an onsite wastewater treatment system OWTS based on the site geologic characteristics and the percolation characteristics of the subsurface earth materials. Earth Systems' scope of services included the following:

A. The excavation and geologic logging of twelve (12), 24-inch diameter bucket auger percolation and groundwater test borings to evaluate and describe the subsurface geologic conditions and to check for the indications of groundwater at locations selected by the environmental consultant.
B. Percolation testing of twelve (12), 24-inch diameter bucket auger test borings.
C. Geologic evaluation of the subject site and surrounding properties with respect to the proposed AOWTS in conformance with the requirement set for by the City of Malibu Environmental Sustainability Department.
D. A summary of findings and recommendations in this written report.

Contained in this report are:

A. Descriptions of the field exploration and percolation tests performed.
B. Geologic evaluation of subject area with respect to the proposed AOWTS.
C. Evaluation of percolation rate calculations.
D. Boring logs and analyses in support of the OWTS design–level site plan.

FIELD EXPLORATION

The field exploration for this study was conducted in October and November of 2014. Field exploration consisted of drilling twelve (12) bucket-auger test borings to depths of approximately

27 feet (B1 through B11) and 50 feet (B12) below existing grade. The borings were drilled and logged, boring B12 was backfilled and sealed at least 10 feet above the groundwater level, then each boring was gravel-packed for infiltration testing.
The location and dimensions of the borings tested was based on plans provided by Ensitu Engineering. The approximate location of the test borings, as indicated on the attached Site Geologic Map (Plate III), were determined by sightings and tape measuring from existing surrounding improvements. The locations of the borings should be considered accurate only to the degree implied by the measurement method used.

The logs of borings are included in Appendix A for reference. The logs of test borings represent Earth Systems' interpretation of the field logs prepared for each boring by Earth Systems' staff. While the noted stratification lines represent approximate boundaries between soil types, the actual transitions may be gradual.

SUBSURFACE CONDITIONS

Artificial fill (af) soils were encountered in all of the test pits excavated during this current investigation. The depth of fill observed ranged from approximately 1.0 to 1.5 feet around the plateau at the site's center. These fill soils were found to consist predominantly of moderately compacted silty to clayey medium to coarse grained sand.

Terrace (Qt) profile is comprised of ancient beach deposits with some continental deposits. These native soils were found to consist predominantly of fine to medium sand with cobbles that became more fine grained and silty with depth (sandy loam based on the USDA texture classification). At the basal contact, the material became heavy with rounded cobbles and the encompassing sandy matrix was extremely silty.

Monterey Formation Bedrock (Tm) was encountered beneath the terrace, between 10.5 and 11.5 feet deep in all test borings. Bedrock consisted of thinly interbedded siliceous shale, sandstone and siltstone of the Monterey Formation. The bedding observed in exploratory excavations on the site dips relatively uniformly at moderate to steep angles toward the north, similar to that reported by previous studies for the site.

The logs of the test borings by Earth Systems are presented in Appendix A and contain more detailed descriptions of the soils and bedrock encountered.

GROUNDWATER

Groundwater in the form of minor seeps was encountered at a depth of approximately 47 feet below existing site grade, in test boring B12. Observations of bedrock texture in the deep exploratory borings does not suggest that the historic shallowest groundwater beneath the site is greater than that observed in boring B12. The lack of distinctive redoximorphic features above and below the observed minor water seeps suggests that the seasonal high groundwater level is no shallower than this. Fluctuations in groundwater levels may occur due to variations in rainfall, regional climate, and other factors.

PERCOLATION TEST PROCEDURES AND RESULTS

The percolation tests were conducted in conformance with City of Malibu Seepage Pit Percolation Testing Policy and Los Angeles County Department of Public Health guidelines. As described above, following downhole logging by the undersigned Engineering Geologist, boring B12 was backfilled to at least ten (10) feet above potential or observed groundwater level and provided with a bentonite seal.

The borings were pre-soaked by filling with clean water on October 29, 2014 for borings B7 through B12 and on November 2, 2014 for borings B1 through B6. The following day a metered percolation test was performed in each boring. The borings were filled with water by means of a 1.5-inch diameter hose connected to a domestic water main. In approximately one-hour intervals the amount of drop in water level, volume of water added to the borehole and the time was recorded. The procedure was repeated for a period of approximately eight hours. The day following the percolation test, the water levels in each boring were recorded.

Appendix B contains detailed results of the borehole and pit percolation tests including water meter calibration certificate, and percolation test calculations. Design depths and percolation rates for seepage pits are as follows:

	Gallons/Day					
Boring #	4-foot pit	5-foot pit	6-foot pit	Total Depth (feet)	Cap Depth (feet)	Effective Depth (feet)
1	526	658	789	37	7	30
2	626	783	939	37	7	30
3	410	513	615	37	7	30
4	726	908	1089	37	7	30
5	544	680	816	37	7	30
6	726	908	1089	37	7	30
7	552	690	828	37	7	30
8	804	1005	1206	37	7	30
9	536	670	804	37	7	30
10	774	968	1161	37	7	30
11	526	658	789	37	7	30
12	970	1213	1455	37	7	30

CONCLUSIONS AND RECOMMENDATIONS

Seepage Pit Disposal

Based on the results of the observations performed in the borings and observations made during the geotechnical site investigation, it is Earth Systems opinion that an alternative on-site wastewater treatment system (AOWTS) with seepage pits is feasible at the site. In conformance with the City of Malibu Environmental Sustainability Department, the seepage pits should be located at the exact test location.

OWTS Layout and Setbacks

The proposed OWTS components should be located so as to comply with all of the restrictions of the County of Los Angeles Plumbing Code as adopted by the City of Malibu (City of Malibu Plumbing Code §15.12.050). All system components must be situated so as to meet the setback requirements of Table H: 1.7.

Cap Depth Statement

The upper portion of the seepage pits, to a depth of at least seven feet below ground surface, should be "capped" or lined with solid (blank) casing for each proposed present and future seepage pit. The recommended cap depth is referenced to existing grade at the time the boreholes were logged and tested for percolation capacity. It is our opinion that this depth allows infiltration in terrace deposits and bedrock that will not conduct effluent laterally or allow mounding and side slope breakout.

Slope Stability

Slope stability analyses were included in the above referenced soils report (Earth Systems, 7/9/2014) which incorporated the anticipated effluent of the proposed seepage pits at the presently proposed location. The resultant safety factors are in excess of 1.5 for static condition and 1.1 for pseudostatic conditions.

Anticipated Path of Effluent

The attached Geologic Cross Section (Plate IV) depicts the location of the proposed and 100% expansion pits on the slope and anticipated path of effluent. In general the observed Trancas formation coarsens downward. It is our opinion that the geologic data observed in the logged borings supports our conclusions regarding the effects of effluent on groundwater levels under the site, the potential for mounding of groundwater, and the potential for effluent to daylight on the ground surface. The depicted effluent path is anticipated to be the result of geologic structure and stratigraphy. Infiltration within the tested section of seepage pit test borings is primarily downward with an along bedding components, that dip at moderate angle to the north. Accordingly, we anticipate the effluent path will be asymmetrically displaced toward the north.

Groundwater Mounding Potential

No geologic structure was observed that might suggest possible mounding of effluent or impoundment of infiltrated groundwater. No water remained in the borings 24 hours following the initiation of the meter tests, with the exception of approximately five (5) feet in boring B7. As noted above, the Trancas formation coarsens with depth. We do not anticipate groundwater mounding to occur on this site. Specifically, lithologic changes resulting from the regressive deposits cause hydraulic conductivity to decrease upward.

Domestic Water Supply Wells

No permitted wells are known to exist within 250 feet of the proposed seepage pits. However Earth Systems understands that a well is located on the adjacent property to the east, no records are available for that well. Based on communications with our clients representatives that well is not used for potable water. The Los Angeles County Waterworks District No. 29 supplies domestic water in the project area.

City of Malibu Section 111 Statement

In accordance with the City of Malibu Guidelines for the Preparation of Engineering Geology and Geotechnical Engineering Reports §5.7- Mandatory Building Code Statements, Earth Systems provides the following findings. Based on the findings summarized in this report, and provided the recommendations in this report are incorporated into the project, it is Earth Systems' opinion that the proposed development on the subject property will not be subject to a geologic hazard from landslides, settlement, or slippage beyond that described herein. It is also Earth Systems' opinion that the proposed structures and associated grading will not adversely affect the geologic stability of the site or adjacent properties provided our recommendations are followed. Test findings and statements of professional opinions do not constitute a guarantee or warranty, expressed or implied.

CLIENT OPTIONAL SERVICES

This report was based on the assumption that an adequate program of client consultation, construction monitoring, and testing will be performed during the final design and construction phases to check conformance with the recommendations of this report. Maintaining Earth Systems as the geotechnical engineering consultant from beginning to end of this project will help provide continuity of services. The recommended services include, but are not necessarily limited to, the following:

a. Consultation as required during the final design stages of the project.
b. Review of grading and/or building plans.
c. Observation and testing during site preparation, grading, placement of engineered fill, and backfill of utility trenches.
d. Consultation as required during construction.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

The conclusions and recommendations submitted in this report relative to the proposed private school building are based, in part, upon the data obtained from site observations during the field exploration operations, and past experience. The nature and extent of variations between the borings may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

In the event of any change in the assumed nature or design of the proposed project as planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing. This report is issued with the understanding that it is the responsibility of David Gray Architects to insure that the information and recommendations contained in this report are called to the attention of the architects and engineers for the project and incorporated into the plan. It is also the responsibility of David Gray Architects, and its representatives, to insure that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

As the geotechnical engineers for this project, Earth Systems strives to provide its services in accordance with generally accepted geotechnical engineering practices in this community at this time. No warranty or guarantee is expressed or implied. This report was prepared for the exclusive use of David Gray Architects for the purposes stated in this document for the referenced project only. No third party may use or rely on this report without the express written authorization of Earth Systems for such use or reliance.

It is recommended that Earth Systems be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design specifications. If Earth Systems is not accorded the privilege of making this recommended review, it can assume no responsibility for misinterpretation of the recommendations.

The scope of current services for this report did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around the site.

The statements contained in this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the conclusions of this report may be invalidated, wholly or partially, by changes outside of Earth Systems' control, and should therefore be reviewed after one year.

CLOSURE

Earth Systems trusts this report is sufficient at this time and meets your current needs. Earth Systems appreciates this opportunity to provide professional geotechnical engineering services for this project. If you have any questions regarding the information contained in this report, or if you require additional geotechnical engineering services, please contact the undersigned.

Respectfully submitted,

Earth Systems

Sara C. Denise

Sara Denise
Staff Geologist

PROFESSIONAL GEOLOGIST
CHRISTOPHER FRASER ALLEN
No. 9085
EXP 8/15
STATE OF CALIFORNIA

Christopher F. Allen, P.G.
Project Geologist

For
William A. LaChapelle, C.E.G.
Project Engineering Geologist

END OF TEXT

REFERENCES

PLATES

APPENDICES

REFERENCES

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PLATES

Source: USGS, Malibu Beach 7.5 Minute Quadrangle, dated 2012, Photorevised 2010.

0 ft. ~ 1,000 ft. ~ 2,000 ft.

N

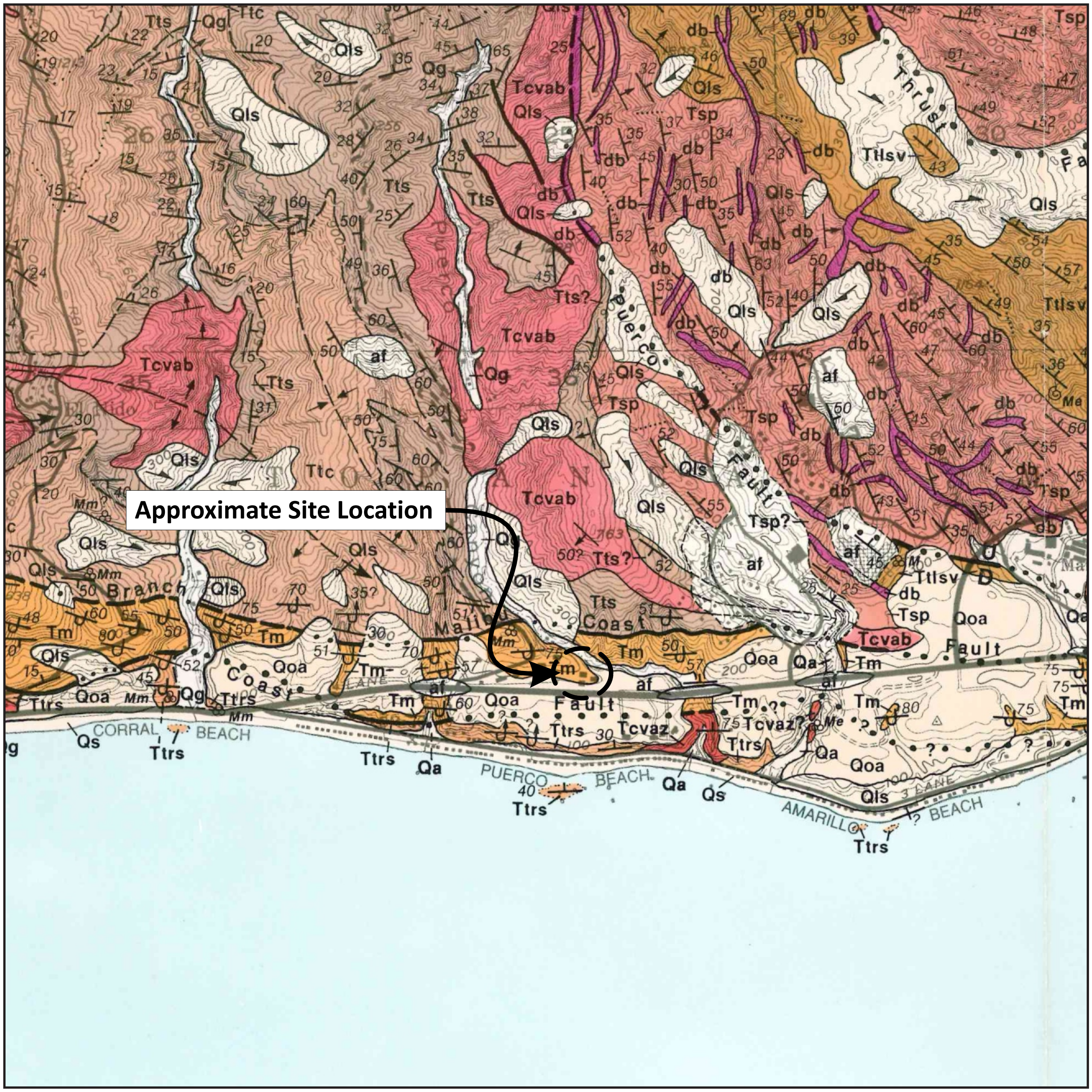
Plate I

SITE LOCATION MAP

PROPOSED OWTS
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

1/6/2015	LA-01576-02



Source: Dibblee Geologic Maps, Malibu Beach Quadrangle, DF-47, 1993.

LEGEND

Quaternary

af Artificial cut and fill
Qs Beach Sand
Qg Gravel and Sand
Qa Alluvium
Qls Landslide
Qoa Old Alluvium

Miocene-Tertiary

Tm Monterey Formation - shale
Ttrs Trancas Formation - Sandstone
Ttc Middle Topanga Formation - Clay shale
Tts Middle Topanga Formation - Sandstone
Tcvab Conejo Volcanics - Andesitic Breccia
Tcvaz Conejo Volcanics - Andesitic Breccia
db diabase or basalt
Ttlsv Lower Topanga Formation - Sandstone
Tsp Sespe Formation - Sandstone

Syncline

Anticline

Geologic contact

Fault

25 Bedding Attitude

20 Approximate Bedding

20 Overturned Bedding

20 Foliation

N

0 ft. ~ 1,000 ft. ~ 2,000 ft.

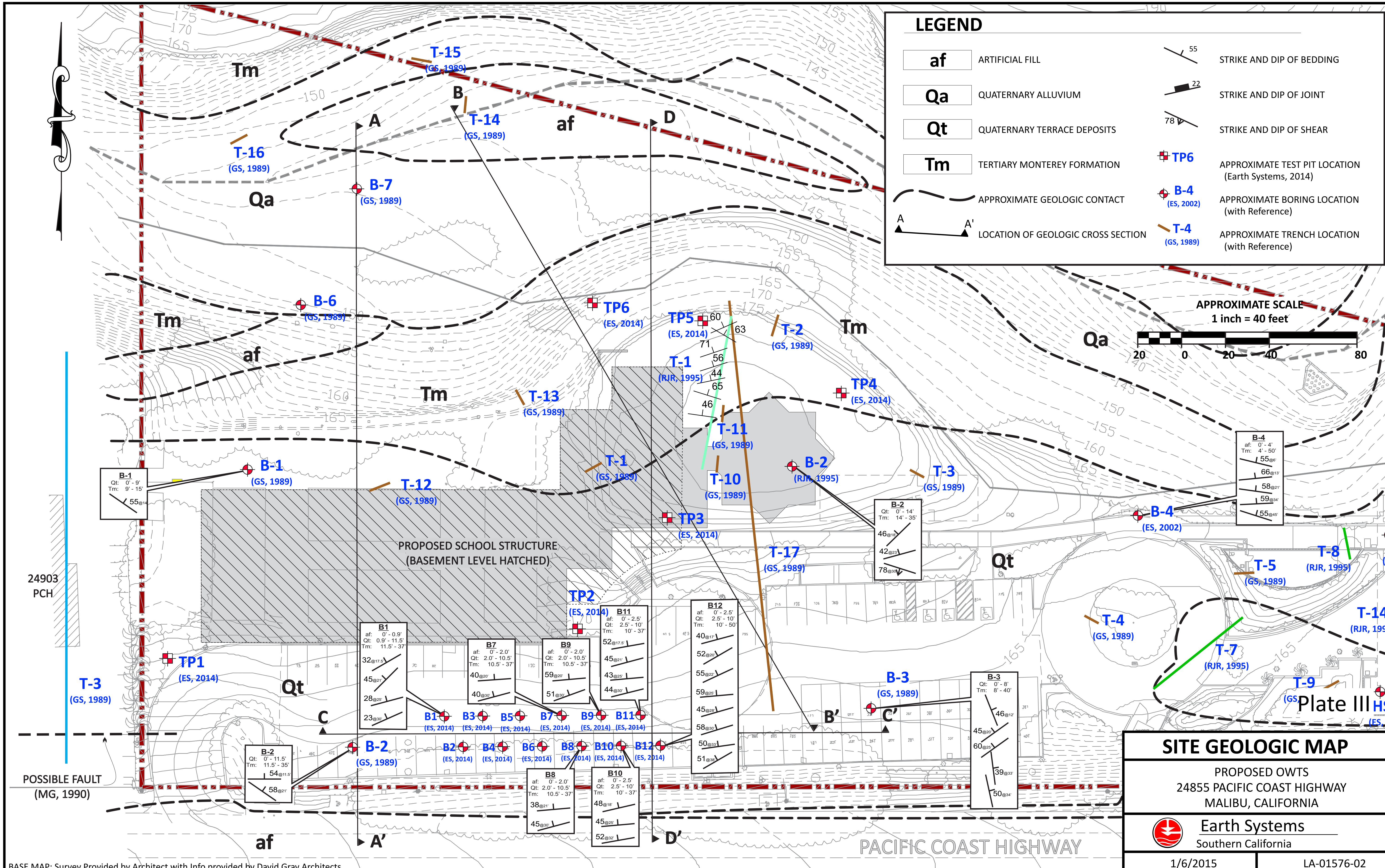
Plate II

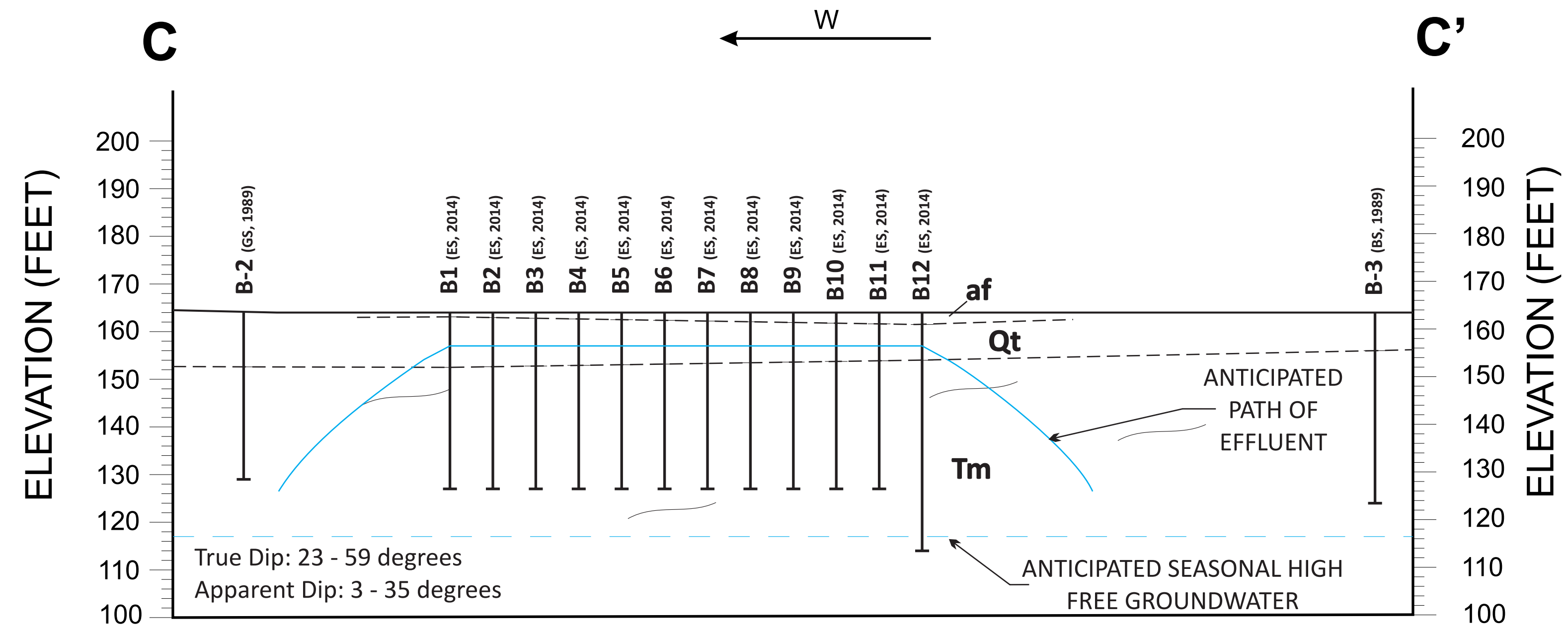
REGIONAL GEOLOGIC MAP

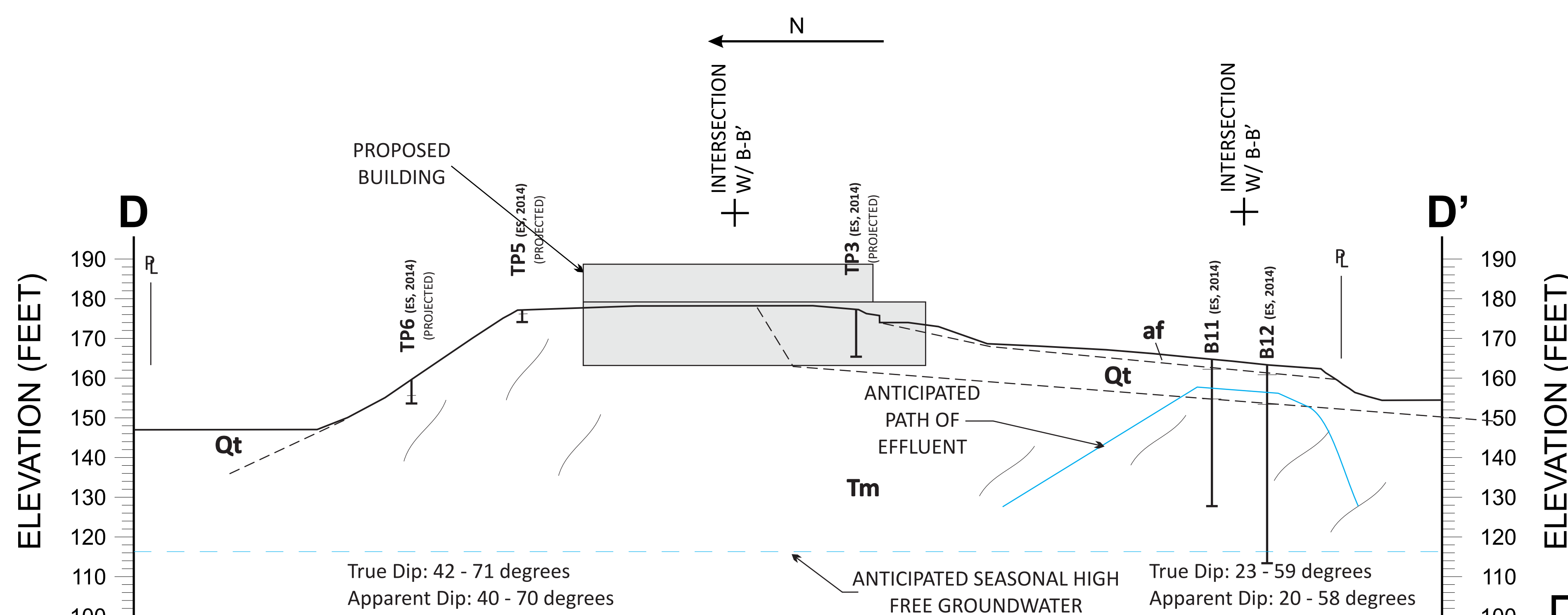
PROPOSED OWTS
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

1/6/2015	LA-01576-02


LEGEND
af ARTIFICIAL FILL
Qa QUATERNARY ALLUVIUM
Qt QUATERNARY TERRACE DEPOSITS
Tm TERTIARY MONTEREY FORMATION
APPROXIMATE GEOLOGIC CONTACT
A A' LOCATION OF GEOLOGIC CROSS SECTION
55 STRIKE AND DIP OF BEDDING
22 STRIKE AND DIP OF JOINT
78 STRIKE AND DIP OF SHEAR
TP6 APPROXIMATE TEST PIT LOCATION (Earth Systems, 2014)
B-4 (ES, 2002) APPROXIMATE BORING LOCATION (with Reference)
T-4 (GS, 1989) APPROXIMATE TRENCH LOCATION (with Reference)
APPROXIMATE SCALE
1 inch = 40 feet
20 0 20 40 80
PROPOSED SCHOOL STRUCTURE
(BASEMENT LEVEL HATCHED)
24903
PCH
POSSIBLE FAULT
(MG, 1990)
PACIFIC COAST HIGHWAY
Plate III
SITE GEOLOGIC MAP
PROPOSED OWTS
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA
Earth Systems
Southern California
1/6/2015
LA-01576-02
BASE MAP: Survey Provided by Architect with Info provided by David Gray Architects





SCALE
1 in = 40 ft
(1:360)

Plate IV

GEOLOGIC CROSS SECTIONS

PROPOSED OWTS
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

1/6/2015	LA-01576-02

APPENDIX A

Logs of Test Borings

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B1 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S – N)	Attitudes	DESCRIPTIONS
0							0 - 0.9ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	0.9 - 11.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS FORESET BEDDING N80W/17NE BOTTOMSET BEDDING: N60W/6SW	Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15						BEDDING N60E/32NW	11.5 - 37ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard.
20						BEDDING N45E/45NW	Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
25						BEDDING N75E/28NW	Thinly interbedded resistant black siliceous shale and yellow to orange siltstone.
							Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
30						BEDDING N66E/23NW	Resistant concretionary siltstone bed.
35							Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
							Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/27/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B2 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S / N)	Attitudes	DESCRIPTIONS
0							0 - 1.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.0 - 11.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15							11.5 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistant black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
20							
25							
30							
35							
40							DOWNHOLE LOGGED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

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Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B3 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log S N	Attitudes	DESCRIPTIONS

0 5 10 15 20 25 30 35 40

0 - 1.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)

1.0 - 11.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)**
Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.

Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.

11.5 - 37ft **- BEDROCK - Monterey Formation (Tm)**
Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard.

Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.

Thinly interbedded resistant black siliceous shale and yellow to orange siltstone.

Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".

Resistant concretionary siltstone bed.

Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.

Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.

DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET.
NO GROUNDWATER.
NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/27/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B4 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 1.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.5 - 11.0ft - **Composite Coastal Terrace sequence (Qt)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser/depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15 20 25 30 35							11.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistant black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

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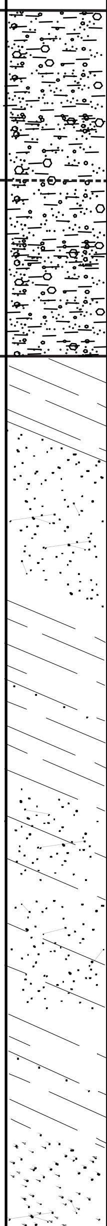
Drilling Date: 10/28/14
Drilling Method: Lo-Drill Auger
Hole Diameter: 24 inch
Logger: BL

Kelly Bar Weights

Boring Number: B5
Project Name: 27740 Pacific Coast Hwy, Malibu, CA
Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 1.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.5 - 11.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15 20 25 30 35							11.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistent black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½ inch. Resistant concretionary siltstone bed. Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING



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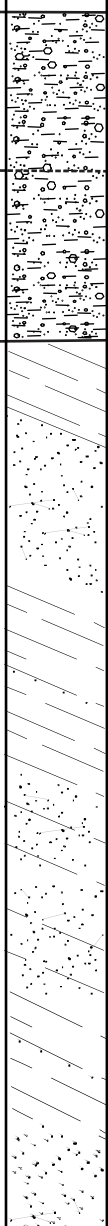
Drilling Date: 10/27/14
Drilling Method: Lo-Drill Auger
Hole Diameter: 24 inch
Logger: BL

Kelly Bar Weights

Boring Number: B6
Project Name: 27740 Pacific Coast Hwy, Malibu, CA
Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log S N	Attitudes	DESCRIPTIONS
0							0 - 1.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.5 - 11.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15–35							11.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistent black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

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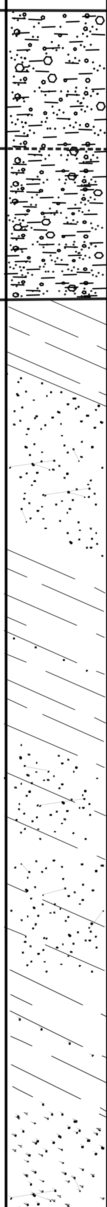
Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B7 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S – N)	Attitudes	DESCRIPTIONS
0							0 - 2.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.0 - 10.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15–20						BEDDING N86W/40NE	10.5 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
25							Thinly interbedded resistent black siliceous shale Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
30						BEDDING N75E/40NW	Resistant concretionary siltstone bed. Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
35							Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

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Drilling Date: 10/27/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B8 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log S N	Attitudes	DESCRIPTIONS
0							0 - 2.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.0 - 10.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS BASAL CONTACT: N80W/8S	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15							**10.5 - 37.0ft - BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard.
20						BEDDING N85E/38NW	Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
25							Resistant concretionary shale bed. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
30						BEDDING N75E/45NW	Dark grayish brown, shale interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
35							Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SHALE

Earth Systems
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Drilling Date: 10/28/14
Drilling Method: Lo-Drill Auger
Hole Diameter: 24 inch
Logger: BL

Kelly Bar Weights

Boring Number: B9
Project Name: 27740 Pacific Coast Hwy, Malibu, CA
Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 2.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.0 - 10.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15							10.5 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some weak orange oxidation on bedding surfaces, moist, hard.
20						BEDDING N85E/59NW	Light gray thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous interbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
25							Thinly interbedded resistent black siliceous shale and yellow to orange siltstone.
30						BEDDING N60E/51NW	Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
							Resistant concretionary siltstone bed.
35							Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
							Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							

DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET.
NO GROUNDWATER.
NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SHALE

Earth Systems
Southern California

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Drilling Date: 10/27/14
Drilling Method: Lo-Drill Auger
Hole Diameter: 24 inch
Logger: BL

Kelly Bar Weights

Boring Number: B10
Project Name: 27740 Pacific Coast Hwy, Malibu, CA
Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 2.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.5 - 10.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15						BEDDING N77E/48NW	10.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard, micaceous with abundant diatoms and broken foram fragments.
20							Thinly interbedded resistent black siliceous shale and yellow to orange siltstone.
25						BEDDING N85E/45NW	Gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
30							Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
35						BEDDING N80E/52NW	Resistant concretionary siltstone bed.
							Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE

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Southern California

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Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B11 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 2.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.5 - 10.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS BASAL CONTACT: N80W/7SW	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15						BEDDING N80E/52NW	10.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard.
20						BEDDING N75E/45NW	Gray thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
25						BEDDING N85E/43NW	Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
30						BEDDING N76E/44NW	Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
35							.
							Resistant dark to light gray thinly interbedded diatomaceous siltstone and black siliceous shale, closely fractured, well indurated, with thin weak irridescent MnO stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE

Earth Systems
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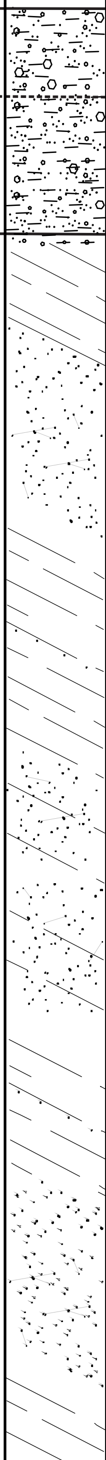
Drilling Date: 10/27/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B12 Project Name: 24855 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0.3' Asphaltic Concrete(A/C) pavement on 0.6' crushed miscellaneous base(CMB) over 1.5 ft - **ARTIFICIAL FILL (af)** - dark yellowish brown (10yr, 3/4 - moist) Clayey fine SAND, moist, moderately dense with suspended gravel & construction debris (broken plaster & concrete).
5						CONTINENTAL SEDIMENTS	2.5 - 10.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark gray Clayey SAND randomly oriented angular fragments to 3/4" platy diatomaceous siltstone and tan silty fine sandstone in a matrix of tan silt clay loam, slightly moist, poorly consolidated, sticky, plastic, grayish brown. Smooth, wavy transitional basal contact over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments on pore faces.
10						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, scattered angular sandstone, siltstone and predominantly shale gravel and cobbles to 8" longest dimension, slightly sticky, slightly plastic, gritty; individual clasts have weak clay coatings, slightly porous with fine tubular porosity and thin brown (10yr, 4/3 - moist) near horizontal fragipans, clay films coating and bridging individual grains; calcareous filaments on pores faces; weakly bedded; grades coarser with depth massive
15						BEDDING N75E/40NW	10.0 - 50ft - **BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard.
20						BEDDING N60E/52NW BEDDING N65E/55NW	Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds.
25						BEDDING N85E/59NW	Thinly interbedded resistant dark siliceous shale and yellowish brown siltstone.
30						BEDDING N74E/45NW BEDDING N73E/58NW	Tan and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces forms oxidation halos in ½".
							Resistant concretionary siltstone bed.
35						BEDDING N82E/50NW	Dark gray thinly interbedded diatomaceous siltstone, widely jointed, smooth massive rock, well indurated, weak organic stain bedding and joint faces. Parts easily on platy bedding surfaces, very low density, translucent when wet, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
40						BEDDING N60E/51NW	Grayish brown, fine sandstone interbedded with diatomaceous siltstone and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, weakly MnO stained iridescent bluish black joint faces. Seepage at bottom of boring stabilized at 47-feet
45							
50							DOWNHOLE LOGGED TO TOTAL DEPTH OF 50 FEET. GROUNDWATER AT 47'; BACKFILLED & SEALED TO 37'. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 15-25 % OF THE LOGGED BORING



APPENDIX B

Summary of Percolation Test Data and Calculations

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B1
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet

Presoak Date:	11/2/2014	at	8:00		
Test Date:	11/3/2014	start at	8:00	end at	15:00
Third Day:	11/4/2014	at	8:00		

Depth to Cap:	7	feet below ground surface
Effective Depth:	30	feet
Calculated Volume:	94.25	cf
Calculated Area:	188.50	sf

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:00	37.00
Start of Test	11/3/2014	8:00	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 263 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 263 gallons

Percolation rate: 1.4 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	526
5 feet	37	658
6 feet	37	789

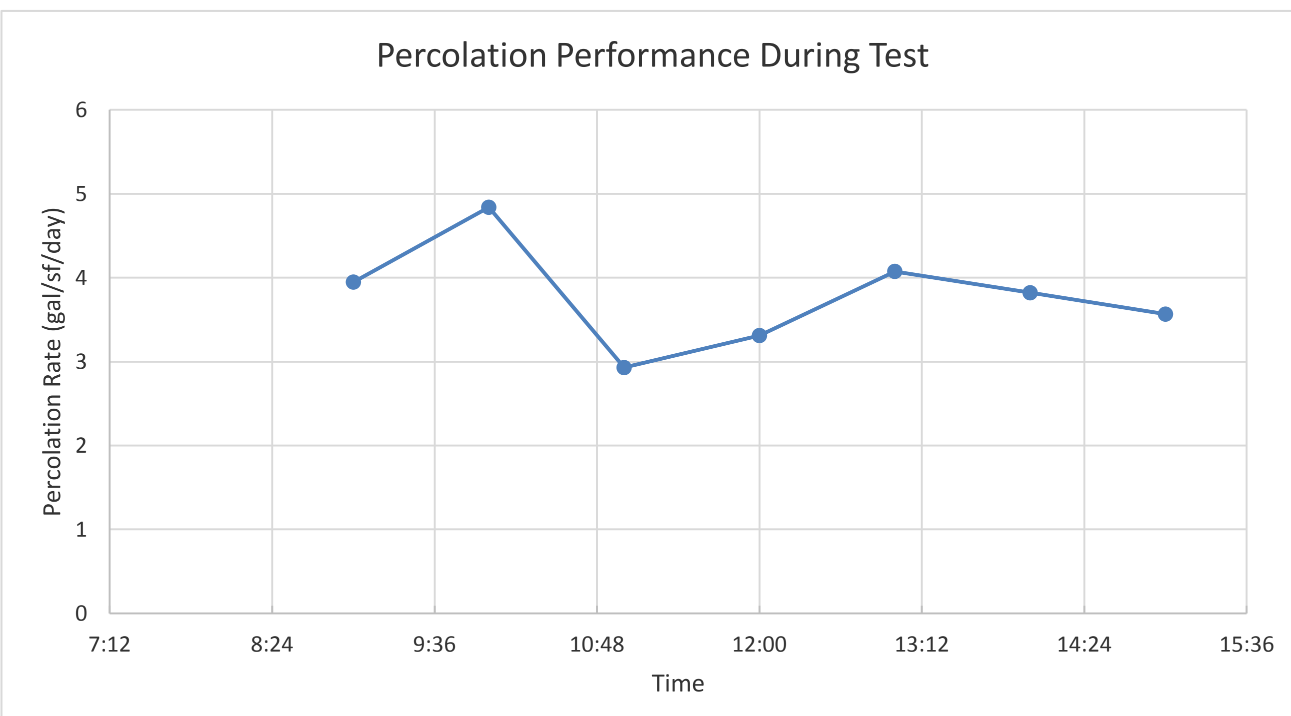
BORING #: B1

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B1
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81470	81525	8:00		55	
81888	81919	9:00	1:00	31	3.95
82153	82191	10:00	1:00	38	4.84
82372	82395	11:00	1:00	23	2.93
82560	82586	12:00	1:00	26	3.31
82744	82776	13:00	1:00	32	4.07
82920	82950	14:00	1:00	30	3.82
83093	83121	15:00	1:00	28	3.57

Total Volume: 263 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B2
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	11/2/2014	at	8:00			
Test Date:	11/3/2014	start at	8:08	end at	15:08	
Third Day:	11/4/2014	at	8:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:08	37.00
Start of Test	11/3/2014	8:08	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 313 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 313 gallons

Percolation rate: 1.7 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	626
5 feet	37	783
6 feet	37	939

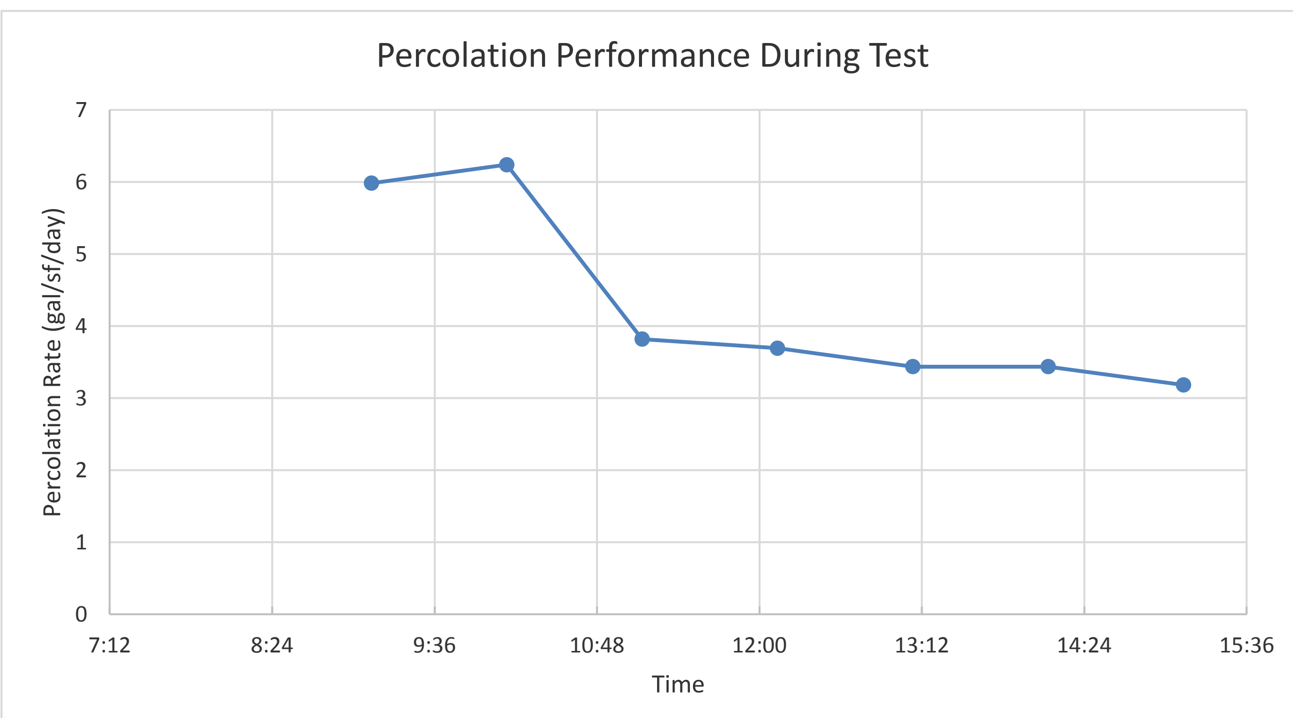
BORING #: B2

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B2
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81525	81604	8:08		79	
81919	81966	9:08	1:00	47	5.98
82191	82240	10:08	1:00	49	6.24
82395	82425	11:08	1:00	30	3.82
82586	82615	12:08	1:00	29	3.69
82776	82803	13:08	1:00	27	3.44
82950	82977	14:08	1:00	27	3.44
83121	83146	15:08	1:00	25	3.18

Total Volume: 313 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B3
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet		Radius of Hole:	1	feet
Presoak Date:	11/2/2014	at	8:00			
Test Date:	11/3/2014	start at	8:16	end at	15:16	
Third Day:	11/4/2014	at	8:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:16	37.00
Start of Test	11/3/2014	8:16	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 205 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 205 gallons

Percolation rate: 1.1 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	410
5 feet	37	513
6 feet	37	615

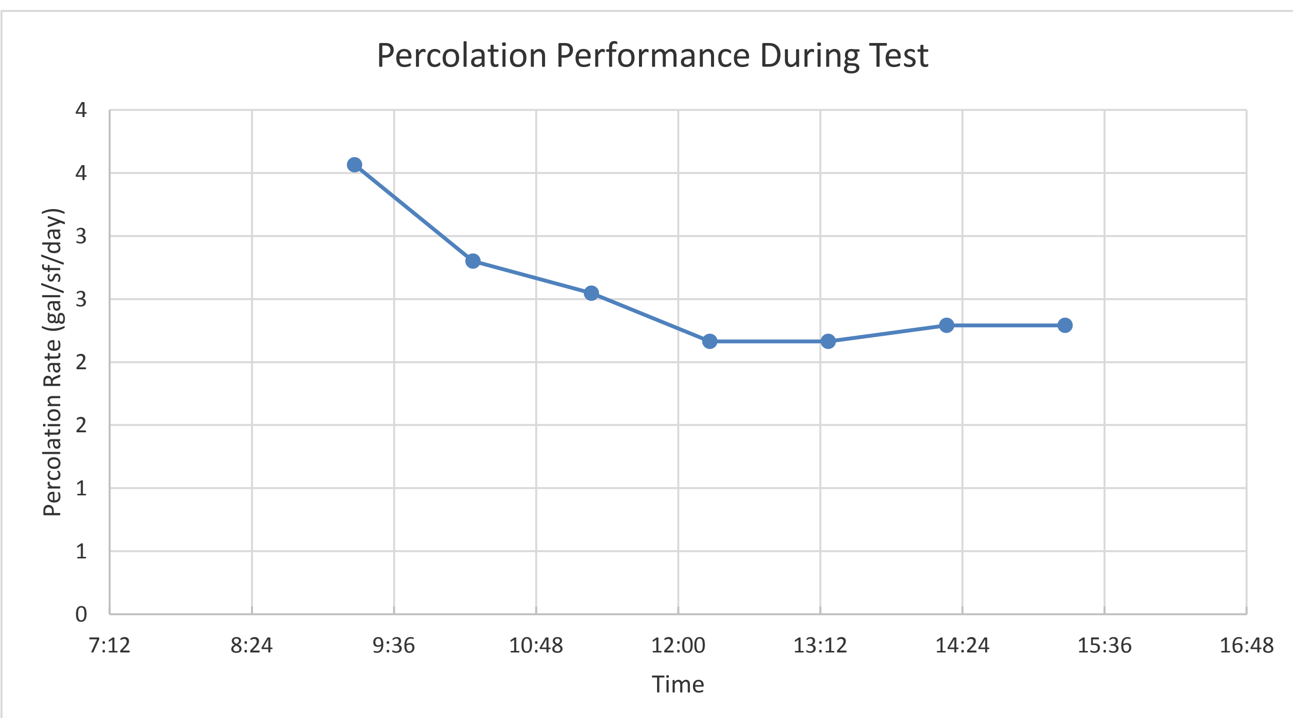
BORING #: B3

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B3
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81604	81669	8:16		65	
81966	81994	9:16	1:00	28	3.57
82240	82262	10:16	1:00	22	2.80
82425	82445	11:16	1:00	20	2.55
82615	82632	12:16	1:00	17	2.16
82803	82820	13:16	1:00	17	2.16
82977	82995	14:16	1:00	18	2.29
83146	83164	15:16	1:00	18	2.29

Total Volume: 205 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B4
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet

Presoak Date:	11/2/2014	at	8:00		
Test Date:	11/3/2014	start at	8:24	end at	15:24
Third Day:	11/4/2014	at	8:00		

Depth to Cap:	7	feet below ground surface
Effective Depth:	30	feet
Calculated Volume:	94.25	cf
Calculated Area:	188.50	sf

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:24	37.00
Start of Test	11/3/2014	8:24	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 363 gallons

CALCULATIONS

Volume of Water Remaining:	0.0	cubic feet	0	gallons
Gravel Pack Correction:	0.375			
Total Water Percolated (volume metered-volume remaining):			363	gallons
Percolation rate:	1.9	gal/sf/day		

pit diameter	pit depth	gallons/day
4 feet	37	726
5 feet	37	908
6 feet	37	1089

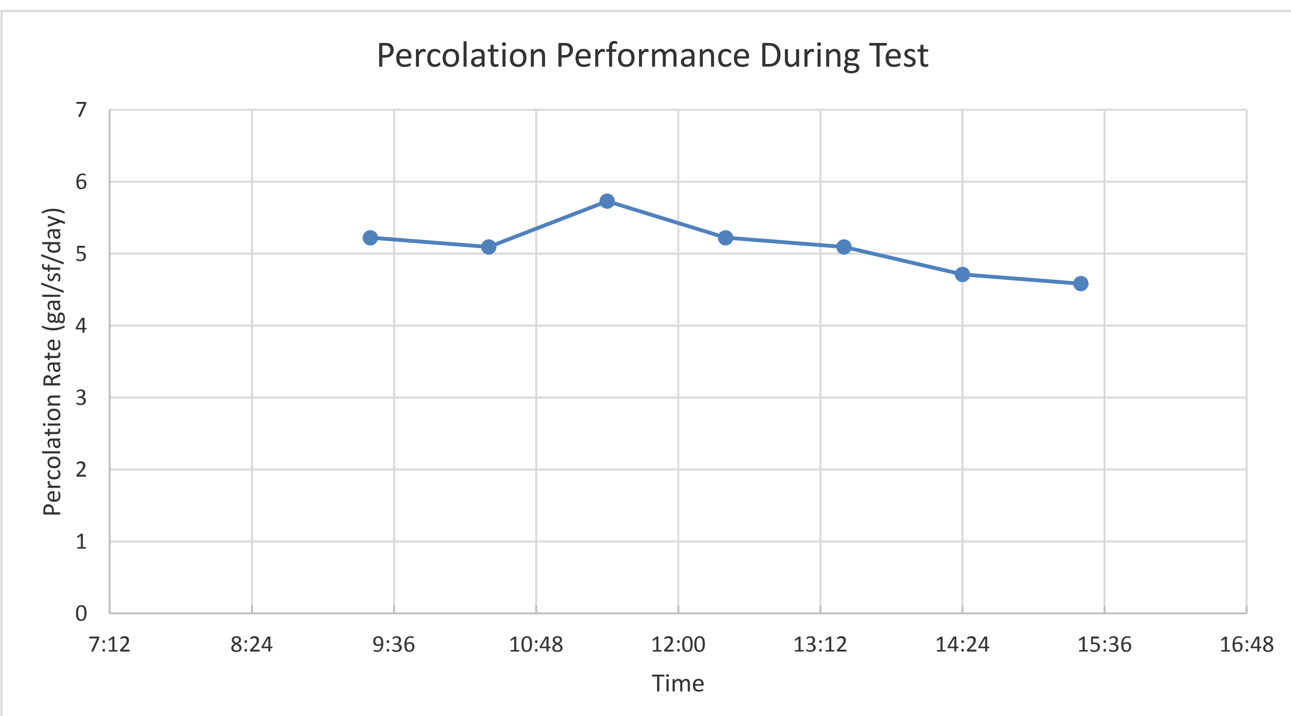
BORING #: B4

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B4
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81669	81752	8:24		83	
81994	82035	9:24	1:00	41	5.22
82262	82302	10:24	1:00	40	5.09
82445	82490	11:24	1:00	45	5.73
82632	82673	12:24	1:00	41	5.22
82820	82860	13:24	1:00	40	5.09
82995	83032	14:24	1:00	37	4.71
83164	83200	15:24	1:00	36	4.58

Total Volume: 363 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B5
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	11/2/2014	at	8:00			
Test Date:	11/3/2014	start at	8:32	end at	3:32	
Third Day:	11/4/2014	at	8:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:32	37.00
Start of Test	11/3/2014	8:32	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 272 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 272 gallons

Percolation rate: 1.4 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	544
5 feet	37	680
6 feet	37	816

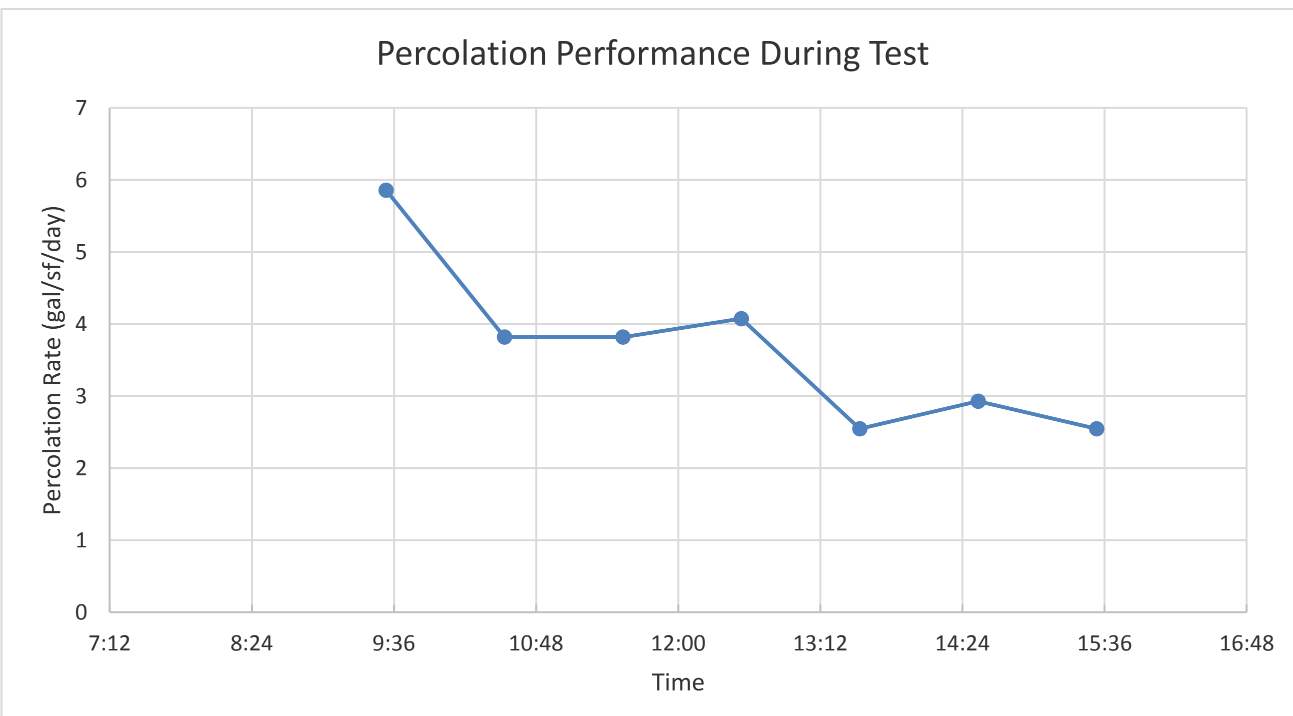
BORING #: B5

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B5
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81752	81823	8:32		71	
82035	82081	9:32	1:00	46	5.86
82302	82332	10:32	1:00	30	3.82
82490	82520	11:32	1:00	30	3.82
82673	82705	12:32	1:00	32	4.07
82860	82880	13:32	1:00	20	2.55
83032	83055	14:32	1:00	23	2.93
83200	83220	15:32	1:00	20	2.55

Total Volume: 272 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B6
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet

Presoak Date:	11/2/2014	at	8:00		
Test Date:	11/3/2014	start at	8:40	end at	3:40
Third Day:	11/4/2014	at	8:00		

Depth to Cap: 7 feet below ground surface

Effective Depth: 30 feet

Calculated Volume: 94.25 cf

Calculated Area: 188.50 sf

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.0
End of Presoak	11/3/2014	8:40	37.0
Start of Test	11/3/2014	8:40	7.0
End of Test	11/4/2014	8:00	37.0

Total volume of water metered during test: 363 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 363 gallons

Percolation rate: 1.9 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	726
5 feet	37	908
6 feet	37	1089

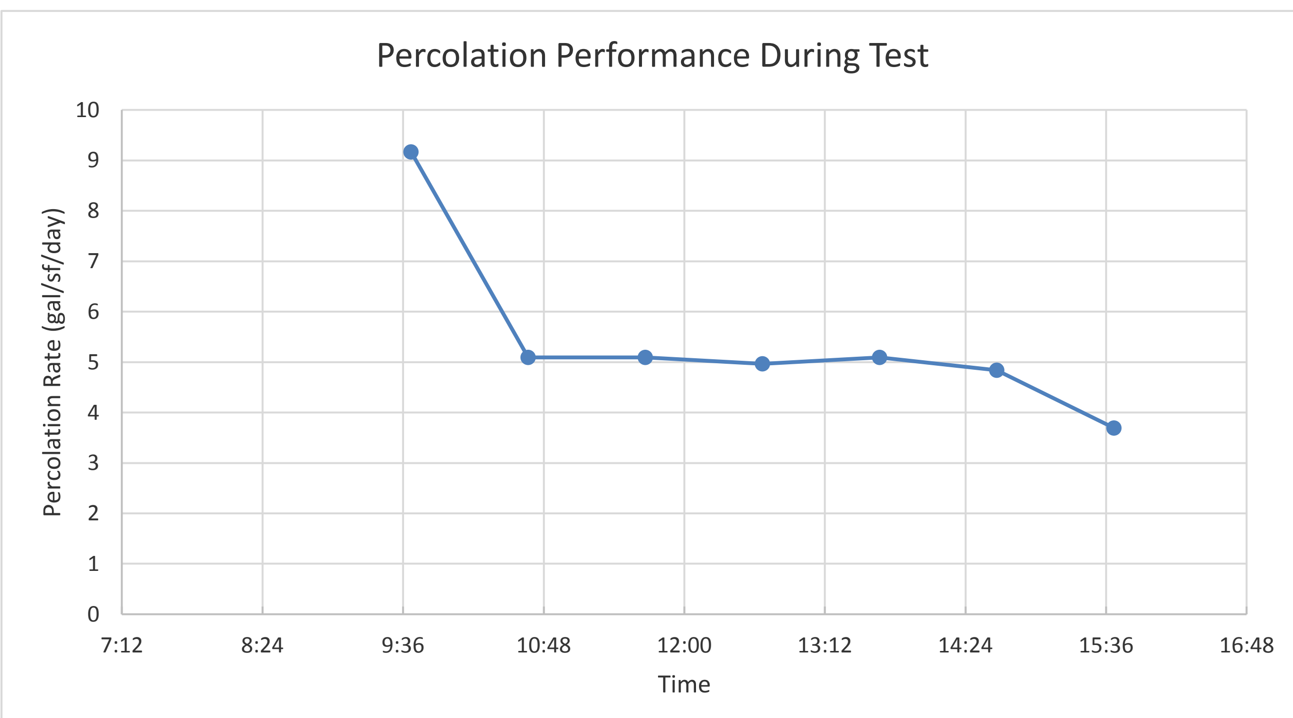
BORING #: B6

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B6
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81823	81888	8:40		65	
82081	82153	9:40	1:00	72	9.17
82332	82372	10:40	1:00	40	5.09
82520	82560	11:40	1:00	40	5.09
82705	82744	12:40	1:00	39	4.97
82880	82920	13:40	1:00	40	5.09
83055	83093	14:40	1:00	38	4.84
83220	83249	15:40	1:00	29	3.69

Total Volume: 363 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B7
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet

Presoak Date:	10/29/2014	at	7:00		
Test Date:	10/30/2014	start at	7:52	end at	2:29
Third Day:	10/31/2014	at	7:00		

Depth to Cap: 7 feet below ground surface

Effective Depth: 30 feet

Calculated Volume: 94.25 cf

Calculated Area: 188.50 sf

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:52	37.0
Start of Test	10/30/2014	7:52	7.0
End of Test	10/31/2014	7:00	32.0

Total volume of water metered during test: 320 gallons

CALCULATIONS

Volume of Water Remaining: 5.9 cubic feet 44 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 276 gallons

Percolation rate: 1.5 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	552
5 feet	37	690
6 feet	37	828

