

**Initial Study/ Negative Declaration  
2880 Mesa Verde East**

**2880 Mesa Verde Drive  
City of Costa Mesa, Orange County, California**

Prepared by:  
**City of Costa Mesa**  
Development Services Department  
77 Fair Drive  
Costa Mesa, CA 92626  
714.754.5000  
Contact: Ryan Loomis, Associate Planner

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## SECTION 1: INTRODUCTION

The City of Costa Mesa has determined the proposed Mesa Verde East Residential Project (i.e., proposed project) is subject to the guidelines and regulations of the California Environmental Quality Act (CEQA). This Initial Study addresses the direct, indirect, and cumulative environmental effects associated with the project, as proposed.

Section 2.0, Project Description, provides a detailed description of the project.

The proposed project involves the following:

- (1) Adoption of an Initial Study/Negative Declaration;
- (2) Rezone of a 2-acre site from I&R (Institutional and Recreational) to PDR-LD (Planned Development Residential – Low Density) (8 dwelling units per acre maximum allowed);
- (3) Master Plan for the development of a 13-unit, two-story, small lot, residential development (6.5 dwelling units per acre proposed). The Master Plan includes a variance from perimeter open space (20 feet required; 3 feet on Mesa Verde Drive East for perimeter wall and 13 feet on Andros Street for the development proposed) and administrative adjustment from perimeter open space requirement for residential structures (20 feet required, 13 feet proposed on Andros Street);
- (4) Tentative Tract Map T-17824 for subdivision of property for homeownership.

The Project consists of the development of 13 single-family, detached residences with a density of 6.5 dwelling units per acre. The project will provide 26 garage/covered parking spaces and 33 open parking spaces, for a total of 59 spaces (4 spaces per residential unit, and 7 guest spaces). Vehicle access to 10 of the units will be provided from a private street from Mesa Verde Drive East, and individual driveways are proposed for the 3 units facing Andros Street.

No deviations from the City's Residential Design Guidelines are requested.

The following environmental analysis examines the environmental effects of a low-density residential land use if the rezone were approved.

### 1.1 - Incorporation by Reference

Pertinent documents relating to this Initial Study/Negative Declaration (IS/ND) have been cited and incorporated, in accordance with Sections 15148 and 15150 of the CEQA Guidelines, to eliminate the need for inclusion of voluminous engineering and technical reports within the Initial Study. Of particular relevance are those previous environmental documents that present information regarding descriptions of environmental settings, and future development-related growth and cumulative impacts. The references outlined below were utilized during preparation of this Initial

Study. The documents are available for review at the City of Costa Mesa Development Services Department located at 77 Fair Drive, Costa Mesa, California 92626.

**City of Costa Mesa 2000 General Plan (Adopted January 22, 2002).** The City of Costa Mesa 2000 General Plan (General Plan) is the primary source of long-range planning and policy direction intended to guide growth and preserve the quality of life within the community. The General Plan contains goals, policies, and plans that are intended to guide land use and development decisions. It consists of a Land Use Plan Map and the following Elements, which together fulfill the state requirements for a General Plan: Land Use; Circulation/Transportation; Housing; Conservation; Noise; Safety; Open Space and Recreation; Growth Management; Community Design; and Historic and Cultural Resources. The General Plan was used throughout this Initial Study as a source of baseline data. According to the current (2013-2021) Housing Element (City of Costa Mesa 2008), as of 2010, there were 39,946 households within 16 square miles in the City.

**City of Costa Mesa 2000 General Plan Environmental Impact Report.** The City of Costa Mesa 2000 General Plan Environmental Impact Report was certified on January 22, 2002 through City Council Resolution No. 02-07. The General Plan EIR analyzed the potential environmental impacts that would result from implementation of the City of Costa Mesa 2000 General Plan. General Plan EIR Table 3-6, Growth Increases Over Existing Conditions (2000) Associated with 2000 General Plan Implementation (2020), identifies new development projected between 2000 and 2020. The environmental impact analysis contained in the General Plan EIR assumes 42,469 dwelling units and 46,683,237 square feet (sq ft) of non-residential land uses, which represents a growth of 1,892 additional dwelling units and 12,643,695 additional square feet of non-residential uses by 2020. The General Plan EIR concluded that impacts in the following areas would be significant and unavoidable (see General Plan EIR Section 8.0):

- Transportation and Circulation (roadway capacity at Gisele Avenue, west of Harbor Boulevard);
- Noise (long-term mobile sources);
- Air Quality (short- and long-term emissions).

The General Plan and General Plan EIR were used in this Initial Study/Negative Declaration as a source of baseline data.

**City of Costa Mesa Municipal Code.** The City of Costa Mesa Municipal Code (CMMC) consists of regulatory, penal, and administrative ordinances of the City of Costa Mesa. It is the method the City uses to implement control of land uses, in accordance with General Plan goals and policies. The City of Costa Mesa Zoning Code is located in CMMC Title 13, Planning, Zoning, and Development. The purpose of CMMC Title 13 is to promote the public health, safety, and general welfare, and preserve and enhance the aesthetic quality of the City by providing regulations to ensure that an appropriate mix of land uses occur in an orderly manner. The CMMC and CMMC Title 13 are referenced throughout this Initial Study for descriptions and requirements of the City's regulatory framework.

## SECTION 2: PROJECT DESCRIPTION

### 2.1 - Project Location

The project site is located in the northwestern portion of the City of Costa Mesa, in the County of Orange; refer to Exhibit 1. Specifically, the site is located east of E. Mesa Verde Drive and north of Adams Avenue; refer to Exhibit 2. The site is located approximately 2.0 miles northwest of the Pacific Ocean. Regional access to the site is provided via Interstate 405 (I-405), which is located approximately one mile to the north. Harbor Boulevard, which is located approximately half a mile east of the site, also provides regional access. Local access to the site is provided via Adams Avenue and Mesa Verde East Drive.

### 2.2 - Environmental Setting

The project site (Assessor Parcel Numbers 139-313-08) consists of one parcel totaling approximately 2.07 acres. The site is relatively flat with onsite elevation of approximately 105 feet above mean sea level. The project site contains the facilities for First Church of Christ Scientist, including offices, classrooms, and the main sanctuary, in two buildings totaling approximately 8,900 square feet, and approximately 124 surface parking spaces.

Primary site access is provided via Mesa Verde Drive East. The site is currently separated from the residential properties to the north by a block wall. Onsite water and sewer are provided by Mesa Water District and Costa Mesa Sanitary District.

#### 2.2.1 - General Plan and Zoning

##### General Plan

The General Plan land use designation for the project area is Low Density Residential (8 dwelling units to the acre maximum). Low-Density Residential areas generally are intended to accommodate single-family residences on their own parcels. Other housing types include attached housing that provide a greater portion of recreation or open space than typically found in multi-family developments, and clustered housing which affords the retention of significant open space. Low-Density Residential areas are intended to accommodate family groups and outdoor living activities in open space adjacent to dwellings. In order to avoid land use conflicts, these areas should be located away from or protected from the more intense non-residential areas and major travel corridors. Pursuant to the Costa Mesa General Plan, the density for this land use designation shall be up to eight units to the acre.

##### Zoning

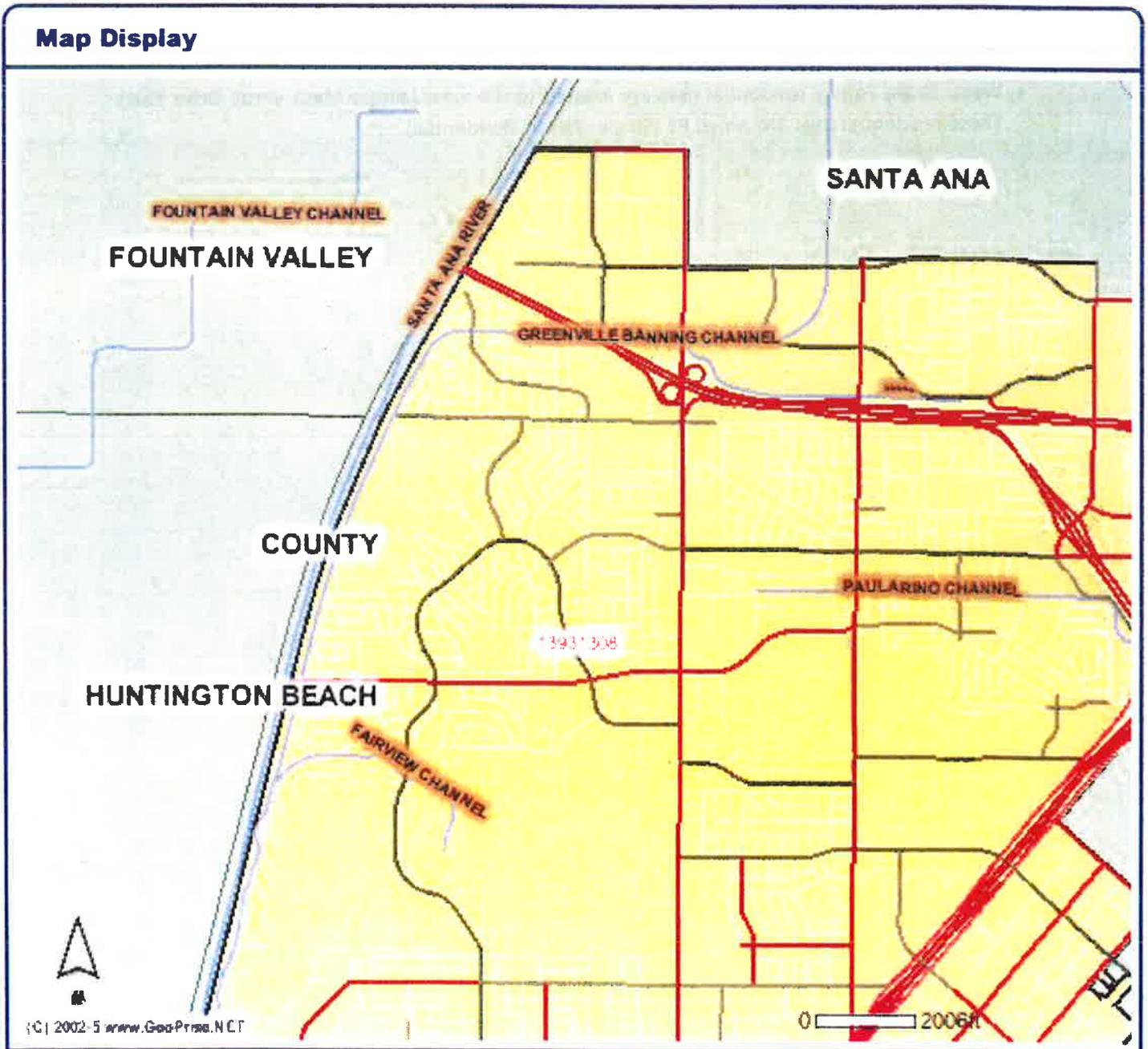
According to the Official Zoning Map, the project site is zoned I&R (Institutional and Recreational). A rezone (or change) of the zoning classification of the 2-acre development site from I&R (Institutional and Recreational) to PDR-LD (Planned Development Residential – Low Density) is proposed. The

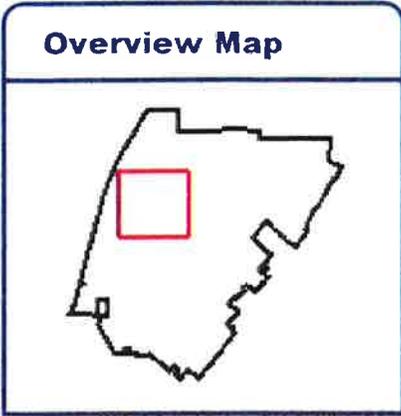
proposed rezone to PDR-LD would be compatible with the existing Low Density Residential General Plan designation for the project site.

### **2.2.2 - Surrounding Zoning**

Surrounding land uses generally consist of commercial and residential uses. Land uses immediately adjacent to the project site consist of the following:

- **North:** Single Family residential uses are located to the north. These residential uses are zoned R1 (Single- Family Residential).
- **East:** Single Family residential uses are located to the east. These residential uses are zoned R1 (Single- Family Residential).
- **South:** Commercial uses are located to the south. These properties are zoned C1 (Local Business).
- **West:** Single Family residential uses are located to the west (across Mesa Verde Drive East). These residential uses are zoned R1 (Single- Family Residential).





### Legend

 Address Points	 Collector Freeway (cont)	 Major Newport Blvd Primary (cont)	 SECONDARY Hydrology Channels
 Freeway	 Freeway		



## 2.3 - Project Features

The City of Costa Mesa is processing a planning application from Mesa Verde East, LLC for, two-story, small lot residential development at a density of 6.5 dwelling units per acre. Approval of the proposed project involves the following:

1. Adoption of an **Initial Study/ Negative Declaration**.
2. **Rezone R-14-05**: An ordinance to rezone a 2-acre site from I&R (Institutional and Recreational) to PDR-LD (Planned Development Residential – Low Density). The maximum allowable General Plan density is 16 dwelling units at a maximum of 8 dwelling units per acre.
3. **Planning Application PA-14-48**: Master Plan for the development of a 13-unit, two-story, small lot residential development at a density of 6.5 dwelling units per acre. The Master Plan also includes the following requested variances from Zoning Code requirements:
  - a. Variance from perimeter open space requirement for location of block walls (20 feet required; 3 feet proposed on Mesa Verde Drive East);
  - b. Administrative Adjustment from perimeter open space requirement for buildings (20 feet required; 13 feet proposed on Andros Street).
4. **Tentative Tract Map T-17824**: Subdivision of the property into fee simple lots for homeownership.

Table 1, Project Summary, summarizes the proposed units and their sizes. The development includes 13 total units and offers these two different products. The project would provide 26 garage parking spaces and 33 open parking spaces for a total of 59 spaces (4 spaces per residential unit, for a total of 52 spaces are required by code). Table 1, Project Summary, summarizes the proposed units and their sizes.

**Table 1: Project Summary**

	Plan 1	Plan 2
Unit Size (Not Including Garage)	2,824 Sq. Ft.	3,120 Sq. Ft.
Total No. of Units	4	9
No. Bedrooms and Baths	4 Bed, 3.5 Bath	4 Bed, 3.5 Bath
No. of Stories	2	2
No. Of Garage Spaces	2	2
No. Of Open Spaces (In Driveway)	2	2
No. Of Open Spaces (Guest)	7	
Total Parking	52 Spaces required by Code 59 Spaces (Proposed)	

The proposed project includes demolition and removal of the existing church building. Prior to demolition of the existing structure(s), removal and/or abatement of asbestos containing building materials, lead containing paints, and any hazardous materials associated with the existing building materials shall be conducted by a qualified environment professional in consultation with the Costa Mesa Fire Department. Once demolition and removals are completed, the project site would be graded and constructed in single-phase. If contaminated soils are encountered during grading activities, excavation and removal of contaminated soils would be required to comply with Federal, State, and local regulations.

Exhibit 3: Site Plan



Leave Blank

## SECTION 3: INITIAL STUDY CHECKLIST

### 3.1 - Background

**1. Project Title**

Mesa Verde East Project

**2. Lead Agency Name and Address:**

City of Costa Mesa  
Development Services Department  
77 Fair Drive  
Costa Mesa, CA 92626

**3. Contact Persons and Phone Number:**

Melvin E. Lee, AICP  
Senior Planner  
714-754-5611  
email: mel.lee@costamesaca.gov

**4. Project Location:**

2880 E. Mesa Verde Drive  
Costa Mesa  
Orange County, CA

**5. Project Sponsor's Name and Address:**

Pinnacle Residential  
20 Enterprise, Suite 320  
Aliso Viejo, CA 92656

**6. General Plan Designation:**

Low Density Residential

**7. Zoning:**

I&R (Institutional and Recreational District)

**8. Description of the Project:**

See Section 2, Project Description

**9. Surrounding Land Uses and Setting:**

See Section 2, Project Description

**10. Other public agencies whose approval is required (e.g., permits):**

- South Coast Air Basin
- Santa Ana Regional Water Quality Control Board - Region 8

### 3.2 - Environmental Factors Potentially Affected

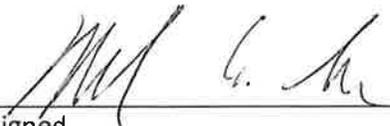
Environmental Factors Potentially Affected		
The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Less Than Significant With Mitigation Incorporated," as indicated by the checklist on the following pages.		
<input type="checkbox"/> Aesthetics	<input type="checkbox"/> Agriculture and Forestry Resources	<input type="checkbox"/> Air Quality
<input type="checkbox"/> Biological Resources	<input type="checkbox"/> Cultural Resources	<input type="checkbox"/> Geology/Soils
<input type="checkbox"/> Greenhouse Gas Emissions	<input type="checkbox"/> Hazards/Hazardous Materials	<input type="checkbox"/> Hydrology/Water Quality
<input type="checkbox"/> Land Use/Planning	<input type="checkbox"/> Mineral Resources	<input type="checkbox"/> Noise
<input type="checkbox"/> Population/Housing	<input type="checkbox"/> Public Services	<input type="checkbox"/> Recreation
<input type="checkbox"/> Transportation/Traffic	<input type="checkbox"/> Utilities/Services Systems	<input type="checkbox"/> Mandatory Findings of Significance

### 3.3 - Lead Agency Determination

Lead Agency 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 the mitigation measures described in Section 4, Environmental Analysis, have been added. 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 proposal MAY have a significant effect(s) 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, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

  
\_\_\_\_\_  
Signed

City of Costa Mesa  
\_\_\_\_\_  
Agency

MEL CEE, SENIOR PLANNER  
\_\_\_\_\_  
Signer's Name, Title

3/26/15  
\_\_\_\_\_  
Date

## SECTION 4: ENVIRONMENTAL ANALYSIS

Sections 4.1 through 4.17 analyze the potential environmental impacts associated with the project. The environmental issue areas that are evaluated are:

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

The environmental analysis in the following sections is patterned after the Initial Study Checklist recommended by the CEQA Guidelines, as amended, and used by the City of Costa Mesa in its environmental review process. For the preliminary environmental assessment undertaken as part of this Initial Study's preparation, a determination that there is a potential for significant effects indicates the need to more fully analyze the development's impacts and to identify mitigation.

For the evaluation of potential impacts, the questions in the Initial Study Checklist are stated and an answer is provided according to the analysis undertaken as part of the Initial Study. The analysis considers the long-term, direct, indirect, and cumulative impacts of the development. To each question, there are four possible responses:

- **No Impact.** The development will not have any measurable environmental impact on the environment.
- **Less than significant impact.** The development will have the potential for impacting the environment, although this impact will be below established thresholds that are considered to be significant.
- **Less than significant with mitigation incorporated.** The development will have the potential to generate impacts, which may be considered as a significant effect on the environment, although mitigation measures or changes to the development's physical or operational characteristics can reduce these impacts to levels that are less than significant.
- **Potentially significant impact.** The development could have impacts, which may be considered significant, and therefore additional analysis is required to identify mitigation measures that could reduce potentially significant impacts to less than significant levels.

The following is a discussion of potential project impacts as identified in the Initial Study/ Environmental Checklist. Explanations are provided for each item.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.1 Aesthetics</b> <i>Would the project:</i>				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Environmental Evaluation

Would the project:

**a) Have a substantial adverse effect on a scenic vista?**

**No Impact.** There are no General Plan-identified scenic vistas/views located in the project area, as there are no officially designated scenic vistas in the City of Costa Mesa. Therefore, project implementation would not have any effect on a designated scenic vista/view.

**b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway?**

**No Impact.** The project site is not located along a designated State scenic highway, as there are no officially designated scenic highways in the City of Costa Mesa. Aside from ornamental landscaping located within the existing church property, there are no protected tree species on the property. No historic buildings or rock outcroppings are located at the project site. Therefore, project implementation would not damage scenic resources within a state scenic highway.

**c) Substantially degrade the existing visual character or quality of the site and its surroundings?**

**Less than significant impact.** The existing visual character of the project site is primarily defined by church buildings, landscaped areas and associated parking lot. The existing visual character of the surrounding area is defined by established residential uses to the north, east and west, and commercial uses located south of the project site. The area does not exhibit distinct architectural

character and there is no uniformity of architectural styles. No unique or scenic visual resources exist on the project site or in its surroundings.

A project is generally considered to have a significant visual/aesthetic impact if it substantially changes the character of the project site, such that it becomes visually incompatible or visually unexpected when viewed in the context of its surroundings. The project site is located in a mature residential area, and would introduce a 13-unit, two-story, residential development at a density of 6.5 dwelling units to the existing mature residential neighborhood. The project would be similar in scale and character to the site's surroundings.

The Community Design Element identifies the following Private Property Focus for residential design (page CD-18):

Objective CD-7A. Encourage excellence in architectural design.

CD-7A.1 Ensure that new and remodeled structures are designed in architectural styles which reflect the City's diversity, yet are compatible in scale and character with existing buildings and natural surroundings within residential neighborhoods. Develop and adopt design guidelines for residential development.

CD-7A.2 Preserve the character and scale of Costa Mesa's established residential neighborhoods; where residential development or redevelopment is proposed, require as a condition of approval that it is consistent with the prevailing character of existing development in the immediate vicinity, and that it does not have a substantial adverse impact on adjacent areas.

According to the City's Zoning Code (Costa Mesa Zoning Code, Section 13-57(a)(2)), the purpose of the Planned Development zoning is to provide a method by which appropriately located areas of the City can be developed utilizing more imaginative and innovative planning concepts than would be possible through strict application of existing zoning and subdivision regulations. It is intended that these developments will meet the broader goals of the General Plan and Zoning Code by exhibiting excellence in design, site planning, integration of uses and structures, and protection of the integrity of neighboring development. A variety of building products are encouraged in the design of projects in the Planned Development zones, thereby maximizing project excellence.

Consistent with the objectives of the Community Design Element, the proposed project includes a traditional architecture with varied building materials, textures and colors, quality landscaped project common areas and project entries, and private open space.

In addition, project implementation would be consistent with the character of the surrounding area through quality architectural design. The design of any future residential use is required to conform with the City's design guidelines and residential development standards (e.g. two-story maximum building height, maximum density allowed in PDR-LD zone, etc.), unless a request for any discretionary approvals (i.e. variance, minor modification, etc.) is approved in conjunction with the development proposal.

Since the proposed project would require the review/approval of a Master Plan to ensure conformance with the Zoning Code and Residential Design Guidelines, no significant impacts related to this environmental topic are anticipated. Standard review, conditions, and requirements completed during the review process will avoid any significant impacts related to aesthetics. Therefore, no mitigation measures are required.

**d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?**

**Less than significant impact.** Light spillage is typically defined as unwanted illumination from light fixtures on adjacent properties. The project site is located within a residential area. Existing lighting conditions in the project area include light emanating from building interiors, security lights and the surrounding residential land uses, as well as nearby street lighting. There are residential uses located north, east, and west of the project site. Commercial uses are located south of the project site. There are no additional sensitive land uses in the project's immediate vicinity.

The residential units would include a garage and living areas on the ground floor, and living areas on the second floor. The project would create new sources of light due to light emanating from building interiors and light from exterior sources (e.g., building illumination, security lighting, and landscape lighting). The existing and proposed residential uses are considered light sensitive and could be exposed to lighting from the existing nearby commercial uses. A seven-foot high block wall would be installed between along the western and southern project boundary to enhance privacy and separate the project from existing residential land uses. No significant lighting is proposed adjacent to the existing residential uses.

As previously noted, the existing and proposed residential uses could be exposed to lighting from the existing surrounding commercial uses to the south. Most of the lighting from the existing uses surrounding the project would be shielded by the proposed seven-foot high screen wall to be located along the southern boundary of the project site. Spillover light impacts on residential uses to less than significant.

Existing lighting conditions in the Project area include light emanating from the abutting commercial property and residential property, as well as nearby street lighting. The proposed development would create new sources of light due to light emanating from the new residential building interiors and light from exterior sources (e.g., building illumination, security lighting, entry sign and landscape lighting). Surrounding sensitive receptors (existing residences) will be separated from new block walls and landscaping within required setbacks. No significant new lighting is proposed adjacent to the existing residential uses. Low voltage landscape lighting will be placed within the common open space areas within the project site.

Standard Condition SC 4.1-1 requires preparation of a Lighting Plan and Photometric Study, in order to demonstrate that the proposed lighting meets minimum security lighting requirements and minimizes light/glare to residents.

Project compliance with CMMC standards and Standard Condition SC 4.1-1 would ensure that potential spillover light impacts on residential uses are less than significant.

**Standard Conditions**

SC 4.1.1 Prior to the issuance of Building Permits, the Applicant shall submit a Lighting Plan and Photometric Study for the approval of the City's Development Services Department. The Lighting Plan shall demonstrate compliance with the following:

- The mounting height of lights on light standards shall not exceed 18 feet in any location on the Project site unless approved by the Development Services Director.
- The intensity and location of lights on buildings shall be subject to the Development Services Director's approval.
- All site lighting fixtures shall be provided with a flat glass lens. Photometric calculations shall indicate the effect of the flat glass lens fixture efficiency.
- Lighting design and layout shall limit spill light to no more than 0.5 foot candle at the property line of the surrounding neighbors, consistent with the level of lighting that is deemed necessary for safety and security purposes on site.
- Glare shields may be required for select light standards.

In regards to glare, the project would involve primarily non-reflective façade treatments and the minimization of unrelieved glass surfaces. Additionally, since the proposed project would require the review/approval of a Master Plan (CMMC Section 13-56) to ensure conformance with the Zoning Code and Residential Design Guidelines, no significant impacts related to this environmental topic are anticipated. Standard review, conditions, and requirements completed during the review process will avoid any significant impacts related to light and glare. A less than significant impact would occur in this regard.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p><b>4.2 Agriculture and Forestry Resources</b></p> <p><i>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 Dept. 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.</i></p> <p><i>Would the project:</i></p>				
<p>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?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>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))?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>d) Result in the loss of forest land or conversion of forest land to non-forest use?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>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?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Environmental Evaluation

- 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?**

**No impact.** The project site is not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide importance. The project site is developed with existing church buildings and parking lot. Thus, project implementation would not result in the conversion of farmland to non-agricultural use.

- b) **Conflict with existing zoning for agricultural use, or a Williamson Act contract?**

**No impact.** The project site is currently zoned I&R (Institutional and Recreational), but is proposed to be rezoned to PDR-LD (Planned Development Residential – Low Density). The project site and surrounding lands are not zoned for agricultural use or part of a Williamson Act Contract. Therefore, project implementation would not 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))?**

**No impact.** The project site is currently zoned I&R (Institutional and Recreational), but is proposed to be rezoned to PDR-LD (Planned Development Residential – Low Density). Project implementation would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production.

- d) **Result in the loss of forest land or conversion of forest land to non-forest use?**

**No impact.** The project site is developed with existing church buildings and parking lot. Thus, project implementation would not 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?**

**No impact.** The project site is developed with existing church buildings and parking lot, and the surrounding area is designated for residential and commercial uses. There are no agricultural or forest uses in the vicinity. Therefore, project implementation would not involve changes in the existing environment that could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.3 Air Quality</b>				
<i>Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.</i>				
<i>Would the project:</i>				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Greenhouse Gas Emissions</b>				
<i>Would the project:</i>				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Environmental Evaluation

### Air Quality

#### a) Conflict with or obstruct implementation of the applicable air quality plan?

**Less than significant impact.** The project consists of an 13-unit detached residential development, replacing an 8,900 square church. The project site is located in Orange County, which is located in the South Coast Air Basin (Air Basin). The regional agency responsible for air quality within the Air Basin is the South Coast Air Quality Management District (SCAQMD). The area is designated nonattainment for the state 1-hour and 8-hour ozone, 24-hour and annual respirable particulate

matter (PM<sub>10</sub>), and annual fine particulate matter (PM<sub>2.5</sub>) standards. The area is also designated nonattainment for federal standards for 8-hour ozone, and 24-hour PM<sub>2.5</sub>. The area is designated as maintenance for the federal PM<sub>10</sub> standard.

The applicable Air Quality Plan (AQP) is the 2012 Air Quality Management Plan for the South Coast Air Basin (AQMP 2012). According to the SCAQMD CEQA Air Quality Handbook, the project is consistent with the AQP if the project addresses two main criteria (and associated questions):

**Criterion 1:**

**Questions 1 and 2.** Would the project result in an increase in the frequency or severity of existing air quality violations? Would the project cause or contribute to new air quality violations?

**Answers 1 and 2:** Given the size and current developed conditions of the project site, and the fact that trip generations will be similar to the existing use, the project would result in a less than significant carbon monoxide (CO) impact during operation. In addition, due to the limited grading and the fact that the future proposed residential development would not involve subsurface grading for underground structures, project construction emissions would not exceed SCAQMD's LST criteria with below Standard Conditions incorporated. Therefore, the project would not increase the frequency or severity of existing air quality violations in the project's vicinity. The project would be consistent with the first and second questions of Criterion 1.

**Question 3.** Would the project delay timely attainment of air quality standards or the interim emissions reductions specified in the AQP?

**Answer 3.** Given the size and current developed conditions of the project site, and the fact that trip generations will be similar to the existing use, the project would result in less than significant impacts with regard to localized pollutant concentrations and regional pollutant contributions, respectively, with below Standard Conditions incorporated. The project would not delay the timely attainment of air quality standards or 2012 AQMP emissions reductions. The project is consistent with the third question of Criterion 1.

**Criterion 2:**

**Question 1.** Would the project be consistent with the population, housing, and employment growth projections utilized in the preparation of the AQMP?

**Answer 1:** In order to be consistent with the growth assumptions in the AQMP, the project must be consistent with the City of Costa Mesa 2000 General Plan (General Plan), the SCAG's Growth Management Chapter of the Regional Comprehensive Plan and Guide (RCPG), and SCAG's 2012 Regional Transportation Plan (RTP).

The General Plan map indicates that the project is located within the City's Low Density Residential (LDR) designation. The designation allows for 8 du/acre, however the project

consists of only 6.5 du/acre. Therefore, the project is consistent with the City-wide plan for population growth at the project site. The project is also consistent with the RCPG's types, intensity, and patterns of land use designated for the area in and around the project site. The population, housing, and employment forecasts, which are adopted by SCAG's Regional Council, are based on the local plans and policies applicable to the City and are used by SCAG in all phases of implementation and review. Additionally, as the SCAQMD has incorporated these same projections into the 2012 AQMP, it can be concluded that the project would be consistent with the projections. Therefore, the project is consistent with the first question of Criterion 2.

**Question 2.** Would the project implement all feasible air quality mitigation measures?

**Answer 3:** The project would result in less than significant impact with all feasible air quality standard conditions incorporated and would therefore be consistent with the second question of Criterion 2.

**Question 3.** Would the project be consistent with the land use planning strategies set forth in the AQMP?

**Answer 3:** The project is located within a developed portion of the City with proximity to transit and a mix of other uses, therefore the project would not conflict with the City's or SCAG's policies. The project is consistent with the third question of Criterion 2.

In summary, the project would not result in a significant localized or regional impact on the region's ability to meet State and Federal air quality standards. In addition, the project would be consistent with the growth forecasts in the AQMP, and is consistent with the land use strategies set forth in the AQMP. Therefore, this impact is less than significant.

**b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?**

Given the size and current developed conditions of the project site, the fact that and the fact that future proposed residential development would not involve subsurface grading for underground structures, short-term air quality impacts are expected to be less than significant. The long-term, operational air quality impacts are also expected to be less than significant because proposed residential development would involve similar average daily vehicle trips compared to the existing church use (RK Engineering Group, 2015). Less than significant impacts related to this environmental topic will occur as a result of the zone change and development. In addition, the City of Costa Mesa requires projects meet certain Standard Conditions. They are requirements and, therefore, incorporated into the analysis. Standard Conditions relevant to the project are provided below. In summary, considering that construction and operation of the proposed project will follow these standard conditions, both construction and operational air quality impacts are expected to be less than significant.

- c) **Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?**

The SCAQMD does not recommend quantified analysis of cumulative construction or operational emissions, nor does it provide separate methodologies or thresholds of significance to be used to assess cumulative construction or operational impacts. However, if an individual development project generates operational emissions that exceed the SCAQMD recommended daily thresholds, project-specific impacts would also cause a cumulative considerable increase in emissions for those pollutants for which the Air Basin is in non-attainment.

The project would generate up to 124 daily trips, including up to 9 trips in the AM peak hour and up to 13 trips in the PM peak hour. Under existing conditions, the project site generates approximately 78 daily trips, including 5 trips in the AM peak hour and 4 trips in the PM peak hour. Overall, the project would generate up to 46 additional daily trips, including an additional 4 AM peak hour trips and an additional 9 PM peak hour trips, than currently occur under existing conditions.

**Table 2: Land Use and Trip Generation Summary**

Land Use Category	Daily 2-Way	AM Peak Hour	PM Peak Hour
		Total	Total
<u>Rates</u>			
Church (TE/TSF)	9.11	0.56	0.55
Single-Family Detached Housing (TE/DU)	9.52	0.75	1.00
<u>Project</u>			
Single-Family Detached Housing (13 DU)	124	9	13
<u>Existing Site</u>			
Church (8.598 TSF)	-78	-5	-4
<b>Total "Net" Project Trip Generation: Project Minus Existing Church</b>	<b>46</b>	<b>4</b>	<b>9</b>
TE/DU= trip end per dwelling unit, TE/TSF= trip end per 1,000 square feet Source: RK Engineering 2015.			

Given the size and current developed conditions of the project site, the similar daily trips and the fact that future proposed residential development would not involve subsurface grading for underground structures, the project would not exceed SCAQMD thresholds during construction or operation. Therefore, the project's impacts would be considered less than significant.

d) **Expose sensitive receptors to substantial pollutant concentrations?**

**Less than significant impact.**

This discussion addresses whether the project would expose sensitive receptors to naturally occurring asbestos, asbestos from building demolition, construction-generated localized criteria pollutant impacts, construction-generated diesel particulate matter (DPM), construction or operational related toxic air contaminants (TACs), or operational CO hotspots.

***Sensitive Receptors***

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24 hours, such as residences, hospitals, or convalescent facilities (SCAQMD 2008a). Commercial and industrial facilities are not included in the definition because employees do not typically remain onsite for 24 hours. However, when assessing the impact of pollutants with 1-hour or 8-hour standards (such as nitrogen dioxide and carbon monoxide), commercial and/or industrial facilities would be considered sensitive receptors for those purposes.

The closest sensitive receptor is a residential development directly adjacent north to the project. The existing residence is located within 25 meters of the project boundary.

***Naturally Occurring Asbestos (NOA)***

Asbestos is a fibrous mineral which is both naturally occurring in ultramafic rock (a rock type commonly found in California), and used as a processed component of building materials. Because asbestos has been proven to cause a number of disabling and fatal diseases, such as asbestosis and lung cancer, it is strictly regulated either based on its natural widespread occurrence, or in its use as a building material. In addition, the ARB approved an Air Toxic Control Measure for construction, grading, quarrying and surface mining operations to minimize emissions of naturally occurring asbestos. The regulation requires application of best management practices to control fugitive dust in areas known to have naturally occurring asbestos and requires notification to the local air district prior to commencement of ground-disturbing activities.

The California Department of Conservation, Division of Mines and Geology (DMG) has a published guide for generally identifying areas that are likely to contain NOA (DMG 2011). The DMG map indicates NOA are not known to occur within the project area. Therefore, disturbance of NOA during project construction is not a concern for the project. The project would result in no impact from exposure of sensitive receptors to naturally occurring asbestos.

***Asbestos Containing Materials (ACM)***

In the initial Asbestos National Emission Standards for Hazardous Air Pollutants rule promulgated in 1973, a distinction was made between building materials that would readily release asbestos fibers when damaged or disturbed (friable) and those materials that were unlikely to result in significant fiber release (non-friable). The United States Environmental Protection Agency (EPA) has since

determined that, severely damaged, otherwise non-friable materials can release significant amounts of asbestos fibers. Asbestos has been banned from many building materials under the Toxic Substances Control Act, the Clean Air Act, and the Consumer Product Safety Act. However, most uses of asbestos for building material are not banned. Therefore, the potential source of asbestos exposure for the project is the demolition activity of the existing structures.

SCAQMD's Rule 1403 specifies work practice requirements to limit asbestos emissions from building demolition and renovation activities, includes the removal and associated disturbance of asbestos-containing materials (ACM). The requirements for demolition and renovation activities include asbestos surveying, notification, ACM removal procedures and time schedules, ACM handling and clean-up procedures, and storage, disposal, and land filling requirements for asbestos-containing waste materials (ACWM). The rule further states that the District shall be notified of the intent to conduct any demolition or renovation activity (SCAQMD 2012)

Compliance with SCAQMD, federal, and state regulations reduces the potential of asbestos-containing material exposure to a less than significant impact.

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**Construction: Localized Construction Impacts**

As shown above, the project would not exceed the localized significance thresholds for construction-generated criteria pollutants with implementation of Standard Conditions. Therefore, the project would not expose receptors to substantial criteria pollutant concentrations from construction activities. Impacts would be less than significant.

**Construction: Diesel Particulate Matter**

The project would generate diesel exhaust, a source of diesel particulate matter, during project construction. Diesel particulates are typically 2.5 microns (PM<sub>2.5</sub>). Onsite emissions of both diesel particulate matter occur during construction from the operation of heavy-duty construction equipment and from vendor trucks that operate on project sites.

Project activities that would generate diesel particulate matter emissions are short-term in nature. Moreover, the current methodological protocols required by SCAQMD and ARB when studying the health risk posed by diesel particulate matter assume the following: (1) 24-hour constant exposure; (2) 350 days a year; (3) for a continuous period lasting 70 years. Therefore, considering the dispersion of the emissions and the short time frame, exposure to diesel particulate matter is anticipated to be less than significant.

