WASTE MANAGEMENT PLAN

Del Cerro Residential

PTS#: 435483

APNs: 434-010-10-00

Northeast Corner of Interstate 8 and College Avenue
San Diego, California 92120

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

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1.0 PURPOSE

According to the City of San Diego, Development Services Department, California Environmental Quality Act (CEQA) Significance Determination Thresholds (January 2011), projects that include the demolition, construction, and/or renovation of 40,000 square feet or more of building space generate 60 tons of waste or more. This amount of waste is further identified as a potentially significant cumulative impact. Cumulative impacts are mitigated by the implementation of a project-specific Waste Management Plan which identifies ways to reduce solid waste impacts to below a level of significance. The purpose of this Waste Management Plan (WMP), for the Parkview Terrace Project, is to identify waste that will be generated by the project during Site Development, Demolition/Construction, and Occupancy and to identify measures to reduce the waste.

The following regulations apply to Demolition/Construction, Site Development, and through Occupancy to assure waste is being diverted from landfills. On December 9, 1997, the City of San Diego adopted Section 142.08 of the San Diego Municipal Code, Refuse and Recyclable Materials Storage Regulations. The ordinance requires the diversion of recyclable materials from landfill disposal to conserve the capacity and extend the useful life of landfills in San Diego County, and reduce greenhouse gas emissions. Section 142.08 provides for permanent, adequate, and convenient space for the storage and collection of refuse and recyclable material to encourage recycling of solid waste. On November 13, 2007, the City of San Diego adopted a Recycling Ordinance. The ordinance requires recycling of plastic and glass bottles and jars, paper, newspaper, metal containers and cardboard at private residences, commercial buildings, and at special events requiring a City permit.

Effective January of 2008, the City of San Diego adopted a Construction and Demolition (C&D) Debris Diversion Deposit Ordinance. The ordinance requires that the majority of construction, demolition, and remodeling projects requiring building, combination, and demolition permits pay a refundable C&D Debris Recycling Deposit and divert at least 50% of their debris by recycling, reusing or donating usable materials. The C&D ordinance has a provision that would require 75% of construction and demolition waste be diverted once a certified facility within San Diego reaches a 75% diversion rate within 25 miles of 202 “C” Street. The ordinance is designed to keep C&D materials out of local landfills and ensure they get recycled. The California legislature has established a minimum diversion of 75% or more statewide.

2.0 PROJECT DESCRIPTION

The Del Cerro Residential project is a proposed 26 lot Single-Family Residential Subdivision located on a vacant 6.0 acre parcel at the northeast corner of Interstate 8 and College Avenue in the City of San Diego, California, and is currently undeveloped in its existing condition. The APN for the project site is 463-010-10-00. The proposed project will include the construction of the 26 single family residences, as well as retaining walls, biofiltration basins, utilities and associated surface improvements.

The subject property is a corner parcel within the City of San Diego and is bordered to the west by College Avenue, to the south by Interstate 8, to the east by Single-Family Residential Homes, and to the north by a Chevron Gas Station. All of the surrounding area has been developed and is mainly comprised of Single-Family Residential and Commercial land uses. The project site is currently zoned as Residential Single Unit RS-1-7.