BORING #: B7

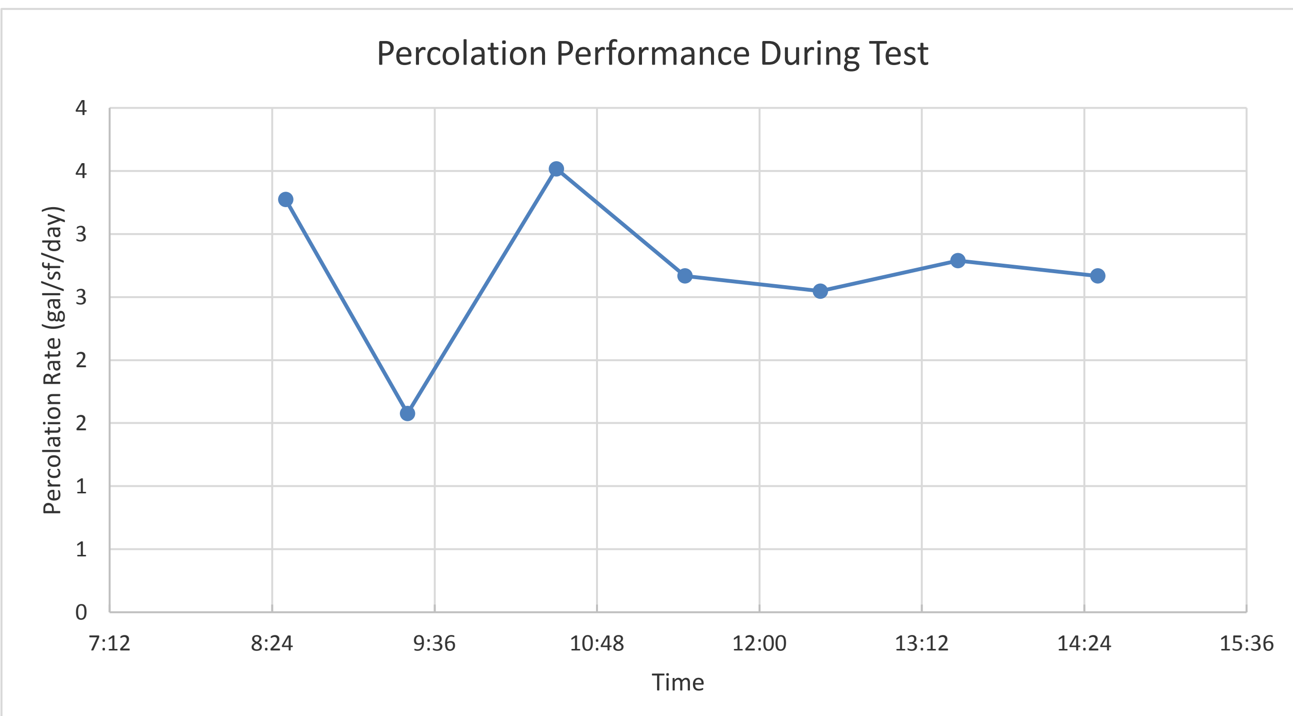
PERCOLATION TEST DATA
METER METHOD

Project: Malibu Jewish Center
Project #: LA-01576-02
Address: 24855 PCH, Malibu
Date: 10/30/2014

Test Pit #: B7
Tested By: WL & SD

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79493	79656	7:52		163	
79830	79857	8:30	0:38	27	3.27
80057	80070	9:24	0:54	13	1.58
80328	80357	10:30	1:06	29	3.52
80543	80565	11:27	0:57	22	2.67
80760	80781	12:27	1:00	21	2.55
80973	80996	13:28	1:01	23	2.79
81190	81212	14:30	1:02	22	2.67

Total Volume: 320 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B8
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	10/29/2014	at	7:00			
Test Date:	10/30/2014	start at	7:46	end at	2:24	
Third Day:	10/31/2014	at	7:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:46	37.0
Start of Test	10/30/2014	7:46	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 402 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 402 gallons

Percolation rate: 2.1 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	804
5 feet	37	1005
6 feet	37	1206

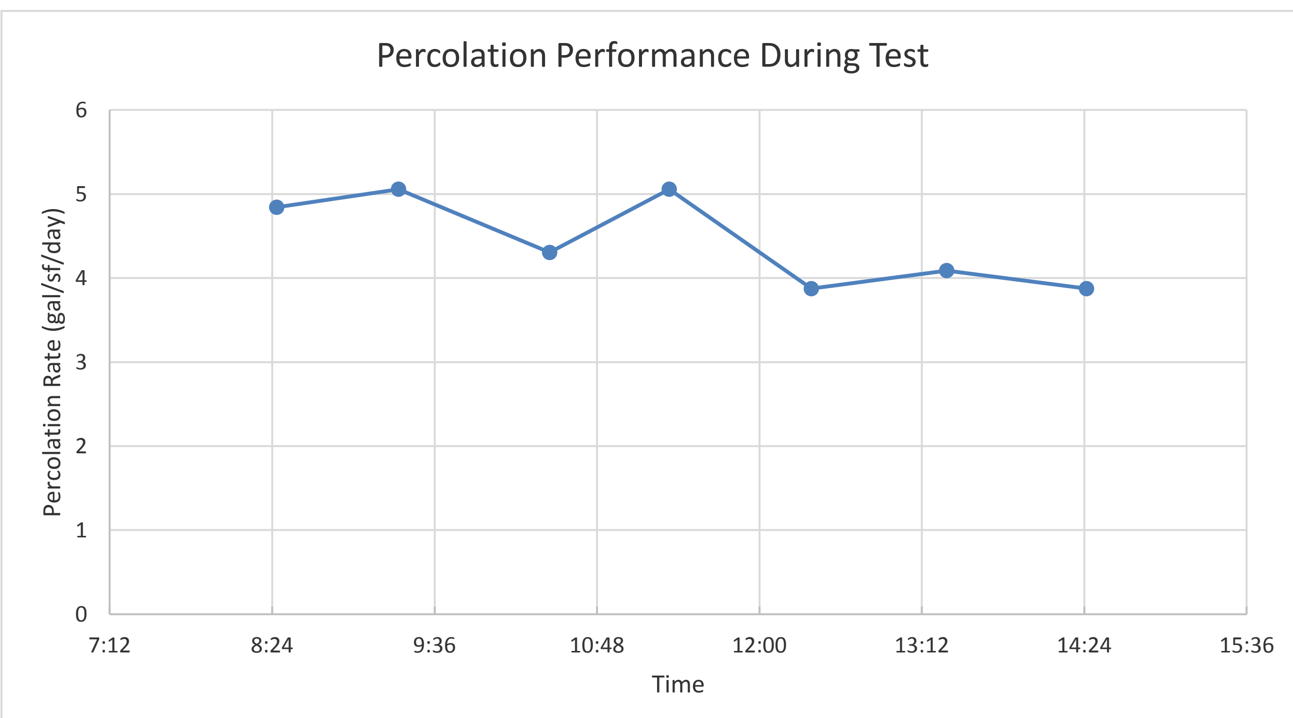
BORING #: B8

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B8
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79493	79606	7:46		113	
79785	79830	8:26	0:40	45	4.84
80010	80057	9:20	0:54	47	5.06
80288	80328	10:27	1:07	40	4.30
80496	80543	11:20	0:53	47	5.06
80724	80760	12:23	1:03	36	3.87
80935	80973	13:23	1:00	38	4.09
81154	81190	14:25	1:02	36	3.87

Total Volume: 402 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center			Test Pit #:	B9
Project #:	LA-01576-02			Tested By:	WL & SD
Address:	24855 PCH, Malibu				

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet		Radius of Hole:	1	feet
Presoak Date:	10/29/2014	at	7:00			
Test Date:	10/30/2014	start at	7:43	end at	2:19	
Third Day:	10/31/2014	at	7:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:43	37.0
Start of Test	10/30/2014	7:43	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 268 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 268 gallons

Percolation rate: 1.4 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	536
5 feet	37	670
6 feet	37	804

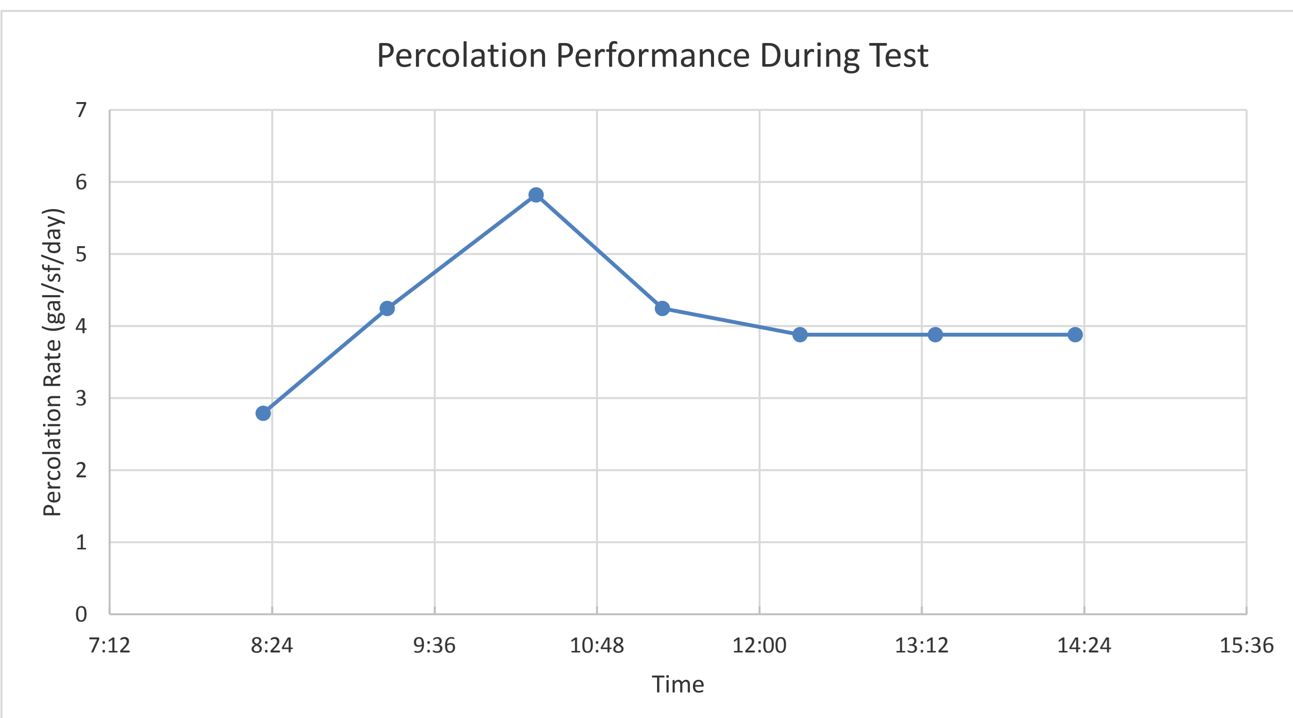
BORING #: B9

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B9
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79493	79524	7:43		31	
79762	79785	8:20	0:37	23	2.79
79975	80010	9:15	0:55	35	4.24
80240	80288	10:21	1:06	48	5.82
80460	80495	11:17	0:56	35	4.24
80692	80724	12:18	1:01	32	3.88
80903	80935	13:18	1:00	32	3.88
81122	81154	14:20	1:02	32	3.88

Total Volume: 268 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B10
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	10/29/2014	at	7:00			
Test Date:	10/30/2014	start at	7:40	end at	2:13	
Third Day:	10/31/2014	at	7:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:40	37.0
Start of Test	10/30/2014	7:40	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 387 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 387 gallons

Percolation rate: 2.1 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	774
5 feet	37	968
6 feet	37	1161

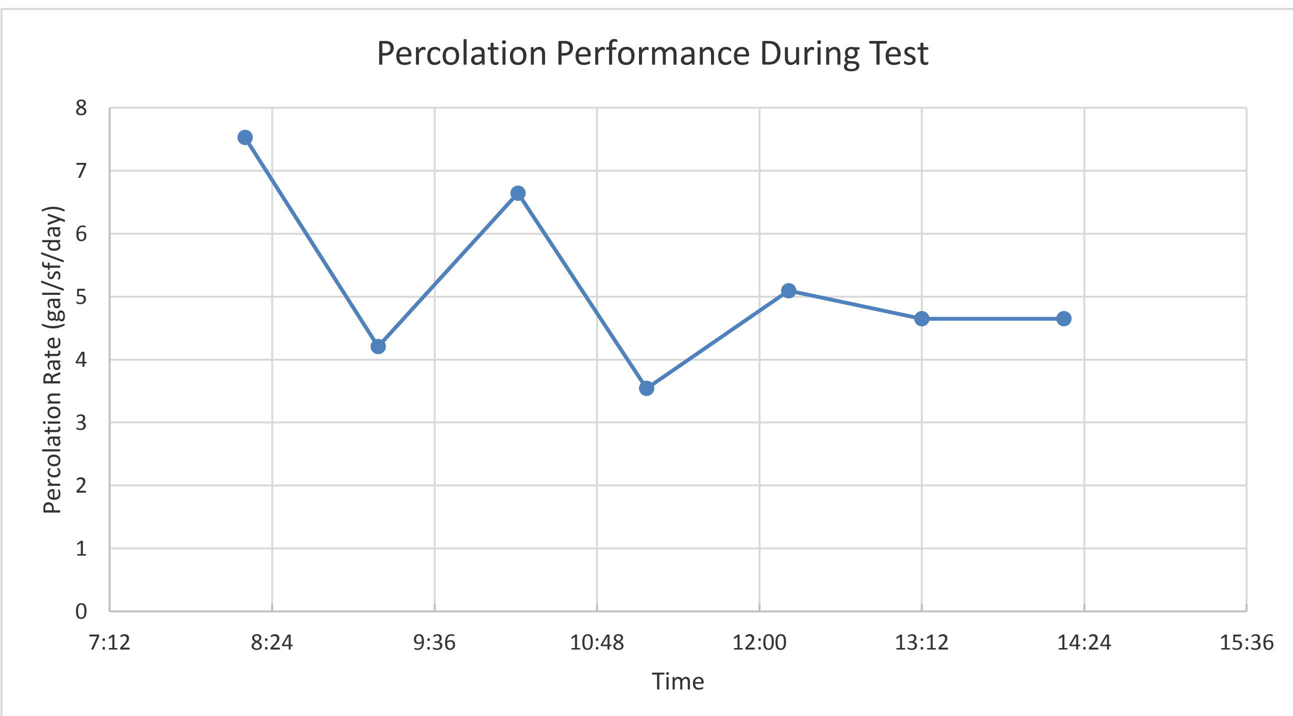
BORING #: B10

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B10
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79434	79493	7:40		59	
79729	79797	8:12	0:32	68	7.53
79937	79975	9:11	0:59	38	4.21
80180	80240	10:13	1:02	60	6.64
80428	80460	11:10	0:57	32	3.54
80646	80692	12:13	1:03	46	5.09
80861	80903	13:12	0:59	42	4.65
81080	81122	14:15	1:03	42	4.65

Total Volume: 387 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B11
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	10/29/2014	at	7:00			
Test Date:	10/30/2014	start at	7:24	end at	2:06	
Third Day:	10/31/2014	at	7:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:24	37.0
Start of Test	10/30/2014	7:24	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 263 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 263 gallons

Percolation rate: 1.4 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	526
5 feet	37	658
6 feet	37	789

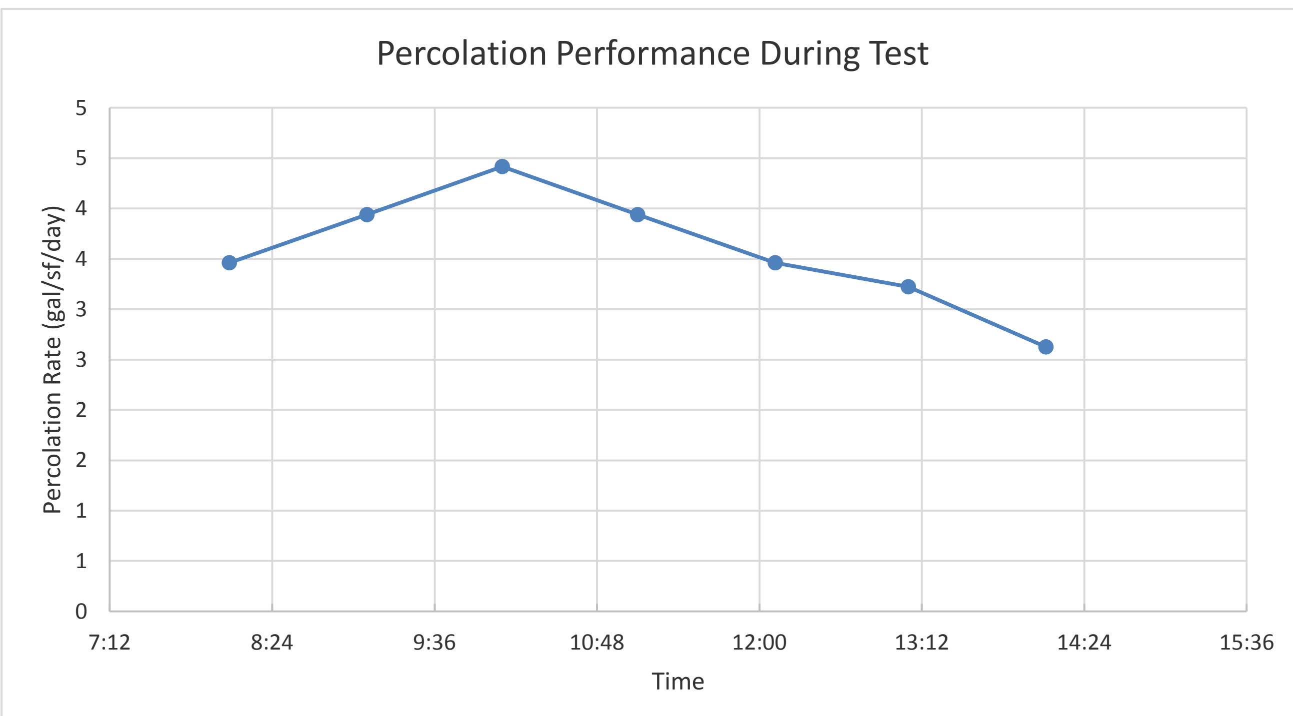
BORING #: B11

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B11
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79381	79434	7:24		53	
79700	79729	8:05	0:41	29	3.46
79904	79937	9:06	1:01	33	3.94
80143	80180	10:06	1:00	37	4.42
80395	80428	11:06	1:00	33	3.94
80617	80646	12:07	1:01	29	3.46
80834	80861	13:06	0:59	27	3.22
81058	81080	14:07	1:01	22	2.63

Total Volume: 263 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B12
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	10/29/2014	at	7:00			
Test Date:	10/30/2014	start at	7:00	end at	2:00	
Third Day:	10/31/2014	at	7:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:00	37.0
Start of Test	10/30/2014	7:00	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 485 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 485 gallons

Percolation rate: 2.6 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	970
5 feet	37	1213
6 feet	37	1455

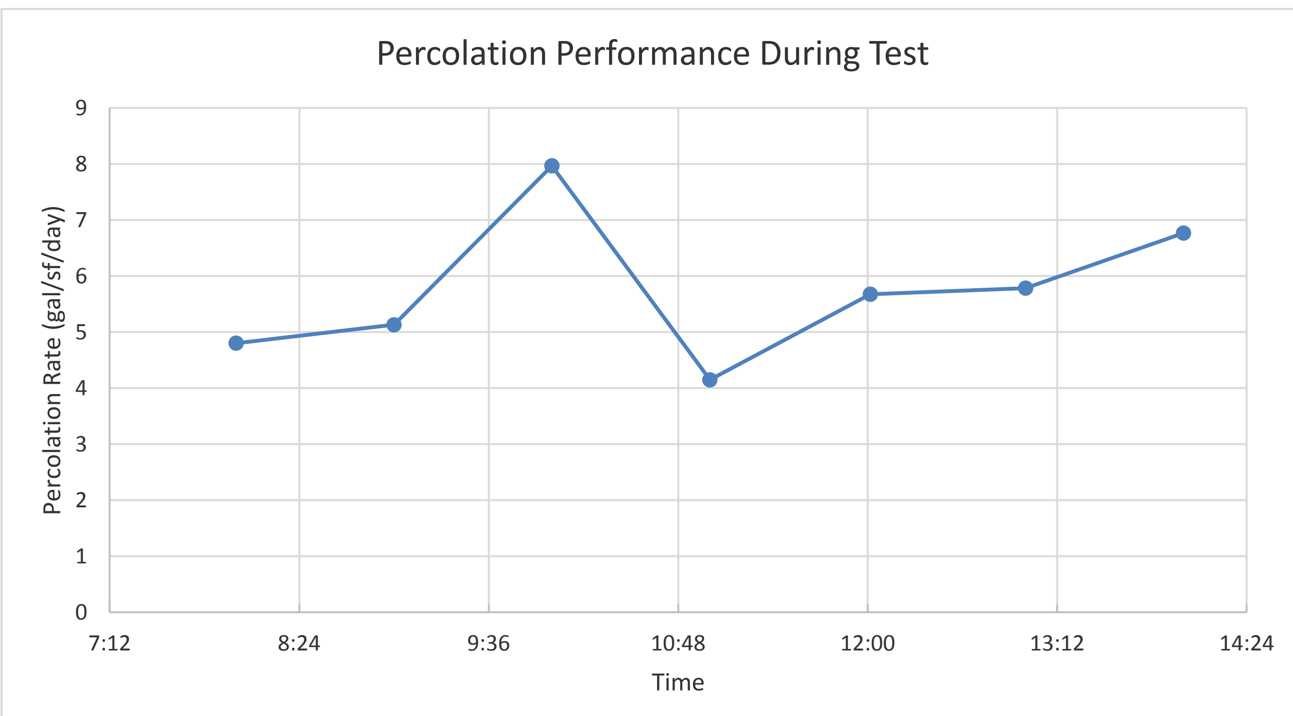
BORING #: B12

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B12
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79265	79381	7:00		116	
79656	79700	8:00	1:00	44	4.80
79857	79904	9:00	1:00	47	5.13
80070	80143	10:00	1:00	73	7.97
80357	80395	11:00	1:00	38	4.15
80565	80617	12:01	1:01	52	5.68
80781	80834	13:00	0:59	53	5.78
80996	81058	14:00	1:00	62	6.77

Total Volume: 485 Gallons



APPENDIX C

Water Meter Calibration Certificate

McCall's

METER SALES & SERVICE

CALIBRATION REPORT

1498 Mesa View Street
Hemet, CA 92543
951-654-3799

Company: JENSEN WATER TRUCKS
P.O. No.: GARY
Test Date: [illegible]
Test Tech: DOUG [illegible]

MANUFACTURER			FLOW RATE (GPM) - AWWA STANDARDS				
SENSUS			70	5	1-1/2		WTD. ACC. 15-70-15
Meter Size	Serial Number	Reading GX100	ACCURACY IN PERCENT				
1-1/2"	68163130	00[illegible]4	100.5	99.3	99.1		99.2

CUSTOMER ADDRESS:

TESTED BY: [signature]

ADDENDUM NO. 1
GEOTECHNICAL ENGINEERING REPORT
RESPONSE TO CITY REVIEW

Proposed Private School and Chapel
APN 4458-032-027
Malibu Jewish Center and Synagogue
24855 Pacific Coast Highway
Malibu, California
LA-01576-01

Prepared for

DAVID GRAY ARCHITECTS

December 21, 2015

Prepared By

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December 21, 2015 LA-01576-01

David Gray Architects
C/O Mr. Mark Meyer
527 West 7th Street, Suite 1001
Los Angeles, California 90014

Subject: **Addendum No. 1 Geotechnical Engineering Report**
Response to City Review
Proposed Private School and Chapel
APN 4458-032-027
Malibu Jewish Center and Synagogue
24855 Pacific Coast Highway
Malibu, California

References: Earth Systems Southern California, 2014, *Preliminary Geotechnical Engineering Report, Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*: Project No. LA-0576-01 dated November 12.

David Gray Architects, 2014, *Building Plans* dated September 17, 2015.

City of Malibu, 2014, *Geotechnical Review Sheet,* Log Number 3677, CDP 14-069, dated December 8, 2014.

INTRODUCTION

This addendum report has been prepared per your request with the goal of providing a documented response to the referenced City of Malibu, Geotechnical Review Sheet dated December 8, 2014 (Log # 3677). A copy of the review letter is included as Attachment A.

SITE DESCRIPTION

The approximate 4.75-acre site is at located on the north side on Pacific Coast (Hwy 1) Highway (PCH) in the City of Malibu, Los Angeles County, California. The site is approximately 4,000 feet west of Malibu Canyon Road and approximately 2,000 feet east of Puerco Canyon Road (see Plates I through III).

The site is situated on an east-west trending ridge, which is defined by the cut slope adjacent to Pacific Coast Highway on the south side, and the incised drainage of Puerco Canyon on the north side of the site. On the westerly portion of the site (the subject of this study) there are existing modular classrooms and offices, play yards, and a parking lot. The easterly portion of the site is occupied by a synagogue structure and parking lot, constructed circa 2005. An existing on-site sewage disposal system located in the existing driveway serves the existing facilities at the site.

Along the south side of the site, a five- to ten-foot tall cut slope ascends from PCH at an approximate gradient of one and a half horizontal to one vertical (1.5H:1V) to the existing parking lot at an elevation of approximately 165 feet above mean sea level. The gently sloping parking lot extends 60 to 80 feet north to a two-foot to five-foot tall retaining wall. Above and behind the retaining wall are the existing school facilities, at an elevation of approximately 171 feet, and an open field to the east at an elevation of roughly 178 feet. Beyond the school facilities, a natural slope descends approximately 35 feet to the Puerco Canyon drainage, with side slope gradients ranging from approximately 1H:1V to 4H:1V.

The developed easterly portion of the site has been landscaped with various grasses, trees and shrubs. Native trees and shrubs are located within the Puerco Canyon drainage and surrounding slopes. The above-cited descriptions are intended to be illustrative, and are specifically not intended for use as a legal description of the subject property.

PROJECT DESCRIPTION

Based on discussions with the project architect Mark Meyer, AIA, and review of the preliminary site plan provided, Earth Systems understands that the proposed project will consist of the demolition of the existing modular school structures and construction of the new school building. The new structure will consist of two floors of classrooms and administration over a semi-subterranean parking level and basement with a one-story sanctuary at the northeast end. The new building will be of wood-frame construction with slab-on-grade ground floors. The project will also include associated retaining walls, parking, walkways, and landscaping. Earth Systems has not received foundation plans for the proposed structure as of this writing. However, based upon the type of construction, estimated structural loads are not expected to exceed 5,000 pounds per linear foot (plf) for bearing walls and 100 kips for isolated columns.

Earth Systems assumes from the provided drawings that conventional cut and fill construction techniques will be utilized for site grading and that standard construction techniques will be utilized for retaining wall and foundation construction. Sewage disposal will be provided by a private onsite wastewater treatment systems (OWTS) that has been designed by others (EnSitu Engineering, Inc., 2014). These assumptions were used as the basis for the exploration, testing, and analyses programs, and for the recommendations contained in this report. If the anticipated foundation loads or other site conditions vary significantly from the values stated herein, the recommendations should be reconfirmed prior to completing project plans.

RESPONSE TO REVIEW COMMENTS

Comment 1: *"The Project Geotechnical Consultant provides recommendations for R & R below the proposed buildings and recommendations for different bearing materials for new foundations (compacted fill, bedrock). Please provide a clear description of the site preparation (grading besides cut) and proposed foundation systems for the proposed school and chapel buildings and any retaining walls, hardscape, and accessory structures."*

Response: It is presently proposed to found the school structure, chapel and any other accessory buildings on a compacted fill pad, with a minimum thickness of three feet below footings. Independent retaining walls may bear entirely on either new properly compacted fill or bedrock. Hardscapes should be supported by 12 inches of properly compacted fill. Final plans should be review by Earth Systems and the project structural engineer to determine the appropriate bearing material. The project civil engineer should incorporate the limits of removal and recompaction, as determined by Earth Systems and the project structural engineer, on the final plans.

Comment 2: *"Provide updated east-west and north-south cross-sections across the proposed development that clearly depict the proposed improvements and grading, including existing and proposed grades, R & R grading, structures, retaining walls, flatwork and roadways, parking lots, the OWTS, geologic conditions, depths to groundwater, and subsurface exploration."*

Response: Cross sections A-A' and B-B' have been updated and additional cross sections C-C' through F-F' have been provided to include the requested information, see Plates II through IV. Additionally, the work completed as part of the OWTS and groundwater study (Earth Systems, 11/12/2014) have been incorporated into the Site Geologic Map (Plate I) and the updated cross-sections.

Comment 3: *"The Environmental Health approval from 2003 describes three existing 5' diameter x 23' BI seepage pits with 12' caps for the school while the Project OWTS Consultant (EnSitu Engineering, Inc.) discusses utilizing two existing 5 '-diameter x 30' BI seepage pits with 8' caps for the proposed school and chapel. Please clarify the quantity and design of the seepage pits and contact Andrew Sheldon regarding any additional requirements for verification of the existing OWTS and additional testing that may be required. It appears that the new OWTS requires additional percolation testing, supporting geology, and design reports to be reviewed by the City."*

Response: A report providing percolation testing and supporting geology for the future seepage pits has been prepared (Earth Systems, 1/6/2015). Ensitu Engineering will provide the OWTS design plans.

Comment 4: *"Please provide a geologic cross section(s) across the site that includes the existing seepage pits to be utilized for the OWTS that extends to the toe of the critical slope (Puerco Canyon). The cross-sections should show the capping depth of the seepage pits and the highest anticipated groundwater levels considering the Puerco Canyon drainage and the proposed OWTS.*

The Project Engineering Geologist shall provide sufficient geologic/hydrostratigraphic data to substantiate their conclusions regarding the potential for groundwater mounding and the potential for effluent to daylight on slopes. Highest anticipated groundwater levels, taking into account the effluent from the OWTS, the Puerco Canyon drainage, and irrigation, shall be utilized in the slope stability analyses. The slope stability analyses need to be re-run incorporating the OWTS and irrigation."

Response: The existing geologic cross sections have been modified to include the existing seepage pits to be utilized for the OWTS and extended to the toe of the critical slope (Puerco Canyon). The modified cross sections show the capping depth (seven feet) of the seepage pits and the highest anticipated groundwater levels considering the Puerco Canyon drainage and the proposed OWTS.

Comment 5: *"The Project Geotechnical Consultant needs to provide a complete finding in accordance with Section 111 of the Malibu Building Code regarding the proposed OWTS."*

Response: As provided in the Earth Systems 1/6/2015 report in accordance with the City of Malibu Guidelines for the Preparation of Engineering Geology and Geotechnical Engineering Reports §5.7- Mandatory Building Code Statements, Earth Systems provides the following findings. Based on the findings summarized in this report, and provided the recommendations in this report are incorporated into the project, it is Earth Systems' opinion that the proposed development on the subject property will not be subject to a geologic hazard from landslides, settlement, or slippage beyond that described herein. It is also Earth Systems' opinion that the proposed structures and associated grading will not adversely affect the geologic stability of the site or adjacent properties provided our recommendations are followed. Test findings and statements of professional opinions do not constitute a guarantee or warranty, expressed or implied.

Comment 6: *"The Project Geotechnical Consultant needs to discuss if building surcharges will impact slope stability. Slope stability analysis may need to be re-run."*

Response: The slope stability analyses have been updated and re-run to include the anticipated building surcharges. For gross static stability with the anticipated building surcharges for circular failure surfaces, the computed safety factor for the existing slope is 3.37 and 2.34, for Section A-A' and B-B', respectively. For planar failure surfaces, the computed safety factor for the existing slope is 3.60 and 2.84, for Section A-A' and B-B', respectively. The City of Malibu requires a minimum safety factor of 1.5 for static conditions.

For the seismic portion of the analysis, a pseudostatic analysis was completed for circular failure surfaces with the anticipated building surcharges and a seismic coefficient of 0.35g per the City of Malibu Guidelines. A safety factor of 1.53 and 1.31 was computed for Section A-A' and B-B', respectively. For planar failure surfaces, the computed safety factor for the existing slope is 1.58 and 1.63, for Section A-A' and B-B', respectively. Since these values exceed 1.0, the site passes the City of Malibu criteria.

The results of the revised slope stability analyses are provided in Attachment C.

Comment 7: *"The Project Geotechnical Consultant needs to re-visit the surficial slope stability. The reviewer takes exception to the Consultant using test data for surficial slope stability from a soil sample classified as having angular shale fragments. It appears that the stress-strain data for the 1,000 psf load is suspect. Neglecting that data, the shear test would result in values of about 28°friction and about 300 psf cohesion. RJR reported direct shear data on slope soil material as 24°friction and 225 psf cohesion in their August 21, 2002 report for 24903 PCH. The Consultant used a value of 34°friction and about 90 psf cohesion for artificial fill in the slope stability calculations. Please revise the soil strength parameters and re-submit for City review."*

Response: The surficial shear test plot has been amended to exclude the 1,000 psf load data which has produced a calculated shear strength of 30° for phi and 320 psf for cohesion, see has been included in Appendix B. However, surficial stability has been re-evaluated using a shear strength of 24° for phi and 225 psf for cohesion as reported by RJR (8/21/2002). Based on those strengths, and assuming a four-foot thick saturated soil section, a slope at a 1H:1V inclination would result in a safety factor of 1.2. Whereas, a slope at a 2H:1V inclination would result in a safety factor of 1.6. Therefore, it is recommended to trim the over-steepened portion of the slope comprised of side cast fill back to a 2H:1V. Updated surficial stability analyses are included in Attachment C.

Comment 8: *"The Consultant suggests that surficial slope stability for slopes steeper than 1½:1 have factors of safety less than 1.5, yet the surficial stability analysis shows an acceptable factor of safety for a 1:1 slope using the high strength values. The Consultant needs to revise this conclusion the basis of the re-evaluation suggested in the preceding comment."*

Response: See response to Comment 7.

Comment 9: *"The fault mapped in the southern portion of the property to the west (24903 PCH) by Mountain Geology trends east into the subject site and is as close as 20 to 30 feet from the proposed school and chapel building. While the fault is most likely not active, the Project Engineering Geologist needs to evaluate whether or not mitigation measures are required for the proposed structures, such as deepened, more rigid foundations, additional grading, etc. Provide a discussion of possible mitigation measures and the risks the fault poses to the proposed development."*

Response: The adjacent site (24903 PCH) was investigated by Mountain Geology in 1989 through 1991 and RJR in 2002. Mountain Geology observed a "possible fault" that was not further investigated by RJR in a subsequent investigation of the same site. The log of this trench was not available from the City of Malibu archives or the consultant that produced it.

Earth Systems and previous consultants have excavated and logged continuous exploratory trenches aimed at identifying the continuity of exposed soil and bedrock. The terrace deposits are located on the southerly portion of the site, where they cap the east-west trending ridge.

Overall, the terrace deposits are approximately 15 feet thick. At the base, these deposits consist of rounded pebbles and cobbles (GP) that grade upward to a clean medium-grained sand (beach deposit). The upper approximately five to seven feet of these deposits become increasingly siltier (SM). This is consistent with the typical coastal terrace sequence where regressive marine sediments are overlain by a subsequent continental terrace deposit that is capped by a well-developed paleosol.

These coastal terrace sediments are considered a dateable pre-Holocene feature. Based upon previous geologic study by Birkeland (1972), the terrace deposits on site correlate to the Corral terrace, which were deposited approximately 131,000 year ago. Textural features within the capping paleosol are also consistent with Birkland's assessment. The undisrupted sediments within the coastal terrace sequence were observed (e.g., Geosystems T-17) to extend southward as far as 25 feet north of the southern site boundary. This supports Earth Systems' interpretation that no Holocene fault offset has occurred in areas overlain by the coastal terrace on the subject site.

The Shoreline Angle (intersection between the eroded bedrock platform and sea cliff) is a relatively rarely observed feature that is represented in several of the seismic trench logs for the subject site (ref. Table 1). Shoreline angles are generally overlain by a wedge of colluvium that has been shed from the sea cliff and shares some textural features with the bedrock that forms the ascending slopes. The observed shoreline angle elevations agree with the Corral terrace projections made by LaChapelle & Allen (2014) and is considered a pre-Holocene datum that further suggests landscape stability.

Table 1
Seismic Trench Summary

Consultant	Excavation	Location	Depth	Feature
Geosystems	T-17	Sta. 0+70	6'	Shoreline Angle
Geosystems	T-18	Sta. 0+50	6'	Shoreline Angle
RJR	T-1	Sta. 0+60	0-6'	Sea Cliff
RJR	T-2	Sta. 0+10	0-6'	Sea Cliff
Earth Systems	T-1	Sta. 0+30	0-8'	Sea Cliff
Earth Systems	T-2	Sta. 0+20	7.5'	Shoreline Angle
Earth Systems	T-3	Sta. 0+6	5'	Shoreline Angle

It is Earth Systems' opinion that the recommendations provided herein and the referenced report (Earth Systems, 1/6/2015), combined with the seismic design parameters incorporation into the structural engineers plans, will be suitable for reasonable mitigation for a seismic episode. Excavations should be observed by a geologist during the remedial grading to confirm potentially active faults do not extend into the proposed development.

RESPONSE TO BUILDING PLAN-CHECK STAGE REVIEW COMMENTS

Comment 1: *"The Project Geotechnical Consultant cites Al Atik and Sitar (2010) to justify limiting the CBC requirement for seismic loading on retaining walls to only those walls in excess of six feet in height. In review of the cited paper, the case that they are showing where there is no lateral force for a Z(m) of 2 meters (~6 feet) is for a specific ground motion from the Loma Prieta earthquake and is not necessarily applicable to all ground motions. Further, the paper states "At this point, more experimental work and well-documented case histories are needed to fully explore the range of potential soil conditions and types of retaining structures and to further develop methods of analysis that are consistent with the actual dynamic behavior of these systems." The CBC does not recognize the conclusions of the cited paper. Although the County of Los Angeles has allowed a six-foot exemption, neither the City of Malibu nor CBC, has adopted the exemption. The Consultant needs to provide recommendations for lateral pressures on all retaining walls, regardless of height."*

Response: The reviewers are misinterpreting our use of Atik and Sitar in this comment. We do not use that reference to justify a 6-foot exemption, it is used to justify a normal right-side-up triangular pressure distribution for seismic lateral earth pressures, and this is also the pressure distribution found by Mononobe-Okabe. Furthermore, Section 1803.5.12.1 of the 2013 CBC requires the incorporation of "dynamic seismic lateral earth pressures on foundation walls and retaining walls supporting more than 6 feet of backfill height". Based on an extensive review of the City of Malibu guidelines and communications with City officials it does not appear that the City of Malibu has adopted a change to the CBC Section 1807.5.12. It is Earth Systems' professional opinion that only retaining walls over 6 feet in height require design of seismic pressures.

If it is the City's policy that all retaining walls require design for seismic pressure, the values provided in the referenced report (Earth Systems, 11/12/2014) may be used for all wall heights. This policy should be provided in writing and made available.

Comment 2: *"Please provide the slot cut calculations referenced in Appendix E"*

Response: Supporting calculations are provided in Attachment D.

Comment 3: *"The Consultant needs to comment on the potential for differential settlement between pile supported, bedrock supported, and compacted fill supported portions of the structure(s) if this condition is expected."*

Response: It is presently proposed to found the school structure, chapel and any other accessory buildings on a compacted fill pad, with a minimum thickness of three feet below footings. Based on a discussion with the project structural engineer, Charles Tan, S.E., the chapel with be structurally independent from the school structure.

Comment 4: *"In accordance with the City guidelines, please provide bearing capacity calculations for all foundations designed for bearing capacities that exceed 3000 psf."*

Response: Supporting calculations are provided in Attachment D.

Comment 5: *"In order to justify the selection of Site Class C for the project, the Project Geotechnical Engineer or the Project Engineering Geologist needs to provide the standard penetration resistance or shear wave velocity of the underlying bedrock materials based on measured values or on judgment as specified in Section 1613.3.2 of the 2013 CBC and present those to the City for review."*

Response: The subject site is underlain by sedimentary bedrock of the Monterey Formations with a thin veneer of soil cover. Based on regional geologic literature (Fumal and Tinsley, 1985), the upper 30 meters (about 100 feet) of these bedrock units in the site vicinity have shear wave velocities (V_s^{30}) likely ranging between 455 to 655 meters per second (about 1,500 to 2,150 ft/s). Thus, the bedrock at the site is considered "soft rock" which is classified as Site Class C in the ASCE 7-10 (Table 20.3-1).

Comment 6: *Section 7.4 of the City's geotechnical guidelines requires a minimum thickness of 10 mils for vapor barriers beneath slabs-on-grade. The Project Geotechnical Engineer has recommended that the vapor barrier conform to ASTM El 746. Building plans shall reflect the Consultant's requirement."*

Response: Acknowledged, the note should appear on the project plans.

Comment 7: *"The following note must appear on the grading and foundation plans: "Tests shall be peerformed prior to pouring footings and slabs to evaluate the Weighted Plasticity and the Expansion Index of the supporting soils, and foundation and slab plans should be reviewed by the Civil or Structural Engineer and revised, if necessary.""*

Response: Acknowledged, the note should appear on the project plans.

Comment 8: *"The following note must appear on the grading and foundation plans: "Tests shall be performed prior to pouring pile foundations, footings and slabs to evaluate corrosivity of the supporting soils, and foundation and slab plans should be reviewed by the Civil or Structural Engineer and revised, if necessary. ""*

Response: Acknowledged, the note should appear on the project plans.

Comment 9: *"The yardages on the grading plans needs to be revised to reflect any R & R grading proposed across the site (for the buildings, flatwork, roadways or parking lots, etc.)"*

Response: Acknowledged, to be provided by others.

Comment 10: *"Recommendations to properly abandon any OWTS components on the property need to be included as notes on the building, grading, and OWTS plans."*

Response: Acknowledged, the architectural, civil engineering, and OWTS designer's plans should show abandonment/removal of the existing OWTS were applicable.

Comment 11: *"Two sets of final grading, retaining wall, OWTS, stable, and riding arena plans (**APROVED BY BUILDING AND SAFETY**) incorporating the Project Geotechnical Consultant's recommendations and items in this review sheet must be **reviewed and wet stamped and manually signed by the Project Engineering Geologist and Project Geotechnical Engineer.** City geotechnical staff will review the plans for conformance with the Project Geotechnical Consultants' recommendations and items in this review sheet over the counter at City Hall. **Appointments for final review and approval of the plans may be made by calling or emailing City Geotechnical staff.**"*

Response: Acknowledged, once final plans are prepared they should be provided to Earth Systems for review..

LIMITATIONS AND UNIFORMITY OF CONDITIONS

The conclusions and recommendations submitted in this report relative to the proposed developement are based, in part, upon the data obtained from the site observations during the field exploration, and past experience. The nature and extent of variations between the borings and test pits may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this addendum report.

This addendum should be made part of the referenced Preliminary Geotechnical Engineering report dated November 12, 2015. All conclusions, recommendations, and limitations of that report, except as specifically amended in this addendum report, remain valid and apply to the currently proposed project.

CLOSURE

Earth Systems trusts this report is sufficient at this time and meets your current needs. Earth Systems appreciates this opportunity to provide professional geotechnical engineering services for this project. If you have any questions regarding the information contained in this report, or if you require additional geotechnical engineering services, please contact the undersigned.

Respectfully submitted,

Earth Systems

REGISTERED PROFESSIONAL ENGINEER
ANTHONY P. MAZZEI
GE 2823
Exp. 6-30-17
GEOTECHNICAL
STATE OF CALIFORNIA

Christopher F. Allen, P.G.
Project Geologist

Anthony P. Mazzei, P.E., G.E.
Project Geotechnical Engineer
12/21/15

CERTIFIED ENGINEERING GEOLOGIST
WILLIAM A. LA CHAPELLE
No. 1311
5/17
STATE OF CALIFORNIA

William LaChapelle, P.G.,C.E.G.
Project Engineering Geologist

END OF TEXT

REFERENCES

PLATES

Plate I	Geologic Site Map
Plates II - IV	Geologic Cross Section

ATTACHMENTS
- Attachment A - City of Malibu Review Sheet
- Attachment B - Updated Results of Direct Shear Tests
- Attachment C - Updated Slope Stability Analysis
- Attachment D - Supplemental Calculations

Distribution:
- 3 – Addressee (hard copy including one unbound copy)
- 1 – Addressee (CD, pdf copy)

REFERENCES

David Gray Architects, 2014, *Building Plans* dated September 17, 2015.

Earth Systems Southern California, 2002, *Preliminary Geotechnical Engineering Report Proposed Malibu Jewish Center 24855 Pacific Coast Highway Malibu California,* PL-05711-01, dated February 22, 2002.

Earth Systems Southern California, 2002, *Addendum No. 1 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated July 1, 2002.

Earth Systems Southern California, 2002, *Addendum No. 2 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated August 13, 2002.

Earth Systems Southern California, 2004, *Addendum No. 3 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated April 9, 2004.

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Earth Systems Southern California, 2004, *Final Rough Grading Report for Building Pad and Interim Rough Grading Report for Parking Areas Malibu Jewish Center, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-03, dated November 15, 2004.

Earth Systems Southern California, 2015, *Preliminary Geotechnical Engineering Report for* Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California, LA-01576-01, dated November 12, 2014.

Fumal, T.E. and Tinsley, J.C., 1985, Mapping Shear-Wave Velocities of Near-Surface Geologic Materials, USGS PP 1360, 1985.

LaChapelle, W.A., and Allen, C.A., 2014, *Use of Pleistocene Strandlines as Indicators of Landscape Stability Along the Emergent Coastline, Malibu, California* in Proceedings of the American Quaternary Association 23rd Biennial Meeting, August 7-10, 2014, Seattle, Washington.

Malibu, City of, 2014, *Geotechnical Review Sheet,* Log Number 3677, CDP 14-069, dated December 8, 2014.

Mountain Geology, 1987, *Engineering Geologic and Soils Engineering Investigation and Percolation Testing Proposed Hotel and Restaurant Complex 14911 Pacific Coast Highway Malibu California*, JH 1974gs, dated October 27, 1987.

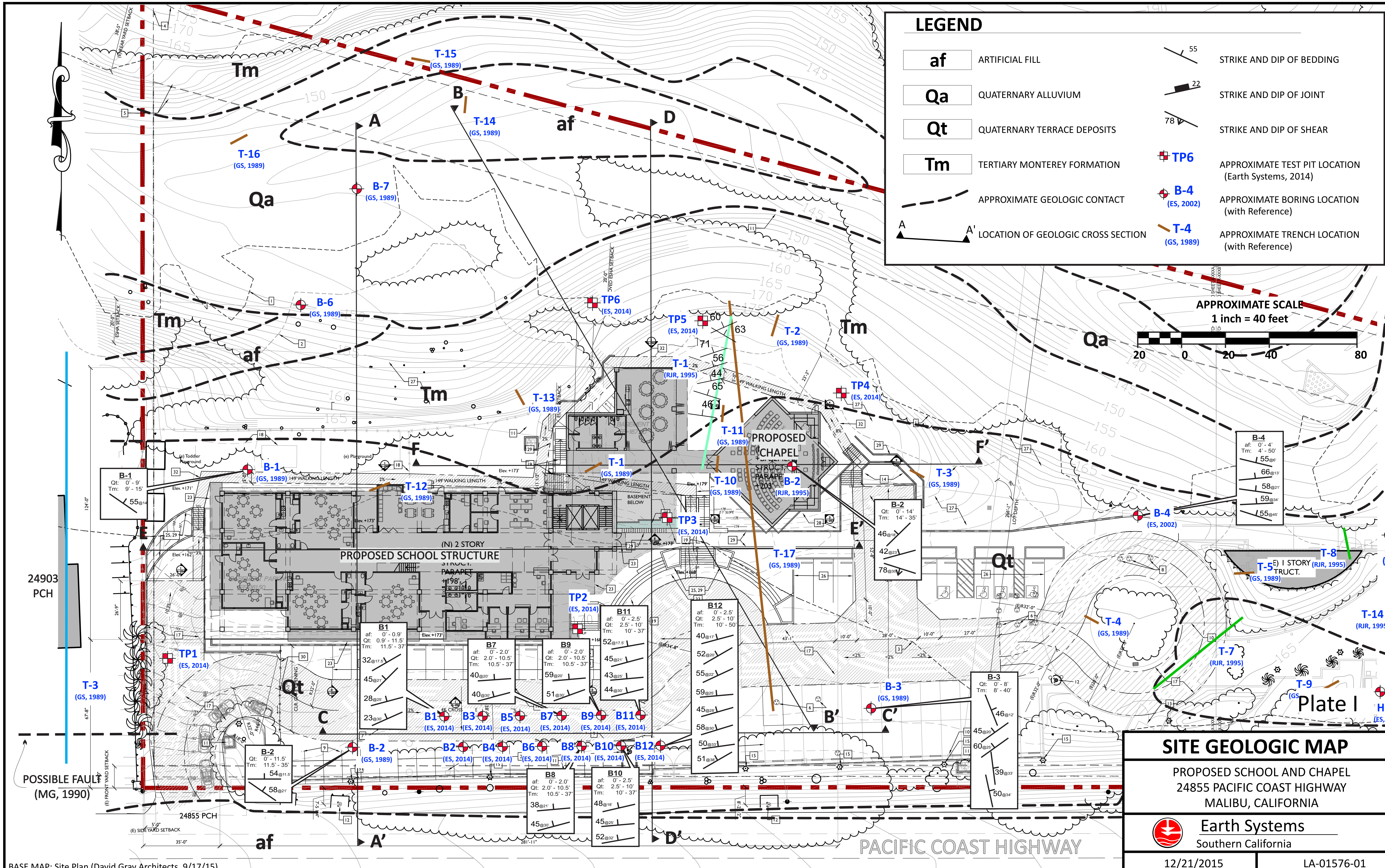
Mountain Geology, 1991, *Addendum Engineering Geology Report Proposed Private Sewerage Disposal System Proposed Restaurant 24911 Pacific Coast Highway Malibu California*, JG 1974sp, dated January 9, 1991.

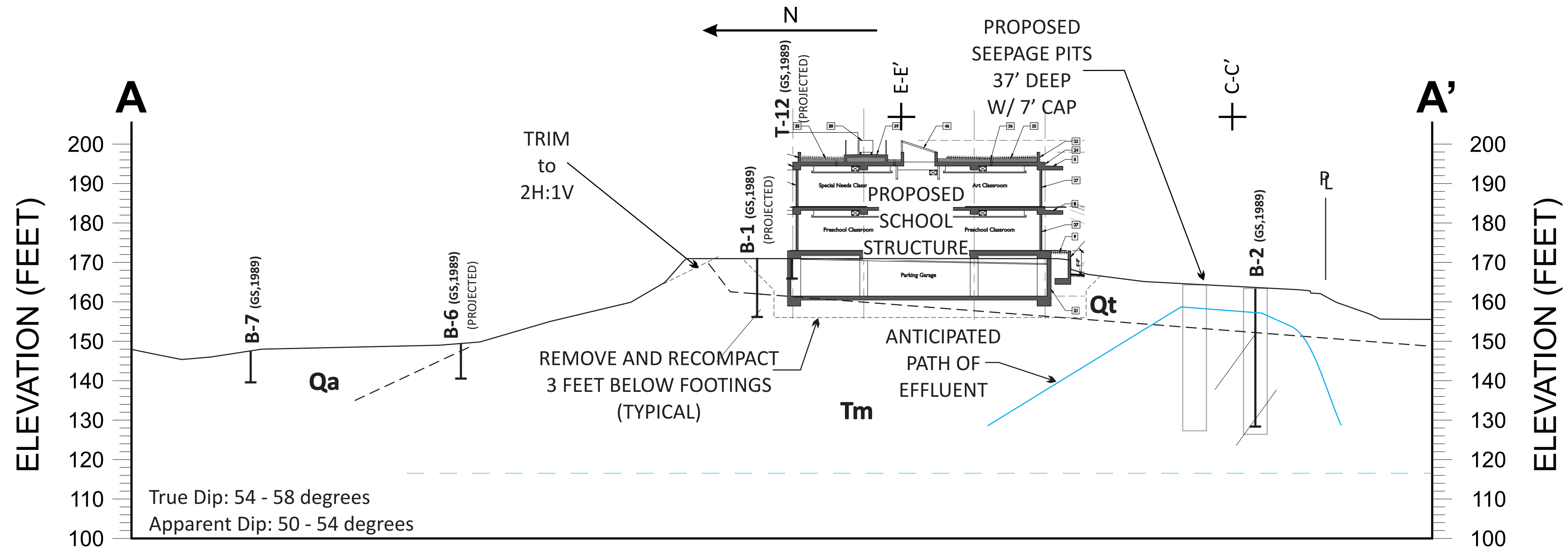
RJR, 1995, *Geotechnical Engineering and Geological Investigation Proposed Facility Expansion Project Malibu Jewish Center 24855 Pacific Coast Highway Malibu California*, Project No. 796.20-95, dated October 25, 1995.

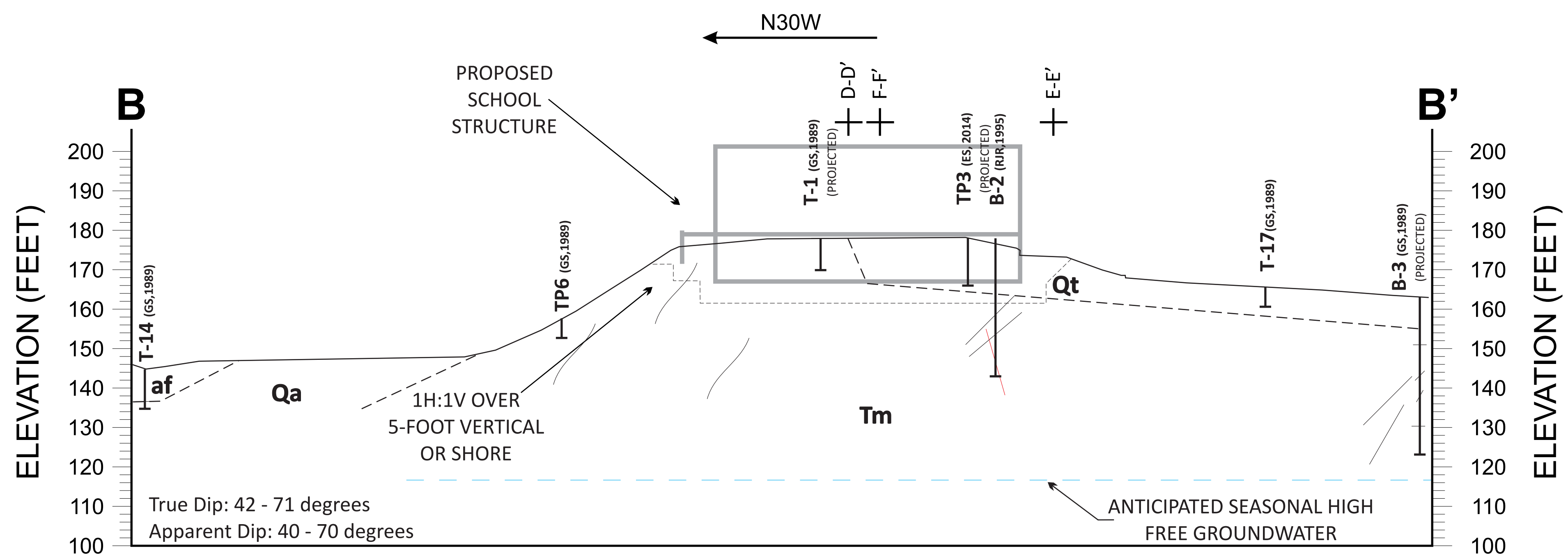
RJR, 2001, *Preliminary Geologic and Geotechnical Engineering Report Proposed Commercial Development 24903 Pacific Coast Highway Malibu California*, Project No. 1243.10-01, dated December 28, 2001.

Treiman, J.A., 1994, *Malibu Coast Fault, Los Angeles County, California:* California Division of Mines and Geology Fault Evaluation Report FER-229, 42 p.