**Construction: Toxic Air Pollutants - Onsite Workers**

There are a variety of state and national programs that protect workers from safety hazards, including high air pollutant concentrations (California OSHA and CDC 2012).

Onsite workers are not required to be addressed through this health risk assessment process. A document published by the California Air Pollution Control Officers Association (CAPCOA, 2009), Health Risk Assessments for Proposed Land Use Projects, indicates that onsite receptors are included in risk assessments if they are persons not employed by the project. Persons not employed by the

project would not remain onsite for any significant period. Therefore, a health risk assessment for onsite workers is not required or recommended. Impacts are less than significant.

### **Operation: Toxic Air Pollutants**

The ARB Air Quality and Land Use Handbook contains recommendations that will “help keep California’s children and other vulnerable populations out of harm’s way with respect to nearby sources of air pollution” (ARB 2005), including recommendations for distances between sensitive receptors and certain land uses. These recommendations are assessed as follows.

- Heavily traveled roads. ARB recommends avoiding new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day. Epidemiological studies indicate that the distance from the roadway and truck traffic densities were key factors in the correlation of health effects, particularly in children. The project is approximately 630 feet west of Placentia Ave, which is currently estimated to have 15,606 vehicles per day (California Environmental Health Tracking Program 2011). Therefore, the project would not expose onsite sensitive receptors to significant health risk from heavily traveled roads.
- Distribution centers. ARB also recommends avoiding siting new sensitive land uses within 1,000 feet of a distribution center. The closest existing or proposed distribution center to the project is located more than 1,000 feet from the project. Therefore, the project would not expose onsite sensitive receptors to significant health risk from distribution centers.
- Fueling stations. ARB recommends avoiding new sensitive land uses within 300 feet of a large fueling station (a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities. The nearest fueling station is 0.50 miles from the project site. Therefore, the project would not expose onsite sensitive receptors to significant health risk from fueling stations.
- Dry cleaning operations. ARB recommends avoiding siting new sensitive land uses within 300 feet of any dry cleaning operation that uses perchloroethylene. For operations with two or more machines, ARB recommends a buffer of 500 feet. For operations with three or more machines, ARB recommends consultation with the local air district. The nearest dry cleaning operations from the project site are 0.54 miles to the southeast of the project site. Therefore, the project would not expose onsite sensitive receptors to significant health risk from dry cleaning operations.

### **Operation: CO Hotspot**

The project is proposed residential and would not create a localized CO hotspot. Therefore, the project would not expose receptors to substantial CO concentrations from operational activities.

### **Conclusion**

The project would not expose receptors to substantial quantities or significant concentrations of asbestos from demolition or soils disturbance, construction-generated localized criteria pollutant

concentrations, construction-generated diesel particulate matter, operational toxic air contaminants, or CO hotspots. Therefore, the project would result in a less than significant impact.

**e) Create objectionable odors affecting a substantial number of people?**

The proposed project will include construction of 13 units. The residential uses are not proposed to create objectionable odors, outside of normal household activities. In addition, the proposed project will be similar to the surrounding residential uses. Therefore, the project will create less than significant impact related to odors affecting a substantial number of people.

**Greenhouses Gases**

**a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

Project-related GHG emissions would include emissions from direct and indirect sources. The project would result in direct and indirect emissions of CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub>. Direct project-related GHG emissions include emissions from construction activities, area sources, and mobile sources, while indirect sources include emissions from electricity consumption, water demand, and solid waste generation. Operational GHG emissions are based on energy emissions from natural gas usage and automobile emissions. The long-term, operational greenhouse gas impacts are also expected to be less than significant because proposed residential development would involve similar average daily vehicle trips compared to the existing church use (RK Engineering Group, 2015).

Less than significant impact. The SCAQMD has prepared recommended significance thresholds for greenhouse gases for local lead agency consideration ("SCAQMD draft local agency threshold"). The current draft thresholds consist of the following tiered approach:

- o Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA.
- o Tier 2 consists of determining whether the project is consistent with a greenhouse gas reduction plan. If a project is consistent with a qualifying local greenhouse gas reduction plan, it does not have significant greenhouse gas emissions.
- o Tier 3 consists of screening values, which the lead agency can choose, but must be consistent with all projects within its jurisdiction. A project's construction emissions are averaged over 30 years and are added to a project's operational emissions. If a project's emissions are under one of the following screening thresholds, then the project is less than significant:
  - All land use types: 3,000 MTCO<sub>2</sub>e per year
  - Based on land use type: residential: 3,500 MTCO<sub>2</sub>e per year; commercial: 1,400 MTCO<sub>2</sub>e per year; or mixed use: 3,000 MTCO<sub>2</sub>e per year
- o Tier 4 has the following options:

- Option 1: Reduce emissions from business as usual by a certain percentage; this percentage is currently undefined
- Option 2: Early implementation of applicable AB 32 Scoping Plan measures
- Option 3, 2020 target for service populations (SP), which includes residents and employees:

- 4.8 MTCO<sub>2</sub>e/SP/year for projects and 6.6 MTCO<sub>2</sub>e/SP/year for plans;

- Option 3, 2035 target: 3.0 MTCO<sub>2</sub>e/SP/year for projects and 4.1 MTCO<sub>2</sub>e/SP/year for plans

- o Tier 5 involves mitigation offsets to achieve target significance threshold.

The SCAQMD discusses its draft thresholds in the following excerpt (SCAQMD 2008b):

The overarching policy objective with regard to establishing a GHG [greenhouse gas] significance threshold for the purposes of analyzing GHG impacts pursuant to CEQA is to establish a performance standard or target GHG reduction objective that will ultimately contribute to reducing GHG emissions to stabilize climate change. Full implementation of the Governor's Executive Order S-3-05 would reduce GHG emissions 80 percent below 1990 levels or 90 percent below current levels by 2050. It is anticipated that achieving the Executive Order's objective would contribute to worldwide efforts to cap GHG concentrations at 450 ppm, thus, stabilizing global climate.

As described below, staff's recommended interim GHG significance threshold proposal uses a tiered approach to determining significance. Tier 3, which is expected to be the primary tier by which the AQMD will determine significance for projects where it is the lead agency, uses the Executive Order S-3-05 goal as the basis for deriving the screening level. Specifically, the Tier 3 screening level for stationary sources is based on an emission capture rate of 90 percent for all new or modified projects. A 90 percent emission capture rate means that 90 percent of total emissions from all new or modified stationary source projects would be subject to some type of CEQA analysis, including a negative declaration, a mitigated negative declaration, or an environmental impact.

Therefore, the policy objective of staff's recommended interim GHG significance threshold proposal is to achieve an emission capture rate of 90 percent of all new or modified stationary source projects. A GHG significance threshold based on a 90 percent emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change. Further, a 90 percent emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that staff estimates that these GHG emissions would account for less than one percent of future 2050 statewide GHG emissions target (85 MMTCO<sub>2</sub>e/yr). In addition, these small projects would be subject to future applicable GHG control regulations that would further reduce their overall future contribution to the statewide GHG inventory.

In summary, the SCAQMD's draft threshold uses the Executive Order S-3-05 goal as the basis for the Tier 3 screening level. Achieving the Executive Order's objective would contribute to worldwide efforts to cap carbon dioxide concentrations at 450 ppm, thus, stabilizing global climate.

For this Project, the 3,000 MTCO<sub>2</sub>e per year for mixed use screening threshold is used as the significance threshold, in addition to the qualitative thresholds of significance. A 13-unit development would not exceed the SCAQMD's threshold of significance for greenhouse gases.

**b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?**

**Less than significant impact.** There are currently no adopted local or regional greenhouse gas reduction plans applicable to the proposed project. However as discussed in Section 4.7a) above, the Air District is in the process of preparing recommended significance thresholds for greenhouse gases for local lead agency consideration which the proposed project does not exceed.

The Scoping Plan states, "The 2020 goal was established to be an aggressive, but achievable, mid-term target, and the 2050 GHG emissions reduction goal represents the level scientists believe is necessary to reach levels that would stabilize climate" (ARB 2008). The year 2020 GHG emission reduction goal of AB 32 corresponds with the mid-term target established by Executive Order S-3-05, which aims to reduce California's fair-share contribution of GHGs in 2050 to levels that would stabilize the climate.

Project Construction

Construction of the proposed project is estimated to generate GHGs. Construction emissions were quantified for demolition, grading, trenching, building construction, paving, and the application of architectural coatings. GHG emissions produced during the approximately two year construction phase of the project are from construction vehicle exhaust. SCAQMD assessment methodology allocates the GHG emissions generated over the construction period and amortizes them over the life of the project (30 years). The combination of construction and operations phase emissions are then evaluated against the SCAQMD GHG significance threshold. Therefore, construction emissions would not conflict with the AB 32 Scoping Plan.

Because the project is limited to the redevelopment of a single-family residence development, it is not a project subject to the Scoping Plan's recommended measures. As such, the Scoping Plan's recommended measures do not directly apply to the project. In other words, there are no specific actions or measures to incorporate into the project in order to comply with the Scoping Plan. Therefore, the project would not conflict with the Scoping Plan's recommended measures and, as such, would not impede implementation of the Scoping Plan.

In conclusion, the project would not conflict with any applicable plan, policy, or regulation of an agency adopted for reducing the emissions of GHGs because the project would generate low levels of GHGs, and would not impede implementation of the Scoping Plan, or conflict with the policies of the Scoping Plan. Therefore, the impact would be less than significant.

## Standard Conditions

**SC-4.3-1** All construction contractors shall comply with South Coast Air Quality Management District (SCAQMD) regulations, including Rule 403, Fugitive Dust. All grading (regardless of acreage) shall apply best available control measures for fugitive dust in accordance with Rule 403. To ensure that the project is in full compliance with applicable SCAQMD dust regulations and that there is no nuisance impact off the site, the contractor would implement each of the following:

- Moisten soil not more than 15 minutes prior to moving soil or conduct whatever watering is necessary to prevent visible dust emissions from exceeding 100 feet in any direction.
- Apply chemical stabilizers to disturbed surface areas (completed grading areas) within five days of completing grading or apply dust suppressants or vegetation sufficient to maintain a stabilized surface.
- Water excavated soil piles hourly or covered with temporary coverings.
- Water exposed surfaces at least twice a day under calm conditions. Water as often as needed on windy days when winds are less than 25 miles per day or during very dry weather in order to maintain a surface crust and prevent the release of visible emissions from the construction site.
- Wash mud-covered tires and under-carriages of trucks leaving construction sites.
- Provide for street sweeping, as needed, on adjacent roadways to remove dirt dropped by construction vehicles or mud, which would otherwise be carried off by trucks departing project sites.
- Securely cover loads with a tight fitting tarp on any truck leaving the construction sites to dispose of debris.
- Cease grading during period when winds exceed 25 miles per hour.

**SC-4.3-2** Prohibits permanently installed wood burning devices into any new development. A wood burning device means any fireplace, wood burning heater, or pellet-fueled wood heater, or any similarly enclosed, permanently installed, indoor or outdoor device burning any solid fuel for aesthetic or space-heating purposes, which has a heat input of less than one million British thermal units per hour.

**SC-4.3-3** The project shall comply with Title 24 of the California Code of Regulations established by the energy conservation standards. The project Applicant shall incorporate the following in building plans:

- Double paned glass or window treatment for energy conservation shall be used in all exterior windows;

- Buildings shall be oriented north/south where feasible.

**SC 4.3-4** The Applicant shall contact the Air Quality Management District (AQMD) at (800) 288-7664 for potential additional conditions of development or for additional permits required by the AQMD.

**SC 4.3-5** Trash facilities shall be screened from view, and designed and located appropriately to minimize potential noise and odor impacts to residential areas.

**SC 4.3-6** All rubber tired dozers and graders used during the grading phase of construction shall be powered by Tier 3 engines.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.4 Biological Resources</b> <i>Would the project:</i>				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Environmental Setting

The project site is developed with existing church buildings and associated parking lot. The project site is surrounded by urban development consisting of residential and commercial uses.

## Environmental Evaluation

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 Game or U.S. Fish and Wildlife Service?**

**No impact.** The project site is fully developed/disturbed and contains limited ornamental landscaping throughout the property. No suitable habitat for any special-status plant or wildlife species occurs within the project site. Therefore, project implementation would not impact either directly or through habitat modifications, any plant or wildlife species identified as a candidate, sensitive, or special status.

- b) **Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?**

**No impact.** There are no riparian habitats or other sensitive natural communities located within the project area identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Therefore, there would be no impacts to any of these habitat types.

- c) **Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

**No impact.** The project is devoid of wetlands, marshes, and vernal pools. Therefore, there would be no impact to any federally protected wetlands under the Clean Water Act.

- 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 wildlife nursery sites?**

**No impact.** The project site is fully developed and is located in an urban setting. The site and surrounding areas do not provide habitat for the movement of any native resident or migratory fish or wildlife species. Therefore, there is no potential for the site to serve as a migration corridor for wildlife and no impact would occur.

- e) **Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

**No impact.** The project site does not contain any protected biological resources or tree species that are considered sensitive. Project implementation would not conflict with any local policies or ordinances.

- 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?**

**No impact.** The City of Costa Mesa is not within the jurisdiction of an adopted Habitat Conservation Plan or Natural Community Conservation Plan. Therefore, project implementation would not conflict with the provisions of an approved local, regional, or state habitat conservation plan.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.5 Cultural Resources</b>				
<i>Would the project:</i>				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Environmental Evaluation

Would the project:

- a) **Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?**

**No impact.** The City’s historic and cultural resources are illustrated on General Plan EIR Exhibit 4.10-1, Properties that Meet the Standards for Listing in the National Register, and outlined in General Plan EIR Table 4.10-1, Historic Resources Inventory. The project site is not identified as a historically/culturally significant resource. City records indicate that the church buildings were constructed in 1968.

The existing structures were assessed for historic significance and do not appear to meet any of the four criteria (A-D) for listing on the California Register of Historic Resources (CR) nor do they appear to meet any criteria for local listing. The buildings were built as functional buildings for a church and therefore, are not associated with events (A) that have made a significant contribution to the broad patterns of history. The church is not recognized locally, and would not be considered historically significant and therefore, the structures are not associated with a person(s) (B) significant in the past. The structure is not unusual or exceptional in any respect and therefore, it does not embody a distinctive characteristic of a type, period, or method of construction (C). Finally, the structure is not capable of providing information important in prehistory or history (D). The structures located onsite do not appear to meet any of the criteria for listing on the CR or local listings and further study is not deemed necessary.

Therefore, project implementation would not cause a substantial adverse change in the significance of a historic resource.

**b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?**

**Less than significant impact.** Ground disturbing activities, such as grading or excavation could disturb previously unidentified subsurface archaeological resources. However, the project site consists of, and is surrounded by, developed land that has been permanently altered due to the construction of below and aboveground improvements (i.e., buildings, driveways, streets, hardscapes, and utilities). Additionally, the project site has already been subject to extensive disruption. Given the highly disturbed condition of the site, the potential for project implementation to impact an unidentified archeological resource is considered low. The project would be subject to compliance with Standard Condition SC 4.5-1, which provides direction in the event archeological resources are unearthed during project subsurface activities. Therefore, project implementation would result in a less than significant impact involving an adverse change in the significance of an archaeological resource.

## Standard Condition

**SC 4.5.-1** In the event that archaeological resources are encountered during grading and construction, all construction activities shall be temporarily halted or redirected to permit the sampling, identification, and evaluation of archaeological materials as determined by the City, who shall establish, in cooperation with the project Applicant and a certified archaeologist, the appropriate procedures for exploration and/or salvage of the artifacts.

**c) Directly or indirectly, destroy a unique paleontological resource or site or unique geologic feature?**

**Less than significant impact.** As noted above, the project site has already been subject to extensive disruption. Additionally, there is no evidence of unique geologic features on the project site. Given the highly disturbed condition of the site, the potential for the project to impact unidentified paleontological resource is considered remote. The project would be subject to compliance with Standard Condition SC 4.5-2, which provides direction in the event paleontological resources are unearthed during project subsurface activities. Therefore, project implementation would result in a less than significant impact involving the potential destruction of a paleontological resource.

## Standard Condition

**SC 4.5.-2** In the event that paleontological resources are encountered during grading and construction operations, all construction activities shall be temporarily halted or redirected to permit a qualified paleontologist to assess the find for significance and, if necessary, develop a paleontological resources impact mitigation plan (PRIMP) for the review and approval by the City prior to resuming excavation activities.

d) **Disturb any human remains, including those interred outside of formal cemeteries?**

**Less than significant impact.** The probability that construction of the project would impact any human remains is low, given the degree of past disturbance of the site, as it is developed with existing church facility. In the event that human remains are encountered during earth removal or disturbance activities, the California Health and Safety Code Section 7050.5 requires that all activities cease immediately and a qualified archaeologist and Native American monitor be contacted immediately. The Coroner would also be contacted pursuant to Sections 5097.98 and 5097.99 of the Public Resources Code relative to Native American remains. Should the Coroner determine the human remains to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC would then be required to contact the most likely descendant of the deceased Native American, who would then serve as consultant on how to proceed with the remains. Compliance with the established regulatory framework (i.e., California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98), as required by Standard Condition SC 4.5-3, would reduce potential impacts involving disturbance to human remains would be less than significant.

### **Standard Condition**

**SC 4.5-3** If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 24 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.6 Geology and Soils</b>				
<i>Would the project:</i>				
a) Expose people or structures to 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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

A Geotechnical Exploration Report, prepared by Leighton and Associates, Inc. (L&A), briefly summarizes the geotechnical constraints for the project (L&A 2014).

## Environmental Evaluation

Would the project:

- a) **Expose people or structures to 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.**

**No impact.** Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. Ground rupture is most likely along active faults, and typically occurs during earthquakes of magnitude five or higher. Ground rupture only affects the area immediately adjacent to a fault.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act requires the State Geologist to establish regulatory zones, known as "Alquist-Priolo (AP) Earthquake Fault Zones," around the surface traces of active faults and to issue appropriate maps. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (typically 50 feet).

The nearest potentially active fault is the San Joaquin Hills blind thrust fault and the Newport-Inglewood Fault, which are located approximately 1.4 miles and 3.0, respectively, from the site (L&A 2014). No faults are known to occur on or within the immediate vicinity of the project site. Therefore, there would be no impact.

- ii) **Strong seismic ground shaking?**

**Less than significant impact.** As with all areas of Southern California, the project would be subject to strong ground shaking associated with seismic activity, especially given that the project site is located near faults that have the potential to cause moderate to large earthquakes. These levels of shaking can be expected to cause damage particularly to older and poorly constructed buildings. The project would involve all new structures and would be required to conform to the seismic design parameters of the California Building Code (CBC). Compliance with the seismic design parameters as outlined in the most recent CBC would ensure that impacts are less than significant.

## Standard Condition

- SC 4.6-1** The Applicant shall comply with the requirements of the 2013 California Building Code, 2013 California Residential code, 2013 California Electrical code, 2013 California Mechanical code, 2013 California Plumbing code, 2013 California Green Building Standards Code, and the 2013 California Energy Code (or the applicable adopted California Building code, California Residential code, California Electrical code, California Mechanical code, California Plumbing Code, California Green Building Standards, California Energy Code at the time of plan submittal or permit issuance), and California Code of Regulations also known as the California Building

Standards Code, as amended by the City of Costa Mesa. Areas of alteration and additions shall comply with 2013 California Green Building Standards Code section 5.303.2 and 5.303.2

**iii) Seismic-related ground failure, including liquefaction?**

**Less than significant impact.** Liquefaction is the loss of soil strength or stiffness due to increased pore-water pressure during severe shaking. Liquefaction is associated primarily with loose (low density), saturated, fine to medium grained, cohesionless soils.

As indicated in the City's General Plan Update EIR, Geology & Seismic Hazards, Exhibit 4.7-4, Liquefaction, the project site is located in an area with low liquefaction potential due to the lack of liquefiable soils (GP EIR 2002). The project must comply with Standard Condition SC 4.6-1, which requires compliance with the California Building Code. Standard Condition SC 4.6-2 must also be followed, which requires that prior to the implementation of the project, the project Applicant would prepare a geotechnical report for the proposed buildings, which would fully identify any site-specific risk for liquefaction, and would identify any specific construction design recommendations in accordance with the CBC. The Geotechnical Exploration Report included borings up to 51.3 feet, and associated soil testing (moisture, shear strength, consolidation, corrosivity, etc.) to determine any geotechnical constraints to development (L&A 2014). Excavation for the site would generally be limited to 10 feet below ground surface, and groundwater depth is estimated between 30 and 50 feet below ground surface. The Review did not identify any barriers to development, and provided specific grading and foundation design recommendations. Accordingly, impacts associated with this issue would be less than significant.

## **Standard Condition**

**SC 4.6-2** Prior to the issuance of Grading Permits, the project Applicant shall provide the City of Costa Mesa Department of Building Safety with a geotechnical investigation of the project site detailing recommendations for remedial grading in order to reduce the potential of onsite soils to cause unstable conditions. Design, grading, and construction shall be performed in accordance with the requirements of the California Building Code applicable at the time of grading, appropriate local grading regulations, and the recommendations of the geotechnical consultant as summarized in a final written report, subject to review by the City of Costa Mesa Department of Building Safety.

**iv) Landslides?**

**No impact.** Due to the level topography, landslides are not anticipated to occur on the project site. Based on the State of California Seismic Hazard Zones Map for the Newport Beach Quadrangle (CGS, 1998), the site is not located within an area that has been identified by the State of California as being potentially susceptible to seismically induced landslides. Therefore, project implementation would not expose people or structures to potential substantial adverse effects involving landslides.

**b) Result in substantial soil erosion or the loss of topsoil?**

**Less than significant impact.** The project site is currently a developed 2-acre site comprised of church buildings and parking lot. While the project would have a greater amount of pervious areas, these areas would take the form of trees and shrubs in private yards, as well as community gathering spaces, and vegetative groundcover. Thus, the increase of pervious areas does not pose a risk for erosion because they would be either vegetated and/or contained. As all storm water flows would be directed to the existing municipal storm drain system or into vegetated pervious areas, the project would not result in substantial soil erosion or the loss of topsoil.

In addition, the project would be subject to compliance with the National Pollutant Discharge Elimination System (NPDES) permitting process, since one or more acres of soil would be disturbed; refer also to Standard Condition 4.6-4. Following development of increased pervious landscaping and compliance with NPDES regulatory requirements, project implementation would result in a less than significant impact involving soil erosion or the loss of topsoil. Furthermore, the project site is currently developed as a church facility that previously required grading and the removal of topsoil during construction. The project would require minimal grading due to the site's current use as a church. Therefore, impacts related to erosion would be less than significant.

## Standard Conditions

**SC 4.6-3** The Applicant shall submit a soils report for this project. Soil's Report recommendations shall be blueprinted on both the architectural and grading plans. For existing slopes or when new slopes are proposed, the Soils Report shall address how existing slopes or the new slopes will be maintained to avoid erosion or future failure.

**SC 4.6-4** The project shall comply with the NPDES requirements, as follows:

- Construction General Permit Notice of Intent (NOI) Design: Prior to the issuance of preliminary or precise grading permits, the project Applicant shall provide the City Engineer with evidence that an NOI has been filed with the Storm Water Resources Control Board (SWRCB). Such evidence shall consist of a copy of the NOI stamped by the SWRCB or Regional Water Quality Control Board (RWQCB), or a letter from either agency stating that the NOI has been filed.
- Construction Phase Storm Water Pollution Prevention Plan (SWPPP): Prior to the issuance of grading permits, the Applicant shall prepare a SWPPP that complies with the Construction General Permit and will include at a minimum the following:
  - Discuss in detail the BMPs planned for the project related to control of sediment and erosion, nonsediment pollutants, and potential pollutants in non-storm water discharges;
  - Describe post-construction BMPs for the project;
- Explain the maintenance program for the project's BMPs

- List the parties responsible for the SWPPP implementation and the BMP maintenance during and after grading. The project Applicant shall implement the SWPPP and modify the SWPPP as directed by the Construction General Permit.

- 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?**

**Less than significant impact.** As the site is relatively level, there is no potential for landslides or slope instabilities. Lateral spreading is a phenomenon in which large blocks of intact, non-liquefied soil move downslope on a liquefied soil layer. For lateral spreading to occur, the liquefied soil must be laterally continuous and free to move along sloping ground. Due to the low susceptibility for liquefaction, the potential for lateral spreading is considered very low. Subsidence or settlement occurs when seismic shaking causes downward shifts of the ground. This settlement generally occurs in loose to moderately dense, unsaturated granular soils. Based on blow counts records, the seismically induced settlement under the proposed buildings is anticipated to be less than one inch. Following compliance with the City's Building Regulations pursuant to Standard Condition 4.6-1, project implementation would not expose people or structures to potential substantial adverse effects involving unstable geologic units or soils.

### **Standard Condition**

Refer to Standard Condition SC 4.6-1 above.

- 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?**

**Less than significant impact.** Expansive soils contain significant amounts of clay particles that swell when wetted and shrink when dried. Expansive soils can cause foundations to heave and crack when expansive soils are subject to uplifting forces caused by swelling and shrinking. As discovered in Geotechnical Exploration Report (L&A, 2014), near surface soils consist of predominately clayey sand to sandy clay. These soils are generally considered to have moderate to high potential for expansion. As required for all new residential buildings, an evaluation of onsite soils will be required as part of building permit review in order to determine compliance with the CBC, and measures to reduce the potential impact of expansive soil impacts to less than significant. The final design of the project building would be based on the results of the geotechnical report, thereby ensuring any impacts associated with this issue would be less than significant.

- 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?**

**No impact.** The project does not propose the use of septic tanks. The project would connect to the existing City sanitary sewer system for wastewater disposal. Therefore, no impacts to soils due to the use of septic systems are anticipated.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.7 Hazards and Hazardous Materials</b>				
<i>Would the project:</i>				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Environmental Evaluation

Would the project:

- a) **Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

**Less than significant impact.** Exposure of the public or the environment to hazardous materials could occur through the following: improper handling or use of hazardous materials or hazardous wastes, particularly by untrained personnel; transportation accidents; environmentally unsound disposal methods; and/or fires, explosions, or other emergencies. The severity of these potential effects varies with the activity conducted, the concentration and type of hazardous material or wastes present, and the proximity of sensitive receptors.

The project would include rezone from I&R (Institutional and Recreational) to PDR-LD and construct a 13-unit residential development. The secondary activities that would occur at these residential units (e.g., building and landscape maintenance) could potentially involve the use of limited quantities of materials considered hazardous. Cleaning and degreasing solvents, fertilizers, pesticides, and other materials used in the regular maintenance of buildings and landscaping could be utilized onsite. Thus, the project could result in an increase in the use of household cleaning products and other materials routinely used in building maintenance, however will not pose any greater hazards than from household products already used by surrounding existing development. Therefore, project implementation would result in less than significant impacts.

- 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?**

**Less than significant impact.** The project site is currently developed, with a church facility and an associated parking lot. The project site is located within a residential area of Costa Mesa.

*Suspect Asbestos-Containing Materials*

Based on the age of the structures (1960s), Asbestos-Containing Materials may be present at the site.

*Lead-Based Paint*

Based on the age of the structures (1960s), Lead-Based Paint may be present at the site.

Compliance with established regulations, and Standard Conditions below would ensure that the project would not 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. Therefore, the project would have a less than significant impact in this regard.

## Standard Condition

- SC 4.7-1** During demolition, grading, and excavation, workers shall comply with the requirements of Title 8 of the California Code of Regulations, Section 1529, which provides for exposure limits, exposure monitoring, respiratory protection, and good working practices by workers exposed to asbestos. Asbestos-contaminated debris

and other wastes shall be managed and disposed of in accordance with the applicable provision of the California Health and Safety Code.

**SC 4.7-2** During demolition, grading, and excavation, workers shall comply with the requirements of Title 8 of the California Code of Regulations, Section 1532.1, which provides for exposure limits, exposure monitoring, respiratory protection, and good working practice by workers exposed to lead. Lead-contaminated debris and other wastes shall be managed and disposed of in accordance with the applicable provision of the California Health and Safety Code.

**SC 4.7-3** Prior to demolition activities, removal and/or abatement of asbestos containing building materials, lead based paints, and hazardous materials associated with the existing building materials, an investigation shall be conducted by a qualified environmental professional in consultation with the Costa Mesa Fire Department. An asbestos and hazardous materials abatement plan shall be developed by the qualified environmental professional, in order to clearly define the scope and objective of the abatement activities. The Applicant shall conduct demolition consistent with the abatement plan, applicable state requirements and City standard conditions.

**c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?**

**Less than significant impact.** Adams Elementary School is located approximately 0.25 miles west of the project site. Due to the nature of the proposed residential project, it is not anticipated that the residences would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste in reportable quantities. Therefore, project implementation would result in less than significant impacts involving hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within 0.25-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 Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?**

**Less than significant impact.** The project site is currently used as a church facility. The site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Compliance with established regulations, and above Standard Conditions would ensure that the project would not create a significant hazard to the public or the environment. The project would have a less than significant impact.

- e) **For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?**

**No impact.** The project site is approximately 5 miles west of John Wayne Airport and outside of the Airport Safety Zone, the AELUP Height Restriction Zone, and the Runway Protection Zones (Clear Zones). The project site is within the FAR Part 77 Notification Area for John Wayne Airport. Therefore, project implementation would not result in an airport-related safety hazard for people residing or working at the proposed residential development.

- f) **For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

**No impact.** The project site is not located within the vicinity of a private airstrip. Therefore, project implementation would not result in an airstrip-related safety hazard for people residing at the proposed residential development.

- g) **Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

**No impact.** The Costa Mesa Disaster Plan serves as the City's Emergency Operations Plan (EOP). The EOP provides guidance during emergency situations associated with natural disasters, technological incidents, and nuclear defense operations. The Plan does not address normal day to-day emergencies or the well-established and routine procedures used in coping with such emergencies. Rather, the EOP analyzes potential large-scale disasters that require a coordinated and immediate response. The EOP considers the City's evacuation routes in its planning. General Plan Safety Element Exhibit SAF-9, *Emergency Evacuation Routes*, illustrates the City's emergency evacuation routes and indicates that Adams Street, located just south of the project site, is a designated emergency evacuation route. Harbor Boulevard, located approximately 0.25 mile east of the project site, is also a designated emergency evacuation route. The project does not include any characteristics that would physically impair or otherwise interfere with emergency response or evacuation in the project vicinity. These conditions preclude the possibility of the project conflicting with an emergency response or evacuation plan. No impact would occur.

- h) **Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?**

**No impact.** The project site is located within an urban area and not adjacent to wild lands. Therefore, project implementation would not expose people or structures to a significant risk involving wild land fires.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.8 Hydrology and Water Quality</b>				
<i>Would the project:</i>				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Environmental Evaluation

**Less than significant impacts.** The property located at 2880 Mesa Verde Drive East consists of approximately two acres of developed land and includes an existing church building and surface parking lot. The Santa Ana River is about two miles west of the proposed project. There are no water resources in the immediate project vicinity to be affected. The proposed project will not involve the modification or alteration of a water resource. The project site is not within an Environmental Protection Agency (EPA) designated or proposed sole-source aquifer. In addition, the project is not: (a) within 1000 yards from mean high tide, (b) within an area regulated by the State Coastal Zone Management Agency, (c) in a coastal zone. The project site is located outside a 500-year floodplain, identified as Zone X on the Flood Insurance Rate Map (Map Number 0602160266H, December 3, 2009). The City of Costa Mesa does not contain any Wild and Scenic Rivers as designated by the National Park Service. Therefore, less than significant impacts related to hydrology and water quality are expected as a result of the proposed project.

Proposed residential development will result in a similar amount of impervious surface compared to the existing development. Compliance with the City's Local Implementation Plan requiring a stormwater pollution prevent program and water quality management plan, where applicable, will be required. A preliminary Water Quality Management Plan will be required during the processing of any proposed residential development. Less than significant impacts related to this environmental topic will occur as a result of the project. Therefore, no mitigation measures are required.

## Standard Conditions

- SC 4.8-1** In order to comply with the 2003 DAMP, the project shall prepare a Storm Drain Plan, Stormwater Pollution Prevention Plan (SWPPP), and Water Quality Management Plan (WQMP) conforming to the current National Pollution Discharge Elimination System (NPDES) requirements, prepared by a Licensed Civil Engineer or Environmental Engineer, which shall be submitted to the Department of Public Works for review and approval.
- The SWPPP shall be prepared and updated as needed during the course of construction to satisfy the requirements of each phase of development.
  - The plan shall incorporate all necessary Best Management Practices (BMPs) and other City requirements to eliminate polluted runoff until all construction work for the project is completed. The SWPPP shall include treatment and disposal of all dewatering operation flows and for nuisance flows during construction.
  - A WQMP shall be maintained and updated as needed to satisfy the requirements of the adopted NPDES program. The plan shall ensure that the existing water quality measures for all improved phases of the project are adhered to.
  - Location of the BMPs shall not be within the public right-of-way.

- SC 4.8-2** Prior to approval of Plans, the project shall fulfill the City of Costa Mesa Drainage Ordinance No. 06-19 requirements.
  
- SC 4.8-3** The project Applicant shall submit grading plans, an erosion control plan, and a hydrology study.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.9 Land Use and Planning</b>				
<i>Would the project:</i>				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Environmental Evaluation

Would the project:

### a) Physically divide an established community?

**No impact.** The physical division of an established community typically refers to the construction of a linear feature, such as an interstate highway or railroad tracks, or removal of a means of access, such as a local bridge that would impact mobility within an existing community or between a community and outlying area. The project site is located on an existing developed I&R zoned property, surrounded by residential and commercial uses. None of the activities associated with project implementation would physically divide an established community.

### b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

**Less than significant impact.**

Any discretionary request for a zone changes involves a **policy decision** of the City Council as to the highest and best use for the subject property and appropriate zoning classification.

The Land Use Element of the General Plan directs long-range development in the City by indicating the location and extent of development to be allowed. The General Plan sets forth land use goals, policies and objectives that guide new development. The City of Costa Mesa General Plan Land Use Map identifies the land use designation of the project site as Low Density Residential.

## General Plan – Existing

The General Plan land use designation of Low Density Residential (8 dwelling units to the acre maximum) is intended to accommodate single-family residences on their own parcels. Other housing types include attached housing that provide a greater portion of recreation or open space than typically found in multi-family developments, and clustered housing which affords the retention of significant open space. Low-Density Residential areas are intended to accommodate family groups and outdoor living activities in open space adjacent to dwellings. In order to avoid land use conflicts, these areas should be located away from or protected from the more intense non-residential areas and major travel corridors. Pursuant to the Costa Mesa General Plan, the density for this land use designation shall be up to eight units to the acre.

## Zoning – Policy Decision

According to the Official Zoning Map, the project site is zoned I&R (Institutional and Recreational). A rezone (or change) of the zoning classification of the 2-acre development site from I&R (Institutional and Recreational) to PDR-LD (Planned Development Residential – Low Density) is proposed. The proposed rezone to PDR-LD would be compatible with the existing Low Density Residential General Plan designation for the project site.

Another low density residential zoning district is R1 (Single-Family Residential). Minimum lot sizes are 6,000 square feet with minimum lot widths of 50 feet or 60 feet, depending on the location of the individual dwelling unit lot. It is a policy decision of the City Council as to the appropriate residential zoning classification for the site and ultimately the maximum number of dwelling units allowed.

The following analysis evaluates the project for consistency with specific goals and objectives of the General Plan Land Use Element. The proposed Rezone involve a policy decision by the final decision-making body. Because of the expansive nature of the General Plan, it cannot be expected that every goal and objective would apply to every project.

Therefore, the following analysis focuses on those issues which are salient and relevant in considering the proposed project. The project complies with the following goals/objectives of the General Plan:

- o Goal LU-1, Land Use: It is the goal of the City of Costa Mesa to provide its citizens with a balanced community of residential, commercial, industrial, recreational, and institutional uses to satisfy the needs of the social and economic segments of the population and to retain the residential character of the City; to meet the competing demands for alternative developments within each land use classification within reasonable land use intensity limits; and, to ensure the long term viability and productivity of the community's natural and man-made environments.

- o Objective LU-1A: Establish and maintain a balance of land uses throughout the community to preserve the residential character of the City at a level no greater than can be supported by the infrastructure.

o Objective LU-2A: Encourage new development and redevelopment to improve and maintain the quality of the environment.

According to the City's Zoning Code (Costa Mesa Zoning Code, Section 13-57(a)(2)), the purpose of the Planned Development zoning is to provide a method by which appropriately located areas of the City can be developed utilizing more imaginative and innovative planning concepts than would be possible through strict application of existing zoning and subdivision regulations. It is intended that these developments will meet the broader goals of the General Plan and Zoning Code by exhibiting excellence in design, site planning, integration of uses and structures, and protection of the integrity of neighboring development. A variety of building products are encouraged in the design of projects in the Planned Development zones, thereby maximizing project excellence.

The proposed project would replace an existing church use and surface parking lot with a planned residential development. The project reflects a quality design and includes traditional architecture with varied building materials, textures and colors, attractive landscaped project common areas and project entries.

The City's Zoning Ordinance allows use of PDR development standards in order to provide a method by which appropriately located areas of the City can be developed utilizing more imaginative and innovative planning concepts than would be possible through strict application of zoning requirements.

#### *Discretionary Review*

The City of Costa Mesa is processing a planning application from Mesa Verde East, LLC for, two-story, small lot residential development at a density of 6.5 dwelling units per acre. Approval of the proposed project involves the following:

1. Adoption of an ***Initial Study/ Negative Declaration***.
2. ***Rezone R-14-05***: An ordinance to rezone a 2-acre site from I&R (Institutional and Recreational) to PDR-LD (Planned Development Residential – Low Density). The maximum allowable General Plan density is 16 dwelling units at a maximum of 8 dwelling units per acre.
3. ***Planning Application PA-14-48***: Master Plan for the development of a 13-unit, two-story, small lot residential development at a density of 6.5 dwelling units per acre. The Master Plan also includes the following requested variances from Zoning Code requirements:
  - a. Variance from perimeter open space requirement for location of block walls (20 feet required; 3 feet proposed on Mesa Verde Drive East);
  - b. Administrative Adjustment from perimeter open space requirement for buildings (20 feet required; 13 feet proposed on Andros Street).
4. ***Tentative Tract Map T-17824***: Subdivision of the property into fee simple lots for homeownership.