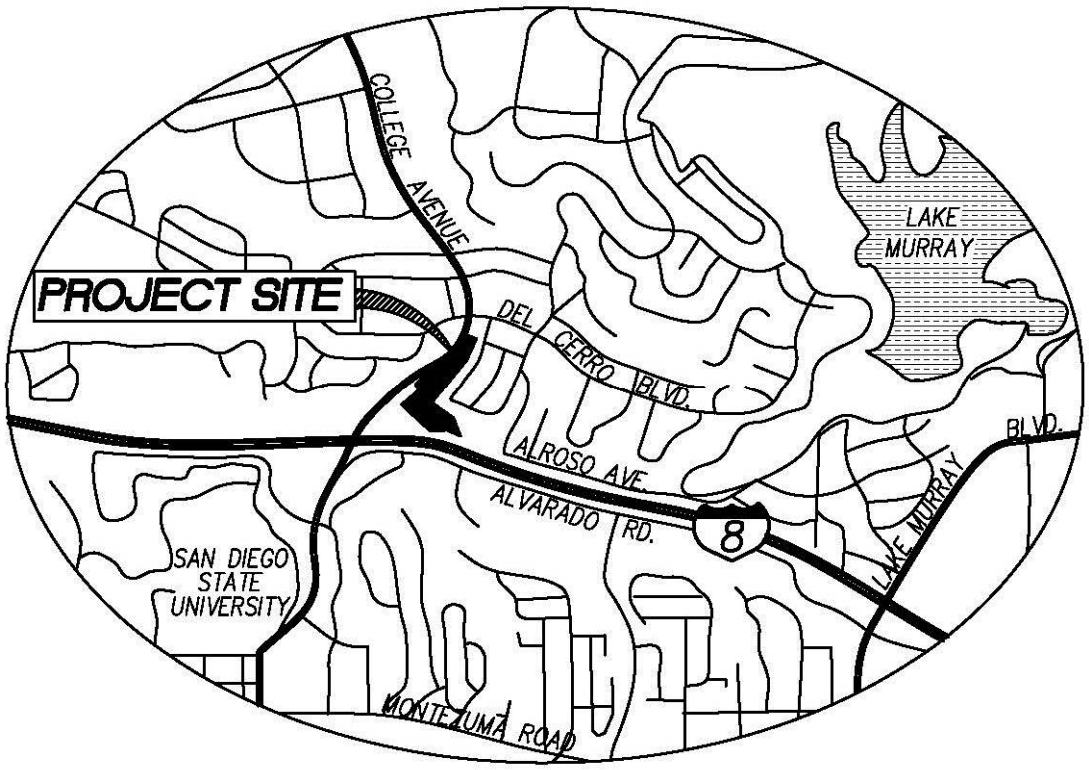

FIGURE 1 – VICINITY MAP

3.0 PRECONSTRUCTION

A Solid Waste Management Coordinator (SWMC) for Del Cerro Residential will be assigned and will have the authority to provide guidelines and procedures for contractor(s) and staff to implement waste reduction and recycling efforts. These responsibilities are, but not limited to, the following:

1. Review and understand the Waste Management Plan including responsibilities of SWMC.
2. Work with contractor(s) to estimate quantities of each type of material that will be salvaged, recycled, or disposed of as waste, then assist contractor(s) with documentation.
3. Review and update procedures as needed for material separation and verify availability of containers and bins needed to avoid delays.
4. Review and update procedures for periodic solid waste collection and transportation to recycling and disposal facilities.
5. Review and update solid waste management requirements for each trade.
6. Possess the Authority to issue Stop Work orders if proper procedures are not being followed.

During each phase, from preconstruction to occupancy of the Del Cerro Residential project, the Waste Management Plan will provide contractors and staff guidelines to ensure the proper reduction, segregation, recycling, and disposal of demolition, construction, and on-going operational waste. Proper segregation of recyclable materials is required based on type of materials generated and the availability of recycling facilities able to accept those materials. This responsibility will be under the direction of the assigned Del Cerro Residential SWMC.

The Del Cerro Residential SWMC will coordinate with Environmental Services Department and/or Mitigation Monitoring staff, including regular communication and invitations to the work site. An invitation shall be extended to an Environmental Services Department representative at least 7 days prior to attend each pre-construction meeting of each phase of the development.

4.0 DEMOLITION AND CONSTRUCTION WASTE

The Del Cerro Residential project shall specify in the contract language that its contractor(s) shall identify which demolition and construction materials will be reused or recycled onsite. Waste materials will be reviewed for reuse in construction, serving as both a solid waste management and cost savings measure. Reuse will be maximized in order to achieve an overall goal of 75% reuse/post-consumer recycled materials. The contractors and subcontractors will coordinate and work closely with the SWMC to minimize the over-purchasing of construction materials to lower the amount of materials taken to recycling and disposal facilities. Ways in which the project will minimize over-purchasing is to purchase pre-cut materials, work closely amongst designers, contractors, and suppliers as well as reuse whenever possible.

The contractor(s) will be required to perform daily inspections of the construction site to ensure compliance with the requirements of the Waste Management Plan and all other applicable laws and ordinances and report directly to the Del Cerro Residential SWMC. Daily inspections will include verifying the availability and number of dumpsters based on amount of debris being generated, assuring correct labeling of dumpsters, proper sorting and segregation of materials, and salvaging of excess materials when feasible.

The proposed project exists today as vacant land. The project site is not expected to produce waste, therefore, for the purpose of this analysis, it is expected that the Del Cerro Residential project will generate 0 tons of demolition waste.

The City of San Diego Environmental Services Department requires projects to estimate tonnage of expected construction waste. As provided by Environmental Services Department and for purposes of this Waste Management Plan, Del Cerro Residential utilizes the Environmental Protection Agency (EPA), 3.0 pounds of waste per square foot for waste generation on new construction to calculate expected tonnage:

2,000 sq. ft. average x 26 Single-Family Residential Units x 3.0/2,000lbs = 78 tons

Table 4.2: Estimated Construction Waste Generated & Percent Diverted

Land Use	Square Feet	EPA Generation Rate (lbs per sq. ft)	Tons Generated [1]	Percent Diverted	Tons Diverted	Tons Disposed
26 Multi-Family Residential Homes	52,000	3	78	80%	63	15

Footnotes:

1. 78 tons is an assumption and is used as a placeholder until further detail is provided and the hired contractor can accurately assess expected waste.

Construction materials that can be recycled or used (on or offsite) are listed below:

1. Asphalt
2. Cardboard packaging
3. Carpet and carpet padding and foam
4. Concrete
5. Drywall
6. Land Clearing debris (vegetation, stumpage, dirt)
7. Wood
8. Plastic film (sheeting, shrink wrap, packaging)
9. Window glass
10. Job-trailer waste, including office paper, aluminum cans, bottles, and office cardboard.

The following table (Table 4.3) lists Construction Waste Generation and Diversion Rates for construction material waste that will be generated from the project site.