PLATES


LEGEND
af ARTIFICIAL FILL
Qa QUATERNARY ALLUVIUM
Qt QUATERNARY TERRACE DEPOSITS
Tm TERTIARY MONTEREY FORMATION
APPROXIMATE GEOLOGIC CONTACT
A A' LOCATION OF GEOLOGIC CROSS SECTION
55 STRIKE AND DIP OF BEDDING
22 STRIKE AND DIP OF JOINT
78 STRIKE AND DIP OF SHEAR
TP6 APPROXIMATE TEST PIT LOCATION (Earth Systems, 2014)
B-4 (ES, 2002) APPROXIMATE BORING LOCATION (with Reference)
T-4 (GS, 1989) APPROXIMATE TRENCH LOCATION (with Reference)
APPROXIMATE SCALE
1 inch = 40 feet
20 0 20 40 80
PROPOSED SCHOOL STRUCTURE
PROPOSED CHAPEL
24903 PCH
24855 PCH
POSSIBLE FAULT (MG, 1990)
PACIFIC COAST HIGHWAY
BASE MAP: Site Plan (David Gray Architects, 9/17/15)
Plate I
SITE GEOLOGIC MAP
PROPOSED SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA
Earth Systems
Southern California
12/21/2015
LA-01576-01





SCALE
1 in = 40 ft (H&V)

Plate II

GEOLOGIC CROSS SECTIONS A & B

PROPOSED PRIVATE SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

12/21/2015	LA-01576-01

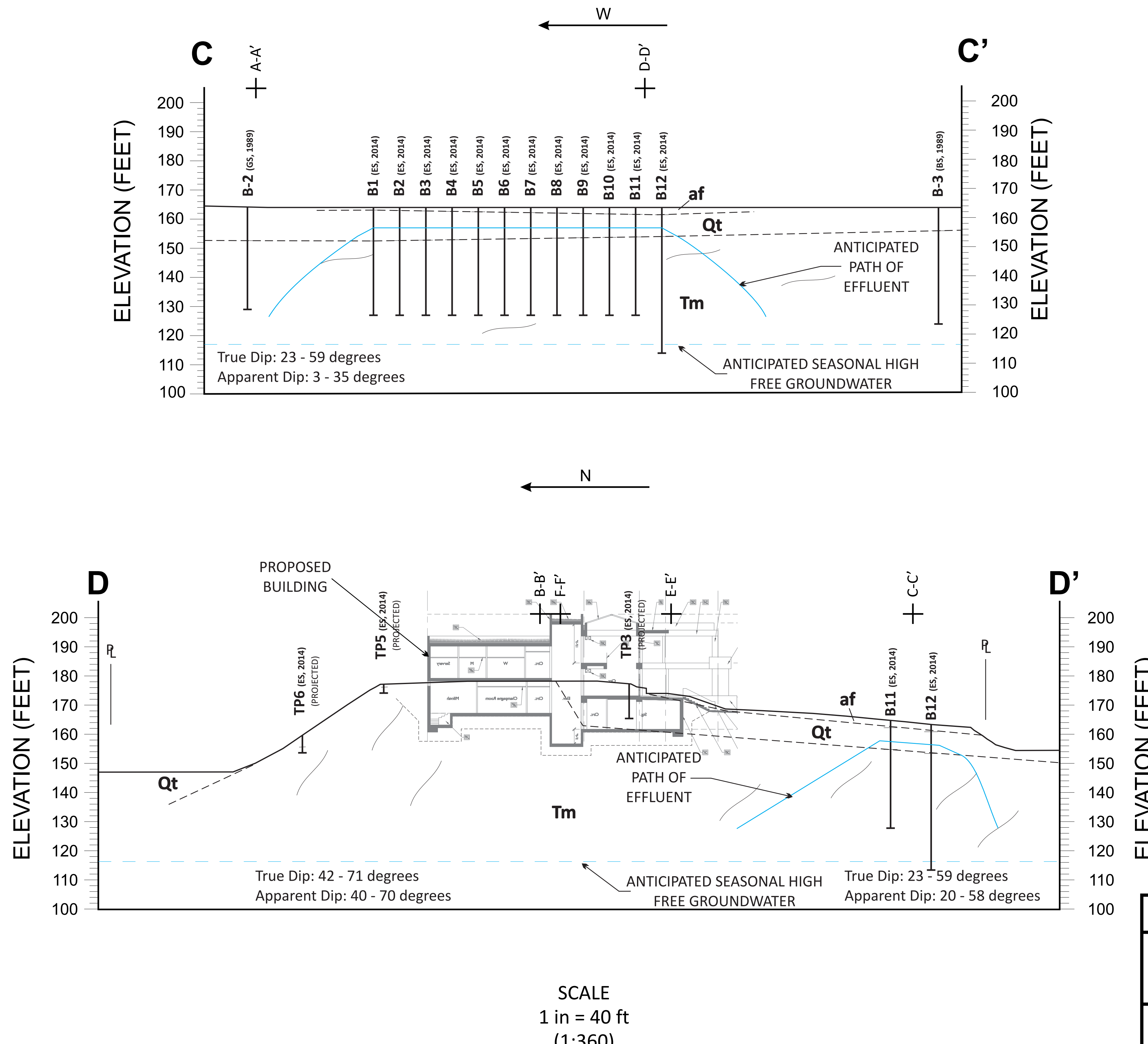


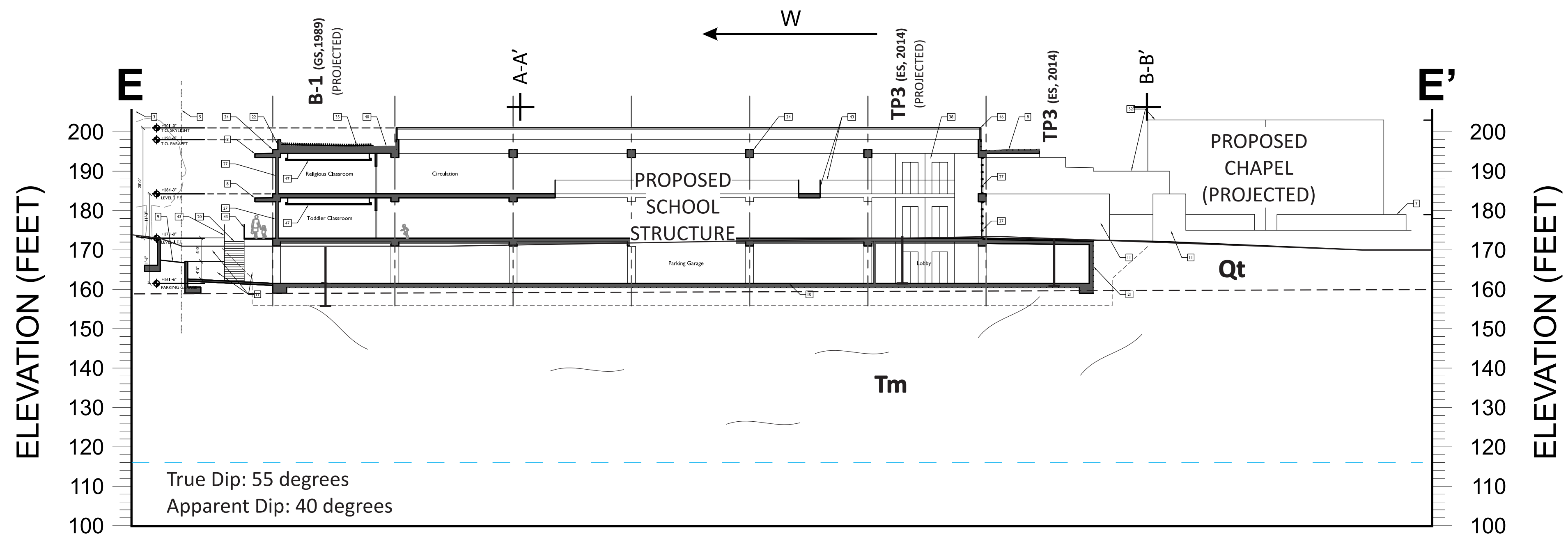
Plate III

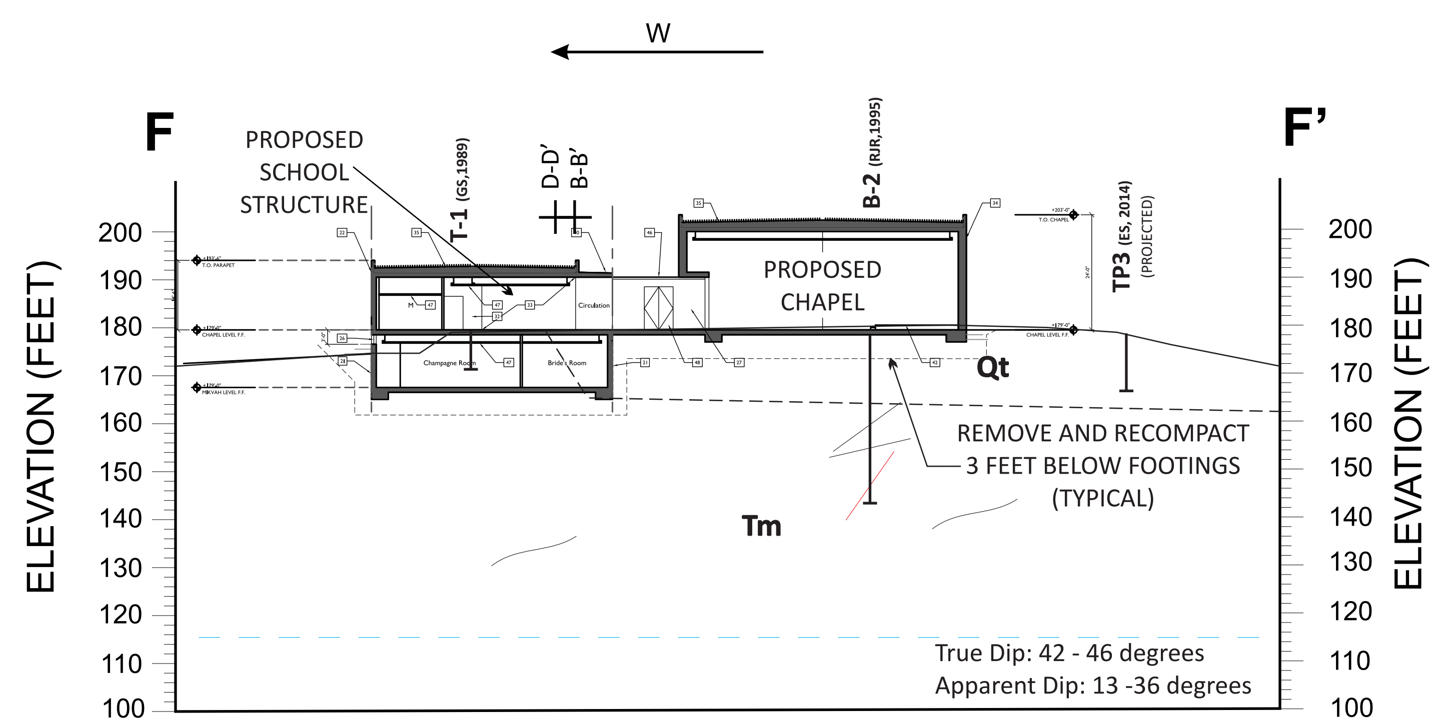
GEOLOGIC CROSS SECTIONS C & D

PROPOSED PRIVATE SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

12/21/2015	LA-01576-01





SCALE
1 in = 40 ft (H&V)

Plate IV

GEOLOGIC CROSS SECTIONS E & F

PROPOSED PRIVATE SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

12/21/2015	LA-01576-01

ATTACHMENT A

City of Malibu Review Sheet

City of Malibu

23825 Stuart Ranch Road • Malibu, California 90265-4861
(310) 456-2489 • Fax (310) 317-1950 • www.malibucity.org

GEOTECHNICAL REVIEW SHEET

Project Information

Date:	December 8, 2014	**Review Log #:**	**3677**
Site Address:	24855 Pacific Coast Highway		
Lot/Tract/PM #:	n/a	**Planning #:**	**CDP 14-069**
Applicant/Contact:	Mark Meyer, david@davidgrayarchitects.com	**BPC/GPC #:**	
Contact Phone #:	213-243-5707 **Fax #:**	**Planner:**	Adrian Fernandez
Project Type:	Malibu Jewish Center-New school and chapel, New onsite wastewater treatment system (OWTS)		

Submittal Information

Consultant(s) / Report Date(s):
(Current submittal(s) in Bold.)

Earth Systems Southern California (Mazzei, GE 2823; LaChapelle, CEG 1311): **11-12-14**
EnSitu Engineering, Inc. (Yaroslaski, RCE 60149): **10-17-14**

Building plans prepared by David Gray Architects dated October 15, 2014.
Grading plans prepared by Peak Surveys, Inc. dated October 15, 2014.
Final OWTS plans prepared by EnSitu Engineering, Inc. dated October 17, 2014.

Previous Reviews: Geotechnical Review Referral Sheet dated 11-18-14, Environmental Health Approval dated June 19, 2003

Review Findings

Coastal Development Permit Review

☐ The project is **APPROVED** from a geotechnical perspective, with the following comments to be addressed prior to building plan check stage approval.

☒ The project is **NOT APPROVED** from a geotechnical perspective. The listed 'Review Comments' shall be addressed prior to approval.

Building Plan-Check Stage Review

☒ Awaiting Building plan check submittal. Please respond to the listed 'Building Plan-Check Stage Review Comments' AND review and incorporate the attached 'Geotechnical Notes for Building Plan Check' into the plans.

☐ **APPROVED** from a geotechnical perspective. Please review the attached 'Geotechnical Notes for Building Plan Check' and incorporate into Building Plan-Check submittals.

☐ **NOT APPROVED** from a geotechnical perspective. The listed 'Building Plan-Check Stage Review Comments' shall be addressed prior to Building Plan-Check Stage approval.

Remarks

The referenced reports and plans were reviewed by the City from a geotechnical perspective. Based on the submitted information and a site reconnaissance, the project comprises demolishing the existing single-story modular school and administration buildings and constructing a new 22,902 square foot two-story school, chapel, and subterranean parking garage/basement. Grading consists of 5,640 yards of cut under structure; 368 yards of cut for safety; 685 yards of cut non-exempt; and 6,693 yards of export. The onsite wastewater treatment system (OWTS) will consist of a new treatment tank system and the utilization of two existing 5'-diameter x 30' BI seepage pits with 8' caps approved by the City in 2003 to dispose of the treated effluent. The existing septic tank will be removed or properly abandoned.

NOTICE: Applicants shall be required to submit all Geotechnical reports for this project as searchable PDF files on a CD. At the time of Building Plan Check application, the Consultant must provide searchable PDF files on a CD to the Building Department for ALL previously submitted reports that have been reviewed by City Geotechnical Staff.

The City of Malibu is pleased to announce the release of the new Geotechnical Guidelines. These new guidelines became effective November 1, 2013. Geotechnical reports submitted to the City with any new development AFTER November 1, 2013 must conform to the requirements of the new guidelines. Geotechnical Consultants are strongly urged to review and familiarize themselves with these new guidelines to insure Geotechnical Reports are consistent with the guidelines.

Review Comments:

1. The Project Geotechnical Consultant provides recommendations for R & R below the proposed buildings and recommendations for different bearing materials for new foundations (compacted fill, bedrock). Please provide a clear description of the site preparation (grading besides cut) and proposed foundation systems for the proposed school and chapel buildings and any retaining walls, hardscape, and accessory structures.
2. Provide updated east-west and north-south cross-sections across the proposed development that clearly depict the proposed improvements and grading, including existing and proposed grades, R & R grading, structures, retaining walls, flatwork and roadways, parking lots, the OWTS, geologic conditions, depths to groundwater, and subsurface exploration.
3. The Environmental Health approval from 2003 describes three existing 5' diameter x 23' BI seepage pits with 12' caps for the school while the Project OWTS Consultant (EnSitu Engineering, Inc.) discusses utilizing two existing 5'-diameter x 30' BI seepage pits with 8' caps for the proposed school and chapel. Please clarify the quantity and design of the seepage pits and contact Andrew Sheldon regarding any additional requirements for verification of the existing OWTS and additional testing that may be required. It appears that the new OWTS requires additional percolation testing, supporting geology, and design reports to be reviewed by the City.
4. Please provide a geologic cross section(s) across the site that includes the existing seepage pits to be utilized for the OWTS that extends to the toe of the critical slope (Puerco Canyon). The cross-sections should show the capping depth of the seepage pits and the highest anticipated groundwater levels considering the Puerco Canyon drainage and the proposed OWTS. The Project Engineering Geologist shall provide sufficient geologic/hydrostratigraphic data to substantiate their conclusions regarding the potential for groundwater mounding and the potential for effluent to daylight on slopes. Highest anticipated groundwater levels, taking into account the effluent from the OWTS, the Puerco Canyon drainage, and irrigation, shall be utilized in the slope stability analyses. The slope stability analyses need to be re-run incorporating the OWTS and irrigation.
5. The Project Geotechnical Consultant needs to provide a complete finding in accordance with Section 111 of the Malibu Building Code regarding the proposed OWTS.

6. The Project Geotechnical Consultant needs to discuss if building surcharges will impact slope stability. Slope stability analysis may need to be re-run.
7. The Project Geotechnical Consultant needs to re-visit the surficial slope stability. The reviewer takes exception to the Consultant using test data for surficial slope stability from a soil sample classified as having angular shale fragments. It appears that the stress-strain data for the 1,000 psf load is suspect. Neglecting that data, the shear test would result in values of about 28°friction and about 300 psf cohesion. RJR reported direct shear data on slope soil material as 24°friction and 225 psf cohesion in their August 21, 2002 report for 24903 PCH. The Consultant used a value of 34°friction and about 90 psf cohesion for artificial fill in the slope stability calculations. Please revise the soil strength parameters and re-submit for City review.
8. The Consultant suggests that surficial slope stability for slopes steeper than 1½:1 have factors of safety less than 1.5, yet the surficial stability analysis shows an acceptable factor of safety for a 1:1 slope using the high strength values. The Consultant needs to revise this conclusion the basis of the re-evaluation suggested in the preceding comment.
9. The fault mapped in the southern portion of the property to the west (24903 PCH) by Mountain Geology trends east into the subject site and is as close as 20 to 30 feet from the proposed school and chapel building. While the fault is most likely not active, the Project Engineering Geologist needs to evaluate whether or not mitigation measures are required for the proposed structures, such as deepened, more rigid foundations, additional grading, etc. Provide a discussion of possible mitigation measures and the risks the fault poses to the proposed development.

Building Plan-Check Stage Review Comments:

1. The Project Geotechnical Consultant cites Al Atik and Sitar (2010) to justify limiting the CBC requirement for seismic loading on retaining walls to only those walls in excess of six feet in height. In review of the cited paper, the case that they are showing where there is no lateral force for a Z(m) of 2 meters (~6 feet) is for a specific ground motion from the Loma Prieta earthquake and is not necessarily applicable to all ground motions. Further, the paper states "*At this point, more experimental work and well-documented case histories are needed to fully explore the range of potential soil conditions and types of retaining structures and to further develop methods of analysis that are consistent with the actual dynamic behavior of these systems.*" The CBC does not recognize the conclusions of the cited paper. Although the County of Los Angeles has allowed a six-foot exemption, neither the City of Malibu nor CBC, has adopted the exemption. The Consultant needs to provide recommendations for lateral pressures on all retaining walls, regardless of height.
2. Please provide the slot cut calculations referenced in Appendix E
3. The Consultant needs to comment on the potential for differential settlement between pile supported, bedrock supported, and compacted fill supported portions of the structure(s) if this condition is expected.
4. In accordance with the City guidelines, please provide bearing capacity calculations for all foundations designed for bearing capacities that exceed 3000 psf.
5. In order to justify the selection of Site Class C for the project, the Project Geotechnical Engineer or the Project Engineering Geologist needs to provide the standard penetration resistance or shear wave velocity of the underlying bedrock materials based on measured values or on judgment as specified in Section 1613.3.2 of the **2013** CBC and present those to the City for review.
6. Section 7.4 of the City's geotechnical guidelines requires a minimum thickness of 10 mils for vapor barriers beneath slabs-on-grade. The Project Geotechnical Engineer has recommended that the vapor barrier conform to ASTM E1746. Building plans shall reflect the Consultant's requirement.

7. The following note must appear on the grading and foundation plans: *"Tests shall be performed prior to pouring footings and slabs to evaluate the Weighted Plasticity and the Expansion Index of the supporting soils, and foundation and slab plans should be reviewed by the Civil or Structural Engineer and revised, if necessary."*

8. The following note must appear on the grading and foundation plans: *"Tests shall be performed prior to pouring pile foundations, footings and slabs to evaluate corrosivity of the supporting soils, and foundation and slab plans should be reviewed by the Civil or Structural Engineer and revised, if necessary."*

9. The yardages on the grading plans needs to be revised to reflect any R & R grading proposed across the site (for the buildings, flatwork, roadways or parking lots, etc.)

10. Recommendations to properly abandon any OWTS components on the property need to be included as notes on the building, grading, and OWTS plans.

11. Two sets of final grading, retaining wall, shoring, OWTS, and school/chapel plans (**APPROVED BY BUILDING AND SAFETY**) incorporating the Project Geotechnical Consultant's recommendations and items in this review sheet must be **reviewed and wet stamped and manually signed by the Project Engineering Geologist and Project Geotechnical Engineer**. City geotechnical staff will review the plans for conformance with the Project Geotechnical Consultants' recommendations and items in this review sheet over the counter at City Hall. **Appointments for final review and approval of the plans may be made by calling or emailing City Geotechnical staff.**

Please direct questions regarding this review sheet to City Geotechnical staff listed below.

Engineering Geology Review by: 12/8/14

Christopher Dean, C.E.G. #1751, Exp. 9-30-16 Date
Engineering Geology Reviewer (310-456-2489, x306)
Email: cdean@malibucity.org

Geotechnical Engineering Review by: *December 8, 2014*

Kenneth Clements, G.E. # 2010, Exp. 6-30-16 Date
Geotechnical Engineering Reviewer (805-563-8909)
Email: kclements@fugro.com

This review sheet was prepared by City Geotechnical Staff contracted with Fugro as an agent of the City of Malibu.

FUGRO CONSULTANTS, INC.
4820 McGrath Street, Suite 100
Ventura, California 93003-7778
(805) 650-7000 (*Ventura office*)
(310) 456-2489, x306 (*City of Malibu*)

City of Malibu

– GEOTECHNICAL –

NOTES FOR BUILDING PLAN-CHECK

The following standard items should be incorporated into Building Plan-Check submittals, as appropriate:

1. One set of grading, retaining walls, OWTS, shoring, and school and chapel building plans, incorporating the Project Geotechnical Consultant's recommendations and items in this review sheet, must be submitted to City geotechnical staff for review. **Additional review comments may be raised at that time that may require a response.**
2. Show the name, address, and phone number of the Project Geotechnical Consultant(s) on the cover sheet of the Building Plans.
3. Include the following note on the Foundation Plans: *"All foundation excavations must be observed and approved by the Project Geotechnical Consultant prior to placement of reinforcing steel."*
4. The Foundation Plans for the proposed project shall clearly depict the embedment material and minimum depth of embedment for the foundations in accordance with the Project Geotechnical Consultant's recommendations.
5. Please depict the Code-required minimum foundation setbacks from descending slopes on the plans, as appropriate.
6. Please contact the Building and Safety Department regarding the submittal requirements for a grading and drainage plan review.
7. A comprehensive Site Drainage Plan, incorporating the Geotechnical Consultant's recommendations, shall be included in the Plans. Show all area drains, outlets, and non-erosive drainage devices on the Plans. Water shall not be allowed to flow uncontrolled over descending slopes.

Grading Plans (as Applicable)

1. Grading Plans shall clearly depict the limits and depths of overexcavation, as applicable.
2. Prior to final approval of the project, an as-built compaction report prepared by the Project Geotechnical Consultant must be submitted to the City for review. The report must include the results of all density tests as well as a map depicting the limits of fill, locations of all density tests, locations and elevations of all removal bottoms, locations and elevations of all keyways and back drains, and locations and elevations of all retaining wall backdrains and outlets. Geologic conditions exposed during grading must be depicted on an as-built geologic map. This comment must be included as a note on the grading plans.

Retaining Walls (As Applicable)

1. Show the retaining wall backdrain and backfill design, as recommended by the Project Geotechnical Consultant, on the Plans.
2. Retaining walls separate from a residence require separate permits. Contact the Building and Safety Department for permit information. One set of retaining wall plans shall be submitted to the City for review by City geotechnical staff. Additional concerns may be raised at that time which may require a response by the Project Geotechnical Consultant and applicant.

City of Malibu

23825 Stuart Ranch Road
Malibu, California 90265
(310) 456-2489 Fax (310) 317-1950

GEOTECHNICAL REVIEW FIXED FEE FORM

PROJECT OWNER/APPLICANT: Mark Meyer

PROJECT ADDRESS: 24855 Pacific Coast Highway

GEOTECHNICAL LOG NO: 3677

PLANNING NO: CDP 14-069

PLAN CHECK NO:

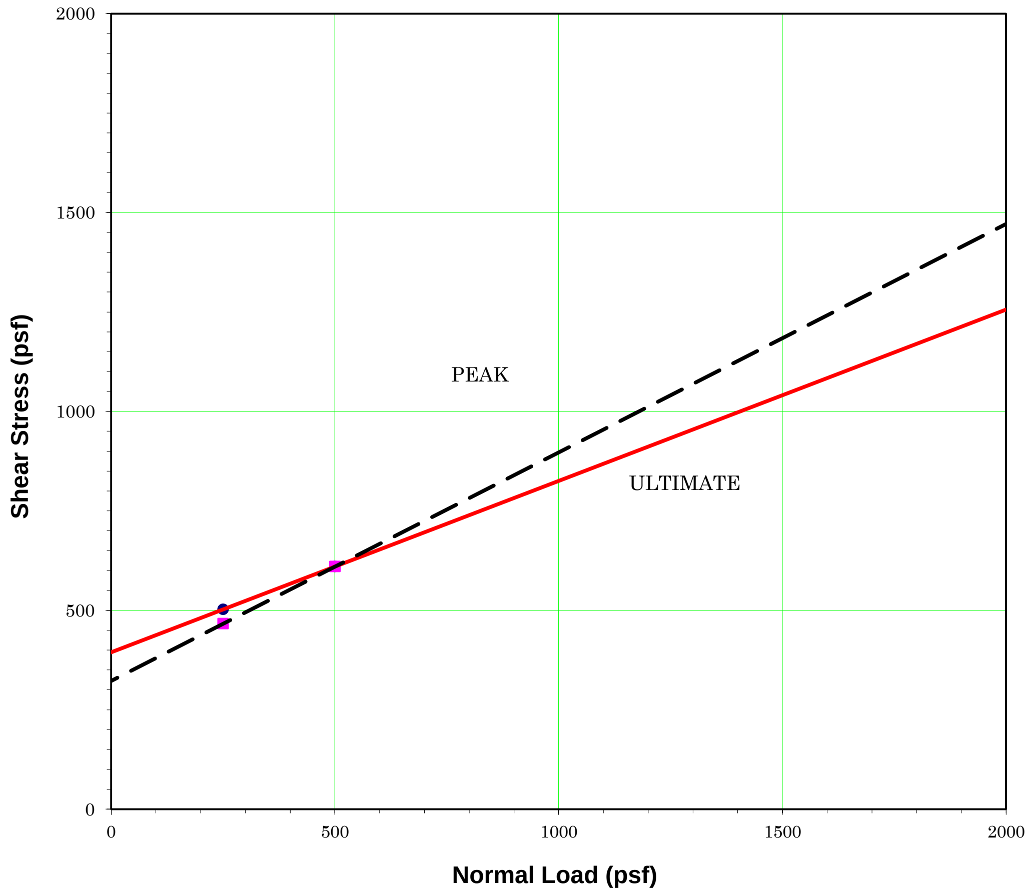
ITEM	STATUS	DATE	DEPOSIT	CHARGE	BALANCE	COMMENTS
FIXED FEE BY: Mark Meyer		11/6/2014	$3,000.00	$0.00	$0.00	**Fixed Fee**
Initial Review, CDP 14-069	**Response Required**	12/8/2014		$0.00	$0.00	Items to address for Consultants
Second review						
Additional Reviews: Time & Material						
Third review						
Fourth review						
Applicant Paid Balance Due						
Fifth review						
Applicant Paid Balance Due						
					$0.00	
REFUND DUE APPLICANT						REFUND # ________
BALANCE DUE CITY OF MALIBU						

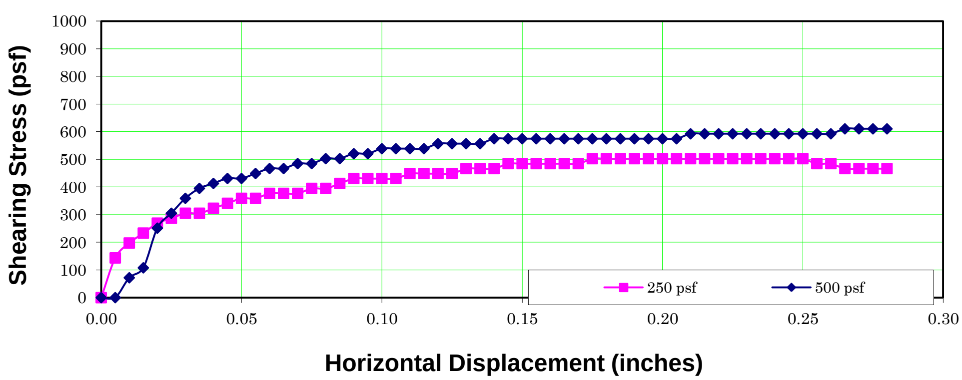
NOTE:

The Fixed Fee incorporates the initial and one subsequent geotechnical review. Subsequent reviews will be performed in accordance with the City's time and materials rate of $201.50 per hour.

ATTACHMENT B

Updated Results of Direct Shear Test





DIRECT SHEAR DATA*

Sample Location:	TP6 at 2.5 feet	
Material:	Artificial fill; Silty SAND (SM)	
Dry Density:	66.2 pcf	
	Initial	Final
Moisture Content:	28.4%	50.4%
Saturation:	50%	89%
	Peak	Ultimate
ϕ Angle of Friction (degrees):	23	30
c Cohesive Strength (psf):	390	320

Test Type: Peak and Ultimate   Shear Rate (in/min): 0.005

* Test Method: ASTM D-3080

DIRECT SHEAR TEST

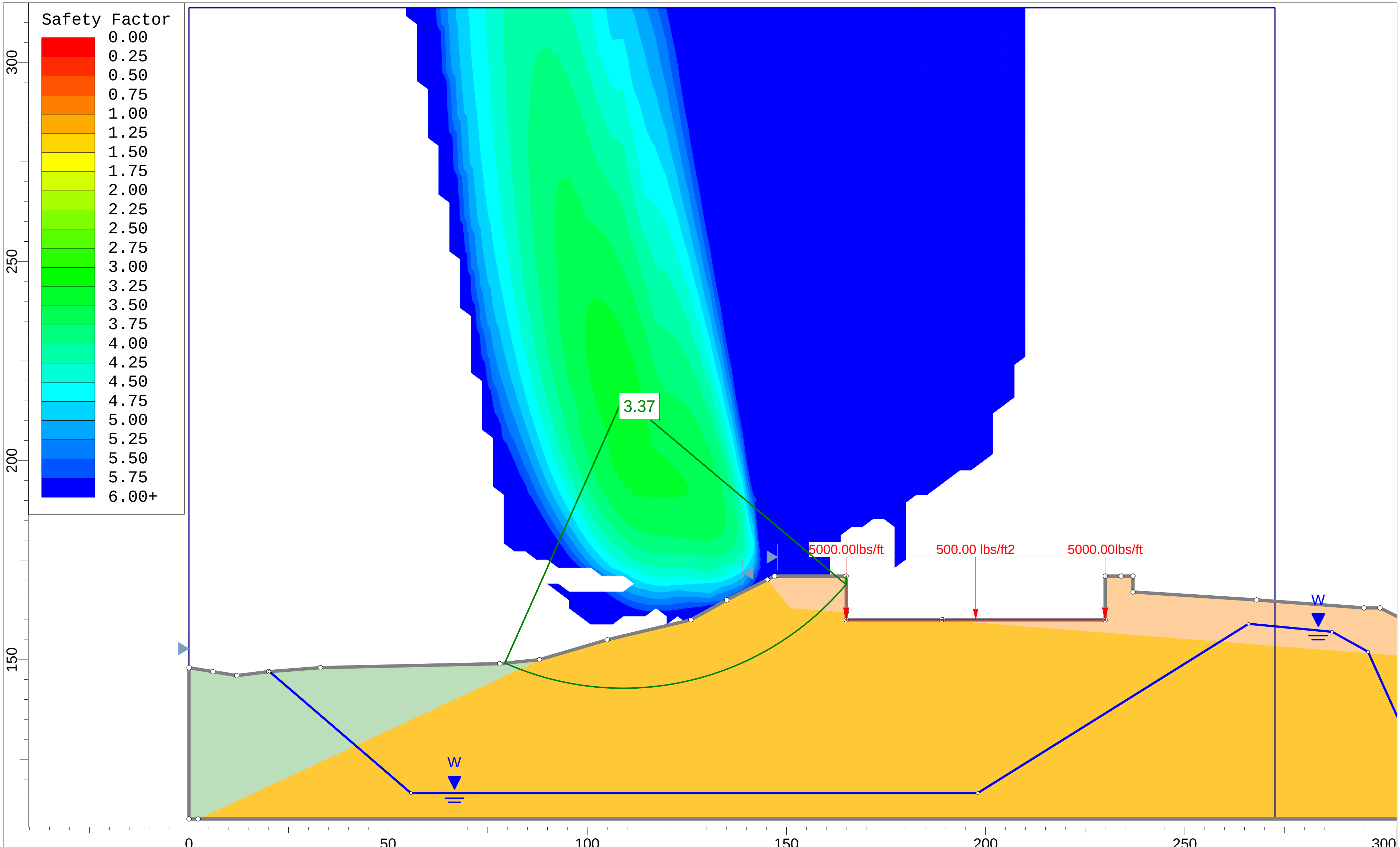
PROPOSED SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

12/21/2015 | LA-01576-01

ATTACHMENT C

Updated Slope Stability Analysis



Project	LA-01576-01 - Malibu Jewish Center
Analysis Description	Section A-A' - Rotational - Static
Drawn By	
Scale	1:400
Company	Earth Systems
Date	12/15/2015
File Name	LA-01576-01_A_Circular.slim

SLIDEINTERPRET 6.029

Slide Analysis Information
LA-01576-01 - Malibu Jewish Center

Project Summary

- File Name: LA-01576-01_A_Circular
- Slide Modeler Version: 6.029
- Project Title: LA-01576-01 - Malibu Jewish Center
- Analysis: Section A-A' - Rotational - Static
- Company: Earth Systems
- Date Created: 12/15/2015

General Settings

- Units of Measurement: Imperial Units
- Time Units: days
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 20
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

  - Spencer
- Number of slices: 25
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

Surface Options

- Surface Type: Circular
- Search Method: Grid Search
- Radius Increment: 10
- Composite Surfaces: Disabled
- Reverse Curvature: Create Tension Crack
- Minimum Elevation: Not Defined
- Minimum Depth: Not Defined

Loading

- 1 Distributed Load present

Distributed Load 1

  - Distribution: Constant
  - Magnitude [psf]: 500
  - Orientation: Normal to boundary
- 2 Line Loads present

Line Load: Line Load #2

  - Angle from horizontal: 270 degrees

- Magnitude: 5000

Line Load: Line Load #3

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Material Properties

Property	Qa	Qt	Tm
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	130	115
Cohesion [psf]	90	90	480
Friction Angle [deg]	34	34	27
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Global Minimums

Method: spencer

- FS: 3.370110
- Center: 109.058, 215.902
- Radius: 73.114
- Left Slip Surface Endpoint: 79.278, 149.128
- Right Slip Surface Endpoint: 165.000, 168.827
- Left Slope Intercept: 79.278 149.128
- Right Slope Intercept: 165.000 171.000
- Resisting Moment=7.49038e+006 lb-ft
- Driving Moment=2.2226e+006 lb-ft
- Resisting Horizontal Force=94877.3 lb
- Driving Horizontal Force=28152.6 lb
- Total Slice Area=1012.86 ft2

Slice Data

- **Global Minimum Query (spencer) - Safety Factor: 3.37011**

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	3.63153	406.82	Qa	90	34	59.923	201.947	165.969	0	165.969
2	3.45287	1074.26	Tm	480	27	214.029	721.3	473.579	0	473.579
3	3.45287	1677.62	Tm	480	27	241.884	815.176	657.821	0	657.821
4	3.45287	2422.98	Tm	480	27	275.73	929.24	881.682	0	881.682
5	3.45287	3129.87	Tm	480	27	306.353	1032.44	1084.23	0	1084.23
6	3.45287	3768.12	Tm	480	27	332.53	1120.66	1257.37	0	1257.37
7	3.45287	4339.41	Tm	480	27	354.612	1195.08	1403.43	0	1403.43
8	3.45287	4830.99	Tm	480	27	372.232	1254.46	1519.97	0	1519.97
9	3.45287	5200.67	Tm	480	27	383.699	1293.11	1595.82	0	1595.82
10	3.45287	5499.43	Tm	480	27	391.59	1319.7	1648.01	0	1648.01
11	3.45287	5733.16	Tm	480	27	396.317	1335.63	1679.27	0	1679.27
12	3.45287	5901.23	Tm	480	27	397.982	1341.24	1690.28	0	1690.28
13	3.45287	6002.54	Tm	480	27	396.657	1336.78	1681.52	0	1681.52
14	3.45287	6094.41	Tm	480	27	394.838	1330.65	1669.49	0	1669.49
15	3.45287	6442.01	Tm	480	27	403.296	1359.15	1725.43	0	1725.43
16	3.45287	6766.37	Tm	480	27	410.261	1382.63	1771.5	0	1771.5
17	3.45287	6982.01	Tm	480	27	412.385	1389.78	1785.55	0	1785.55
18	3.45287	7072.1	Tm	480	27	409.21	1379.08	1764.55	0	1764.55
19	3.45287	7074.76	Tm	480	27	402.397	1356.12	1719.49	0	1719.49

20	3.45287	7049.23	Tm	480	27	394.252	1328.67	1665.62	0	1665.62
21	3.45287	6502.32	Tm	480	27	367.105	1237.18	1486.06	0	1486.06
22	3.45287	5573.36	Tm	480	27	327.187	1102.66	1222.03	0	1222.03
23	3.45287	4459.46	Tm	480	27	282.315	951.434	925.242	0	925.242
24	3.06388	2829.22	Qt	90	34	158.011	532.514	656.054	0	656.054
25	3.06388	1546.2	Qt	90	34	93.8604	316.32	335.533	0	335.533

Interslice Data

- **Global Minimum Query (spencer) - Safety Factor: 3.37011**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	79.2775	149.128	0	0	0
2	82.9091	147.624	467.341	105.952	12.7737
3	86.3619	146.4	1786.47	405.014	12.7737
4	89.8148	145.366	3302.38	748.686	12.7737
5	93.2677	144.513	5006.45	1135.02	12.7737
6	96.7206	143.836	6798.88	1541.38	12.7737
7	100.173	143.33	8584.72	1946.25	12.7737
8	103.626	142.99	10286.7	2332.11	12.7737
9	107.079	142.815	11839.1	2684.05	12.7736
10	110.532	142.803	13183.7	2988.89	12.7737
11	113.985	142.954	14287.1	3239.05	12.7737
12	117.438	143.27	15126.3	3429.31	12.7737
13	120.891	143.752	15686.5	3556.3	12.7737
14	124.344	144.404	15960.7	3618.48	12.7737
15	127.796	145.23	15945.3	3614.97	12.7736
16	131.249	146.237	15601	3536.91	12.7736
17	134.702	147.433	14900.1	3378.02	12.7737
18	138.155	148.827	13834.8	3136.51	12.7737
19	141.608	150.433	12414.7	2814.56	12.7737
20	145.061	152.267	10652.3	2415.01	12.7737
21	148.514	154.348	8547.83	1937.89	12.7737
22	151.966	156.703	6316.15	1431.94	12.7737
23	155.419	159.367	4191.81	950.331	12.7737
24	158.872	162.384	2375.23	538.493	12.7737
25	161.936	165.409	875.01	198.375	12.7737
26	165	168.827	0	0	0

List Of Coordinates

Water Table

X	Y
20.22	147.02
55.7426	116.5
198	116.5
266	159
287	157
296	152
312	116.5
330	116.5

Line Load

X	Y
230	160
189.357	160
189	160
165	160

External Boundary

X	Y
0	110
2.3	110
330	110
330	149
330	155
315	155
314	157
305	160
299	163
295	163
268	165
237	167
237	171
234	171
230	171
230	160
189.357	160
189	160
165	160
165	161.905
165	162
165	171
147	171
145.222	170.111
135	165
126	160
105	155
88	150
78	149
33	148
20	147
12	146
6	147
0	148

Material Boundary

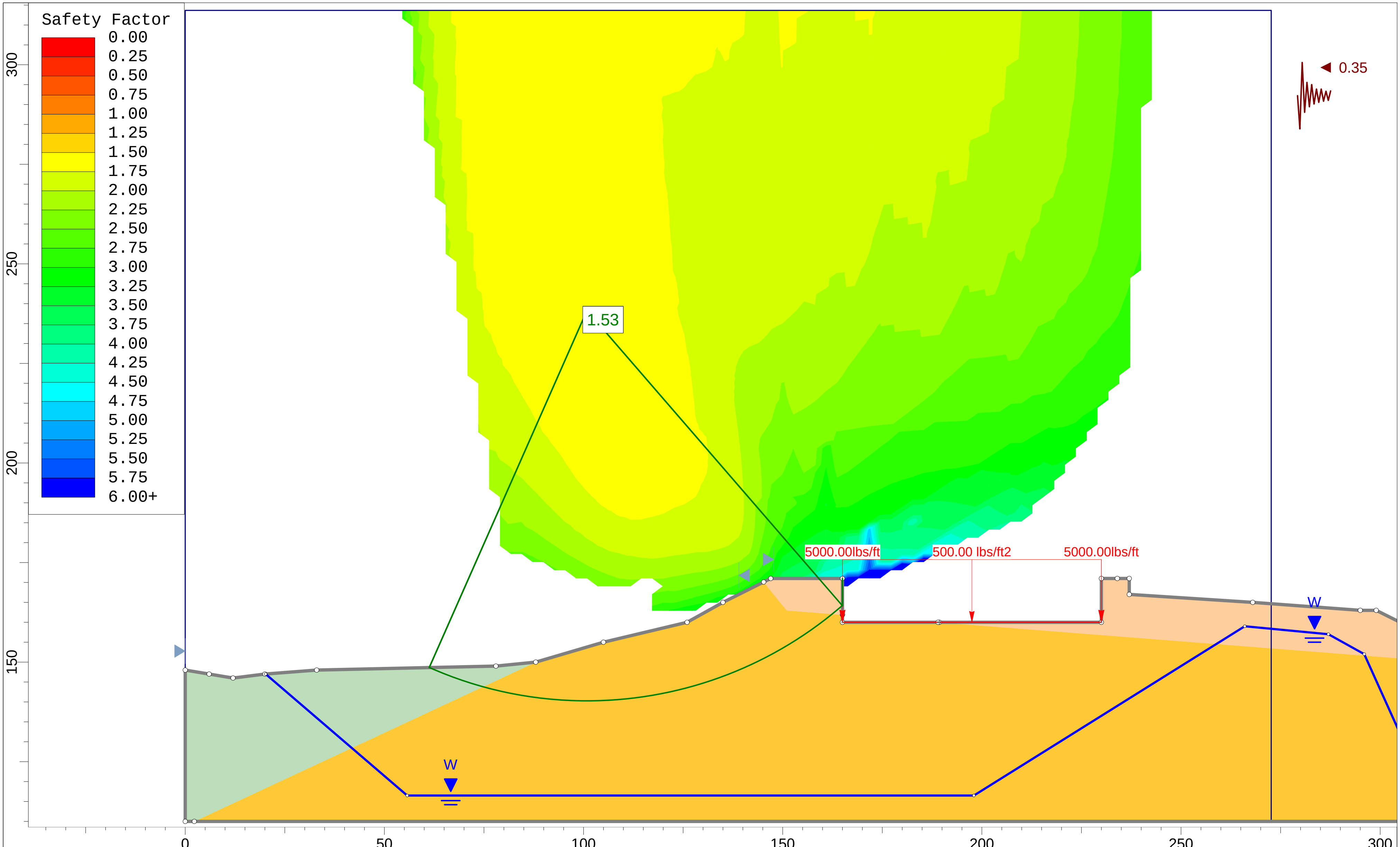
X	Y
2.3	110
88	150

Material Boundary

X	Y
145.222	170.111
151	163
164.99	161.906
165	161.905

Material Boundary

X	Y
189.357	160
330	149



Project	LA-01576-01 - Malibu Jewish Center		
Analysis Description	Section A-A' - Rotational - Pseudostatic		
Drawn By	*Scale* 1:400	*Company*	Earth Systems
Date 12/15/2015		*File Name*	LA-01576-01_A_Circular_g.slim

SLIDEINTERPRET 6.029

Slide Analysis Information
LA-01576-01 - Malibu Jewish Center

Project Summary

- File Name: LA-01576-01_A_Circular_g
- Slide Modeler Version: 6.029
- Project Title: LA-01576-01 - Malibu Jewish Center
- Analysis: Section A-A' - Rotational - Pseudostatic
- Company: Earth Systems
- Date Created: 12/15/2015

General Settings

- Units of Measurement: Imperial Units
- Time Units: days
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 20
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

  - Spencer
- Number of slices: 25
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

Surface Options

- Surface Type: Circular
- Search Method: Grid Search
- Radius Increment: 10
- Composite Surfaces: Disabled
- Reverse Curvature: Create Tension Crack
- Minimum Elevation: Not Defined
- Minimum Depth: Not Defined

Loading

- Seismic Load Coefficient (Horizontal): 0.35
- 1 Distributed Load present

Distributed Load 1

  - Distribution: Constant
  - Magnitude [psf]: 500
  - Orientation: Normal to boundary
- 2 Line Loads present

Line Load: Line Load #2

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #3

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Material Properties

Property	Qa	Qt	Tm
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	130	115
Cohesion [psf]	90	90	480
Friction Angle [deg]	34	34	27
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Global Minimums

Method: spencer

- FS: 1.525750
- Center: 100.878, 238.304
- Radius: 98.031
- Left Slip Surface Endpoint: 61.276, 148.628
- Right Slip Surface Endpoint: 165.000, 164.152
- Left Slope Intercept: 61.276 148.628
- Right Slope Intercept: 165.000 171.000
- Resisting Moment=1.19757e+007 lb-ft
- Driving Moment=7.84907e+006 lb-ft
- Resisting Horizontal Force=115807 lb
- Driving Horizontal Force=75901.6 lb
- Total Slice Area=1297.75 ft2

Slice Data

- **Global Minimum Query (spencer) - Safety Factor: 1.52575**

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	4.49299	526.314	Qa	90	34	197.352	301.11	312.983	0	312.983
2	4.49299	1510.67	Qa	90	34	342.843	523.093	642.087	0	642.087
3	4.49299	2361.93	Qa	90	34	446.272	680.899	876.043	0	876.043
4	4.18043	2824.66	Tm	480	27	705.796	1076.87	1171.42	0	1171.42
5	4.18043	3406.47	Tm	480	27	736.517	1123.74	1263.41	0	1263.41
6	4.18043	3946.04	Tm	480	27	761.076	1161.21	1336.95	0	1336.95
7	4.18043	4542.37	Tm	480	27	788.962	1203.76	1420.46	0	1420.46
8	4.18043	5321.3	Tm	480	27	830.377	1266.95	1544.47	0	1544.47
9	4.18043	6019.7	Tm	480	27	862.2	1315.5	1639.76	0	1639.76
10	4.18043	6632.16	Tm	480	27	884.974	1350.25	1707.96	0	1707.96
11	4.18043	7125.87	Tm	480	27	897.056	1368.68	1744.14	0	1744.14
12	4.18043	7456.86	Tm	480	27	896.208	1367.39	1741.6	0	1741.6
13	4.18043	7697.75	Tm	480	27	888.737	1355.99	1719.23	0	1719.23
14	4.18043	7850.28	Tm	480	27	875.293	1335.48	1678.97	0	1678.97
15	4.18043	7912.58	Tm	480	27	856.22	1306.38	1621.86	0	1621.86
16	4.18043	8057.61	Tm	480	27	843.004	1286.21	1582.28	0	1582.28
17	4.18043	8548.01	Tm	480	27	851.184	1298.69	1606.78	0	1606.78
18	4.18043	8940.54	Tm	480	27	852.022	1299.97	1609.29	0	1609.29

19	4.18043	9145.48	Tm	480	27	840.835	1282.9	1575.79	0	1575.79
20	4.18043	9234.89	Tm	480	27	822.622	1255.12	1521.25	0	1521.25
21	4.18043	9195.8	Tm	480	27	797.209	1216.34	1445.15	0	1445.15
22	4.18043	8310.34	Tm	480	27	728.106	1110.91	1238.23	0	1238.23
23	4.18043	7034.93	Tm	480	27	642.939	980.964	983.196	0	983.196
24	4.18043	5597.46	Tm	480	27	554.887	846.619	719.53	0	719.53
25	2.45643	2514.88	Qt	90	34	306.187	467.165	559.17	0	559.17

Interslice Data

- **Global Minimum Query (spencer) - Safety Factor: 1.52575**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	61.2756	148.628	0	0	0
2	65.7686	146.776	1284.52	534.804	22.6042
3	70.2616	145.177	3326.89	1385.14	22.6042
4	74.7546	143.818	5700.72	2373.47	22.6042
5	78.935	142.76	8908.7	3709.1	22.6042
6	83.1154	141.896	11895.6	4952.69	22.6042
7	87.2959	141.218	14609.5	6082.61	22.6042
8	91.4763	140.725	17027.3	7089.23	22.6042
9	95.6567	140.412	19127.9	7963.8	22.6041
10	99.8371	140.278	20853.5	8682.26	22.6042
11	104.018	140.323	22164.7	9228.15	22.6041
12	108.198	140.547	23040.5	9592.8	22.6042
13	112.378	140.95	23484.2	9777.55	22.6042
14	116.559	141.535	23508.3	9787.57	22.6042
15	120.739	142.306	23134.9	9632.1	22.6042
16	124.92	143.267	22395.6	9324.33	22.6042
17	129.1	144.423	21278.5	8859.22	22.6042
18	133.281	145.783	19669.4	8189.25	22.6041
19	137.461	147.355	17581.4	7319.92	22.6041
20	141.641	149.15	15075.3	6276.53	22.6042
21	145.822	151.182	12198.6	5078.82	22.6041
22	150.002	153.469	9016.19	3753.85	22.6042
23	154.183	156.032	5986.16	2492.31	22.6042
24	158.363	158.896	3401.97	1416.39	22.6041
25	162.544	162.097	1465.23	610.041	22.6042
26	165	164.152	0	0	0

List Of Coordinates

Water Table

X	Y
20.22	147.02
55.7426	116.5
198	116.5
266	159
287	157
296	152
312	116.5
330	116.5

Line Load

X	Y
230	160
189.357	160
189	160
165	160

External Boundary

X	Y
0	110
2.3	110
330	110
330	149
330	155
315	155
314	157
305	160
299	163
295	163
268	165
237	167
237	171
234	171
230	171
230	160
189.357	160
189	160
165	160
165	161.905
165	162
165	171
147	171
145.222	170.111
135	165
126	160
105	155
88	150
78	149
33	148
20	147
12	146
6	147
0	148

Material Boundary

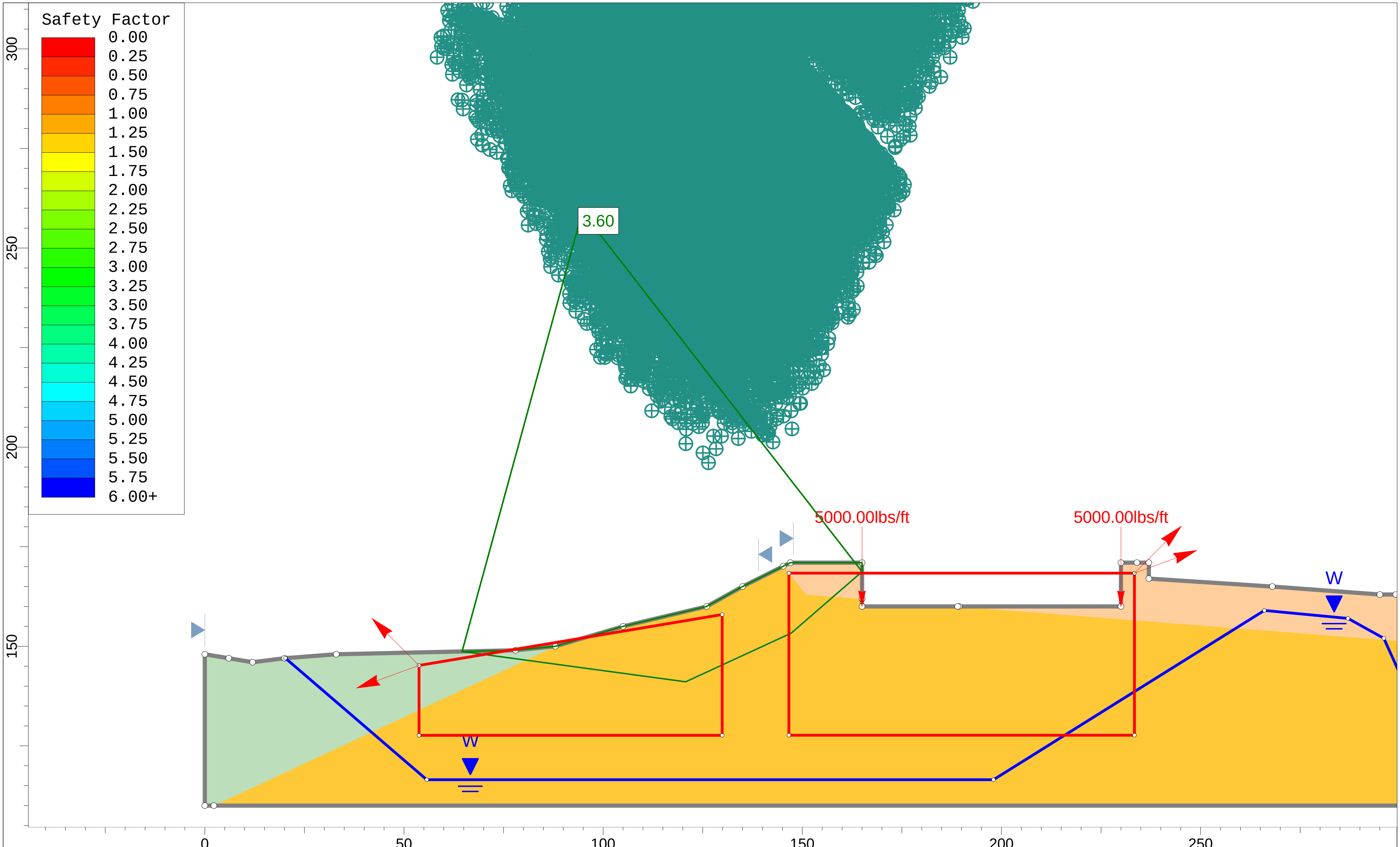
X	Y
2.3	110
88	150

Material Boundary

X	Y
145.222	170.111
151	163
164.99	161.906
165	161.905

Material Boundary

X	Y
189.357	160
330	149



Project	LA-01576-01 - Malibu Jewish Center		
Analysis Description	A-A' - Planar - Static		
Drawn By		*Scale* 1:400	*Company* Earth Systems
Date 12/15/2015		*File Name* LA-01576-01_A_Planar.slim	

SLIDEINTERPRET 6.029

Slide Analysis Information
LA-01576-01 - Malibu Jewish Center

Project Summary

- File Name: LA-01576-01_A_Planar
- Slide Modeler Version: 6.029
- Project Title: LA-01576-01 - Malibu Jewish Center
- Analysis: A-A' - Planar - Static
- Company: Earth Systems
- Date Created: 12/15/2015

General Settings

- Units of Measurement: Imperial Units
- Time Units: days
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 20
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

  - Spencer
- Number of slices: 25
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

Surface Options

- Surface Type: Non-Circular Block Search
- Number of Surfaces: 50000
- Pseudo-Random Surfaces: Enabled
- Convex Surfaces Only: Disabled
- Left Projection Angle (Start Angle): 135
- Left Projection Angle (End Angle): 200
- Right Projection Angle (Start Angle): 20
- Right Projection Angle (End Angle): 45
- Minimum Elevation: Not Defined
- Minimum Depth: Not Defined

Loading

- 2 Line Loads present

Line Load: Line Load #1

  - Angle from horizontal: 270 degrees
  - Magnitude: 5000

Line Load: Line Load #2

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Material Properties

Property	Qa	Qt	Tm
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	130	115
Cohesion [psf]	90	90	480
Friction Angle [deg]	34	34	27
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Global Minimums

Method: spencer

- FS: 3.595870
- Axis Location: 94.787, 259.105
- Left Slip Surface Endpoint: 64.605, 148.702
- Right Slip Surface Endpoint: 165.000, 168.718
- Left Slope Intercept: 64.605 148.702
- Right Slope Intercept: 165.000 171.000
- Resisting Moment=1.25102e+007 lb-ft
- Driving Moment=3.47904e+006 lb-ft
- Resisting Horizontal Force=99682.9 lb
- Driving Horizontal Force=27721.5 lb
- Total Slice Area=1052.04 ft2

Global Minimum Coordinates

Method: spencer

X	Y
64.6052	148.702
120.728	141.068
147.228	153.305
165	168.718
165.001	171

Slice Data

- **Global Minimum Query (spencer) - Safety Factor: 3.59587**

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	3.99056	151.211	Qa	90	34	34.8159	125.194	52.1765	0	52.1765
2	3.99056	453.633	Qa	90	34	50.5972	181.941	136.308	0	136.308
3	3.99056	756.056	Qa	90	34	66.3784	238.688	220.439	0	220.439
4	3.99056	1089.24	Qa	90	34	83.765	301.208	313.127	0	313.127
5	4.01602	1517.75	Tm	480	27	199.356	716.859	464.862	0	464.862
6	4.01602	1930.31	Tm	480	27	215.222	773.909	576.828	0	576.828
7	4.01602	2587.15	Tm	480	27	240.482	864.741	755.096	0	755.096
8	4.01602	3384.99	Tm	480	27	271.164	975.069	971.627	0	971.627
9	4.01602	4182.82	Tm	480	27	301.845	1085.4	1188.16	0	1188.16
10	4.01602	4980.66	Tm	480	27	332.527	1195.72	1404.69	0	1404.69
11	4.01602	5734.88	Tm	480	27	361.532	1300.02	1609.39	0	1609.39
12	4.01602	6429.17	Tm	480	27	388.232	1396.03	1797.81	0	1797.81
13	4.01602	7123.09	Tm	480	27	414.918	1491.99	1986.14	0	1986.14

14	4.01602	7817.02	Tm	480	27	441.604	1587.95	2174.47	0	2174.47
15	4.4168	8727.81	Tm	480	27	375.586	1350.56	1708.57	0	1708.57
16	4.4168	8457.51	Tm	480	27	367.968	1323.16	1654.8	0	1654.8
17	4.4168	8654.53	Tm	480	27	373.521	1343.13	1693.99	0	1693.99
18	4.4168	8828.11	Tm	480	27	378.413	1360.72	1728.52	0	1728.52
19	4.4168	8917.2	Tm	480	27	380.924	1369.75	1746.24	0	1746.24
20	4.4168	9053.5	Tm	480	27	384.765	1383.57	1773.35	0	1773.35
21	3.52185	6839.98	Tm	480	27	337.706	1214.35	1441.24	0	1441.24
22	3.52185	5739.3	Tm	480	27	303.337	1090.76	1198.68	0	1198.68
23	3.52185	4517.28	Tm	480	27	265.178	953.546	929.388	0	929.388
24	3.603	3264.18	Qt	90	34	151.726	545.586	675.434	0	675.434
25	3.603	1800.51	Qt	90	34	93.7617	337.155	366.422	0	366.422

Interslice Data

- **Global Minimum Query (spencer) - Safety Factor: 3.59587**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	64.6052	148.702	0	0	0
2	68.5958	148.159	167.316	38.0847	12.8233
3	72.5864	147.617	443.304	100.906	12.8233
4	76.5769	147.074	827.965	188.463	12.8233
5	80.5675	146.531	1332.35	303.272	12.8233
6	84.5835	145.985	2387.26	543.392	12.8233
7	88.5995	145.438	3567.08	811.944	12.8233
8	92.6155	144.892	4945.77	1125.76	12.8232
9	96.6315	144.346	6566.03	1494.57	12.8233
10	100.648	143.799	8427.86	1918.36	12.8233
11	104.664	143.253	10531.2	2397.14	12.8233
12	108.68	142.707	12863	2927.9	12.8233
13	112.696	142.16	15405	3506.5	12.8232
14	116.712	141.614	18157	4132.93	12.8233
15	120.728	141.068	21119.2	4807.19	12.8233
16	125.144	143.107	19294	4391.73	12.8233
17	129.561	145.147	17544.8	3993.58	12.8233
18	133.978	147.186	15740.2	3582.82	12.8233
19	138.395	149.226	13886.9	3160.95	12.8232
20	142.812	151.266	12008.4	2733.38	12.8233
21	147.228	153.305	10091.7	2297.08	12.8232
22	150.75	156.36	6879.25	1565.87	12.8233
23	154.272	159.414	4286.61	975.726	12.8233
24	157.794	162.469	2382.09	542.216	12.8233
25	161.397	165.594	818.327	186.269	12.8233
26	165	168.718	0	0	0

List Of Coordinates

Water Table

X	Y
20.22	147.02
55.7426	116.5
198	116.5
266	159
287	157
296	152
312	116.5
330	116.5

Block Search Window

X	Y
53.786	127.624
129.891	127.624
129.891	157.96
53.786	145.187

Block Search Window

X	Y
146.656	127.652
233.406	127.652
233.406	168.346
146.656	168.346

External Boundary

X	Y
0	110
2.3	110
330	110
330	149
330	155
315	155
314	157
305	160
299	163
295	163
268	165
237	167
237	171
234	171
230	171
230	160
189.357	160
189	160
165	160
165	161.905
165	162
165	171
147	171
145.222	170.111
135	165
126	160
105	155
88	150
78	149
33	148
20	147
12	146
6	147
0	148

Material Boundary

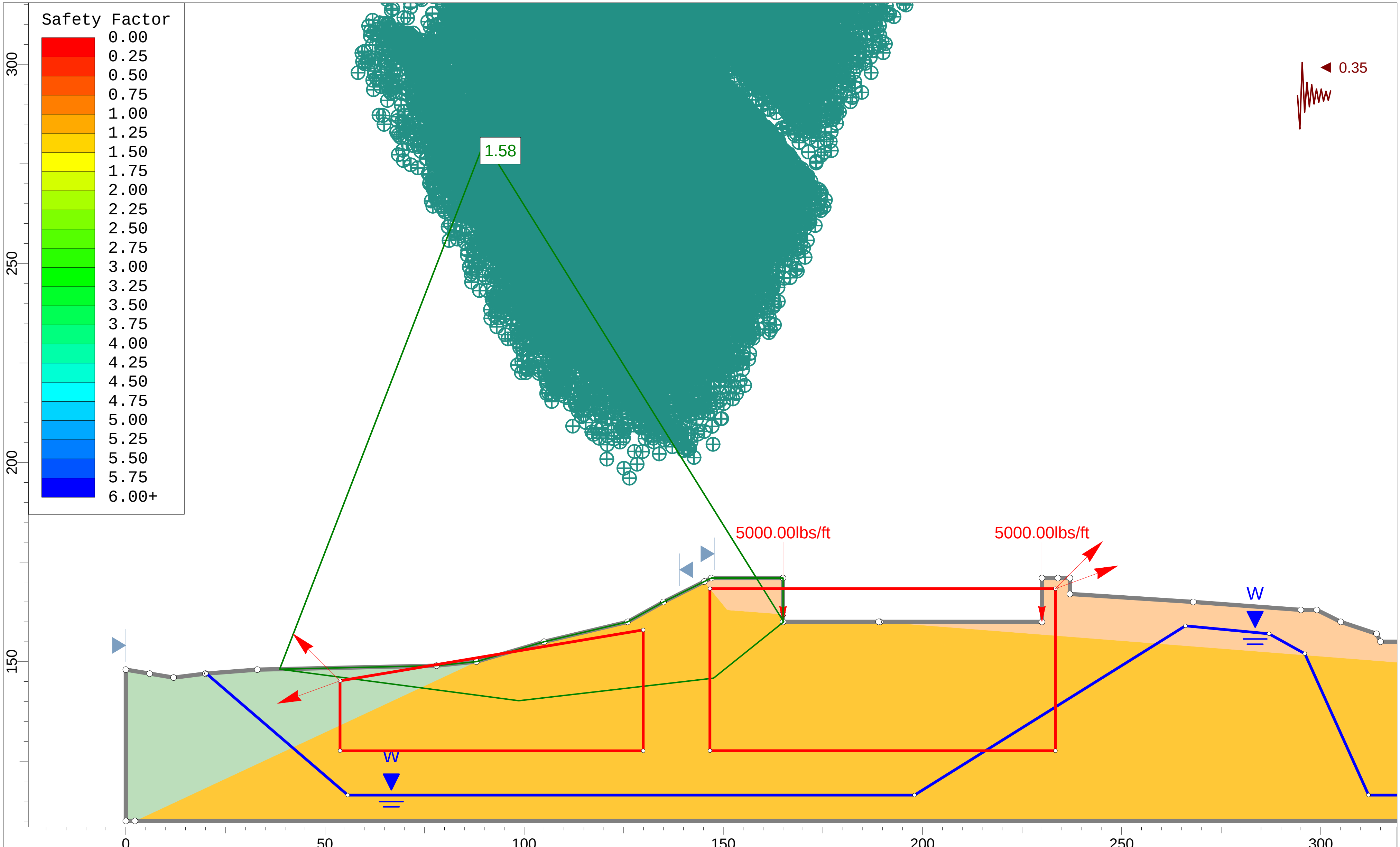
X	Y
2.3	110
88	150

Material Boundary

X	Y
145.222	170.111
151	163
164.99	161.906
165	161.905

Material Boundary

X	Y
189.357	160
330	149



Project	LA-01576-01 - Malibu Jewish Center		
Analysis Description	A-A' - Planar - Pseudostatic		
Drawn By		*Scale* 1:400	*Company* Earth Systems
Date 12/15/2015		*File Name* LA-01576-01_A_Planar_g.slim	