Density, Site Coverage, and Open Space.

The project proposes approximately 6.5 dwelling units per acre, within the maximum 8 dwelling units per acre density allowed in the PDR-LD zone. The project does not meet the perimeter open space requirement (20 foot-setback required from street).

Setbacks and Distance Between Buildings.

Other than the required above-described deviations, the building setbacks and minimum distance between buildings are compliant with Code.

Number of Stories and Building Height.

The project proposes two-story residential units.

Parking.

The project proposes 59 total parking spaces. Each residence is provided a two car garage and individual parking spaces within a private driveway. The project also provides guest parking exceeding the Code required parking by seven spaces.

Land use compatibility.

Land use compatibility issues can arise when sensitive land uses (i.e., residential) are introduced into areas that are predominantly commercial or industrial. In this case, the proposed low density residential use would be introduced on a site abutting an R1 residential district and a local commercial center. Notwithstanding proposed deviations from open space development standards, the proposed project use is in keeping with the mix of uses in the surrounding area and recently approved densities, and would not be incompatible with surrounding land uses.

**c) Conflict with any applicable habitat conservation plan or natural communities' conservation plan?**

No impact.

Environmental Issues		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.10</b>	<b>Mineral Resources</b>				
	<i>Would the project:</i>				
	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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Environmental Evaluation

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?**

**No impact.** The Costa Mesa 2000 General Plan does not identify the project site as a mineral resource zone. The project site is developed with an existing church and does not support mineral extraction operations. This condition precludes the possibility of related impacts. No impact would occur.

- 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?**

**No impact.** The Costa Mesa 2000 General Plan does not identify the project site as a mineral resource zone. In addition, the project site is developed with a church and does not support mineral extraction operations. This condition precludes the possibility of related impacts. No impacts would occur.

Environmental Issues		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.11 Noise</b>					
	<i>Would the project result in:</i>				
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b)	Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Environmental Evaluation

### a-d) Noise Levels

**Less than Significant Impact.** Various noise guidelines and standards have been promulgated at the federal, state, and local levels. The City of Costa Mesa maintains a comprehensive Noise Ordinance, which sets standards for noise levels citywide and provides the means to enforce the reduction of obnoxious or offensive noises. The basic noise standards contained in Table 2, City Noise Ordinance Standards-Residential, below, are for the daytime period (7:00 a.m. to 11:00 p.m.) and apply to both outdoor and indoor residential areas. Between the hours of 11:00 p.m. and 7:00 a.m., the noise standards are 5 dBA more stringent for exterior areas and 10 dBA more stringent for indoor areas. The ordinance is designed to control unnecessary, excessive and annoying sounds generated on one piece of property from impacting an adjacent property, and to protect residential areas from noise sources other than transportation sources.

<b>Exterior Noise Standards</b>	
55 dba	7:00 a.m. – 11:00 p.m.
50 dba	11:00 p.m. – 7:00 a.m.
<b>Interior Noise Standards</b>	
55 dba	7:00 a.m. – 11:00 p.m.
45 dba	11:00 p.m. – 7:00 a.m.

\*dba=decibels

The Municipal Code specifies outdoor and indoor noise limits for various land uses impacted by transportation noise sources. The noise limits specified in the City’s Municipal Code are in terms of the Community Noise Equivalent Level (CNEL). The Municipal Code identifies the following noise criteria for transportation noise sources: For residential land uses, the exterior noise exposure level shall not exceed 65 CNEL and the interior noise exposure level shall not exceed 45 CNEL.

**Short-term Impacts**

Construction noise represents a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers, and portable generators, can reach high levels. Grading and construction activities present the highest potential for noise impacts. For short periods of time, grading equipment noise could impact the residential uses located to the north, west, and east of the project site. These grading activities would generate noise levels in excess of the City’s Municipal Code noise limits. However, noise generated by construction activities during daytime hours is exempted from the Noise Ordinance standards. Therefore, if construction is limited to those hours specified by the Noise Ordinance, construction-related noise impacts are considered less than significant. The following standard condition will minimize any short-term construction related noise impacts to below a level of significance:

**Standard Conditions**

**SC 4.11-1** Grading materials delivery, equipment operation, and other construction-related activity shall be limited to be-tween the hours of 7 a.m. and 8 p.m., Monday through Friday, and 8 a.m. to 6 p.m. Saturday. Construction is prohibited on Sundays and federal holidays. Exceptions may be made for activities that will not generate noise audible from off-site, such as painting and other quiet interior work.

**Long-term Impacts**

According to the 2000 General Plan, existing (Year 2000) and expected (Year 2020) noise contours along the project site are located outside the 60 to 75 CNEL noise contours. These noise contours were based on the average daily traffic volume (ADT) noise levels at 100 feet from the roadway centerline without sound attenuation (e.g. block walls, land-scape berms, etc.). This noise data does

not take into account noise barriers or topography which may affect ambient noise levels. Since the project site is outside the 60 to 70 CNEL noise contours from major roadways, no significant noise impacts are anticipated. The primary source of noise is from motor vehicle noise on Mesa Verde Drive. No additional noise impacts are anticipated from existing commercial land uses located to the south of the property nor from the residential uses to the east, west and north.

On-site residential uses would be required to comply with the City's 65 CNEL exterior and 45 CNEL interior noise standards. Typical residential construction achieves an average of 12 decibels of outdoor-to-indoor interior noise reduction with windows open. With windows closed, the outdoor-to-indoor noise reduction increases to an average of 20 decibels. In order to assume that windows can remain closed, adequate ventilation in accordance with the Uniform Building Code must be provided. Typically, this is accomplished through mechanical ventilation or HVAC systems. In addition, a seven-foot high wall is proposed along Mesa Verde Drive. This wall may adequately reduce noise levels further for properties adjacent to Mesa Verde Drive.

Due to the City's Noise Ordinance regulating both exterior and interior noise levels, and the fact that short-term construction of the project is limited to those hours specified by the Noise Ordinance, exposure of persons to long-term noise levels and short-term noise levels, including ground borne vibration or ground borne noise levels, will be considered less than significant.

- e) **For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?**

**Less than Significant Impact.** The project site is located approximately 4.1 miles southwest of John Wayne Airport (the nearest airport). While aircraft noise is occasionally audible on the project site, due to the distance from area airports and the orientation of runways and flight patterns the project site does not lay within the 55-dBA CNEL noise contours of any airport. Therefore, the impact of noise levels from aviation sources would be less than significant.

- f) **For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?**

**No Impact.** The project site is not located in the vicinity of a private airstrip. Therefore, implementation of the project would not expose people to excessive noise levels, and no impact would occur.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.12 Population and Housing</b> <i>Would the project:</i>				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Environmental Evaluation

Would the project:

- a) **Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?**

**Less than significant impact.** A project could induce population growth in an area, either directly (for example, by proposing new homes) or indirectly (for example, through extension of roads and/or other infrastructure). The project involves construction of a 13-unit residential development in place of the existing church facility on site.

The City's average household size was 2.68 according to the Costa Mesa General Plan. Notwithstanding, in order to provide a conservative analysis, based on average household size of 2.68, project implementation could result in a population increase of approximately 35 persons. The potential population growth would be nominal, representing less than one-tenth of one percent (less than 0.01%) increase over the City's existing 2013 population of 111,358 persons. Therefore, project implementation would not induce substantial population growth within the City.

- b) **Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?**

**No impact.** The project site currently contains a church facility and parking lot. The project is a 13-unit residential development and has a General Plan designation Low Density Residential. The proposed project will not displace existing housing, but will increase the number of residential units

in the area. Therefore, the project would have no impact in regards to displacing a substantial numbers of existing housing.

- c) **Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

**No impact.** As discussed, the project implementation would include the demolition of an existing church facility, as well as the construction of a new residential development. Therefore, the project will have no impact in regards to causing the displacement of a substantial number of people.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.13 Public Services</b>				
<i>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:</i>				
a) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Environmental Evaluation

### a-e) Public Services

**Less than significant impact.** Given the developed nature of the project site and surrounding properties, the proposed 13-unit residential development is not expected to significantly increase demand for City services. As discussed in Standard Conditions below, the proposed development project will be subject to the payment of development impact fees (e.g. school fees, parkland fees, traffic impact fees, etc.) to provide for the cost of additional services, as stated in the standard conditions below. Therefore, the proposed residential project will have less than a significant impact to public services.

## Standard Conditions

- SC 4.13-1** Prior to the issuance of a Building Permit, the City of Costa Mesa Fire Department shall review and approve the developer’s project design features to assess compliance with the California Building Code and California Fire Code. The Applicant shall then pay the appropriate fee in effect to mitigate the project’s proportionate impact to additional demands on fire protection services, if any.
- SC 4.13-2** Projections, including eaves, shall be one-hour fire resistive construction, heavy timber or of noncombustible material if they project into the 5 ft (setback area from the property line). They may project a maximum of 12 inches beyond the 3 ft setback. CRC Tables R302.1(1) and R302.1(2).
- SC 4.13-3** As final building plans are submitted to the City of Costa Mesa for review and approval, the Costa Mesa Police Department shall review all plans for the purpose of

ensuring that design requirements are incorporated into the building design to increase safety and avoid unsafe conditions. These measures focus on security measures are recommended by the Police Department, including but not limited to, the following:

- Lighting shall be provided in open areas and parking lots.
- Required building address numbers shall be readily apparent from the street and rooftop building identification shall be readily apparent from police helicopters for emergency response agencies.
- Landscaping requirements (e.g. minimize use of hedges, use of low height shrubs for greater visibility).
- Emergency vehicle parking areas shall be designated within proximity to buildings.
- Prior to the issuance of a Building Permit, the City of Costa Mesa Police Department shall review and approve the developer's project design features to satisfy local requirements. The applicant shall then pay the appropriate fee in effect to mitigate the project's proportionate impact to additional demands on police protection services, if any.

**SC 4.13-4** Prior to issuance of building permits, the Developer shall pay a school impact fee currently calculated at \$1.84 per square foot for residential development and \$0.30 per square foot for commercial development.

**SC 4.13-5** Prior to issuance of occupancy permits, the Developer shall pay a park impact fee or dedicate parkland to meet the demands of the proposed development.

4.14	Recreation	Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
	a)	Would the project 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Environmental Evaluation

### a-b) Recreation

**Less than significant impact.** Given the developed nature of the project site and surrounding properties, the proposed 13-unit residential development is not expected to significantly increase demand for recreational services. As discussed in Standard Conditions below, new development will be subject to the payment of development impact fees (e.g. parkland fees) to provide for the cost of additional recreational facilities. Therefore, less than significant impacts related to recreational services will occur as a result of the zone change and proposed development.

## Standard Conditions

**SC 4.14-1** Prior to issuance of occupancy permits, the Developer shall pay a park impact fee or dedicate parkland to meet the demands of the proposed development. The current park impact fee is calculated at \$13,572 per new single-family dwelling unit.

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.15 Transportation/Traffic</b> <i>Would the project:</i>				
a) Conflict with an applicable plan, 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

This section is based on the Trip Generation Study prepared by RK Engineering Group, Inc. (February 27, 2015), which is included as Appendix F, Transportation and Traffic Data. The study evaluates the trip generation for the proposed project and determines if it increases traffic load on the existing circulation system.

### Existing Conditions

The project site is currently developed with an 8,598 square foot church and includes an associated parking lot.

## Environmental Evaluation

Would the project:

- a) **Conflict with an applicable plan, 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?**

**Less than significant impact.** Table 4, Project Trip Generation, summarizes the trip generation for the existing site and the project. The trip generation potential of the project was estimated using the average rates for ITE Land Use 210: Single-Family Detached Housing and ITE Land Use 560: Church published in the Trip Generation, 9<sup>th</sup> Edition, Institute of Transportation Engineers. Table 3, below, depicts the trip generation rates used to forecast existing and proposed trips, summarizes the project’s daily, AM peak hour, and PM peak hour trip generation potential, and compares these estimates to the existing trip generation “budget.”

The project would generate up to 124 daily trips, including up to 9 trips in the AM peak hour and up to 13 trips in the PM peak hour. Under existing conditions, the project site generates approximately 78 daily trips, including 5 trips in the AM peak hour and 4 trips in the PM peak hour. Overall, the project would generate up to 46 additional daily trips, including an additional 4 AM peak hour trips and an additional 9 PM peak hour trips, than currently occur under existing conditions.

**Table 4: Land Use and Trip Generation Summary**

Land Use Category	Daily 2-Way	AM Peak Hour	PM Peak Hour
		Total	Total
<u>Rates</u>			
Church (TE/TSF)	9.11	0.56	0.55
Single-Family Detached Housing (TE/DU)	9.52	0.75	1.00
<u>Project</u>			
Single-Family Detached Housing (13 DU)	124	9	13
<u>Existing Site</u>			
Church (8.598 TSF)	-78	-5	-4
<b>Total “Net” Project Trip Generation: Project Minus Existing Church</b>	<b>46</b>	<b>4</b>	<b>9</b>
TE/DU= trip end per dwelling unit, TE/TSF= trip end per 1,000 square feet Source: RK Engineering 2015.			

Even though the proposed development is projected to add 4 trips in the a.m. peak hour, 9 trips in the p.m. peak hour and 46 trips during the day, the projected increase is considered nominal and will not have a significant impact on the adjacent circulation system as the surrounding intersections are currently operating at better than acceptable conditions.

The project would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system. The project would result in less than significant impacts on traffic/circulation and the surrounding roadway network. The project would be subject to compliance with Standard Condition SC 4.15-1, which requires payment of traffic impact fees. No mitigation is required. Please refer to Response 4.15.f for a discussion of pedestrian and bicycle paths and mass transit.

### Standard Condition

**SC 4.15-1** The project Applicant shall be responsible for the payment of fees in accordance with Costa Mesa's traffic impact fee program to mitigate project-generated traffic impacts.

- b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?**

**Less than significant impact.** The purpose of the Congestion Management Program (CMP) is to develop a coordinated approach to managing and decreasing traffic congestion by linking the various transportation, land use, and air quality planning programs throughout the County, consistent with that of the Southern California Association of Governments (SCAG). The CMP requires review of substantial individual projects, which might on their own impact the CMP transportation system. Specifically, the Congestion Management Program (CMP) Traffic Impact Analysis (TIA) measures impacts of a project on the CMP Highway System (CMPHS). Development projects that generate more than 2,400 daily trips are subject to a TIA for CMP evaluation. For projects that will directly access or be in close proximity to a CMP Highway System link, a reduced threshold of 1,600 trips per day is used.

As discussed above, under Response 4.15.a, the project would generate up to 46 additional daily trips, including an additional 4 AM peak hour trips and an additional 9 PM peak hour trips, than currently occur under existing conditions. The project would generate a total of 124 daily trips, and thus would not meet the criteria for a CMP TIA. Project-related impacts on applicable CMPs and other established standards are considered less than significant.

- c) **Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?**

**No impact.** The project involves an 13-unit Single-Family Detached residential development. Due to the nature and scope of the proposed developed, project implementation would not result in a change in air traffic patterns.

- d) **Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**

**Less than significant impact.** Access to the project site will be provided via one full access driveway along Mesa Verde Drive East and three individual driveways to three single family detached residential units along Andros Street. The internal driveways that provide access to the proposed units would vary in width between from 20 feet to 28 feet. Emergency access to the proposed units would be provided via the same entry points on Mesa Verde Drive East and Andros Street, as well as via internal drives. The project does not propose or require improvements to roadways or intersections, thus, the project would not substantially increase hazards due to a design feature.

- e) **Result in inadequate emergency access?**

**Less than significant impact.** Refer to Responses 4.7.g. and 4.15.a.

- f) **Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?**

**Less than significant impact.** The project site is served by the Orange County Transportation Authority (OCTA), a multi-modal transportation agency serving Orange County. OCTA provides countywide bus and paratransit service and Metrolink rail service, among other services. The nearest bus lines to the project site are located along Adams Avenue, near the intersection of Mesa Verde Drive East and Adams Avenue, just south of the project site.

Based on CMP guidelines, person transit trips are typically estimated using a 1.4 percent factor to convert total vehicle trips to person trips, and a 3.5 percent factor to convert person trips to total transit trips. As discussed above, under Response 4.15.a, the project would generate up to 124 daily trips. Based on the CMP guidelines and given the proximity of the various land uses in relation to available transit routes in the project vicinity, the project would generate up to 7 transit trips (Orange County CMP, 2013). Since these project-related transit trips can be accommodated by the existing transit services in the project vicinity, project-related CMP transit impacts would be less than significant. Project implementation would not conflict with adopted policies, plans, or programs regarding public transit.

Environmental Issues		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.16</b>	<b>Utilities and Service Systems</b>				
	<i>Would the project:</i>				
a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e)	Result in a determination by the wastewater treatment provider, which 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g)	Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Environmental Evaluation

Would the project:

- a) **Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?**

**Less than significant impact.** The Regional Water Quality Control Board, Santa Ana Region, issued a National Pollutant Discharge Elimination System (NPDES) permit, which includes the City as a Permittee. That NPDES permit implements federal and state law governing point source discharges (a municipal or industrial discharge at a specific location or pipe) and nonpoint source discharges

(diffuse runoff of water from adjacent land uses) to surface waters of the United States. Implementation of the project would only nominally increase wastewater generation, thus, nominally increasing the demand for wastewater treatment; refer to Response 4.16.b. Therefore, given the nature and scope of the project, project implementation would not cause an exceedance of wastewater treatment requirements of the applicable Regional Water Quality Control Board.

- b) **Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**Less than significant impact.**

## **Water**

The project site is located within the Mesa Consolidated Water District (Mesa Water) service area and specifically within their Division Area 2. Mesa Water provides water service to an 18-square-mile area that includes the City of Costa Mesa (as well as parts of Newport Beach and parts of unincorporated Orange County). In compliance with legislative requirements, Mesa Water has prepared their 2010 Urban Water Management Plan (UWMP). The UWMP provides information on the present and future water resources and demands, and assesses Mesa Water's water resource needs.

### ***Water Supplies and Demand***

According to the UWMP, Mesa Water's main sources of water supply are groundwater pumped from wells within the Orange County Basin and imported water from Metropolitan Water District of Southern California through Municipal Water District of Orange County.

The project involves construction of a 13-unit, residential development in place of the existing church facility on the property. Project implementation would result in a net increase of 13 dwelling units, which will result in a population increase of approximately 35 persons. Project implementation would generate a demand for approximately 6,261 gallons per day<sup>1</sup>. The increase in water demand would place an incremental increase in the demand for water supplies and treatment facilities. The increase is not considered substantial, since the project is consistent with the site's General Plan land use designation of Low Density Residential. The City General Plan forms the basis for evaluating the service area's future water demands. Mesa Water has concluded they are capable of meeting the water demands of their customers in normal, single dry, and multiple dry years between 2015 and 2035.

### ***Water Treatment***

According to the UWMP, groundwater is pumped from six wells that pump clear water from the Orange County Basin and two wells that pump colored water. The colored water is treated at the Colored Water Treatment Facility (CWTF) and imported water is treated at the Diemer Filtration

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<sup>1</sup> Based on water use factors of 178.9 gallons per capita per day for residential uses per Mesa Water UWMP

Plant, then delivered to Mesa Water through the imported water connections. As concluded above, the project would result in a negligible increase in water demand, thus, resulting in a negligible impact on the existing water treatment facilities. Therefore, project implementation would not require or result in the construction of new water treatment facilities or expansion of existing facilities.

### **Water Conveyance**

As concluded above, the project would result in a negligible increase in water demand, thus, resulting in a negligible impact on the existing water conveyance facilities. The applicant would be responsible for construction of all water conveyance facilities pursuant to current Uniform Codes, City Ordinances, Public Works standards, and Water Division criteria. Therefore, the project would not require the construction of new water conveyance facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. A less than significant impact would occur in this regard.

### **Wastewater**

The project site is located within the Costa Mesa Sanitary District (Sanitary District) service area. The Sanitary District boundaries include all of the City of Costa Mesa and portions of the City of Newport Beach and unincorporated County of Orange.

### **Wastewater Generation**

The increase in wastewater generation would place an incremental increase in the demand for wastewater conveyance and treatment facilities. The project is consistent with the site's General Plan land use designation and City General Plans form the basis for issuance of the County Sanitation's NPDES wastewater discharge permits; refer also to the *Wastewater Treatment* Section below.

### **Wastewater Conveyance**

The Sanitary District's facilities include 216 miles of mainline, 114 miles of private property sewer lateral pipelines, and 20 pumping stations. As concluded above, the project would result in a negligible increase in wastewater generation, thus, resulting in a negligible impact on the existing wastewater conveyance facilities. The applicant would be responsible for construction of all wastewater conveyance facilities pursuant to current Uniform Codes, City Ordinances, and Public Works standards, pursuant to Standard Condition SC 4.16-1. The Sanitary District would issue a Sewer Service Confirmation Letter indicating that they will serve sanitary sewer to the project. Service to the project would be conditioned upon approval of sewer infrastructure construction plans by the Sanitary District's Engineers, processing of easements (if necessary), and payment of all applicable fees, pursuant to Standard Conditions SC 4.16-2 through 4.16-4. Therefore, the project would not require the construction of new wastewater conveyance facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. A less than significant impact would occur in this regard.

### **Wastewater Treatment**

Wastewater collected by the Sanitary District is sent to the County Sanitation Districts of Orange County (County Sanitation) plants for treatment and disposal. County Sanitation is responsible for collecting, treating, and disposing the wastewater generated within their 479-square mile service area. Wastewater is treated at County Sanitation's treatment plants in Fountain Valley and Huntington Beach. According to County Sanitation's treatment plant operational data, the combined effluent treated at both plants (2004-2005) totaled approximately 244 million gallons daily (average). County Sanitation operates under an NPDES ocean discharge permit issued by the California Regional Water Quality Control Board. The project's increase in wastewater generation is not considered substantial, since the project is consistent with the site's General Plan land use designation and City General Plans form the basis for issuance of the NPDES wastewater discharge permits. Project implementation would not cause the treatment plants' operating capacities to be exceeded. Therefore, a less than significant impact would occur in this regard.

### **Standard Conditions**

- SC 4.16-1 Applicant will be required to construct sewers to serve the project, at his/her own expense, meeting the approval of the Costa Mesa Sanitary District.
- SC 4.16-2 County Sanitation District fees, fixtures fees, inspection fees, and sewer permit are required prior to installation of sewer.
- SC 4.16-3 The Applicant shall submit a plan showing sewer improvements that meets the District Engineer's approval to the Building Division as part of the plans submitted for plan check.
- SC 4.16-4 The Applicant is required to contact the Costa Mesa Sanitary District to arrange final sign-off prior to Certificate of Occupancy being released.

- c) **Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**Less than significant impact.** The proposed project is located in an already urbanized area where existing water drainage facilities exist. The project would result in a negligible increase in wastewater generation, thus, resulting in a negligible impact on the existing wastewater conveyance facilities. Therefore, the proposed project will have less than significant impacts on the environment in regards to storm water drainage facilities.

- d) **Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

**Less than significant impact.**

## Senate Bill 610

SB 610 requires a detailed report regarding water availability and planning for additional water supplies to be included with the environmental document for specified projects. Under SB 610, water supply assessments are required to be included in environmental documentation for certain projects, as defined in Water Code 10912[a], subject to CEQA. Under SB 221, approval by a city or county of certain residential subdivisions requires a written verification of sufficient water supply. Thus, no future action is necessary under the provisions of SB 221 and 610. All projects that meet any of the following criteria require the water availability assessment:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 sq ft of floor space;
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 sq ft of floor space;
- A proposed hotel and motel having more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or an industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 sq ft of floor area;
- A mixed-use project that includes one or more of the projects specified in this subdivision; or
- A project that would demand an amount of water equivalent to or greater than the amount of water required by a 500 dwelling unit project.

## Senate Bill 221

While SB 610 primarily affects the Water Code, SB 221 principally applies to the Subdivision Map Act. The primary effect of SB 221 is to condition every tentative map for an applicable subdivision on the applicant by verifying that the public water supplier (PWS) has sufficient water supply available to serve it. Under SB 221, approval by a city or county of certain residential subdivisions requires a written verification of sufficient water supply. SB 221 applies to any subdivision, defined as:

- A proposed residential development of more than 500 dwelling units (if the PWS has more than 5,000 service connections); or
- Any proposed development that increases connections by 10 percent or more (if the PWS has fewer than 5,000 connections).

The project does not satisfy the criteria outlined above, thus, preparation of a Water Supply Assessment, in order to verify that sufficient water supplies are available to serve the project from existing entitlements/resources, is not warranted and a less than significant impact would occur in this regard.

- e) **Result in a determination by the wastewater treatment provider, which 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?**

**Less than significant impact.** Refer to Response 4.16.b.

- f) **Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?**

**Less than significant impact.** The project site would continue to be served by the solid waste facilities and landfills that currently serve the City:

- Frank R. Bowerman Sanitary Landfill
- Olinda Alpha Sanitary Landfill
- Prima Deschecha Sanitary Landfill

In total, 110,886.46 tons of solid waste was generated by the City of Costa Mesa in 2012.

Project implementation would result in a net increase of 13 dwelling units, with a resultant population increase of approximately 35 persons. Demolition and construction activities associated with the project would generate construction debris. Based on CalRecycle's Estimated Solid Waste Generation Rates generation rates of 12.23 pounds per dwelling unit per day, it is estimated that the project would generate approximately 26 tons of solid waste per year. The increased solid waste generation would contribute to incrementally shortening the lifespan of the landfills identified above. However, given project's scale, and since the City would continue to comply with the existing regulatory framework for reducing solid waste disposal volumes, it is anticipated that the specified landfills would have the capacity to accommodate the project's waste disposal needs. Additionally, the project would be subject to compliance with Standard Conditions SC 4.16-5 and SC 4.16-6, which address solid waste disposal and District consultation. A less than significant impact would occur in this regard.

## Standard Conditions

**SC 4.16-5** Unless an offsite trash hauler is being used, the Applicant shall contact the Costa Mesa Sanitary District to pay trash collection program fees and arrange for service for all new residences. Residences using bin or dumpster services are exempt from the requirement.

**SC 4.16-6** The Applicant shall contact Costa Mesa Sanitary District for any additional district requirements.

- g) **Comply with federal, state, and local statutes and regulations related to solid waste?**

**Less than significant impact.** In 1989, the Legislature adopted the California Integrated Waste Management Act of 1989 (AB 939), in order to "reduce, recycle, and re-use solid waste generated in

the state to the maximum extent feasible.” AB 939 established a waste management hierarchy: Source Reduction; Recycling; Composting; Transformation; and Disposal. The law also required that each county prepare a new Integrated Waste Management Plan and each city prepare a Source Reduction and Recycling Element (SRRE) by July 1, 1991. The SRRE is required to identify how each jurisdiction will meet the mandatory state waste diversion goal of 50 percent by the year 2000. The Act mandated that California’s 450 jurisdictions (i.e., cities, counties, and regional waste management compacts), implement waste management programs aimed at a 25 percent diversion rate by 1995 and a 50 percent diversion rate by 2000. If the 50 percent goal was not met by the end of 2000, the jurisdiction was required to submit a petition for a goal extension to Cal Recycle. The City of Costa Mesa adopted the final SRRE in January 1992.

Senate Bill (SB) 2202 made a number of changes to the municipal solid waste diversion requirements under the Integrated Waste Management Act. These changes included a revision to the statutory requirement for 50 percent diversion of solid waste to clarify that local governments shall continue to divert 50 percent of all solid waste on and after January 1, 2000.

SB 1016, Wiggins, Chapter 343, Statutes of 2008 introduced a per capita disposal measurement system that measures the 50 percent diversion requirement using a disposal measurement equivalent. The bill repealed the board’s two-year process, requiring instead that the board make a finding whether each jurisdiction was in compliance with the act’s diversion requirements for calendar year 2006 and to determine compliance for the 2007 calendar year, and after, based on the jurisdiction’s change in its per capita disposal rate. The board is required to review a jurisdiction’s compliance with those diversion requirements in accordance with a specified schedule, which is conditioned upon the board finding that the jurisdiction is in compliance with those requirements or has implemented its source reduction and recycling element and household hazardous waste element. The bill requires the board to issue an order of compliance if the board finds that the jurisdiction has failed to make a good faith effort to implement its source reduction and recycling element or its household hazardous waste element, pursuant to a specified procedure.

The per capita disposal rate is a jurisdiction-specific index, which is used as one of several “factors” in determining a jurisdiction’s compliance with the intent of AB 939, and allows CalRecycle and jurisdictions to set their primary focus on successful implementation of diversion programs. Meeting the disposal rate targets is not necessarily an indication of compliance. CalRecycle reports that Costa Mesa’s Disposal Rate Targets for Reporting Year 2013 are 8.5 pounds per day (PPD) per Resident and 11.3 PPD per Employee.

The Applicant is currently working with the Costa Mesa Sanitary District to establish service for the project and will be required to integrate District requirements into the project design (e.g. established locations for trash carts and bulky pickup, sufficient clearance and appropriate routing for trucks).

Participation in the City’s recycling programs during project construction and operation would ensure that the project would not conflict with federal, state, and local statutes and regulations

related to solid waste. A less than significant impact would occur in this regard. Refer also to Response 4.16.f.

Environmental Issues		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>4.17</b>	<b>Mandatory Findings of Significance</b>				
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b)	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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c)	Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Environmental Evaluation

Would the project:

- a) **Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?**

**Less than significant impact.** As concluded in Section 4.4, Biological Resources, the project proposes a rezone from from I&R (Institutional and Recreational) to PDR-LD (Planned Development Residential – Low Density) and construction of a 13-unit residential development on an already disturbed site. The project site and its surroundings are fully developed, and there are no biological resources present in the area. Therefore, the project does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal.

As concluded in Response 4.5.a, the project site does not contain a historically/culturally significant structure. Therefore, project implementation would not eliminate important examples of the major periods of California history.

As concluded in Response 4.5.b, the project site has already been subject to extensive disruption. Given the highly disturbed condition of the site, the potential for project implementation to impact a yet unidentified archeological resource is considered remote. Therefore, project implementation would not eliminate important examples of the major periods of California prehistory.

- b) 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)?**

**Less than significant impact.** The project impacts less than significant. Standard conditions will also be imposed upon the project, including the payment of fair-share development impact fees, design standards, etc. Other new development projects within the City would also be subject to these requirements.

The design of any future residential use is required to conform with the City’s design guidelines and residential development standards (e.g. two-story maximum building height, maximum density allowed in PDR-LD zone, etc.), unless a request for any discretionary approvals (i.e. variance, minor modification, etc.) is approved and appropriate findings are made in conjunction with the development proposal.

Proposed standard conditions will minimize the proposed project’s impacts related to noise and air quality to below a level of significance. As an existing church site with nonnative vegetation, the proposed project would not have the potential to degrade the quality of environment, sensitive biological resources, or cultural/paleontological resources. Due to the projected similarity in average daily trips from the proposed change from church to residential use, the proposed project would not result in any cumulatively considerable impacts related to traffic/circulation. No significant adverse environmental effects on human beings will result, either directly or indirectly, from the proposed project.

All other impacts of the project were determined either to have no impact, or to be less than significant without the need for mitigation. Cumulatively, the project would not result in any significant impacts that would substantially combine with impacts of other current or probable future impacts. Therefore, the project, in conjunction with other future development projects, would not result in any cumulatively considerable impacts.

- c) **Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?**

**Less than significant impact.** Previous sections of this Initial Study/Negative Declaration reviewed the project's potential impacts related to air quality, geology/soils, hazards/hazardous materials, and noise, among other environmental issue areas. As concluded in these previous discussions, the project would result in less than significant environmental impacts with implementation of the standard conditions. Therefore, the project would cause less than significant adverse effects on human beings.

### **Standard Conditions**

Refer to Sections 4.1 through 4.17 above.

## SECTION 5: REFERENCES

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Appendix A:

2880 Mesa Verde Drive Trip Generation Study



February 27, 2015

Mr. Peter Zehnder  
MESA VERDE EAST, LLC.  
20 Enterprise, Suite 320  
Aliso Viejo, CA 92656

**Subject: 2880 Mesa Verde Drive Trip Generation Study (Updated 02/27/15),  
City of Costa Mesa**

Dear Mr. Zehnder:

**Introduction**

RK ENGINEERING GROUP, INC. (RK) is pleased to provide this trip generation analysis for the 2880 Mesa Verde Drive Project in the City of Costa Mesa. A location map is provided in Exhibit A.

The proposed project would replace the existing 8,598 square foot church with 13 dwelling units of single family residential. The proposed project would provide 26 garage parking spaces, and 33 open parking spaces, for a total of 59 parking spaces provided. Access for the proposed residential development is planned via Mesa Verde Drive and Serang Place. An aerial site plan for the project is shown in Exhibit B.

The project site is currently zoned for Institutional and Recreational use, and has an area of approximately 2 acres. Hence, the project site could operate as either a church or an institutional use under current approvals. The current zoning allows for a floor area ratio (FAR) of 0.25. Therefore, the 2-acre project site would allow for up to 21,780 square feet of church or institutional use without the need for any further approvals. As part of this analysis, the potential trips which could be generated by the currently allowed maximum of 21,780 square feet of church or institutional use is determined.

The purpose of this trip generation analysis is to determine the proposed project's AM and PM peak hour and daily trip generation as it compares to the following:

1. Existing church land use without any changes;
2. Current Zoning Option 1: Expansion of the existing church land use to 21,780 square feet as allowed under current approvals; and
3. Current Zoning Option 2: Replacement of the existing church with 21,780 square feet of institutional land use (community or trade college) as allowed under current approvals.

## **Trip Generation**

Trip generation represents the amount of trips that are produced and attracted by a development. Trip generation rates are developed by the ITE (Institution of Transportation Engineers) in their *Trip Generation Manual*, 9th Edition, 2012. The trip generation rates for this project are shown in Table 1.

The existing land use is a church (ITE Land Use Code 560). The proposed project will consist of 13 single family residential dwelling units (ITE Land Use Code 210). Without the need for a zone change and under current approvals, the project site could be developed with 21,780 square feet of church (ITE Land Use Code 560) or 21,780 square feet of community/trade college (ITE Land Use Code 540). This analysis is conducted in order to provide a comparison between these various land use scenarios for the project site.

ITE trip generation calculations for the various land use scenarios are summarized in Table 2.

As shown in Table 2, based on ITE trip generation calculations:

- The existing church land use is currently generating approximately 78 trip ends per day, with 5 vehicles per hour during the AM peak hour and 4 vehicles per hour during the PM peak hour;
- The proposed 13-unit residential project is forecast to generate 124 trip ends per day, with 9 vehicles per hour during the AM peak hour and 13 vehicles per hour during the PM peak hour;
- Current Zoning Option 1 (expansion of the existing church to 21,780 square feet) is forecast to generate 198 trip ends per day, with 13 vehicles per hour during the AM peak hour and 12 vehicles per hour during the PM peak hour; and
- Current Zoning Option 2 (replacement of the existing church with 21,780 square feet of community or trade college) is forecast to generate 601 trip ends per day, with 65 vehicles per hour during the AM peak hour and 55 vehicles per hour during the PM peak hour.

Table 3 provides a comparison of trip generation between the proposed project and the land use alternatives. As shown in Table 3:

- When compared to the existing church land use, the proposed project is forecast to generate 46 more trip ends per day, with four (4) more trips generated in the AM peak hour, and nine (9) more trip generated in the PM peak hour;

- When compared to Current Zoning Option 1 (expansion of the existing church to 21,780 square feet), the proposed project is forecast to generate 74 fewer trip ends per day, with four (4) fewer vehicles per hour during the AM peak hour and one (1) more vehicle per hour during the PM peak hour; and
- When compared to Current Zoning Option 2 (replacement of the existing church with 21,780 square feet of community or trade college), the proposed project is forecast to generate 477 fewer trip ends per day, with 56 fewer vehicles per hour during the AM peak hour and 42 fewer vehicles per hour during the PM peak hour.

### **Conclusions**

RK has completed a trip generation analysis for the proposed 2880 Mesa Verde Drive Project. The proposed project will consist of 13 dwelling units of single family residential use, with 59 parking spaces provided. The main access would be provided on Mesa Verde Drive and Serang Place.

**When compared to the existing church land use, the proposed project is forecast to generate 46 more trip ends per day, with four (4) more trips generated in the AM peak hour, and nine (9) more trip generated in the PM peak hour;**

**When compared to Current Zoning Option 1 (expansion of the existing church to 21,780 square feet), the proposed project is forecast to generate 74 fewer trip ends per day, with four (4) fewer vehicles per hour during the AM peak hour and one (1) more vehicle per hour during the PM peak hour.**

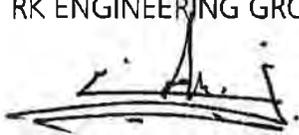
**When compared to Current Zoning Option 2 (replacement of the existing church with 21,780 square feet of community or trade college), the proposed project is forecast to generate 477 fewer trip ends per day, with 56 fewer vehicles per hour during the AM peak hour and 42 fewer vehicles per hour during the PM peak hour.**

**RK concludes that a traffic impact study would not be appropriate to determine how the slight increase of trips generated by the proposed project will affect the nearby intersections. Additionally, it can be concluded that the proposed residential project would generate less trips overall than if the approved land use were to fully utilize the project site.**

Mr. Peter Zehnder  
MESA VERDE EAST, LLC.  
February 27, 2015  
Page 4

RK Engineering Group, Inc. appreciates this opportunity to work with MESA VERDE EAST, LLC on this project. If you have any questions regarding this study, please do not hesitate to call us at (949) 474-0809.