Table 4.3: Construction Waste Generation and Diversion

Material Type	Estimated Waste Quantity (Tons)	Handling Facility	Estimated Diversion (Tons)	Estimated Disposal (Tons)
Asphalt Concrete	**8**	**Eniss Incorporated** 12421 Vigilante Road Lakeside, CA 92040 (100% Diversion)	8	---
Metals	**7**	Allan Company 6733 Consolidated Way San Diego, CA 92121 (100% Diversion)	7	---
Brick/Masonry/Tile	**7**	**Eniss Incorporated** 12421 Vigilante Road Lakeside, CA 92040 (100% Diversion)	7	---
Clean Wood	**15**	**Miramar Greenery** 5480 Convoy Street San Diego, CA 92111 (100% Diversion)	15	---
Carpet, Padding/Foam	**7**	**DFS Flooring** 10178 Willow Creek Road San Diego, CA 92131 (100% Diversion)	7	---
Drywall	**15**	**EDCO Recovery and Transfer** 3660 Dalbergia Street San Diego, CA 92113 (67% Diversion)	12	3
Corrugated Cardboard	**5**	**Allan Company** 6733 Consolidated Way San Diego, California 92121 (100% Diversion)	5	---
Trash/Garbage	**14**	**Miramar Landfill** 5480 Convoy Street San Diego, CA 92111 (0% Diversion)	---	14
TOTAL	**78**		**61**	**17**

See Appendix 1 for a list of private companies that can handle construction debris and recycling/reuse of various materials.

Contractors will be required to comply with the following methods and procedures below:

1. Construction, Demolition, and Land-Clearing containers will be provided for waste that is to be recycled. Containers shall be clearly labeled, with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.

2. The collection containers for recyclable Construction, Demolition, and Land-Clearing waste must contain no more than 10% non-recyclable materials, by volume.

3. Use detailed material estimates to reduce risk of unplanned and potentially wasteful material cuts.

4. Conduct daily visual inspections of dumpsters and recycling bins to remove contaminants.

5. Include material purchasing agreements, a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, that packaging be taken back for reuse or recycling, and to take back all unused product. Ensure that subcontractors require the same provisions in their purchase agreements.

6. Removal of demolition and construction waste materials from the project site will be performed at least once every week to ensure no over-topping of waste bins. The accumulation and burning of on-site Construction, Demolition, and Land-Clearing waste materials will be prohibited.

7. Post-consumer products will be employed in the design and construction of the new facilities with the goal of achieving 50% of post-consumer content. Examples include reuse of concrete and asphalt generated during demolition and products manufactured with post-consumer content.

Furthermore, Del Cerro Residential will be required to comply with the following:

1. The City's Construction and Demolition Debris Diversion Deposit Program which requires a refundable deposit based on the tonnage and value of the expected recyclable waste materials as part of the building permit requirements.

2. The City Construction and Demolition Recycling Ordinance which requires identification and sorting of demolition and construction waste materials to be diverted to the appropriate recycling facility.

3. This Waste Management Plan –The Del Cerro Residential project will source-separate waste for recycling. The waste contractor will provide monthly reports regarding the amount of waste and recyclable materials to the Del Cerro Residential SWMC who will be responsible for compliance actions with the aforementioned guidelines and make adjustments as needed to maintain conformance. The name and contact information of the waste contractor and SWMC will be provided to ESD at least 10 days prior to the start of any work and updated within 5 days of any changes.

4. The timeline for demolition and construction phases of the Del Cerro Residential project is undetermined at this time.

5.0 OCCUPANCY

The Del Cerro Residential Project will be managed by Colrich, LLC. Waste Management shall collect the refuse and recycled material from the Del Cerro Residential site within San Diego County. Based upon information obtained from CalRecycle and Waste Management, it is estimated that at occupancy, the proposed development will generate 1 ton of waste per residential home per year. Therefore, the Del Cerro Residential Project may generate 78 tons of waste per year (Refer to Table 5.1).

Table 5.1: Waste Generation – Occupancy Phase

Facility	Waste Generated Per Year*
Del Cerro Residential	78 Tons
*Source: Cal Recycle and Waste Management Data	

In order to continually reduce waste delivered to the landfill during the Occupancy, one recycling bin will be provided to each Multi-Family Residence. Colrich, LLC shall educate their employees and residents to recycle all paper products, cardboard, glass, aluminum cans, recyclable plastics, and yard waste. These products will be source separated by the appropriate labeling method. Del Cerro Residential will further continue to provide and maintain the comprehensive Waste Management Plan and ensure efforts of recycling and proper disposal of solid waste materials are practiced. Other ways in which Colrich, LLC will divert waste from the landfill is to conduct annual resident recycling education seminars.