SLIDEINTERPRET 6.029

Slide Analysis Information
LA-01576-01 - Malibu Jewish Center

Project Summary

- File Name: LA-01576-01_A_Planar_g
- Slide Modeler Version: 6.029
- Project Title: LA-01576-01 - Malibu Jewish Center
- Analysis: A-A' - Planar - Pseudostatic
- Company: Earth Systems
- Date Created: 12/15/2015

General Settings

- Units of Measurement: Imperial Units
- Time Units: days
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 20
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

  - Spencer
- Number of slices: 25
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

Surface Options

- Surface Type: Non-Circular Block Search
- Number of Surfaces: 50000
- Pseudo-Random Surfaces: Enabled
- Convex Surfaces Only: Disabled
- Left Projection Angle (Start Angle): 135
- Left Projection Angle (End Angle): 200
- Right Projection Angle (Start Angle): 20
- Right Projection Angle (End Angle): 45
- Minimum Elevation: Not Defined
- Minimum Depth: Not Defined

Loading

- Seismic Load Coefficient (Horizontal): 0.35
- 2 Line Loads present

Line Load: Line Load #1

  - Angle from horizontal: 270 degrees
  - Magnitude: 5000

Line Load: Line Load #2

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Material Properties

Property	Qa	Qt	Tm
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	130	115
Cohesion [psf]	90	90	480
Friction Angle [deg]	34	34	27
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Global Minimums

Method: spencer

- FS: 1.582400
- Axis Location: 90.031, 280.611
- Left Slip Surface Endpoint: 38.632, 148.125
- Right Slip Surface Endpoint: 165.180, 160.000
- Resisting Moment=1.97605e+007 lb-ft
- Driving Moment=1.24876e+007 lb-ft
- Resisting Horizontal Force=134366 lb
- Driving Horizontal Force=84912.6 lb
- Total Slice Area=1486.62 ft2

Global Minimum Coordinates

Method: spencer

X	Y
38.6318	148.125
98.6847	140.199
147.566	145.854
165.18	160

Slice Data

- **Global Minimum Query (spencer) - Safety Factor: 1.5824**

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	5.05053	236.018	Qa	90	34	99.8377	157.983	100.789	0	100.789
2	5.05053	708.055	Qa	90	34	147.863	233.979	213.457	0	213.457
3	5.05053	1180.09	Qa	90	34	195.889	309.975	326.127	0	326.127
4	5.05053	1652.13	Qa	90	34	243.915	385.971	438.795	0	438.795
5	5.05053	2124.16	Qa	90	34	291.941	461.967	551.464	0	551.464
6	5.05053	2596.2	Qa	90	34	339.966	537.962	664.132	0	664.132
7	5.05053	3068.24	Qa	90	34	387.992	613.958	776.8	0	776.8
8	4.93985	3425.1	Tm	480	27	624.077	987.54	996.103	0	996.103
9	4.93985	3956.17	Tm	480	27	662.695	1048.65	1116.04	0	1116.04
10	4.93985	4570.27	Tm	480	27	707.351	1119.31	1254.72	0	1254.72
11	4.93985	5559.53	Tm	480	27	779.287	1233.14	1478.13	0	1478.13
12	4.93985	6755.3	Tm	480	27	866.24	1370.74	1748.17	0	1748.17
13	4.88817	7521.37	Tm	480	27	780.148	1234.51	1480.8	0	1480.8
14	4.88817	7973.04	Tm	480	27	806.785	1276.66	1563.53	0	1563.53

15	4.88817	8315.92	Tm	480	27	827.006	1308.66	1626.33	0	1626.33
16	4.88817	8652.24	Tm	480	27	846.841	1340.04	1687.93	0	1687.93
17	4.88817	8988.56	Tm	480	27	866.676	1371.43	1749.52	0	1749.52
18	4.88817	9398.9	Tm	480	27	890.876	1409.72	1824.68	0	1824.68
19	4.88817	10456.7	Tm	480	27	953.261	1508.44	2018.43	0	2018.43
20	4.88817	11640.5	Tm	480	27	1023.07	1618.91	2235.24	0	2235.24
21	4.88817	12710.6	Tm	480	27	1086.18	1718.77	2431.22	0	2431.22
22	4.88817	13827.4	Tm	480	27	1152.05	1823.01	2635.8	0	2635.8
23	5.87137	15985.9	Tm	480	27	786.442	1244.47	1500.36	0	1500.36
24	5.87137	12944.5	Tm	480	27	689.632	1091.27	1199.69	0	1199.69
25	5.87137	9548.2	Tm	480	27	768.406	1215.93	1444.34	0	1444.34

Interslice Data

- **Global Minimum Query (spencer) - Safety Factor: 1.5824**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	38.6318	148.125	0	0	0
2	43.6823	147.459	487.652	214.081	23.7016
3	48.7328	146.792	1127.19	494.842	23.7017
4	53.7834	146.125	1918.63	842.284	23.7016
5	58.8339	145.459	2861.95	1256.41	23.7017
6	63.8844	144.792	3957.16	1737.21	23.7017
7	68.9349	144.125	5204.26	2284.69	23.7017
8	73.9855	143.459	6603.26	2898.85	23.7016
9	78.9253	142.807	9129.68	4007.96	23.7016
10	83.8652	142.155	11738.8	5153.36	23.7016
11	88.805	141.503	14443.4	6340.71	23.7017
12	93.7449	140.851	17302	7595.65	23.7017
13	98.6847	140.199	20346.7	8932.29	23.7017
14	103.573	140.764	20681.5	9079.23	23.7016
15	108.461	141.33	20941.2	9193.27	23.7017
16	113.349	141.895	21144.1	9282.32	23.7016
17	118.237	142.461	21291.1	9346.87	23.7016
18	123.126	143.027	21382.3	9386.91	23.7017
19	128.014	143.592	21405.4	9397.06	23.7017
20	132.902	144.158	21253	9330.13	23.7016
21	137.79	144.723	20904	9176.95	23.7017
22	142.678	145.289	20377.5	8945.8	23.7017
23	147.566	145.854	19665.6	8633.28	23.7017
24	153.438	150.57	11602.9	5093.74	23.7018
25	159.309	155.285	5455.33	2394.91	23.7017
26	165.18	160	0	0	0

List Of Coordinates

Water Table

X	Y
20.22	147.02
55.7426	116.5
198	116.5
266	159
287	157
296	152
312	116.5
330	116.5

Block Search Window

X	Y
53.786	127.624
129.891	127.624
129.891	157.96
53.786	145.187

Block Search Window

X	Y
146.656	127.652
233.406	127.652
233.406	168.346
146.656	168.346

External Boundary

X	Y
0	110
2.3	110
330	110
330	149
330	155
315	155
314	157
305	160
299	163
295	163
268	165
237	167
237	171
234	171
230	171
230	160
189.357	160
189	160
165	160
165	161.905
165	162
165	171
147	171
145.222	170.111
135	165
126	160
105	155
88	150
78	149
33	148
20	147
12	146
6	147
0	148

Material Boundary

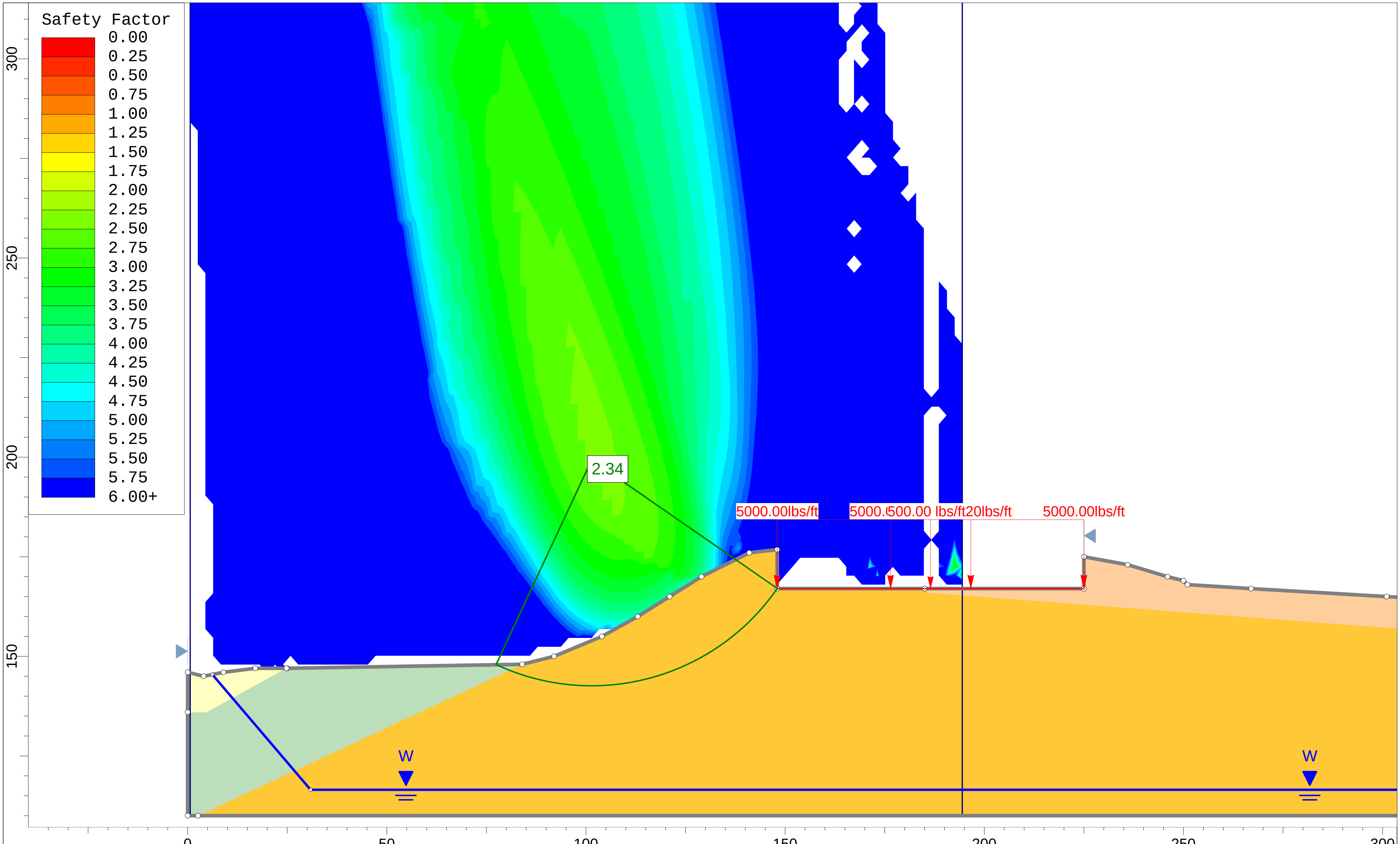
X	Y
2.3	110
88	150

Material Boundary

X	Y
145.222	170.111
151	163
164.99	161.906
165	161.905

Material Boundary

X	Y
189.357	160
330	149



Project	LA-01576-01 - Malibu Jewish Center
Analysis Description	Section B-B' - Rotational - Static
Drawn By	
Scale	1:400
Company	Earth Systems
Date	12/15/2015
File Name	LA-01576-01_B_Circular.slim

SLIDEINTERPRET 6.029

Slide Analysis Information
LA-01576-01 - Malibu Jewish Center

Project Summary

- File Name: LA-01576-01_B_Circular
- Slide Modeler Version: 6.029
- Project Title: LA-01576-01 - Malibu Jewish Center
- Analysis: Section B-B' - Rotational - Static
- Company: Earth Systems
- Date Created: 12/15/2015

General Settings

- Units of Measurement: Imperial Units
- Time Units: days
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 20
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

  - Spencer
- Number of slices: 25
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

Surface Options

- Surface Type: Circular
- Search Method: Grid Search
- Radius Increment: 10
- Composite Surfaces: Disabled
- Reverse Curvature: Create Tension Crack
- Minimum Elevation: Not Defined
- Minimum Depth: Not Defined

Loading

- 1 Distributed Load present

Distributed Load 1

  - Distribution: Constant
  - Magnitude [psf]: 500
  - Orientation: Normal to boundary
- 4 Line Loads present

Line Load: Line Load #2

  - Angle from horizontal: 270 degrees

- Magnitude: 5000

Line Load: Line Load #3

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #4

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #5

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Material Properties

Property	af	Qa	Qt	Tm
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	115
Cohesion [psf]	90	90	90	480
Friction Angle [deg]	34	34	34	27
Water Surface	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1

Global Minimums

Method: spencer

- FS: 2.340750
- Center: 101.420, 199.318
- Radius: 56.753
- Left Slip Surface Endpoint: 77.423, 147.889
- Right Slip Surface Endpoint: 148.072, 167.000
- Resisting Moment=5.3222e+006 lb-ft
- Driving Moment=2.27372e+006 lb-ft
- Resisting Horizontal Force=83187.2 lb
- Driving Horizontal Force=35538.7 lb
- Total Slice Area=920.436 ft2

Slice Data

- **Global Minimum Query (spencer) - Safety Factor: 2.34075**

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	3.30418	291.842	Qa	90	34	90.1993	211.134	179.588	0	179.588
2	2.80603	658.192	Tm	480	27	315.068	737.496	505.363	0	505.363
3	2.80603	1036.46	Tm	480	27	345.444	808.599	644.91	0	644.91
4	2.80603	1509.6	Tm	480	27	383.136	896.825	818.066	0	818.066
5	2.80603	1936.83	Tm	480	27	414.234	969.619	960.931	0	960.931
6	2.80603	2389.47	Tm	480	27	445.887	1043.71	1106.34	0	1106.34
7	2.80603	2873.91	Tm	480	27	478.596	1120.27	1256.61	0	1256.61
8	2.80603	3312.95	Tm	480	27	505.646	1183.59	1380.87	0	1380.87
9	2.80603	3707.02	Tm	480	27	527.501	1234.75	1481.28	0	1481.28
10	2.80603	4087.6	Tm	480	27	547.055	1280.52	1571.1	0	1571.1
11	2.80603	4512.1	Tm	480	27	568.913	1331.68	1671.52	0	1671.52
12	2.80603	4896.45	Tm	480	27	586.357	1372.51	1751.66	0	1751.66
13	2.80603	5242.11	Tm	480	27	599.717	1403.79	1813.04	0	1813.04

14	2.80603	5587.12	Tm	480	27	611.93	1432.38	1869.14	0	1869.14
15	2.80603	5890.47	Tm	480	27	620.034	1451.35	1906.37	0	1906.37
16	2.80603	6141.96	Tm	480	27	623.48	1459.41	1922.2	0	1922.2
17	2.80603	6338.67	Tm	480	27	622.255	1456.54	1916.57	0	1916.57
18	2.80603	6476.88	Tm	480	27	616.295	1442.59	1889.19	0	1889.19
19	2.80603	6515.9	Tm	480	27	603.231	1412.01	1829.18	0	1829.18
20	2.80603	6410.59	Tm	480	27	580.743	1359.37	1725.87	0	1725.87
21	2.80603	6225.53	Tm	480	27	553.297	1295.13	1599.78	0	1599.78
22	2.80603	5952.35	Tm	480	27	520.716	1218.87	1450.11	0	1450.11
23	2.80603	5528.97	Tm	480	27	480.043	1123.66	1263.26	0	1263.26
24	2.80603	4719.5	Tm	480	27	420.218	983.626	988.422	0	988.422
25	2.80603	3631.91	Tm	480	27	589.112	1378.96	1764.32	0	1764.32

Interslice Data

- **Global Minimum Query (spencer) - Safety Factor: 2.34075**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	77.4228	147.889	0	0	0
2	80.727	146.472	552.125	174.314	17.5217
3	83.533	145.458	1948.26	615.095	17.5217
4	86.3391	144.606	3466.36	1094.38	17.5217
5	89.1451	143.909	5110.88	1613.58	17.5217
6	91.9511	143.361	6798.82	2146.49	17.5217
7	94.7572	142.958	8494.93	2681.97	17.5216
8	97.5632	142.697	10165.2	3209.3	17.5217
9	100.369	142.575	11750.7	3709.87	17.5217
10	103.175	142.593	13204	4168.69	17.5216
11	105.981	142.749	14492.1	4575.37	17.5217
12	108.787	143.046	15591.5	4922.45	17.5216
13	111.593	143.485	16466.5	5198.72	17.5217
14	114.399	144.07	17087.7	5394.84	17.5217
15	117.205	144.805	17429	5502.59	17.5217
16	120.011	145.697	17467	5514.57	17.5216
17	122.817	146.754	17183.9	5425.2	17.5216
18	125.623	147.986	16568.2	5230.83	17.5217
19	128.429	149.405	15614.8	4929.83	17.5217
20	131.236	151.029	14336.2	4526.15	17.5217
21	134.042	152.878	12772.6	4032.5	17.5217
22	136.848	154.982	10958.9	3459.89	17.5217
23	139.654	157.377	8944.95	2824.05	17.5217
24	142.46	160.119	6827.8	2155.64	17.5217
25	145.266	163.285	4876.69	1539.64	17.5216
26	148.072	167	0	0	0

List Of Coordinates

Water Table

X	Y
6.189	145.436
30.8638	116.499
330.34	116.493

Line Load

X	Y
225	167
185	167
148	167

External Boundary

X	Y
0	110
2.58	110
330	110
330	155
330	163
320	164
301	165
267	167
251	168
250	169
246	170
236	173
225	175
225	167
185	167
148	167
148	176.8
141	176
129	170
121	165
113	160
104	155
92	150
84	148
25	147
24.7846	147
17	147
9	146
4	145
0	146
0	136

Material Boundary

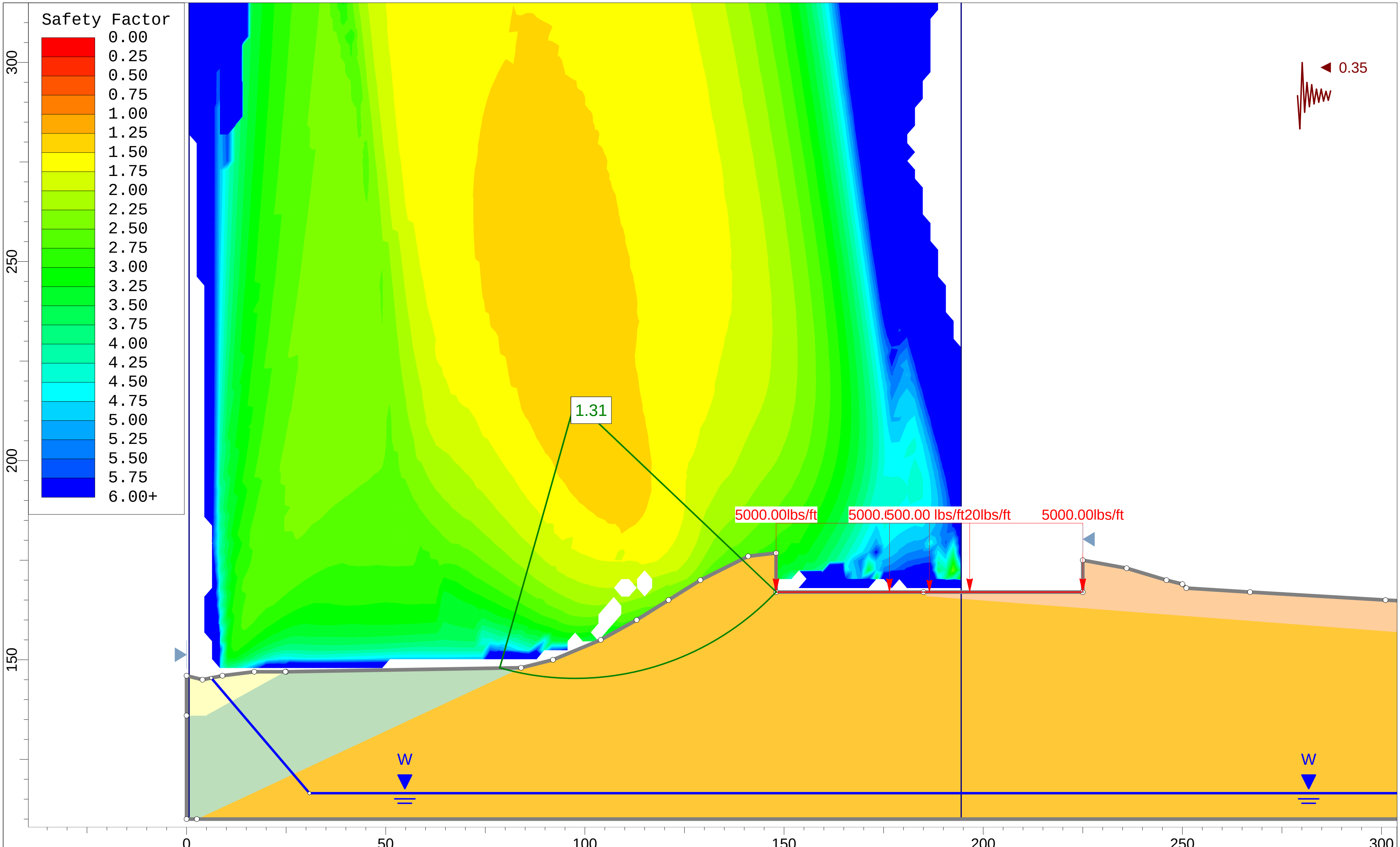
X	Y
2.58	110
84	148

Material Boundary

X	Y
0	136
5	136
24.7846	147

Material Boundary

X	Y
185	167
185.002	166.998
186	166
330	155



Project	LA-01576-01 - Malibu Jewish Center		
Analysis Description	Section B-B' - Rotational - Pseudostatic		
Drawn By		*Scale* 1:400	*Company* Earth Systems
Date 12/15/2015		*File Name* LA-01576-01_B_Circular_g.slim	

SLIDEINTERPRET 6.029

Slide Analysis Information
LA-01576-01 - Malibu Jewish Center

Project Summary

- File Name: LA-01576-01_B_Circular_g
- Slide Modeler Version: 6.029
- Project Title: LA-01576-01 - Malibu Jewish Center
- Analysis: Section B-B' - Rotational - Pseudostatic
- Company: Earth Systems
- Date Created: 12/15/2015

General Settings

- Units of Measurement: Imperial Units
- Time Units: days
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 20
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

    - Spencer
- Number of slices: 25
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

Surface Options

- Surface Type: Circular
- Search Method: Grid Search
- Radius Increment: 10
- Composite Surfaces: Disabled
- Reverse Curvature: Create Tension Crack
- Minimum Elevation: Not Defined
- Minimum Depth: Not Defined

Loading

- Seismic Load Coefficient (Horizontal): 0.35
- 1 Distributed Load present

Distributed Load 1

    - Distribution: Constant
    - Magnitude [psf]: 500
    - Orientation: Normal to boundary
- 4 Line Loads present

Line Load: Line Load #2

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #3

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #4

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #5

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Material Properties

Property	af	Qa	Qt	Tm
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	115
Cohesion [psf]	90	90	90	480
Friction Angle [deg]	34	34	34	27
Water Surface	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1

Global Minimums

Method: spencer

- FS: 1.313890
- Center: 97.543, 214.949
- Radius: 69.661
- Left Slip Surface Endpoint: 78.615, 147.909
- Right Slip Surface Endpoint: 148.076, 167.000
- Resisting Moment=5.35904e+006 lb-ft
- Driving Moment=4.07875e+006 lb-ft
- Resisting Horizontal Force=70430.8 lb
- Driving Horizontal Force=53604.7 lb
- Total Slice Area=751.227 ft2

Slice Data

- **Global Minimum Query (spencer) - Safety Factor: 1.31389**

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	3.35262	183.876	Qa	90	34	182.866	240.266	222.779	0	222.779
2	2.75452	399.431	Tm	480	27	633.05	831.758	690.363	0	690.363
3	2.75452	721.092	Tm	480	27	666.519	875.733	776.67	0	776.67
4	2.75452	1066.76	Tm	480	27	700.256	920.059	863.663	0	863.663
5	2.75452	1386.38	Tm	480	27	726.057	953.959	930.198	0	930.198
6	2.75452	1777.21	Tm	480	27	760.085	998.668	1017.94	0	1017.94
7	2.75452	2163.38	Tm	480	27	789.949	1037.91	1094.95	0	1094.95
8	2.75452	2515.01	Tm	480	27	811.993	1066.87	1151.8	0	1151.8
9	2.75452	2832.05	Tm	480	27	827.176	1086.82	1190.95	0	1190.95
10	2.75452	3175.03	Tm	480	27	843.98	1108.9	1234.28	0	1234.28
11	2.75452	3543.24	Tm	480	27	861.985	1132.55	1280.71	0	1280.71
12	2.75452	3875.67	Tm	480	27	873.789	1148.06	1311.15	0	1311.15

13	2.75452	4187.89	Tm	480	27	881.725	1158.49	1331.61	0	1331.61
14	2.75452	4504.72	Tm	480	27	888.746	1167.72	1349.72	0	1349.72
15	2.75452	4784.97	Tm	480	27	890.537	1170.07	1354.33	0	1354.33
16	2.75452	5024.99	Tm	480	27	887.153	1165.62	1345.61	0	1345.61
17	2.75452	5222.97	Tm	480	27	878.825	1154.68	1324.13	0	1324.13
18	2.75452	5376.71	Tm	480	27	865.725	1137.47	1290.35	0	1290.35
19	2.75452	5436.82	Tm	480	27	843.912	1108.81	1234.11	0	1234.11
20	2.75452	5384.7	Tm	480	27	812.708	1067.81	1153.64	0	1153.64
21	2.75452	5278.09	Tm	480	27	777.747	1021.87	1063.49	0	1063.49
22	2.75452	5112.35	Tm	480	27	739.054	971.036	963.711	0	963.711
23	2.75452	4826.77	Tm	480	27	692.693	910.122	844.161	0	844.161
24	2.75452	4216.99	Tm	480	27	625.924	822.395	671.988	0	671.988
25	2.75452	3406.26	Tm	480	27	958.525	1259.4	1529.65	0	1529.65

Interslice Data

- **Global Minimum Query (spencer) - Safety Factor: 1.31389**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	78.615	147.909	0	0	0
2	81.9676	147.051	741.944	431.872	30.2029
3	84.7222	146.478	2748.24	1599.7	30.2029
4	87.4767	146.019	4694.86	2732.8	30.203
5	90.2312	145.673	6556.55	3816.45	30.2029
6	92.9857	145.437	8297.68	4829.93	30.2029
7	95.7402	145.311	9905.14	5765.6	30.2029
8	98.4947	145.294	11350.3	6606.79	30.2029
9	101.249	145.387	12608.7	7339.29	30.2029
10	104.004	145.588	13664.2	7953.68	30.2029
11	106.758	145.9	14501.1	8440.84	30.2029
12	109.513	146.324	15101.2	8790.12	30.2029
13	112.267	146.862	15455.2	8996.18	30.2029
14	115.022	147.516	15555.4	9054.53	30.2029
15	117.776	148.291	15390.2	8958.34	30.2029
16	120.531	149.19	14959.7	8707.79	30.203
17	123.285	150.219	14269.4	8305.98	30.203
18	126.04	151.383	13329	7758.58	30.2029
19	128.794	152.691	12152.8	7073.9	30.2028
20	131.549	154.152	10780.2	6274.97	30.203
21	134.303	155.777	9267.93	5394.7	30.2029
22	137.058	157.58	7653.49	4454.96	30.2029
23	139.813	159.578	5981.67	3481.82	30.2029
24	142.567	161.793	4337	2524.49	30.2029
25	145.322	164.255	2937.38	1709.8	30.203
26	148.076	167	0	0	0

List Of Coordinates

Water Table

X	Y
6.189	145.436
30.8638	116.499
330.34	116.493

Line Load

X	Y
225	167
185	167
148	167

External Boundary

X	Y
0	110
2.58	110
330	110
330	155
330	163
320	164
301	165
267	167
251	168
250	169
246	170
236	173
225	175
225	167
185	167
148	167
148	176.8
141	176
129	170
121	165
113	160
104	155
92	150
84	148
25	147
24.7846	147
17	147
9	146
4	145
0	146
0	136

Material Boundary

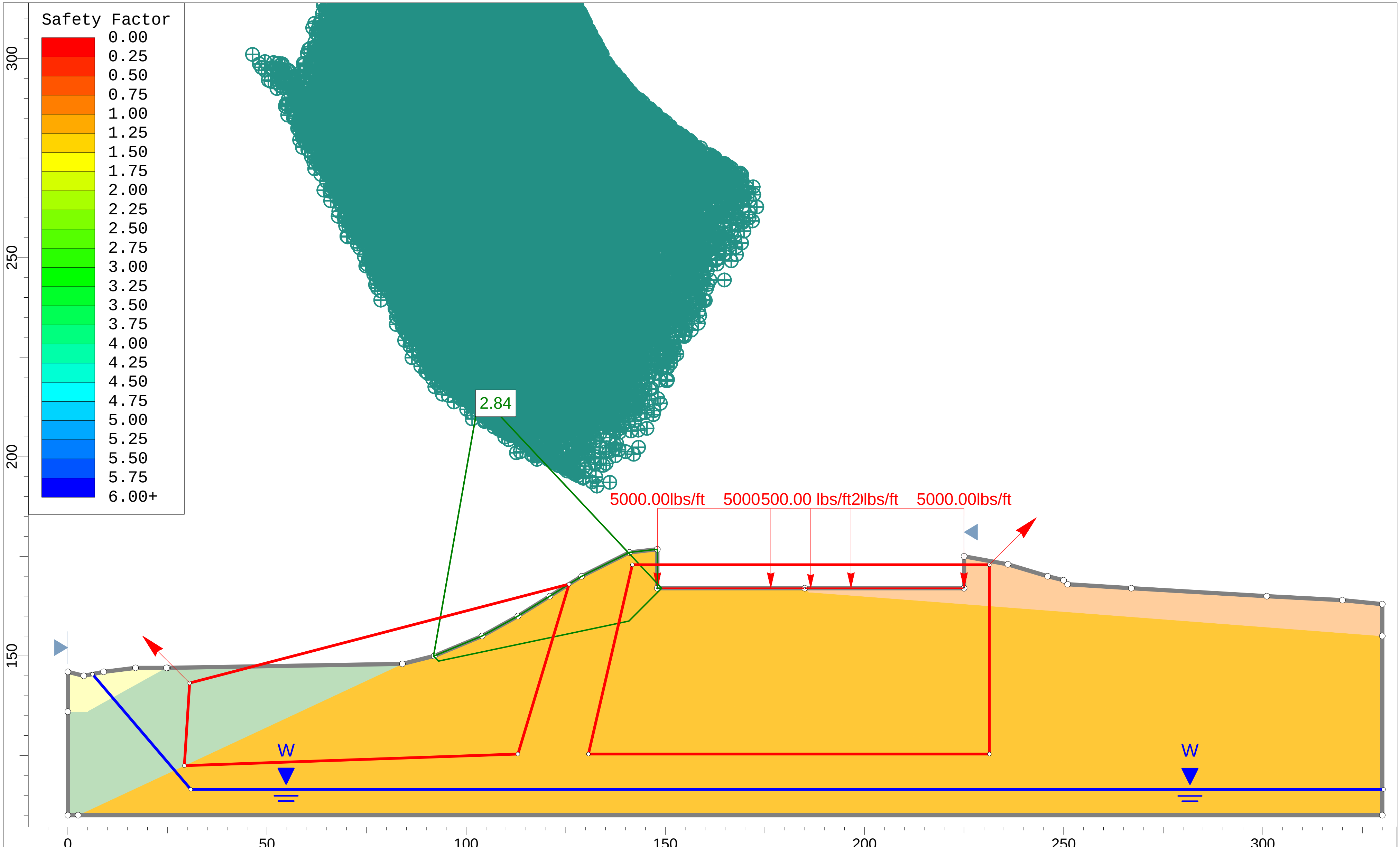
X	Y
2.58	110
84	148

Material Boundary

X	Y
0	136
5	136
24.7846	147

Material Boundary

X	Y
185	167
185.002	166.998
186	166
330	155



rocscience	*Project* LA-01576-01 - Malibu Jewish Center		
	Analysis Description Section B-B' - Planar - Static		
	Drawn By	*Scale* 1:400	*Company* Earth Systems
SLIDEINTERPRET 6.029	*Date* 12/15/2015		*File Name* LA-01576-01_B_Planar.slim

Slide Analysis Information
LA-01576-01 - Malibu Jewish Center

Project Summary

- File Name: LA-01576-01_B_Planar
- Slide Modeler Version: 6.029
- Project Title: LA-01576-01 - Malibu Jewish Center
- Analysis: Section B-B' - Planar - Static
- Company: Earth Systems
- Date Created: 12/15/2015

General Settings

- Units of Measurement: Imperial Units
- Time Units: days
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 20
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

  - Spencer
- Number of slices: 25
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

Surface Options

- Surface Type: Non-Circular Block Search
- Number of Surfaces: 50000
- Pseudo-Random Surfaces: Enabled
- Convex Surfaces Only: Disabled
- Left Projection Angle (Start Angle): 135
- Left Projection Angle (End Angle): 135
- Right Projection Angle (Start Angle): 45
- Right Projection Angle (End Angle): 45
- Minimum Elevation: Not Defined
- Minimum Depth: Not Defined

Loading

- 1 Distributed Load present

Distributed Load 1

  - Distribution: Constant
  - Magnitude [psf]: 500
  - Orientation: Normal to boundary
- 4 Line Loads present

Line Load: Line Load #2

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #3

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #4

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #5

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Material Properties

Property	af	Qa	Qt	Tm
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	115
Cohesion [psf]	90	90	90	480
Friction Angle [deg]	34	34	34	27
Water Surface	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1

Global Minimums

Method: spencer

- FS: 2.839900
- Axis Location: 103.383, 215.760
- Left Slip Surface Endpoint: 91.792, 149.948
- Right Slip Surface Endpoint: 149.078, 167.000
- Resisting Moment=4.07461e+006 lb-ft
- Driving Moment=1.43477e+006 lb-ft
- Resisting Horizontal Force=58195.3 lb
- Driving Horizontal Force=20492 lb
- Total Slice Area=532.805 ft2

Global Minimum Coordinates

Method: spencer

X	Y
91.7916	149.948
93.0376	148.702
140.848	158.77
149.078	167

Slice Data

- **Global Minimum Query (spencer) - Safety Factor: 2.8399**

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	1.24597	121.898	Tm	480	27	296.498	842.025	710.515	0	710.515
2	2.3905	543.414	Tm	480	27	211.12	599.561	234.651	0	234.651
3	2.3905	678.849	Tm	480	27	220.822	627.111	288.721	0	288.721

4	2.3905	814.284	Tm	480	27	230.523	654.661	342.791	0	342.791
5	2.3905	949.718	Tm	480	27	240.224	682.211	396.862	0	396.862
6	2.3905	1092.98	Tm	480	27	250.486	711.354	454.058	0	454.058
7	2.3905	1304.03	Tm	480	27	265.603	754.285	538.313	0	538.313
8	2.3905	1530.74	Tm	480	27	281.842	800.402	628.824	0	628.824
9	2.3905	1757.44	Tm	480	27	298.081	846.519	719.334	0	719.334
10	2.3905	1993.77	Tm	480	27	315.009	894.593	813.684	0	813.684
11	2.3905	2263.31	Tm	480	27	334.315	949.422	921.293	0	921.293
12	2.3905	2535.65	Tm	480	27	353.823	1004.82	1030.02	0	1030.02
13	2.3905	2808	Tm	480	27	373.331	1060.22	1138.75	0	1138.75
14	2.3905	3080.34	Tm	480	27	392.839	1115.62	1247.48	0	1247.48
15	2.3905	3352.69	Tm	480	27	412.347	1171.02	1356.21	0	1356.21
16	2.3905	3625.03	Tm	480	27	431.855	1226.42	1464.94	0	1464.94
17	2.3905	3859.83	Tm	480	27	448.673	1274.19	1558.68	0	1558.68
18	2.3905	4050.1	Tm	480	27	462.303	1312.89	1634.65	0	1634.65
19	2.3905	4240.3	Tm	480	27	475.927	1351.58	1710.58	0	1710.58
20	2.3905	4430.5	Tm	480	27	489.55	1390.27	1786.51	0	1786.51
21	2.3905	4620.7	Tm	480	27	503.174	1428.96	1862.45	0	1862.45
22	2.05758	3856.82	Tm	480	27	387.849	1101.45	1219.67	0	1219.67
23	2.05758	3426.11	Tm	480	27	361.807	1027.5	1074.52	0	1074.52
24	2.05758	2994.89	Tm	480	27	335.734	953.451	929.199	0	929.199
25	2.05758	1341.2	Tm	480	27	571.207	1622.17	2241.63	0	2241.63

Interslice Data

- **Global Minimum Query (spencer) - Safety Factor: 2.8399**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	91.7916	149.948	0	0	0
2	93.0376	148.702	1254.98	402.261	17.7723
3	95.4281	149.205	1641.91	526.288	17.7724
4	97.8186	149.709	2024.84	649.029	17.7724
5	100.209	150.212	2403.76	770.485	17.7724
6	102.6	150.715	2778.67	890.655	17.7724
7	104.99	151.219	3149.33	1009.46	17.7723
8	107.381	151.722	3513.75	1126.27	17.7723
9	109.771	152.226	3871.45	1240.93	17.7724
10	112.162	152.729	4222.44	1353.43	17.7724
11	114.552	153.232	4566.43	1463.69	17.7724
12	116.943	153.736	4902.44	1571.39	17.7723
13	119.333	154.239	5230.38	1676.51	17.7724
14	121.724	154.743	5550.26	1779.04	17.7724
15	124.114	155.246	5862.08	1878.99	17.7724
16	126.505	155.749	6165.83	1976.35	17.7724
17	128.895	156.253	6461.51	2071.13	17.7724
18	131.286	156.756	6750.25	2163.68	17.7724
19	133.676	157.26	7033.35	2254.42	17.7724
20	136.067	157.763	7310.81	2343.36	17.7724
21	138.457	158.266	7582.65	2430.49	17.7724
22	140.848	158.77	7848.85	2515.81	17.7723
23	142.905	160.827	6137.9	1967.4	17.7724
24	144.963	162.885	4671.98	1497.53	17.7724
25	147.02	164.942	3451.39	1106.29	17.7725
26	149.078	167	0	0	0

List Of Coordinates

Water Table

X	Y
6.189	145.436
30.8638	116.499
330.34	116.493

Line Load

X	Y
225	167
185	167
148	167

Block Search Window

X	Y
29.2495	122.447
113	125.375
125.84	168.025
30.579	143.191

Block Search Window

X	Y
130.687	125.375
231.36	125.375
231.36	172.884
141.715	172.884

External Boundary

X	Y
0	110
2.58	110
330	110
330	155
330	163
320	164
301	165
267	167
251	168
250	169
246	170
236	173
225	175
225	167
185	167
148	167
148	176.8
141	176
129	170
121	165
113	160
104	155
92	150
84	148
25	147
24.7846	147
17	147
9	146
4	145
0	146
0	136

Material Boundary

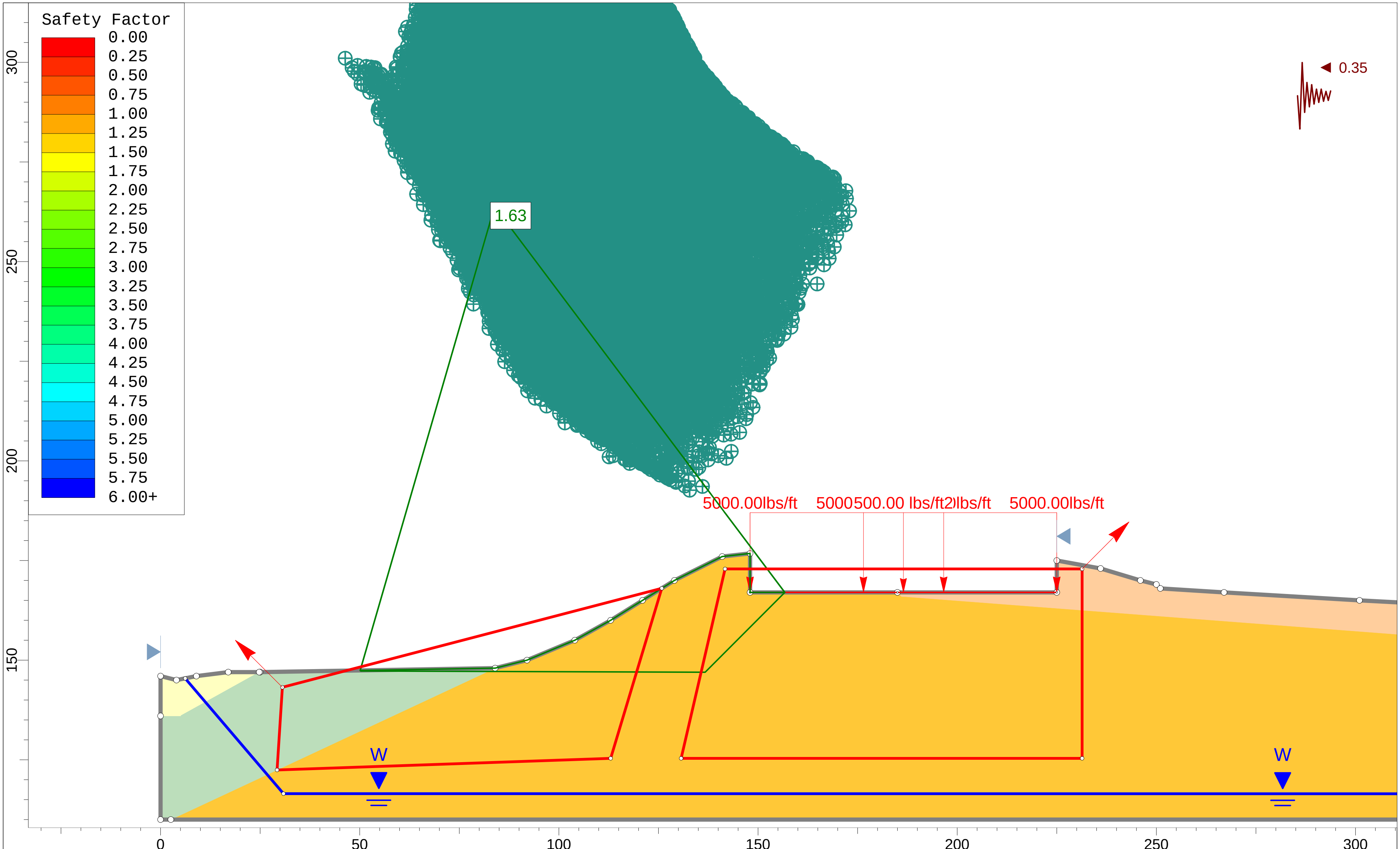
X	Y
2.58	110
84	148

Material Boundary

X	Y
0	136
5	136
24.7846	147

Material Boundary

X	Y
185	167
185.002	166.998
186	166
330	155



SLIDEINTERPRET 6.029

Project	LA-01576-01 - Malibu Jewish Center
Analysis Description	Section B-B' - Planar - Pseudostatic
Drawn By	
Scale	1:400
Company	Earth Systems
Date	12/15/2015
File Name	LA-01576-01_B_Planar_g.slim

Slide Analysis Information
LA-01576-01 - Malibu Jewish Center

Project Summary

- File Name: LA-01576-01_B_Planar_g
- Slide Modeler Version: 6.029
- Project Title: LA-01576-01 - Malibu Jewish Center
- Analysis: Section B-B' - Planar - Pseudostatic
- Company: Earth Systems
- Date Created: 12/15/2015

General Settings

- Units of Measurement: Imperial Units
- Time Units: days
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 20
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

  - Spencer
- Number of slices: 25
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

Surface Options

- Surface Type: Non-Circular Block Search
- Number of Surfaces: 50000
- Pseudo-Random Surfaces: Enabled
- Convex Surfaces Only: Disabled
- Left Projection Angle (Start Angle): 135
- Left Projection Angle (End Angle): 135
- Right Projection Angle (Start Angle): 45
- Right Projection Angle (End Angle): 45
- Minimum Elevation: Not Defined
- Minimum Depth: Not Defined

Loading

- Seismic Load Coefficient (Horizontal): 0.35
- 1 Distributed Load present

Distributed Load 1

  - Distribution: Constant
  - Magnitude [psf]: 500
  - Orientation: Normal to boundary

- 4 Line Loads present

Line Load: Line Load #2

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #3

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #4

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Line Load: Line Load #5

- Angle from horizontal: 270 degrees
- Magnitude: 5000

Material Properties

Property	af	Qa	Qt	Tm
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	115
Cohesion [psf]	90	90	90	480
Friction Angle [deg]	34	34	34	27
Water Surface	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1

Global Minimums

Method: spencer

- FS: 1.628600
- Axis Location: 83.844, 263.832
- Left Slip Surface Endpoint: 50.109, 147.426
- Right Slip Surface Endpoint: 156.728, 167.000
- Resisting Moment=1.21331e+007 lb-ft
- Driving Moment=7.45006e+006 lb-ft
- Resisting Horizontal Force=94871.1 lb
- Driving Horizontal Force=58253.2 lb
- Total Slice Area=969.655 ft2

Global Minimum Coordinates

Method: spencer

X	Y
50.1086	147.426
50.2538	147.28
136.709	146.981
156.728	167

Slice Data

- **Global Minimum Query (spencer) - Safety Factor: 1.6286**

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	0.145248	1.28727	Qa	90	34	882.07	1436.54	1996.33	0	1996.33
2	4.56674	106.484	Qa	90	34	84.3267	137.334	70.1761	0	70.1761

3	4.56674	157.561	Qa	90	34	89.2276	145.316	82.0094	0	82.0094
4	4.56674	208.637	Qa	90	34	94.1285	153.298	93.8427	0	93.8427
5	4.56674	259.713	Qa	90	34	99.0294	161.279	105.676	0	105.676
6	4.56674	310.79	Qa	90	34	103.93	169.261	117.509	0	117.509
7	4.56674	361.866	Qa	90	34	108.831	177.243	129.342	0	129.342
8	4.56674	412.942	Qa	90	34	113.732	185.224	141.176	0	141.176
9	4.54065	547.765	Tm	480	27	401.766	654.316	342.116	0	342.116
10	4.54065	1102.75	Tm	480	27	439.097	715.113	461.435	0	461.435
11	4.54065	1845.24	Tm	480	27	489.039	796.449	621.066	0	621.066
12	4.54065	2836.7	Tm	480	27	555.728	905.059	834.225	0	834.225
13	4.54065	3839.65	Tm	480	27	623.19	1014.93	1049.85	0	1049.85
14	4.54065	5060.64	Tm	480	27	705.318	1148.68	1312.36	0	1312.36
15	4.54065	6390.11	Tm	480	27	794.743	1294.32	1598.19	0	1598.19
16	4.54065	7830.3	Tm	480	27	891.615	1452.09	1907.82	0	1907.82
17	4.54065	9320.39	Tm	480	27	991.846	1615.32	2228.19	0	2228.19
18	4.54065	10810.5	Tm	480	27	1092.07	1778.55	2548.54	0	2548.54
19	4.54065	12228.4	Tm	480	27	1187.45	1933.88	2853.41	0	2853.41
20	4.54065	13435.7	Tm	480	27	1268.65	2066.13	3112.95	0	3112.95
21	4.00376	11912.5	Tm	480	27	697.198	1135.46	1286.41	0	1286.41
22	4.00376	10684.4	Tm	480	27	653.452	1064.21	1146.58	0	1146.58
23	4.00376	8238.47	Tm	480	27	808.283	1316.37	1641.47	0	1641.47
24	4.00376	2765.2	Tm	480	27	461.716	751.951	533.735	0	533.735
25	4.00376	921.732	Tm	480	27	399.821	651.149	335.899	0	335.899

Interslice Data

- **Global Minimum Query (spencer) - Safety Factor: 1.6286**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	50.1086	147.426	0	0	0
2	50.2538	147.28	417.649	254.753	31.3819
3	54.8206	147.265	766.643	467.628	31.3819
4	59.3873	147.249	1120.33	683.367	31.3819
5	63.954	147.233	1478.72	901.97	31.3818
6	68.5208	147.217	1841.79	1123.44	31.382
7	73.0875	147.201	2209.57	1347.77	31.3819
8	77.6543	147.186	2582.04	1574.96	31.3818
9	82.221	147.17	2959.2	1805.02	31.3819
10	86.7617	147.154	4597.41	2804.27	31.3818
11	91.3023	147.138	6212.77	3789.59	31.3818
12	95.843	147.123	7797.58	4756.28	31.3819
13	100.384	147.107	9341.58	5698.07	31.3819
14	104.924	147.091	10844.3	6614.68	31.3819
15	109.465	147.075	12296.8	7500.64	31.3818
16	114.006	147.06	13694.5	8353.23	31.3819
17	118.546	147.044	15033	9169.66	31.3819
18	123.087	147.028	16310.2	9948.68	31.3818
19	127.628	147.013	17526	10690.3	31.3819
20	132.168	146.997	18683.5	11396.3	31.3818
21	136.709	146.981	19791.2	12072	31.3819
22	140.713	150.985	13263.2	8090.15	31.3819
23	144.716	154.989	7549.71	4605.09	31.3819
24	148.72	158.992	1330.85	811.775	31.3818
25	152.724	162.996	74.9589	45.7225	31.3818
26	156.728	167	0	0	0

List Of Coordinates

Water Table

X	Y
6.189	145.436
30.8638	116.499
330.34	116.493

Line Load

X	Y
225	167
185	167
148	167

Block Search Window

X	Y
29.2495	122.447
113	125.375
125.84	168.025
30.579	143.191

Block Search Window

X	Y
130.687	125.375
231.36	125.375
231.36	172.884
141.715	172.884

External Boundary

X	Y
0	110
2.58	110
330	110
330	155
330	163
320	164
301	165
267	167
251	168
250	169
246	170
236	173
225	175
225	167
185	167
148	167
148	176.8
141	176
129	170
121	165
113	160
104	155
92	150
84	148
25	147
24.7846	147
17	147
9	146
4	145
0	146
0	136

Material Boundary

X	Y
2.58	110
84	148

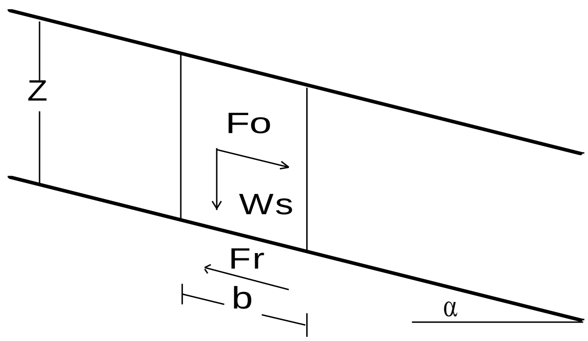
Material Boundary

X	Y
0	136
5	136
24.7846	147

Material Boundary

X	Y
185	167
185.002	166.998
186	166
330	155

Surficial Slope Stability by Infinite Slope Method



$$Fo = Z\ W \cos\alpha\ \sin\alpha = \tfrac{1}{2} Z\ W \sin 2\alpha$$

$$Fr = P \tan\Phi + C = Z\ (W-Ww)\ (\cos\alpha)^2 \tan\Phi + C$$

$$\text{Factor of Safety} = \frac{2\ Z\ (W-Ww)\ (\cos\alpha)^2 \tan\Phi + 2\ C}{Z\ W \sin(2\alpha)}$$

WHERE:	Z= Minimum Acceptable Vertical Depth of Soil Saturation (ft)	4
	Φ= Effective Angle of Internal Friction (Degrees)	24
	C= Effective Cohesion (lb/ft²)	225
	W= Saturated Soil Unit Weight (lb/ft³)	120
	Ww= Unit Weight of Water (lb/ft³)	62.4
	α= Slope Angle (Degrees)	26.3

FACTOR OF SAFETY = 1.6

2H:1V Soil Covered Slope

SURFICIAL STABILITY ANALYSIS

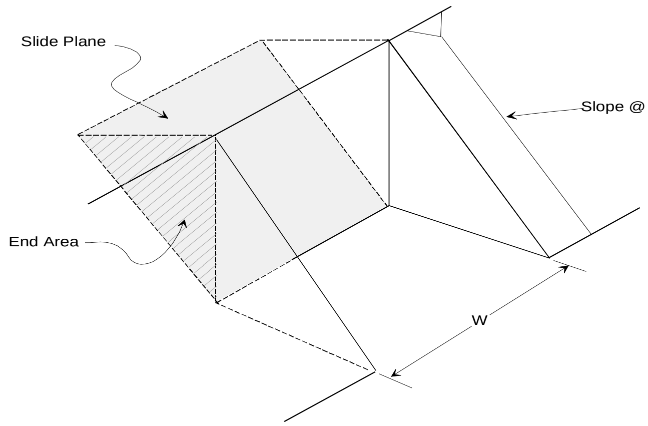
PROPOSED PRIVATE SCHOOL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

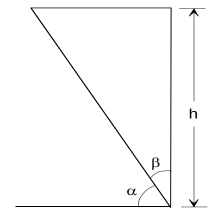
12/21/2015 LA-01576-01

ATTACHMENT D

Supplemental Calculations



VIEW OF SLOT CUT



SECTIONAL VIEW OF END AREA

$$\text{End area } a = \frac{h^2}{2}\tan\beta$$

h = height of cut + surcharge (H)

$$SF = \frac{\text{Resistance of two end areas + Resistance along slide plane}}{\text{Driving force for wedge having width W}}$$

$$SF = \frac{2a\,(c + 0.33\,K\gamma h\ \tan\phi)\ +\ W\,(ch\sec\beta + \gamma a\sin\beta\ \tan\phi)}{W\gamma a\ \cos\beta}$$

$$W = \frac{2a\,(c + 0.33\,K\gamma h\tan\phi)}{\gamma a\,(SF\cos\beta - \sin\beta\tan\phi)\ -\ ch\sec\beta}$$

SLOT CUT WITH LEVEL BACK-SLOPE AND NO SURCHARGE

DESIGN VALUES

Unit Weight, γ (pcf):	120	α (deg): 45+ϕ/2 =	62
Friction Angle, ϕ (deg	34	β (deg): 45-ϕ/2 =	28
Cohesion, c (psf):	90	Safety Factor, SF:	1.25

Lateral Earth Pressure Coefficient, Ko = (1-sinϕ): 0.4408

Section Analyzed: *Excavation in Terrace*

Total Ht of Slope to be cut (ft): 5

CALCULATED VALUES

End Area, a (sq ft): 7

Calculated Width of Slot Cut (feet) = 10

USE MAXIMUM SLOT CUT WIDTH = 8 ***Feet***

SLOT CUT CALCULATION

PROPOSED SCHOOL AND CHAPEL

24855 PACIFIC COAST HIGHWAY

MALIBU, CALIFORNIA

Earth Systems
Southern California

12/21/2015	LA-01576-01

Job Number:	LA-01576-01		
Job Name:	Malibu Jewish Center		
Friction Angle (deg):	29	Nq =	16
Cohesion (psf):	280	Nc =	28
Max. Density (pcf):		Nγ =	13
Opt. Moisture (%)			
γ Used in Calcs	105	ref: Shear on compacted fill (S4) Earth Systems, 2004	

Bearing capacity is calculated using Terzaghi's formula with Nc after Meyerhof. The results are valid when the soils are dense to a depth below the footing equal to 2 times the footing width for continuous footings and 1.5 times the footing width for square footings. Also, the groundwater should be more than 1 footing width below the footing. For soft soils, shallow groundwater, sloping ground, inclined loads, etc., special calculations are needed. See DM 7.2 for those cases. For this spread sheet soil density is taken as 90% of maximum density plus one-half of opt. moist.

Continuous Footing Formula

$$\text{Bearing Capacity} = cN_c + \gamma DN_q + (0.5)B\gamma N_\gamma$$

Square Footing Formula

$$\text{Bearing Capacity} = (1.3)cN_c + \gamma DN_q + (0.4)B\gamma N_\gamma$$

Selected Safety Factor: 3.0

CONTINUOUS FOOTING *ALLOWABLE* BEARING CAPACITY

Footing Depth (D) (feet)	Footing Width (B), feet: 1.0	1.5	2.0	2.5	3.0
1.0	3,400	3,500	3,600	3,700	3,800
1.5	3,600	3,800	3,900	4,000	4,100
2.0	3,900	4,000	4,200	4,300	4,400
2.5	4,200	4,300	4,500	4,600	4,700
3.0	4,500	4,600	4,700	4,900	5,000

SQUARE FOOTING *ALLOWABLE* BEARING CAPACITY

Footing Depth (D) (feet)	Footing Width (B), feet: 2.0	2.5	3.0	3.5	4.0
1.0	3,600	3,700	3,800	3,900	4,000
1.5	3,900	4,000	4,100	4,200	4,300
2.0	4,200	4,300	4,400	4,500	4,600
2.5	4,500	4,600	4,700	4,800	4,900
3.0	4,700	4,900	5,000	5,100	5,200

EARTH SYSTEMS SOUTHERN CALIFORNIA

Bearing Capacity Analysis
Terzaghi's Method

ADDENDUM NO. 2
GEOTECHNICAL ENGINEERING REPORT
RESPONSE TO CITY REVIEW

Proposed Private School and Chapel
APN 4458-032-027
Malibu Jewish Center and Synagogue
24855 Pacific Coast Highway
Malibu, California
LA-01576-01

Prepared for

DAVID GRAY ARCHITECTS

May 11, 2016

Prepared By

Earth Systems Southern California
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Pasadena, California 91107

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May 11, 2016 LA-01576-01

David Gray Architects
C/O Mr. Mark Meyer
353 South Broadway, Suite 200
Los Angeles, California 90013

Subject: **Addendum No. 2 Geotechnical Engineering Report**
Response to City Review
Proposed Private School and Chapel
APN 4458-032-027
Malibu Jewish Center and Synagogue
24855 Pacific Coast Highway
Malibu, California

References: Earth Systems Southern California, 2014, *Preliminary Geotechnical Engineering Report, Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*: Project No. LA-0576-01 dated November 12, 2014.

Earth Systems Southern California, 2015, *Addendum No. 1 Geotechnical Engineering Report, Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*: Project No. LA-0576-01 dated December 21, 2015.

City of Malibu, *Geotechnical Review Sheets,* Log Number 3677, CDP 14-069, dated May 4, 2016 and December 8, 2014.

David Gray Architects, Project Plan Set dated March, 28, 2016.

INTRODUCTION

This addendum report has been prepared per your request with the goal of providing a documented response to the referenced City of Malibu, Geotechnical Review Sheet dated May 4, 2016 (Log # 3677). A copy of the review letter is included as Attachment A.

SITE DESCRIPTION

The approximate 4.75-acre site is at located on the north side on Pacific Coast (Hwy 1) Highway (PCH) in the City of Malibu, Los Angeles County, California. The site is approximately 4,000 feet west of Malibu Canyon Road and approximately 2,000 feet east of Puerco Canyon Road.

The site is situated on an east-west trending ridge, which is defined by the cut slope adjacent to Pacific Coast Highway on the south side, and the incised drainage of Puerco Canyon on the north side of the site. On the westerly portion of the site (the subject of this study) there are existing modular classrooms and offices, play yards, and a parking lot. The easterly portion of the site is occupied by a synagogue structure and parking lot, constructed circa 2005. An existing on-site sewage disposal system located in the existing driveway serves the existing facilities at the site.

Along the south side of the site, a five- to ten-foot tall cut slope ascends from PCH at an approximate gradient of one and a half horizontal to one vertical (1.5H:1V) to the existing parking lot at an elevation of approximately 165 feet above mean sea level. The gently sloping parking lot extends 60 to 80 feet north to a two-foot to five-foot tall retaining wall. Above and behind the retaining wall are the existing school facilities, at an elevation of approximately 171 feet, and an open field to the east at an elevation of roughly 178 feet. Beyond the school facilities, a natural slope descends approximately 35 feet to the Puerco Canyon drainage, with side slope gradients ranging from approximately 1H:1V to 4H:1V.

The developed easterly portion of the site has been landscaped with various grasses, trees and shrubs. Native trees and shrubs are located within the Puerco Canyon drainage and surrounding slopes. The above-cited descriptions are intended to be illustrative, and are specifically not intended for use as a legal description of the subject property.