Sincerely,  
RK ENGINEERING GROUP, INC.



Mohammad "Alex" Tabrizi, P.E., T.E.  
Associate Principal



Tiffany Giordano, E.I.T.  
Engineer II

Attachments



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# Exhibits

Exhibit A  
**Location Map**

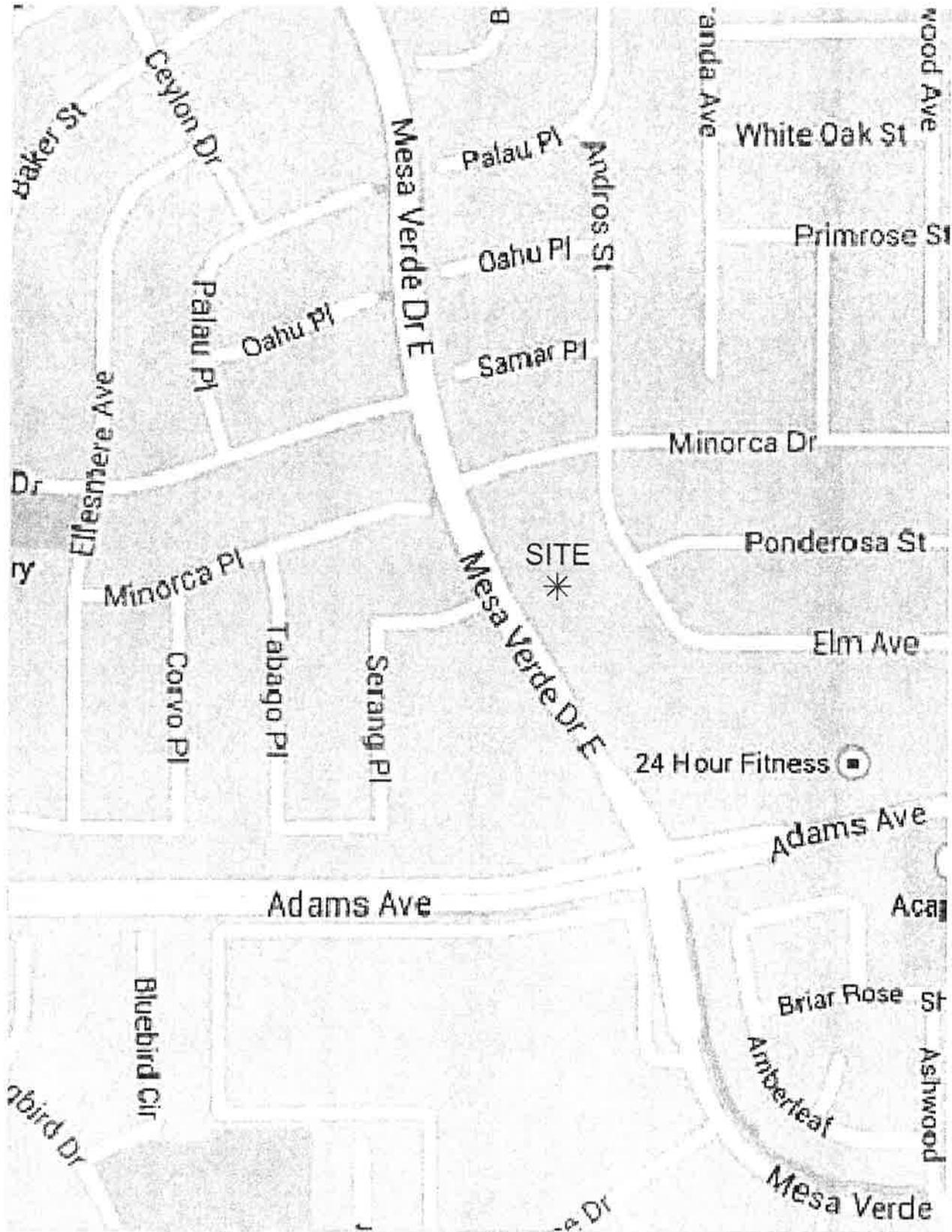
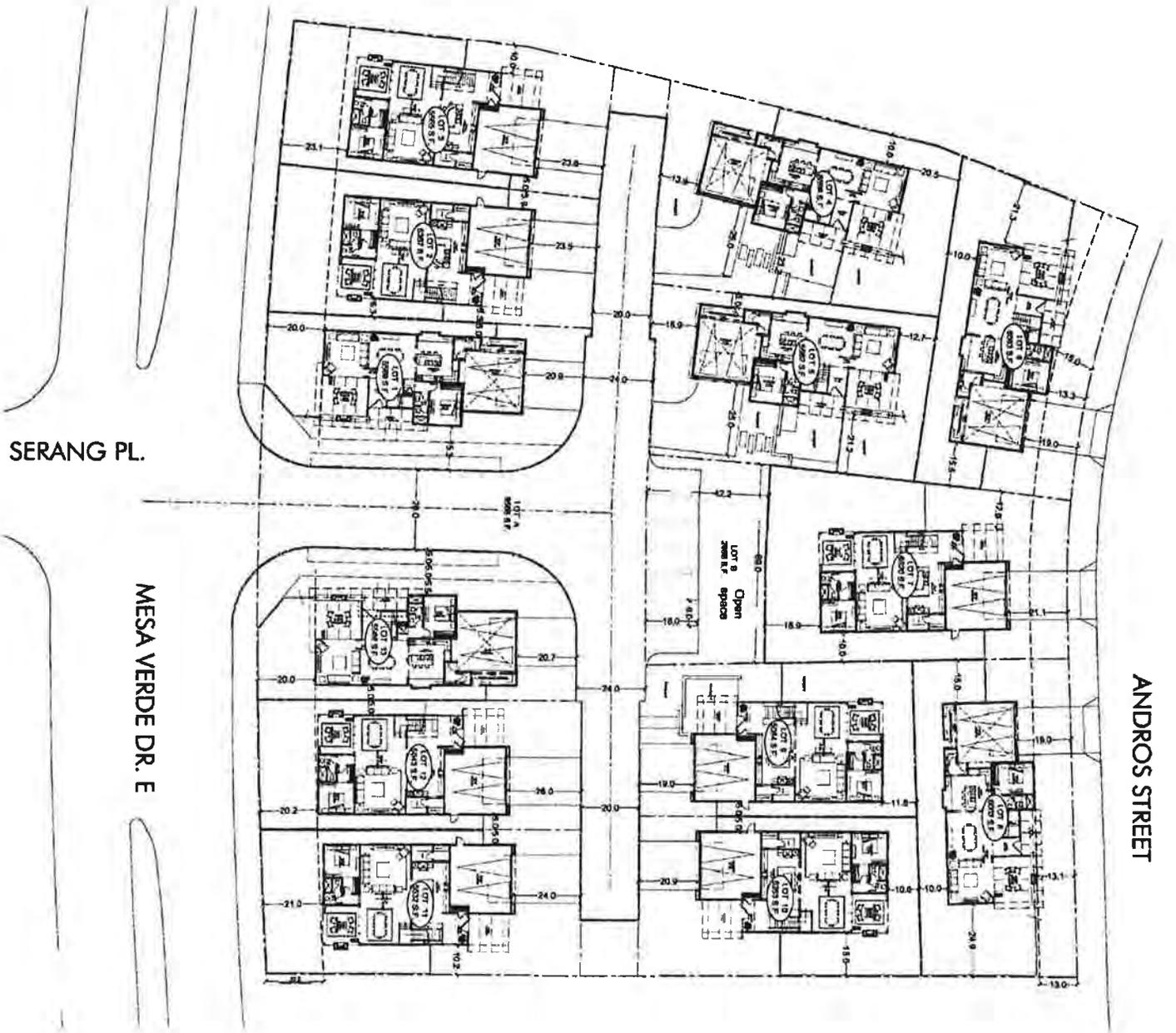


Exhibit B  
Site Plan



SERANG PL.

MESA VERDE DR. E

ANDROS STREET



---

# Tables

**TABLE 1**  
**Trip Generation Rates<sup>1</sup>**

Land Use	ITE Code	Units <sup>2</sup>	Peak Hour						Daily
			AM			PM			
			In	Out	Total	In	Out	Total	
Church	560	TSF	0.35	0.21	0.56	0.26	0.29	0.55	9.11
Single Family Residential	210	DU	0.19	0.56	0.75	0.63	0.37	1.00	9.52
Junior / Community College	540	TSF	2.21	0.78	2.99	1.47	1.07	2.54	27.49

<sup>1</sup> Source: Institute of Transportation Engineers (ITE), *Trip Generation, 9th Edition*, 2012.

<sup>2</sup> DU = Dwelling Units  
TSF= Thousand Square Feet

**TABLE 2**  
**Project Trip Generation**

<b>Existing Land Use</b>										
<b>Existing Land Use</b>	<b>ITE Code</b>	<b>Quantity</b>	<b>Units<sup>1</sup></b>	<b>Peak Hour</b>						<b>Daily</b>
				<b>AM</b>			<b>PM</b>			
				<b>In</b>	<b>Out</b>	<b>Total</b>	<b>In</b>	<b>Out</b>	<b>Total</b>	
Church	560	8.598	TSF	3	2	5	2	2	4	78

<b>Proposed Land Use</b>										
<b>Proposed Land Use</b>	<b>ITE Code</b>	<b>Quantity</b>	<b>Units<sup>1</sup></b>	<b>Peak Hour</b>						<b>Daily</b>
				<b>AM</b>			<b>PM</b>			
				<b>In</b>	<b>Out</b>	<b>Total</b>	<b>In</b>	<b>Out</b>	<b>Total</b>	
Single Family Residential	210	13	DU	2	7	9	8	5	13	124

<b>High Intensity Approved Land Use</b>										
<b>High Intensity Approved Land Use</b>	<b>ITE Code</b>	<b>Quantity</b>	<b>Units<sup>1</sup></b>	<b>Peak Hour</b>						<b>Daily</b>
				<b>AM</b>			<b>PM</b>			
				<b>In</b>	<b>Out</b>	<b>Total</b>	<b>In</b>	<b>Out</b>	<b>Total</b>	
Option 1: Church	560	21.780	TSF	8	5	13	6	6	12	198
Option 2: Community College	540	21.780	TSF	48	17	65	32	23	55	601

<sup>1</sup> DU = Dwelling Units  
TSF = Thousand Square Feet

**TABLE 3**  
**Project Trip Generation Comparison**

<b>Comparison: Existing Land Use vs. Proposed Land Use</b>							
	<b>Peak Hour</b>						<b>Daily</b>
	<b>AM</b>			<b>PM</b>			
	<b>In</b>	<b>Out</b>	<b>Total</b>	<b>In</b>	<b>Out</b>	<b>Total</b>	
Existing Land Use (Church Land Use)	3	2	5	2	2	4	78
Proposed Land Use (Residential Land Use)	2	7	9	8	5	13	124
<b>Difference</b>	-1	+5	+4	+6	+3	+9	+46

<b>Comparison: High Intensity Approved Land Use Option 1 vs. Proposed Land Use</b>							
	<b>Peak Hour</b>						<b>Daily</b>
	<b>AM</b>			<b>PM</b>			
	<b>In</b>	<b>Out</b>	<b>Total</b>	<b>In</b>	<b>Out</b>	<b>Total</b>	
High Intensity Approved Land Use (Church Land Use)	8	5	13	6	6	12	198
Proposed Land Use (Residential Land Use)	2	7	9	8	5	13	124
<b>Difference</b>	-6	+2	-4	+2	-1	+1	-74

<b>Comparison: High Intensity Approved Land Use Option 2 vs. Proposed Land Use</b>							
	<b>Peak Hour</b>						<b>Daily</b>
	<b>AM</b>			<b>PM</b>			
	<b>In</b>	<b>Out</b>	<b>Total</b>	<b>In</b>	<b>Out</b>	<b>Total</b>	
High Intensity Approved Land Use (Community College Land Use)	48	17	65	32	23	55	601
Proposed Land Use (Residential Land Use)	2	7	9	8	5	13	124
<b>Difference</b>	-46	-10	-56	-24	-18	-42	-477

Appendix B:  
Mesa Verde Development Package February 2015



1234

# MESA VERDE

DEVELOPMENT PACKAGE

PINNACLE RESIDENTIAL

FEBRUARY 2015

**GENERAL PLAN LAND USE DESIGNATION:**

Low Density Residential

**ZONING:**

Current: Institutional and Recreational

Proposed: Planned Development Residential (PDR) - Low Density

**DENSITY:**

Allowable: 16 units (8.0 unit/acre)

Proposed: 13 units (6.5 units/acre)

**SITE SUMMARY:**

Site: 2.0 ac (87,120 sq.ft.)

Units: 13 du.

Density: 6.5 du/ac.



# SITE PLAN

fitting into the context of the surrounding community

# ANDROS STREET



## SITE SUMMARY

SITE: 2.0 ac. (87,120 sq.ft.)  
 UNITS: 13 du  
 DENSITY: 6.5 du/a.

## UNIT SUMMARY

PLAN 1: 4 du (2,540 sqft.)  
 2-story; 4br+3.5 ba  
 PLAN 2: 9 du (2,956 sqft.)  
 2-story; 4br+3.5 ba

## PARKING

Required  
 garage 26 spaces (2.0 covered spaces / unit)  
 open 26 spaces (2.0 spaces / unit)  
 total 52 spaces

## Provided

garage 26 spaces  
 open 33 spaces  
 total 59 spaces

## OPEN SPACE

Required 39,204 sq.ft. (45%)  
 Provided 46,646 sq.ft. (53%)

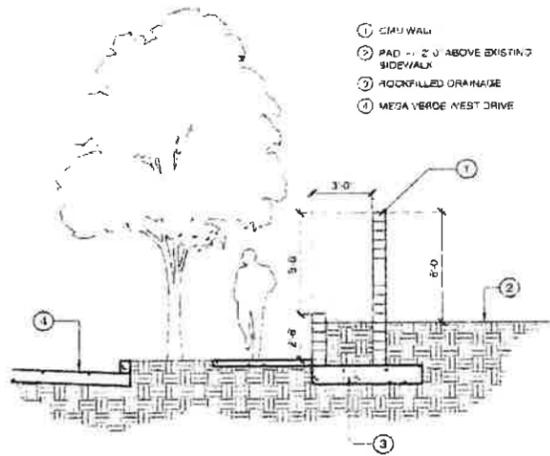
## LOT SUMMARY

LOT	LOT SIZE
1	5,569 sq.ft.
2	5,387 sq.ft.
3	5,565 sq.ft.
4	6,674 sq.ft.
5	5,549 sq.ft.
6	6,234 sq.ft.
7	6,325 sq.ft.
8	5,992 sq.ft.
9	5,090 sq.ft.
10	5,358 sq.ft.
11	5,532 sq.ft.
12	5,043 sq.ft.
13	5,566 sq.ft.
<b>TOTAL</b>	<b>73,884 sq.ft.</b>

# TECHNICAL SITE PLAN

PRELIMINARY PLANT SCHEDULE

TREES	BOTANICAL NAME	COMMON NAME	SIZE	QTY	
	ARBUTUS UNEDO	STRAWBERRY TREE	24"BOX	6	
	BAUHINIA ACULEATA	WHITE ORCHID TREE	36"BOX	13	
	DRACAENA DRACO	DRAGON TREE	24"BOX	8	
	ERYTHRINA CORALLOIDES	NAKED CORAL TREE	36"BOX	9	
	EXISTING TREE	TO REMAIN	24"BOX	9	
	EXISTING TREE	TO REMOVE	24"BOX	4	
	PYRUS CALLERYANA REDSPIRE	ARISTOCRAT FLOWERING PEAR	24"BOX	2	
PALE TREES	BOTANICAL NAME	COMMON NAME	SIZE	QTY	
	ARCH-ONTOPHOENIX CLAWINGHAMIANA	KING PALM	24"BOX	8	
SHRUBS	BOTANICAL NAME	COMMON NAME	SIZE	QTY	
	AGAPANTHUS X MEXICANO	MIDNIGHT BLUE AGAPANTHUS	1 GAL	549	
	AGAVE ATTENUATA	AGAVE	5 GAL	50	
	ALOE STRICTA	ALOE	5 GAL	98	
	BAMBUSA TEXTILIS MUTABILIS	GRACEFUL BAMBOO	20 GAL	81	
	BOUGAINVILLEA NANA	BOUGAINVILLEA	5 GAL	42	
	BOUGAINVILLEA X ROSENKA	BOUGAINVILLEA	5 GAL	24	
	BRUNFELSIA CALYXIA FLOREBUNDA	YESTERDAY TODAY AND TOMMORROW	5 GAL	12	
	CARSSIA MACROCARPA PROSTRATA	PROSTRATE NATAL PLUM	1 GAL	520	
	CRASSULA ARGENTEA	JADE PLANT	5 GAL	9	
	EUPHORBIA TRICALLI STICKS ON FIRE	PENCIL TREE	5 GAL	12	
	FURCRAEA FOETIDA	MAURITIUS HEMP	10 GAL	27	
	HESPERALOE PARVIFLORA	RED YUCCA	1 GAL	44	
	LIQUSTRUM TEXANUM	TEXAS PRIVET	15 GAL	16	
	LIRIOPE GIGANTEA	GIANT LIRIOPE	2 GAL	98	
	LOMANDRA LONGIFOLIA BREEZE	DWARF MAT RUSH	2 GAL	37	
	PARTINENOCISSUS TRICUSPIDATA	BOSTON-IVY	1 GAL	25	
	PHILODENDRON SELLOUM	LACY TREE PHILODENDRON	5 GAL	13	
	PHORUM DOOKIANUM TRICOLOR	VARIEGATED MOUNTAIN FLAX	5 GAL	127	
	PRUNUS CAROLINIANA COMPACTA	CAROLINA CHERRY	15 GAL	15	
	STRELTZIA NICOLA	GIANT BIRD OF PARADISE	15 GAL	7	
	STRELTZIA REGINAE	BIRD OF PARADISE	15 GAL	38	
GROUND COVERS	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	QTY
	CAREX DIVULSA	BERKELEY SEDGE	1 GAL	12" o.c.	607 SF
	DYMONDIA MARGARETAE	DYMONDIA	1 GAL	12" o.c.	2,922 SF
	GRAPTOPETALUM PARAGUAYENSE	GHOST PLANT	1 GAL	12" o.c.	481 SF
	GRAPTOSEDUM ROSA	HCN	5 GAL		401 SF
	SENECIO MANDRALISCAE BLUE CHALK STICKS	SENECIO	1 GAL	12" o.c.	1,144 SF



A-A MESA VERDE WEST DRIVE SECTION  
SCALE: 1/4" = 1'-0"



not to scale

# LANDSCAPE PLAN

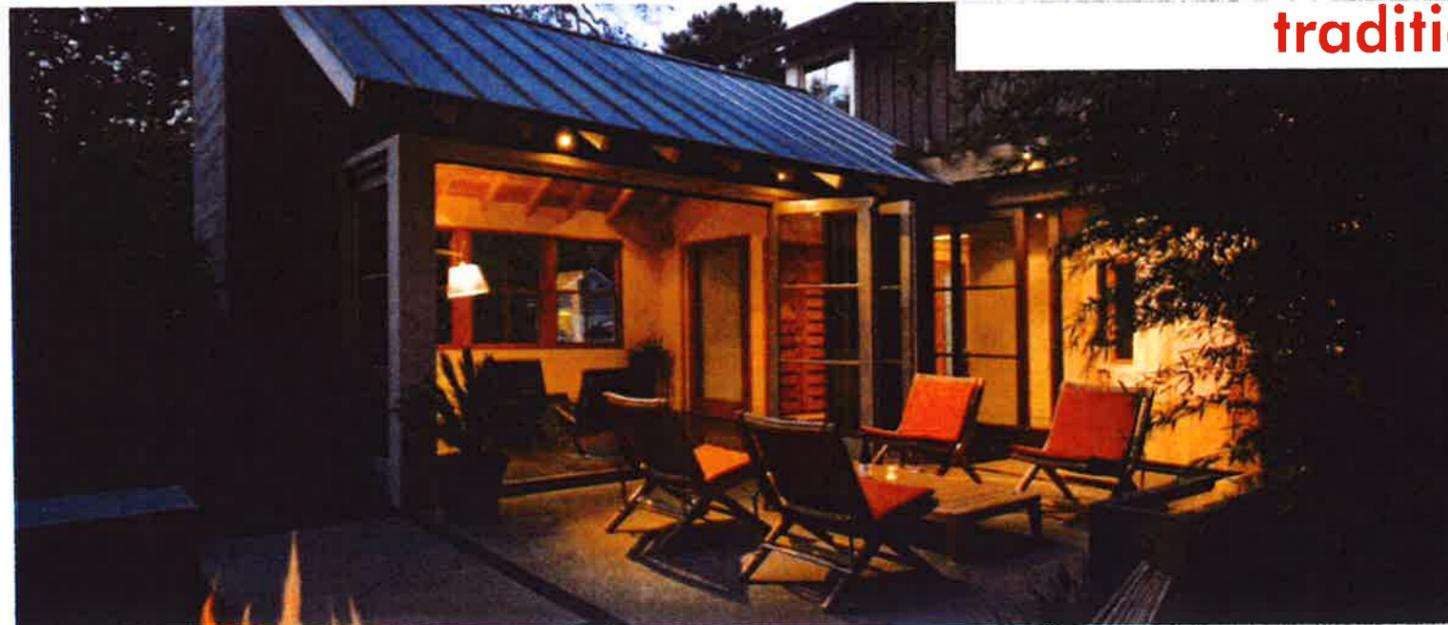
native plant palette, with texture and color





# ARCHITECTURAL CHARACTER

traditional living with modern forms and custom details



# PLAN 1

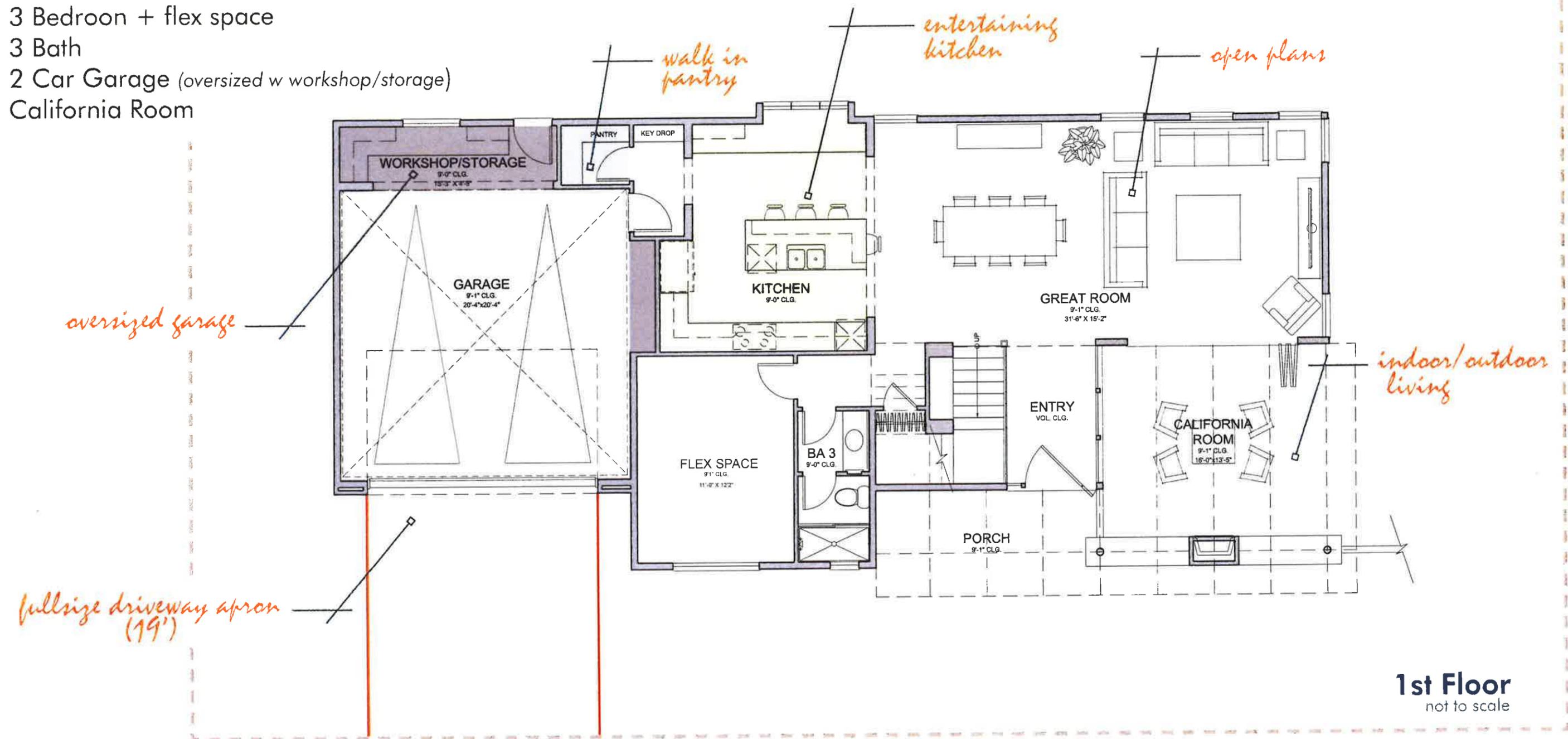
2,834 sq.ft. (w/o garage)

3 Bedroom + flex space

3 Bath

2 Car Garage (oversized w workshop/storage)

California Room



# FLOOR PLANS open plan, indoor-outdoor living

# PLAN 1

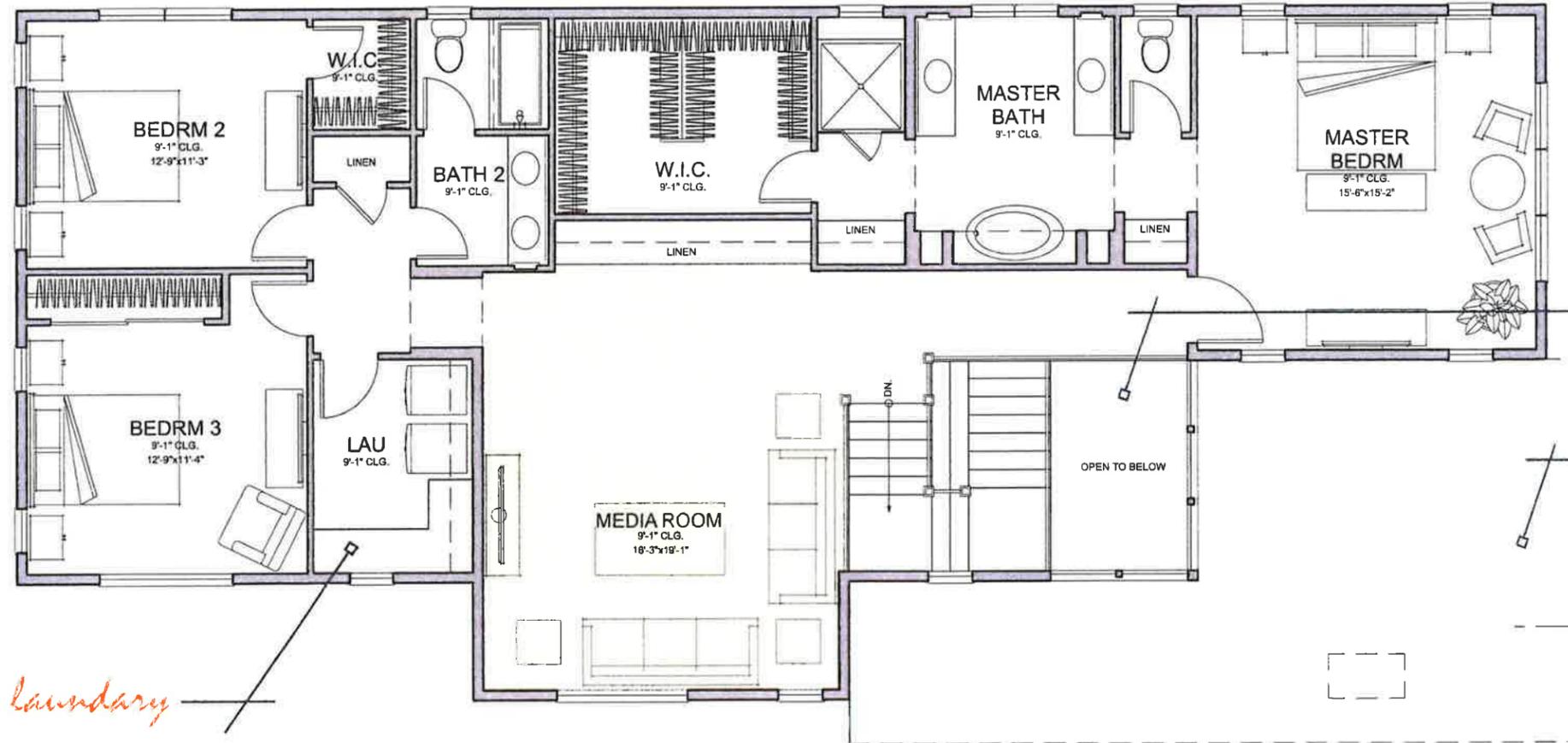
2,834 sq.ft. (w/o garage)

3 Bedroom + flex space

3 Bath

2 Car Garage (oversized w workshop/storage)

California Room



*2 story volume at entry*

*single story edge*

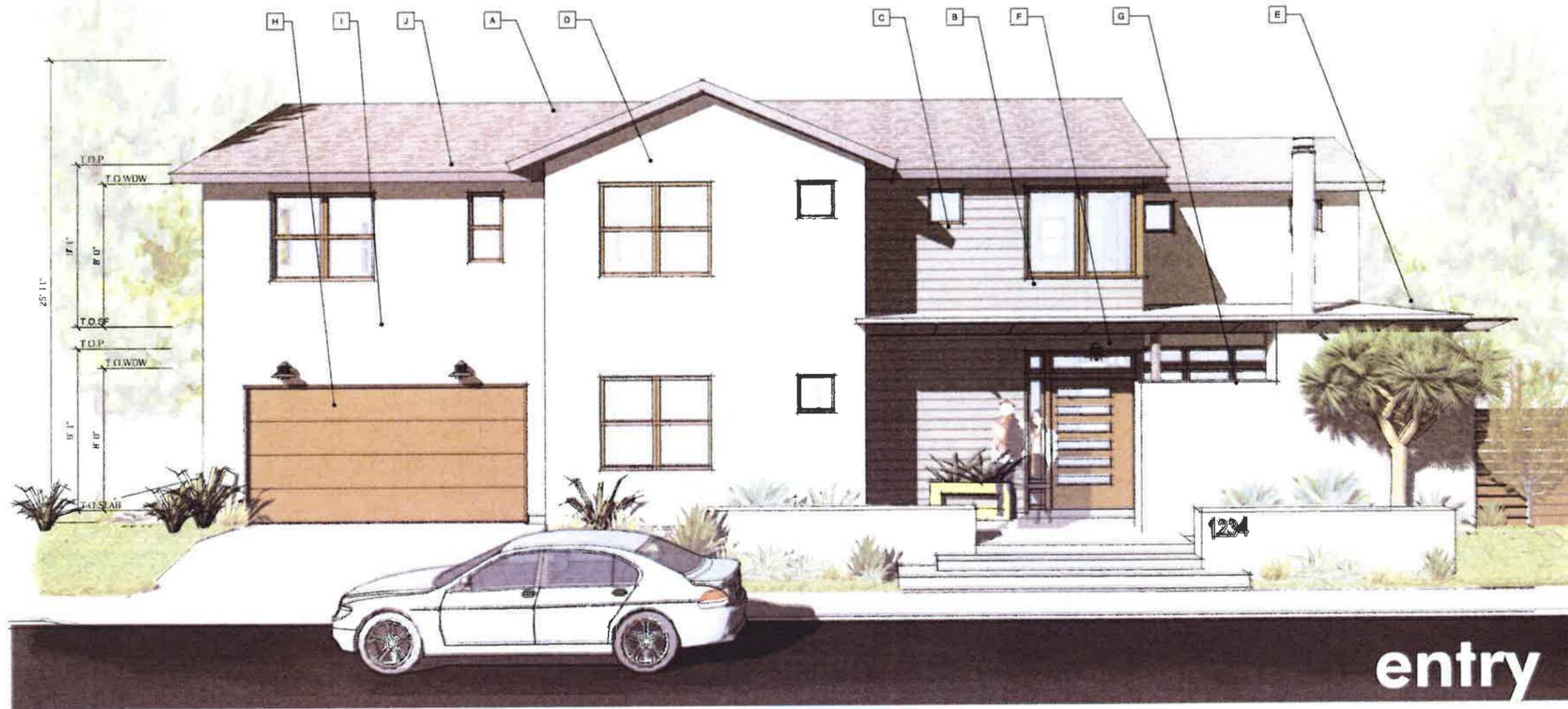
*upstairs laundry room*

**2nd Floor**  
not to scale

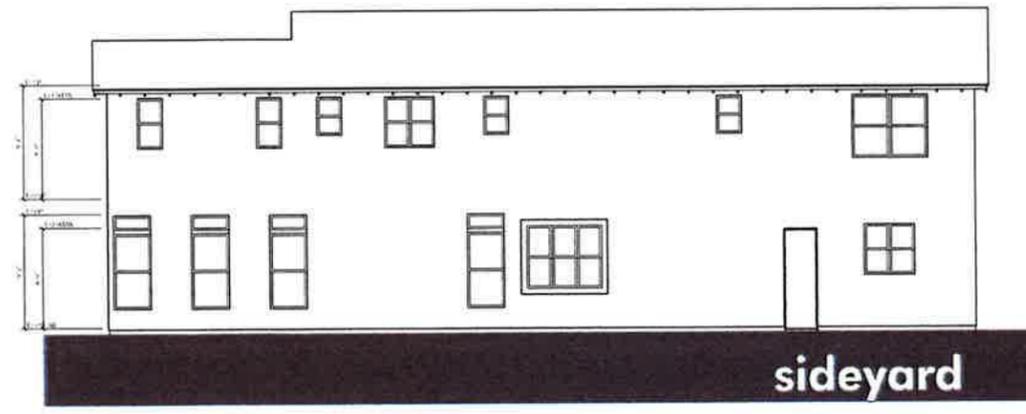
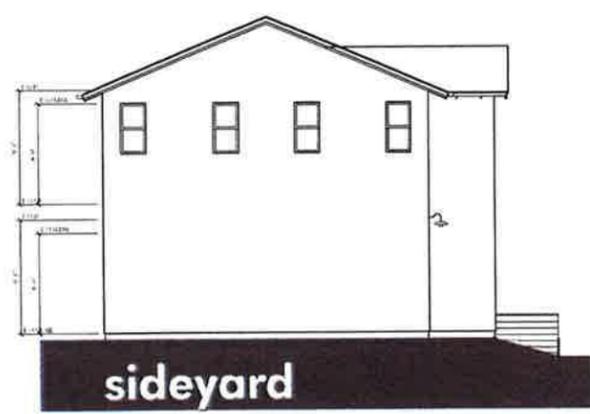
# FLOOR PLANS *open plan, indoor-outdoor living*



# ELEVATIONS PLAN 1 traditional materials and forms, contemporary details



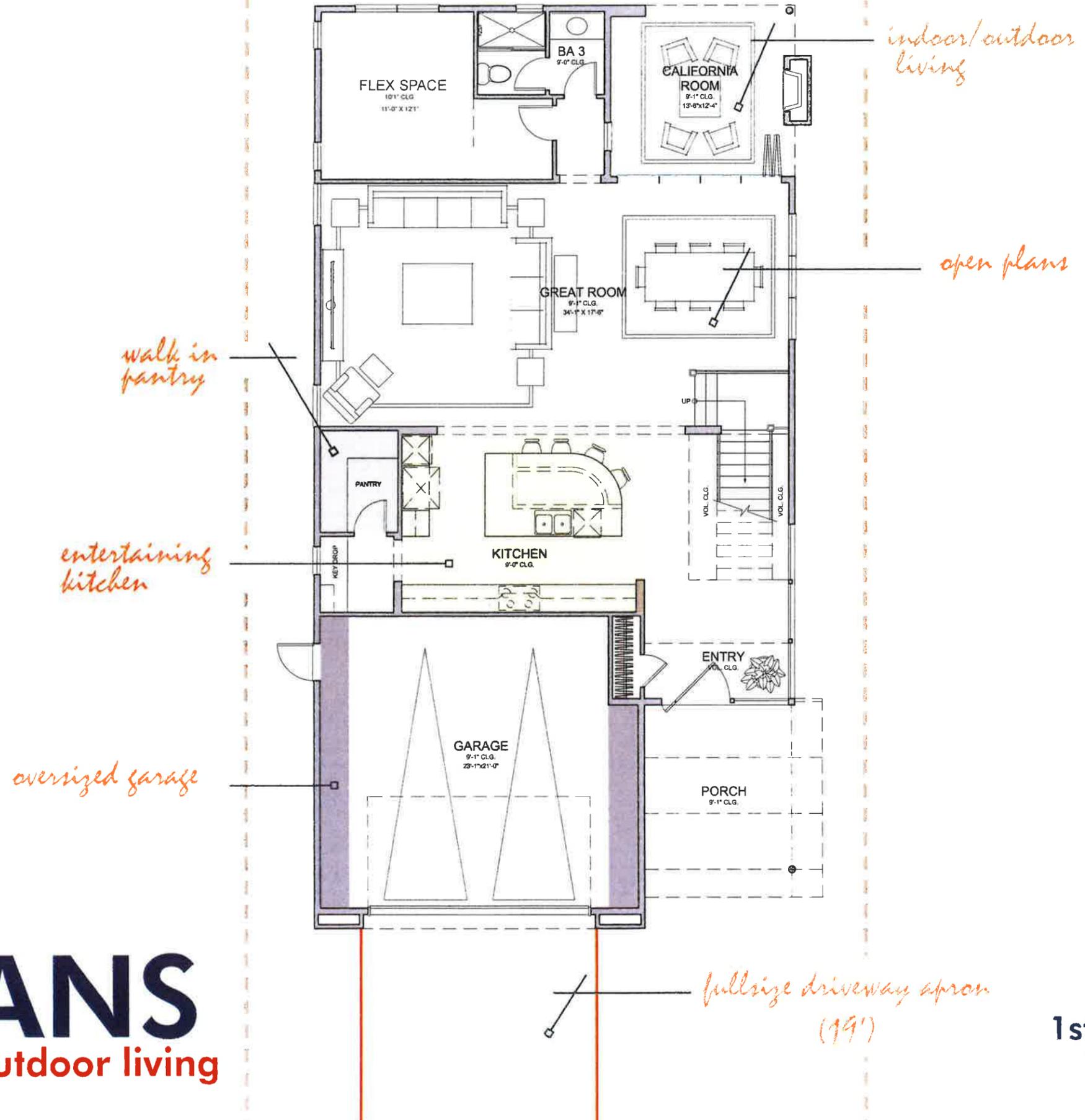
- A - COMP. SHINGLE ROOF
- B - METAL ROOF
- C - WOOD SIDING
- D - STUCCO
- E - METAL POST AND BEAM
- F - WOOD TRIM
- G - CONCRETE
- H - ROLL UP GARAGE DOOR (METAL)
- I - COACH LIGHT
- J - WOOD FASCIA