Furthermore, the Del Cerro Residential Development will be required to comply with the City of San Diego Municipal Code section 142.0820 Refuse and Recyclable Material Storage Regulations for Residential Development (Table 142-08C). The proposed project is a multi-family residential subdivision; therefore, the residential category was utilized to determine the minimum storage requirements. The proposed number of dwelling units for the Del Cerro Residential project is 58. Based on Table 142-08B below, the total minimum storage area per development is 192 square feet. The proposed Del Cerro Residential. Project will provide more

than the minimum storage area, as each Single-Family Residence shall have approximately 20 square feet of dedicated waste and recyclable material storage area, where the Waste Container and Recyclable Material Containers shall be located. The entire residential development would provide 26 x 20 SF = 520 square feet of Total Storage Area.

Table 142-08B: Minimum Exterior Refuse and Recyclable Material Storage Areas for Residential Development

Refuse and Recyclable Material Storage "Residential"				
Number of Dwelling Units	Square Footage	Minimum Refuse Storage Area Per Development (Square Feet)	Minimum Recyclable Material Storage Area Per Development (Square Feet)	Total Minimum Storage Area Per Development (Square Feet)
26	52,000	96	96	192

6.0 CONCLUSION

Demolition waste consists primarily of waste generated from the demolition of the existing vegetation and brush on-site. Colrich, LLC will divert the green waste to the local landfill for a diversion rate of 100%. Construction waste anticipated for the Del Cerro Residential project is 165 tons and is based on EPA's estimate of waste generated for development. The minimum requirement of the Del Cerro Residential Project is to meet the 75% diversion rate. However, the goal shall be to exceed the 75% diversion to the maximum extent by purchasing pre-cut materials. Construction waste will be taken to the applicable facilities as shown in Table 4.3 of this report, for a diversion rate of 80% or greater.

Colrich, LLC is committed to establishing recycling guidelines throughout the Preconstruction, Demolition, Construction, and Occupancy phases. A Waste Management Coordinator will be assigned to the Del Cerro Residential Project. The Coordinator will ensure compliance with the San Diego Municipal Code, Recycling Ordinance, Refuse, Construction and Demolition Recycling Ordinance, and Recyclable Materials Storage Regulations and aim to exceed the 75% recycled material goal by estimating tonnage to be recycled and tracking where recycled material will be diverted during all phases.

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Appendix 1
Refuse and Recyclable Materials Storage Regulations

Article 2: General Development Regulations

Division 8: Refuse and Recyclable Materials Storage Regulations

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§142.0801 Purpose of Refuse and Recyclable Materials Storage Regulations

The purpose of these regulations is to provide permanent, adequate, and convenient space for the storage and collection of refuse and *recyclable material*. The intent of these regulations is to encourage recycling of solid waste to reduce the amount of waste material entering landfills and to meet the recycling goals established by the City Council and mandated by the state of California.
(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§142.0805 When Refuse and Recyclable Materials Storage Regulations Apply

Refuse and recyclable materials storage shall be provided for the following types of *development* as indicated in Table 142-08A:

(a) New residential *development* projects involving two or more *dwelling units*,

(b) New nonresidential *development*, or

(c) Additions to existing *multiple dwelling unit* residential, commercial or industrial *development* where the *gross floor area* would be increased by 30 percent or more.

Table 142-08A
Refuse and Recyclable Material Storage Regulations
Applicability

Type of *Development* Proposal	**Applicable Regulations**	**Required Permit Type/Decision Process**
Development- of a *single dwelling unit*	Exempt from this division	Exempt from this division
New residential *development* involving two or more *dwelling units*	Sections 142.0810 and 142.0820	No permit required by this division
New nonresidential development	Sections 142.0810 and 142.0830	No permit required by this division
Additions to existing *multiple dwelling unit* residential, commercial, or industrial *development* where the *gross floor area* would be increased by 30 percent or more	Sections 142.0810, 142.0820 and 142.0830	No permit required by this division

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)
(Amended 11-13-08 by O-19799 N.S; effective 12-13-2008.)

§142.0810 General Regulations for Refuse and Recyclable Material Storage

New residential *development* as indicated in Section 142.0805 shall provide on-site areas for the storage of refuse and *recyclable material* that meet the following standards:

(a) Size of Material Storage Areas. The size of required material storage areas shall meet or exceed the minimum requirements in Tables 142-08B and 142-08C.

(b) Location of Material Storage Areas

(1) Material storage areas may be located in a designated interior area that is not in a *dwelling unit*.

(2) Material storage areas may be located outside a *structure* in required rear *yards* or in required side *yards*. Exterior material storage areas shall not be located in any front *yard*, street side yard, *street yard* area, parking area, landscaped area, or any other area required by the Municipal Code to be constructed or maintained unencumbered according to fire or other applicable building or public safety laws.

(3) Material storage areas shall be accessible to occupants and haulers.

(4) *Premises* served by an *alley* shall provide material storage areas that are directly accessible from the *alley*.

(5) One *sign* identifying the material storage area is required for each area and shall be posted on the exterior of the material storage area near the point of access. The maximum *sign copy area* permitted for each *sign* shall be one square foot.

(6) For commercial *development* on *premises* not served by an *alley*, material storage areas shall be located at least 25 feet from any *street* or sidewalk.