PROJECT DESCRIPTION

Based on discussions with the project architect Mark Meyer, AIA, and review of the current plans provided, Earth Systems understands that the proposed project will consist of the demolition of the existing modular school structures and construction of the new school building. The new structure will consist of two floors of classrooms and administration over a semi-subterranean parking level and basement with a one-story sanctuary at the northeast end. The basement/parking level will have a finished floor elevation of 161.5 feet. The new building will be of masonry- and wood-frame construction with slab-on-grade ground floors. The project will also include associated retaining walls, parking, walkways, and landscaping. Earth Systems has not received foundation plans for the proposed structure as of this writing. However, based upon the type of construction, estimated structural loads are not expected to exceed 5,000 pounds per linear foot (plf) for bearing walls and 100 kips for isolated columns.

Earth Systems assumes from the provided drawings that conventional cut and fill construction techniques will be utilized for site grading and that standard construction techniques will be utilized for retaining wall and foundation construction. Sewage disposal will be provided by a private onsite wastewater treatment system (OWTS) that has been designed by EnSitu Engineering, Inc. These assumptions were used as the basis for the exploration, testing, and analyses programs, and for the recommendations contained in this report. If the anticipated foundation loads or other site conditions vary significantly from the values stated herein, the recommendations should be reconfirmed prior to completing project plans.

RESPONSE TO REVIEW COMMENTS

Comment 1: *"The Project Geotechnical Consultant recommends that the proposed school, chapel and accessory structures be founded on a compacted fill pad with a minimum thickness of 3 feet below the bottom of the proposed footings. The grading plans need to include the removal and re-compaction (R & R) grading on the total grading yardage verification certificate, and either show the limits and depths of the R & R grading on the grading plan or include cross-sections that show the limits and depths of the proposed R & R grading.."*

Response: Acknowledged, to be completed by others.

Comment 2: *"The Project Geotechnical Consult needs to review the grading plans (that include the R & R grading per comment# 1 above) and evaluate whether or not any changes to the design of the proposed seepage pits is necessary (specifically, capping depths)."*

Response: Based on the current Grading and Drainage Plans (Peak Surveys, Inc., 3/25/2016), the grade of the parking lot will be raised on the order of one to three feet in the area of the proposed seepage pits. The proposed cap depth of seven feet is based on the site grades at the time of the testing, not proposed grades.

Based on the current Grading and Drainage Plans, the surface grade at odd numbered borings (B1, B3, B5, B7, B9 and B11) is at an approximate elevation of 164.5 feet and 163 feet at the even number borings (B2, B4, B6, B8, B10 and B12). Therefore, the approximate cap elevation for seepage pits at B1, B3, B5, B7, B9 and B11 should be at approximately 157.5 feet and for seepage pits at B2, B4, B6, B8, B10 and B12 should be at approximately 156 feet.

No changes to the design of the seepage pits are necessary at this time.

Comment 3: *"The Project Wastewater Consultant needs to clarify if the two existing seepage pits (5'diameter x 30' BI seepage pits with 8' caps approved by the City in 2003 to dispose of the treated effluent) will be utilized for the new development project."*

Response: Acknowledged, to be completed by others.

Comment 4: *"The Project Geotechnical Consultant needs to provide a complete finding, not an opinion, in accordance with Section 111 of the Malibu Building Code. Please include in the finding a direct reference to Section 111 of the Code."*

Response: In accordance with Section 111 of the Malibu Building Code, based on the findings summarized in this and the above referenced geotechnical reports, and provided the recommendations of these reports are incorporated into the project, it is Earth Systems' opinion that the proposed structure and seepage pits on the subject property will not be subject to a geologic hazard from landslides, settlement, or slippage beyond that described. It is also Earth Systems' opinion that the proposed structure and associated grading will not adversely affect the geologic stability of the site or adjacent properties provided our recommendations are followed. Test findings and statements of professional opinions do not constitute a guarantee or warranty, expressed or implied.

RESPONSE TO BUILDING PLAN-CHECK STAGE REVIEW COMMENTS

Comment 1: *"The Project Geotechnical Consultant responded to the previous review comment regarding the CBC requirement for seismic loading on retaining walls in excess of six feet in height. The Consultant cited UBC Sections 1803.5.12.1 and 1807.5.12 (sic). The Consultants however cited the Title 24 modifications to the 2013 CBC. As stated in the review comment, the standard CBC (without the modifications) does not exempt any walls; therefore, Consultants need to provide recommendations for lateral pressures on all retaining walls, regardless of height. The Project Geotechnical Consultant has addressed the wall loading in the second paragraph of their response. No further clarification from the City or the Consultant should be necessary."*

Response: Acknowledged, no response necessary.

Comment 2: *"Section 7.4 of the City's geotechnical guidelines requires a minimum thickness of 10 mils for vapor barriers beneath slabs-on-grade. The Project Geotechnical Engineer has recommended that the vapor barrier conform to ASTM E1746. Building plans shall reflect the Consultant's requirement."*

Response: Acknowledged, to be completed by others.

Comment 3: *"The following note must appear on the grading and foundation plans: "Tests shall be performed prior to pouring footings and slabs to evaluate the Weighted Plasticity and the Expansion Index of the supporting soils, and foundation and slab plans should be reviewed by the Civil or Structural Engineer and revised, if necessary."*

Response: Acknowledged, to be completed by others.

Comment 4: "*The following note must appear on the grading and foundation plans: "Tests shall be performed prior to pouring pile foundations, footings and slabs to evaluate corrosivity of the* *supporting soil, and foundation and slab plans should be reviewed by the Civil or Structural Engineer and revised, if necessary""*

Response: Acknowledged, to be completed by others.

Comment 5: *"The yardages on the grading plans needs to be revised to reflect any R & R grading proposed across the site (for the buildings, flatwork, roadways or parking lots, etc.)"*

Response: Acknowledged, to be completed by others.

Comment 6: *Recommendations to properly abandon any OWTS components on the property need to be included as notes on the building, grading, and OWTS plans.*

Response: Acknowledged, the note should appear on the project plans.

Comment 7: *"Two sets of final grading, retaining wall, OWTS, stable, and riding arena plans (**APROVED BY BUILDING AND SAFETY**) incorporating the Project Geotechnical Consultant's recommendations <u>and items in this review sheet</u> must be **reviewed and wet stamped and manually signed by the Project Engineering Geologist and Project Geotechnical Engineer.** City geotechnical staff will review the plans for conformance with the Project Geotechnical Consultants' recommendations and items in this review sheet over the counter at City Hall. **Appointments for final review and approval of the plans may be made by calling or emailing City Geotechnical staff.**"*

Response: Acknowledged, once final plans are prepared, they should be provided to Earth Systems for review.

<u>LIMITATIONS AND UNIFORMITY OF CONDITIONS</u>

The conclusions and recommendations submitted in this report relative to the proposed development are based, in part, upon the data obtained from the site observations during the field exploration, and past experience. The nature and extent of variations between the borings and test pits may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this addendum report.

This addendum should be made part of the referenced Preliminary and Addendum Geotechnical Engineering reports dated November 12, 2014, and December 21, 2015. All conclusions, recommendations, and limitations of that report, except as specifically amended in this addendum report, remain valid and apply to the currently proposed project.

CLOSURE

Earth Systems trusts this report is sufficient at this time and meets your current needs. Earth Systems appreciates this opportunity to provide professional geotechnical engineering services for this project. If you have any questions regarding the information contained in this report, or if you require additional geotechnical engineering services, please contact the undersigned.

Respectfully submitted,

Earth Systems

CERTIFIED ENGINEERING GEOLOGIST
CHRISTOPHER FRASER ALLEN
No. 2648
Exp. 8/2016
STATE OF CALIFORNIA

Christopher F. Allen, P.G., E.G.
Project Engineering Geologist

REGISTERED PROFESSIONAL ENGINEER
ANTHONY P. MAZZEI
GE 2823
Exp. 6-30-17
GEOTECHNICAL
STATE OF CALIFORNIA

Anthony P. Mazzei, P.E., G.E.
Project Geotechnical Engineer

5/11/16

END OF TEXT

REFERENCES

ATTACHMENTS
City of Malibu Review Sheet

Distribution:
3 – Addressee (hard copy including one unbound copy)
1 – Addressee (CD, pdf copy)

REFERENCES

Earth Systems Southern California, 2002, *Preliminary Geotechnical Engineering Report Proposed Malibu Jewish Center 24855 Pacific Coast Highway Malibu California,* PL-05711-01, dated February 22, 2002.

Earth Systems Southern California, 2002, *Addendum No. 1 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated July 1, 2002.

Earth Systems Southern California, 2002, *Addendum No. 2 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated August 13, 2002.

Earth Systems Southern California, 2004, *Addendum No. 3 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated April 9, 2004.

Earth Systems Southern California, 2004, *Addendum No. 4 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated October 12, 2004.

Earth Systems Southern California, 2006, *Addendum No. 5 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-03, dated February 28, 2006.

Earth Systems Southern California, 2004, *Final Rough Grading Report for Building Pad and Interim Rough Grading Report for Parking Areas Malibu Jewish Center, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-03, dated November 15, 2004.

Earth Systems Southern California, 2014, *Preliminary Geotechnical Engineering Report for* Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California, LA-01576-01, dated November 12, 2014.

Earth Systems Southern California, 2015, *Proposed Advanced On-Site Wastewater Treatment System (AOWTS)l, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-02 dated January 6, 2015.

Earth Systems Southern California, 2015a, *Addendum No. 1 Geotechnical Engineering Report, Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-01 dated December 21, 2015.

Malibu, City of, 2014, *Geotechnical Review Sheet,* Log Number 3677, CDP 14-069, dated December 8, 2014.

Malibu, City of, 2016, *Geotechnical Review Sheet,* Log Number 3677, CDP 14-069, dated May 4, 2016.

Mountain Geology, 1987, *Engineering Geologic and Soils Engineering Investigation and Percolation Testing Proposed Hotel and Restaurant Complex 14911 Pacific Coast Highway Malibu California*, JH 1974gs, dated October 27, 1987.

Mountain Geology, 1991, *Addendum Engineering Geology Report Proposed Private Sewerage Disposal System Proposed Restaurant 24911 Pacific Coast Highway Malibu California*, JG 1974sp, dated January 9, 1991.

RJR, 1995, *Geotechnical Engineering and Geological Investigation Proposed Facility Expansion Project Malibu Jewish Center 24855 Pacific Coast Highway Malibu California*, Project No. 796.20-95, dated October 25, 1995.

RJR, 2001, *Preliminary Geologic and Geotechnical Engineering Report Proposed Commercial Development 24903 Pacific Coast Highway Malibu California*, Project No. 1243.10-01, dated December 28, 2001.

Treiman, J.A., 1994, *Malibu Coast Fault, Los Angeles County, California:* California Division of Mines and Geology Fault Evaluation Report FER-229, 42 p.

ATTACHMENT

City of Malibu Review Sheet

City of Malibu

23825 Stuart Ranch Road • Malibu, California 90265-4861
(310) 456-2489 • Fax (310) 317-1950 • www.malibucity.org

GEOTECHNICAL REVIEW SHEET

Project Information

Date:	May 4, 2016	**Review Log #:**	**3677**
Site Address:	24855 Pacific Coast Highway		
Lot/Tract/PM #:	n/a	**Planning #:**	**CDP 14-069**
Applicant/Contact:	Mark Meyer, david@davidgrayarchitects.com	**BPC/GPC #:**	
Contact Phone #:	213-243-5707 **Fax #:**	**Planner:**	**Adrian Fernandez**
Project Type:	Malibu Jewish Center-New school and chapel, New onsite wastewater treatment system (OWTS)		

Submittal Information

Consultant(s) / Report Date(s):
*(Current submittal(s) in **Bold.**)*

Earth Systems Southern California (Mazzei, GE 2823; LaChapelle, CEG 1311): **12-21-15**, 11-12-14
Earth Systems Southern California (Allen, PG 9085; LaChapelle, CEG 1311): **1-6-15**
EnSitu Engineering, Inc. (Yaroslaski, RCE 60149): **4-6-16**, 10-17-14

Building plans prepared by David Gray Architects dated March 28, 2016.
Grading plans prepared by Peak Surveys, Inc. dated March 28, 2016.
Final OWTS plan prepared by EnSitu Engineering, Inc. dated March 28, 2016.

Previous Reviews: 12-8-14, Geotechnical Review Referral Sheet dated 11-18-14, Environmental Health Approval dated June 19, 2003

Review Findings

Coastal Development Permit Review

☐ The project is **APPROVED** from a geotechnical perspective, with the following comments to be addressed prior to building plan check stage approval.

☒ The project is **NOT APPROVED** from a geotechnical perspective. The listed 'Review Comments' shall be addressed prior to approval.

Building Plan-Check Stage Review

☒ Awaiting Building plan check submittal. Please respond to the listed 'Building Plan-Check Stage Review Comments' AND review and incorporate the attached 'Geotechnical Notes for Building Plan Check' into the plans.

☐ **APPROVED** from a geotechnical perspective. Please review the attached 'Geotechnical Notes for Building Plan Check' and incorporate into Building Plan-Check submittals.

☐ **NOT APPROVED** from a geotechnical perspective. The listed 'Building Plan-Check Stage Review Comments' shall be addressed prior to Building Plan-Check Stage approval.

Remarks

The referenced addendum geotechnical report, building plans, grading plans, OWTS plan, and OWTS reports were reviewed by the City from a geotechnical perspective. Based on the submitted information, the project comprises demolishing the existing single-story modular school and administration buildings and constructing a new 19,780 square foot two-story school, chapel, and 13,768 square foot subterranean parking garage/basement. Grading consists of 5,640 yards of cut under structure; 386 yards of cut and 346 yards of fill for safety; 594 yards of cut and 389 yards of fill non-exempt; and 5,885 yards of export. The onsite wastewater treatment system (OWTS) will consist of a new treatment tank system and six 6' diameter x 30' BI seepage pits with 7' caps and 100% expansion. The existing septic tank will be removed or properly abandoned.

Review Comments:

1. The Project Geotechnical Consultant recommends that the proposed school, chapel and accessory structures be founded on a compacted fill pad with a minimum thickness of 3 feet below the bottom of the proposed footings. The grading plans need to include the removal and re-compaction (R & R) grading on the total grading yardage verification certificate, and either show the limits and depths of the R & R grading on the grading plan or include cross-sections that show the limits and depths of the proposed R & R grading.
2. The Project Geotechnical Consultant needs to review the grading plans (that include the R & R grading per comment # 1 above) and evaluate whether or not any changes to the design of the proposed seepage pits is necessary (specifically, capping depths).
3. The Project Wastewater Consultant needs to clarify if the two existing seepage pits (5'diameter x 30' BI seepage pits with 8' caps approved by the City in 2003 to dispose of the treated effluent) will be utilized for the new development project.
4. The Project Geotechnical Consultant needs to provide a complete finding, not an opinion, in accordance with Section 111 of the Malibu Building Code. Please include in the finding a direct reference to Section 111 of the Code.

Building Plan-Check Stage Review Comments:

1. The Project Geotechnical Consultant responded to the previous review comment regarding the CBC requirement for seismic loading on retaining walls in excess of six feet in height. The Consultant cited UBC Sections 1803.5.12.1 and 1807.5.12 (sic). The Consultants however cited the Title 24 modifications to the 2013 CBC. As stated in the review comment, the standard CBC (without the modifications) does not exempt any walls; therefore, Consultants need to provide recommendations for lateral pressures on all retaining walls, regardless of height. The Project Geotechnical Consultant has addressed the wall loading in the second paragraph of their response. No further clarification from the City or the Consultant should be necessary.
2. Section 7.4 of the City's geotechnical guidelines requires a minimum thickness of 10 mils for vapor barriers beneath slabs-on-grade. The Project Geotechnical Engineer has recommended that the vapor barrier conform to ASTM E1746. Building plans shall reflect the Consultant's requirement.
3. The following note must appear on the grading and foundation plans: *"Tests shall be performed prior to pouring footings and slabs to evaluate the Weighted Plasticity and the Expansion Index of the supporting soils, and foundation and slab plans should be reviewed by the Civil or Structural Engineer and revised, if necessary."*
4. The following note must appear on the grading and foundation plans: *"Tests shall be performed prior to pouring pile foundations, footings and slabs to evaluate corrosivity of the supporting soils, and foundation and slab plans should be reviewed by the Civil or Structural Engineer and revised, if necessary."*

5. The yardages on the grading plans needs to be revised to reflect any R & R grading proposed across the site (for the buildings, flatwork, roadways or parking lots, etc.)
6. Recommendations to properly abandon any OWTS components on the property need to be included as notes on the building, grading, and OWTS plans.
7. Two sets of final grading, retaining wall, shoring, OWTS, and school/chapel plans (**APPROVED BY BUILDING AND SAFETY**) incorporating the Project Geotechnical Consultant's recommendations and items in this review sheet must be **reviewed and wet stamped and manually signed by the Project Engineering Geologist and Project Geotechnical Engineer**. City geotechnical staff will review the plans for conformance with the Project Geotechnical Consultants' recommendations and items in this review sheet over the counter at City Hall. **Appointments for final review and approval of the plans may be made by calling or emailing City Geotechnical staff.**

Please direct questions regarding this review sheet to City Geotechnical staff listed below.

Engineering Geology Review by: 5/4/16

Christopher Dean, C.E.G. #1751, Exp. 9-30-16 Date
Engineering Geology Reviewer (310-456-2489, x306)
Email: cdean@malibucity.org

Geotechnical Engineering Review by: *May 4, 2016*

Kenneth Clements, G.E. # 2010, Exp. 6-30-16 Date
Geotechnical Engineering Reviewer (805-563-8909)
Email: kclements@fugro.com

This review sheet was prepared by City Geotechnical Staff contracted with Fugro as an agent of the City of Malibu.

FUGRO CONSULTANTS, INC.
4820 McGrath Street, Suite 100
Ventura, California 93003-7778
(805) 650-7000 (*Ventura office*)
(310) 456-2489, x306 (*City of Malibu*)

City of Malibu

– GEOTECHNICAL –

<u>NOTES FOR BUILDING PLAN-CHECK</u>

The following standard items should be incorporated into Building Plan-Check submittals, as appropriate:

1. One set of grading, retaining walls, OWTS, shoring, and school and chapel building plans, incorporating the Project Geotechnical Consultant's recommendations <u>and items in this review sheet</u>, must be submitted to City geotechnical staff for review. **<u>Additional review comments may be raised at that time that may require a response.</u>**

2. Show the name, address, and phone number of the Project Geotechnical Consultant(s) on the cover sheet of the Building Plans.

3. Include the following note on the Foundation Plans: *"All foundation excavations must be observed and approved by the Project Geotechnical Consultant prior to placement of reinforcing steel."*

4. The Foundation Plans for the proposed project shall clearly depict the embedment material and minimum depth of embedment for the foundations in accordance with the Project Geotechnical Consultant's recommendations.

5. Please depict the Code-required minimum foundation setbacks from descending slopes on the plans, as appropriate.

6. Please contact the Building and Safety Department regarding the submittal requirements for a grading and drainage plan review.

7. A comprehensive Site Drainage Plan, incorporating the Geotechnical Consultant's recommendations, shall be included in the Plans. Show all area drains, outlets, and non-erosive drainage devices on the Plans. Water shall not be allowed to flow uncontrolled over descending slopes.

<u>Grading Plans (as Applicable)</u>

1. Grading Plans shall clearly depict the limits and depths of overexcavation, as applicable.

2. Prior to final approval of the project, an as-built compaction report prepared by the Project Geotechnical Consultant must be submitted to the City for review. The report must include the results of all density tests as well as a map depicting the limits of fill, locations of all density tests, locations and elevations of all removal bottoms, locations and elevations of all keyways and back drains, and locations and elevations of all retaining wall backdrains and outlets. Geologic conditions exposed during grading must be depicted on an as-built geologic map. This comment must be included as a note on the grading plans.

<u>Retaining Walls (As Applicable)</u>

1. Show the retaining wall backdrain and backfill design, as recommended by the Project Geotechnical Consultant, on the Plans.

2. Retaining walls separate from a residence require separate permits. Contact the Building and Safety Department for permit information. One set of retaining wall plans shall be submitted to the City for review by City geotechnical staff. Additional concerns may be raised at that time which may require a response by the Project Geotechnical Consultant and applicant.

City of Malibu

23825 Stuart Ranch Road
Malibu, California 90265
(310) 456-2489 Fax (310) 317-1950

GEOTECHNICAL REVIEW FIXED FEE FORM

PROJECT OWNER/APPLICANT: Mark Meyer

PROJECT ADDRESS: 24855 Pacific Coast Highway

GEOTECHNICAL LOG NO: 3677

PLANNING NO: **CDP 14-069**

PLAN CHECK NO:

ITEM	STATUS	DATE	DEPOSIT	CHARGE	BALANCE	COMMENTS
FIXED FEE BY: Mark Meyer		11/6/2014	$3,000.00	$0.00	$0.00	**Fixed Fee**
Initial Review, CDP 14-069	Response Required	12/8/2014		$0.00	$0.00	Items to address for Consultants
Second review, CDP 14-069	Response Required	5/4/2016				
Additional Reviews: Time & Material						
Third review						
Fourth review						
Applicant Paid Balance Due						
Fifth review						
Applicant Paid Balance Due						
					$0.00	
REFUND DUE APPLICANT						REFUND # ________
BALANCE DUE CITY OF MALIBU						

NOTE:

The Fixed Fee incorporates the initial and one subsequent geotechnical review. Subsequent reviews will be performed in accordance with the City's time and materials rate of $201.50 per hour.

<u>ADDENDUM NO. 3</u>
<u>GEOTECHNICAL ENGINEERING REPORT</u>
Proposed Private School and Chapel
APN 4458-032-027
Malibu Jewish Center and Synagogue
24855 Pacific Coast Highway
Malibu, California
LA-01576-01

Prepared for

DAVID GRAY ARCHITECTS

September 20, 2017
Revised September 22, 2017

Prepared By

Earth Systems Southern California
2122 East Walnut Street, Suite 200
Pasadena, California 91107

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September 22, 2017 LA-01576-01

David Gray Architects
c/o Mr. Mark Meyer
353 South Broadway, Suite 200
Los Angeles, California 90013

Subject: **Addendum No. 3 Geotechnical Engineering Report**
Proposed Private School and Chapel
APN 4458-032-027
Malibu Jewish Center and Synagogue
24855 Pacific Coast Highway
Malibu, California

References: Earth Systems Southern California, 2014, *Preliminary Geotechnical Engineering Report, Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-01, dated November 12, 2014.

Earth Systems Southern California, 2015, *Preliminary Geologic and Percolation Report, Proposed Advanced On-Site Wastewater Treatment Systems (AOWTS), APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-02, dated January 6, 2017.

Earth Systems Southern California, 2015, *Addendum No. 1 Geotechnical Engineering Report, Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-01, dated December 21, 2015.

Earth Systems Southern California, 2016, *Addendum No. 2 Geotechnical Engineering Report, Response to City Review, Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-01, dated May 11, 2016.

City of Malibu, *Geotechnical Review Sheets,* Log Number 3677, CDP 14-069, dated December 8, 2014, May 4, 2016 and July 20, 2016.

Earth Systems Southern California, 2017, *Infiltration Feasibility Letter, Proposed Dry Well, APN 4458-032-027, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-01, dated May 11, 2016.

David Gray Architects, Project Plan Set dated November 7, 2016.

INTRODUCTION

This addendum report has been prepared per your request with the goal of addressing the presently proposed building configuration.

PROJECT DESCRIPTION

Based on discussions with the project architect Mark Meyer, AIA, and review of the current plans provided, Earth Systems understands that the proposed project will consist of the removal of the existing modular school structures and construction of the new school building and chapel. The building design has changed since the submittal of our previous geotechnical reports. The currently proposed main structure now has a smaller footprint, but still includes a two-story structure over a basement level (finished floor elev. of 161.5 feet). That building now includes a second, partial basement level (finished floor elev. of 150 feet). The previously proposed, at-grade chapel has been replaced with a one-story building over a basement level (finished floor elev. of 156 feet), see Plates II – IV. The new buildings will be of masonry-, steel- and wood-frame construction with slab-on-grade ground floors. The project will also include associated retaining walls, parking, walkways, landscaping and a new OWTS. Earth Systems has not received foundation plans for the proposed structure as of this writing. However, based upon the type of construction, estimated structural loads are not expected to exceed 5,000 pounds per linear foot (plf) for bearing walls and 100 kips for isolated columns.

Earth Systems assumes from the provided drawings that conventional cut and fill construction techniques will be utilized for site grading and that standard construction techniques will be utilized for retaining wall and foundation construction. Sewage disposal will be provided by a private onsite wastewater treatment system (OWTS) that has been designed by EnSitu Engineering, Inc. These assumptions were used as the basis for the exploration, testing, and analyses programs, and for the recommendations contained in this report. If the anticipated foundation loads or other site conditions vary significantly from the values stated herein, the recommendations should be reconfirmed prior to completing project plans.

UPDATED RECOMMENDATIONS

A. Seismic Design Parameters

It is assumed that the 2014 Los Angeles County Building Code will still be applicable to the proposed project. The seismic design parameters presented in the referenced geotechnical engineering report dated November 12, 2014 were based on the 2013 California Building Code (CBC). With implementation of the 2016 CBC on January 1, 2017, the seismic design parameters derived using the 2013 CBC and ASCE 7-10 guidelines will remain the same. Therefore, the seismic design parameters presented in the referenced geotechnical engineering report are applicable to this project.

B. Foundations

In the referenced report dated November 12, 2014, Earth Systems provided recommendations for the foundations of the proposed structures to be supported on three (3) feet of engineered fill beneath the bottom of proposed footings or formational bedrock, but not both.

Earth Systems anticipates that excavation for the basement level(s) beneath the proposed structures will remove the majority, if not all, of the existing artificial fill and terrace deposits encountered in the test borings/pits. If terrace deposits are present upon reaching the bottom of the excavation for the basement level(s), the foundations for the basement walls may be deepened or drilled piers (caissons) can be used to extend into bedrock. Alternatively, remedial grading may be performed to support conventional shallow continuous and isolated foundations on at least 3 feet of compacted engineered fill. Remedial excavations should be performed to a distance of at least three (3) feet laterally beyond the building perimeter.

Independent walls and ancillary structures planned throughout the project site may bear in the competent native terrace or bedrock, but not both.

With the proposed basement levels and the relocation of the structures further back from the descending slope, maintaining the minimum setback requirement for structures near slopes steeper than three horizontal to one vertical (3H:1V) should be achieved. However, for independent walls and ancillary structures planned near slopes steeper than 3H:1V, conventional spread foundations should be deepened or drilled piers (caissons) used to satisfy the minimum setback requirements in the 2016 CBC.

The recommendations presented in the referenced geotechnical engineering report for allowable bearing capacity, coefficient of friction, and passive pressure in both compacted fill and bedrock should be used in the design of the foundations.

C. Retaining Walls

The walls of the second, partial basement level (finished floor elev. of 150 feet) should be designed for full hydrostatic pressure. As a result, a wall drainage system will not be required behind these walls.

Weepholes, backdrains, or an equivalent system of backfill drainage should be incorporated into the design of the walls for the upper basement level (finished floor elev. of 161.5 feet). For placement of the drain pipe of the wall drainage system of the upper basement level, the void between the walls of the lower partial basement level and excavation sidewalls can be backfilled with a sand/cement slurry up the elevation of the drain pipe. Alternatively, the walls of the upper basement level may be designed for full hydrostatic pressure to avoid installation of a wall drainage system.

Regardless of the type of wall drainage system used or not used, waterproofing of the basement walls should be provided to help reduce the potential for efflorescent formation.

GEOTECHNICAL CONCLUSIONS

Based on the review of the updated data, it appears that the referenced geotechnical engineering reports, with the exceptions and augmentations provided above, remain applicable to the currently proposed project. This addendum report shall serve to update the referenced geotechnical engineering reports for a period of one year.

CITY OF MALIBU SECTION 111 STATEMENT

Based on the findings summarized in this report, and provided the recommendations in this report are incorporated into the project, it is Earth Systems' opinion that the proposed structure on the subject property will not be subject to a geologic hazard from landslides, settlement, or slippage beyond that described herein. It is also Earth Systems' opinion that the proposed structure and associated grading will not adversely affect the geologic stability of the site or adjacent properties provided our recommendations are followed. Test findings and statements of professional opinions do not constitute a guarantee or warranty, expressed or implied.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

The conclusions and recommendations submitted in this report relative to the proposed development are based, in part, upon the data obtained from the site observations during the field exploration, and past experience. The nature and extent of variations between the borings and test pits may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this addendum report.

This addendum should be made part of the referenced Preliminary and Addendum Geotechnical Engineering reports dated November 12, 2014, December 21, 2015, and May 11, 2016. All conclusions, recommendations, and limitations of those reports, except as specifically amended in this addendum report, remain valid and apply to the currently proposed project.

CLOSURE

Earth Systems trusts this report is sufficient at this time and meets your current needs. Earth Systems appreciates this opportunity to provide professional geotechnical engineering services for this project. If you have any questions regarding the information contained in this report, or if you require additional geotechnical engineering services, please contact the undersigned.

Respectfully submitted,

Earth Systems

CERTIFIED ENGINEERING GEOLOGIST
CHRISTOPHER FRASER ALLEN
No. 2648
Exp. 8/2018
STATE OF CALIFORNIA

Christopher F. Allen, P.G., E.G.
Project Engineering Geologist

REGISTERED PROFESSIONAL ENGINEER
ANTHONY P. MAZZEI
GE 2823
Exp. 6-30-19
GEOTECHNICAL
STATE OF CALIFORNIA

9/20/17

Anthony P. Mazzei, P.E., G.E.
Project Geotechnical Engineer

END OF TEXT

REFERENCES

PLATES

Plate I	Site Geologic Map
Plates II - V	Geologic Cross Sections

Distribution:

3 – Addressee
1 – Addressee (CD, pdf copy)

REFERENCES

Earth Systems Southern California, 2002, *Preliminary Geotechnical Engineering Report Proposed Malibu Jewish Center 24855 Pacific Coast Highway Malibu California,* PL-05711-01, dated February 22, 2002.

Earth Systems Southern California, 2002, *Addendum No. 1 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated July 1, 2002.

Earth Systems Southern California, 2002, *Addendum No. 2 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated August 13, 2002.

Earth Systems Southern California, 2004, *Addendum No. 3 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated April 9, 2004.

Earth Systems Southern California, 2004, *Addendum No. 4 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-02, dated October 12, 2004.

Earth Systems Southern California, 2006, *Addendum No. 5 Geotechnical Engineering Report, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-03, dated February 28, 2006.

Earth Systems Southern California, 2004, *Final Rough Grading Report for Building Pad and Interim Rough Grading Report for Parking Areas Malibu Jewish Center, 24855 Pacific Coast Highway, Malibu, California*, PL-05711-03, dated November 15, 2004.

Earth Systems Southern California, 2014, *Preliminary Geotechnical Engineering Report for* Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California, LA-01576-01, dated November 12, 2014.

Earth Systems Southern California, 2015, *Proposed Advanced On-Site Wastewater Treatment System (AOWTS)l, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-02 dated January 6, 2015.

Earth Systems Southern California, 2015a, *Addendum No. 1 Geotechnical Engineering Report, Proposed Private School and Chapel, APN 4458-032-027, Malibu Jewish Center and Synagogue, 24855 Pacific Coast Highway, Malibu, California*, LA-0576-01 dated December 21, 2015.

Malibu, City of, 2014, *Geotechnical Review Sheet,* Log Number 3677, CDP 14-069, dated December 8, 2014.

Malibu, City of, 2016, *Geotechnical Review Sheet,* Log Number 3677, CDP 14-069, dated May 4, 2016.

Mountain Geology, 1987, *Engineering Geologic and Soils Engineering Investigation and Percolation Testing Proposed Hotel and Restaurant Complex 14911 Pacific Coast Highway Malibu California*, JH 1974gs, dated October 27, 1987.

Mountain Geology, 1991, *Addendum Engineering Geology Report Proposed Private Sewerage Disposal System Proposed Restaurant 24911 Pacific Coast Highway Malibu California*, JG 1974sp, dated January 9, 1991.

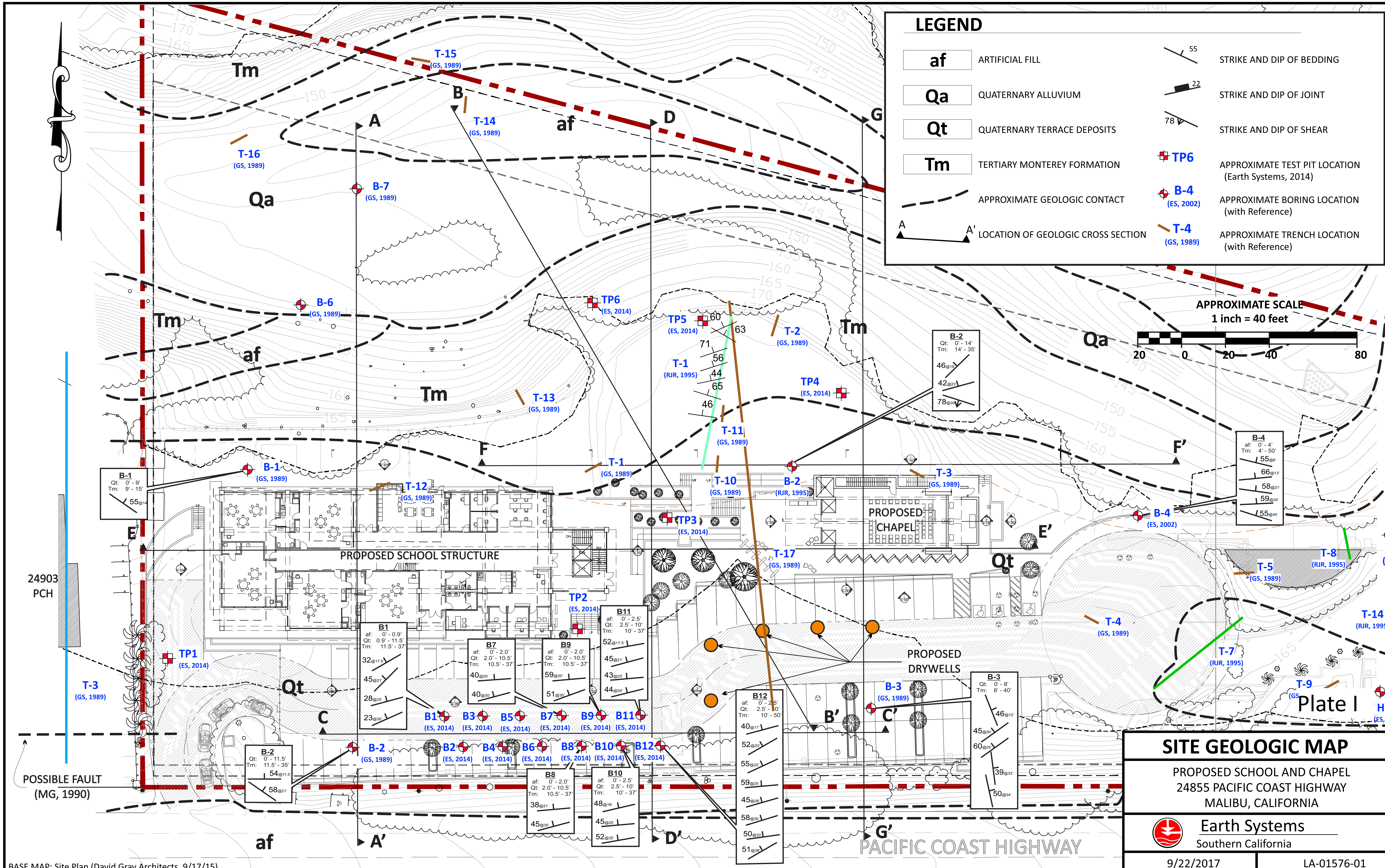
RJR, 1995, *Geotechnical Engineering and Geological Investigation Proposed Facility Expansion Project Malibu Jewish Center 24855 Pacific Coast Highway Malibu California*, Project No. 796.20-95, dated October 25, 1995.

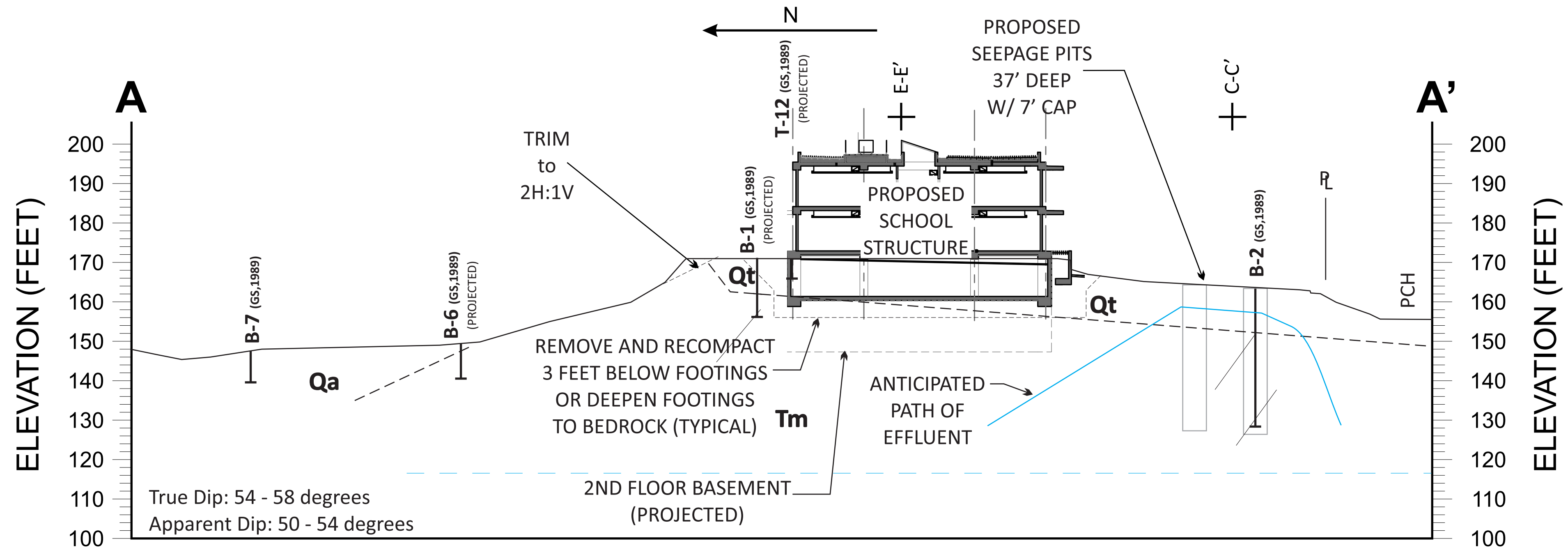
RJR, 2001, *Preliminary Geologic and Geotechnical Engineering Report Proposed Commercial Development 24903 Pacific Coast Highway Malibu California*, Project No. 1243.10-01, dated December 28, 2001.

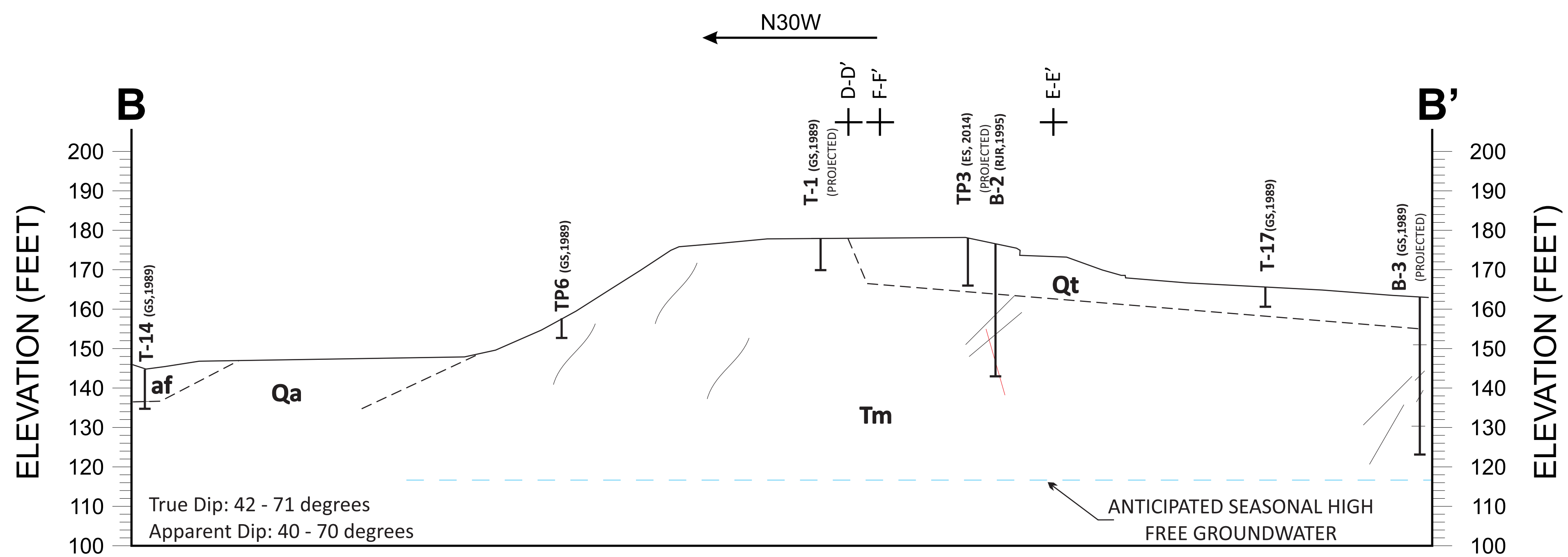
Treiman, J.A., 1994, *Malibu Coast Fault, Los Angeles County, California:* California Division of Mines and Geology Fault Evaluation Report FER-229, 42 p.

PLATES

Plate I
Plates II - V


LEGEND
af ARTIFICIAL FILL
Qa QUATERNARY ALLUVIUM
Qt QUATERNARY TERRACE DEPOSITS
Tm TERTIARY MONTEREY FORMATION
APPROXIMATE GEOLOGIC CONTACT
A A' LOCATION OF GEOLOGIC CROSS SECTION
55 STRIKE AND DIP OF BEDDING
22 STRIKE AND DIP OF JOINT
78 STRIKE AND DIP OF SHEAR
TP6 APPROXIMATE TEST PIT LOCATION (Earth Systems, 2014)
B-4 (ES, 2002) APPROXIMATE BORING LOCATION (with Reference)
T-4 (GS, 1989) APPROXIMATE TRENCH LOCATION (with Reference)
APPROXIMATE SCALE
1 inch = 40 feet
20 0 20 40 80
PROPOSED SCHOOL STRUCTURE
PROPOSED CHAPEL
PROPOSED DRYWELLS
24903 PCH
POSSIBLE FAULT (MG, 1990)
PACIFIC COAST HIGHWAY
Plate I
SITE GEOLOGIC MAP
PROPOSED SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA
Earth Systems
Southern California
9/22/2017
LA-01576-01
BASE MAP: Site Plan (David Gray Architects, 9/17/15)





SCALE
1 in = 40 ft (H&V)

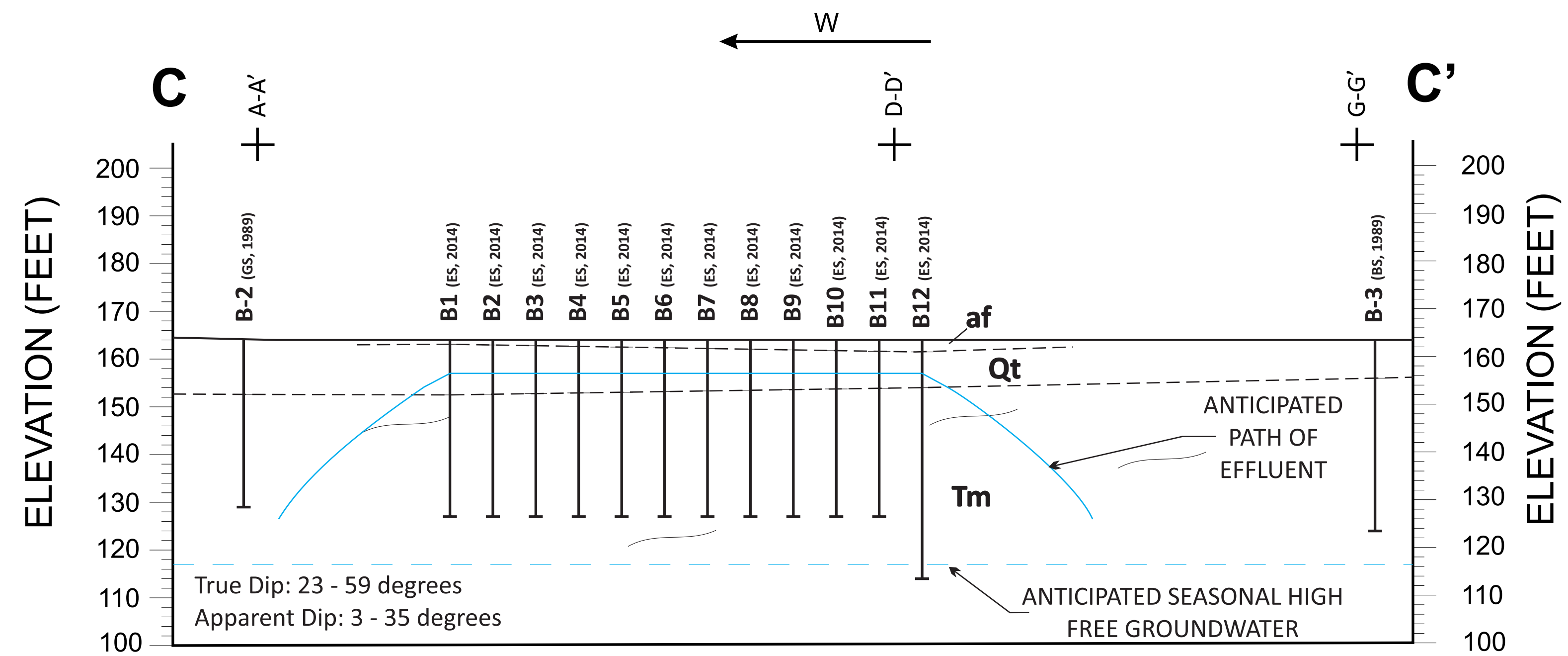
Plate II

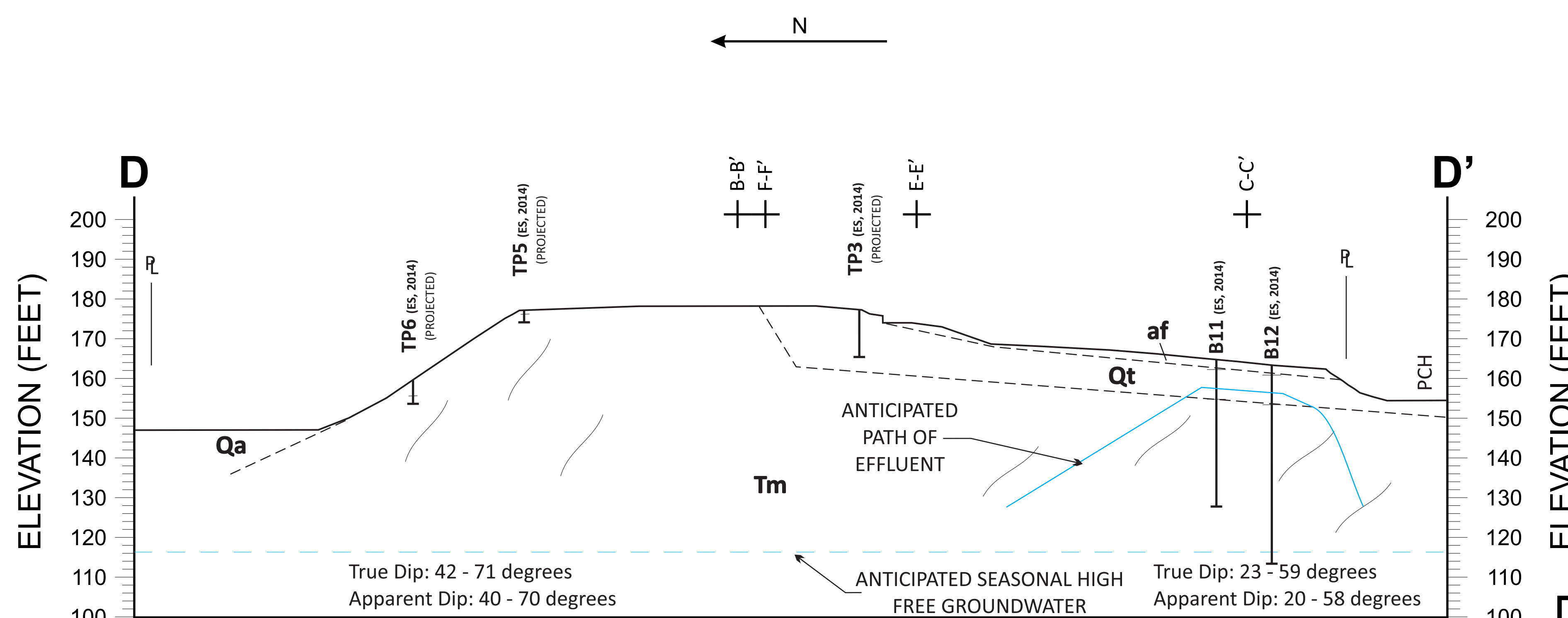
GEOLOGIC CROSS SECTIONS A & B

PROPOSED PRIVATE SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

9/22/2017	LA-01576-01





SCALE
1 in = 40 ft
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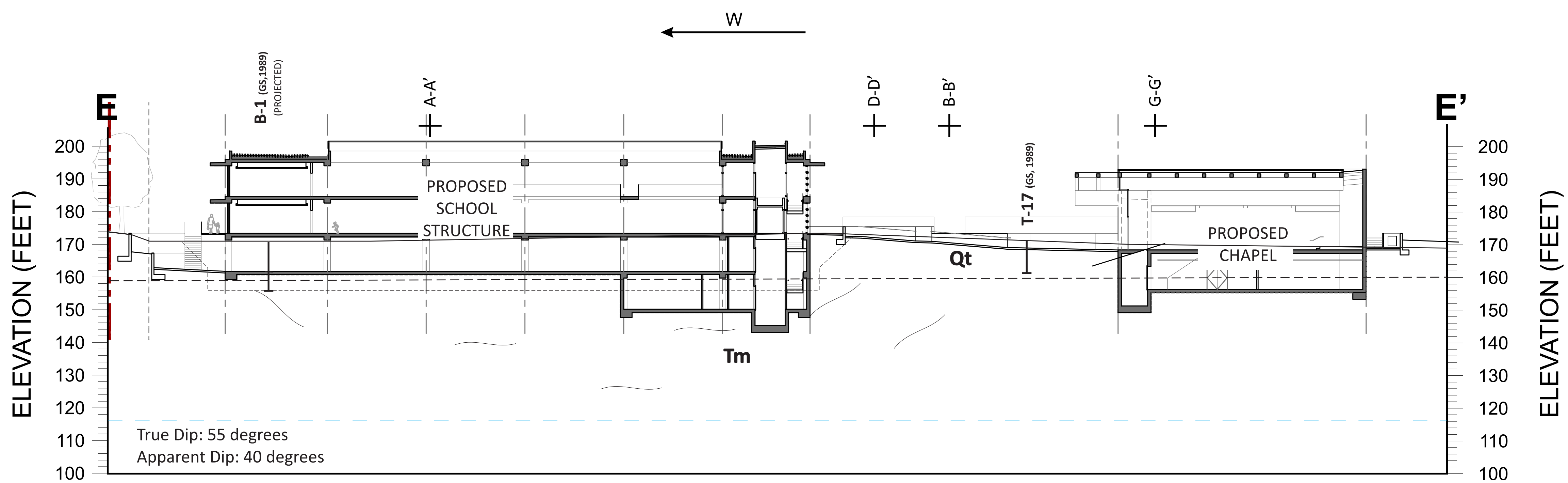
Plate III

GEOLOGIC CROSS SECTIONS C & D

PROPOSED PRIVATE SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

9/22/2017	LA-01576-01



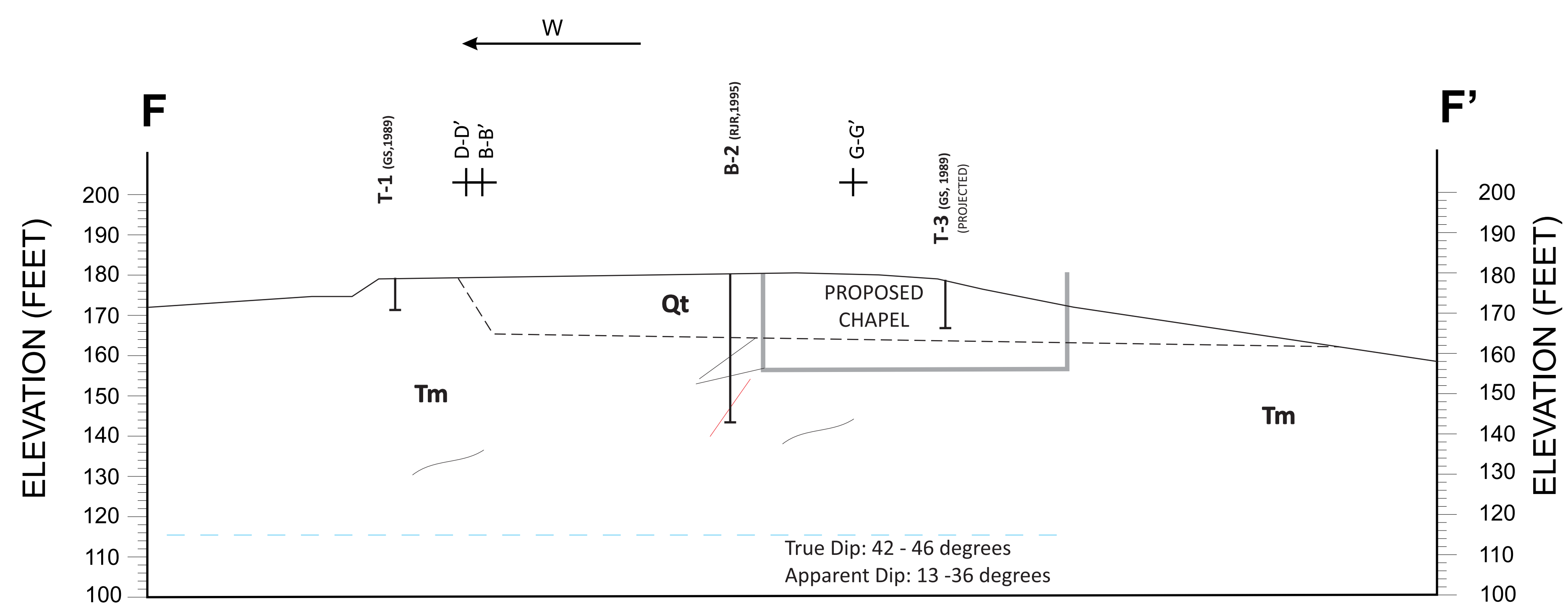


Plate IV

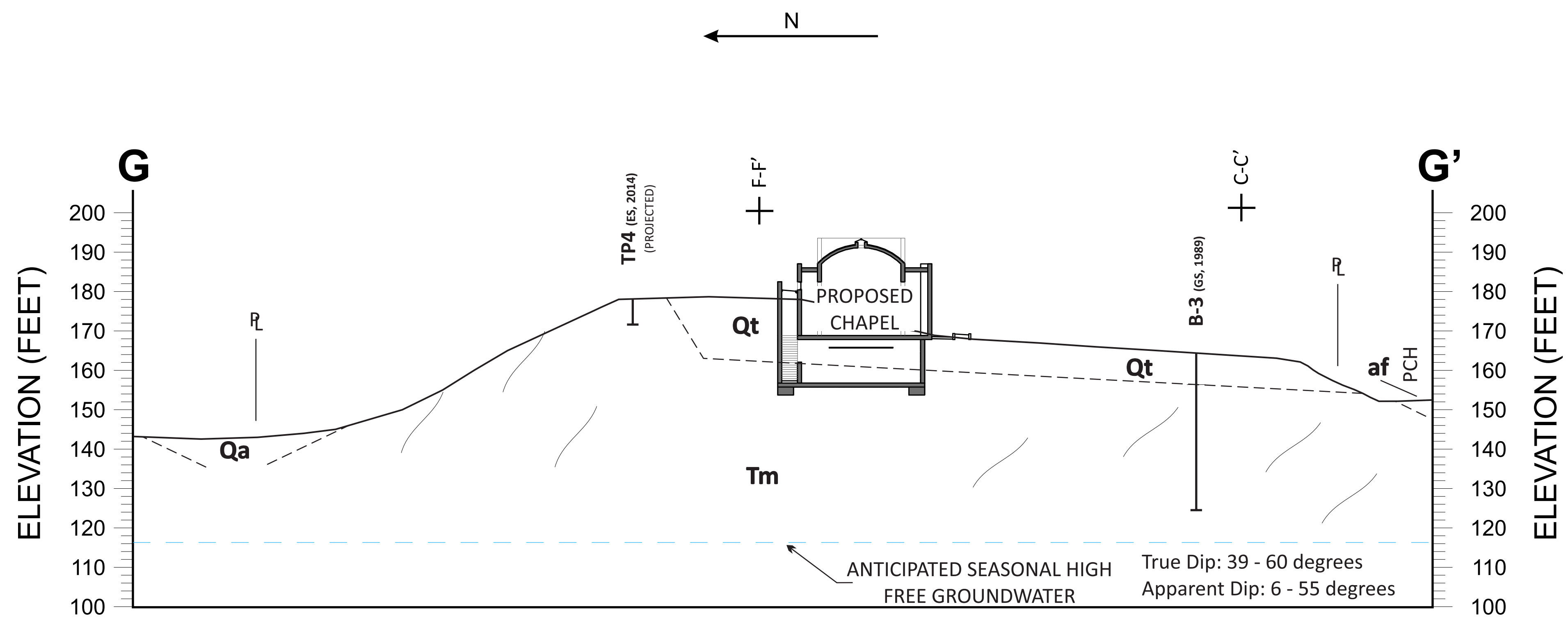
SCALE
1 in = 40 ft (H&V)

GEOLOGIC CROSS SECTIONS E & F

PROPOSED PRIVATE SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

9/22/2017 | LA-01576-01



SCALE
1 in = 40 ft
(1:360)

Plate V

GEOLOGIC CROSS SECTION G

PROPOSED PRIVATE SCHOOL AND CHAPEL
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

9/22/2017	LA-01576-01

PRELIMINARY GEOLOGIC AND PERCOLATION REPORT
Proposed Advanced On-Site Wastewater Treatment Systems (AOWTS)
APN 4458-032-027
24855 Pacific Coast Highway
Malibu, California
LA-01576-02

Prepared For

DAVID GRAY ARCHITECTS

January 6, 2015

Prepared By

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January 6, 2015 LA-01576-02

David Gray Architects
C/O Mr. Mark Meyer
527 West 7th Street, Suite 1001
Los Angeles, California 90014

Subject: **Preliminary Geologic and Percolation Report**
Proposed Advanced On-Site Wastewater Treatment Systems (AOWTS)
APN 4458-032-027
24855 Pacific Coast Highway, Malibu, California

Presented herewith is the percolation test data and geologic report for the proposed advanced on-site wastewater treatment system (AOWTS); a design level report will be prepared by others under a separate cover. Earth Systems strives to provide analyses and recommendations in accordance with the applicable standards of care for the geotechnical engineering profession at the time the study is conducted.

The submittal of this report marks the completion of the scope of geotechnical engineering services described in Earth Systems' proposal dated August 24, 2014 and authorized on October 14, 2014. Other services which may be required, such as consultation and plan review, are additional services that will be billed according to the Fee Schedule in effect at the time such services are provided. Budgets for these services, which are dependent upon design and construction schedules, can be provided when requested. Earth Systems appreciates this opportunity to provide professional geotechnical engineering services for this project. If you need clarification of the information contained in this report, or if Earth Systems can be of additional service, please contact the undersigned.

Respectfully submitted,

Earth Systems

Christopher F. Allen, P.G.
Project Geologist

Distribution:
- 3 – Addressee
- 1 – Addressee (CD, pdf copy)
- 1 – Ensitu c/o John Yaroslaski

TABLE OF CONTENTS

January 6, 2015 LA-01576-02

PRELIMINARY GEOLOGIC AND PERCOLATION REPORT
PROPOSED ADVANCED ON-SITE WASTEWATER TREATMENT SYSTEM (OWTS)
APN 4458-032-027
MALIBU JEWISH CENTER
MALIBU, CALIFORNIA

INTRODUCTION

This Preliminary Geologic and Percolation Report has been prepared to provide the information required by the City of Malibu Environmental Health Department for design of the proposed advance on-site wastewater treatment system (OWTS) that will serve the proposed residential development.

This report includes:

1. Descriptions of the field exploration and percolation tests performed.
2. Geologic evaluation of subject area with respect to the proposed AOWTS.