# ELEVATIONS PLAN 1 traditional materials and forms, contemporary details

## PLAN 2

3,120 sq.ft. (w/o garage)  
3 Bedroom + flex space  
4 Bath  
2 Car Garage  
California Room



# FLOOR PLANS

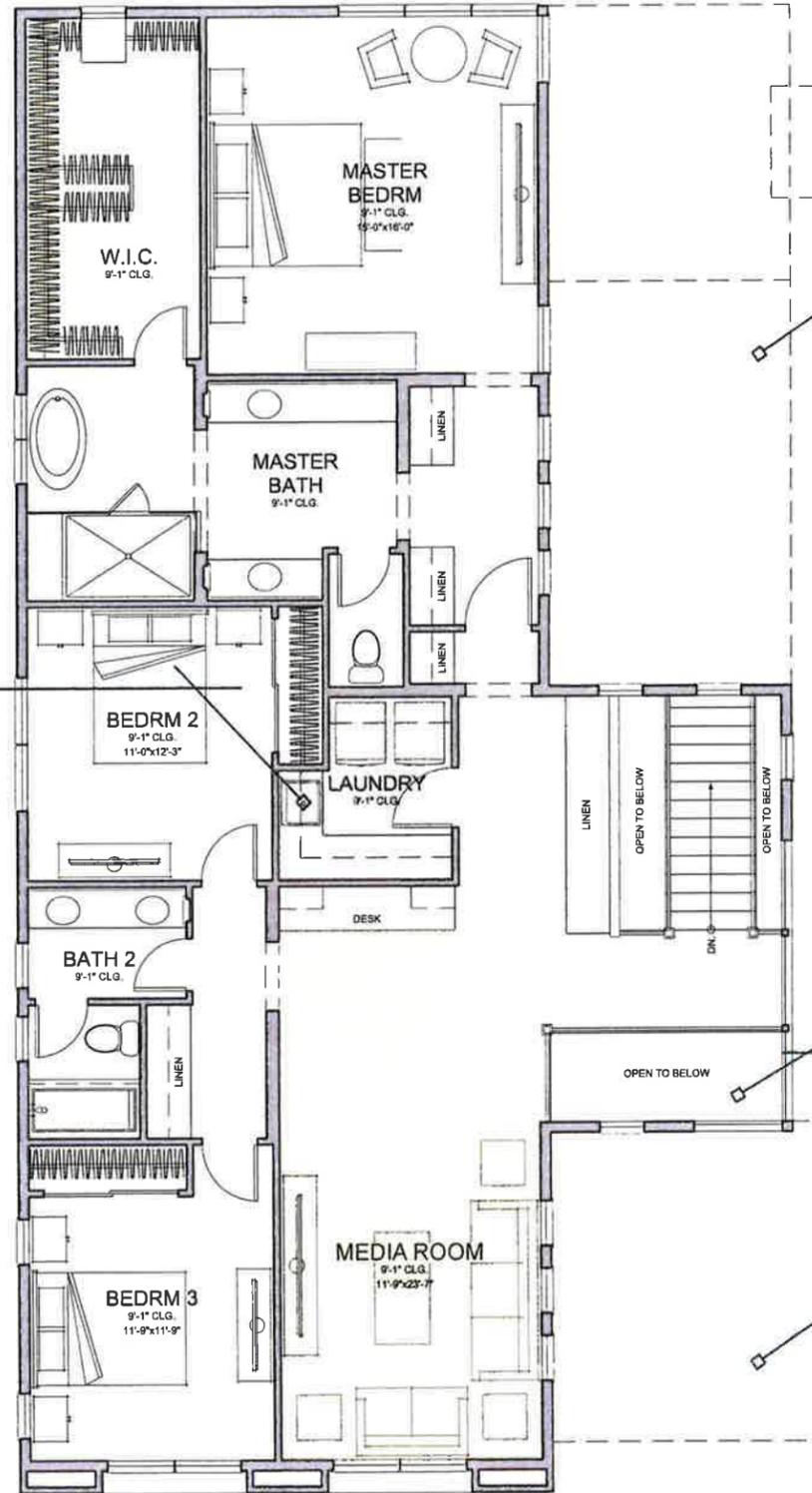
open plan, indoor-outdoor living

1st Floor  
not to scale

**PLAN 2**

- 3,120 sq.ft. (w/o garage)
- 3 Bedroom + flex space
- 4 Bath
- 2 Car Garage
- California Room

*upstairs laundry room*



*single story edges*

*2 story volume*

*single story edges*

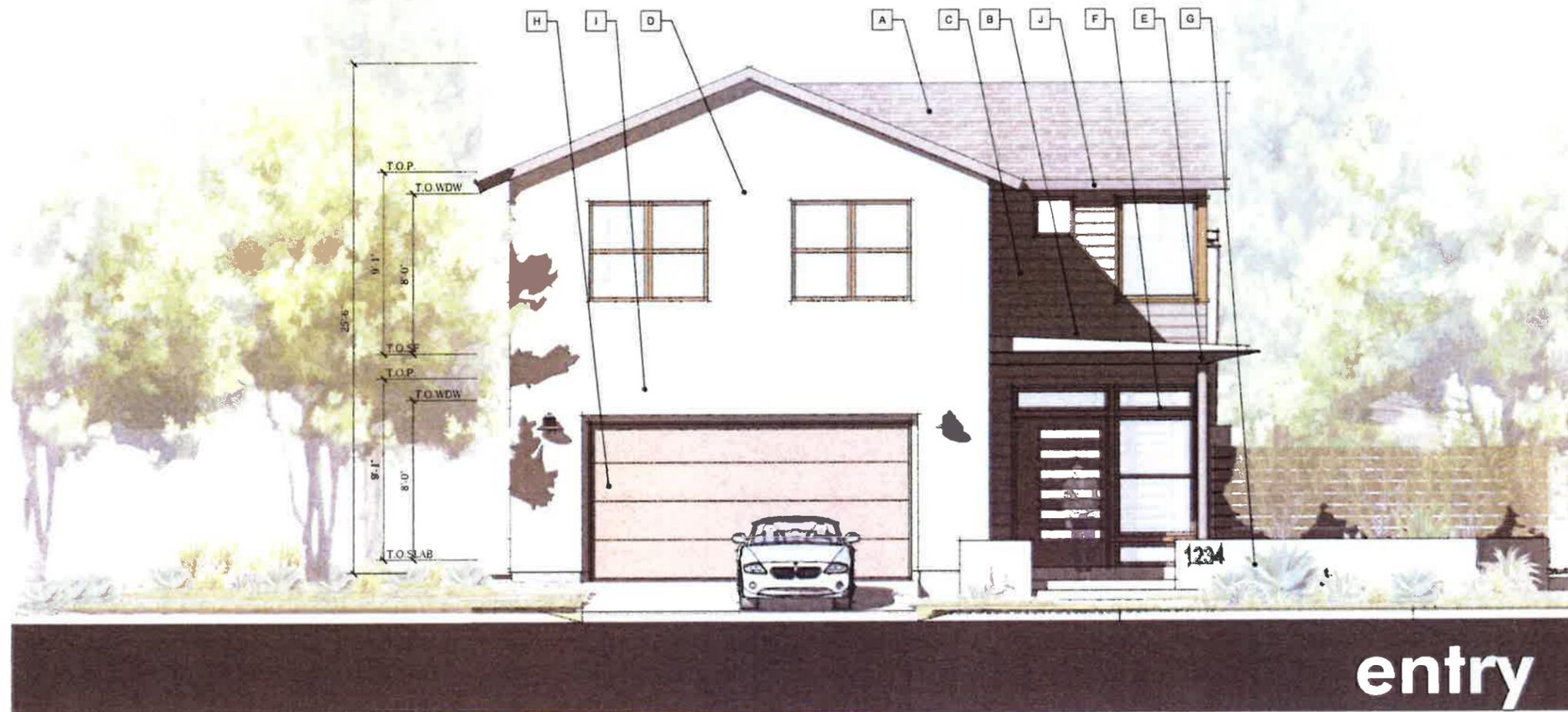
# FLOOR PLANS

open plan, indoor-outdoor living

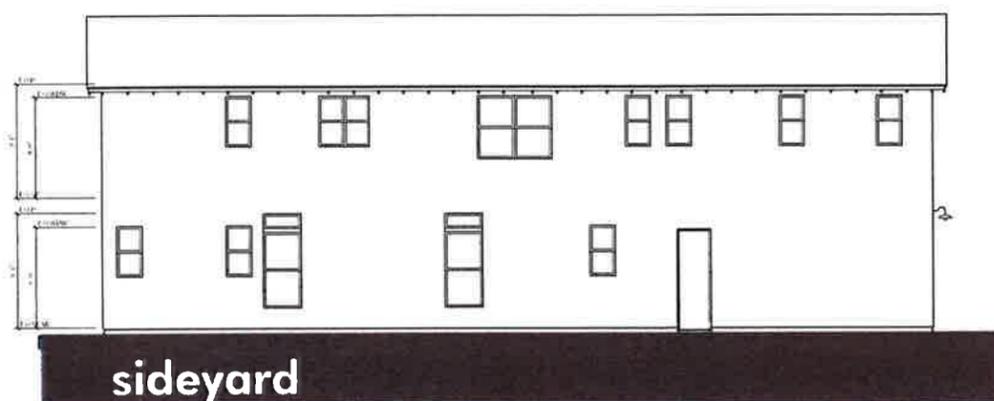
**2nd Floor**  
not to scale



# ELEVATIONS PLAN 2 traditional materials and forms, contemporary details



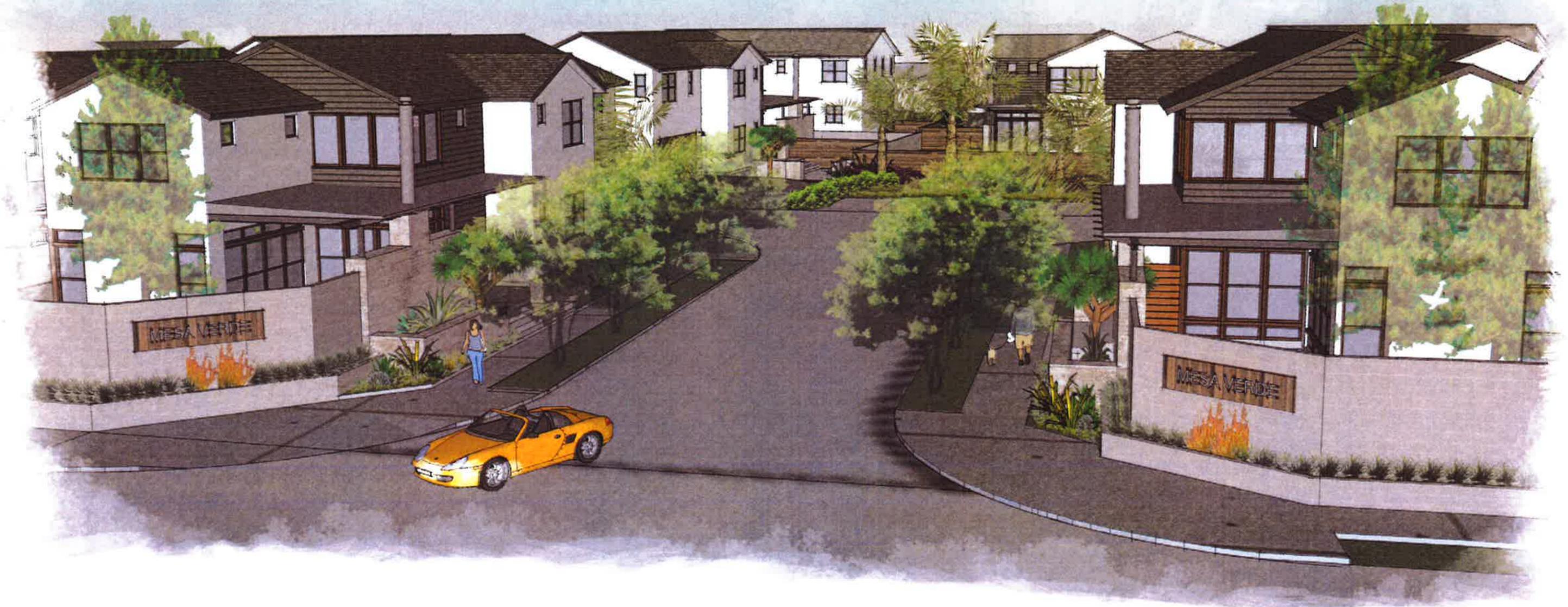
- A - COMP. SHINGLE ROOF
- B - METAL ROOF
- C - WOOD SIDING
- D - STUCCO
- E - METAL POST AND BEAM
- F - WOOD TRIM
- G - CONCRETE
- H - ROLL UP GARAGE DOOR (METAL)
- I - COACH LIGHT
- J - WOOD FASCIA



# ELEVATIONS PLAN 2 traditional materials and forms, contemporary details



# STREETSCENE **Andros Street**



# STREETSCENE *Mesa Verde Drive*



# PERSPECTIVE **Overall Site**

Appendix C:  
Mesa Water District Letter



*Dedicated to  
Satisfying our Community's  
Water Needs*

**BOARD OF DIRECTORS**

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*President  
Division V*

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Division III*

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Division IV*

**Fred R. Bockmiller, Jr., P.E.**  
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Division I*

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*Director  
Division II*

**Paul E. Shoenberger, P.E.**  
*General Manager*

**Coleen L. Monteleone**  
*District Secretary*

**Andrew N. Hamilton**  
*District Treasurer*

**Bowie, Arneson,  
Wiles & Giannone**  
*Legal Counsel*

1965 Placentia Avenue  
Costa Mesa, CA 92627  
tel 949.631.1200  
fax 949.574.1036  
Info@MesaWater.org  
**MesaWater.org**

March 26, 2015

Michael R. Murphy  
Pinnacle Residential  
20 Enterprise, Suite 320  
Aliso Viejo, CA 92656

Subject: 2880 Mesa Verde Drive East (13 Homes)

Dear Michael:

Please be advised that proper applications and financial arrangements will be completed with the Mesa Water District (Mesa Water®) for the installation of domestic water services, water mains, fire hydrants and fire services in the City of Costa Mesa.

The subject projects are within the boundaries of Mesa Water®. The aforementioned water systems are to be installed by the developer as per Mesa Water's standard specifications and, upon completion of construction, will be delivered to Mesa Water® to become part of Mesa Water's distribution facilities.

Engineering Plan Check deposit, Inspection deposit and Construction Performance Bond shall be paid and an Application Permit (A.P.) completed by the applicant prior to the approval of the plans and issuance of the A.P.

Additionally, Capacity Charges shall be collected by Mesa Water® prior to approval of plans or execution of a service agreement.

The developer shall contact Mesa Water® immediately so the proposed project development can be evaluated and the appropriate project requirements and deposits can be determined.

There is sufficient water supply and adequate pressure to serve this project, including fire protection. However, the developer will also be required to provide necessary improvements to existing impacted infrastructure and be responsible for all associated costs resulting from development activities as identified through the plan check review and approval process.

Very truly yours,

Phil Lauri, P.E.  
District Engineer

Appendix D:  
Geotechnical Exploration Report

**GEOTECHNICAL EXPLORATION REPORT  
PROPOSED RESIDENTIAL DEVELOPMENT  
2880 MESA VERDE DRIVE EAST  
COSTA MESA, CALIFORNIA**

Prepared for:

**Pinnacle Residential**

20 Enterprise, Suite 320  
Aliso Viejo, California 92656

Project No. 10646-001

April 2, 2014



**Leighton and Associates, Inc.**

A LEIGHTON GROUP COMPANY



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LIST OF ATTACHMENTS

Important Information About Your Geotechnical Engineering Report      Rear of Text

FIGURES

Figure 1 – Site Location Map.....	Rear of Text
Figure 2 – Boring Location Map.....	Rear of Text
Figure 3 – Regional Geology Map.....	Rear of Text
Figure 4 – Regional Fault Map.....	Rear of Text
Figure 5 – Historical Seismicity Map.....	Rear of Text
Figure 6 – Seismic Hazard Map.....	Rear of Text
Figure 7 – Flood Hazard Zone Map.....	Rear of Text
Figure 8 – Retaining Wall Backfill and Subdrain Detail.....	Rear of Text

APPENDICES

- Appendix A – Field Exploration Logs
- Appendix B – Laboratory Test Results
- Appendix C – General Earthwork and Grading Recommendations

## 1.0 INTRODUCTION

### 1.1 Site Description and Proposed Development

The project site is located at 2880 Mesa Verde Drive East in the city of Costa Mesa. The site location (latitude 33.6749°, longitude -117.9261°) and immediate vicinity are shown on Figure 1, *Site Location Map*. The subject site is bordered by single family residential development to the north, Andros Street to the east, Life Coach Institute (single-story wood framed structures) to the south, and Mesa Verde Drive East to the west. Topographically, the site is relatively flat with approximate ground surface elevation ranging from 56 to 60 feet above mean sea level (msl). Current drainage is accomplished as sheet flow over paved surfaces to Mesa Verde Drive East.

The project site currently consists of church buildings with paved parking areas and underground utilities. The structures were occupied at the time of this report preparation and consist of wood-framed, single-story buildings built in 1968. Based on review of historical aerial photographs (NETR, 2014), the site previously was used for agriculture prior to construction of the church buildings.

No grading plan was provided for our review, however we understand based on review of information provided by you that the proposed residential development for the site includes grading to facilitate construction of ten single-family residences up to two stories in height with associated access, utilities, and other ancillary improvements.

### 1.2 Purpose and Scope of Exploration

The purpose of our geotechnical exploration was to evaluate the subsurface conditions at the site and provide geotechnical recommendations to aid in design and construction for the project as currently proposed.

The scope of this geotechnical report included the following tasks:

- Background Review – A background review was performed of readily available, relevant geotechnical and geological literature pertinent to the project site. References used in preparation of this report are listed in Section 7.0.

- Field Exploration – Our field exploration was performed on March 11, 2014, and consisted of four hollow-stem auger borings (designated as B-1, B-2, B-3, and B-4) drilled to depths between 26½ and 51½ feet below existing ground surface (bgs). The approximate locations of the explorations performed by Leighton are shown on Figure 2, *Boring Location Map*. Prior to the field exploration, the boring locations were marked and Underground Service Alert (USA) was notified for utility clearance.

During drilling, both bulk and relatively undisturbed drive samples were obtained from the borings for geotechnical laboratory testing. Relatively undisturbed samples were collected from the borings using a Modified California Ring sampler conducted in accordance with ASTM Test Method D 3550. Standard Penetration Tests (SPT) were also performed within the hollow-stem auger test borings in accordance with ASTM Test Method D 1586. The samplers were driven for a total penetration of 18 inches, unless practical refusal, using a 140-pound automatic hammer falling freely for 30 inches. The number of blows per 6 inches of penetration was recorded on the boring logs.

The borings were logged in the field by a certified engineering geologist from our technical staff. Each soil sample collected was reviewed and described in accordance with the Unified Soil Classification System. The samples were sealed and packaged for transportation to our laboratory. After completion of drilling, the borings were backfilled with soils generated during the exploration. The boring logs are presented in Appendix A, *Field Exploration Logs*.

- Laboratory Testing – Laboratory tests were performed on representative soil samples to evaluate geotechnical engineering properties of subsurface materials. The following laboratory tests were performed:
  - In-situ Moisture Content and Dry Density (ASTM D 2216 and ASTM D 2937);
  - Atterberg Limits (ASTM D 4318);
  - Consolidation (ASTM D 2435);
  - Percent Passing No. 200 Sieve (ASTM D 1140);
  - Expansion Index (ASTM D 4829); and
  - Direct Shear (ASTM D 3080).

The results of the moisture and density determination are shown on the borings logs included in Appendix A. The results of the remaining laboratory tests are presented in Appendix B, *Laboratory Test Results*.

- Engineering Analysis – Geotechnical analysis was performed on the collected data to develop conclusions and recommendations for design and construction presented in this report.
- Report Preparation - This geotechnical report presents our findings, conclusions, and recommendations.

It should be noted that the recommendations in this report are subject to the limitations presented in Section 6.0. An information sheet prepared by ASFE (the Association of Engineering Firms Practicing in the Geosciences) is also included at the rear of the text. We recommend that all individuals using this report read the limitations along with the attached document.

## 2.0 GEOTECHNICAL FINDINGS

### 2.1 Geologic Setting

The proposed development is located at the southern margin of the Los Angeles Basin in the northwestern region of Newport Mesa, a geographically distinct topographic feature that is traceable from south of San Onofre northward almost continuously to Dana Point. From Dana Point to Newport Beach the terrace becomes semi continuous due to erosion. This wave-cut bench in Miocene and Pliocene shale deposits (Monterey Formation) has been overlain by middle to early Pleistocene paralic deposits consisting of marine strandline, beach, estuarine and non-marine colluvial deposits composed of silt, sand and cobbles (Figure 3, *Regional Geology Map*).

The Newport Mesa is characterized by an upper surface sloping gently inland from an 85- to 105-foot high cliff that faces the sea along its southern edge. The Newport-Inglewood fault zone forms an important element of the regional tectonic structure, resulting in the broad up-arching and disruption of the subsurface formations before extending out to sea beneath the southeastern corner of the mesa. The landward tilt of the mesa surface is the southernmost on-land expression of deformation along the Newport-Inglewood fault zone (Barrows, 1974).

#### 2.1.1 Geologic Structure

The Newport-Inglewood fault zone (NIFZ) is northwest-trending, right-lateral, strike-slip zone of approximately a 2- to 4-mile wide belt of anticlinal folds and faults disrupting early Holocene to Late Pleistocene-age and older deposits (Barrows, 1974) characterized by structural trends attributable to right-lateral shearing of basement rocks at depth (Moody and Hill, 1956). The zone defines the boundary between the western basement complex of Catalina type schist and related rocks to the southwest and the eastern basement complex of metasedimentary, metavolcanic, and plutonic rocks to the northeast (Yerkes et al., 1965). Right-lateral, strike-slip displacement of 3,000 to 5,000 feet has been measured in Lower Pliocene strata along the Newport-Inglewood structural zone (Dudley, 1954). Apparent vertical offset across faults of the Newport-Inglewood structural zone ranges from 4,000 feet at the basement interface, to 1,000 feet in the Pliocene strata, and 200 feet at the Plio-Pleistocene boundary (Yerkes et al., 1965). Movement along

this structural zone is inferred to have been initiated during middle Miocene time (approximately 15 million years ago), with seismic activity continuing up to present time (Figure 5, *Historical Seismicity Map*). Tilted and structurally deformed sediments have also been observed within the structural Newport-Inglewood zone (Barrows, 1974).

## 2.2 Subsurface Soil Conditions

The field explorations (hollow stem auger borings) indicate the site is underlain by undocumented artificial fill and Quaternary age Pleistocene terrace deposits.

### Artificial Fill, Undocumented: Map Symbol (Afu)

The artificial fill soils form a relatively thin mantle (2-3½ feet thick) and consist primarily of dark brown, stiff, silty to dark reddish brown, dense, coarse grained clayey with occasional manmade debris. For purposes of this report all existing fill soils are considered undocumented.

### Quaternary Old Paralic Deposits: Map Symbol (Qopf)

The late to middle Pleistocene age terrace deposits consist mostly of interbedded to massive, impermeable clays to moderately permeable sands, reddish brown, interfingering strandline, beach, colluvial, and estuarine deposits composed of firm to hard, clay, sandy clay, silty clay, clayey silt, and sandy silt to medium dense to very dense sand with varying amounts of gravel and silt. Intermixed within the blocky structure of these deposits are varying proportions of calcium carbonate, oxidation staining, and clay development. This unit was deposited along a wave-cut abrasion platform during the late to middle Pleistocene (Morton D.M., and Miller, F.K., 2006,).

A more detailed description of the subsurface soils encountered in the borings is presented in the boring logs (Appendix A). Some of the engineering properties of these soils are described in the following subsections.

#### 2.2.1 Expansive Soil

Expansive soils contain significant amounts of clay particles that swell considerably when wetted and which shrink when dried. Foundations constructed on these soils are subject to uplifting forces caused by the swelling. Without proper mitigation measures, heaving and cracking of

both building foundations and slabs-on-grade could result. Based on our exploration, the near surface onsite soils consist predominantly of clayey sand to sandy clay. The onsite near surface soils are generally considered to have a moderate to high potential for expansion. The laboratory test result of a representative composite sample from Leighton boring LB-2 showed moderate expansion potential when wetted (EI = 35).

Variance in expansion potential of onsite soil is anticipated, therefore additional testing is recommended upon completion of rough grading to confirm the expansion potential result presented in this report.

### 2.2.2 Compressibility/Collapse Potential

Based on the results of consolidation tests, the onsite soils exhibit low compressibility characteristics when subject to the anticipated loading. Potential for collapse is not a design factor for this project.

## 2.3 Groundwater

Groundwater was not encountered during our field exploration to a depth explored of 51½ feet bgs. According to groundwater information obtained through the California Geological Survey (CGS), formerly the California Division of Mines and Geology, in the vicinity of the site, historically shallowest groundwater depth is approximately 30 feet below the existing ground surface (CGS, 1997). Based on the current proposed residential development scheme, groundwater is not expected to pose a constraint during construction.

Based on groundwater data presented in this report, seasonal fluctuations in groundwater elevations should be anticipated over time. Local perched groundwater conditions or surface seepage may develop once site development is completed and landscape irrigation commences.

### 3.0 GEOLOGIC/SEISMIC HAZARDS

Geologic and seismic hazards include surface faulting, seismic shaking, landslides, liquefaction, seismically induced settlement, lateral spreading, seismically induced landslides, seiches and tsunamis, and flooding. The following sections discuss these hazards and their potential impact at the project site.

#### 3.1 Surface Fault Rupture

Our review of available in-house literature indicates that no known active faults have been mapped across the site, and the site is not located within a designated Alquist-Priolo Earthquake Fault Zone (CGS, 1986; Hart and Bryant, 2007). Therefore, a surface fault rupture hazard evaluation is not mandated for this site. There are no currently known active surface faults at this site (Figure 4, *Regional Fault Map*).

Presently, several sections of the Newport-Inglewood zone of deformation south and west of the site are included in the Alquist-Priolo Earthquake Fault Zone. However, from Huntington Beach Mesa southward, the Newport-Inglewood zone has not been designated as part of the Alquist-Priolo Earthquake Fault Zone, mainly because of the lack of evidence for faulting in young sediments. The South Branch of the Newport Inglewood fault zone trends just south the site. However, this fault is not considered active by State of California definition; therefore, the potential risk for surface fault rupture at this site is currently deemed low.

The location of the closest active faults to the site was generated using the United States Geological Survey (USGS) Earthquake Hazards Program (USGS, 2008a). The closest active faults to the site are the San Joaquin Hills blind thrust fault and the Newport-Inglewood Fault Zone, located approximately 1.4 miles and 3.0 miles, respectively, from the site. The San Andreas fault, which is the largest active fault in California, is approximately 49.2 miles northeast of the site.

#### 3.2 Secondary Seismic Hazards

In general, secondary seismic hazards for the site could include soil liquefaction, seismically induced settlement, lateral spreading, seismically induced landsliding, seiches and tsunamis. These potential secondary seismic hazards are discussed below.



### 3.2.1 Liquefaction Potential

Liquefaction is the loss of soil strength or stiffness due to increasing pore-water pressure during severe ground shaking. Liquefaction is associated primarily with loose (low density), saturated, fine- to medium-grained, cohesionless soils.

As shown on the State of California Seismic Hazard Zones Map for the Newport Beach Quadrangle (CGS, 1998), this site is not located within an area that has been identified by the State of California as being potentially susceptible to liquefaction (Figure 6, *Seismic Hazard Map*). Furthermore, the blow counts recorded during our exploration did not suggest the site soil is prone to liquefaction. Therefore, it is our opinion that the potential for liquefaction occurring at the site is low.

### 3.2.2 Seismically Induced Settlement

During a strong seismic event, seismically induced settlement can occur within loose to moderately dense, unsaturated granular soils, separate from liquefaction. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. Based on blow count records, the seismically induced settlement under the building is anticipated to be less than one inch.

### 3.2.3 Lateral Spreading

Lateral spreading is a phenomenon in which large blocks of intact, non-liquefied soil move downslope on a liquefied soil layer. Lateral spreading is often a regional event. For lateral spreading to occur, the liquefiable soil zone must be laterally continuous, unconstrained laterally, and free to move along sloping ground. Due to the low susceptibility for liquefaction, the potential for lateral spreading is considered very low.

### 3.2.4 Seismically Induced Landslides

Significant slopes are not located on or near the site. Based on the State of California Seismic Hazard Zones Map for the Newport Beach Quadrangle (CGS, 1998), the site is not located within an area that has been identified by the State of California as being potentially susceptible to seismically induced landslides (Figure 6).

### 3.2.5 Seiches and Tsunamis

Seiches are large waves generated in very large enclosed bodies of water or partially enclosed arms of the sea in response to ground shaking. Tsunamis are waves generated in large bodies of water by fault displacement or major ground movement. According to the State of California Tsunami Inundation Map for Emergency Planning Newport Beach Quadrangle (CGS, 2009), the Site is situated well above the tsunami inundation line, therefore the risk of tsunami inundation is very low. Additionally, based on the lack of large enclosed water bodies nearby, seiche risks are considered very low.

### 3.3 Flooding Hazards

According to a Federal Emergency Management Agency (FEMA) flood insurance rate map (FEMA, 2008), the site is not located within a flood zone (Figure 7, *Flood Hazard Zone Map*).

## 4.0 DESIGN RECOMMENDATIONS

Geotechnical recommendations for the proposed development are presented in the following sections and are intended to provide sufficient geotechnical information to develop the project in general accordance with 2013 California Building Code (CBC) requirements. The following recommendations are considered preliminary and should be considered minimal from a geotechnical viewpoint as there may be more restrictive requirements of the architect, structural engineer, governing agencies and the City of Costa Mesa.

The geotechnical consultant should review the grading plan, foundation plan and specifications as they become available to verify that the recommendations presented in this report have been incorporated into the plans prepared for the project.

### 4.1 Earthwork

We recommend all earthwork for the project be performed in accordance with the following recommendations, future grading plan review report(s), the City of Costa Mesa grading requirements and the *General Earthwork and Grading Specifications* included in Appendix C. In case of conflict the following recommendations shall supersede those provided in Appendix C.

#### 4.1.1 Site Preparation

Prior to construction, the areas proposed for residential development and improvements should be cleared of any existing improvements associated with the former land use (demolition of structures, concrete pads and asphalt) and properly disposed of offsite. Efforts should be made to locate any existing utility lines to be removed or rerouted where interfering with the proposed construction. Any resulting cavities should be properly backfilled and compacted. After the areas are cleared, the soils should be carefully observed for the removal of all potentially unsuitable deposits.

#### 4.1.2 Overexcavation and Recommpaction

The existing undocumented artificial fill should be removed to expose competent native terrace deposits and replaced as engineered fill. The structural elements for the proposed residential structures and improvements may be supported on conventional shallow footing foundation systems established on at least three feet of engineered fill

soils established on competent native soils (terrace deposits). All other incidental improvements (such as flatwork and hardscape) may be supported on one foot of engineered fill established on competent native soils. Overexcavation and recompaction should extend a minimum horizontal distance equal to the vertical distance between the proposed footing bottom and depth of overexcavation. However, care should be used to avoid undermining existing improvements surrounding the project site. Excavation adjacent to existing wall foundations in the north and south portions of the site that extend below bearing elevation may require slot-cutting techniques or shoring to perform the excavation and protect the foundations.

The "ABC" slot cut method may be used for construction of the new foundation located immediately adjacent to existing foundations. The initial cut along the excavation should not be steeper than 1H to 1V (horizontal to vertical). The maximum width and height of the slots should not exceed eight feet. The width of the earth buttress on either side of the slot should be maintained at a minimum of 12 feet.

After completion of the overexcavation and prior to fill placement or other improvements such as flatwork and hardscape, the exposed soils should be scarified to a minimum depth of six inches, moisture conditioned 3 to 4 percentage points above optimum moisture content and compacted to a minimum of 90 percent relative compaction (ASTM D 1557).

#### 4.1.3 Fill Placement

The onsite soils, less any deleterious material (construction debris) or organic matter, can be used in required fills. Oversized material greater than 6 inches in maximum dimension should not be placed in the fill. Areas prepared to receive structural fill and/or other surface improvements should be scarified, brought to 3 to 4 percent over optimum moisture content and recompacted to at least 90 percent relative compaction per ASTM Test Method D 1557.

Any required import material should consist of non-corrosive and relatively non-expansive soils with an Expansion Index (EI) less than 20. The imported materials should contain sufficient fines (binder material) so as to result in a stable subgrade when compacted. All proposed import

materials should be approved by the geotechnical engineer of record prior to being placed at the site. The use of free-draining granular soils as structural compacted fill adjacent to or within the proposed buildings is generally not recommended since soils of this type can allow the accumulation of water infiltration, which may activate the expansive characteristics of the underlying soils.

With the anticipation that all fill soil will be derived from onsite moderate to highly expansive clay earth material all fill should be placed in thin, loose lifts, with each lift properly moisture conditioned 3 to 4 percentage points above optimum moisture content and compacted to a minimum of 90 percent relative compaction (ASTM D 1557). The optimum lift thickness to produce a uniformly compacted fill will depend on the type and size of compaction equipment used. Proper moisture conditioning of the soils is vital in reducing expansion potential and reducing the potential for post-construction heave that may result in distortion and possibly damage to new improvements. Aggregate base should be compacted to a minimum of 95 percent relative compaction (ASTM D 1557).

#### 4.1.4 Pipe Bedding

Any proposed pipe should be placed on properly placed bedding materials. Pipe bedding should extend to a depth in accordance with the pipe manufacturer's specification. The pipe bedding should extend to at least 12 inches over the top of the pipeline. The bedding material may consist of compacted free-draining sand, gravel, or crushed rock and should be densified by mechanical means (flooding or jetting are not appropriate at this site). Pipe bedding material should have a Sand Equivalent (SE) of at least 30 per California Test Method CTM-217. A 5-foot-long seepage plug consisting of clay soil or CLSM slurry should be placed as backfill where the trench enters under the building slab, with the purpose of preventing water from within the trench bedding from seeping into/under the building pad.

#### 4.1.5 Trench Backfill

Trench excavations above pipe bedding zone may be backfilled with onsite soils under the observation of the geotechnical consultant. All fill soils should be placed in loose lifts, moisture conditioned as required and

compacted to a minimum of 90 percent relative compaction based on ASTM Test Method D 1557. Lift thickness will be dependent on the equipment used as suggested in the latest edition of the Standard Specifications for Public Works Construction (Greenbook). The fill soils should extend to the bottom of the aggregate base for new pavement, or to finished grade in non-paved areas.

#### 4.1.6 Surface Drainage

Positive drainage of surface water away from structures is very important. Water should not be allowed to pond adjacent to buildings. Positive drainage may be accomplished by providing drainage away from buildings a minimum of 2 percent for earthen surfaces for a lateral distance of at least five feet and further maintained by a swale or drainage path at a gradient of at least 1 percent. Where necessary, drainage paths may be shortened by the use of area drains and collector pipes. Eave gutters are recommended and should reduce water infiltration into the subgrade materials. Downspouts should be connected to appropriate outlet devices.

Irrigation of landscaping should be controlled to maintain, as much as possible, consistent moisture content sufficient to provide healthy plant growth without over watering.