(c) *Screening* of Material Storage Areas. Material storage areas located outside any *structure* shall be *screened* with a minimum 6-foot-high solid *screening* enclosure that is designed to be architecturally consistent with the primary *structure*. Refuse, *recyclable material*, and material storage containers shall not exceed the height of the solid *screening* enclosure.

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)
(Amended 11-28-2005 by O-19444 N.S.; effective 2-9-2006.)
(Amended 11-13-08 by O-19799 N.S; effective 12-13-2008.)

§142.0820 Refuse and Recyclable Materials Storage Regulations for Residential Development

Applicable residential *development* in accordance with Section 142.0805, shall provide interior and exterior refuse and recycling storage areas as specified below:

(a) Interior Refuse and *Recyclable Material* Storage. Each *dwelling unit* shall be equipped with an interior refuse and *recyclable material* storage area.

(b) Exterior Refuse and *Recyclable Material* Storage. Each *structure* that contains *dwelling units* shall provide at least one exterior storage area. The total storage area~~s~~ requirement is based on the number of *dwelling units* in the *development* as shown in Table 142-08B and includes the sum of all residential material storage areas located outside of individual *dwelling units*.

Table 142-08B
Minimum Exterior Refuse and Recyclable Material Storage Areas for Residential Development

Number of Dwelling Units Per Development	**Minimum Refuse Storage Area Per Development** (Square Feet)	**Minimum *Recyclable Material* Storage Area Per Development** (Square Feet)	**Total Minimum Storage Area Per Development** (Square Feet)
2-6	12	12	24
7-15	24	24	48
16-25	48	48	96
26-50	96	96	192
51-75	144	144	288
76-100	192	192	384
101-125	240	240	480
126-150	288	288	576
151-175	336	336	672
176-200	384	384	768
201+	384 plus 48 square feet for every 25 dwelling units above 201	384 plus 48 square feet for every 25 dwelling units above 201	768 plus 96 square feet for every 25 dwelling units above 201

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)
(Amended 3-1-2006 by O-19468 N.S.; effective 4-1-2006.)
(Amended 11-13-08 by O-19799 N.S; effective 12-13-2008.)

§142.0830 Refuse and Recyclable Material Storage Regulations for Nonresidential Development

(a) All new nonresidential *development,* or additions to existing commercial or industrial *development* where the *gross floor area* would be increased by 30 percent or more, shall provide at least one exterior refuse and *recyclable material* storage area for each building. The total storage area requirement is based on the *gross floor area* of the nonresidential buildings on the *premises*, as shown in Table 142-08C and includes the sum of all nonresidential refuse and recyclable material storage areas.

(b) Where a *development* includes residential as part of a mixed use project, the *development* shall provide refuse and *recyclable material* storage for the residential portion of the project in accordance with Table 142-08B, in addition to the storage areas required by Table 142-08C for the nonresidential *development*.

Table 142-08C
Minimum Exterior Refuse and Recyclable Material Storage Areas for Nonresidential Development

Gross Floor Area Per Development (Square Feet)	**Minimum Refuse Storage Area Per Development** (Square Feet)	**Minimum *Recyclable Material* Storage Area Per Development** (Square Feet)	**Total Minimum Area Per Development** (Square Feet)
0-5,000	12	12	24
5,000-10,000	24	24	48
10,001-25,000	48	48	96
25,001-50,000	96	96	192
50,001-75,000	144	144	244
75,001-100,000	192	192	384
100,001+	192 plus 48 square feet for every 25,000 square feet of building area above 100,001	192 plus 48 square feet for every 25,000 square feet of building area above 100,001	384 plus 96 square feet for every 25,000 square feet of building area above 100,001

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)
(Amended 11-13-08 by O-19799 N.S; effective 12-13-2008.)

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Appendix 2
Information Bulletin 119: Construction and Demolition Debris

NEW Construction & Demolition (C&D) Deposit Schedule

Effective January 1, 2014

New Deposit Schedule - Effective January 1, 2014				
Deposit Types	Deposit/ Sq Ft	Minimum Sq Ft Subject to Ordinance	Maximum Sq Ft Subject to Deposit	Range of Deposits
Residential New Construction, Non-residential Alterations, Demolition	$0.40	1,000	100,000	$400 - $40,000
Non-residential New Construction	$0.20	1,000	50,000	$200 - $10,000
Flat Rate				
Residential Alterations*	$1,000	1,000	6,999	$1,000

* Residential Alterations 7,000 square feet and greater in size, and hotels are considered Non-Residential Alterations.

DEPOSIT AMOUNTS

Deposit amounts are applied to the entire area(s) where the work will be performed, and are calculated based on the square footage. Deposits are applied to each qualifying permit. Phased projects with multiple permits/approvals are subject to multiple deposits. Deposit type for mixed use buildings will be determined according to the largest use square footage, which will be applied to the entire square footage of the project. Deposits must be paid at the time of permit issuance and appear in the project invoice as "C&D Deposits." In order to be eligible for a full refund of the deposit, at least 50% by weight of the total C&D debris generated by the project must be recycled.