SITE DESCRIPTION

The approximate 4.75-acre site is at located on the north side on Pacific Coast Highway (PCH) in the City of Malibu, Los Angeles County, California. The site is approximately 4,000 feet west of Malibu Canyon Road and approximately 2,000 feet east of Puerco Canyon Road (see Plates I and II).

The site is situated on an east-west trending ridge, which is defined by the cut slope adjacent to Pacific Coast Highway on the south side, and the incised drainage of Puerco Canyon on the north side of the site. On the westerly portion of the site, the subject of this study, there are existing modular classrooms and offices, play yards, and a parking lot. The easterly portion of the site is occupied by a synagogue structure and parking lot, constructed circa 2005. An existing on-site sewage disposal system serves the existing facilities at the site and is located in the existing driveway.

Along the south side of the site, a five- to ten-foot tall cut slope ascends from PCH at an approximate gradient of one and a half horizontal to one vertical (1.5H:1V) gradient to the existing parking lot at an elevation of approximately 165 feet above mean sea level. The gently sloping parking lot extends 60 to 80 feet north to a two-foot to five-foot tall retaining wall. Above and behind the retaining wall are the existing school facilities, at an elevation of 171 feet, with an open field to the east at an elevation of roughly 178 feet. Beyond the school facilities a natural slope descends approximately 35 feet to the Puerco Canyon drainage, with slope gradients ranging from 1H:1V to 4H:1V.

The developed easterly portion of the site has been landscaped with various grasses, trees and shrubs. Native trees and shrubs are located within the Puerco Canyon drainage and surrounding slopes. The above-cited descriptions are intended to be illustrative, and are specifically not intended for use as a legal description of the subject property.

PROJECT DESCRIPTION

Based on discussions with the project AOWTS designer and review of the preliminary plans provided, Earth Systems understands that a new AOWTS system will service the proposed new private school facilities. The proposed system will consist of several new seepage pits and a new septic tank to be located in the existing driveway and parking lot. Existing seepage pits may supplement the new system.

PURPOSE AND SCOPE OF SERVICES

The purpose of Earth Systems' services was to provide a Geologic and Percolation Report for the express purpose of providing information to be used for design of an onsite wastewater treatment system OWTS based on the site geologic characteristics and the percolation characteristics of the subsurface earth materials. Earth Systems' scope of services included the following:

A. The excavation and geologic logging of twelve (12), 24-inch diameter bucket auger percolation and groundwater test borings to evaluate and describe the subsurface geologic conditions and to check for the indications of groundwater at locations selected by the environmental consultant.
B. Percolation testing of twelve (12), 24-inch diameter bucket auger test borings.
C. Geologic evaluation of the subject site and surrounding properties with respect to the proposed AOWTS in conformance with the requirement set for by the City of Malibu Environmental Sustainability Department.
D. A summary of findings and recommendations in this written report.

Contained in this report are:

A. Descriptions of the field exploration and percolation tests performed.
B. Geologic evaluation of subject area with respect to the proposed AOWTS.
C. Evaluation of percolation rate calculations.
D. Boring logs and analyses in support of the OWTS design–level site plan.

FIELD EXPLORATION

The field exploration for this study was conducted in October and November of 2014. Field exploration consisted of drilling twelve (12) bucket-auger test borings to depths of approximately

27 feet (B1 through B11) and 50 feet (B12) below existing grade. The borings were drilled and logged, boring B12 was backfilled and sealed at least 10 feet above the groundwater level, then each boring was gravel-packed for infiltration testing.
The location and dimensions of the borings tested was based on plans provided by Ensitu Engineering. The approximate location of the test borings, as indicated on the attached Site Geologic Map (Plate III), were determined by sightings and tape measuring from existing surrounding improvements. The locations of the borings should be considered accurate only to the degree implied by the measurement method used.

The logs of borings are included in Appendix A for reference. The logs of test borings represent Earth Systems' interpretation of the field logs prepared for each boring by Earth Systems' staff. While the noted stratification lines represent approximate boundaries between soil types, the actual transitions may be gradual.

SUBSURFACE CONDITIONS

Artificial fill (af) soils were encountered in all of the test pits excavated during this current investigation. The depth of fill observed ranged from approximately 1.0 to 1.5 feet around the plateau at the site's center. These fill soils were found to consist predominantly of moderately compacted silty to clayey medium to coarse grained sand.

Terrace (Qt) profile is comprised of ancient beach deposits with some continental deposits. These native soils were found to consist predominantly of fine to medium sand with cobbles that became more fine grained and silty with depth (sandy loam based on the USDA texture classification). At the basal contact, the material became heavy with rounded cobbles and the encompassing sandy matrix was extremely silty.

Monterey Formation Bedrock (Tm) was encountered beneath the terrace, between 10.5 and 11.5 feet deep in all test borings. Bedrock consisted of thinly interbedded siliceous shale, sandstone and siltstone of the Monterey Formation. The bedding observed in exploratory excavations on the site dips relatively uniformly at moderate to steep angles toward the north, similar to that reported by previous studies for the site.

The logs of the test borings by Earth Systems are presented in Appendix A and contain more detailed descriptions of the soils and bedrock encountered.

GROUNDWATER

Groundwater in the form of minor seeps was encountered at a depth of approximately 47 feet below existing site grade, in test boring B12. Observations of bedrock texture in the deep exploratory borings does not suggest that the historic shallowest groundwater beneath the site is greater than that observed in boring B12. The lack of distinctive redoximorphic features above and below the observed minor water seeps suggests that the seasonal high groundwater level is no shallower than this. Fluctuations in groundwater levels may occur due to variations in rainfall, regional climate, and other factors.

PERCOLATION TEST PROCEDURES AND RESULTS

The percolation tests were conducted in conformance with City of Malibu Seepage Pit Percolation Testing Policy and Los Angeles County Department of Public Health guidelines. As described above, following downhole logging by the undersigned Engineering Geologist, boring B12 was backfilled to at least ten (10) feet above potential or observed groundwater level and provided with a bentonite seal.

The borings were pre-soaked by filling with clean water on October 29, 2014 for borings B7 through B12 and on November 2, 2014 for borings B1 through B6. The following day a metered percolation test was performed in each boring. The borings were filled with water by means of a 1.5-inch diameter hose connected to a domestic water main. In approximately one-hour intervals the amount of drop in water level, volume of water added to the borehole and the time was recorded. The procedure was repeated for a period of approximately eight hours. The day following the percolation test, the water levels in each boring were recorded.

Appendix B contains detailed results of the borehole and pit percolation tests including water meter calibration certificate, and percolation test calculations. Design depths and percolation rates for seepage pits are as follows:

	Gallons/Day					
Boring #	4-foot pit	5-foot pit	6-foot pit	Total Depth (feet)	Cap Depth (feet)	Effective Depth (feet)
1	526	658	789	37	7	30
2	626	783	939	37	7	30
3	410	513	615	37	7	30
4	726	908	1089	37	7	30
5	544	680	816	37	7	30
6	726	908	1089	37	7	30
7	552	690	828	37	7	30
8	804	1005	1206	37	7	30
9	536	670	804	37	7	30
10	774	968	1161	37	7	30
11	526	658	789	37	7	30
12	970	1213	1455	37	7	30

CONCLUSIONS AND RECOMMENDATIONS

Seepage Pit Disposal

Based on the results of the observations performed in the borings and observations made during the geotechnical site investigation, it is Earth Systems opinion that an alternative on-site wastewater treatment system (AOWTS) with seepage pits is feasible at the site. In conformance with the City of Malibu Environmental Sustainability Department, the seepage pits should be located at the exact test location.

OWTS Layout and Setbacks

The proposed OWTS components should be located so as to comply with all of the restrictions of the County of Los Angeles Plumbing Code as adopted by the City of Malibu (City of Malibu Plumbing Code §15.12.050). All system components must be situated so as to meet the setback requirements of Table H: 1.7.

Cap Depth Statement

The upper portion of the seepage pits, to a depth of at least seven feet below ground surface, should be "capped" or lined with solid (blank) casing for each proposed present and future seepage pit. The recommended cap depth is referenced to existing grade at the time the boreholes were logged and tested for percolation capacity. It is our opinion that this depth allows infiltration in terrace deposits and bedrock that will not conduct effluent laterally or allow mounding and side slope breakout.

Slope Stability

Slope stability analyses were included in the above referenced soils report (Earth Systems, 7/9/2014) which incorporated the anticipated effluent of the proposed seepage pits at the presently proposed location. The resultant safety factors are in excess of 1.5 for static condition and 1.1 for pseudostatic conditions.

Anticipated Path of Effluent

The attached Geologic Cross Section (Plate IV) depicts the location of the proposed and 100% expansion pits on the slope and anticipated path of effluent. In general the observed Trancas formation coarsens downward. It is our opinion that the geologic data observed in the logged borings supports our conclusions regarding the effects of effluent on groundwater levels under the site, the potential for mounding of groundwater, and the potential for effluent to daylight on the ground surface. The depicted effluent path is anticipated to be the result of geologic structure and stratigraphy. Infiltration within the tested section of seepage pit test borings is primarily downward with an along bedding components, that dip at moderate angle to the north. Accordingly, we anticipate the effluent path will be asymmetrically displaced toward the north.

Groundwater Mounding Potential

No geologic structure was observed that might suggest possible mounding of effluent or impoundment of infiltrated groundwater. No water remained in the borings 24 hours following the initiation of the meter tests, with the exception of approximately five (5) feet in boring B7. As noted above, the Trancas formation coarsens with depth. We do not anticipate groundwater mounding to occur on this site. Specifically, lithologic changes resulting from the regressive deposits cause hydraulic conductivity to decrease upward.

Domestic Water Supply Wells

No permitted wells are known to exist within 250 feet of the proposed seepage pits. However Earth Systems understands that a well is located on the adjacent property to the east, no records are available for that well. Based on communications with our clients representatives that well is not used for potable water. The Los Angeles County Waterworks District No. 29 supplies domestic water in the project area.

City of Malibu Section 111 Statement

In accordance with the City of Malibu Guidelines for the Preparation of Engineering Geology and Geotechnical Engineering Reports §5.7- Mandatory Building Code Statements, Earth Systems provides the following findings. Based on the findings summarized in this report, and provided the recommendations in this report are incorporated into the project, it is Earth Systems' opinion that the proposed development on the subject property will not be subject to a geologic hazard from landslides, settlement, or slippage beyond that described herein. It is also Earth Systems' opinion that the proposed structures and associated grading will not adversely affect the geologic stability of the site or adjacent properties provided our recommendations are followed. Test findings and statements of professional opinions do not constitute a guarantee or warranty, expressed or implied.

CLIENT OPTIONAL SERVICES

This report was based on the assumption that an adequate program of client consultation, construction monitoring, and testing will be performed during the final design and construction phases to check conformance with the recommendations of this report. Maintaining Earth Systems as the geotechnical engineering consultant from beginning to end of this project will help provide continuity of services. The recommended services include, but are not necessarily limited to, the following:

a. Consultation as required during the final design stages of the project.
b. Review of grading and/or building plans.
c. Observation and testing during site preparation, grading, placement of engineered fill, and backfill of utility trenches.
d. Consultation as required during construction.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

The conclusions and recommendations submitted in this report relative to the proposed private school building are based, in part, upon the data obtained from site observations during the field exploration operations, and past experience. The nature and extent of variations between the borings may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

In the event of any change in the assumed nature or design of the proposed project as planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing. This report is issued with the understanding that it is the responsibility of David Gray Architects to insure that the information and recommendations contained in this report are called to the attention of the architects and engineers for the project and incorporated into the plan. It is also the responsibility of David Gray Architects, and its representatives, to insure that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

As the geotechnical engineers for this project, Earth Systems strives to provide its services in accordance with generally accepted geotechnical engineering practices in this community at this time. No warranty or guarantee is expressed or implied. This report was prepared for the exclusive use of David Gray Architects for the purposes stated in this document for the referenced project only. No third party may use or rely on this report without the express written authorization of Earth Systems for such use or reliance.

It is recommended that Earth Systems be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design specifications. If Earth Systems is not accorded the privilege of making this recommended review, it can assume no responsibility for misinterpretation of the recommendations.

The scope of current services for this report did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around the site.

The statements contained in this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the conclusions of this report may be invalidated, wholly or partially, by changes outside of Earth Systems' control, and should therefore be reviewed after one year.

CLOSURE

Earth Systems trusts this report is sufficient at this time and meets your current needs. Earth Systems appreciates this opportunity to provide professional geotechnical engineering services for this project. If you have any questions regarding the information contained in this report, or if you require additional geotechnical engineering services, please contact the undersigned.

Respectfully submitted,

Earth Systems

Sara Denise
Staff Geologist

Christopher F. Allen, P.G.
Project Geologist

PROFESSIONAL GEOLOGIST
CHRISTOPHER FRASER ALLEN
No. 9085
EXP 8/15
STATE OF CALIFORNIA

FOR
William A. LaChapelle, C.E.G.
Project Engineering Geologist

END OF TEXT

REFERENCES

PLATES

APPENDICES

REFERENCES

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PLATES

Source: USGS, Malibu Beach 7.5 Minute Quadrangle, dated 2012, Photorevised 2010.

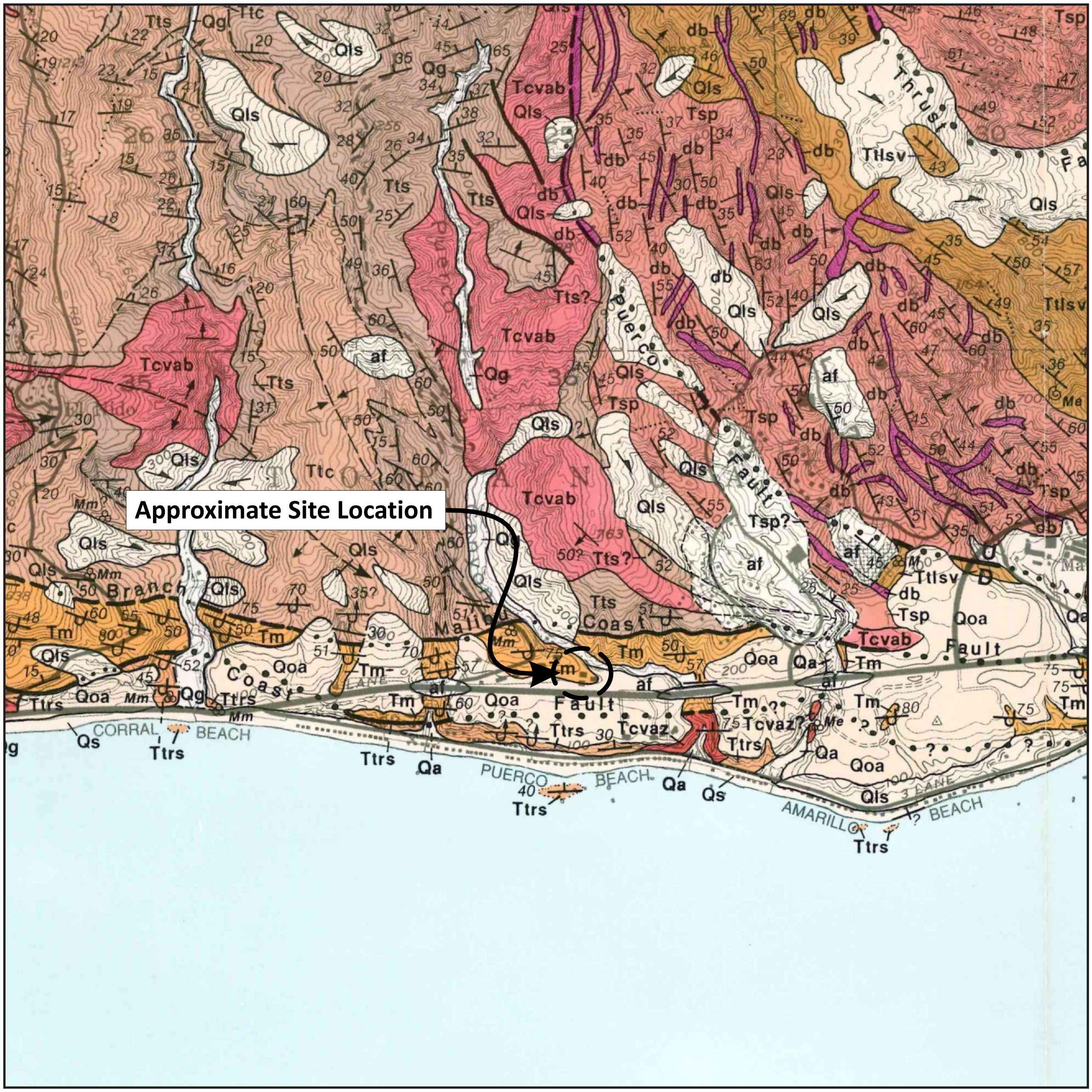
Plate I

SITE LOCATION MAP

PROPOSED OWTS
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

1/6/2015	LA-01576-02



Source: Dibblee Geologic Maps, Malibu Beach Quadrangle, DF-47, 1993.

LEGEND

Quaternary

af Artificial cut and fill
Qs Beach Sand
Qg Gravel and Sand
Qa Alluvium
Qls Landslide
Qoa Old Alluvium

Miocene-Tertiary

Tm Monterey Formation - shale
Ttrs Trancas Formation - Sandstone
Ttc Middle Topanga Formation - Clay shale
Tts Middle Topanga Formation - Sandstone
Tcvab Conejo Volcanics - Andesitic Breccia
Tcvaz Conejo Volcanics - Andesitic Breccia
db diabase or basalt
Ttlsv Lower Topanga Formation - Sandstone
Tsp Sespe Formation - Sandstone

Syncline
Anticline
Geologic contact
Fault

25 Bedding Attitude
20 Approximate Bedding
20 Overturned Bedding
20 Foliation

N

0 ft. ~ 1,000 ft. ~ 2,000 ft.

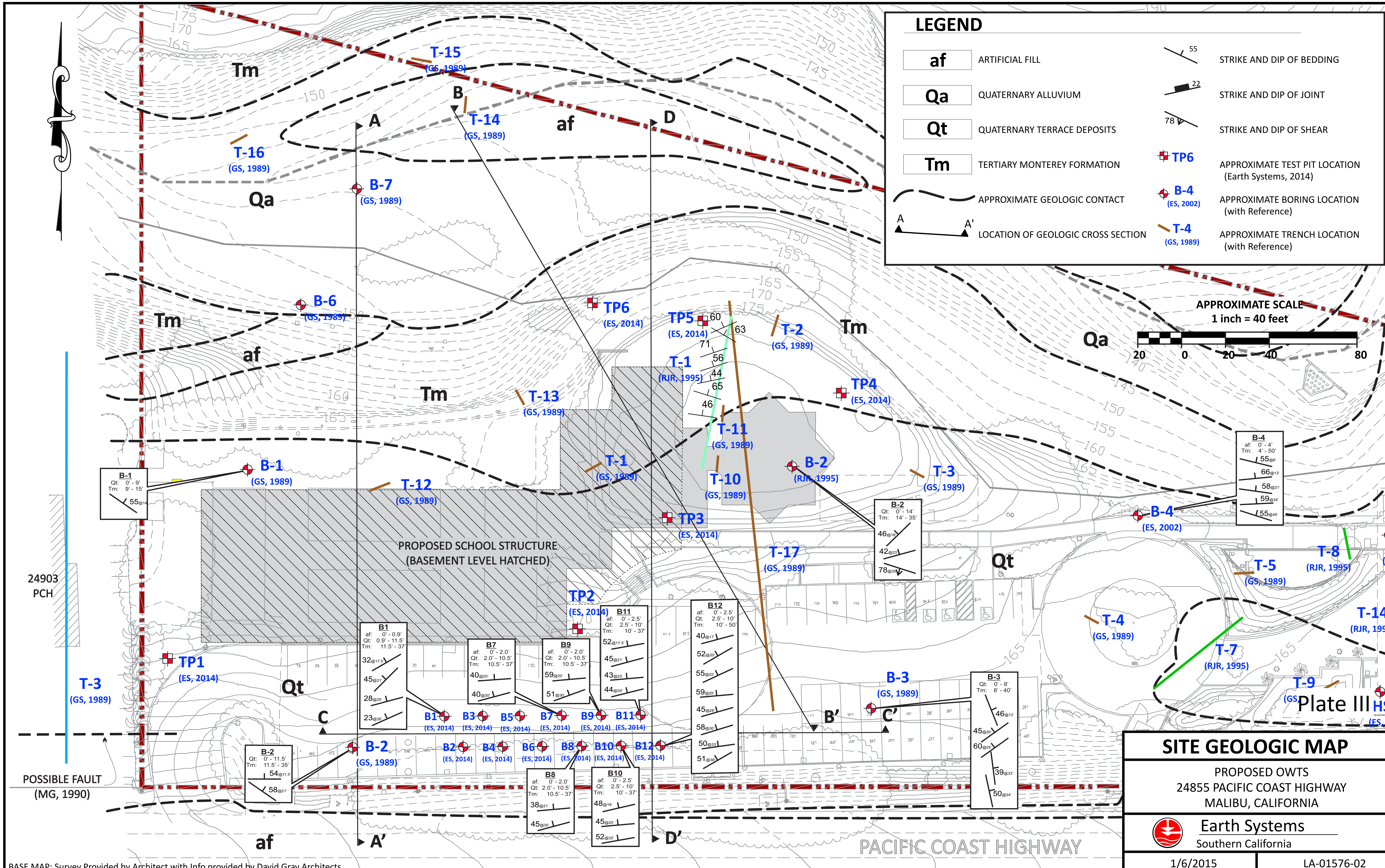
Plate II

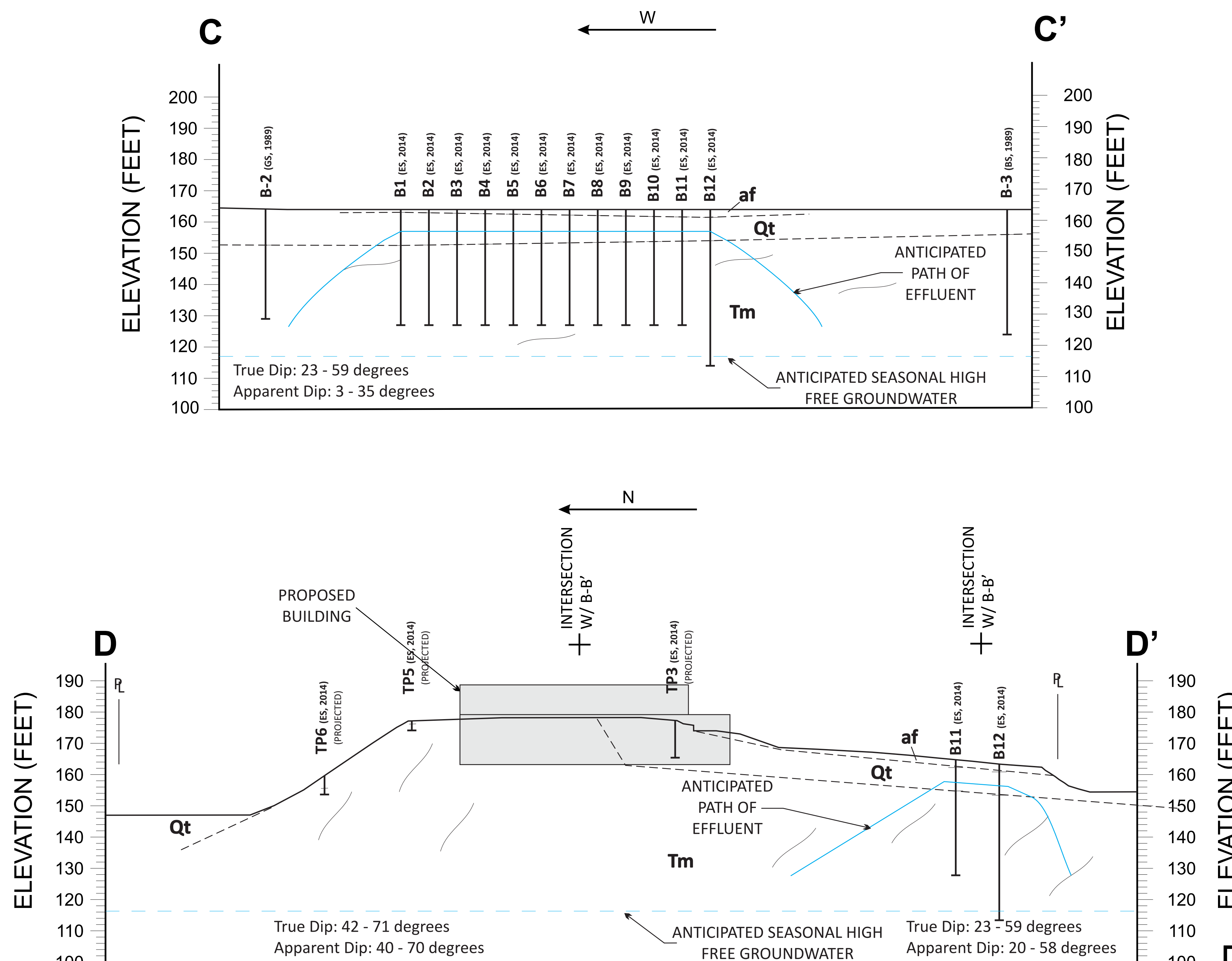
REGIONAL GEOLOGIC MAP

PROPOSED OWTS
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

1/6/2015	LA-01576-02


LEGEND
af ARTIFICIAL FILL
Qa QUATERNARY ALLUVIUM
Qt QUATERNARY TERRACE DEPOSITS
Tm TERTIARY MONTEREY FORMATION
APPROXIMATE GEOLOGIC CONTACT
A A' LOCATION OF GEOLOGIC CROSS SECTION
55 STRIKE AND DIP OF BEDDING
22 STRIKE AND DIP OF JOINT
78 STRIKE AND DIP OF SHEAR
TP6 APPROXIMATE TEST PIT LOCATION (Earth Systems, 2014)
B-4 (ES, 2002) APPROXIMATE BORING LOCATION (with Reference)
T-4 (GS, 1989) APPROXIMATE TRENCH LOCATION (with Reference)
APPROXIMATE SCALE
1 inch = 40 feet
20 0 20 40 80
PROPOSED SCHOOL STRUCTURE
(BASEMENT LEVEL HATCHED)
24903
PCH
POSSIBLE FAULT
(MG, 1990)
PACIFIC COAST HIGHWAY
BASE MAP: Survey Provided by Architect with Info provided by David Gray Architects
SITE GEOLOGIC MAP
PROPOSED OWTS
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA
Earth Systems
Southern California
1/6/2015
LA-01576-02
Plate III



SCALE
1 in = 40 ft
(1:360)

Plate IV

GEOLOGIC CROSS SECTIONS

PROPOSED OWTS
24855 PACIFIC COAST HIGHWAY
MALIBU, CALIFORNIA

Earth Systems
Southern California

1/6/2015	LA-01576-02

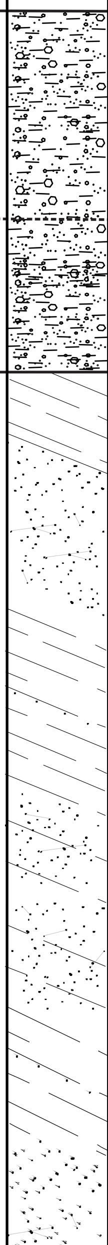
APPENDIX A

Logs of Test Borings

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B1 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S – N)	Attitudes	DESCRIPTIONS
0							0 - 0.9ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	0.9 - 11.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS FORESET BEDDING N80W/17NE BOTTOMSET BEDDING: N60W/6SW	Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15–35						BEDDING N60E/32NW BEDDING N45E/45NW BEDDING N75E/28NW BEDDING N66E/23NW	11.5 - 37ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistant black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/27/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B2 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 1.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.0 - 11.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15							11.5 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistant black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
20							
25							
30							
35							
40							DOWNHOLE LOGGED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B3 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 1.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.0 - 11.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15 20 25 30 35							11.5 - 37ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistant black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

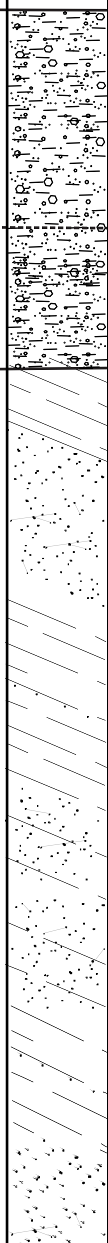
Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/27/14
Drilling Method: Lo-Drill Auger
Hole Diameter: 24 inch
Logger: BL

Kelly Bar Weights

Boring Number: B4
Project Name: 27740 Pacific Coast Hwy, Malibu, CA
Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 1.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.5 - 11.0ft - **Composite Coastal Terrace sequence (Qt)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser/depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15–35							11.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistant black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B5 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 1.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.5 - 11.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brown to dark grayish brown SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Silty SAND [sandy loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth predominantly massive structure; with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15 20 25 30 35							11.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistent black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½ inch. Resistant concretionary siltstone bed. Dark yellowish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark gray to black thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/27/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B6 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 1.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5							1.5 - 11.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10							Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15 20 25 30 35							11.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistent black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

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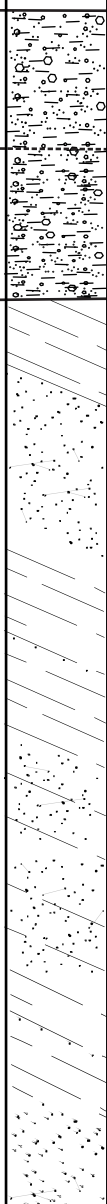
Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B7 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S – N)	Attitudes	DESCRIPTIONS
0							0 - 2.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.0 - 10.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15 20						BEDDING N86W/40NE	10.5 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard. Gray thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistent black siliceous shale
25 30 35						BEDDING N75E/40NW	Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 20-25 % OF THE LOGGED BORING

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/27/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B8 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log S N	Attitudes	DESCRIPTIONS
0							0 - 2.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.0 - 10.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS BASAL CONTACT: N80W/8S	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15, 20							10.5 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard.
						BEDDING N85E/38NW	Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
25							Resistant concretionary shale bed.
							Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
30						BEDDING N75E/45NW	Dark grayish brown, shale interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
35							Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SHALE

Earth Systems
Southern California

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Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B9 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S – N)	Attitudes	DESCRIPTIONS
0							0 - 2.0ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.0 - 10.5ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15 20 25 30 35						BEDDING N85E/59NW BEDDING N60E/51NW	10.5 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some weak orange oxidation on bedding surfaces, moist, hard. Light gray thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous interbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments. Thinly interbedded resistent black siliceous shale and yellow to orange siltstone. Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½". Resistant concretionary siltstone bed. Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces. Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SHALE

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/27/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B10 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0 - 2.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.5 - 10.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
10						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
15						BEDDING N77E/48NW	10.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard, micaceous with abundant diatoms and broken foram fragments.
20							Thinly interbedded resistent black siliceous shale and yellow to orange siltstone.
25						BEDDING N85E/45NW	Gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
30							Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
35						BEDDING N80E/52NW	Resistant concretionary siltstone bed.
							Resistant dark to light gray thinly interbedded diatomaceous siltstone and siliceous shale with orange-brown stained fracture surfaces, closely fractured, widely jointed, well indurated, weakly stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/28/14 Drilling Method: Lo-Drill Auger Hole Diameter: 24 inch Logger: BL	Kelly Bar Weights	Boring Number: B11 Project Name: 27740 Pacific Coast Hwy, Malibu, CA Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log S N	Attitudes	DESCRIPTIONS
0							0 - 2.5ft - **ARTIFICIAL FILL (af)** 0.3' Asphaltic Concrete(A/C) pavement on 0.7' crushed miscellaneous base(CMB)
5						CONTINENTAL SEDIMENTS	2.5 - 10.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark brownish gray Clayey SAND with few matrix supported randomly oriented angular fragments to 3/4" of platy diatomaceous siltstone, slightly moist, dense, sticky, plastic. Smooth, wavy basal contact transitional over 6". Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments (strong effervescent under dilute 1N HCL) on pore faces.
						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, with scattered matrix-supported angular sandstone siltstone and few broken pectin fragments, slightly sticky, slightly plastic, gritty, individual clasts have weak clay coatings, slightly porous with fine dendritic tubular porosity and thin brown (10yr, 4/3 - moist) near-horizontal fragipans with clay films coating and bridging individual grains and pore faces; calcareous filaments on pore faces, weakly cross-bedded; grades coarser with depth, predominantly massive structure with rounded gravel to 3" diameter longest dimension over abrupt smooth, planar basal contact.
10						BASAL CONTACT: N80W/7SW	
15						BEDDING N80E/52NW	10.0 - 37.0ft **- BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard.
20						BEDDING N75E/45NW	Gray thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
25						BEDDING N85E/43NW	Grayish brown, fine sandstone interbedded with diatomaceous siltstone, and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, thin dark brown weak organic stained joint faces.
30						BEDDING N76E/44NW	Dark gray and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces form oxidation halos to ½".
35							.
							Resistant dark to light gray thinly interbedded diatomaceous siltstone and black siliceous shale, closely fractured, well indurated, with thin weak irridescent MnO stained bedding and joint faces.
40							DOWNHOLE LOGGED, BACKFILLED AND SEALED TO TOTAL DEPTH OF 37 FEET. NO GROUNDWATER. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE

Earth Systems
Southern California

2114 East Walnut Street, Pasadena, California 91024
Phone: (626) 356-0955 Fax: (626) 356-0956

Drilling Date: 10/27/14
Drilling Method: Lo-Drill Auger
Hole Diameter: 24 inch
Logger: BL

Kelly Bar Weights

Boring Number: B12
Project Name: 24855 Pacific Coast Hwy, Malibu, CA
Project Number: LA-01576-02

Depth (Ft.)	Sample	Blow Counts per 12"	Dry Density pcf	Moisture Content %	Graphic Log (S N)	Attitudes	DESCRIPTIONS
0							0.3’ Asphaltic Concrete(A/C) pavement on 0.6’ crushed miscellaneous base(CMB) over 1.5 ft - **ARTIFICIAL FILL (af)** - dark yellowish brown (10yr, 3/4 - moist) Clayey fine SAND, moist, moderately dense with suspended gravel & construction debris (broken plaster & concrete).
5						CONTINENTAL SEDIMENTS	2.5 - 10.0ft - **Composite Coastal Terrace sequence (Qtc/Qtm)** Dark gray Clayey SAND randomly oriented angular fragments to 3/4” platy diatomaceous siltstone and tan silty fine sandstone in a matrix of tan silt clay loam, slightly moist, poorly consolidated, sticky, plastic, grayish brown. Smooth, wavy transitional basal contact over 6”. Matrix is moderately porous with fine to medium near-vertical tubular dendritic pores with few calcareous filaments on pore faces.
10						MARINE SEDIMENTS	Dark yellowish brown (10yr, 4/4 - moist) Clayey SAND [sandy clay loam], moist, very dense, scattered angular sandstone, siltstone and predominantly shale gravel and cobbles to 8” longest dimension, slightly sticky, slightly plastic, gritty; individual clasts have weak clay coatings, slightly porous with fine tubular porosity and thin brown (10yr, 4/3 - moist) near horizontal fragipans, clay films coating and bridging individual grains; calcareous filaments on pores faces; weakly bedded; grades coarser with depth massive
15						BEDDING N75E/40NW	10.0 - 50ft - **BEDROCK - Monterey Formation (Tm)** Brown diatomaceous siltstone with interbedded sandstone, some orange stain on bedding surfaces, moist, hard.
20						BEDDING N60E/52NW BEDDING N65E/55NW	Gray (5yr, 5/2) thinly bedded platy porcelaneous with dark gray to black extremely resistant siliceous underbeds.
25						BEDDING N85E/59NW	Thinly interbedded resistant dark siliceous shale and yellowish brown siltstone.
30						BEDDING N74E/45NW BEDDING N73E/58NW	Tan and light gray thinly interbedded diatomaceous siltstone and shale, widely jointed, moderately weathered, well indurated, weak orange stained bedding and joint faces forms oxidation halos in ½”.
							Resistant concretionary siltstone bed.
35						BEDDING N82E/50NW	Dark gray thinly interbedded diatomaceous siltstone, widely jointed, smooth massive rock, well indurated, weak organic stain bedding and joint faces. Parts easily on platy bedding surfaces, very low density, translucent when wet, thicker beds are slightly micaceous with abundant diatoms and broken foram fragments.
40						BEDDING N60E/51NW	Grayish brown, fine sandstone interbedded with diatomaceous siltstone and black porcelaneous shale, widely jointed, smooth massive rock, well indurated, weakly MnO stained iridescent bluish black joint faces. Seepage at bottom of boring stabilized at 47-feet
45							
50							DOWNHOLE LOGGED TO TOTAL DEPTH OF 50 FEET. GROUNDWATER AT 47’; BACKFILLED & SEALED TO 37’. NO CAVING. DIFFICULT DRILLING IN CONCRETIONARY SILTSTONE COMPRISING 15-25 % OF THE LOGGED BORING

APPENDIX B

Summary of Percolation Test Data and Calculations

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B1
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet

Presoak Date:	11/2/2014	at	8:00		
Test Date:	11/3/2014	start at	8:00	end at	15:00
Third Day:	11/4/2014	at	8:00		

Depth to Cap: 7 feet below ground surface

Effective Depth: 30 feet

Calculated Volume: 94.25 cf

Calculated Area: 188.50 sf

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:00	37.00
Start of Test	11/3/2014	8:00	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 263 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 263 gallons

Percolation rate: 1.4 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	526
5 feet	37	658
6 feet	37	789

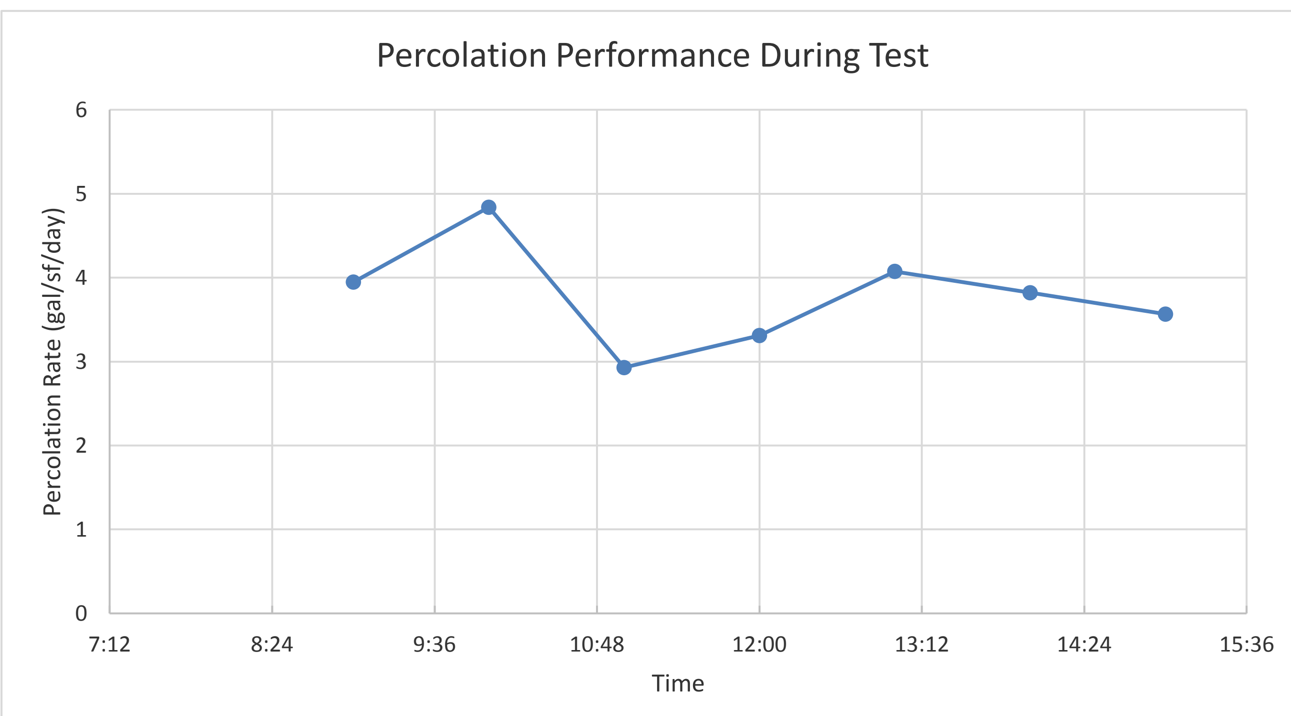
BORING #: B1

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B1
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81470	81525	8:00		55	
81888	81919	9:00	1:00	31	3.95
82153	82191	10:00	1:00	38	4.84
82372	82395	11:00	1:00	23	2.93
82560	82586	12:00	1:00	26	3.31
82744	82776	13:00	1:00	32	4.07
82920	82950	14:00	1:00	30	3.82
83093	83121	15:00	1:00	28	3.57

Total Volume: 263 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center		Test Pit #:	B2
Project #:	LA-01576-02		Tested By:	WL
Address:	24855 PCH, Malibu			

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	11/2/2014	at	8:00			
Test Date:	11/3/2014	start at	8:08	end at	15:08	
Third Day:	11/4/2014	at	8:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:08	37.00
Start of Test	11/3/2014	8:08	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 313 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 313 gallons

Percolation rate: 1.7 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	626
5 feet	37	783
6 feet	37	939

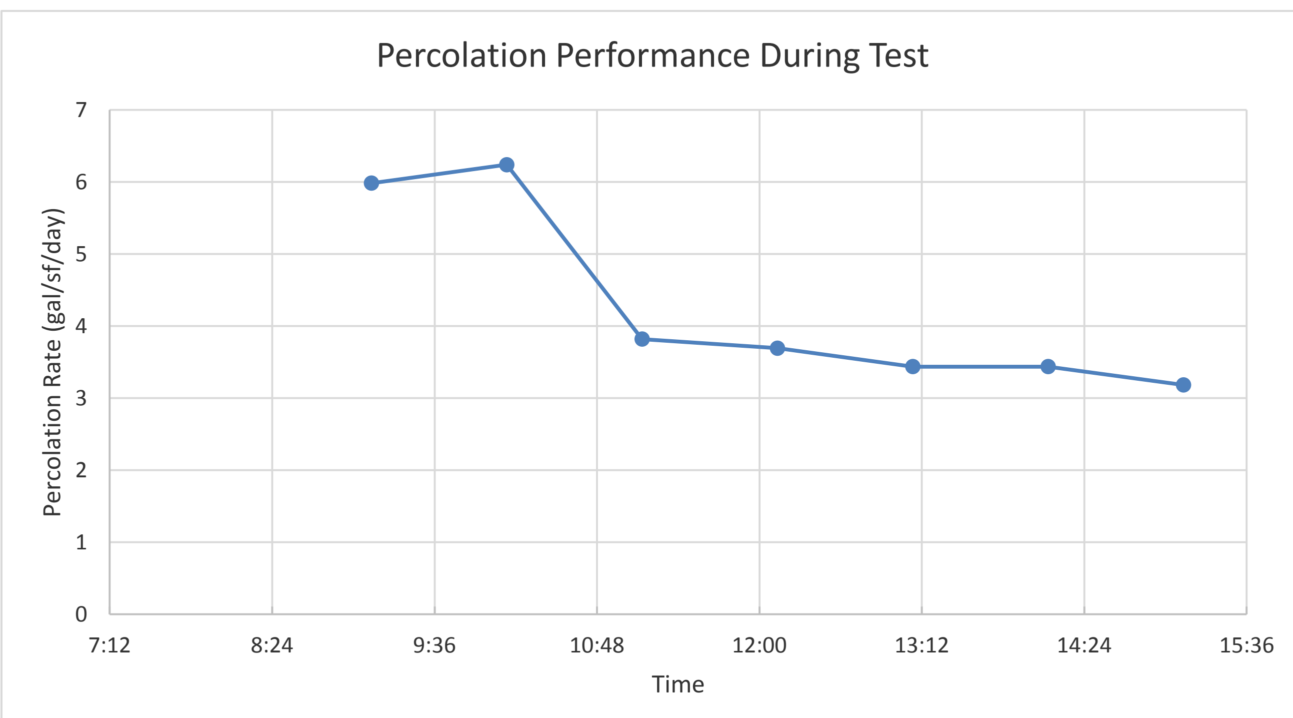
BORING #: B2

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B2
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81525	81604	8:08		79	
81919	81966	9:08	1:00	47	5.98
82191	82240	10:08	1:00	49	6.24
82395	82425	11:08	1:00	30	3.82
82586	82615	12:08	1:00	29	3.69
82776	82803	13:08	1:00	27	3.44
82950	82977	14:08	1:00	27	3.44
83121	83146	15:08	1:00	25	3.18

Total Volume: 313 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B3
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet
Presoak Date:	11/2/2014	at	8:00		
Test Date:	11/3/2014	start at	8:16	end at	15:16
Third Day:	11/4/2014	at	8:00		
Depth to Cap:	7	feet below ground surface			
Effective Depth:	30	feet			
Calculated Volume:	94.25	cf			
Calculated Area:	188.50	sf			

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:16	37.00
Start of Test	11/3/2014	8:16	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 205 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 205 gallons

Percolation rate: 1.1 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	410
5 feet	37	513
6 feet	37	615

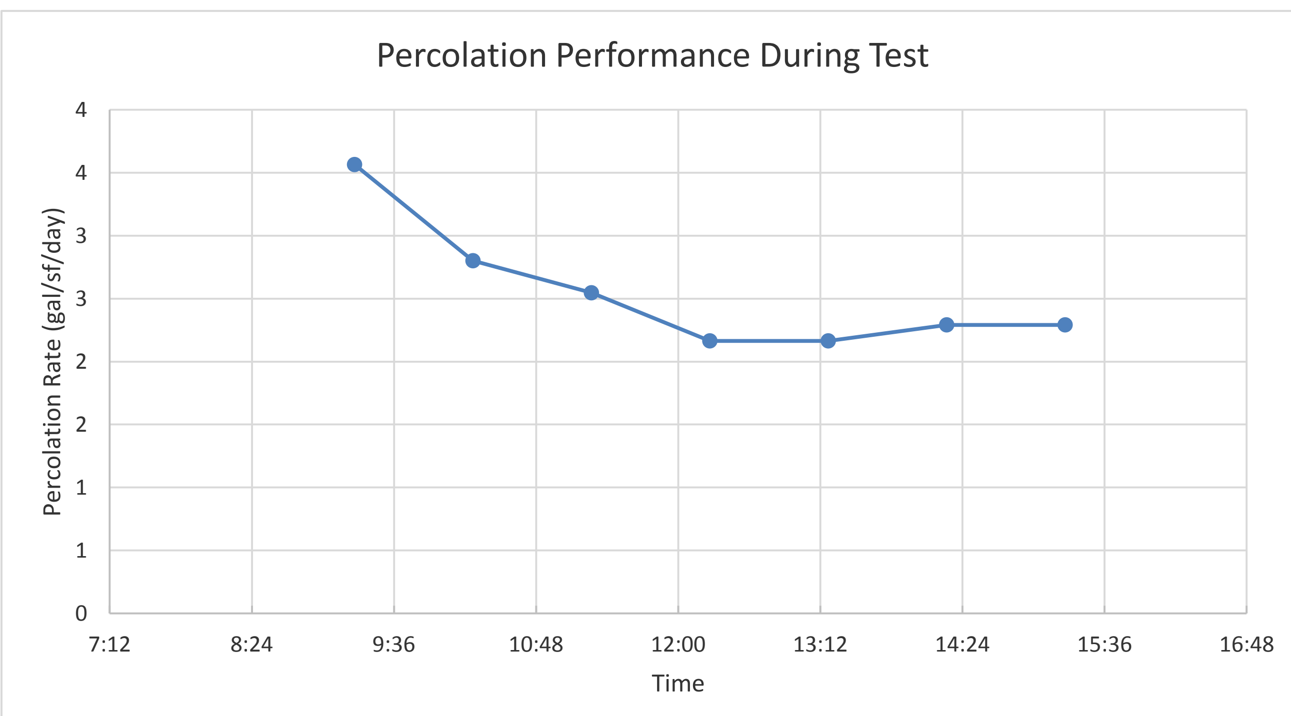
BORING #: B3

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B3
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81604	81669	8:16		65	
81966	81994	9:16	1:00	28	3.57
82240	82262	10:16	1:00	22	2.80
82425	82445	11:16	1:00	20	2.55
82615	82632	12:16	1:00	17	2.16
82803	82820	13:16	1:00	17	2.16
82977	82995	14:16	1:00	18	2.29
83146	83164	15:16	1:00	18	2.29

Total Volume: 205 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B4
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet
Presoak Date:	11/2/2014	at	8:00		
Test Date:	11/3/2014	start at	8:24	end at	15:24
Third Day:	11/4/2014	at	8:00		
Depth to Cap:	7	feet below ground surface			
Effective Depth:	30	feet			
Calculated Volume:	94.25	cf			
Calculated Area:	188.50	sf			

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:24	37.00
Start of Test	11/3/2014	8:24	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 363 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 363 gallons

Percolation rate: 1.9 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	726
5 feet	37	908
6 feet	37	1089

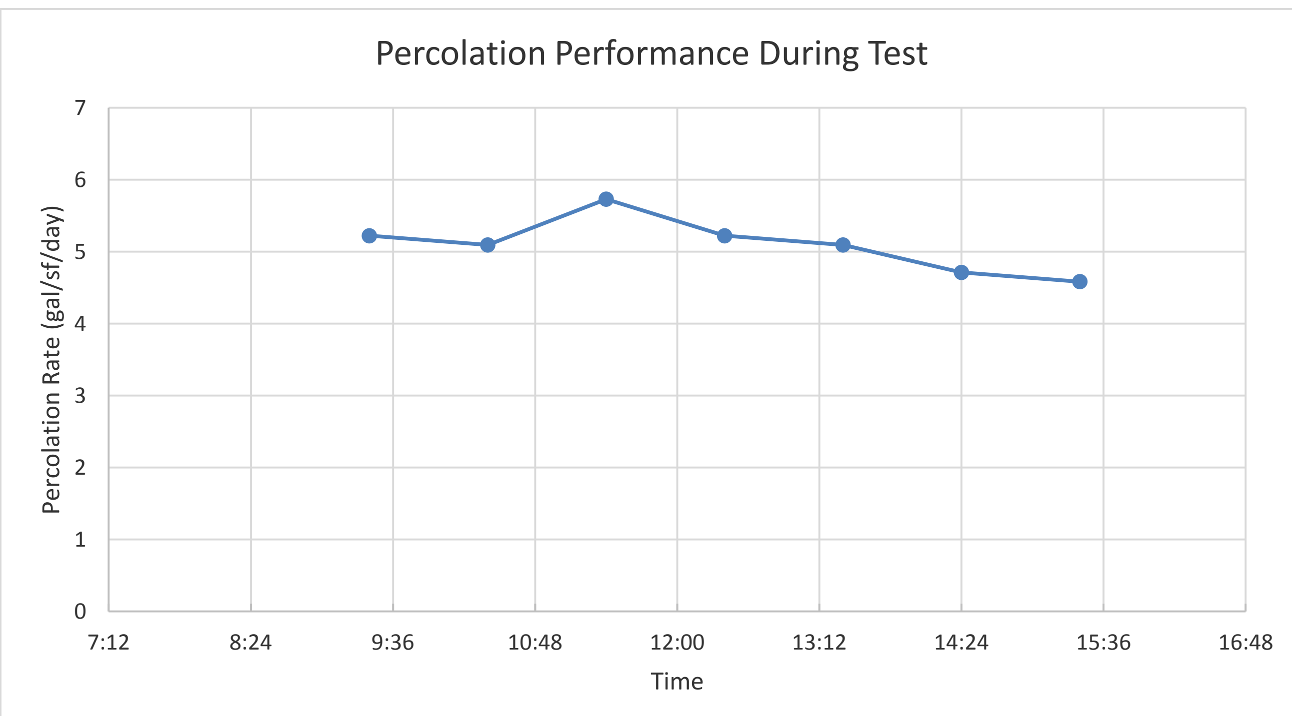
BORING #: B4

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B4
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81669	81752	8:24		83	
81994	82035	9:24	1:00	41	5.22
82262	82302	10:24	1:00	40	5.09
82445	82490	11:24	1:00	45	5.73
82632	82673	12:24	1:00	41	5.22
82820	82860	13:24	1:00	40	5.09
82995	83032	14:24	1:00	37	4.71
83164	83200	15:24	1:00	36	4.58

Total Volume: 363 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B5
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	11/2/2014	at	8:00			
Test Date:	11/3/2014	start at	8:32	end at	3:32	
Third Day:	11/4/2014	at	8:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.00
End of Presoak	11/3/2014	8:32	37.00
Start of Test	11/3/2014	8:32	7.00
End of Test	11/4/2014	8:00	37.00

Total volume of water metered during test: 272 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 272 gallons

Percolation rate: 1.4 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	544
5 feet	37	680
6 feet	37	816

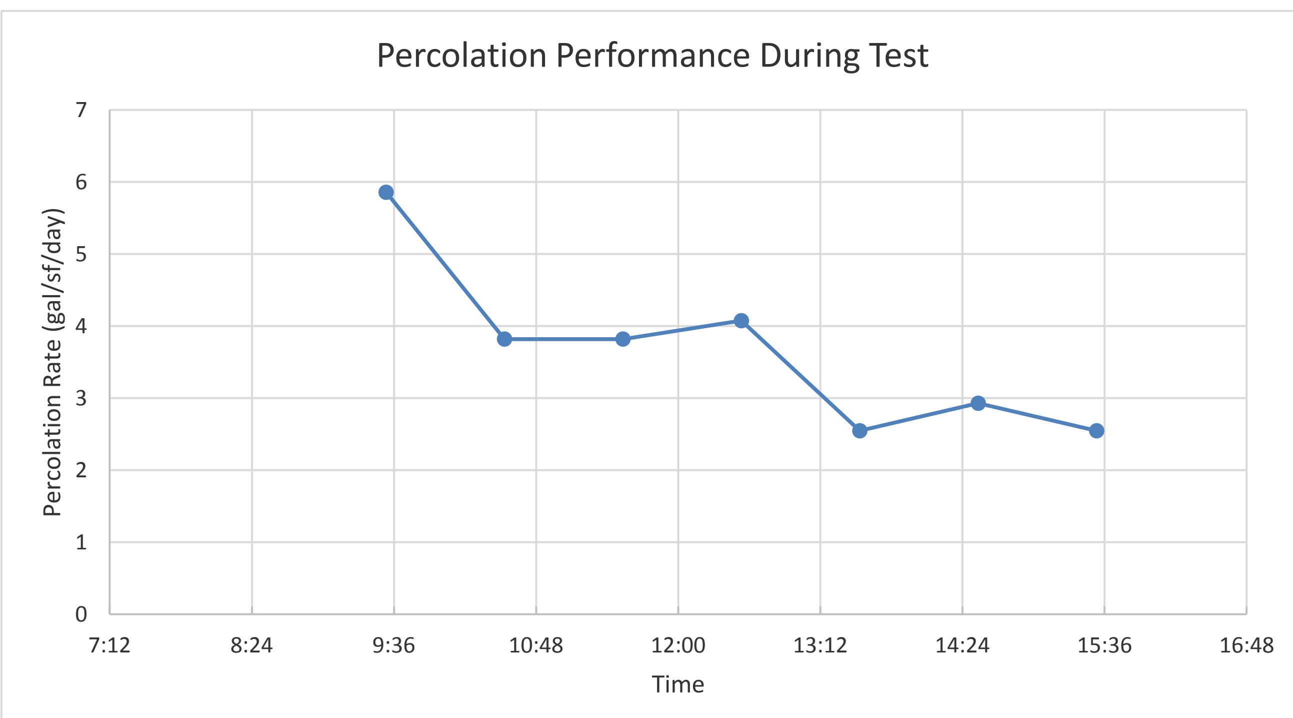
BORING #: B5

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B5
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81752	81823	8:32		71	
82035	82081	9:32	1:00	46	5.86
82302	82332	10:32	1:00	30	3.82
82490	82520	11:32	1:00	30	3.82
82673	82705	12:32	1:00	32	4.07
82860	82880	13:32	1:00	20	2.55
83032	83055	14:32	1:00	23	2.93
83200	83220	15:32	1:00	20	2.55

Total Volume: 272 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B6
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet

Presoak Date:	11/2/2014	at	8:00		
Test Date:	11/3/2014	start at	8:40	end at	3:40
Third Day:	11/4/2014	at	8:00		

Depth to Cap: 7 feet below ground surface

Effective Depth: 30 feet

Calculated Volume: 94.25 cf

Calculated Area: 188.50 sf

	Date	Time	Depth to Water
Start of Presoak	11/2/2014	8:00	7.0
End of Presoak	11/3/2014	8:40	37.0
Start of Test	11/3/2014	8:40	7.0
End of Test	11/4/2014	8:00	37.0

Total volume of water metered during test: 363 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 363 gallons

Percolation rate: 1.9 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	726
5 feet	37	908
6 feet	37	1089

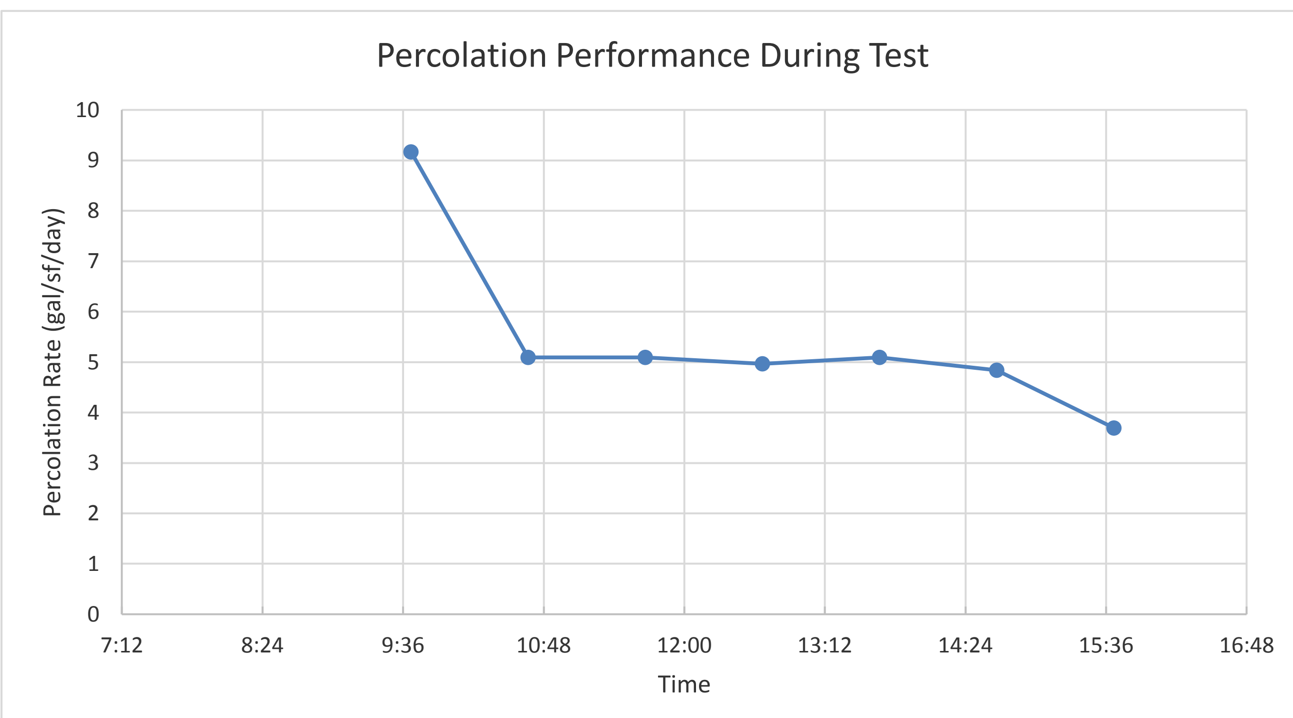
BORING #: B6

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B6
Project #:	LA-01576-02	Tested By:	WL
Address:	24855 PCH, Malibu		
Date:	11/3/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
81823	81888	8:40		65	
82081	82153	9:40	1:00	72	9.17
82332	82372	10:40	1:00	40	5.09
82520	82560	11:40	1:00	40	5.09
82705	82744	12:40	1:00	39	4.97
82880	82920	13:40	1:00	40	5.09
83055	83093	14:40	1:00	38	4.84
83220	83249	15:40	1:00	29	3.69

Total Volume: 363 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B7
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet

Presoak Date:	10/29/2014	at	7:00		
Test Date:	10/30/2014	start at	7:52	end at	2:29
Third Day:	10/31/2014	at	7:00		

Depth to Cap: 7 feet below ground surface

Effective Depth: 30 feet

Calculated Volume: 94.25 cf

Calculated Area: 188.50 sf

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:52	37.0
Start of Test	10/30/2014	7:52	7.0
End of Test	10/31/2014	7:00	32.0