#### 4.2 Seismic Design Parameters

To accommodate effects of ground shaking produced by regional seismic events, seismic design can, at the discretion of the designing Structural Engineer, be performed in accordance with the 2013 edition of the California Building Code (CBC). Table 1, *2013 CBC Seismic Parameters*, lists seismic design parameters based on the 2013 CBC methodology, which is based on ASCE/SEI 7-10:

### 2013 CBC Seismic Parameters

Seismic Design Parameters	Value
Site Latitude (decimal degrees)	33.6749
Site Longitude (decimal degrees)	-117.9261
Site Class Definition (ASCE 7 Table 20.3-1)	D
Mapped Spectral Response Acceleration at 0.2s Period, $S_s$ (Figure 1613.3.1(1))	1.601
Mapped Spectral Response Acceleration at 1s Period, $S_1$ (Figure 1613.3.1(2))	0.592
Short Period Site Coefficient at 0.2s Period, $F_a$ (Table 1613.3.3(1))	1.0
Long Period Site Coefficient at 1s Period, $F_v$ (Table 1613.3.3(2))	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, $S_{MS}$ (Eq. 16-37)	1.601
Adjusted Spectral Response Acceleration at 1s Period, $S_{M1}$ (Eq. 16-38)	0.888
Design Spectral Response Acceleration at 0.2s Period, $S_{DS}$ (Eq. 16-39)	1.067
Design Spectral Response Acceleration at 1s Period, $S_{D1}$ (Eq. 16-40)	0.592

#### 4.3 Footing Foundations

New shallow spread footings established on engineered fill may be used to support the proposed residential structures. It is anticipated that a perimeter property line free standing wall will be constructed around a majority of the site. Earthwork removals may be limited due to the proximity of the adjacent property line. Footings may need to be deepened due to grading limitations from property line constraints. Recommendations for deepened footings can be provided in a geotechnical grading plan review report based on the proposed grading plan.

Due to the variance in expansion potential anticipated, additional testing is recommended upon completion of rough grading to verify the expansion potential results presented in this report. These recommendations may need to be revised based on results of future testing.

##### 4.3.1 Minimum Embedment and Width

Continuous strip footings should have a minimum width of 18 inches. Isolated square pad column footings are recommended to be a minimum of 24 inches in width. The bottom of the footing should be at least 24 inches below lowest adjacent grade or finish floor elevation.

#### 4.3.2 Allowable Bearing Pressure

The footings may be designed for a maximum net allowable soil bearing pressure of 2,000 pounds per square foot (psf) for isolated column footings and 3,000 psf continuous strip footings. The soil bearing pressure may be increased by one-third for transient loads such as wind and seismic forces.

#### 4.3.3 Lateral Load Resistance

Resistance to lateral loads will be provided by a combination of friction between the soil and foundation interface and passive pressure acting against the vertical portion of the footings. For calculating allowable lateral resistance, a passive pressure of 250 psf per foot of depth to a maximum of 2,500 psf and a frictional coefficient of 0.30 may be used provided the foundations are supported within structural compacted fill as previously described. No reduction is necessary when combining frictional and passive resistance.

#### 4.3.4 Settlement

The estimated total settlement of the structures supported on spread footings as recommended above is less than 1 inch. The differential settlement between adjacent columns is estimated to be less than ½ inch over a horizontal distance of 30 feet.

#### 4.4 Conventional Slab-On-Grade

Concrete slabs may be designed using a modulus of subgrade reaction of 100 pci provided the subgrade is prepared as described in Section 4.1 of this report, which includes proper moisture conditioning and recompaction of the soils. Moisture content in the finish subgrade within the building footprint should be maintained at 120 percent above the optimum moisture content to a depth of at least 24 inches. For areas 5 feet laterally outside the building footprint, the moisture content within the top 16 inches of finish grade should be maintained at 120 percent above optimum moisture content. The subgrade soils should be evaluated by the geotechnical engineer at the time of construction to verify adequate moisture conditioning has been performed and maintained. From a geotechnical standpoint, we recommend slab-on-grade be a minimum four inches thick with No. 4 rebar placed at the center of the slab at 18 inches on

center in each direction. The structural engineer should design the actual thickness and reinforcement based on anticipated loading conditions and expansive characteristics of the onsite soil.

Minor cracking of concrete after curing due to drying and shrinkage is normal and should be expected; however, concrete is often aggravated by a high water/cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations should also be expected. The use of low-slump concrete or low water/cement ratios can reduce the potential for shrinkage cracking. Additionally, our experience indicates that the use of reinforcement in slabs and foundations can generally reduce the potential for concrete cracking. To reduce the potential for excessive cracking, concrete slabs-on-grade should be provided with construction or weakened plane joints at frequent intervals. Joints should be laid out to form approximately square panel

#### 4.5 Post-Tensioned Foundation Recommendations

As an alternative to conventional slab-on-grade, a post-tensioned slab may be used. Based on results of this investigation, preliminary recommendations for post-tensioned slabs design are as follows:

Condition	Center Lift	Edge Lift
Edge Moisture Variance Distance, $e_m$ (feet)	5.3	3.7
Differential Soil Movement, $y_m$ (inches)	4.5	1.6

The slabs may be designed for an average allowable bearing pressure of 1,500 pounds per square foot (psf) for dead plus live loads with maximum localized bearing pressure of 2,000 psf for column or wall loads. The allowable bearing pressure may be increased by one-third for short-term loading including wind and seismic loads. The structural engineer should also design the post-tensioned slabs with adequate stiffness to minimize potential cracking in the slabs. A minimum thickness of 12 inches should be maintained around the outer edge of the slab below the lowest adjacent grade.

We also recommend that the moisture content in the finish subgrade within the building footprint be maintained at 120 percent above the optimum moisture

content to a depth of at least 24 inches. For areas five feet laterally outside the building footprint, the moisture content within the top 16 inches of the finish subgrade should be maintained at 120 percent above the optimum moisture content. Adequate observation and testing should be performed during future site grading to verify the moisture and density of the in-place fill and new fill meet the desired requirements.

We recommend additional Expansion Index tests be conducted prior to the home construction phase. The above recommended design criteria may subject to change if the expansion potential of the subgrade soil is found to be different than assumed herein.

#### 4.6 Vapor Retarder

The following recommendations are for informational purposes since they are unrelated to the geotechnical performance of the foundation. Post construction moisture migration should be expected below the foundation.

In general, interior floor slabs with moisture sensitive floor coverings are recommended to be underlain by a minimum 10-mil thick vapor retarder that has a permeance of less than 0.3 perms, as determined by ASTM E 96, and meets the applicable code requirements (ASTM E 1745). The foundation engineer/architect should determine whether the use of a capillary break (crushed gravel layer) in conjunction with a vapor retarder is necessary or required by code. Sand layer thickness above the barrier should also be determined by the foundation engineer/architect. Sand layers should be installed where applicable in accordance with ACI Publication 302 Guide for Concrete Floor and Slab Construction.

Leighton does not practice in the field of moisture vapor transmission evaluation, since this is not specifically a geotechnical issue. Therefore, we recommend that a qualified person, such as the flooring subcontractor and/or structural engineer, be consulted to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. That person should provide recommendations for mitigation of potential adverse impact of moisture vapor transmission on various components of the structures as deemed appropriate.

#### 4.7 Stormwater Infiltration

No plans regarding the design of stormwater infiltration devices were presented for our review. Often, a combination of methods is implemented to reduce storm water runoff and increase infiltration including permeable pavements, grass-lined swales, retention areas and/or drywells.

Due to the thick, expansive clay layer encountered in our borings that extends 15 feet to 25 feet bgs, stormwater infiltration is not feasible for this project site.

#### 4.8 Lateral Earth Pressures

We recommend that retaining walls be backfilled with very low expansive soil and constructed with a backdrain in accordance with the recommendations provided on Figure 8, *Retaining Wall Backfill and Subdrain Detail*. Using expansive soil as retaining wall backfill will result in higher lateral earth pressures exerted on the wall and are, therefore, not recommended. Based on these recommendations, the following parameters may be used for the design of conventional retaining walls.

Static Equivalent Fluid Pressure (pcf)	
Condition	Level Backfill
Active	40
At-Rest	55
Passive (ultimate)	250 (Maximum 2,500 psf)

The above values do not contain an appreciable factor of safety, so the structural engineer should apply the applicable factors of safety and/or load factors during design. Cantilever walls that are designed to yield at least  $0.001H$ , where  $H$  is equal to the wall height, may be designed using the active condition. Rigid walls and walls braced at the top should be designed using the at-rest condition. Passive pressure is used to compute soil resistance to lateral structural movement. In addition, for sliding resistance, a frictional resistance coefficient of 0.30 may be used at the concrete and soil interface. The lateral passive resistance should be taken into account only if it is ensured that the soil providing passive resistance, embedded against the foundation elements, will remain intact

with time. A soil unit weight of 125 pcf may be assumed for calculating the actual weight of the soil over the wall footing.

In addition to the above lateral forces due to retained earth, surcharge due to improvements, such as an adjacent structure or traffic loading, should be considered in the design of the retaining wall. Loads applied within a 1:1 projection from the surcharging structure on the stem of the wall should be considered in the design. A third of uniform vertical surcharge loads should be applied at the surface as a horizontal pressure on cantilever (active) retaining walls, while half of uniform vertical surcharge-loads should be applied as a horizontal pressure on braced (at-rest) retaining walls. To account for automobile parking surcharge, we suggest that a uniform horizontal pressure of 100 psf (for restrained walls) or 70 psf (for cantilever walls) be added for design, where autos are parked within a horizontal distance behind the retaining wall less than the height of the retaining wall stem.

For walls with a retained height over 12 feet, or where otherwise required by Code or deemed appropriate by the structural engineer, we recommend that the wall designs be checked seismically using an *additive seismic* Equivalent Fluid Pressure (EFP) of 15 pcf, which is added to the *active* EFP. Such walls that are to be designed in the static case assuming the *at-rest* condition should be checked seismically using this *additive seismic* EFP added to the *active* condition (i.e., the *additive seismic* EFP is not added to the *at-rest* EFP). The *additive seismic* EFP should be applied with a standard EFP pressure distribution (i.e., it is not an inverted triangle).

Conventional retaining wall footings should have a minimum width of 18 inches and a minimum embedment of 24 inches below the lowest adjacent grade. An allowable bearing pressure of 2,000 psf may be used for retaining wall footing design, based on the minimum footing width and depth. This bearing value may be increased by 250 psf per foot increase in width or depth to a maximum allowable bearing pressure of 3,000 psf.

#### 4.9 Pavement Design

Based on the design procedures outlined in the current Department of Transportation (Caltrans) Highway Design Manual, and using an assumed R-value of 15 for subgrade and 78 for crushed aggregate base course, the following flexible pavement sections may be used for various Traffic Indices.

Traffic Index	Asphalt Concrete (inches)	Base Course (inches)
5.0 or less	3	8
6.0	4	10

In areas where Portland Cement Concrete (PCC) pavements are planned, such as fire-truck access road, the pavement is recommended to be a minimum of six inches in thickness underlain by a minimum six inches of base course.

All pavement construction should be performed in accordance with the latest edition of the Standard Specifications for Public Works Construction (SSPWC). Field observation and periodic testing, as needed during placement of the base course materials, should be undertaken to ensure that the requirements of the standard specifications are fulfilled. Prior to placement of base course, the subgrade soil should be scarified to a minimum depth of six inches, moisture-conditioned to 3 to 4 percent above optimum moisture content, and recompact to a minimum of 90 percent relative compaction. Base material should be placed in thin lifts, moisture conditioned as necessary, and compacted to a minimum of 95 percent relative compaction.

Upon completion of rough grading samples of street subgrade should be collected and tested for R-value to verify the assumed value used in design of structural sections in this report. Additionally, if paver construction is considered, the concrete paver type should be provided to Leighton along with the appropriate Traffic Index (TI) values to generate appropriate recommendations for structural paver support.

#### 4.10 Grading and Foundation Plan Review

When available, grading and foundation plans should be reviewed by Leighton in order to verify our geotechnical recommendations are properly implemented into design of the project. Updated recommendations and/or field work may be necessary.

## 5.0 CONSTRUCTION CONSIDERATIONS

### 5.1 Temporary Excavations

All temporary excavations, including footings, utility trenches, should be performed in accordance with project plans, specifications, and all OSHA requirements. Excavations 5 feet or deeper should be laid back or shored in accordance with OSHA requirements before personnel are allowed to enter.

No surcharge loads should be permitted within a horizontal distance equal to the height of cut or 5 feet, whichever is greater from the top of the cut, unless the cut is shored appropriately.

During construction, the soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor shall be responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Soil types will vary, but Type C soils can be expected at shallow depths. Close coordination between the competent person and the geotechnical engineer should be maintained to facilitate construction while providing safe excavations.

### 5.2 Additional Geotechnical Services

The geotechnical recommendations presented in this report are based on subsurface conditions as interpreted from limited subsurface explorations and limited laboratory testing. Our conclusions and recommendations presented in this report should be reviewed and verified by Leighton during site grading and construction and revised accordingly, if exposed geotechnical conditions vary from our preliminary findings and interpretations. The recommendations presented in this report are only valid if Leighton verifies the site conditions during construction.

Geotechnical observation and testing should be provided during the following activities:

- Grading and excavation of the site;
- Subgrade preparation;
- Compaction of all fill materials;

- Utility trench backfilling and compaction;
- Footing excavation and slab-on-grade preparation;
- During installation of temporary shoring, wherever needed; and
- When any unusual conditions are encountered.

## 6.0 LIMITATIONS

This report was based solely on data obtained from a limited number of geotechnical exploration, and soil samples and tests. Such information is, by necessity, incomplete. The nature of many sites is such that differing soil or geologic conditions can be present within small distances and under varying climatic conditions. Changes in subsurface conditions can and do occur over time. Therefore, the findings, conclusions, and recommendations presented in this report are only valid if Leighton and Associates, Inc. has the opportunity to observe subsurface conditions during grading and construction, to confirm that our preliminary data are representative for the site. Leighton and Associates, Inc. should also review the construction plans and project specifications, when available, to comment on the geotechnical aspects.

This report was prepared using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. The findings, conclusion, and recommendations included in this report are considered preliminary and are subject to verification. We do not make any warranty, either expressed or implied.

## 7.0 REFERENCES

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# Important Information about Your Geotechnical Engineering Report

*Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.*

*While you cannot eliminate all such risks, you can manage them. The following information is provided to help.*

## **Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects**

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

## **Read the Full Report**

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

## **A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors**

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## **Subsurface Conditions Can Change**

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.*

## **Most Geotechnical Findings Are Professional Opinions**

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

## **A Report's Recommendations Are Not Final**

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual*

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

### **A Geotechnical Engineering Report Is Subject to Misinterpretation**

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

### **Do Not Redraw the Engineer's Logs**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

### **Give Contractors a Complete Report and Guidance**

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

### **Read Responsibility Provisions Closely**

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### **Geoenvironmental Concerns Are Not Covered**

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

### **Obtain Professional Assistance To Deal with Mold**

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

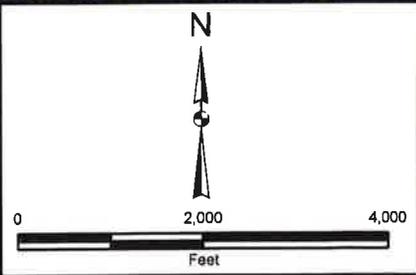
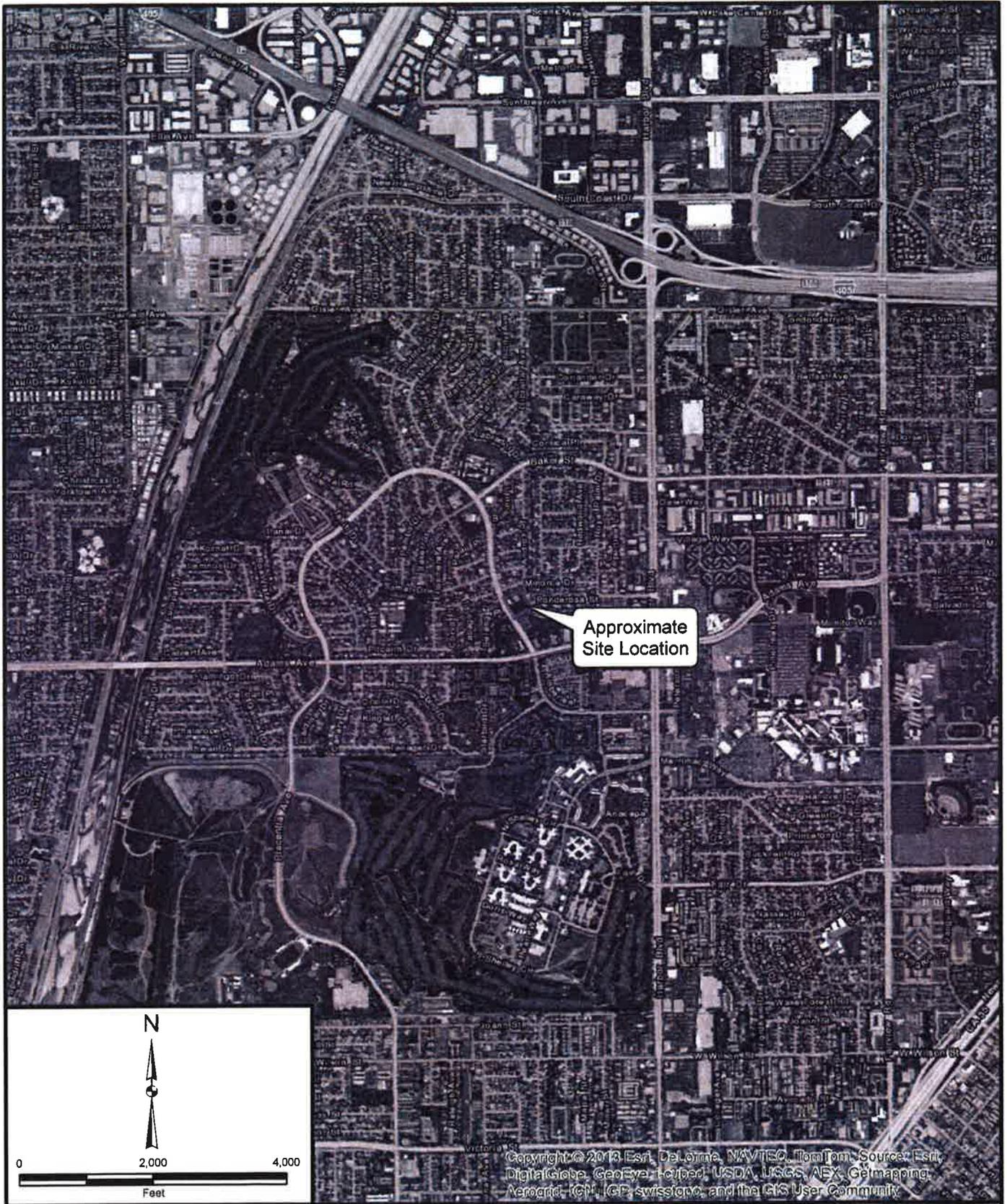
### **Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance**

Membership in ASFE/THE BEST PEOPLE ON EARTH exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910  
Telephone: 301/565-2733 Facsimile: 301/589-2017  
e-mail: info@asfe.org www.asfe.org

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Project: 10646.001	Eng/Geol: CR/JAR
Scale: 1" = 2,000'	Date: March 2014
Base Map: ESRI ArcGIS Online 2014	
Thematic Information: Leighton	
Author: Leighton Geomatics (mmurphy)	

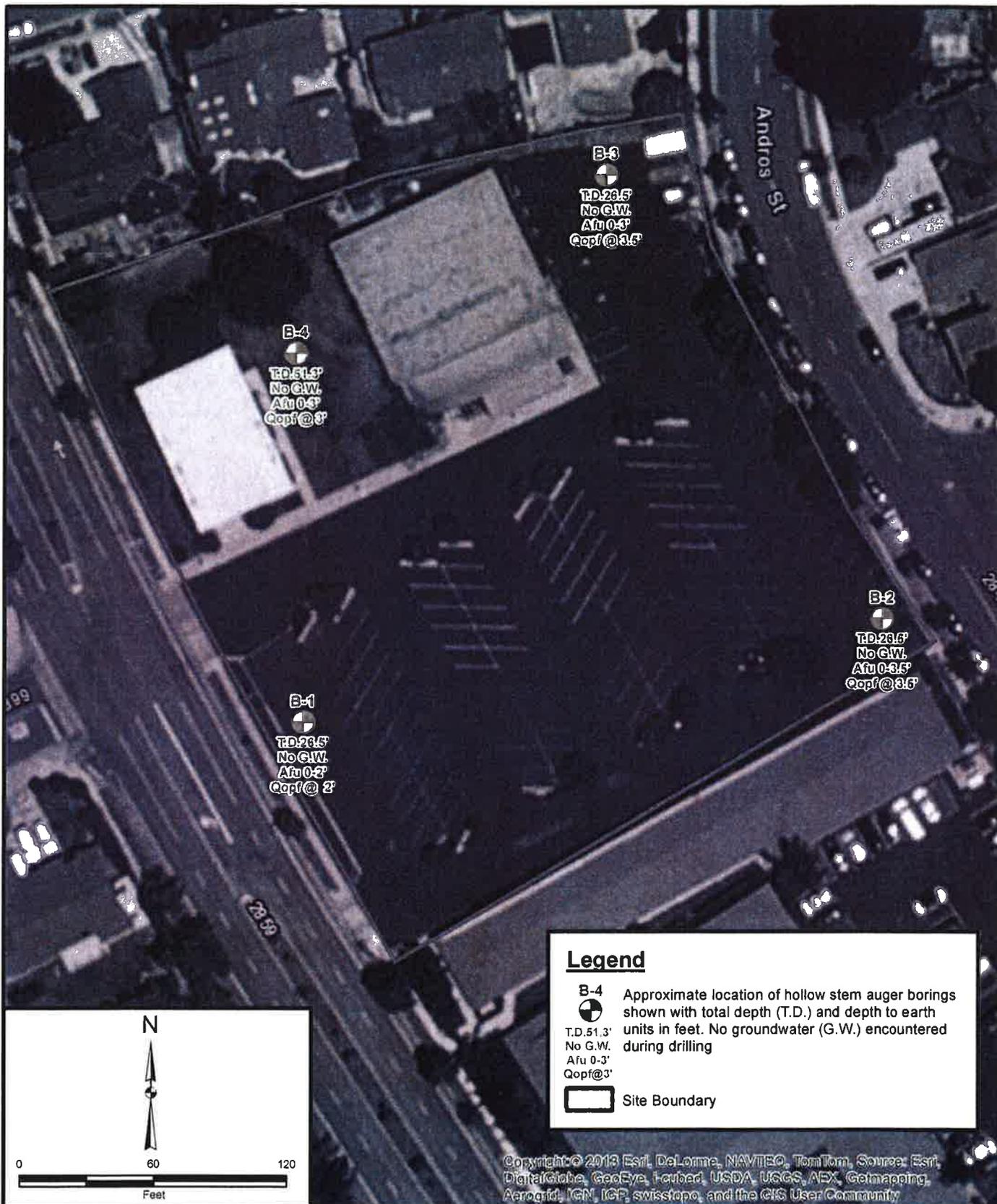
## SITE LOCATION MAP

2880 Mesa Verde Drive East  
Costa Mesa, California

Figure 1



Leighton



Project: 10646.001	Eng/Geol: CR/JAR
Scale: 1" = 60'	Date: March 2014
Base Map: ESRI ArcGIS Online 2014 Thematic Information: Leighton Author: Leighton Geomatics (mmurphy)	

## BORING LOCATION MAP

2880 Mesa Verde Drive East  
 Costa Mesa, California

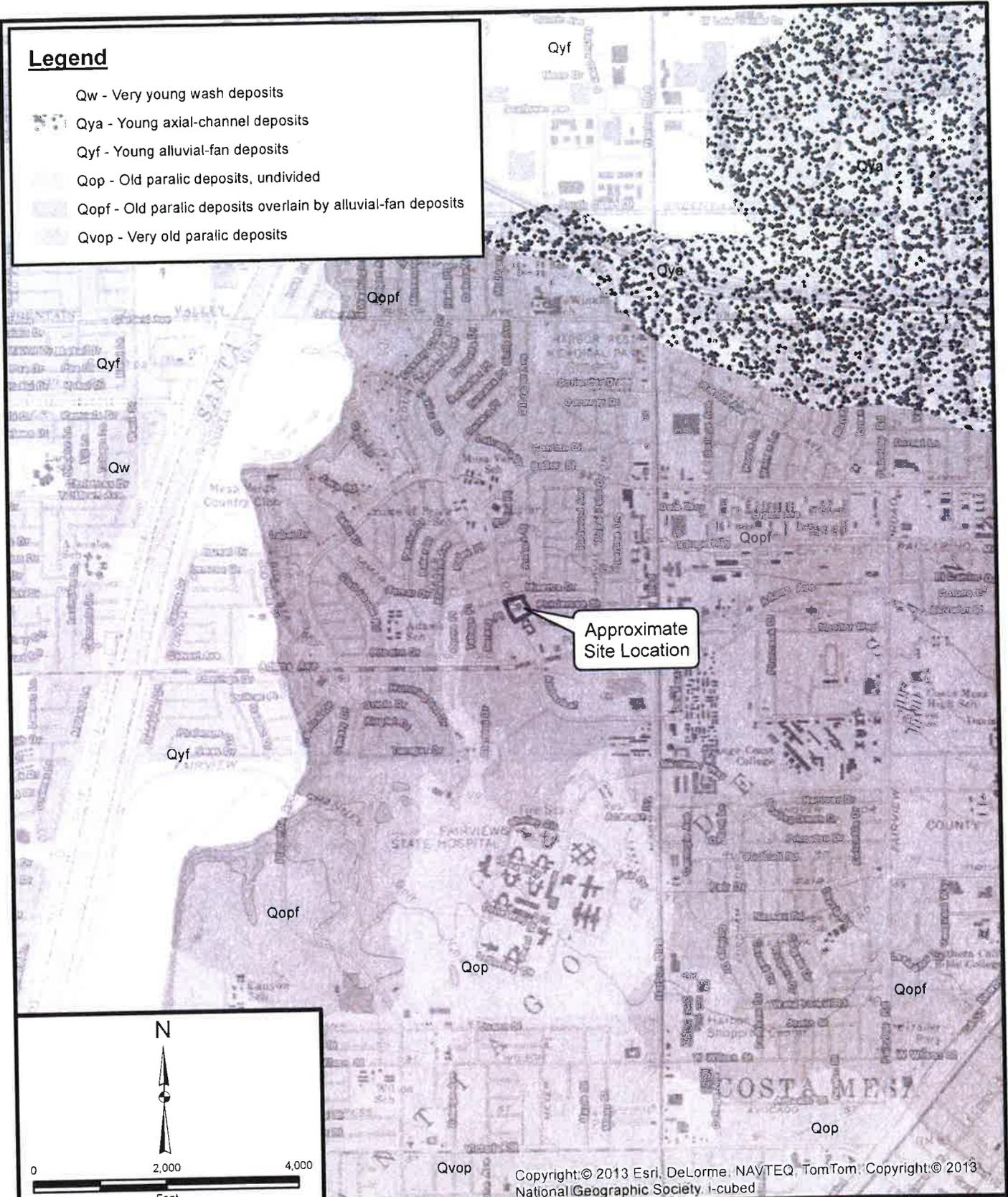
Figure 2



Leighton

**Legend**

- Qw - Very young wash deposits
- Qya - Young axial-channel deposits
- Qyf - Young alluvial-fan deposits
- Qop - Old paralic deposits, undivided
- Qopf - Old paralic deposits overlain by alluvial-fan deposits
- Qvop - Very old paralic deposits



Project: 10646.001	Eng/Geol: CR/JAR
Scale: 1" = 2,000'	Date: March 2014
USGS, 2006, Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California, Version 1.0, Open File Report 2006-1217 Author: Leighton Geomatics (rmmurphy)	

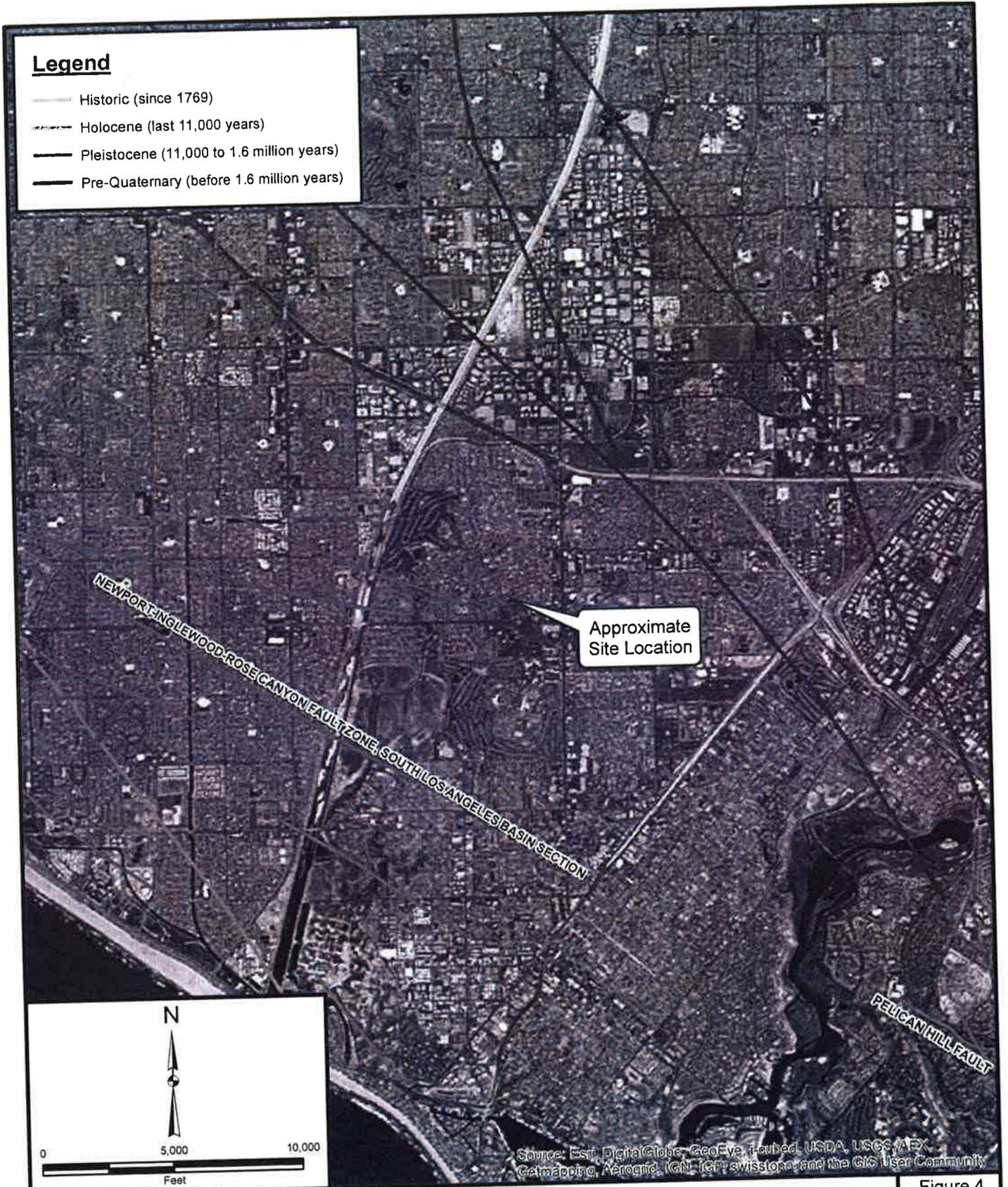
**REGIONAL GEOLOGY MAP**  
 2880 Mesa Verde Drive East  
 Costa Mesa, California

Figure 3



**Legend**

- Historic (since 1769)
- Holocene (last 11,000 years)
- Pleistocene (11,000 to 1.6 million years)
- Pre-Quaternary (before 1.6 million years)



Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Project: 10646.001	Eng/Geol: CR/JAR
Scale: 1" = 5,000'	Date: March 2014

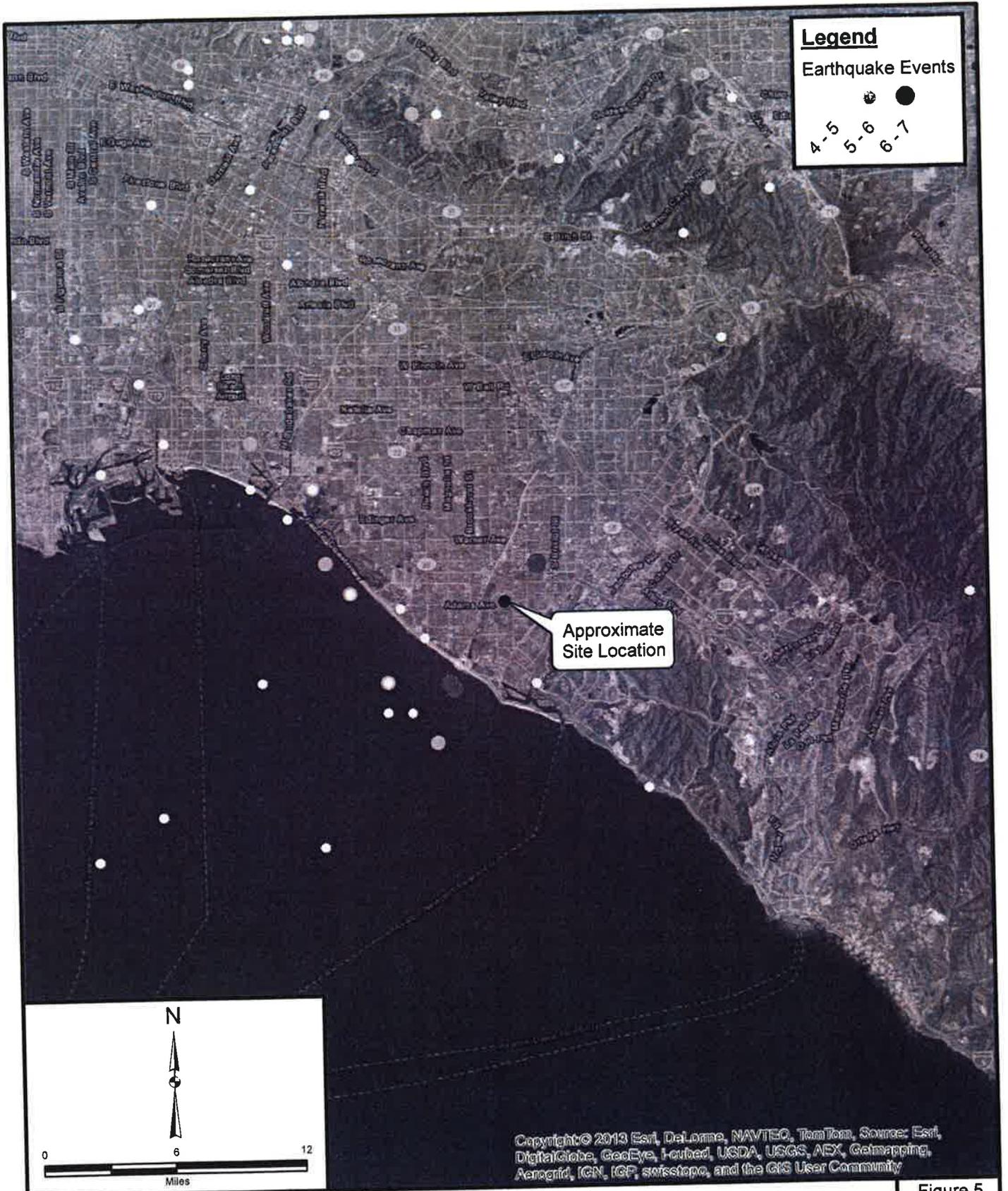
Faults: CGS, 2010  
 Author: Leighton Geomatics (mmurphy)

**REGIONAL FAULT MAP**

2880 Mesa Verde Drive East  
 Costa Mesa, California

Figure 4





**Legend**  
 Earthquake Events

○ ●

4 5 6 7

Approximate Site Location

N

0 6 12

Miles

Copyright © 2013 Esri, DeLorme, NAVTEQ, TomTom, Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Geomapping, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community

Figure 5

Project: 10646.001	Eng/Geol: CR/JAR
Scale: 1" = 6 miles	Date: March 2014
Base Map: ESRI ArcGIS Online 2014	
Thematic Information: Leighton	
Author: Leighton Geomatics (mmurphy)	

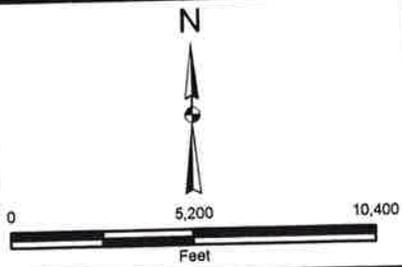
**HISTORICAL SEISMICITY MAP**  
 2880 Mesa Verde Drive East  
 Costa Mesa, California



**Legend**

-  Landslide Hazard Zone
-  Liquefaction Susceptibility Zone

Approximate Site Location



Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Project: 10646.001	Eng/Geol: CR/JAR
Scale: 1" = 5,280'	Date: March 2014
CGS, Seismic Hazards Zonation Program	
Author: Leighton Geomatics (mmurphy)	