EXEMPTIONS:

The following projects, alone or in combination with one another, are exempt from the requirements, except if the project(s) is/are undertaken in conjunction with a project which otherwise is subject to the requirements:

A. Roofing projects;
B. Installation, replacement or repair of: retaining wall; fence; shade structure, awning or canopy; carport, patio cover, balcony, trellis or fireplace; deck; skylights, windows, doors, stair flights or poles; siding, stucco or veneer; swimming pool or spa; pre-fabricated sign or antenna which does not require modification to the structure to which the sign is attached; storage racks; partitions only; seismic tie-downs;
C. Modification, alteration or repair of facades;
D. Re-pipe repairs;
E. Foundation repairs;
F. Installation or replacement of a pre-fabricated modular building or mobile home;
G. Projects which require only an electrical permit, only a plumbing permit or only a mechanical permit;
H. Projects which do not require plans for a Building Permit;
I. Projects which are expected to generate only hazardous waste and/or hazardous substances; and
J. Projects for which the C&D debris deposit is less than $200.

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Appendix 3
Construction and Demolition Recycling Facilities Directory

THE CITY OF SAN DIEGO

2015 Certified Construction & Demolition Recycling Facility Directory

These facilities are certified by the City of San Diego to accept materials listed in each category. Hazardous materials are not accepted. The diversion rate for these materials shall be considered 100%, except mixed C&D debris which updates quarterly. The City is not responsible for changes in facility information. Please call ahead to confirm details such as accepted materials, days and hours of operation, limitations on vehicle types, and cost. For more information visit: www.recyclingworks.com.

Please note: In order to receive recycling credit, Mixed C&D Facility and transfer station receipts must: *-be coded as construction & demolition (C&D) debris -have project address or permit number on receipt *Make sure to notify weighmaster that your load is subject to the City of San Diego C&D Ordinance.* ***Note about landfills: Miramar Landfill and other landfills do not recycle mixed C&D debris.***	**Mixed C&D Debris**	**Asphalt /Concrete**	**Brick/Block/Rock**	**Building Materials for Reuse**	**Cardboard**	**Carpet**	**Carpet Padding**	**Ceiling Tile**	**Ceramic Tile / Porcelain**	**Clean Fill Dirt**	**Clean Wood / Green Waste**	**Drywall**	**Industrial Plastics**	**Lamps / Light Fixtures**	**Metal**	**Mixed Inerts**	**Styrofoam Blocks**
EDCO Recovery & Transfer 3660 Dalbergia St, San Diego, CA 92113 619-234-7774 | www.edcodisposal.com/public-disposal	65%											●					
EDCO Station Transfer Station & Buy Back Center 8184 Commercial St, La Mesa, CA 91942 619-466-3355 | www.edcodisposal.com/public-disposal	65%				●							●			●		
EDCO CDI Recycling & Buy Back Center 224 S. Las Posas Rd, San Marcos, CA 92078 760-744-2700 | www.edcodisposal.com/public-disposal	89%				●										●		
Escondido Resource Recovery 1044 W. Washington Ave, Escondido 760-745-3203 | www.edcodisposal.com/public-disposal	65%																
Fallbrook Transfer Station & Buy Back Center 550 W. Aviation Rd, Fallbrook, CA 92028 760-728-6114 | www.edcodisposal.com/public-disposal	65%				●										●		
Otay C&D/Inert Debris Processing Facility 1700 Maxwell Rd, Chula Vista, CA 91913 619-421-3773 | www.sd.disposal.com	66%																
Ramona Transfer Station & Buy Back Center 324 Maple St, Ramona, CA 92065 760-789-0516 | www.edcodisposal.com/public-disposal	65%				●										●		
SANCO Resource Recovery & Buy Back Center 6750 Federal Blvd, Lemon Grove, CA 91945 619-287-5696 | www.edcodisposal.com/public-disposal	65%				●										●		
All American Recycling 10805 Kenney St, Santee, CA 92071 619-508-1155 (Must call for appointment)						●											
Allan Company 6733 Consolidated Wy, San Diego, CA 92121 858-578-9300 | www.allancompany.com/facilities.htm					●										●		
Allan Company Miramar Recycling 5165 Convoy St, San Diego, CA 92111 858-268-8971 | www.allancompany.com/facilities.htm					●										●		
Allan Company 8514 Mast Blvd, Santee, CA 92701 619-448-4295 | www.allancompany.com/facilities.htm					●										●		
AMS 4674 Cardin St, San Diego, CA 92111 858-541-1977 | www.a-m-s.com								●									
AMS 1120 West Mission Ave, Escondido, CA 92025 858-541-1977 | www.a-m-s.com								●									
Armstrong World Industries, Inc. 300 S. Myrida St, Pensacola, FL 32505 877-276-7876 (Press 1, Then 8) www.armstrong.com/commceilingsna								●									
Cactus Recycling 8710 Avenida De La Fuente, San Diego, CA 92154 619-661-1283 | www.cactusrecycling.com					●								●		●		●