Total volume of water metered during test: 320 gallons

CALCULATIONS

Volume of Water Remaining: 5.9 cubic feet 44 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 276 gallons

Percolation rate: 1.5 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	552
5 feet	37	690
6 feet	37	828

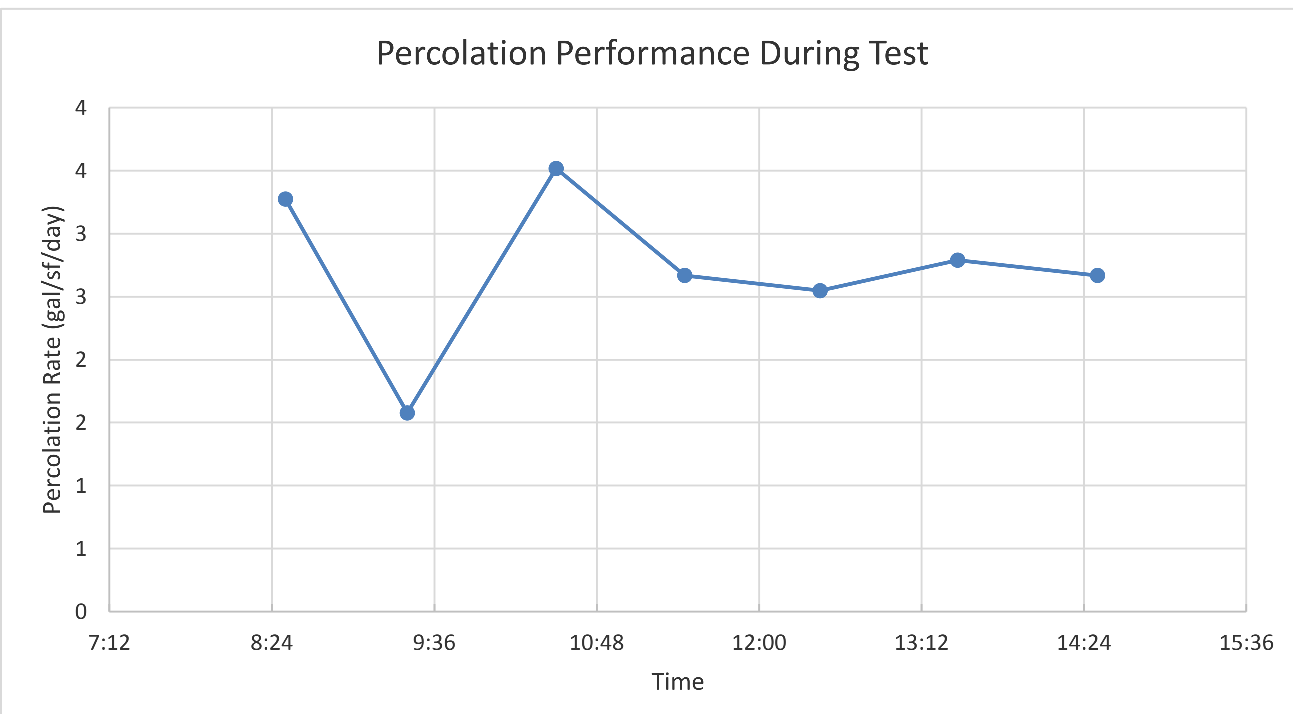
BORING #: B7

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B7
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79493	79656	7:52		163	
79830	79857	8:30	0:38	27	3.27
80057	80070	9:24	0:54	13	1.58
80328	80357	10:30	1:06	29	3.52
80543	80565	11:27	0:57	22	2.67
80760	80781	12:27	1:00	21	2.55
80973	80996	13:28	1:01	23	2.79
81190	81212	14:30	1:02	22	2.67

Total Volume: 320 Gallons



EARTH SYSTEMS SOUTHERN CALIFORNIA

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B8
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	10/29/2014	at	7:00			
Test Date:	10/30/2014	start at	7:46	end at	2:24	
Third Day:	10/31/2014	at	7:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:46	37.0
Start of Test	10/30/2014	7:46	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 402 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 402 gallons

Percolation rate: 2.1 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	804
5 feet	37	1005
6 feet	37	1206

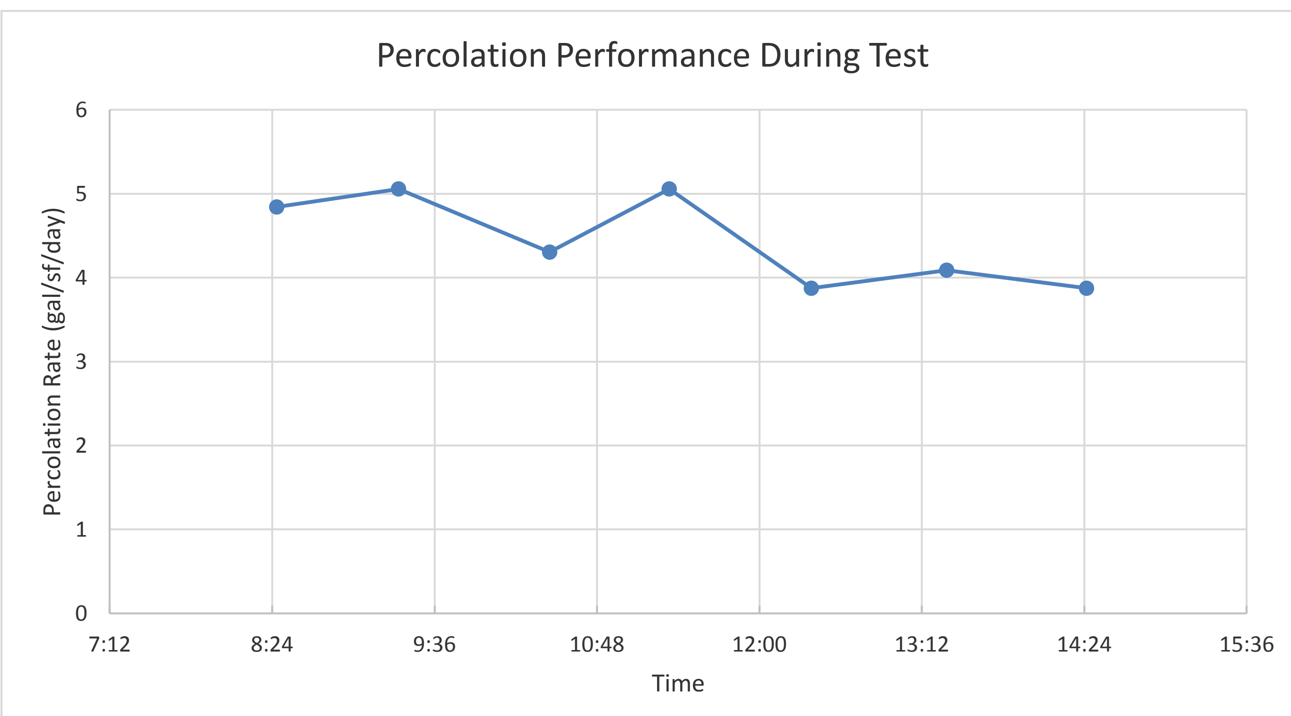
BORING #: B8

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B8
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79493	79606	7:46		113	
79785	79830	8:26	0:40	45	4.84
80010	80057	9:20	0:54	47	5.06
80288	80328	10:27	1:07	40	4.30
80496	80543	11:20	0:53	47	5.06
80724	80760	12:23	1:03	36	3.87
80935	80973	13:23	1:00	38	4.09
81154	81190	14:25	1:02	36	3.87

Total Volume: 402 Gallons



PERCOLATION TEST DATA
METER METHOD

Project: Malibu Jewish Center
Project #: LA-01576-02
Address: 24855 PCH, Malibu

Test Pit #: B9
Tested By: WL & SD

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet

Presoak Date:	10/29/2014	at	7:00		
Test Date:	10/30/2014	start at	7:43	end at	2:19
Third Day:	10/31/2014	at	7:00		

Depth to Cap: 7 feet below ground surface

Effective Depth: 30 feet

Calculated Volume: 94.25 cf

Calculated Area: 188.50 sf

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:43	37.0
Start of Test	10/30/2014	7:43	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 268 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 268 gallons

Percolation rate: 1.4 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	536
5 feet	37	670
6 feet	37	804

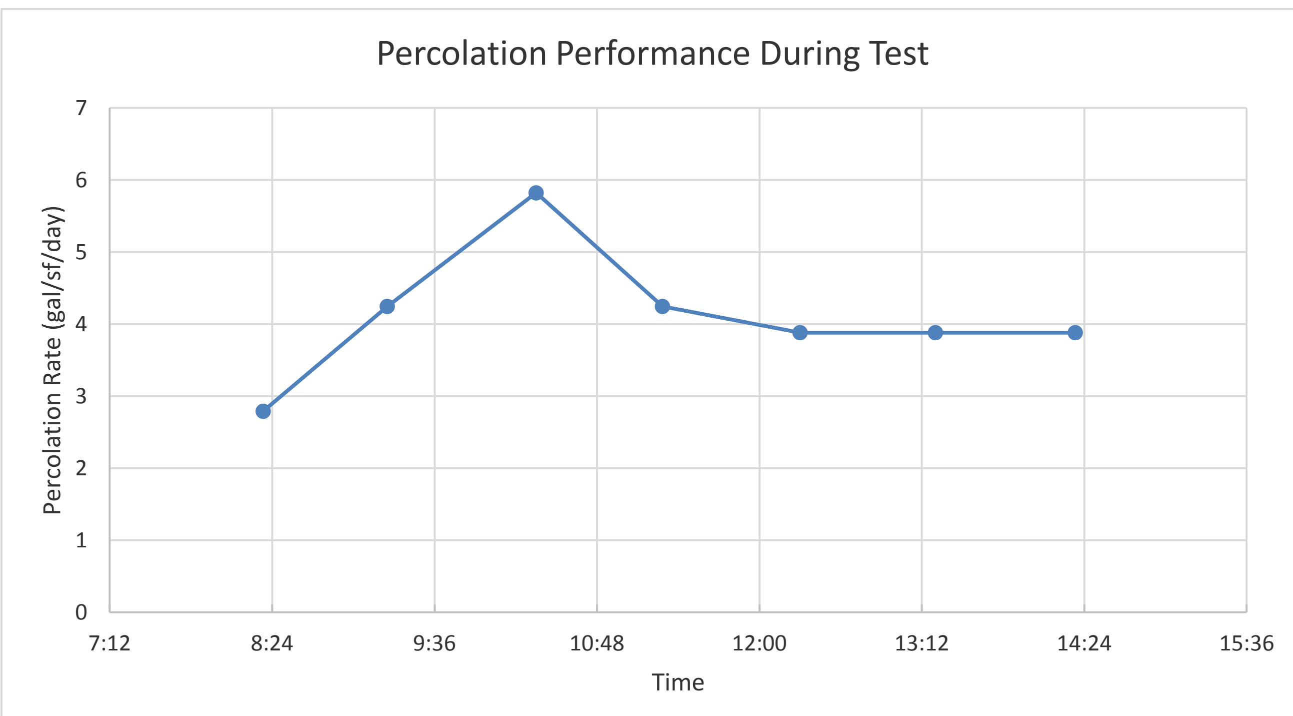
BORING #: B9

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B9
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79493	79524	7:43		31	
79762	79785	8:20	0:37	23	2.79
79975	80010	9:15	0:55	35	4.24
80240	80288	10:21	1:06	48	5.82
80460	80495	11:17	0:56	35	4.24
80692	80724	12:18	1:01	32	3.88
80903	80935	13:18	1:00	32	3.88
81122	81154	14:20	1:02	32	3.88

Total Volume: 268 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B10
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface			
Diameter of Hole:	2	feet	Radius of Hole:	1	feet
Presoak Date:	10/29/2014	at	7:00		
Test Date:	10/30/2014	start at	7:40	end at	2:13
Third Day:	10/31/2014	at	7:00		
Depth to Cap:	7	feet below ground surface			
Effective Depth:	30	feet			
Calculated Volume:	94.25	cf			
Calculated Area:	188.50	sf			

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:40	37.0
Start of Test	10/30/2014	7:40	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 387 gallons

CALCULATIONS

Volume of Water Remaining:	0.0	cubic feet	0	gallons
Gravel Pack Correction:	0.375			
Total Water Percolated (volume metered-volume remaining):			387	gallons
Percolation rate:	2.1	gal/sf/day		

pit diameter	pit depth	gallons/day
4 feet	37	774
5 feet	37	968
6 feet	37	1161

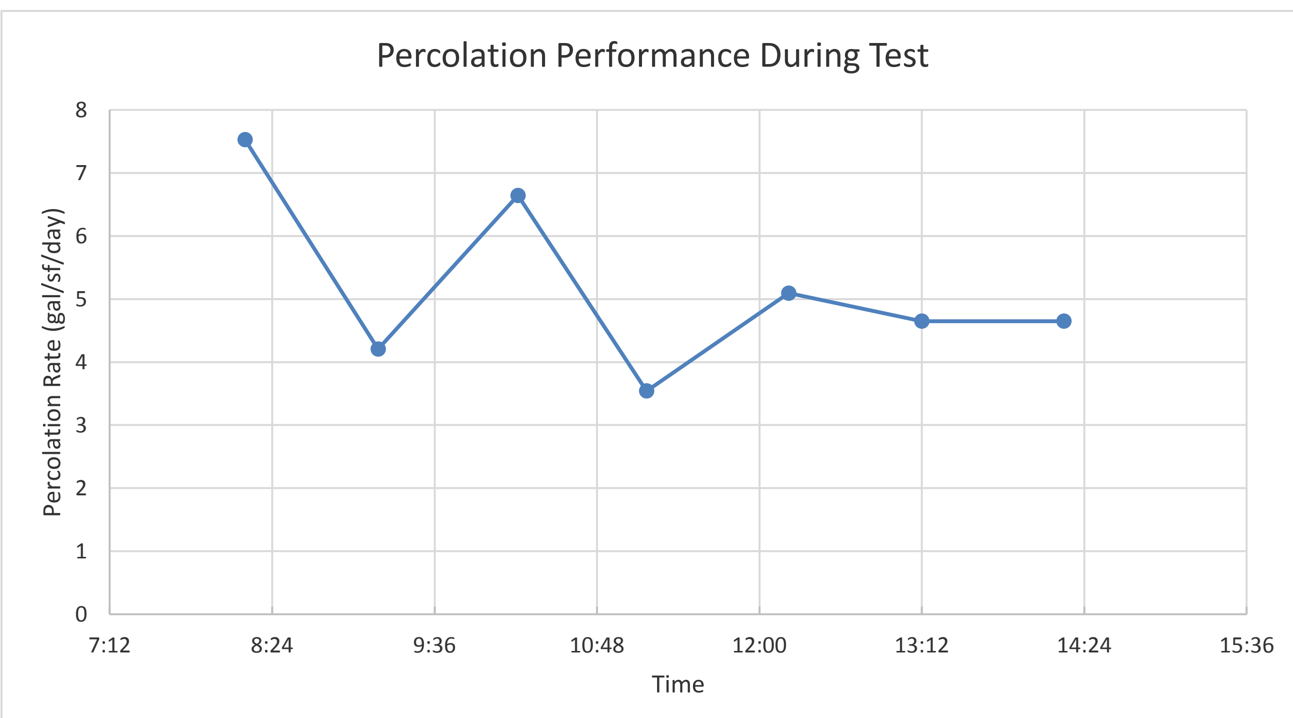
BORING #: B10

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B10
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79434	79493	7:40		59	
79729	79797	8:12	0:32	68	7.53
79937	79975	9:11	0:59	38	4.21
80180	80240	10:13	1:02	60	6.64
80428	80460	11:10	0:57	32	3.54
80646	80692	12:13	1:03	46	5.09
80861	80903	13:12	0:59	42	4.65
81080	81122	14:15	1:03	42	4.65

Total Volume: 387 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B11
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	10/29/2014	at	7:00			
Test Date:	10/30/2014	start at	7:24	end at	2:06	
Third Day:	10/31/2014	at	7:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:24	37.0
Start of Test	10/30/2014	7:24	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 263 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 263 gallons

Percolation rate: 1.4 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	526
5 feet	37	658
6 feet	37	789

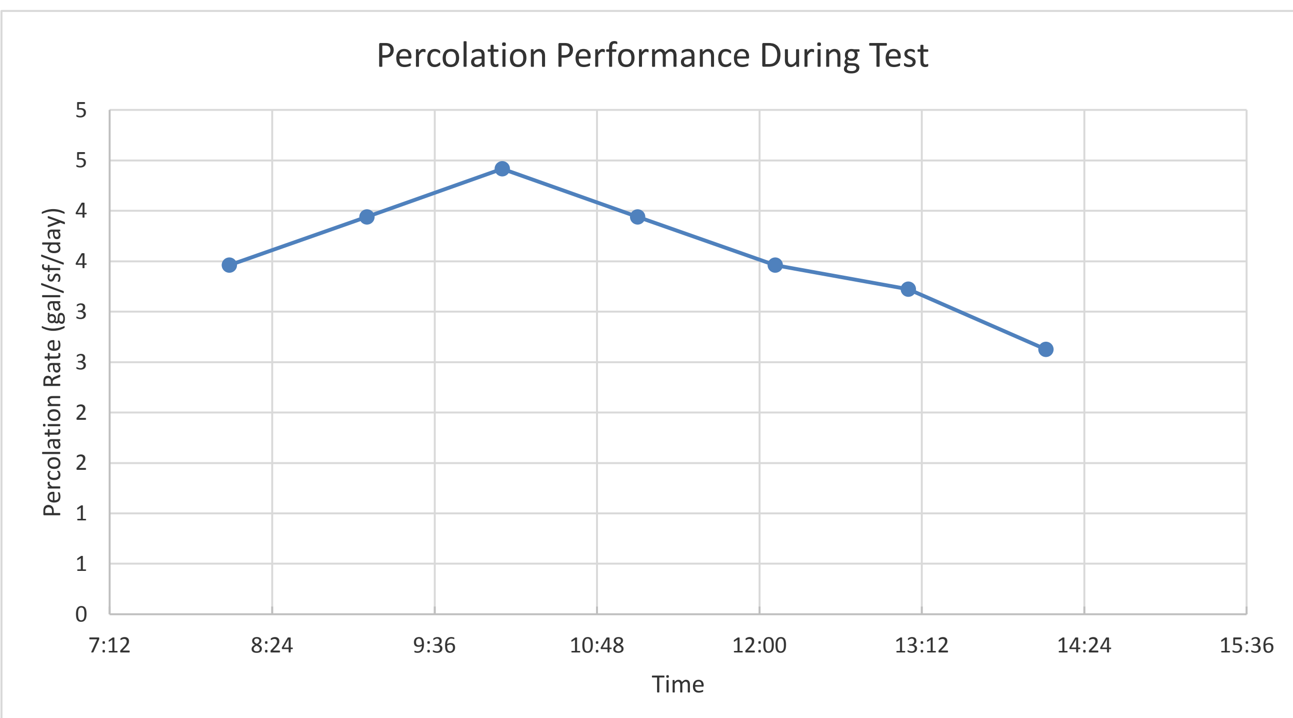
BORING #: B11

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B11
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79381	79434	7:24		53	
79700	79729	8:05	0:41	29	3.46
79904	79937	9:06	1:01	33	3.94
80143	80180	10:06	1:00	37	4.42
80395	80428	11:06	1:00	33	3.94
80617	80646	12:07	1:01	29	3.46
80834	80861	13:06	0:59	27	3.22
81058	81080	14:07	1:01	22	2.63

Total Volume: 263 Gallons



PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B12
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		

Depth of Hole:	37	feet below ground surface				
Diameter of Hole:	2	feet	Radius of Hole:		1	feet
Presoak Date:	10/29/2014	at	7:00			
Test Date:	10/30/2014	start at	7:00	end at	2:00	
Third Day:	10/31/2014	at	7:00			
Depth to Cap:	7	feet below ground surface				
Effective Depth:	30	feet				
Calculated Volume:	94.25	cf				
Calculated Area:	188.50	sf				

	Date	Time	Depth to Water
Start of Presoak	10/29/2014	7:00	7.0
End of Presoak	10/30/2014	7:00	37.0
Start of Test	10/30/2014	7:00	7.0
End of Test	10/31/2014	7:00	37.0

Total volume of water metered during test: 485 gallons

CALCULATIONS

Volume of Water Remaining: 0.0 cubic feet 0 gallons

Gravel Pack Correction: 0.375

Total Water Percolated (volume metered-volume remaining): 485 gallons

Percolation rate: 2.6 gal/sf/day

pit diameter	pit depth	gallons/day
4 feet	37	970
5 feet	37	1213
6 feet	37	1455

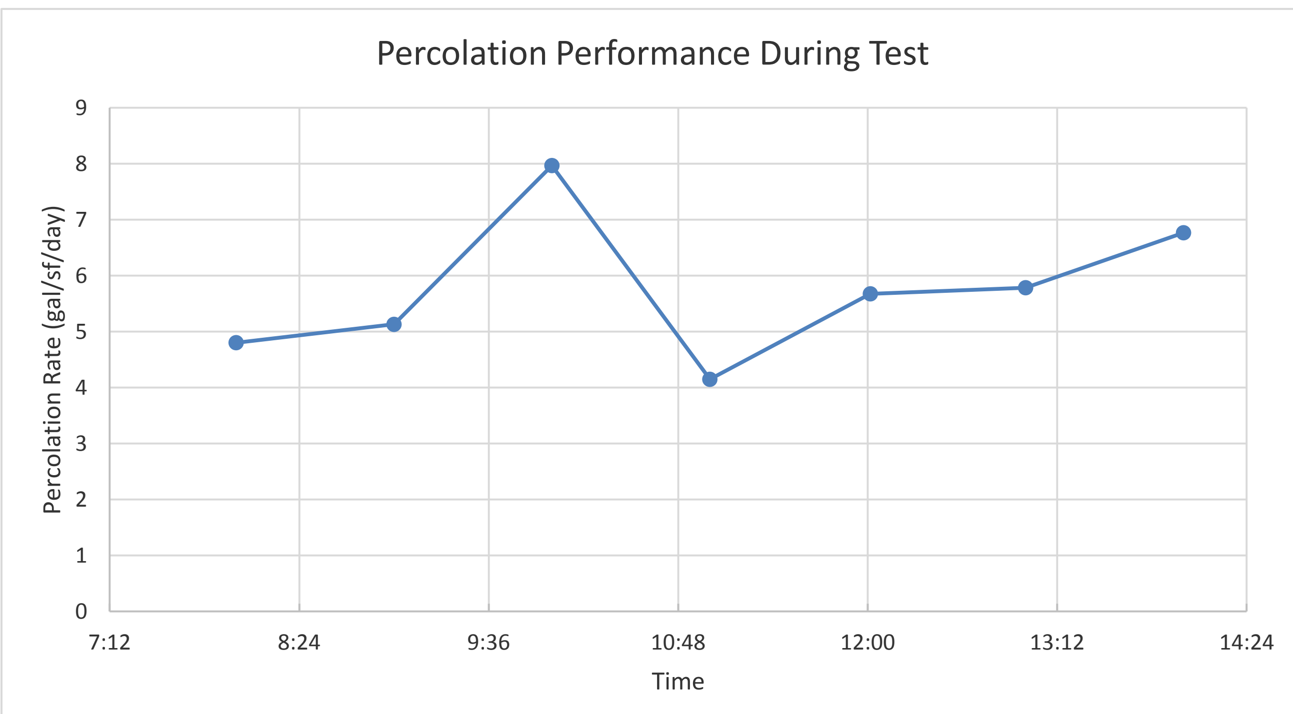
BORING #: B12

PERCOLATION TEST DATA
METER METHOD

Project:	Malibu Jewish Center	Test Pit #:	B12
Project #:	LA-01576-02	Tested By:	WL & SD
Address:	24855 PCH, Malibu		
Date:	10/30/2014		

Start Meter (gallons)	End Meter (gallons)	Time	Time Interval (minutes)	Metered Amount (gallons)	Rate (gal./sf/day)
79265	79381	7:00		116	
79656	79700	8:00	1:00	44	4.80
79857	79904	9:00	1:00	47	5.13
80070	80143	10:00	1:00	73	7.97
80357	80395	11:00	1:00	38	4.15
80565	80617	12:01	1:01	52	5.68
80781	80834	13:00	0:59	53	5.78
80996	81058	14:00	1:00	62	6.77

Total Volume: 485 Gallons



APPENDIX C

Water Meter Calibration Certificate

McCall's

METER SALES & SERVICE

1498 Mesa View Street
Hemet, CA 92543
951-654-3760

CALIBRATION REPORT

Company: JENSEN WATER TRUCKS
P.O. No.: GARY
Test Date: [illegible]
Test Tech: DOUG [illegible]

MANUFACTURER			FLOW RATE (GPM) - AWWA STANDARDS				
SENSUS			70	5	1-1/2		WTD. ACC. [illegible]
Meter Size	Serial Number	Reading GX100	ACCURACY IN PERCENT				
1-1/2"	[illegible]	00[illegible]	100.5	[illegible]	[illegible]		[illegible]

CUSTOMER ADDRESS:

TESTED BY: [signature]

RECEIVED
NOV 03 2016
PLANNING DEPT.

CITY OF MALIBU
24855 PACIFC COAST HIGHWAY

Malibu Jewish Center & Synagogue

DRAINAGE CALCULATIONS

Prepared by:
PEAK SURVEYS INC.
Since 1976
CIVIL · SURVEY · DESIGN
2488 TOWNSGATE RD, Suite D
WESTLAKE VILLAGE, CA 91361
P: 805.497.0102 F: 805.495.7014
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REGISTERED PROFESSIONAL ENGINEER
GENE THOMAS LOGAN
NO. C56724
EXP. 6,2017
CIVIL
STATE OF CALIFORNIA

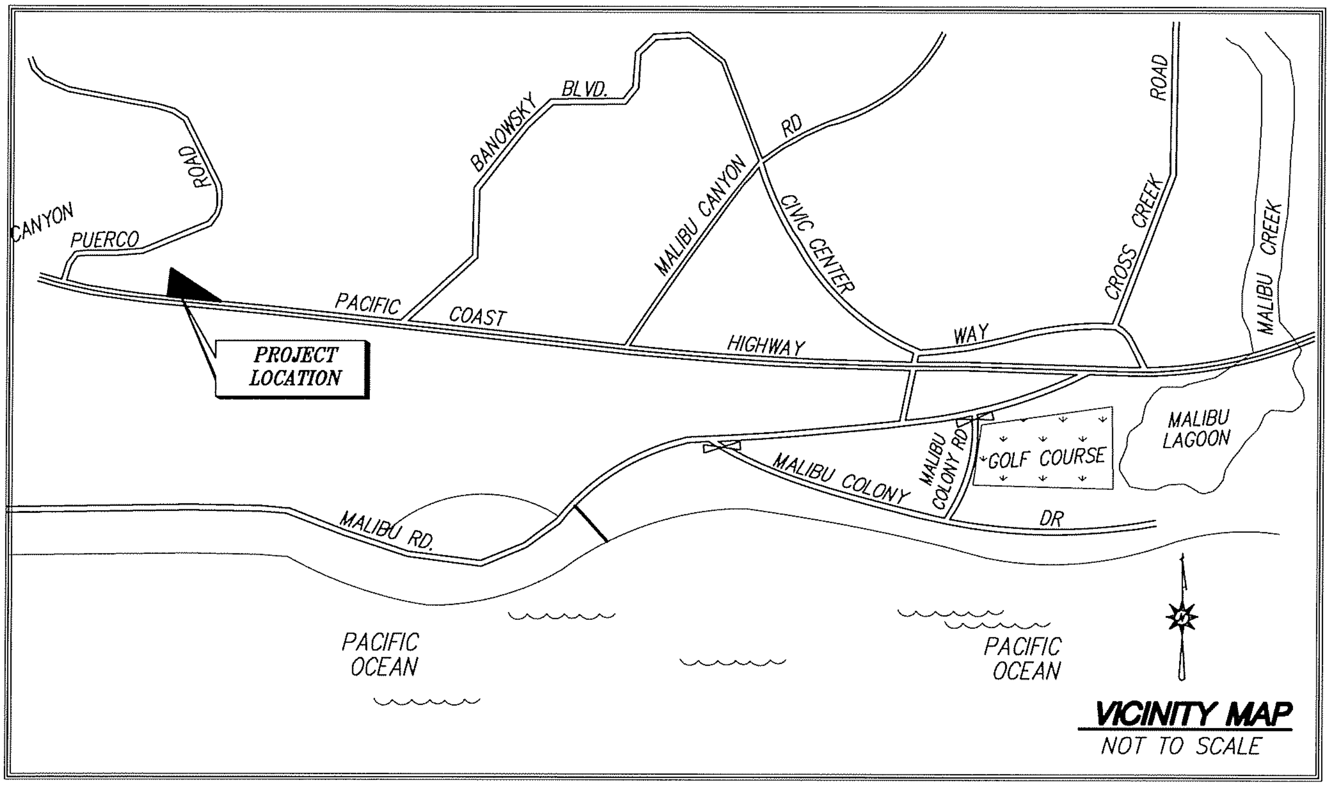
11-2-16

REVISED

November 2, 2016

14-5653 - REDESIGN

24855 PACIFIC COAST HIGHWAY
CITY OF MALIBU



24855 Pacific Coast Hwy
City of Malibu

Drainage Study

Introduction:

The project is an approximately 4.60 Acres developed property located at 24855 Pacific Coast Hwy, in the City of Malibu (Jewish Center and Synagogue). The property is bounded on the North, East and West by commercial development, and by Pacific Coast Hwy on the South. The existing drainage pattern is northerly to natural water course. The scope of proposed development is to remodel and alter a portion of existing improvement for construction of a new building with green roof, and to improve Fire Department turnaround. . The most recent approved grading and drainage improvement by ENSITU engineering, was approved on May 25, 2004 by Department of Public Works, City of Malibu. The drainage areas for the proposed development is broken into two drainage subareas; A, and B. 50-year 24-hr rainfall isohyet for this location is estimated to be 6.9 inches of rainfall; soils classification is soils type 29, and 85^{th} percentile 24-hr rainfall is 0.70" of rainfall. The project is located outside of Area of Special Biological Significance, (ASBS).

Existing Condition:

The grading plan prepared by ENSITU Engineering for the existing development was approved on May 25, 2004; it includes 2.90 Acres of drainage area with 70% impervious for overall drainage area, as shown on BMP plans, Sheet G-16 of G-19. The existing development is provided with a storm water treatment unit CDS Model PMSU 2015 (CONTECT ENGINEERING SOLUTION), capable of 1.059 cfs of treated flow for MS4 runoff. The peak 100-year frequency storm runoff is discharged through an 18-inch PVC drainage pipe with 2% slope. A riprap is installed to minimize the velocity and erosion as part of the approved grading plan for the existing development. The existing drainage discharges to the existing canyon on the north of property. The full flow capacity for 18inch PVC with 2% slope is 19.31 cfs.

Analysis of Existing Facilities within proposed Disturbed Area

Proposed Drainage Area	Total Disturbed Area	Existing Impermeable Paving	Existing Permeable Paving	Existing Roof	Total Existing Impermeable
A	15,480 SF	3,096 SF	-	2,502 SF	5,598 SF
B	47,019 SF	26,890 SF	3,998 SF	3,280 SF	30,170 SF
Total	62,499 SF	29,986 SF	3,998 SF	5,782 SF	35,768 SF

Proposed development:

The proposed development disturbs approximately 1.43 acres of land within the existing development to construct an approximately 16,100 SF new multilevel building, which has 8,354 SF of green roof, and adding 4,972 SF of grass-crete parking area to the existing 3,998 SF of grass-crete parking making a total of 8,970 SF of proposed grass-crete parking. The proposed drainage area is broken into three drainage subarea; Subarea A, Subarea B and Subarea C. The breakdown of drainage subareas is tabulated in this report.

The existing impervious surface within the proposed disturbed area is 35, 768 SF and the proposed impervious surface will be 34,128 SF, which is a reduction of 1,640 SF. The proposed percent impervious for drainage subarea A is 41.63% and proposed percent impervious for drainage subarea B is 69.20%. The percent impervious for drainage subarea A is increased by 5.47% and for drainage subarea B is reduced by 6.20%. The proposed drainage system from drainage area B will be connected to the existing drainage system and will maintain the existing drainage course, and drainage from drainage area B will discharge to the canyon to the north of the proposed development and within existing drainage course. The peak post development 100-year storm frequency for drainage area A and drainage area B do not exceed the peak pre development 100-year frequency storm runoff; therefore, detention storage is not required to drain at pre development runoff rate.

Analysis of Proposed Facilities within Proposed Disturbed Area

Proposed Drainage Area	Total Disturbed Area	Proposed Impermeable Paving	Proposed Permeable paving	Proposed Roof	Proposed Green Roof (Permeable)	Total Proposed Impermeable	Net Change
A	15,480 SF	3,526 SF	-	2,918 SF	3,681 SF	6,444 SF	846 SF
B	47,019SF	22,840 SF	8,970SF	4,844 SF	4,673 SF	27,684 SF	-2,486 SF
Total	62,499 SF	26,366 SF	8,970 SF	7,762 SF	8,354 SF	34,128 SF	-1,640 SF

(Proposed Drainage Area Breakdown)

Area	Total Disturbed	Existing Impervious	Proposed Impervious	Existing % Impervious	Proposed % Impervious	Net Changed
A	15,480 SF	5,598 SF	6,444 SF	36.16%	41.63%	5.47%
B	40,019 SF	30,172SF	27,684SF	75.4%	69.20%	-6.20%
Total	62,499 SF	35,768 SF	34,128 SF	-	-	-0.73%

Hydrology Calculations:

The hydrology calculations for the proposed site; has been prepared using the design data, criteria, and methodology developed by Los Angeles County Department of Public Works. The 50-year, 24-hour rainfall isohyet for this location is approximately 6.9 inches. Applying the County's Precipitation Depth Factors, the 100-year rainfall depths have been estimated to be approximately 7.7 inches of rainfall. The hydrology calculations have been prepared for the 100-year post development condition for each drainage sub-areas which is tabulated in this report.

The hydrology calculation also includes the computation for MS4 runoff (SUSMP) based on the 85-th percentile 24-hr or ¾" rainfall whichever is greater. The 85the percentile 24-hr rainfall for this location is approximately 0.70 inches of rainfall, therefore; MS4 is based on ¾" of rainfall over the proposed impervious surfaces within the proposed disturbed area.

Area	Q100-year Existing	MS4 Existing	Q100-year Proposed	MS4 Proposed
A	1.33 cfs	0.03 cfs	1.33 cfs	0.03 cfs
B	3.49 cfs	0.13 cfs	3.49 cfs	0.12 cfs
Total	4.82 cfs	0.16 cfs	4.82 cfs	0.15 cfs

The calculated MS4 runoff for existing condition is 0.16 cfs and MS4 runoff for the post development is calculated to be 0.15 cfs, a reduction of 0.01 cfs. The scope of the proposed development will reduce the existing MS4 runoff load on the existing treatment facilities by 0.02 cfs, therefore; the existing facility is adequate for the proposed remodeling project. The peak Q100 and peak QMS4 discharges to a natural canyon to allow further bio-treatment before it is discharged via existing water course to the Pacific Ocean. The post development runoff will improve the existing stormwater quality from the site.

Proposed Storm Drainage System:

The proposed storm drainage system consists of drain pipes and local catch basins that intercept the runoff from the disturbed areas for the proposed development and drains to the existing onsite storm drain system. The existing onsite storm drain consists of 6 inch and 8 inch PVC drain pipes that connect to 18-inch pvc discharge pipe. The full capacity of 6 inch PVC at 2% is 1.03 cfs, 8-inch PVC is 2.25 cfs, and 18inch PVC is 19.31 cfs. The calculated peak Q100 runoff from the entire project based on 2.9 acres with 70% impervious is 10.3 cfs (this condition is more restrictive than the proposed post development condition). Therefore; the existing storm drain system is adequate for proposed development.

Water Quality Control:

The Stormwater Quality Design Flows (SWQDf) have been calculated based on the ¾" of rainfall which is greater than the eighty five percentile 24-hr rainfall for this location which is 0.70 inches of rainfall. The calculated SWQDf for the proposed alteration is 0.15 cfs and the existing SWQDf is 0.16 cfs , a reduction of 0.01 cfs from the existing SWQDf within the disturb area. In addition; the calculated SWQDf for drainage area A is 0.03 cfs, and for drainage area B is 0.12 cfs. the proposed development will be provide with a separate Filterra Bio-treatment system for each drainage area size based on the 150% capacity.

Conclusions and Design Memo:

The proposed project reduces the impervious surface within the existing development. The post development runoff does not exceed pre-development runoff. The post development MS4 is actually less than existing MS4 by 0.01 cfs. The calculated volume for the MS4 runoff is fully contained within the capacity provided by the proposed Green Roof. The grading plan for the existing development was approved on May 25, 2004; it includes 2.90 Acres of drainage area with 70% impervious as stated on BMP plans, Sheet G-16 of G-19.

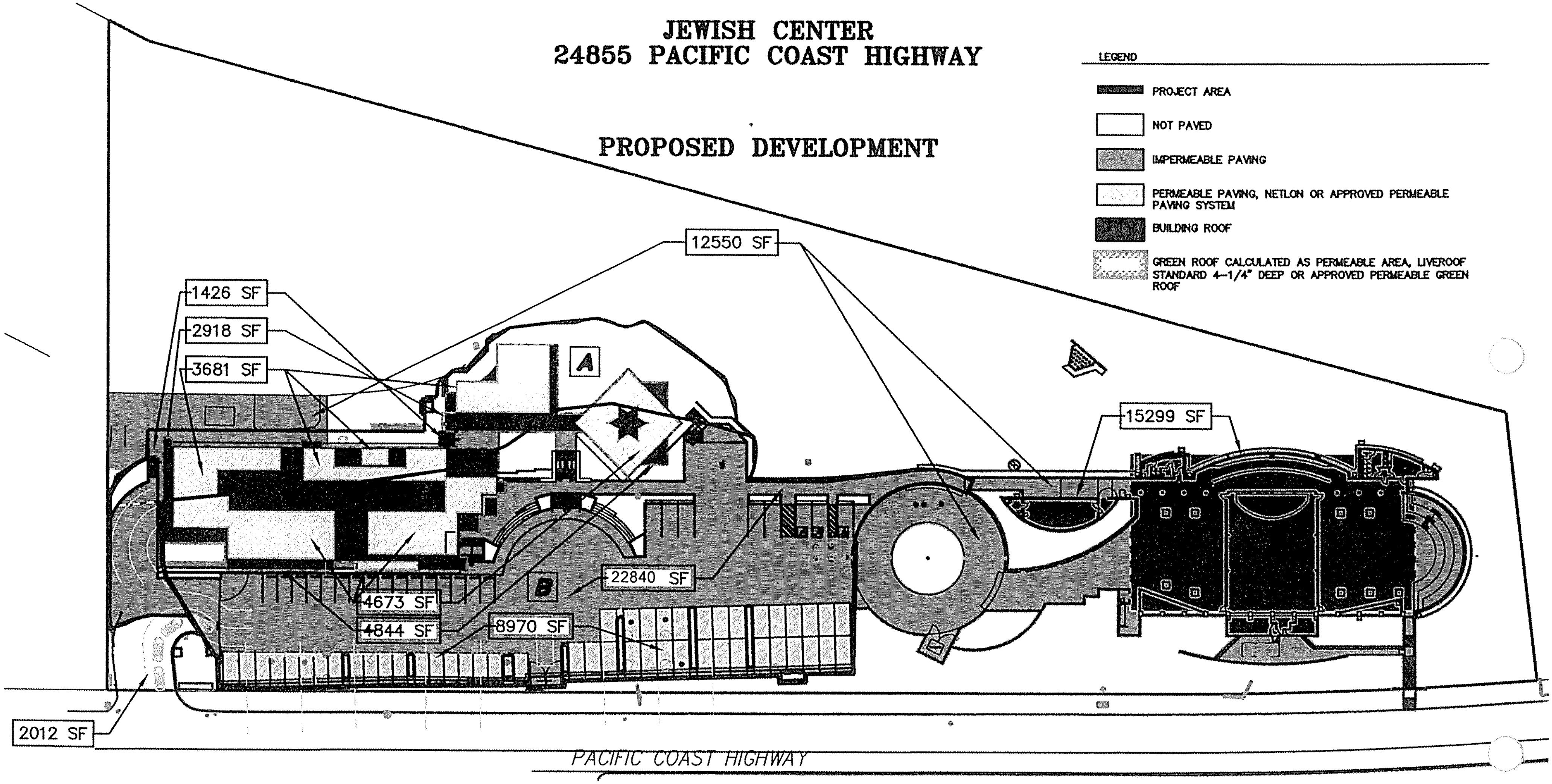
The existing impervious surface within the proposed disturbed area is 35, 768 SF and the proposed impervious surface will be 34,128 SF, which is a reduction of 1,640 SF. The proposed percent impervious for drainage subarea A is 41.63% and proposed percent impervious for drainage subarea B is 69.20%. The percent impervious for drainage subarea A is increased by 5.47% and for drainage subarea B is reduced by 6.20%. The proposed drainage system from drainage area B will be connected to the existing drainage system and will maintain the existing drainage course, and drainage from drainage area B will discharge to the canyon to the north of the proposed development and within existing drainage course. The peak post development 100-year storm frequency for drainage area A and drainage area B do not exceed the peak pre development 100-year frequency storm runoff; therefore, detention storage is not required to drain at pre development runoff rate.

In addition; the calculated SWQDf for drainage area A is 0.03 cfs, and for drainage area B is 0.12 cfs. the proposed development will be provide with a separate Filterra Bio-treatment system for each drainage area size based on the 150% capacity.

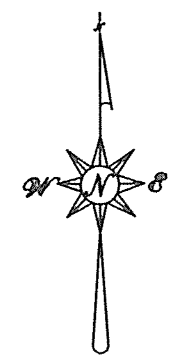
The peak Q100 and peak QMS4 discharges to a natural canyon to allow further treatment via natural bio-treatment before it is discharged to existing water course. The post development runoff will improve the existing stormwater quality from the site. The onsite treatment facility is installed by the property owner and it is under ongoing maintenance.

JEWISH CENTER
24855 PACIFIC COAST HIGHWAY

PROPOSED DEVELOPMENT

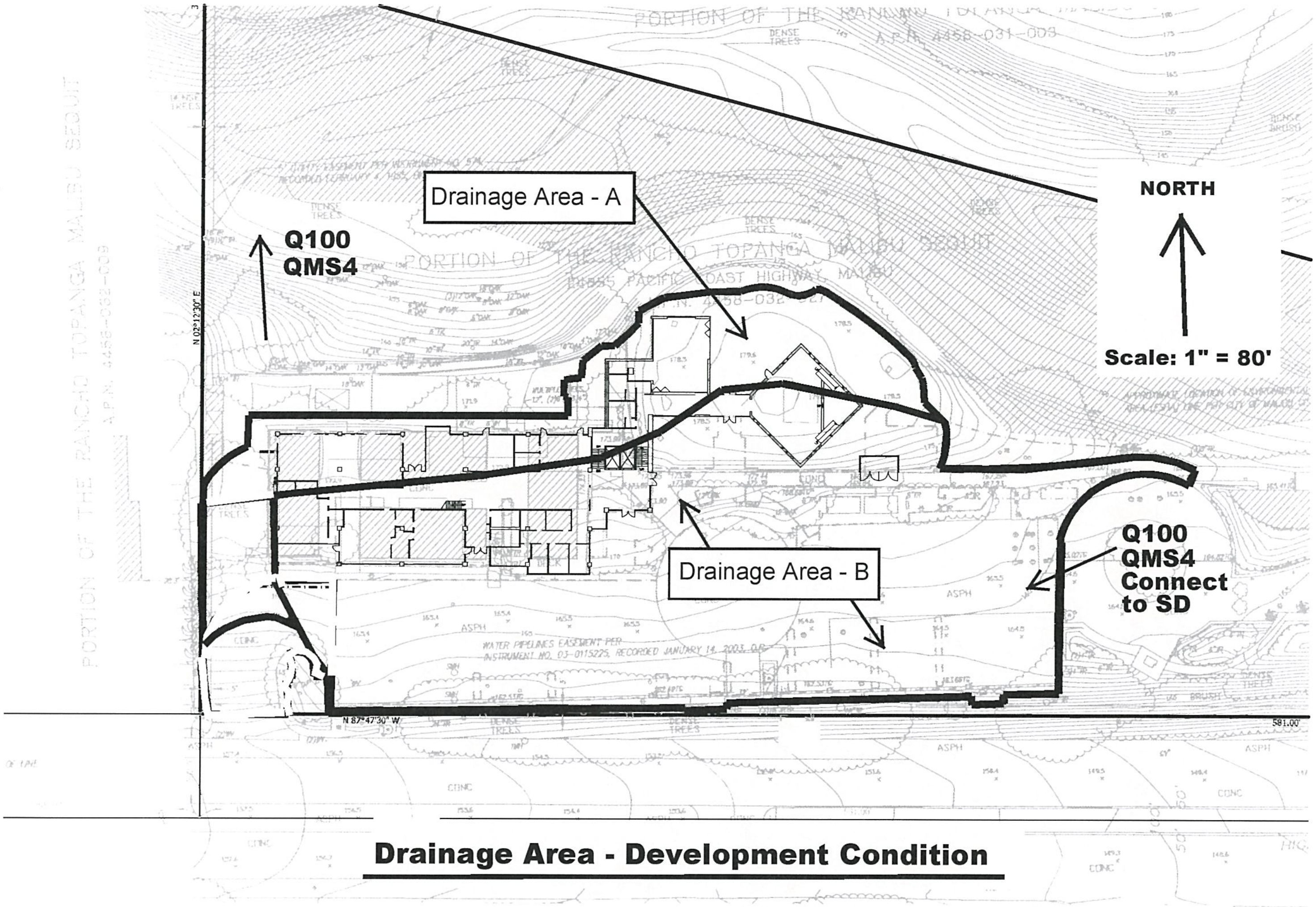


PROPOSED CONDITION							
AREA	TOTAL DISTURBED SURFACE	ASPHALT PAVING OR SIDEWALK	PERMEABLE SURFACE OR GRASS-CRETE	ROOF	TOTAL EXISTING PERMEABLE	TOTAL PROPOSED PERMEABLE	TOTAL PROPOSED IMPERMEABLE
A	15,480 SF	3,526 SF	–	2,918 SF	3,681 SF	3,681 SF	6,444 SF
B	47,019 SF	22,840 SF	8,970 SF	4,844 SF	4,673 SF	13,643 SF	27,684 SF
TOTAL	62,499 SF	26,366 SF	8,970 SF	7,762 SF	8,354 SF	17,324 SF	35,928 SF



SCALE: 1" = 80'

24855 Pacific Coast Highway
Malibu, Ca

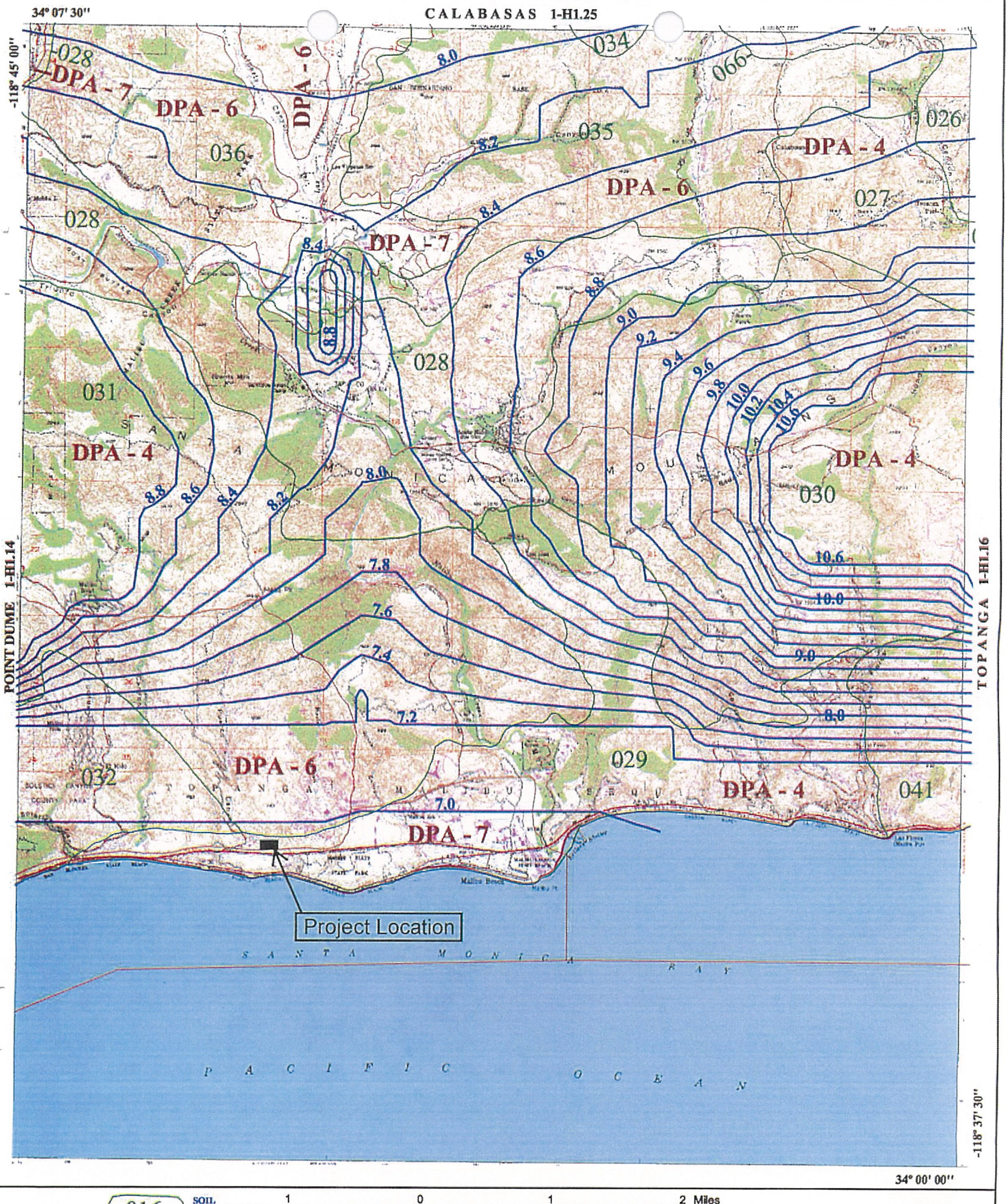


Drainage Area - Development Condition

Proposed Drainage Area	Total Disturbed Area	Proposed Impermeable Paving	Proposed Permeable paving	Proposed Roof	Proposed Green Roof (Permeable)	Total Proposed Impermeable	Net Change
A	15,480 SF	3,526 SF	-	2,918 SF	3,681 SF	6,444 SF	846 SF
B	47,019SF	22,840 SF	8,970SF	4,844 SF	4,673 SF	27,684 SF	-2,486 SF
Total	62,499 SF	26,366 SF	8,970 SF	7,762 SF	8,354 SF	34,128 SF	-1,640 SF

Existing and Proposed Storm Drain Runoff

Area	Q100-year Existing	MS4 Existing	Q100-year Proposed	MS4 Proposed
A	1.33 cfs	0.03 cfs	1.33 cfs	0.03 cfs
B	3.49 cfs	0.13 cfs	3.49 cfs	0.12 cfs
Total	4.82 cfs	0.16 cfs	4.82 cfs	0.15 cfs



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

MALIBU BEACH
50-YEAR 24-HOUR ISOHYET

1-H1.15

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

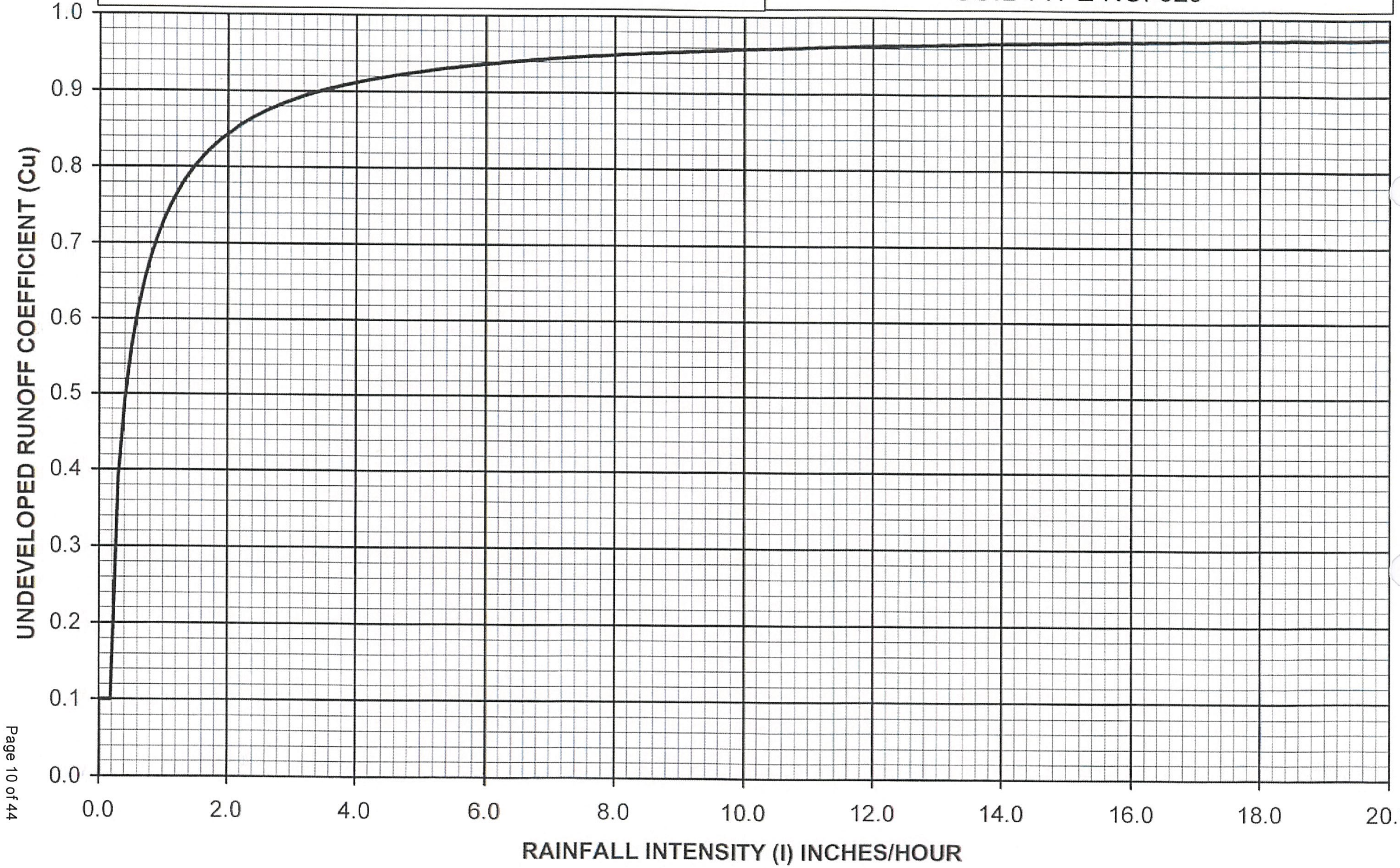
Where: C_D = Developed Runoff Coefficient

IMP = Proportion Impervious

C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 029



Precipitation Depth Factor

Based on Los Angeles County Hydrology Manual Table 5.3.1				
Rainfall Frequency	Multipilation Factors	Reading from Isohyt	Design Value	
1-yr 24-hr	0.283	6.87	1.9	
2-yr 24-hr	0.387	6.87	2.7	
5-yr 24-hr	0.584	6.87	4.0	
10-yr 24-hr	0.714	6.87	4.9	
25-yr 24-hr	0.878	6.87	6.0	
50-yr 24-hr	1.000	6.87	6.9	<-----------
100-yr 24-hr	1.122	6.87	7.7	
500-yr 24-hr	1.402	6.87	9.6	

HYDROLOGY CALCULATIONS

PRE - DEVELOPMENT CONDITION

Peak Q-100 Year

DRAINAGE AREA - A

Q-100 YEAR PRE DEVELOPMNET RUNOFF

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Fire Factor	
A Q100 Pre	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.35	0.362	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	.02

Subarea Parameters Selected

Subarea Number	Fire Factor	
	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.35	0.362	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

☑ Calculate Runoff Volume

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A Q100 Pre	4.22	0.9	0.9

Calculate Tc

Cancel

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Peak Flow Rate (cfs)	Burned Peak Flow Rate (cfs)	24-Hour Runoff Volume (acre-ft)
6	1.33	n/a	0.13

DRAINAGE AREA - B

Q-100 YEAR PRE DEVELOPMNET RUNOFF

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Fire Factor	
B Q100 Pre	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.918	0.754	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	.02

Subarea Parameters Selected

Subarea Number	Fire Factor	
	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.918	0.754	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
B Q100 Pre	4.22	0.9	0.9

☑ Calculate Runoff Volume

Calculate Tc

Cancel

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Peak Flow Rate (cfs)	Burned Peak Flow Rate (cfs)	24-Hour Runoff Volume (acre-ft)
6	3.49	n/a	0.45

HYDROLOGY CALCULATIONS

POST - DEVELOPMENT CONDITION

Peak Q-100 Year

DRAINAGE AREA - A

Q-100 YEAR POST DEVELOPMNET RUNOFF

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Fire Factor	
A Q100 Post	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.35	0.4163	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	.02

Subarea Parameters Selected

Subarea Number	Fire Factor	
	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.35	0.4163	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

● Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

☑ Calculate Runoff Volume

Calculate Tc

Cancel

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A Q100 Pos	4.22	0.9	0.9

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Peak Flow Rate (cfs)	Burned Peak Flow Rate (cfs)	24-Hour Runoff Volume (acre-ft)
6	1.33	n/a	0.14

DRAINAGE AREA - B

Q-100 YEAR POST DEVELOPMNET RUNOFF

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Fire Factor	
B Q100 Post	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.918	0.692	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	.02

Subarea Parameters Selected

Subarea Number	Fire Factor	
	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.918	0.692	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
B Q100 Pos	4.22	0.9	0.9

☑ Calculate Runoff Volume

Calculate Tc

Cancel

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Peak Flow Rate (cfs)	Burned Peak Flow Rate (cfs)	24-Hour Runoff Volume (acre-ft)
6	3.49	n/a	0.44

MS4 STORMWATER QUALITY

DESIGN CALCULATIONS

SWQD *f*

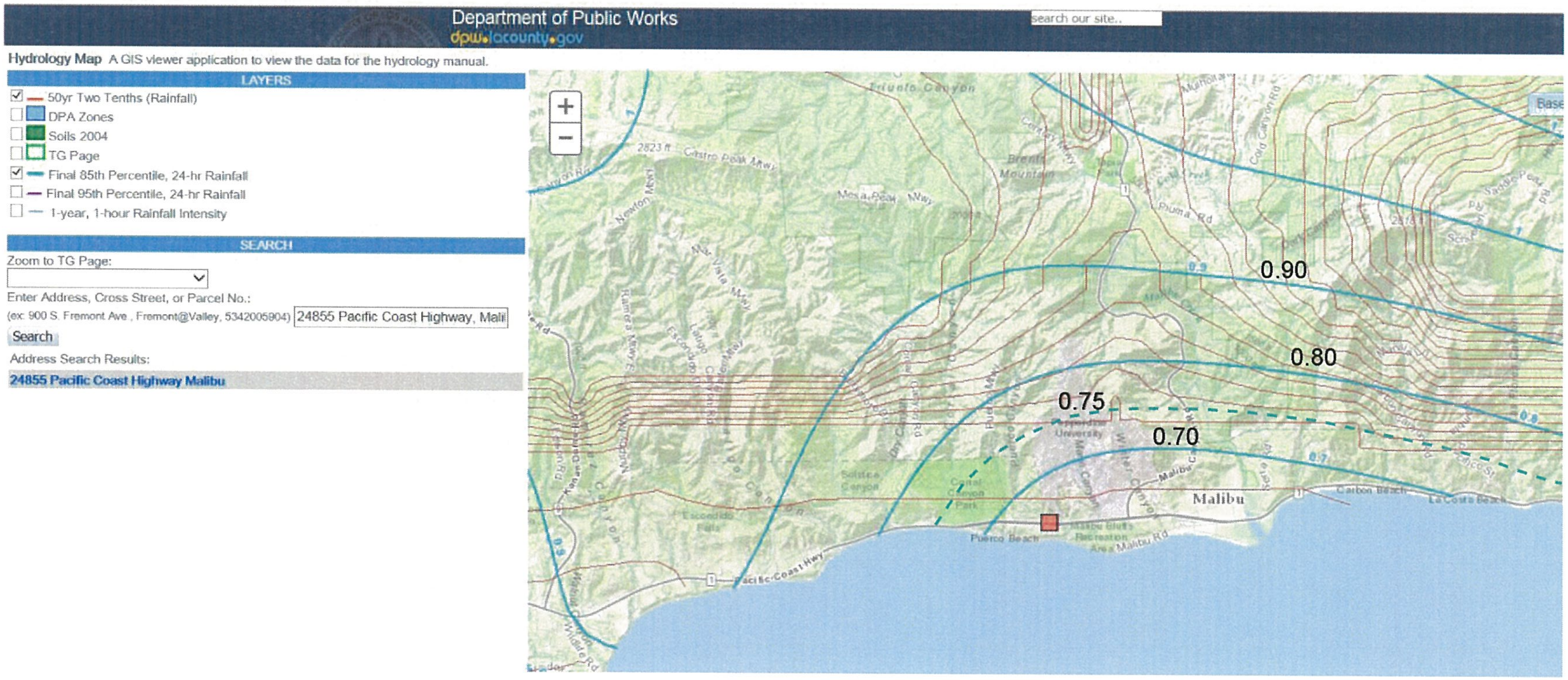
SUSMP Water Quality Control

The proposed project results in the creation of 1,640 SF less impervious surfaces than existing impervious surfaces. Since the scope of remodeling reduces the impervious surface in the disturbed area within the existing improvement; the stormwater runoff is reduced.