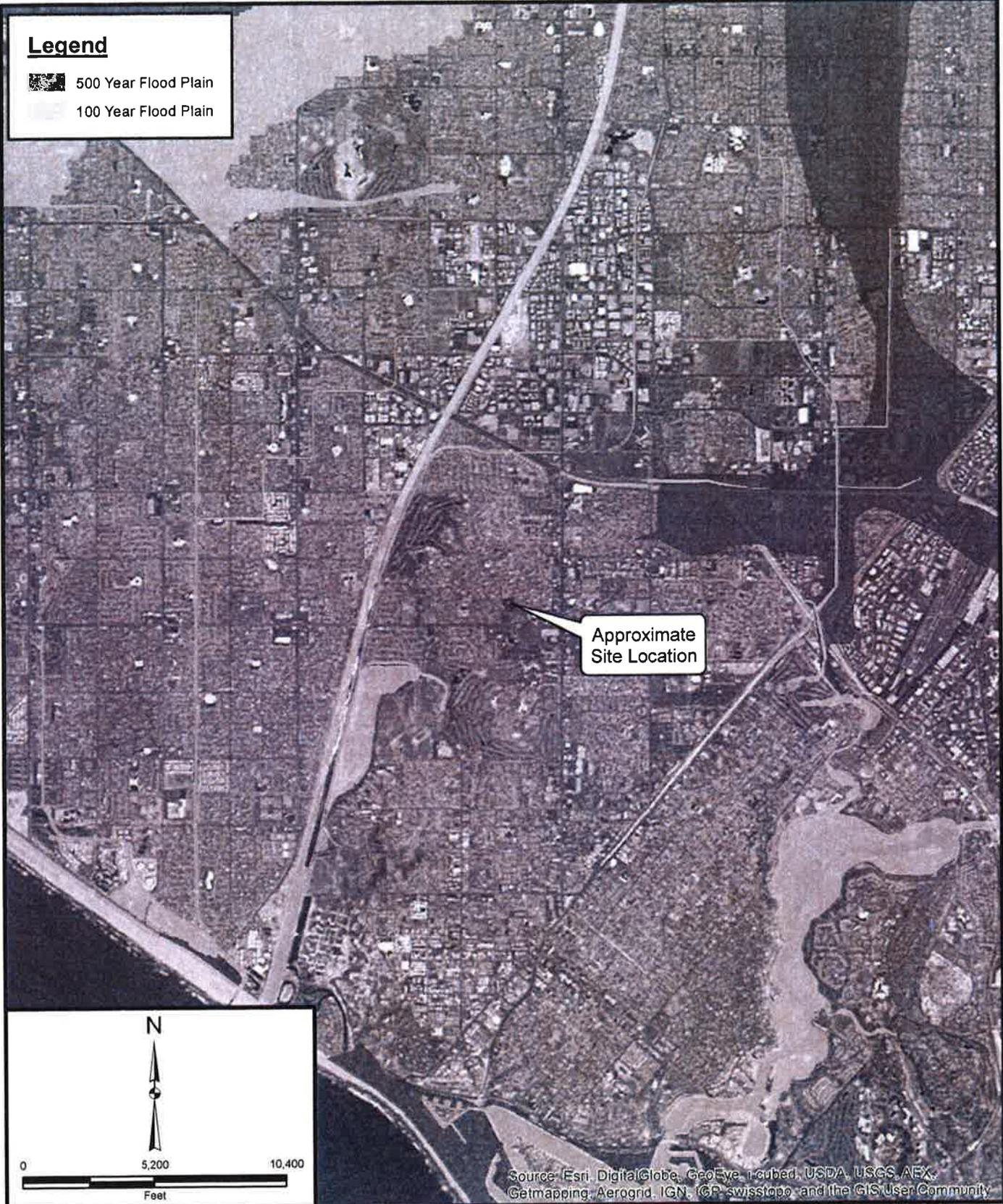
**SEISMIC HAZARD MAP**  
2880 Mesa Verde Drive East  
Costa Mesa, California

Figure 6



**Legend**

-  500 Year Flood Plain
-  100 Year Flood Plain



Approximate  
Site Location



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Project: 10646.001	Eng/Geol: CR/JAR
Scale: 1" = 5,280'	Date: March 2014
CGS, FEMA Q3 Flood Data	
Author: Leighton Geomatics (mmurphy)	

**FLOOD HAZARD ZONE MAP**

2880 Mesa Verde Drive East  
Costa Mesa, California

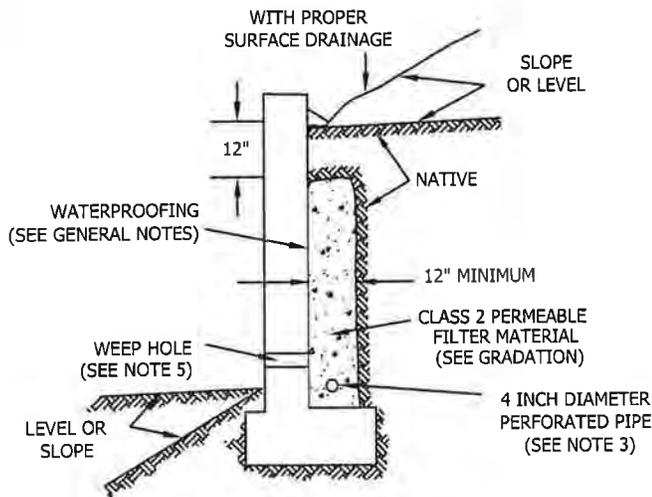
Figure 7



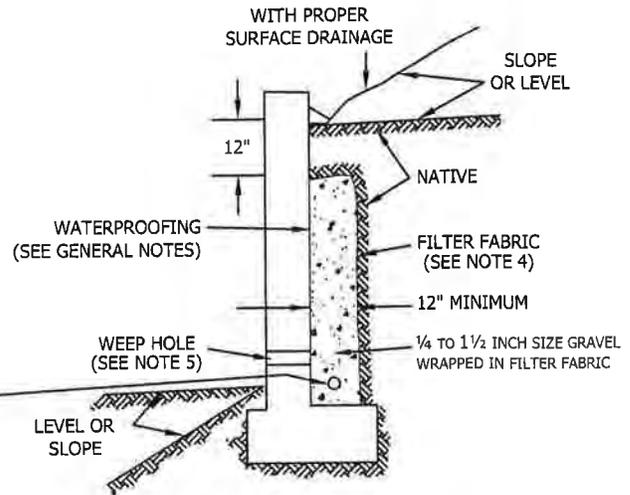
Leighton

## SUBDRAIN OPTIONS AND BACKFILL WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF <50

**OPTION 1: PIPE SURROUNDED WITH CLASS 2 PERMEABLE MATERIAL**



**OPTION 2: GRAVEL WRAPPED IN FILTER FABRIC**



Class 2 Filter Permeable Material Gradation  
Per Caltrans Specifications

Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

### GENERAL NOTES:

- \* Waterproofing should be provided where moisture nuisance problem through the wall is undesirable.
- \* Water proofing of the walls is not under purview of the geotechnical engineer
- \* All drains should have a gradient of 1 percent minimum
- \* Outlet portion of the subdrain should have a 4-inch diameter solid pipe discharged into a suitable disposal area designed by the project engineer. The subdrain pipe should be accessible for maintenance (rodding)
- \* Other subdrain backfill options are subject to the review by the geotechnical engineer and modification of design parameters.

### Notes:

- 1) Sand should have a sand equivalent of 30 or greater and may be densified by water jetting.
- 2) 1 Cu. ft. per ft. of 1/4- to 1 1/2-inch size gravel wrapped in filter fabric
- 3) Pipe type should be ASTM D1527 Acrylonitrile Butadiene Styrene (ABS) SDR35 or ASTM D1785 Polyvinyl Chloride plastic (PVC), Schedule 40, Armco A2000 PVC, or approved equivalent. Pipe should be installed with perforations down. Perforations should be 3/8 inch in diameter placed at the ends of a 120-degree arc in two rows at 3-inch on center (staggered)
- 4) Filter fabric should be Mirafi 140NC or approved equivalent.
- 5) Weephole should be 3-inch minimum diameter and provided at 10-foot maximum intervals. If exposure is permitted, weepholes should be located 12 inches above finished grade. If exposure is not permitted such as for a wall adjacent to a sidewalk/curb, a pipe under the sidewalk to be discharged through the curb face or equivalent should be provided. For a basement-type wall, a proper subdrain outlet system should be provided.
- 6) Retaining wall plans should be reviewed and approved by the geotechnical engineer.
- 7) Walls over six feet in height are subject to a special review by the geotechnical engineer and modifications to the above requirements.

## RETAINING WALL BACKFILL AND SUBDRAIN DETAIL FOR WALLS 6 FEET OR LESS IN HEIGHT

WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF <50



Leighton  
Figure 8

# **APPENDIX A**

# GEOTECHNICAL BORING LOG B-1

Project No.	10646-001	Date Drilled	3-11-14
Project	2880 Mesa Verde Dr. East	Logged By	Joe Roe
Drilling Co.	Martini Drilling Corporation	Hole Diameter	8"
Drilling Method	Hollow Stem Auger, 140lb Autohammer, 30" Drop	Ground Elevation	59'
Location	See Figure 2 - Boring Location Map	Sampled By	Joe Roe

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
0								CL	@0': 4-inches Asphalt Concrete (AC) over 3.5-inches asphalt treated Aggregate Base (AB), non-woven geofabric @2.5-inches.	
				R-1	3 4 8	110.4	18	CL	<b>Artificial Fill, undocumented: (Afu)</b> @8-inches: Silty CLAY (CL), dark brown, very moist, with fine grained sand and asphalt pieces.	
	55			R-2	5 16 28	114.3	17		<b>Quaternary Old Parallic Deposits: (Qopf)</b> @2': Sandy CLAY (CL), dark reddish brown, very moist, firm, medium grained sand. @5': Hard, oxidized, reddish brown, coarse grained sand, minor gleying.	
	50			R-3	7 15 24	114.7	17		@7': Dark reddish brown, moist, very stiff, medium grained sand, well developed blocky structure.	
	45			R-4	7 13 16	94.3	29		@10': CLAY (CL), dark reddish brown to reddish black, moist, very stiff, some silt and fine grained sand, heavy manganese development.	
	40			R-5	8 15 18	95.4	27	ML-CL	@15': Clayey SILT to Silty CLAY (ML-CL), olive green, moist, very stiff, very fine grained sandy laminations.	
	35			S-1	4 11 13			ML CL SP-SM	@20': Sandy SILT (ML), olive brown, slightly moist, very stiff, very fine grained, trace clay. @21.3': CLAY (CL), dark reddish brown, slightly moist, very stiff. @22': SAND with silt (SP-SM), yellow brown, moist, dense, very fine grained, poorly graded, oxidized.	
	30			S-2	4 14 19					
									Total Depth of Boring: 26.5 feet bgs No Groundwater encountered during drilling Boring backfilled with soil cuttings and capped with cold patch asphalt upon completion of drilling. Excess soil cuttings spread on site.	

**SAMPLE TYPES:**  
 B BULK SAMPLE  
 C CORE SAMPLE  
 G GRAB SAMPLE  
 R RING SAMPLE  
 S SPLIT SPOON SAMPLE  
 T TUBE SAMPLE

**TYPE OF TESTS:**  
 -200 % FINES PASSING  
 AL ATTERBERG LIMITS  
 CN CONSOLIDATION  
 CO COLLAPSE  
 CR CORROSION  
 CU UNDRAINED TRIAXIAL

DS DIRECT SHEAR  
 EI EXPANSION INDEX  
 H HYDROMETER  
 MD MAXIMUM DENSITY  
 PP POCKET PENETROMETER  
 RV R VALUE

SA SIEVE ANALYSIS  
 SE SAND EQUIVALENT  
 SG SPECIFIC GRAVITY  
 UC UNCONFINED COMPRESSIVE STRENGTH



# GEOTECHNICAL BORING LOG B-2

Project No.	10646-001	Date Drilled	3-11-14
Project	2880 Mesa Verde Dr. East	Logged By	Joe Roe
Drilling Co.	Martini Drilling Corporation	Hole Diameter	8"
Drilling Method	Hollow Stem Auger, 140lb Autohammer, 30" Drop	Ground Elevation	58'
Location	See Figure 2 - Boring Location Map	Sampled By	Joe Roe

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
0				BB-1				SC	@0': 2-inches Asphalt Concrete (AC) over 3-inches Aggregate Base (AB), asphalt treated Aggregate Base (AB), non-woven geofabric @2-inches.	
55				R-1	8 16 34	124.4	10	SC	<b>Artificial Fill, undocumented: (Afu)</b> @5': Clayey SAND (SC), orange brown to dark reddish brown, moist, dense, coarse grained sand.	EI
5				R-2	5 12 16			CL	<b>Quaternary Old Paralic Deposits: (Qopf)</b> @3.5': Sandy CLAY (CL), dark reddish brown, slightly moist, very stiff, fine to coarse grained sand, moderate blocky structure, clay lined pedogenic faces, approximate channel incision filled with clayey sand (SC), spotty manganese development in sand channel.	DS
50				R-3	9 23 28	96.7	27		@7': CLAY (CL), olive grayish white, moist, hard, abundant CaCO <sub>3</sub> development with concretions.	
10				R-4	9 14 19	93.8	36		@10': CLAY with silt, gray, very stiff.	
45										
15				R-5	5 10 19	95.0	30		@15': Silty CLAY (CL), olive gray, moist, very stiff, abundant CaCO <sub>3</sub> , moderate blocky structure.	
40										
20				S-1	5 12 14			ML	@20': Sandy SILT (ML), yellow brown, dry, very stiff, very fine grained, micaceous.	
35										
25				S-2	12 26 29			SP	@25': SAND (SP), light yellow brown, dry, very dense, fine to medium grained sand, poorly graded.	
30									Total Depth of Boring: 26.5 feet bgs No Groundwater encountered during drilling Boring backfilled with soil cuttings and capped with cold patch asphalt upon completion of drilling. Excess soil cuttings spread on site.	
30										

<b>SAMPLE TYPES:</b> B BULK SAMPLE C CORE SAMPLE G GRAB SAMPLE R RING SAMPLE S SPLIT SPOON SAMPLE T TUBE SAMPLE	<b>TYPE OF TESTS:</b> -200 % FINES PASSING AL ATTERBERG LIMITS CN CONSOLIDATION CO COLLAPSE CR CORROSION CU UNDRAINED TRIAXIAL	DS DIRECT SHEAR EI EXPANSION INDEX H HYDROMETER MD MAXIMUM DENSITY PP POCKET PENETROMETER RV R VALUE	SA SIEVE ANALYSIS SE SAND EQUIVALENT SG SPECIFIC GRAVITY UC UNCONFINED COMPRESSIVE STRENGTH
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# GEOTECHNICAL BORING LOG B-3

**Project No.** 10646-001  
**Project** 2880 Mesa Verde Dr. East  
**Drilling Co.** Martini Drilling Corporation  
**Drilling Method** Hollow Stem Auger, 140lb Autohammer, 30" Drop  
**Location** See Figure 2 - Boring Location Map

**Date Drilled** 3-11-14  
**Logged By** Joe Roe  
**Hole Diameter** 8"  
**Ground Elevation** 57'  
**Sampled By** Joe Roe

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
0								CL	@0': 4-inches Asphalt Concrete over 3-inches asphalt treated Aggregate Base, non-woven geofabric @2-inches. <b>Artificial Fill, undocumented: (Afu)</b> @1': Silty CLAY (CL), dark brown, wet, fine to coarse grained sand, asphalt pieces.	
55				R-1	3 6 13			CL	<b>Quaternary Old Paralic Deposits: (Qonf)</b> @3': Sandy CLAY (CL), dark reddish brown, moist, stiff, fine to medium grained sand. @5': Very stiff, minor CaCO <sub>3</sub> .	
5				R-2	5 12 14					
50				R-3	3 7 12				@7': CLAY (CL), olive gray to grayish white, moist, stiff, abundant CaCO <sub>3</sub> development, hackly structure with concretions, blocky.	
10				R-4	7 13 19				@10': Olive green, very stiff, heavy carbonate mineralization, paleosol, laminated.	
45										
15				R-5	6 14 21			ML	@15': Clayey SILT (ML), olive green, very moist, very stiff, laminated.	
40										
20				S-1	4 11 13				@20': Sandy SILT with trace clay (ML), olive brown to reddish brown, slightly moist, very stiff, very fine grained sand, some mica, minor spotty manganese development.	
35										
25				S-2	4 11 23				@25': Very moist, hard, micaceous.	
30									Total Depth of Boring: 26.5 feet bgs No Groundwater encountered during drilling Boring backfilled with soil cuttings and capped with cold patch asphalt upon completion of drilling. Excess soil cuttings spread on site.	
30										

**SAMPLE TYPES:**

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

**TYPE OF TESTS:**

- 200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL

- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE

- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH



\*\*\* This log is a part of a report by Leighton and should not be used as a stand-alone document. \*\*\*

# GEOTECHNICAL BORING LOG B-4

Project No.	10646-001	Date Drilled	3-11-14
Project	2880 Mesa Verde Dr. East	Logged By	Joe Roe
Drilling Co.	Martini Drilling Corporation	Hole Diameter	8"
Drilling Method	Hollow Stem Auger, 140lb Autohammer, 30" Drop	Ground Elevation	58'
Location	See Figure 2 - Boring Location Map	Sampled By	Joe Roe

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
0				BB-1				CL	<b>Artificial Fill, undocumented: (Afu)</b> @0': Grass area, Topsoil - 8-inches thick. @8-inches: CLAY with silt and some sand (CL), dark brown, very moist, some fine grained sand and rootlets.	AL
55				R-1	3 6 10			CL	@2': Silty CLAY (CL), dark brown, very moist, stiff, trace fine grained sand, porous, 1 to 3-mm unlined voids, minor gleying of root lined pores.	
5				R-2	3 6 10				<b>Quaternary Old Paralic Deposits: (Qopf)</b> @3': Silty CLAY with sand (CL), medium brown, very moist, stiff, coarse grained sand, minor CaCQ on poorly developed soil pedogens, LL=38; PL=17; PI=21	
50				R-3 BB-2	4 10 18				@7': Silty CLAY (CL), olive gray, moist, very stiff, laminated, abundant CaCO <sub>3</sub> development with concretions, poorly developed blocky structure.	
10				R-4	6 12 17				@10': Becomes grayish white to olive grey lean CLAY (CL), color change due to presence of caliche (CaCQ)	CN
45				S-1	3 8 9			ML	@15': Clayey SILT (ML), olive green, very moist, very stiff, abundant CaCO <sub>3</sub> , 86% passing No. 200 sieve	-200
40				R-5	3 14 17			CL	@20': CLAY (CL), olive gray, moist, very stiff, moderately oxidized, CaCO <sub>3</sub> development along poorly developed blocky structure, with CaCO <sub>3</sub> concretions.	
35				S-2	8 18 22			SP	@25.5': SAND (SP), light gray brown, dry, dense, very fine grained, poorly graded.	
30										

<b>SAMPLE TYPES:</b> B BULK SAMPLE C CORE SAMPLE G GRAB SAMPLE R RING SAMPLE S SPLIT SPOON SAMPLE T TUBE SAMPLE	<b>TYPE OF TESTS:</b> -200 % FINES PASSING AL ATTERBERG LIMITS CN CONSOLIDATION CO COLLAPSE CR CORROSION CU UNDRAINED TRIAXIAL	DS DIRECT SHEAR EI EXPANSION INDEX H HYDROMETER MD MAXIMUM DENSITY PP POCKET PENETROMETER RV R VALUE	SA SIEVE ANALYSIS SE SAND EQUIVALENT SG SPECIFIC GRAVITY UC UNCONFINED COMPRESSIVE STRENGTH
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\*\*\* This log is a part of a report by Leighton and should not be used as a stand-alone document. \*\*\*

# GEOTECHNICAL BORING LOG B-4

Project No.	10646-001	Date Drilled	3-11-14
Project	2880 Mesa Verde Dr. East	Logged By	Joe Roe
Drilling Co.	Martini Drilling Corporation	Hole Diameter	8"
Drilling Method	Hollow Stem Auger, 140lb Autohammer, 30" Drop	Ground Elevation	58'
Location	See Figure 2 - Boring Location Map	Sampled By	Joe Roe

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
<i>This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.</i>										
30		N S		R-6	17 50/6"			SW	@30': SAND (SW), light brown, dry, very dense, fine to coarse grained, well graded, unconsolidated.	
25										
35				S-3	15 24 42				@35': SAND (SW), light brown, dry, very dense, fine to coarse grained, well graded, unconsolidated.	
20										
40				R-7	17 50/5"			SW-GW	@40': SAND with gravel (SW-GW), orange brown to yellow brown, dry, very dense, fine to coarse grained sand, fine to coarse gravel, some gravel >3-inches in size and mechanically fractured, well graded.	
15										
45				S-4	9 17 30			SP-SM	@45': SAND with silt (SP-SM), light gray, dry, dense, very fine grained, micaceous.	
10										
50				R-8	14 40 50/3"			SP	@50': SAND (SP), light gray, dry, very dense, very fine grained, poorly graded. @51': Becomes coarse grained sand with gravel.	
5									Total Depth of Boring: 51.3 feet bgs No Groundwater encountered during drilling Boring backfilled with soil cuttings upon completion of drilling. Excess soil cuttings spread on site.	
55										
0										
60										

**SAMPLE TYPES:**

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

**TYPE OF TESTS:**

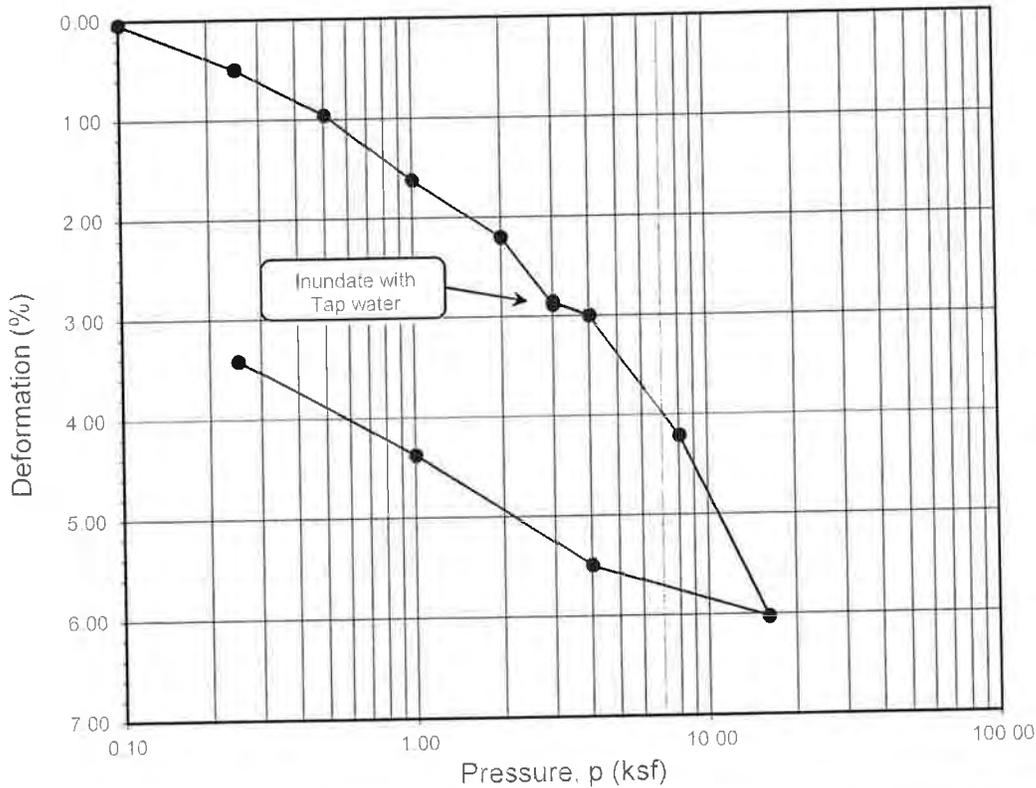
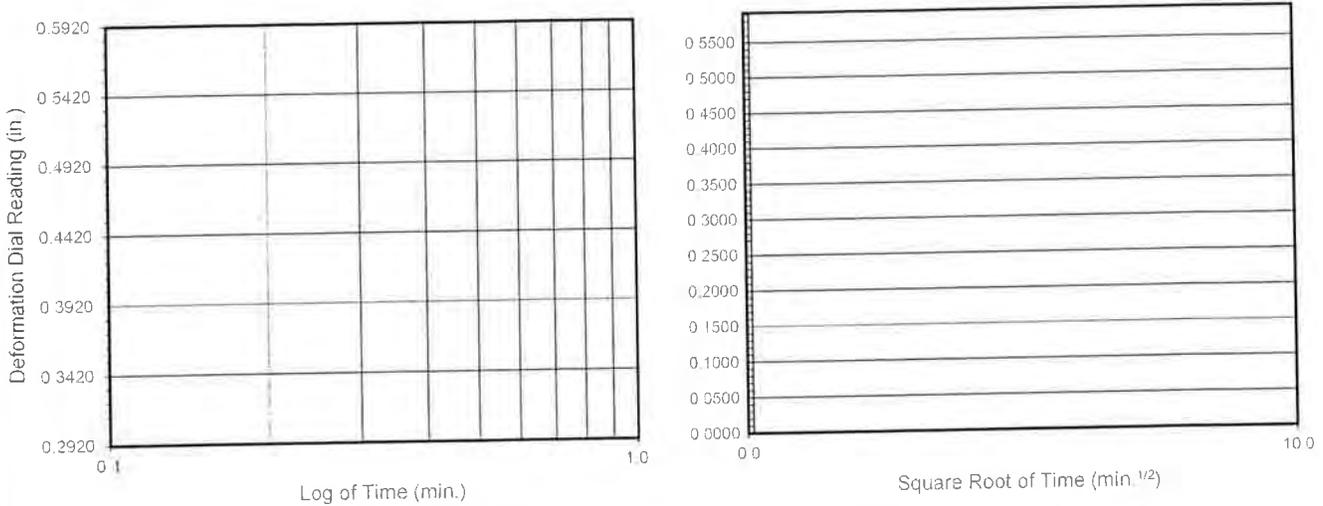
- 200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
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- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

# **APPENDIX B**

Boring No.	B-4							
Sample No.	S-1							
Depth (ft.)	15.0							
Sample Type	SPT							
Soil Identification	Brown silt (ML)							
<b>Moisture Correction</b>								
Wet Weight of Soil + Container (g)	0.00							
Dry Weight of Soil + Container (g)	0.00							
Weight of Container (g)	1.00							
Moisture Content (%)	0.00							
<b>Sample Dry Weight Determination</b>								
Weight of Sample + Container (g)	300.00							
Weight of Container (g)	0.00							
Weight of Dry Sample (g)	300.00							
Container No.:								
<b>After Wash</b>								
Method (A or B)	B							
Dry Weight of Sample + Cont. (g)	41.10							
Weight of Container (g)	0.00							
Dry Weight of Sample (g)	41.10							
<b>% Passing No. 200 Sieve</b>	<b>86.3</b>							
<b>% Retained No. 200 Sieve</b>	<b>13.7</b>							
	<b>PERCENT PASSING No. 200 SIEVE ASTM D 1140</b>				Project Name: Pinnacle/Mesa Verde Drive East			
					Project No.: 10646.001			
					Client Name: Pinnacle Residential			
					Tested By: MVH/ACS		Date: 03/20/14	



No Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
<b>B-4</b>	<b>R4</b>	<b>10.0</b>	<b>24.6</b>	<b>26.1</b>	<b>94.5</b>	<b>96.9</b>	<b>0.784</b>	<b>0.724</b>	<b>85</b>	<b>95</b>

Soil Identification: Light olive gray lean clay (CL), caliche noted



**ONE-DIMENSIONAL CONSOLIDATION  
PROPERTIES of SOILS  
ASTM D 2435**

Project No.: 10646.001

Pinnacle/Mesa Verde Drive East

03-14



Leighton

### DIRECT SHEAR TEST

Consolidated Undrained

Project Name: Pinnacle/Mesa Verde Drive East

Tested By: G. Bathala

Date: 03/17/14

Project No.: 10646.001

Checked By: J. Ward

Boring No.: B-2

Sample Type: Ring

Sample No.: R2

Depth (ft.): 5.0

Soil Identification: Olive brown lean clay (CL)

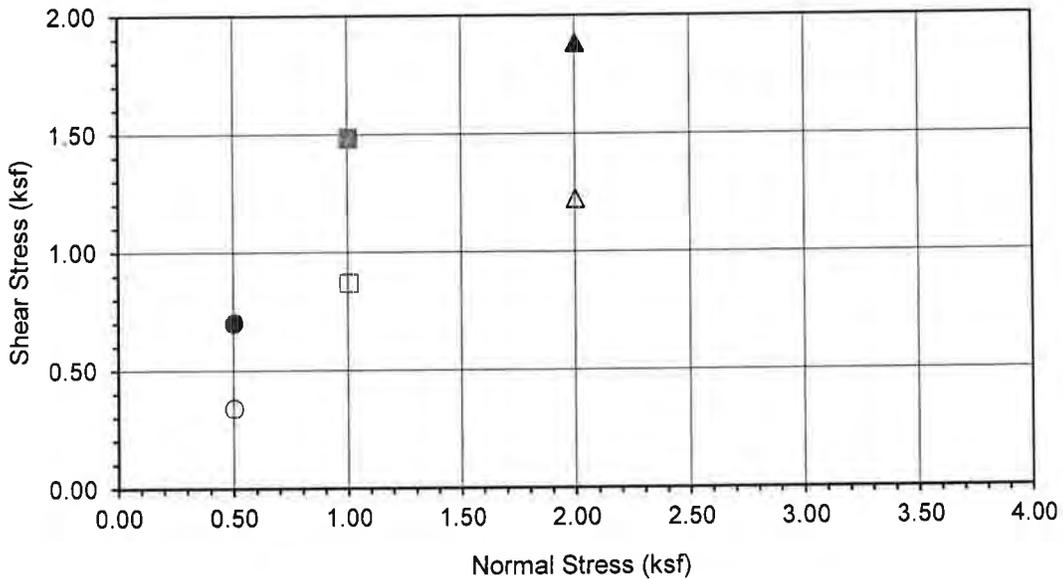
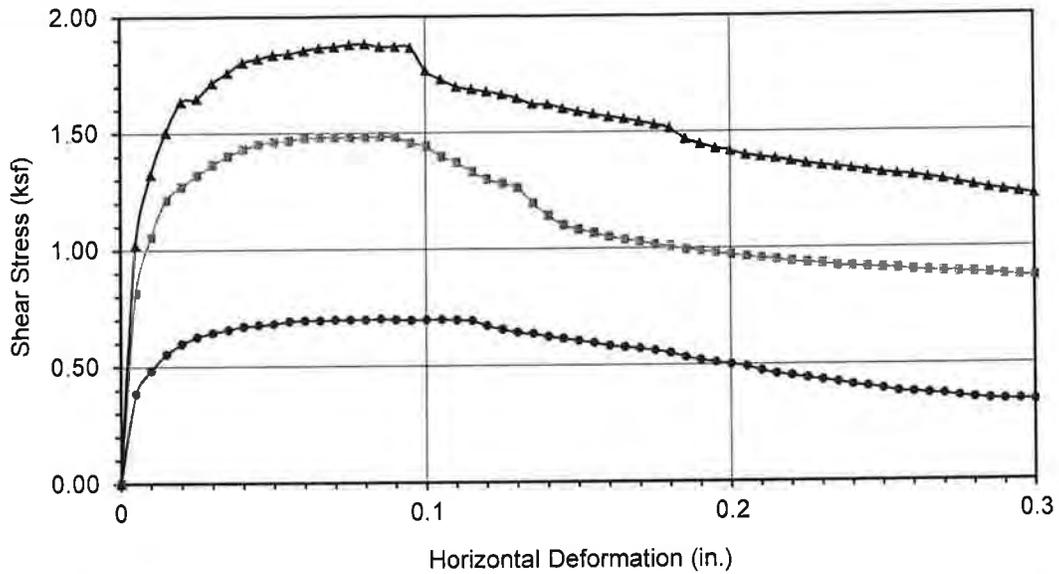
Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	187.26	187.36	187.69
Weight of Ring(gm):	42.17	43.01	43.98

Before Shearing

Weight of Wet Sample+Cont.(gm):	111.52	111.52	111.52
Weight of Dry Sample+Cont.(gm):	100.61	100.61	100.61
Weight of Container(gm):	57.74	57.74	57.74
Vertical Rdg.(in): Initial	0.2587	0.2402	0.0000
Vertical Rdg.(in): Final	0.2399	0.2251	0.0005

After Shearing

Weight of Wet Sample+Cont.(gm):	206.67	218.01	183.56
Weight of Dry Sample+Cont.(gm):	173.92	181.90	148.35
Weight of Container(gm):	58.00	70.37	37.96
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43



<b>Boring No.</b>	<b>B-2</b>
<b>Sample No.</b>	<b>R2</b>
<b>Depth (ft)</b>	<b>5</b>
<u>Sample Type:</u>	
Ring	
<u>Soil Identification:</u>	
Olive brown lean clay (CL)	

Normal Stress (kip/ft <sup>2</sup> )	0.500	1.000	2.000
Peak Shear Stress (kip/ft <sup>2</sup> )	● 0.701	■ 1.484	▲ 1.883
Shear Stress @ End of Test (ksf)	○ 0.340	□ 0.871	△ 1.223
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	25.45	25.45	25.45
Dry Density (pcf)	96.2	95.7	95.3
Saturation (%)	91.3	90.2	89.3
Soil Height Before Shearing (in.)	1.0188	1.0151	1.0005
Final Moisture Content (%)	28.3	32.4	31.9



**DIRECT SHEAR TEST RESULTS**  
Consolidated Undrained

Project No.: 10646.001  
Pinnacle/Mesa Verde Drive East



## EXPANSION INDEX of SOILS

ASTM D 4829

Project Name: Pinnacle/Mesa Verde Drive East      Tested By: M. Van Horn      Date: 03/18/14  
 Project No.: 10646.001      Checked By: J. Ward      Date: 03/20/14  
 Boring No.: B-2      Depth (ft.): 0-5  
 Sample No.: BB-1  
 Soil Identification: Brown clayey sand (SC)

Dry Wt. of Soil + Cont.	(g)	1000.00
Wt. of Container No.	(g)	0.00
Dry Wt. of Soil	(g)	1000.00
Weight Soil Retained on #4 Sieve		0.00
Percent Passing # 4		100.00

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0340
Wt. Comp. Soil + Mold (g)	587.20	457.70
Wt. of Mold (g)	163.50	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	0	0
Wet Wt. of Soil + Cont. (g)	854.90	621.20
Dry Wt. of Soil + Cont. (g)	795.20	557.64
Wt. of Container (g)	0.00	163.50
Moisture Content (%)	7.51	16.13
Wet Density (pcf)	127.8	133.5
Dry Density (pcf)	118.9	115.0
Void Ratio	0.418	0.466
Total Porosity	0.295	0.318
Pore Volume (cc)	61.0	68.1
Degree of Saturation (%) [ S <sub>meas</sub> ]	<b>48.5</b>	93.4

**SPECIMEN INUNDATION** in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
03/18/14	12:05	1.0	0	0.1230
03/18/14	12:15	1.0	10	0.1220
Add Distilled Water to the Specimen				
03/18/14	13:31	1.0	76	0.1540
03/19/14	7:03	1.0	1128	0.1570
03/19/14	8:03	1.0	1188	0.1570

Expansion Index (EI <sub>meas</sub> ) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	<b>35</b>
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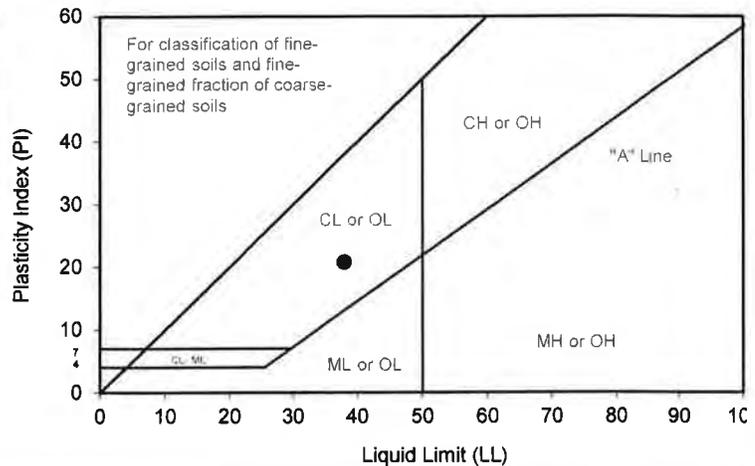
# ATTERBERG LIMITS

ASTM D 4318

Project Name: Pinnacle/Mesa Verde Drive East Tested By: M. Van Horn Date: 03/20/14  
 Project No. : 10646.001 Input By: J. Ward Date: 03/21/14  
 Boring No.: B-4 Checked By: J. Ward  
 Sample No.: BB-1 Depth (ft.) 0-5  
 Soil Identification: Olive lean clay (CL)

TEST NO.	PLASTIC LIMIT		LIQUID LIMIT			
	1	2	1	2	3	4
Number of Blows [N]			32	25	17	
Wet Wt. of Soil + Cont. (g)	6.52	8.37	13.64	12.86	19.34	
Dry Wt. of Soil + Cont. (g)	5.75	7.26	10.25	9.56	14.11	
Wt. of Container (g)	1.09	1.10	1.09	1.06	1.10	
Moisture Content (%) [Wn]	16.52	18.02	37.01	38.82	40.20	

<b>Liquid Limit</b>	<b>38</b>
<b>Plastic Limit</b>	<b>17</b>
<b>Plasticity Index</b>	<b>21</b>
<b>Classification</b>	<b>CL</b>



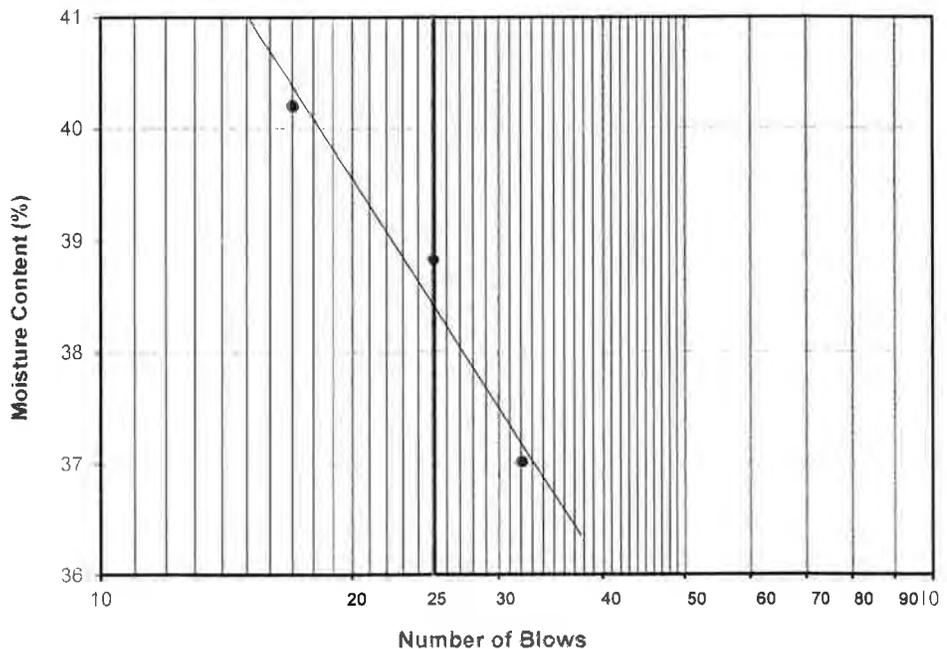
PI at "A" - Line =  $0.73(LL-20)$  13.14

One - Point Liquid Limit Calculation

$$LL = Wn(N/25)^{0.121}$$

## PROCEDURES USED

- Wet Preparation  
Multipoint - Wet
- Dry Preparation  
Multipoint - Dry
- Procedure A  
Multipoint Test
- Procedure B  
One-point Test



# APPENDIX C

## APPENDIX C

### LEIGHTON AND ASSOCIATES, INC. EARTHWORK AND GRADING GUIDE SPECIFICATIONS

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## **C-1.0 GENERAL**

### **C-1.1 Intent**

These Earthwork and Grading Guide Specifications are for grading and earthwork shown on the current, approved grading plan(s) and/or indicated in the Leighton and Associates, Inc. geotechnical report(s). These Guide Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the project-specific recommendations in the geotechnical report shall supersede these Guide Specifications. Leighton and Associates, Inc. shall provide geotechnical observation and testing during earthwork and grading. Based on these observations and tests, Leighton and Associates, Inc. may provide new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

### **C-1.2 Role of Leighton and Associates, Inc.**

Prior to commencement of earthwork and grading, Leighton and Associates, Inc. shall meet with the earthwork contractor to review the earthwork contractor's work plan, to schedule sufficient personnel to perform the appropriate level of observation, mapping and compaction testing. During earthwork and grading, Leighton and Associates, Inc. shall observe, map, and document subsurface exposures to verify geotechnical design assumptions. If observed conditions are found to be significantly different than the interpreted assumptions during the design phase, Leighton and Associates, Inc. shall inform the owner, recommend appropriate changes in design to accommodate these observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include (1) natural ground after clearing to receiving fill but before fill is placed, (2) bottoms of all "remedial removal" areas, (3) all key bottoms, and (4) benches made on sloping ground to receive fill.