	Mixed C&D Debris	Asphalt /Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile / Porcelain	Clean Fill Dirt	Clean Wood / Green Waste	Drywall	Industrial Plastics	Lamps / Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
DFS Flooring 10178 Willow Creek Road, San Diego, CA 92131 858-630-5200 | www.dfsflooring.com						●	●										
Enniss Incorporated 12421 Vigilante Rd, Lakeside, CA 92040 619-443-9024 | www.enniss.net		●	●						●	●							
Escondido Sand and Gravel 500 N. Tulip St, Escondido, CA 92025 760-432-4690 | www.weirasphalt.com/esg		●															
Habitat for Humanity ReStore 10222 San Diego Mission Rd, San Diego, CA 92108 619-516-5267 | www.sdhfh.org/restore.php				●													
Hanson Aggregates West – Lakeside Plant 12560 Highway 67, Lakeside, CA 92040 858-547-2141		●															
Hanson Aggregates West – Miramar 9229 Harris Plant Rd, San Diego, CA 92126 858-974-3849		●								●							
Hidden Valley Steel & Scrap, Inc. 1342 Simpson Wy, Escondido, CA 92029 760-747-6330															●		
HVAC Exchange 2675 Faivre St, Chula Vista, CA 91911 619-423-1855 | www.thehvacexchange.com															●		
IMS Recycling Services 2740 Boston Ave, San Diego, CA 92113 619-231-2521 | www.imsrecyclingservices.com					●								●				
IMS Recycling Services 2697 Main St, San Diego, CA 92113 619-231-2521 | www.imsrecyclingservices.com													●		●		
Inland Pacific Resource Recovery 12650 Slaughterhouse Canyon Rd, Lakeside, CA 92040 619-390-1418											●						
Lakeside Land Co., Inc. 10101 Riverford Rd, Lakeside, CA 92040 619-449-9083 | www.lakesideland.com		●														●	
Lamp Disposal Solutions 8248 Ronson Ct, San Diego, CA 92111 858-569-1807 | www.lampdisposalsolutions.com														●			
Lights Out Disposal 1097 Palm Ave, Ste 100, El Cajon, CA 92020 619-438-1093 | www.lightsoutdisposal.com														●			
Los Angeles Fiber Company 4920 S. Boyle Ave, Vernon, CA 90058 323-589-5637 | www.lafiber.com						●	●										
Miramar Greenery, City of San Diego 5180 Convoy St, San Diego, CA 92111 858-694-7000 | www.sandiego.gov/environmental-services/miramar/greenery.shtml											●						
Moody's 3210 Oceanside Blvd., Oceanside, CA 92056 760-433-3316		●								●						●	
Otay Valley Rock, LLC 2041 Heritage Rd, Chula Vista, CA 91913 619-591-4717 | www.otayrock.com		●															
Pacific Steel, Inc. 1700 Cleveland Ave, National City, CA 91950 619-474-7081															●		
Reclaimed Aggregates Chula Vista 855 Energy Wy, Chula Vista, CA 91913 619-656-1836		●														●	

	Mixed C&D Debris	Asphalt /Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile / Porcelain	Clean Fill Dirt	Clean Wood / Green Waste	Drywall	Industrial Plastics	Lamps / Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
Reconstruction Warehouse 3341 Hancock St., San Diego, CA 92110 619-795-7326 | www.recowarehouse.com				●													
Robertson's Ready Mix 2094 Willow Glen Dr, El Cajon, CA 92019 619-593-1856		●								●						●	
Romero General Construction Corp. 8354 Nelson Wy, Escondido, CA 92026 760-749-9312 | www.romerogc.com/crushing/nelsonway.htm		●															
SA Recycling 3055 Commercial St., San Diego, CA 92113 619-238-6740 | www.sarecycling.com															●		
SA Recycling 1211 S. 32nd St., San Diego, CA 92113 619-234-6691 | www.sarecycling.com															●		
Vulcan Carol Canyon Landfill and Recycle Site 10051 Black Mountain Rd, San Diego, CA 92126 858-530-9465 | www.vulcanmaterials.com/carrollcanyon		●	●							●						●	