The Stormwater Quality Design Flows (SWQDf) have been calculated based on the ¾" of rainfall which is greater that the eighty five percentile 24-hr rainfall for this location which is 0.70 inches of rainfall. The existing treatment facility for the entire site was approved in May 25, 2004 and it is sized for 2.90 Acres with70% impervious; the calculated required design MS4 flow for the entire project is 0.56 cfs. The capacity of the existing onsite treatment system is 1.059 cfs and it exceeds the required MS4 design treatment flow for the entire site. The scope of the proposed remodeling reduces the MS4 flow on the existing system by 0.01 cfs; therefore, the existing onsite treatment system is adequate. The peak Q100 and peak QMS4 discharges to a natural canyon to allow further treatment via natural bio-treatment before it is discharged to existing water course.

In addition; the calculated SWQDf for drainage area A is 0.03 cfs, and for drainage area B is 0.12 cfs. the proposed development will be provide with a separate Filterra Bio-treatment system for each drainage area size based on the 150% capacity. The onsite treatment facility is installed and maintained by the property owner at the present time.

24855 Pacific Coast Highway
Malibu, Ca



DRAINAGE AREA - A

SWQDf - MS4 RUNOFF - POST DEVELOPMENT CONDITION

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Fire Factor	
A MS4 POST	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.35	0.4163	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
0.75	700	.02

Subarea Parameters Selected

Subarea Number	Fire Factor	
	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.35	0.4163	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
0.75	700	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A MS4 POS	0.19	0.15	0.46

☑ Calculate Runoff Volume

Calculate Tc

Cancel

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Peak Flow Rate (cfs)	Burned Peak Flow Rate (cfs)	24-Hour Runoff Volume (acre-ft)
30	0.03	n/a	0.01

WSQDf = 0.03 cfs X 1.5 = 0.045 cfs

Filterra Box 4 x 6 Capacity = 0.055 cfs > 0.045 cfs

DRAINAGE AREA - B

SWQDf - MS4 RUNOFF - POST DEVELOPMENT CONDITION

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Fire Factor	
B MS4 Post	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.918	0.692	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
0.75	700	.02

Subarea Parameters Selected

Subarea Number	Fire Factor	
	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
0.918	0.692	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
7.7	700	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

☑ Calculate Runoff Volume

Calculate Tc

Cancel

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
B MS4 Post	0.19	0.15	0.67

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Peak Flow Rate (cfs)	Burned Peak Flow Rate (cfs)	24-Hour Runoff Volume (acre-ft)
30	0.12	n/a	0.04

SWQDf = 0.12 cfs x 1.5 = 0.18 cfs

Filterra Box 8 x 12 Capacity = 0.224 cfs > 0.180 cfs

Existing Condition

Design MS4 Flow for the Entire Site

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Fire Factor	
MS4 Extg Co	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
2.90	0.70	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
0.75	720	.02

Subarea Parameters Selected

Subarea Number	Fire Factor	
	0	
Area (Acres)	**Proportion Impervious**	**Soil Type**
2.9	0.7	29
Rainfall Isohyet (in.)	**Flow Path Length (ft.)**	**Flow Path Slope**
0.75	720	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
MS4 Extg Co	0.19	0.15	0.68

☑ Calculate Runoff Volume

Calculate Tc

Cancel

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

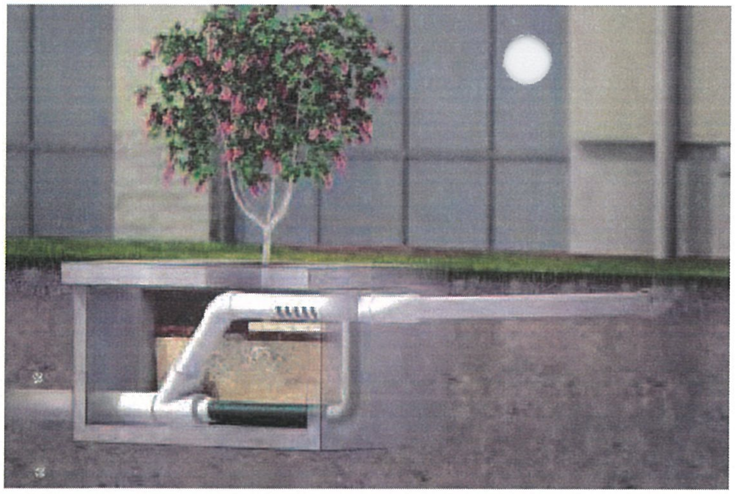
Tc Value (min.)	Peak Flow Rate (cfs)	Burned Peak Flow Rate (cfs)	24-Hour Runoff Volume (acre-ft)
30	0.37	n/a	0.12

For Comparison

References:

Approved Grading Plan -
Total Disturbed Area = 2.90 Acres
Impervious = 0.70

Required Design MS4 Flow = 1.5 x 0.37 cfs = 0.55 cfs
Provided Capacity = 1.059 cfs > 0.55 cfs



NEW FILTERRA MODEL

CONTACT US FOR DETAILS

24855 Pacific Coast Highway
Malibu, Ca

filterra
Bioretention Systems
CELEBRATING 10 YEARS
by KRISTAR

Filterra® Roofdrain Stormwater Treatment System

A Greenroof at Ground Level™

Filterra® Roofdrain System

The Filterra Roofdrain System treats piped in stormwater runoff from rooftops. Using bioretention filtration the system captures and immobilizes pollutants of concern such as; TSS, nutrients and metals.

Stormwater continues to flow through the media and into the underdrain system, where treated water is discharged. Higher flows bypass the bioretention treatment via an overflow/bypass pipe design.

Features and Benefits

Best Value for Rooftop Treatment.

- compact size
- needs no external bypass
- easy installation
- simple maintenance

Versatile.
Filterra Roofdrain can be used for:

- new construction
- retrofits
- commercial or residential applications.

Filterra Roofdrain can be placed:

- At grade
- Slightly above grade to meet elevation challenges of high water tables
- Install next to or away from your building

Maintenance. Maintenance is simple and safe (at ground level), and the first year is provided FREE with the purchase of every unit. The procedure is so easy you can perform it yourself.

Protection. The Filterra Roofdrain's hydraulic configuration was tested by the Colorado State University Hydraulics Laboratory.

Below grade treatment using Filterra roofdrain avoids the slipping hazard liabilities of daylighted roofdrains during freezing weather.

Protect from erosion with Filterra's monolithic water tight design.

Expected Pollutant Removal

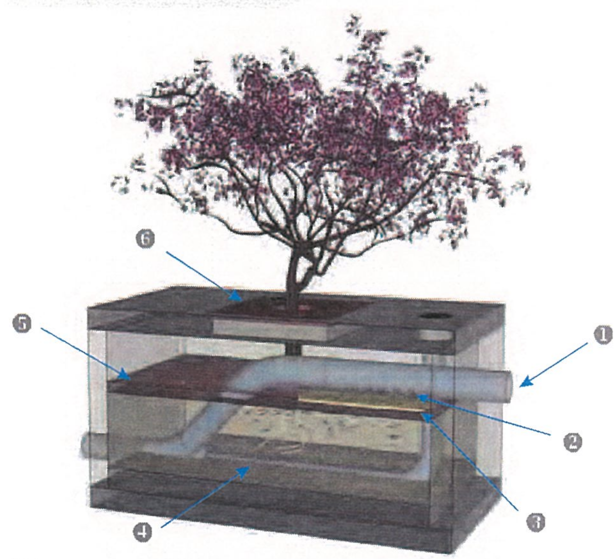
(Ranges Varying with Particle Size, Pollutant Loading and Site Conditions)

TSS Removal	85%
Phosphorus Removal	60% - 70%
Zinc Removal	> 66%
Copper Removal	>58%
Nitrogen Removal	43%
TPH* Removal	> 93%

*Total Petroleum Hydrocarbons

Information on the pollutant removal efficiency of the filter soil/plant media is based on third party lab and field studies.

Filterra media has been TAPE and TARP tested and approved.



1. Influent Pipe from Roof Leader
2. Erosion Control Device
3. Protective Mulch Layer
4. Perforated Underdrain for Treatment Flows
5. Cast Iron Tree Grate for Maintenance Access

filterra
Bioretention Systems
CELEBRATING 10 YEARS

Filterra® Internal Bypass - Pipe

A Greenroof at Ground Level™

Design Guidelines

1) Use the Filterra Internal Bypass - Pipe Design Guidance as a reference available from design@filterra.com.

2) Select Filterra Internal Bypass - Pipe model according to your Regional Sizing Table, and according to the building's roof drainage area and associated roof drain pipe sizes.

3) Determine Filterra Internal Bypass - Pipe placement next to a building, or away from your building.

4) Ensure piping to and from Filterra Internal Bypass - Pipe system is free-draining at minimum 1% slope, or per local codes.

Placement Review

Because we want your project with Filterra to be a great success, we respectfully require that each Filterra Internal Bypass - Pipe project be reviewed by our placement/design staff. This review is mandatory, as proper placement ensures you of the most efficient and cost effective solution, as well as optimum performance and minimal maintenance

Proper Placement

1) Pipe flow of the Filterra Internal Bypass - Pipe eliminates the cross-linear flow requirements necessary with standard Filterra.

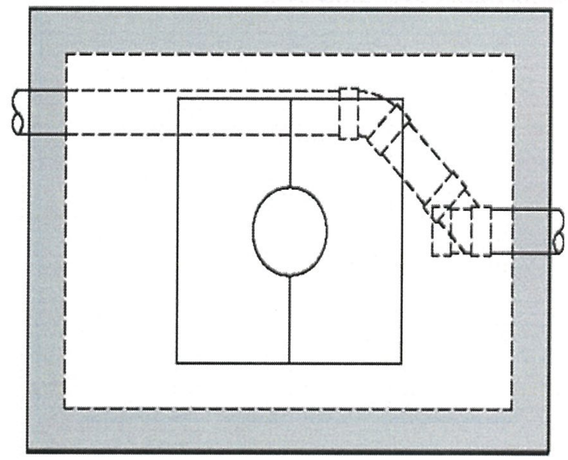
2) Filterra Internal Bypass - Pipe should only receive piped in runoff.

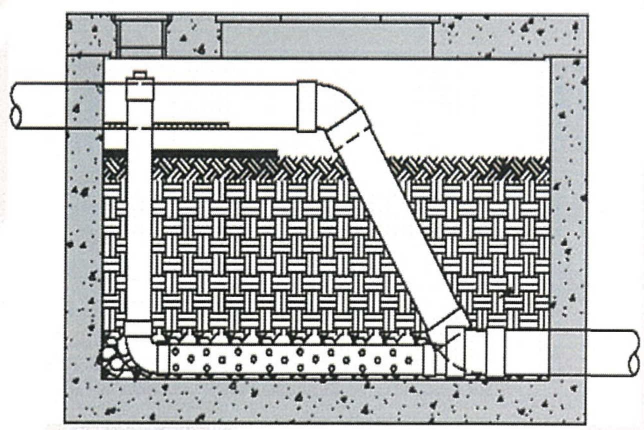
3) Rooftop drainage should still be designed with emergency bypass relief prior to the Filterra Internal Bypass - Pipe (e.g.: rooftop scuppers, etc.)

Always follow local plumbing codes for roof drainage requirements.

The Filterra System is not a substitute for rooftop overflow/bypass.

4) Send completed project information form along with plans to Filterra for placement and application review.





Filterra Internal Bypass - Pipe
One pipe in, one pipe out, with internal high-flow bypass.

Corporate Headquarters & Region Support
11352 Virginia Precast Road
Ashland, VA 23005

Toll Free: (866) 349-3458 • F: (804) 798-8400

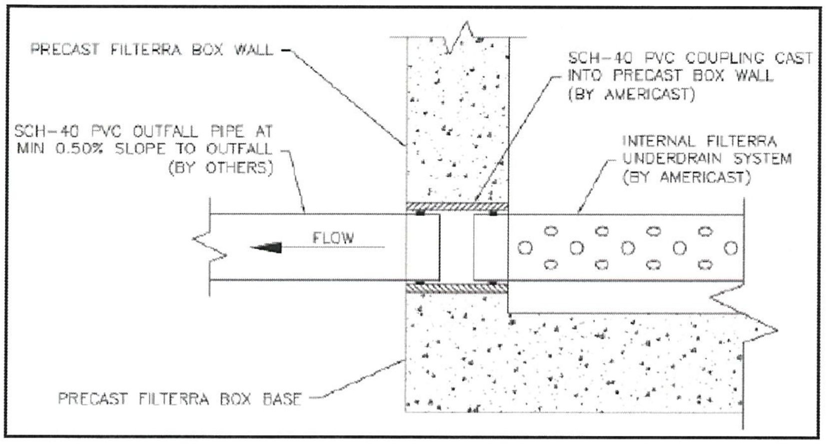
E-mail: support@filterra.com • Web: www.filterra.com

Design MS4 : **Subarea A = 0.03 x 1.5 = 0.045 cfs**
Subarea B = (0.12) x 1.5 = 0.224 cfs

filterra
Bioretention Systems
CELEBRATING 10 YEARS
by KRISTAR

Filterra® Piping Technical Details

Filterra® is supplied with an internal underdrain system that exits a wall in a perpendicular direction. Most efficient drainage is accomplished when the drain exits on the lower side of the Filterra®, i.e. nearest the overflow bypass. This is more important when using the larger sized Filterra® Systems.



Drawing DP1:
Section View through Filterra Precast Box Wall at Outfall Pipe Connection

All units are supplied with the drainage pipe coupling precast into the wall, at a depth of 3.50 feet (INV to TC). Drawing DP1 is a detail of the coupling. The coupling used is SCH-40 PVC.

Typically, a minimum slope of 0.5% is adequate to accommodate the flow of treated water from the Filterra®, but each site may present unique conditions based on routing of the outfall pipe (elbows). The pipe must not be a restricting point for the successful operation of Filterra®. All connecting pipes must accommodate freefall flow. Table 3 lists approved treatment sizing flow rates of the various size Filterra® units. A safety factor of at least two should be used to size piping from the Filterra based on these conservative approved treatment flow rates.

Table 3: Filterra Flow Rates & Pipe Details

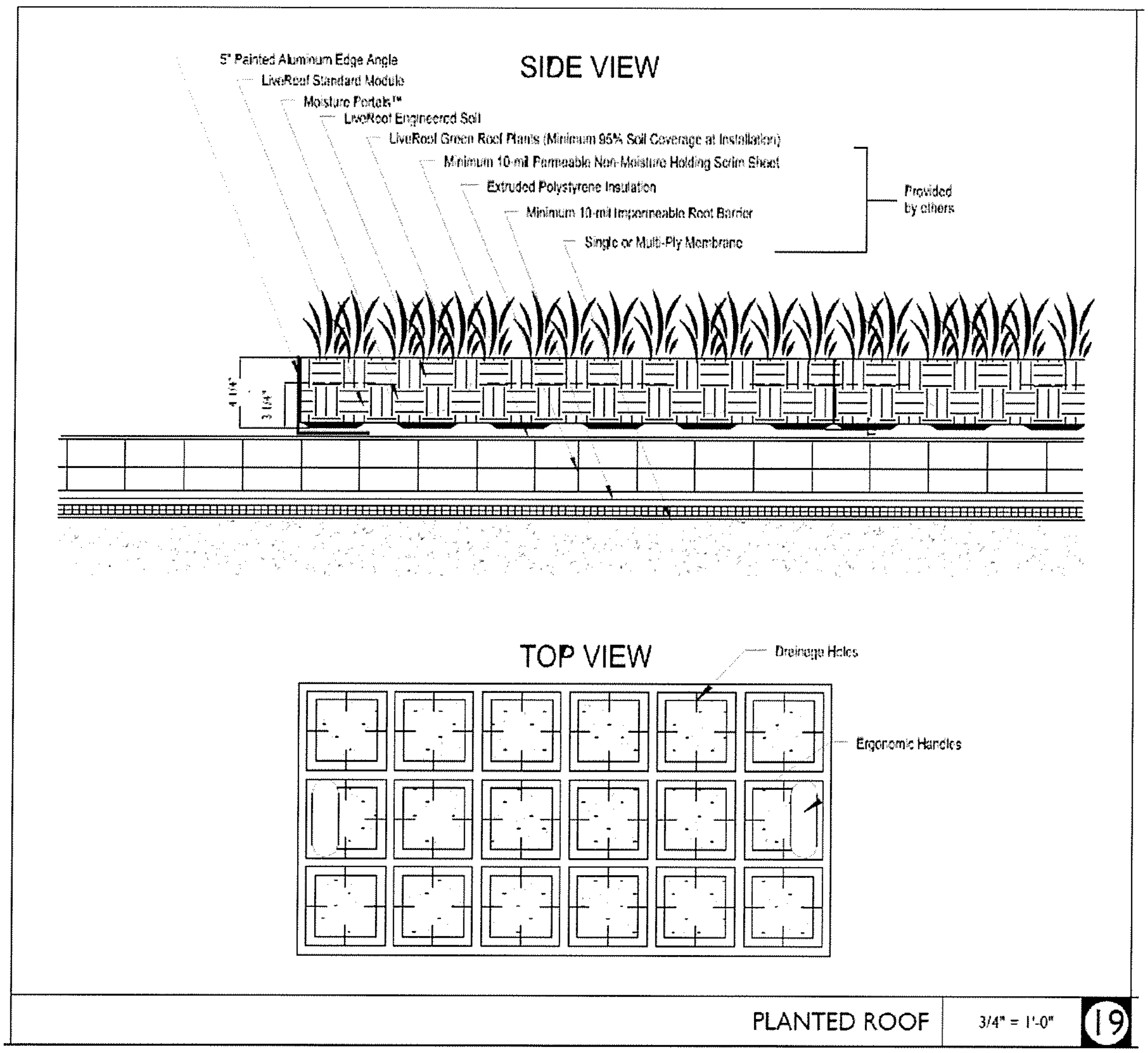
Important Note: Actual flow rate may be more than double rates below.

	Filterra® Size (feet)	Expected Flow Rate (cubic feet/second)	Connecting Drainage Pipe
(Subarea A) →	4x4	0.037	4" SCH-40 PVC
	4 x 6 or 6 x 4	0.055	4" SCH-40 PVC
	4x6.5 or 6.5x4	0.061	4" SCH-40 PVC
	4 x 8 or 8 x 4	0.075	4" SCH-40 PVC
	4x16 or 16x4	0.150	6" SCH-40 PVC
	6 x 6	0.084	4" SCH-40 PVC
	6 x 8 or 8 x 6	0.112	4" SCH-40 PVC
	6 x 10 or 10 x 6	0.140	6" SCH-40 PVC
	6 x 12 or 12 x 6	0.168	6" SCH-40 PVC
(Subarea B) →	8x12 or 12x8	0.224	6" SCH-40 PVC
	8x16 or 16x8	0.297	6" SCH-40 PVC
	8x18 or 18x8	0.337	6" SCH-40 PVC
	8x20 or 20x8	0.374	6" SCH-40 PVC

Green Roof

Green Roof - Capacity

The proposed development is provided with 8,354 SF of Green Roof. The Capacity of the proposed Green Roof based on 4 ¼ inches deep and 48% maximum capacity is 1,420 CF, which it is greater than the calculated MS4volume of 436 CF, therefore; the entire peak MS4 runoff is contained within the Green Roof.



System Properties

SYSTEM	LITE	STANDARD	DEEP	MAXX
Soil Depth	2.5 in (63 mm)	4.25 in (108 mm)	6 in (152 mm)	8 in (203 mm)
Dry Weight	±12 lbs/ft^2 (±0.57 kPa)	±20 lbs/ft^2 (±0.96 kPa)	±30 lbs/ft^2 (±1.44 kPa)	±40 lbs/ft^2 (±1.92 kPa)
Fully Saturated Weight *Maximum, varies by vegetation type and maturity level*	≤17 lbs/ft^2 (≤0.81 kPa)	≤29 lbs/ft^2 (≤1.39 kPa)	≤50 lbs/ft^2 (≤2.39 kPa)	≤65 lbs/ft^2 (≤3.11 kPa)
Maximum Water Holding Capacity (ASTM E2397)	48.3%			
Wilt Point of Plants	10%			
Maximum Available Capacity of Growing Medium to Hold Water	38.3%			
Growing Medium Maximum Moisture Storage	.96 in (24 mm) 0.6 gal/ft^2 (24.4 L/m^2)	1.6 in (40 mm) 1 gal/ft^2 (41.3 L/m^2)	2.2 in (55 mm) 1.3 gal/ft^2 (55.9 L/m^2)	3 in (76 mm) 1.8 gal/ft^2 (76.2 L/m^2)
Plant Moisture Storage (Sedums)	0.4" (10 mm) 0.25 gal/ft^2 (10.1 L/m^2)			
System Total Storm Water Storage (Assuming Initial Moisture 0.25 in / 6mm)	1.11 in (28 mm) 0.7 gal/ft^2 (28.2 L/m^2)	1.75 in (44 mm) 1.1 gal/ft^2 (44.4 L/m^2)	2.35 in (60 mm) 1.5 gal/ft^2 (59.7 L/m^2)	3.15 in (80 mm) 2 gal/ft^2 (80 L/m^2)
Water Permeability (saturated hydraulic conductivity)	0.434 in/min (0.018 cm/s)			
WITH ROOFBLUE™ RISER (for use with control-flow drain system)				
Maximum Water Depth	3.5 in (89 mm)			
Void Space	90.5%			
Maximum Water Volume Detained	456 in^3 (7472 cm^3) 1.97 gal/ft^2 (80.4 L/m^2)			
Maximum Water Volume Managed with Retention and Detention Actual water retained / detained will vary with drain selection, spacing and roof pitch	615 in^3/ft^2 2.6 gal/ft^2 (108 L/m^2)	708 in^3/ft^2 3 gal/ft^2 (125 L/m^2)	793 in^3/ft^2 3.4 gal/ft^2 (140 L/m^2)	908 in^3/ft^2 3.9 gal/ft^2 (160 L/m^2)
WIND AND FIRE RESISTANCE				
FM Approval Standard for Vegetative Roof Systems (FM 4477)		FM Approved		
Fire Resistance (ASTM E108) with Succulent Plantings * *Test Performed* ** *Performance Expected Based on Similar Testing*	Class A**	Class A*		Class A**
External Fire Design Standard for Vegetative Roofs (ANSI/SPRI VF-1)	Meets requirements for generic fire resistive vegetative systems (4.1)			
Wind Uplift Resistance (CAN/CSA A123.24-15) * Full Scale Test Performed ** *Performance Expected Based on Similar Testing of Lighter System(s)*	200 PSF (9.6 kPa) sustained* (133 PSF (6.4 kPa) rating after 1.5 experimental factor)		200 PSF** (133 PSF after 1.5 experimental factor)	
Wind Flow Resistance (CAN/CSA A123.24-15) * *Test Performed – Exceeded **maximum wind speed** sustained by testing equipment.* ** *Performance Expected Based on Similar Testing of Lighter System(s)*		124 mph (200 km/h) sustained* (83mph (133 km/h) rating after 1.5 experimental factor)	124 mph (200 km/h)** (83mph (133 km/h) after 1.5 experimental factor)	
Wind Design Standard for Vegetative Roofing Systems (ANSI/SPRI RP-14)	#4 Ballast (3.13.1)	#2 Ballast (3.13.2) and #4 Ballast (3.13.1)		

Green Roof MS4 Runoff

Tc Calculator

Subarea Parameters Manual Input

- Subarea Number: GR MS4
- Fire Factor: 0
- Area (Acres): 0.192
- Proportion Impervious: 0.62
- Soil Type: 29
- Rainfall Isohyet (in.): 0.75
- Flow Path Length (ft.): 160
- Flow Path Slope: .01

Subarea Parameters Selected

- Subarea Number:
- Fire Factor: 0
- Area (Acres): 0.192
- Proportion Impervious: 0.62
- Soil Type: 29
- Rainfall Isohyet (in.): 4.9
- Flow Path Length (ft.): 160
- Flow Path Slope: 0.01

Input File

- [ ] Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

- ○ Calculate Single Tc From Subarea Parameters Provided In Input File
- ● Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

- [x] Calculate Runoff Volume

Calculate Tc

Cancel

- Subarea Number: GR MS4
- Intensity: 0.25
- Undeveloped Runoff Coefficient (Cu): 0.26
- Developed Runoff Coefficient (Cd): 0.66
- Tc Equation: Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135
- Tc Value (min.): 17
- Peak Flow Rate (cfs): 0.03
- Burned Peak Flow Rate (cfs): n/a
- 24-Hour Runoff Volume (acre-ft): 0.01 ←

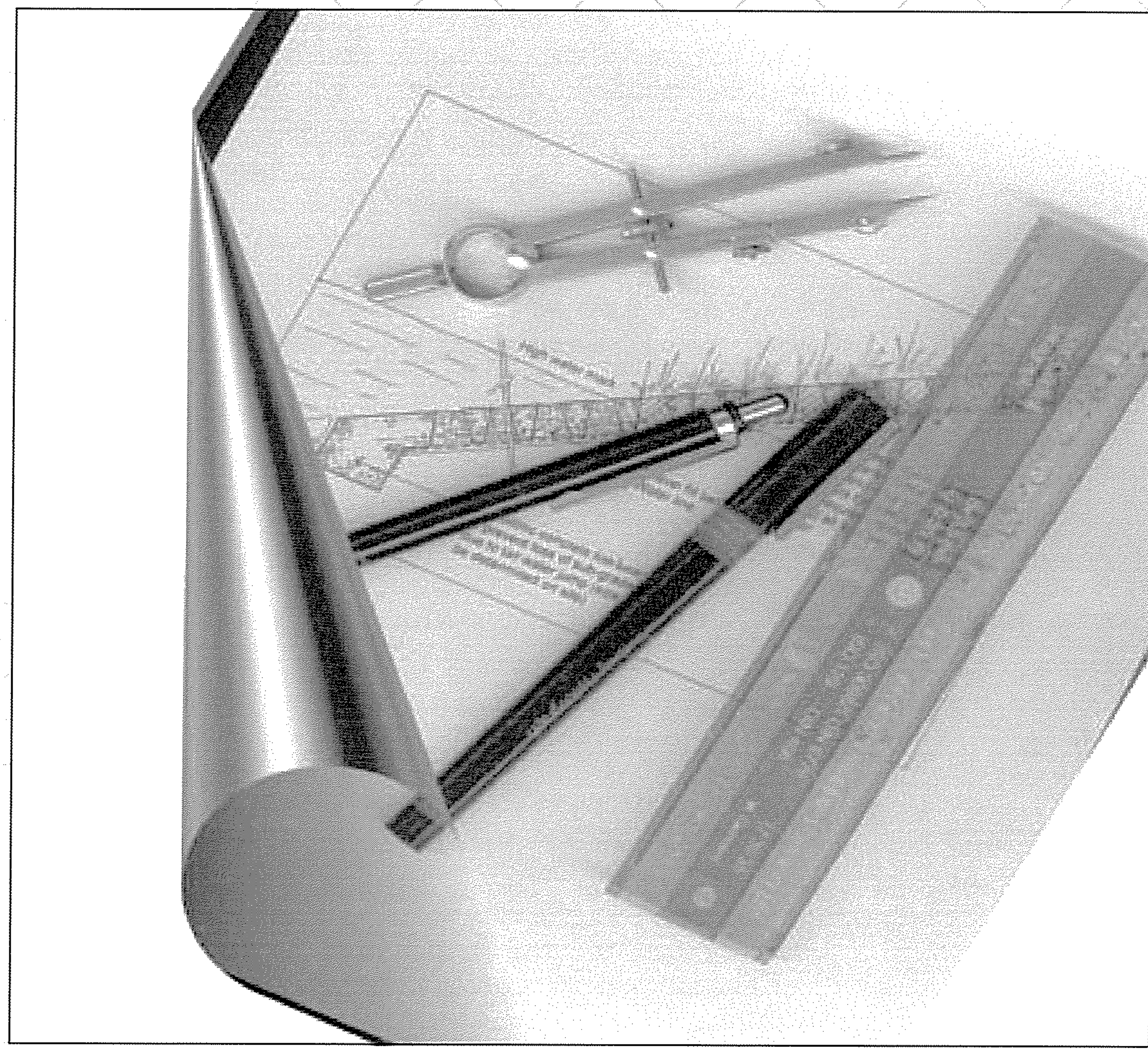
Volume = 0.01 acre-ft * 43,560 = 435.60 CF

Grass-Crete

GRASSCRETE®

CAST INSITU PAVING SYSTEM

DESIGN AND SPECIFICATION GUIDE



GRASS CONCRETE LIMITED

PART OF THE GC GROUP OF COMPANIES

INTRODUCTION

So versatile is the GRASSCRETE system that it can often be claimed as a tailored solution to a range of construction problems from heavy traffic applications to high water flow erosion control.

Across the years, GRASSCRETE has become a generic reference to the process of grass and concrete paving. Occasionally however, the unique cast on site system is confused with precast variants.

We hope, with this publication, to provide a definitive guide for GRASSCRETE in all of its major applications which should enable safe specification without confusion.

CONTENTS

CHAPTER ONE – DESIGN PRINCIPLES

PART ONE ~ THEORY

GRASSCRETE is essentially a cellular reinforced concrete slab, the cells being created by casting around plastic void formers.

The plastic former, manufactured from recycled materials is the culmination of many years of study which has perfected the shape of the pocket and the form and draw of the vacuum forming process. It provides crucially, the strength to accept live concrete loads, yet is thin enough to enable the tops to be easily melted to reveal the voids.

Structural analysis of the finished concrete section is based upon the bending moment of the mesh reinforcement contained within the slab, relatively to slab depth, contact area with base and an assumed allowable ground bearing of 45kN/m^2 for its base. By using combinations of depth and different mesh types, the system can be tailored to provide the most economical solution.

PART TWO ~ CONSTRUCTION

The 600x600mm plastic formers are laid edge to edge over a sand blinded formation to form a continuous layer broken only by a 100mm margin to the edge of each bay and at the point of each expansion joint.

Once the formers are in position the mesh reinforcement is laid over the former upstands, the individual 200x200mm upstands of each corresponding to the grid module of the reinforcement. As the mesh drops over the upstand, it is located in position by a spacer, this integrally moulded feature fixes the position of the mesh.

Expansion joints are located at maximum 10x10m centres and can be specified in the 3 following types:-

<u>Type A</u> - Ambient climates (fig.1)
Pre-soaked 25mm wide softwood filler to full depth of system with no sealant.

<u>Type B</u> - Extreme climates (fig.1)
Closed cell 25mm wide polyethylene (PE) foam or bitumen impregnated fibreboard. (It is advisable to seal the latter type to prevent subsequent chafing).

<u>Type C</u> - Heavy load transference (fig.2)
As Type B but incorporating 300mm long x 20mm diameter dowels at 600mm centres with cap and de-bond to one end with joint sealed irrespective of filler type (we recommend this type of joint for use only in the 150mm thick systems and only for regular load transference.

To Type A & B joints we recommend a 100mm wide trowelled margin to expansion joints. For Type C dowelled joints this should be increased to 150mm.

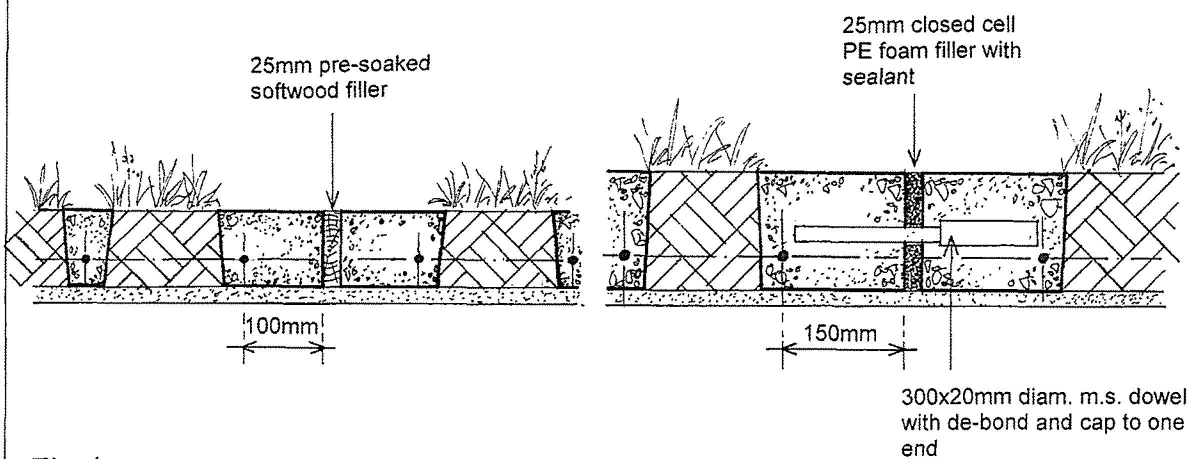


Fig.1

Fig.2

The concrete mix is of a readily available readymix type and can be identified by the following design mix description –

Cement type	:	Ordinary Portland (sulphate resisting may be used for extreme exposure)
Minimum cement content	:	350kgs/m^3
Maximum water/cement ratio	:	0.55
Maximum size aggregate	:	10mm
Ratio sand/total aggregate	:	0.45
Control/ batch slump	:	100mm general applications 50mm steep slopes
Site added admixtures	:	Superplasticiser to manufacturer's recommended dosage levels.
Final slump	:	Flowing:- general applications 75-100mm:- steep slopes
Air content	:	3% +/- 1^1/2% (higher values can be considered for compliance with highway related specifications)

The type of superplasticiser used can vary and may slightly increase or decrease the air content depending upon the formulation.

The concrete mix is designed to self compact around the plastic formers. Only when laying to the very steepest slopes where the slump is markedly reduced should any form of compaction be considered.

During pouring the concrete is drawn level to the tops of the formers by use of rubber bladed squeegees. This should be the only finish applied. Tamping or brushing is not required.
The system is designed to be capable of following most profiles either in the plan shape or vertical level. The former is simply cut to allow the incorporation of curves etc without stepping to the edges.

In respect of tolerances, the depth of the concrete is limited by the depth of the plastic former. The level at the surface will therefore generally reflect that of the prepared sub-base.

After the concrete has set and hardened (generally after 48 hours), the former tops are removed. This is carried out by use of LPG or paraffin (Kerosene) flame guns. Waving the burner across the top of the mould removes the top allowing the side walls to melt down to harmless residue deposited in the base of the void.

Please note that the melting out process does not emit any CFC's and there is only a small quantity of CO_2 evident, the operation being similar in it's emission levels to wood burning.

Following the melting operation the voids are infilled with topsoil and then seeded. Consideration should be given to the potential settlement of the topsoil which should be allowed to naturally take place. The seed can therefore be incorporated within a fine topsoil overlayer if the surface is not to be used immediately.

Alternatively, where immediate use is required the soil levels can be topped up at a later stage after initially striking flush to the upper concrete level.

For types of seed mix please see the appropriate chapters elsewhere in this publication.

Where gravel infill is used in lieu of topsoil/seed, we recommend the use of a 20-5mm grading which will be less susceptible to displacement than smaller graded 'pea gravel' types.

First trafficking of the surface should be linked to the curing period of the concrete. Under ambient conditions and a normal curing process we would recommend the following guidelines.

After 24 hours	-	foot traffic
After 7 days	-	40% of design load*
After 14 days	-	75% of design load*
After 28 days	-	100% of design load*

* Where regular early use is required we would recommend the incorporation of fibre reinforcement in the concrete mix to harden to the pocket walls.

CHAPTER TWO – TRAFFIC APPLICATIONS

PART ONE ~ EARTHWORKS & SUB-BASE DESIGN

As stated in Chapter One the surfacing has a structural requirement of a 45kN/m^2 allowable ground bearing. Where the existing ground naturally provides this, a sub-base depth of 150mm is normally adequate. For infrequently used parking, this can possibly be reduced.

In any event, consideration should be given to the access requirement for plant and deliveries during the construction process. This temporary works loading may therefore dictate the actual depth adopted.

To limit the possibility of "sub-grade pumping" through the sub-base under load, we recommend the utilisation of an underlying geotextile layer where the sub-base is to be heavily trafficked.

The sub-base specification for UK applications should relate to a Specification for Highways and Bridges Clause 803 Type 1 granular sub-base. For applications elsewhere in the world this relates to a free draining granular material of low plasticity and non frost susceptibility.

The cellular nature of the surface allows the release of frost heave pressure and this can be witnessed by the soil levels rising an falling under a freeze/thaw cycle. This feature enables the often stipulated guidelines of a frost free 450mm of construction to be relaxed enabling the surface to be laid over chalk sub-strata without additional sub-base depth.

PART TWO ~ DRAINAGE

On level ground GRASSCRETE can drain at 90% the rate of ordinary grassland. In the early stages of grass germination this figure may be slightly reduced until the root matrix is established. There may also be a natural raising of water table levels where significant site development has recently taken place.

The shape of the GRASSCRETE pocket will enable the retention of surface water during periods where the sub-grade is slow to drain (see fig.3).

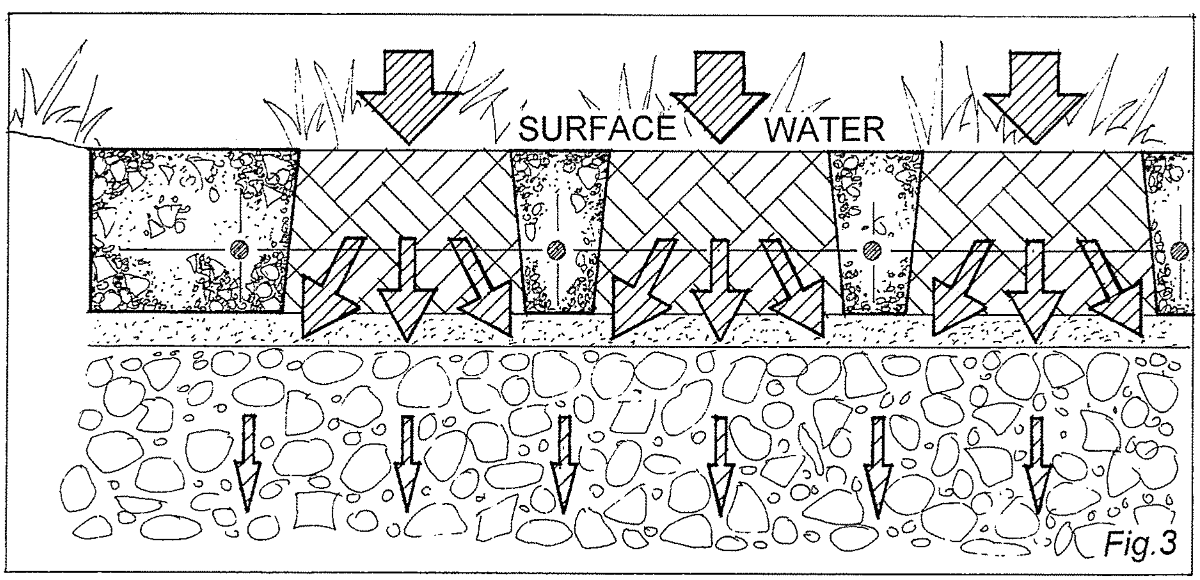


Fig.3

Where a slow draining sub-grade such as a cohesive clay is encountered, consideration can be given to the utilisation of an underlying drainage blanket as part of the overall sub-base design. This enables a reservoir head to be formed without weakening the ground bearing capability (see fig.4).

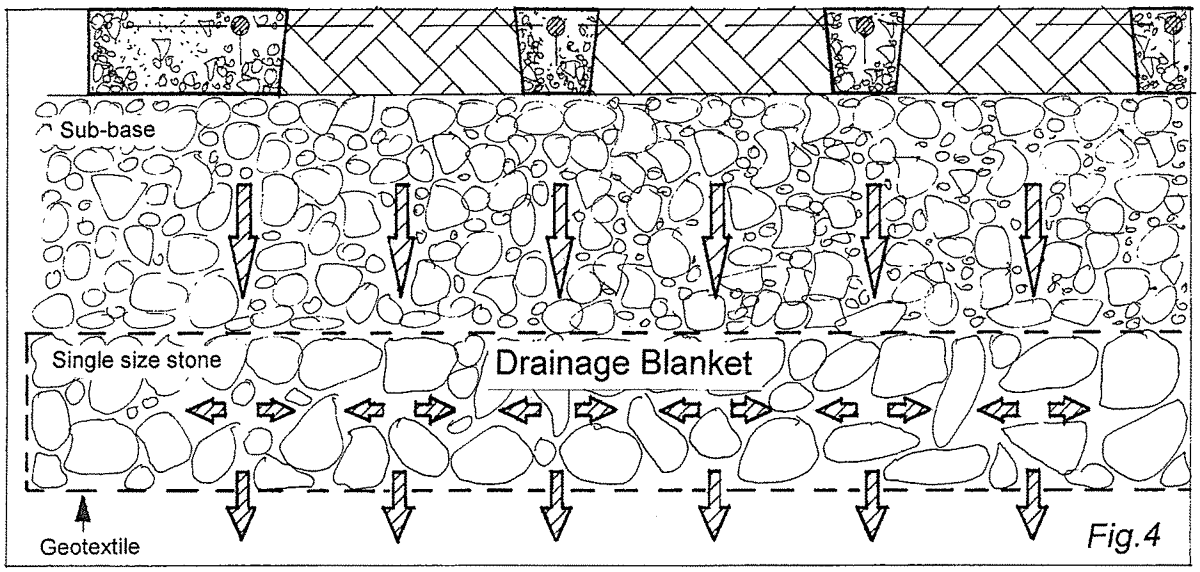


Fig.4

Please see our separate publication "GRASSCRETE STORM WATER MANAGEMENT- THE CASE FOR A POROUS PAVING SYSTEM" which details the advantages of a sustainable self-draining paving system on new developments.

PART THREE ~ CAR PARKS

A common feature of precast systems is their susceptibility to "elephant track" under regular loading often rendering them unsuitable for all but the infrequently used car parks. GRASSCRETE however, places no reliance upon grass for stability - a drawback with precast. It can therefore be specified in a wide range of applications.

Another factor in the specification of a grassed car park is the tyre rumble under use, a factor associated with precast units, which on large areas in particular, can be uncomfortable and cause displacement of units due to the resulting vibration. With its reinforced structure GRASSCRETE does not suffer from such problems.

A typical car park module is 4.8 x 2.4 metres with a 6.0 metre wide access aisle for two way traffic flow. Long strip casting enables bays of 4.8/5.0 metres and 6.0 metres wide can be constructed utilising the 100mm wide solid concrete edge as a subtle bay delineation (see fig.5).

HYDRAULIC CALCULATIONS

HYDRAULIC CALCULATIONS

Minor Drainage System

The proposed storm drainage system consists of drain pipes and local catch basins that intercept the runoff from the disturbed areas for the proposed development and drains to the existing onsite storm drain system. The existing onsite storm drain consists of 6 inch and 8 inch pvc drain pipes that connect to an 18-inch pvc discharge pipe. The full capacity of 6 inch pvc at 2% is 1.03 cfs, 8-inch pvc is 2.25 cfs, and 18-inch pvc is 19.31 cfs . Peak Q100 for the entire site is 10.30 cfs; the capacity of the existing 18-inch pvc discharge pipe is 19.31 cfs, which exceeds the peak Q100 runoff from the entire site. The capacity of existing storm drain system is adequate for the proposed development and capable to carry peak 100-year storm frequency runoff.

Rating Table for 6-inch PVC

Project Description

Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.01000	ft/ft
Normal Depth	0.50	ft
Diameter	0.50	ft
Discharge	0.73	ft³/s

Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00000	0.50			0.20	1.57	0.00
0.00500	0.50	0.52	2.63	0.20	1.57	0.00
0.01000	0.50	0.73	3.71	0.20	1.57	0.00
0.01500	0.50	0.89	4.55	0.20	1.57	0.00
0.02000	0.50	1.03	5.25	0.20	1.57	0.00
0.02500	0.50	1.15	5.87	0.20	1.57	0.00
0.03000	0.50	1.26	6.43	0.20	1.57	0.00
0.03500	0.50	1.36	6.95	0.20	1.57	0.00
0.04000	0.50	1.46	7.43	0.20	1.57	0.00
0.04500	0.50	1.55	7.88	0.20	1.57	0.00
0.05000	0.50	1.63	8.31	0.20	1.57	0.00

Rating Table for 18" PVC

Project Description

Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.01000	ft/ft
Normal Depth	1.50	ft
Diameter	1.50	ft
Discharge	13.65	ft³/s

Channel Slope (ft/ft)	Normal Depth (ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00500	1.50	9.66	5.46	1.77	4.71	0.00
0.01000	1.50	13.65	7.73	1.77	4.71	0.00
0.01500	1.50	16.72	9.46	1.77	4.71	0.00
0.02000	1.50	19.31	10.93	1.77	4.71	0.00
0.02500	1.50	21.59	12.22	1.77	4.71	0.00
0.03000	1.50	23.65	13.38	1.77	4.71	0.00
0.03500	1.50	25.55	14.46	1.77	4.71	0.00
0.04000	1.50	27.31	15.45	1.77	4.71	0.00
0.04500	1.50	28.97	16.39	1.77	4.71	0.00
0.05000	1.50	30.53	17.28	1.77	4.71	0.00
0.05500	1.50	32.02	18.12	1.77	4.71	0.00
0.06000	1.50	33.45	18.93	1.77	4.71	0.00
0.06500	1.50	34.81	19.70	1.77	4.71	0.00
0.07000	1.50	36.13	20.44	1.77	4.71	0.00
0.07500	1.50	37.40	21.16	1.77	4.71	0.00
0.08000	1.50	38.62	21.86	1.77	4.71	0.00
0.08500	1.50	39.81	22.53	1.77	4.71	0.00
0.09000	1.50	40.96	23.18	1.77	4.71	0.00
0.09500	1.50	42.09	23.82	1.77	4.71	0.00
0.10000	1.50	43.18	24.44	1.77	4.71	0.00

Appendix E

Post-Fire Assessment Memorandum

Prepared by: Wood Environment & Infrastructure Solutions.

October 2019

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Memo

To	**City of Malibu**
From	**Wood Environment & Infrastructure**
Tel	**858-300-4300**
Fax	**858-300-4301**
Date	**October 10, 2019**

Subject **Malibu Jewish Center & Synagogue Project Post-Fire Assessment**

Dear City of Malibu,

This memorandum presents the results of a visual assessment of the post-Woolsey fire effects on the vegetation communities surrounding the Malibu Jewish Center and Synagogue Project. The site assessment was conducted by Wood Environment and Infrastructure Solutions, Inc. (Wood) in support of the Mitigated Negative Declaration being prepared for the Project in accordance with the California Environmental Quality Act (CEQA) of 1970. The purpose of this memorandum is to discuss the results of the site assessment conducted by Wood on October 7, 2019.

1.0 Site Location and Description

The Malibu Jewish Center and Synagogue Project (project site) is located at 24855 Pacific Coast Highway in Malibu (western Los Angeles County), California, between the Pacific Coast Highway and Puerco Canyon Creek. The Malibu Jewish Center and Synagogue is partially in the Puerco Canyon watershed at the base of the Malibu foothills, and lies 1,000 feet north of the Pacific Ocean. Puerco Canyon and Puerco Canyon Creek run south and then bend eastward just north of the project site. They enter the parcel on the northwest corner and exit on the east end, passing through the northern section of the parcel. The proposed project footprint is situated directly on top of a ridge, which has largely been flattened for development of the current Jewish Center. The west side of the level, graded hilltop consists of four, one-story modular structures that house school and administrative uses. The eastern portion of the hilltop supports a 28-foot-tall, one-story temple/event building and two support structures. To the north of the proposed project, a north facing slope dominated by oak-sycamore woodland drops several feet into the creek bottom which was (prior to the fire) dominated by riparian vegetation (willow riparian) and non-native vegetation. The creek heads southeast toward the Pacific Coast Highway, where it is flanked on either side by oak-walnut woodlands to the south and a south-facing slope dominated by coastal sage scrub to the north.

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1.1 Woolsey Fire

The Woolsey Fire burned over 96,900 acres of land in Los Angeles and Ventura Counties in November 2018. The fire began in Woolsey Canyon on the Santa Susana Field Laboratory property in the Santa Susana Mountains, above the Simi Valley and near the boundary between Los Angeles and Ventura Counties. The fire headed south into the Santa Monica Mountains, passing through Puerco Canyon and Puerco Canyon Creek, just to the north of the project site. The fire burned up to edge of the hilltop, where it burned vegetation but did not burn any of the Jewish Center structures.

2.0 Methods

Prior to the site assessment, Wood reviewed *Biological Resources Assessment for the Malibu Jewish Center and Synagogue 24855 Pacific Coast Highway Malibu, California* and associated figures, authored by David Magney Environmental Consulting (September 2017). This document details the biological resources including vegetation communities, known to exist within the project area prior to the Woolsey fire. In addition, aerial imagery of the site was reviewed utilizing Google Earth's (2019) timeline function to evaluate pre- and post-fire vegetation conditions.

To conduct the post-fire assessment, a brief walkover survey of Puerco Canyon and Puerco Canyon Creek just north of the project area was conducted by Wood biologist Emily Mastrelli. Representative photographs of the current conditions of vegetation communities and the project site are included in Appendix A. All previously mapped vegetation communities were updated utilizing Figure 4 "Habitat Types and ESHA at the Project Site" from Magney's report. Changes to the vegetation communities were noted on Figure 4 in the field and are presented in Appendix B.

2.1 Pre-Fire Site Conditions

A total of six habitat and land cover types were previously identified within the site and adjacent areas (Appendix B). These vegetation types included an *Arundo donax* stand, ruderal grassland, coastal sage scrub, oak-walnut woodland, oak-sycamore woodland and willow thicket/riparian. On the south side of Puerco Canyon/Puerco Canyon Creek, a section of oak-sycamore woodland formed the upland slope areas between Puerco Canyon Creek and the modular buildings on the west side of the project site. Ruderal grassland was present east of the oak-sycamore woodland and ran downslope into the Puerco Canyon Creek bottom. An *Arundo donax* stand was immediately north of and slightly mixed in with the oak-sycamore woodland area. The *Arundo donax* stand covered much of the northwestern and central parts of Puerco Canyon Creek within the project site. Mixed in to the *Arundo donax* and heading east in the creek was a section of willow riparian that formed the bottom of the creek. To the south, walnut-woodland formed the upland slope that turned into ruderal grassland to the north of the temple on the east side of the project site. The south-facing slope of Puerco Canyon to the far north of the project site was covered in coastal sage scrub.

Two special-status plant species were previously documented within the project site: Southern California black walnut (*Juglans California,* CNPS list 4.2) and Plummer's baccharis (*Baccharis plummerae* ssp. p*lummerae*, CNPS 4.3) (Appendix B).

3.0 Post-Fire Assessment Results

During the Woolsey Fire, most of the coastal sage scrub area was consumed and has not yet begun to recover. Ruderal grassland now covers the entire northern portion of the project area on the south-facing slope of Puerco Canyon. The replacement of coastal sage scrub with ruderal grassland is expected, as post-fire early successional habitat typically includes grassy, herbaceous species that move in and form the dominant coverage where it may not have existed prior. Few sage "skeletons" are still present on the hillside, and a few live sage scrub individuals are persisting along drainages on the hillslope. The ruderal grassland on the south side of the creek does not appear to have increased and is still in existence regardless of the fire. The oak-sycamore woodland has some trees that appear to be blackened/burned by the Woolsey Fire; however, the burned trees are still living. Other unburned trees in the oak-woodland are alive and healthy. Most of the burned trees are oaks. The walnut-woodland shows some patterns of burning but overall is alive and has successfully survived the fire. Neither the oak-sycamore or the oak-walnut woodlands have a substantial reduction in volume, and still cover approximately the same percentage of cover that they previously did.

The only major observed changes in vegetation coverage were the *Arundo donax* and willow riparian communities. The *Arundo donax* population has exploded and now covers most of the creek bottom from west to east, with the highest concentration of stands in the west and slowly dwindles as the creek moves east and south. The *Arundo* has also begun to intensely invade the willow riparian areas and choke out individual trees. Almost all previously mapped willow riparian trees are now completely burned; however, some new young trees and trunks of burned trees showing green branches are mixed among the burned willows and *Arundo.* The *Arundo donax* was so thick in most areas that the biologist was unable to walk through. Also, of note, it was observed that mixed in with the *Arundo donax* were noticeably high amounts of the following non-native/invasive species: tree tobacco (*Nicotiana glauca*), castor bean (*Ricinus communis*), and fennel (*Foeniculum vulgare*). The California Invasive Plant Council (CAL-IPC) keeps an Inventory with categories of plants that threaten California's natural areas and generally cause damage within California. The Cal-IPC Inventory List includes the designations "High", "Moderate", "Limited" and "Watch". The "Watch" plants are non-native species that are at high risk of becoming invasive in the future. *Arundo,* tree tobacco, fennel, and castor bean are listed as high, moderate, moderate and limited, respectively. Representative photographs of the current conditions of vegetation communities and the project site are included in Appendix A.

Only one of the two previously identified special-status plant species were observed during the fire damage assessment of the project site - Southern California black walnut. The Plummer's baccharis was not located; however, it may still exist within the site as an exhaustive survey was not conducted. The dense *Arundo* made it very difficult to observe from a distance or move through some areas.

4.0 Discussion

Overall, the vegetation communities to the south of Puerco Canyon Creek are largely unchanged after the Woolsey Fire. The oak-sycamore and oak-walnut woodlands are still thriving and cover large portions of the upland slope. Ruderal grassland still exists between the two woodlands and reaches down to the creek bottom and to the hilltop near the project site structures. The major changes post-fire includes the destruction of the coastal sage scrub and willow riparian communities. As with most highly invasive non-native species, the *Arundo donax* has taken advantage of the effects of the fire and has spread wildly throughout the creek bottom. The *Arundo donax* stands now account for the highest percentage of vegetation community coverage within the project site.

Please do not hesitate to contact us if you have any questions concerning this memo.

Respectfully submitted,

Wood Environment & Infrastructure, Inc.

Emily Mastrelli

Angie Harbin-Ireland

Emily Mastrelli
Senior Wildlife Biologist

Angie Harbin-Ireland
Biology Group Manager

References and Data Sources

David Magney Environmental Consulting. 2017. *Biological Resources Assessment for the Malibu Jewish Center and Synagogue 24855 Pacific Coast Highway Malibu, California*. Unpublished report produced for David Lawrence Gray Architects. Produced in September 2014. Updated September 2017.

Google Earth. 2019. Map showing location of Malibu Jewish Center and Synagogue. Dates reviewed 2012-2019.

Attachments
Appendix A. Representative Photographs
Appendix B. Vegetation Community Figure 4 with Field Notes

Photo 1. View facing northwest of the *Arundo donax* stand in the bottom of Puerco Canyon Creek.

Photo 2. View facing north of the burned south-facing slope in Puerco Canyon that is mostly ruderal grassland post-fire.

Photo 3. View facing northeast of the burned willow riparian area. *Arundo donax* can be observed in the foreground with some willows and other unknown greenery in the background.

Photo 4. View facing northeast of the ruderal grassland that has replaced the coastal sage scrub on the south-facing slope of Puerco Canyon across from the temple.

Photo 5. View facing southeast of the oak-walnut woodland on the slope just north of the temple.

Photo 6. View looking downslope into the bottom of Puerco Canyon Creek at portions of burned oak-walnut woodland and willow riparian.

Photo 7. View facing east of the oak-sycamore woodland that survived the Woolsey Fire.

Photo 8. View facing northwest from the bottom of Puerco Canyon Creek of the burned willow riparian and heavy *Arundo donax* coverage, as well as fennel and other non-native invasive species.

Figure 4 – City of Malibu ESHA Overlay Zone of the Project Site

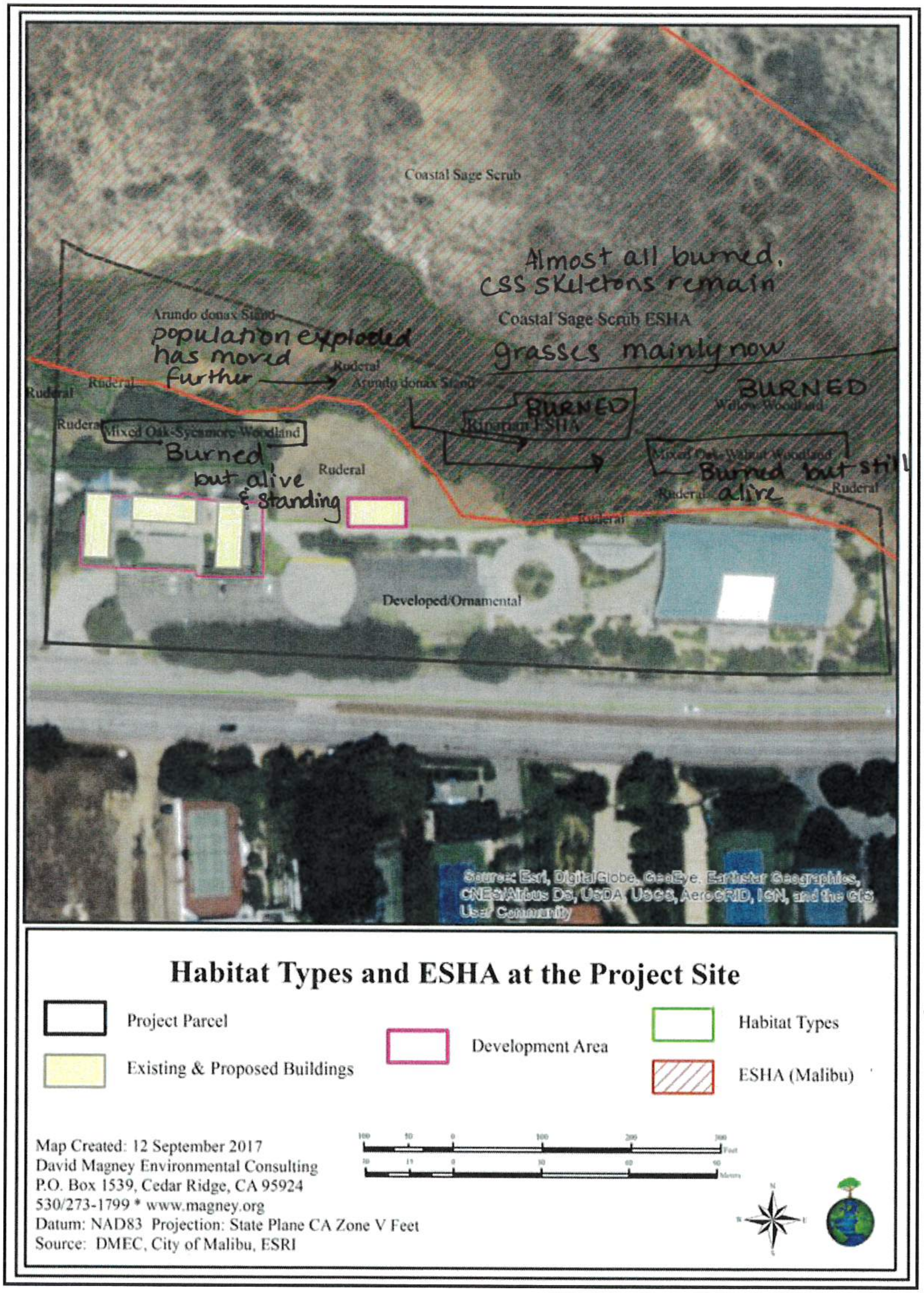

Figure 5 – Special-status Species and Habitats Onsite