Leighton and Associates, Inc. shall observe moisture-conditioning and processing of the subgrade and fill materials, and perform relative compaction testing of fill to determine the attained relative compaction. Leighton and Associates, Inc. shall provide *Daily Field Reports* to the owner and the Contractor on a routine and frequent basis.

### **C-1.3 The Earthwork Contractor**

The earthwork contractor (Contractor) shall be qualified, experienced and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor

shall review and accept the plans, geotechnical report(s), and these Guide Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing grading and backfilling in accordance with the current, approved plans and specifications.

The Contractor shall inform the owner and Leighton and Associates, Inc. of changes in work schedules at least one working day in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that Leighton and Associates, Inc. is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish earthwork and grading in accordance with the applicable grading codes and agency ordinances, these Guide Specifications, and recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of Leighton and Associates, Inc., unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, adverse weather, etc., are resulting in a quality of work less than required in these specifications, Leighton and Associates, Inc. shall reject the work and may recommend to the owner that earthwork and grading be stopped until unsatisfactory condition(s) are rectified.

## **C-2.0 PREPARATION OF AREAS TO BE FILLED**

### **C-2.1 Clearing and Grubbing**

Vegetation, such as brush, grass, roots and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies and Leighton and Associates, Inc. Care should be taken not to encroach upon or otherwise damage native and/or historic trees designated by the Owner or appropriate agencies to remain. Pavements, flatwork or other construction should not extend under the "drip line" of designated trees to remain.

Leighton and Associates, Inc. shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 3 percent of organic materials (by dry weight: ASTM D 2974-00). Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area. As presently defined by the State of California, most refined petroleum products

(gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed.

### **C-2.2 Processing**

Existing ground that has been declared satisfactory for support of fill, by Leighton and Associates, Inc., shall be scarified to a minimum depth of 6 inches (15 cm). Existing ground that is not satisfactory shall be over-excavated as specified in the following Section C-2.3. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

### **C-2.3 Overexcavation**

In addition to removals and over-excavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be over-excavated to competent ground as evaluated by Leighton and Associates, Inc. during grading. All undocumented fill soils under proposed structure footprints should be excavated

### **C-2.4 Benching**

Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), (>20 percent grade) the ground shall be stepped or benched. The lowest bench or key shall be a minimum of 15 feet (4.5 m) wide and at least 2 feet (0.6 m) deep, into competent material as evaluated by Leighton and Associates, Inc. Other benches shall be excavated a minimum height of 4 feet (1.2 m) into competent material or as otherwise recommended by Leighton and Associates, Inc. Fill placed on ground sloping flatter than 5:1 (horizontal to vertical units), (<20 percent grade) shall also be benched or otherwise over-excavated to provide a flat subgrade for the fill.

### **C-2.5 Evaluation/Acceptance of Fill Areas**

All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by Leighton and Associates, Inc. as suitable to receive fill. The Contractor shall obtain a written acceptance (*Daily Field Report*) from Leighton and Associates, Inc. prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys and benches.

## **C-3.0 FILL MATERIAL**

### **C-3.1 Fill Quality**

Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by Leighton and Associates, Inc. prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to Leighton and Associates, Inc. or mixed with other soils to achieve satisfactory fill material.

### **C-3.2 Oversize**

Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 6 inches (15 cm), shall not be buried or placed in fill unless location, materials and placement methods are specifically accepted by Leighton and Associates, Inc. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 feet (3 m) measured vertically from finish grade, or within 2 feet (0.61 m) of future utilities or underground construction.

### **C-3.3 Import**

If importing of fill material is required for grading, proposed import material shall meet the requirements of Section C-3.1, and be free of hazardous materials ("contaminants") and rock larger than 3-inches (8 cm) in largest dimension. All import soils shall have an Expansion Index (EI) of 20 or less and a sulfate content no greater than ( $\leq$ ) 500 parts-per-million (ppm). A representative sample of a potential import source shall be given to Leighton and Associates, Inc. at least four full working days before importing begins, so that suitability of this import material can be determined and appropriate tests performed.

## **C-4.0 FILL PLACEMENT AND COMPACTION**

### **C-4.1 Fill Layers**

Approved fill material shall be placed in areas prepared to receive fill, as described in Section C-2.0, above, in near-horizontal layers not exceeding 8 inches (20 cm) in loose thickness. Leighton and Associates, Inc. may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers, and only if the building officials with the appropriate jurisdiction approve. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

**C-4.2 Fill Moisture Conditioning**

Fill soils shall be watered, dried back, blended and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM) Test Method D 1557-09.

**C-4.3 Compaction of Fill**

After each layer has been moisture-conditioned, mixed, and evenly spread, each layer shall be uniformly compacted to not-less-than ( $\geq$ ) 90 percent of the maximum dry density as determined by ASTM Test Method D 1557-09. In some cases, structural fill may be specified (see project-specific geotechnical report) to be uniformly compacted to at-least ( $\geq$ ) 95 percent of the ASTM D 1557-09 modified Proctor laboratory maximum dry density. For fills thicker than ( $>$ ) 15 feet (4.5 m), the portion of fill deeper than 15 feet below proposed finish grade shall be compacted to 95 percent of the ASTM D 1557-09 laboratory maximum density. Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

**C-4.4 Compaction of Fill Slopes**

In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by back rolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet (1 to 1.2 m) in fill elevation, or by other methods producing satisfactory results acceptable to Leighton and Associates, Inc.. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of the ASTM D 1557-09 laboratory maximum density.

**C-4.5 Compaction Testing**

Field-tests for moisture content and relative compaction of the fill soils shall be performed by Leighton and Associates, Inc. Location and frequency of tests shall be at our field representative(s) discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

**C-4.6 Compaction Test Locations**

Leighton and Associates, Inc. shall document the approximate elevation and horizontal coordinates of each density test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that Leighton

and Associates, Inc. can determine the test locations with sufficient accuracy. Adequate grade stakes shall be provided.

### **C-5.0 EXCAVATION**

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by Leighton and Associates, Inc. during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by Leighton and Associates, Inc. based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, then observed and reviewed by Leighton and Associates, Inc. prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by Leighton and Associates, Inc.

### **C-6.0 TRENCH BACKFILLS**

#### **C-6.1 Safety**

The Contractor shall follow all OSHA and Cal/OSHA requirements for safety of trench excavations. Work should be performed in accordance with Article 6 of the *California Construction Safety Orders*, 2003 Edition or more current (see also: <http://www.dir.ca.gov/title8/sb4a6.html> ).

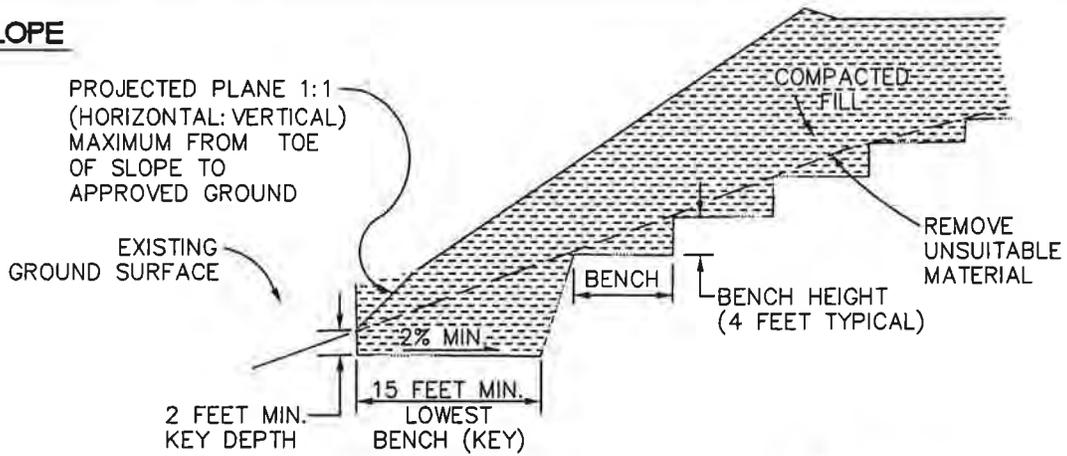
#### **C-6.2 Bedding and Backfill**

All utility trench bedding and backfill shall be performed in accordance with applicable provisions of the 2012 Edition of the *Standard Specifications for Public Works Construction* (Green Book). Bedding material shall have a Sand Equivalent greater than 30 (SE>30). Bedding shall be placed to 1-foot (0.3 m) over the top of the conduit, and densified by jetting in areas of granular soils, if allowed by the permitting agency. Otherwise, the pipe-bedding zone should be backfilled with Controlled Low Strength Material (CLSM) consisting of at least one sack of Portland cement per cubic-yard of sand, and conforming to Section 201-6 of the 2012 Edition of the *Standard Specifications for Public Works Construction* (Green Book). Backfill over the bedding zone shall be placed and densified mechanically to a minimum of 90 percent of relative compaction (ASTM D 1557-09) from 1 foot (0.3 m) above the top of the conduit to the surface. Backfill above the pipe zone shall **not** be jetted. Jetting of the bedding around the conduits shall be observed by Leighton and Associates, Inc. and backfill above the pipe zone (bedding) shall be observed and tested by Leighton and Associates, Inc.

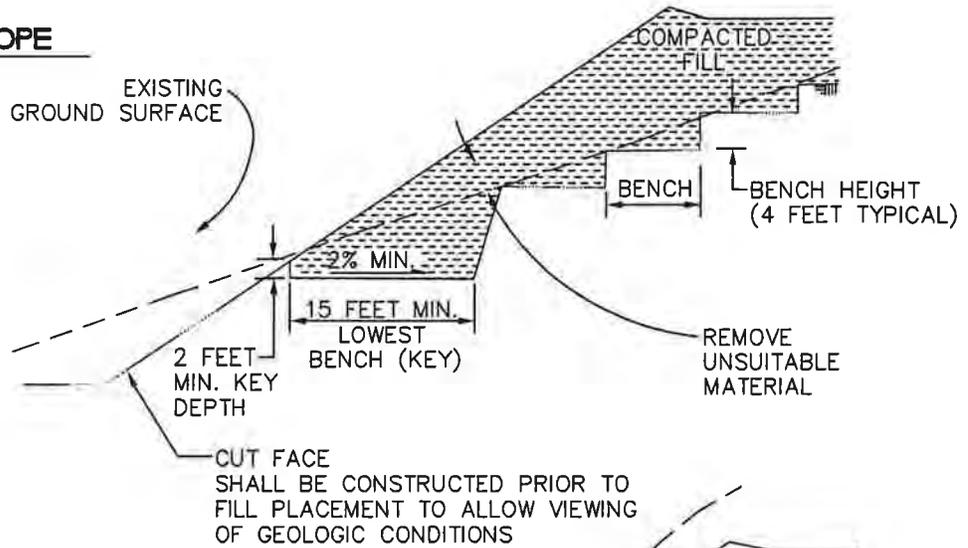
**C-6.3 Lift Thickness**

Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to Leighton and Associates, Inc. that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method, and only if the building officials with the appropriate jurisdiction approve.

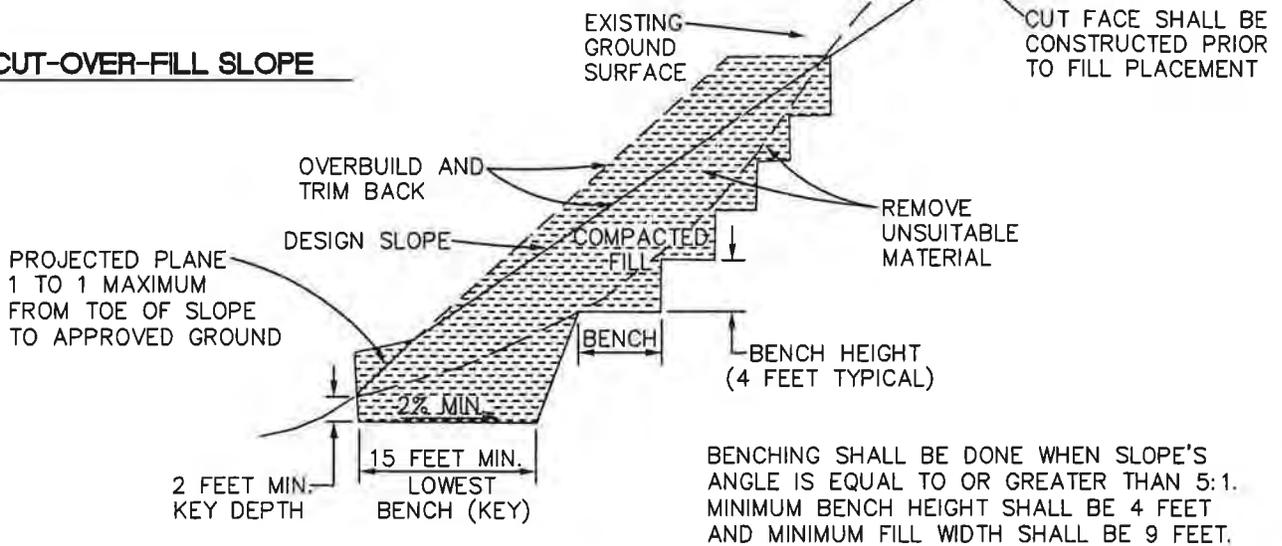
**FILL SLOPE**

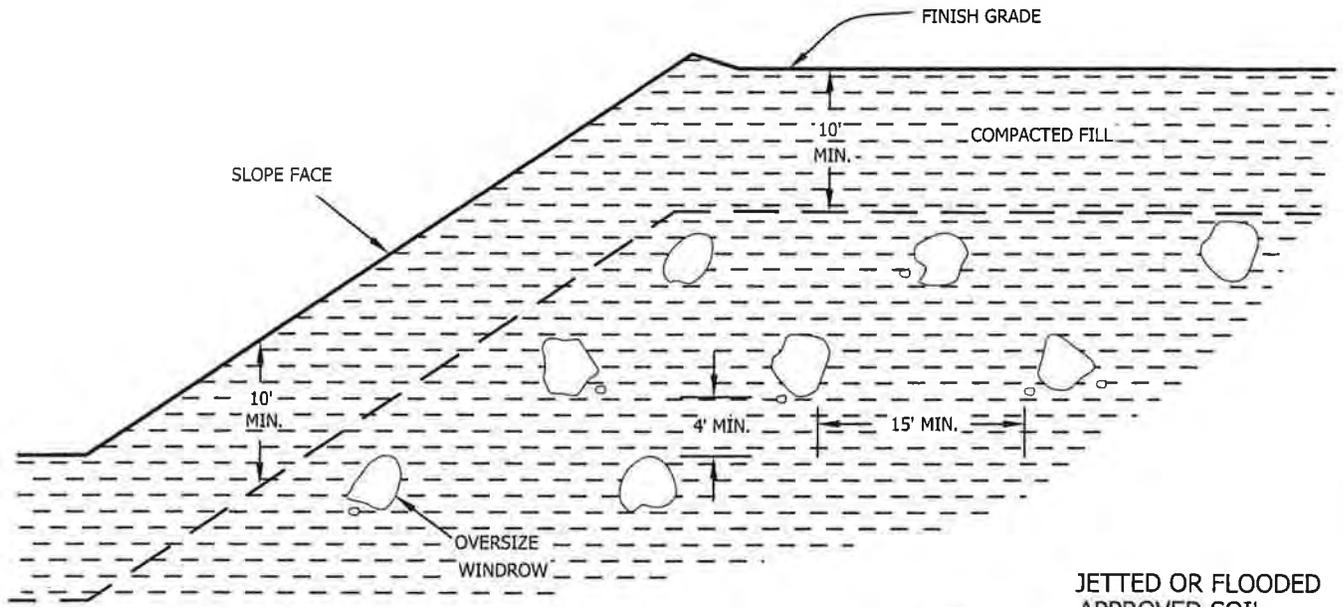


**FILL-OVER-CUT SLOPE**

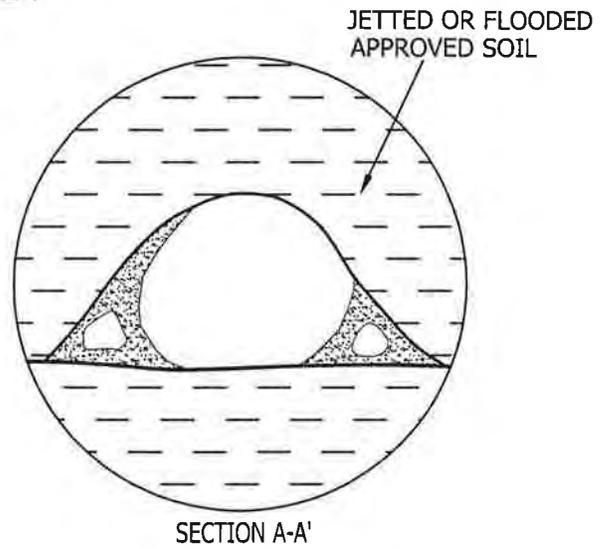


**CUT-OVER-FILL SLOPE**

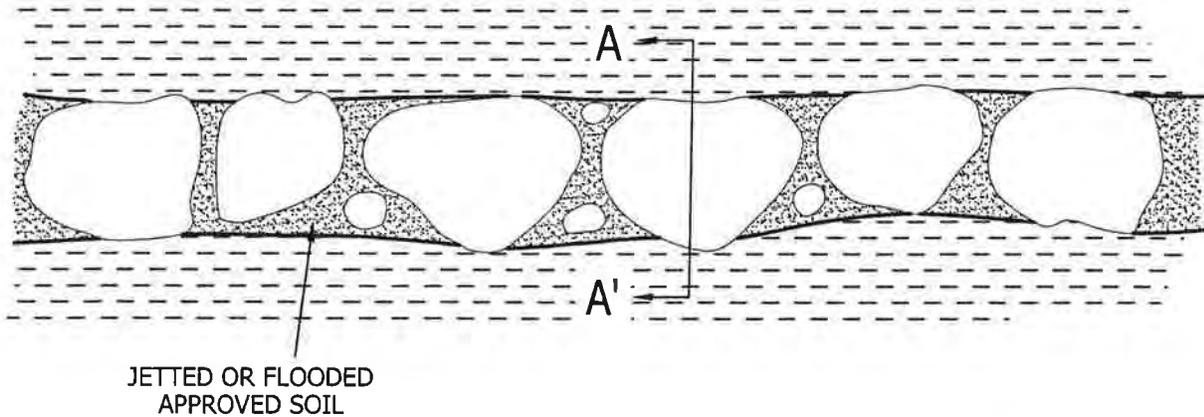




- Oversize rock is larger than 8 inches in largest dimension.
- Backfill with approved soil jetted or flooded in place to fill all the voids.
- Do not bury rock within 10 feet of finish grade.
- Windrow of buried rock shall be parallel to the finished slope face.



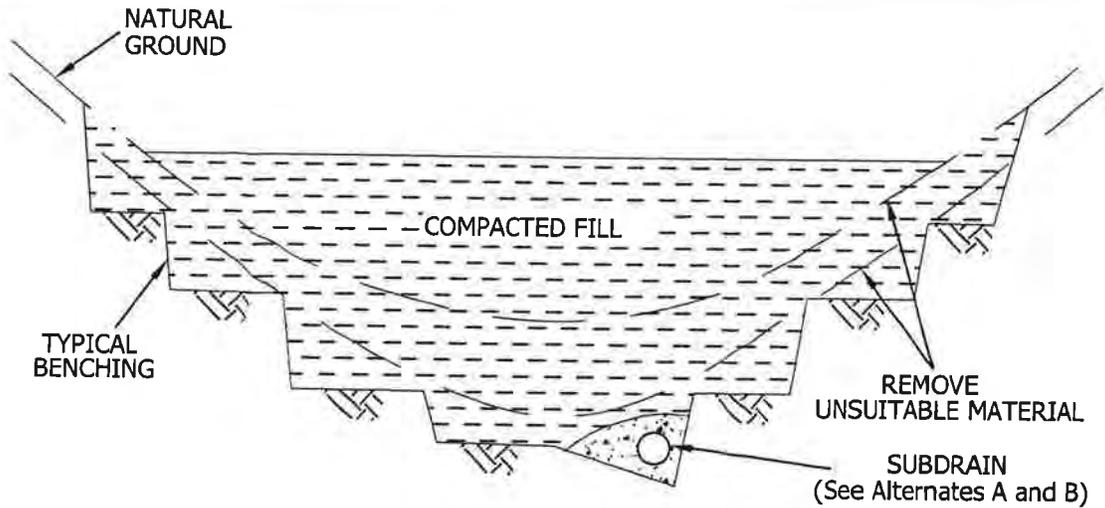
PROFILE ALONG WINDROW



# OVERSIZE ROCK DISPOSAL

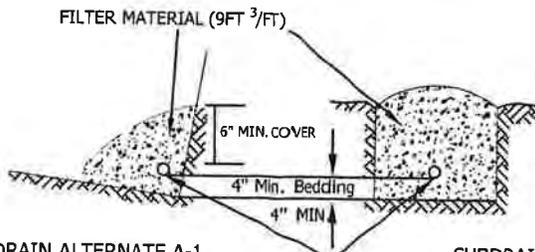
GENERAL EARTHWORK AND GRADING  
SPECIFICATIONS  
STANDARD DETAILS B





**SUBDRAIN ALTERNATE A**

PERFORATED PIPE SURROUNDED WITH FILTER MATERIAL



**SUBDRAIN ALTERNATE A-1**

PERFORATED PIPE  
6" Ø MIN.

**SUBDRAIN ALTERNATE A-2**

**FILTER MATERIAL**

FILTER MATERIAL SHALL BE CLASS 2 PERMEABLE MATERIAL PER STATE OF CALIFORNIA STANDARD SPECIFICATION, OR APPROVED ALTERNATE, CLASS 2 GRADING AS FOLLOWS:

Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

**SUBDRAIN ALTERNATE B**

**DETAIL OF CANYON SUBDRAIN TERMINAL**

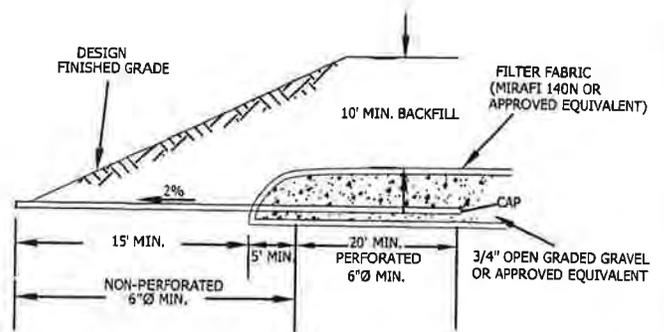


**ALTERNATE B-1**

3/4" MAX. GRAVEL OR APPROVED EQUIVALENT  
(9FT<sup>3</sup>/FT)

**ALTERNATE B-2**

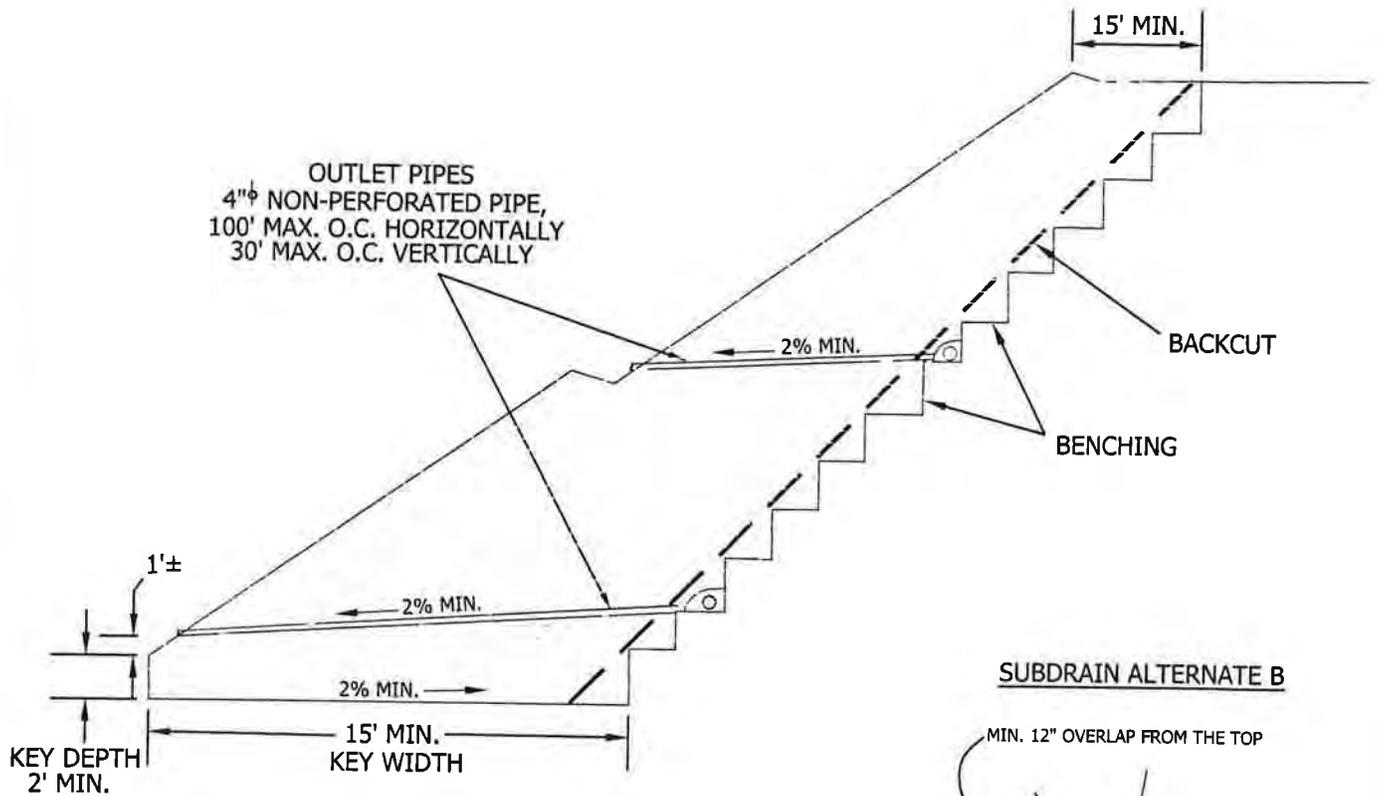
PERFORATED PIPE IS OPTIONAL PER GOVERNING AGENCY'S REQUIREMENTS



CANYON  
SUBDRAIN

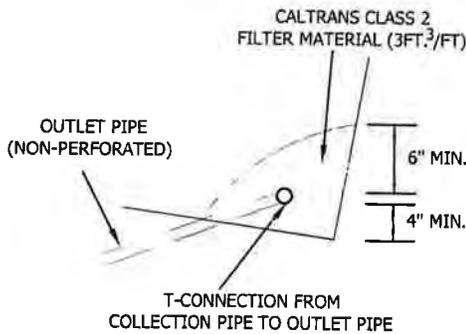
GENERAL EARTHWORK AND GRADING  
SPECIFICATIONS  
STANDARD DETAILS C



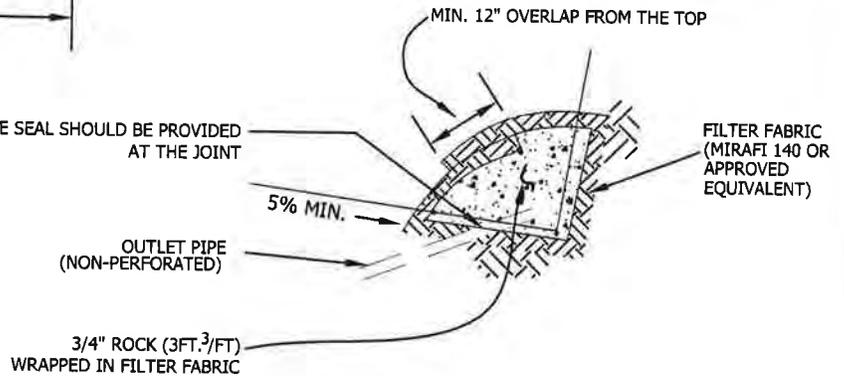


**SUBDRAIN ALTERNATE A**

**SUBDRAIN ALTERNATE B**



POSITIVE SEAL SHOULD BE PROVIDED  
AT THE JOINT



- **SUBDRAIN INSTALLATION** - Subdrain collector pipe shall be installed with perforations down or, unless otherwise designated by the geotechnical consultant. Outlet pipes shall be non-perforated pipe. The subdrain pipe shall have at least 8 perforations uniformly spaced per foot. Perforation shall be 1/4" to 1/2" if drilled holes are used. All subdrain pipes shall have a gradient at least 2% towards the outlet.

- **SUBDRAIN PIPE** - Subdrain pipe shall be ASTM D2751, ASTM D1527 (Schedule 40) or SDR 23.5 ABS pipe or ASTM D3034 (Schedule 40) or SDR 23.5 PVC pipe.

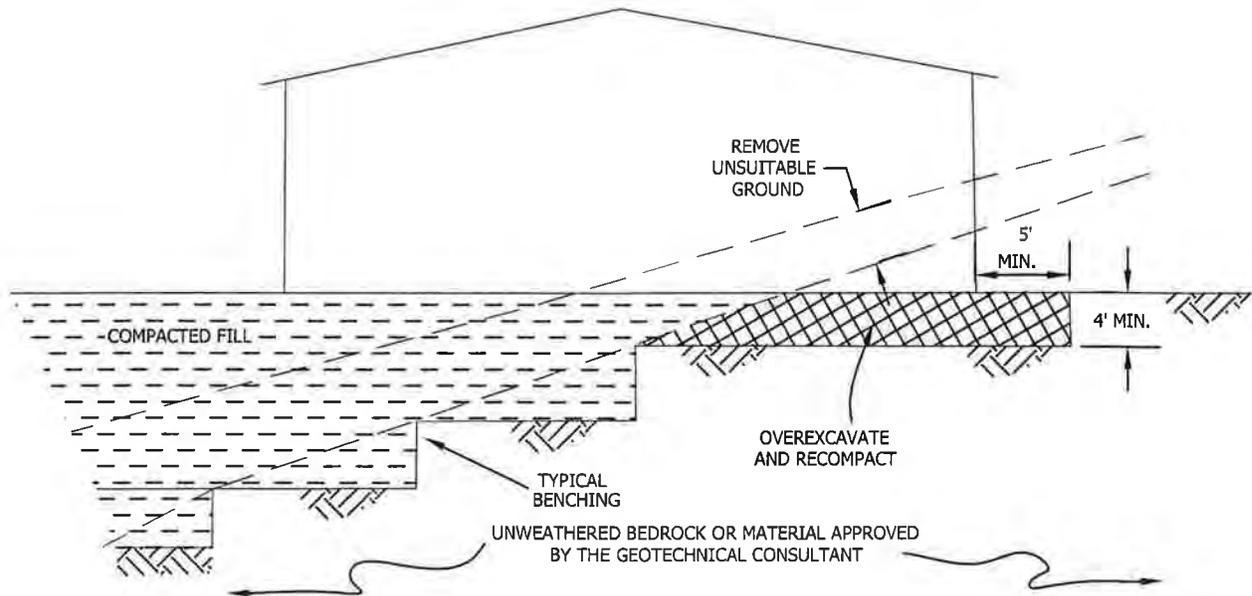
All outlet pipe shall be placed in a trench and, after fill is placed above it, rodded to verify integrity.

**BUTTRESS OR  
REPLACEMENT FILL  
SUBDRAINS**

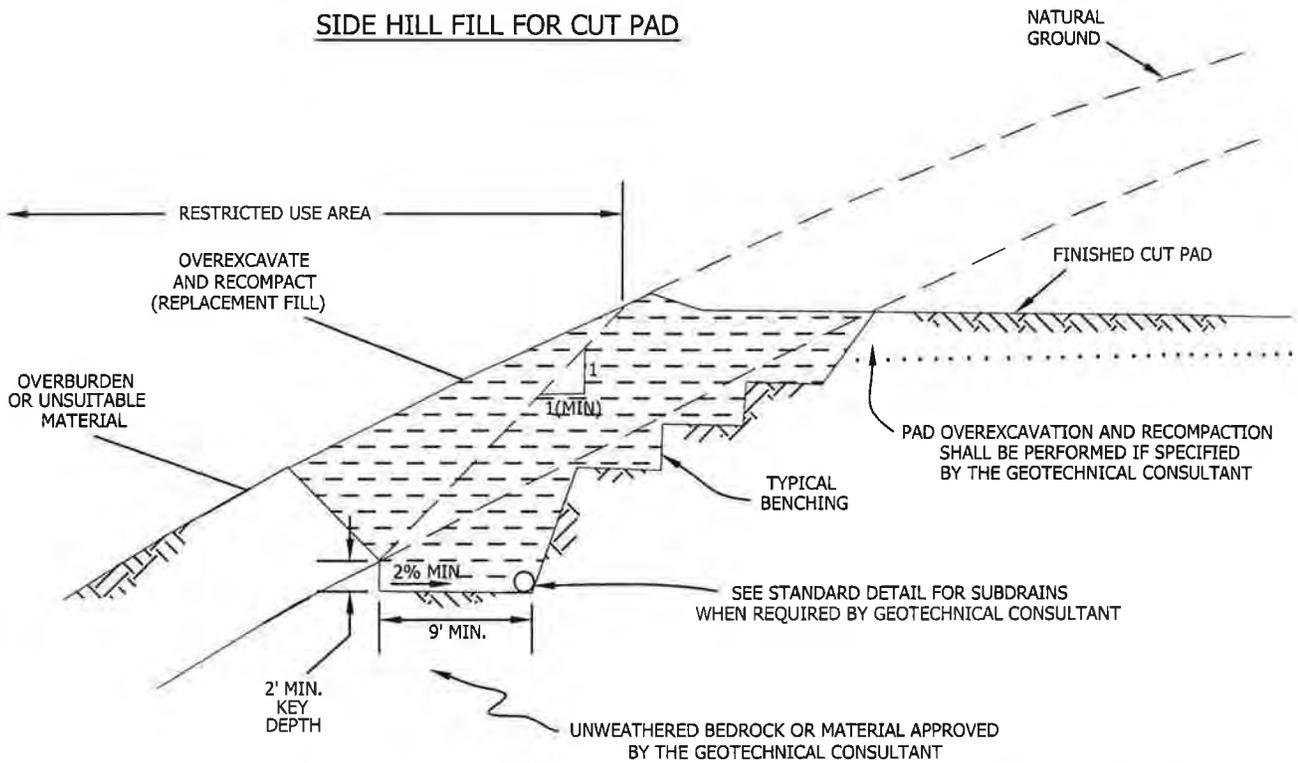
**GENERAL EARTHWORK AND GRADING  
SPECIFICATIONS  
STANDARD DETAILS D**



**CUT-FILL TRANSITION LOT OVEREXCAVATION**



**SIDE HILL FILL FOR CUT PAD**



**TRANSITION LOT FILLS  
AND SIDE HILL FILLS**

**GENERAL EARTHWORK AND GRADING  
SPECIFICATIONS  
STANDARD DETAILS E**