PASCO LARET SUITER & ASSOCIATES

CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

PRELIMINARY WASTE MANAGEMENT PLAN
Del Cerro Residential

Appendix 4
Proposed Development Exhibit / Site Plan

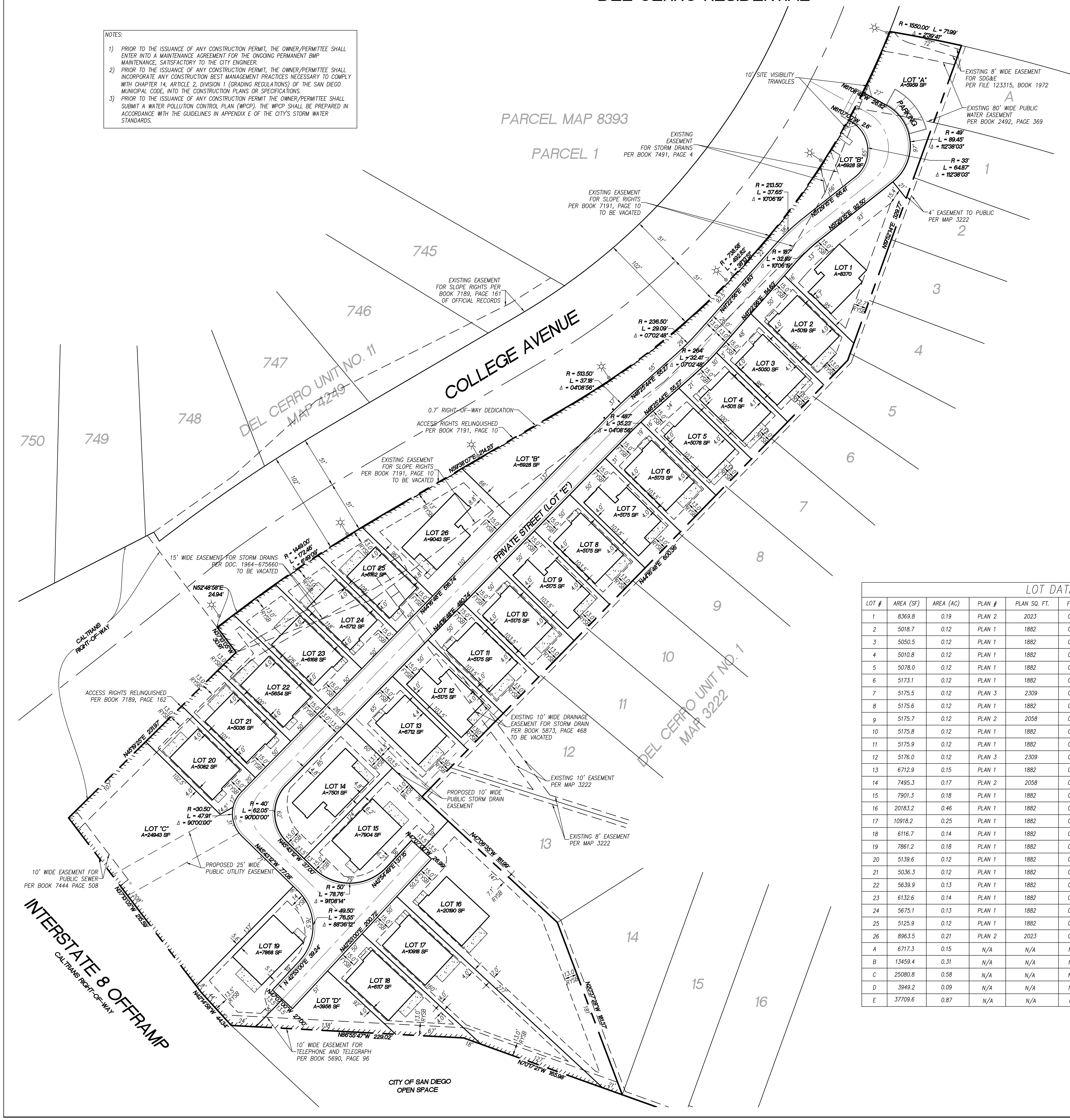
SITE PLAN

TENTATIVE MAP AND SITE DEVELOPMENT PERMIT

DEL CERRO RESIDENTIAL

NOTES:

1) PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL ENTER INTO A MAINTENANCE AGREEMENT FOR THE ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER.
2) PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS.
3) PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT THE OWNER/PERMITTEE SHALL SUBMIT A WATER POLLUTION CONTROL PLAN (WPCP). THE WPCP SHALL BE PREPARED IN ACCORDANCE WITH THE GUIDELINES IN APPENDIX E OF THE CITY'S STORM WATER STANDARDS.



LEGEND

- SITE BOUNDARY
- RIGHT OF WAY
- EXISTING LOT LINE
- PROPOSED LOT LINE
- PROPOSED SETBACKS
- STREET CENTERLINE
- EXISTING EASEMENT
- PROPOSED LOT — LOT 10
- PROPOSED LOT AREA — A=5000 SF
- LIMITS OF ACCESS RELINQUISHMENT
- COVERED PATIOS
- PROPOSED BUILDING FOOTPRINT

GRADING QUANTITIES

AMOUNT OF CUT:	18300 CUBIC YARDS*
MAXIMUM DEPTH OF CUT OUTSIDE OF BUILDING:	18 FEET
AMOUNT OF FILL:	51700 CUBIC YARDS*
MAXIMUM DEPTH OF FILL OUTSIDE OF BUILDING:	24 FEET
NET:	33400 CUBIC YARDS IMPORT
MAXIMUM HEIGHT OF FILL SLOPES:	24 FEET
FILL SLOPE RATIO:	2:1 HORIZONTAL TO VERTICAL
MAXIMUM HEIGHT OF CUT SLOPES:	18 FEET
CUT SLOPE RATIO:	2:1 HORIZONTAL TO VERTICAL

*NOTE: EARTHWORK QUANTITIES DO NOT INCLUDE EXCAVATION FOR WATER AND SEWER LATERALS.

RETAINING WALLS

TOTAL LENGTH OF WALLS:	1970 LF
MAXIMUM HEIGHT:	12 FEET

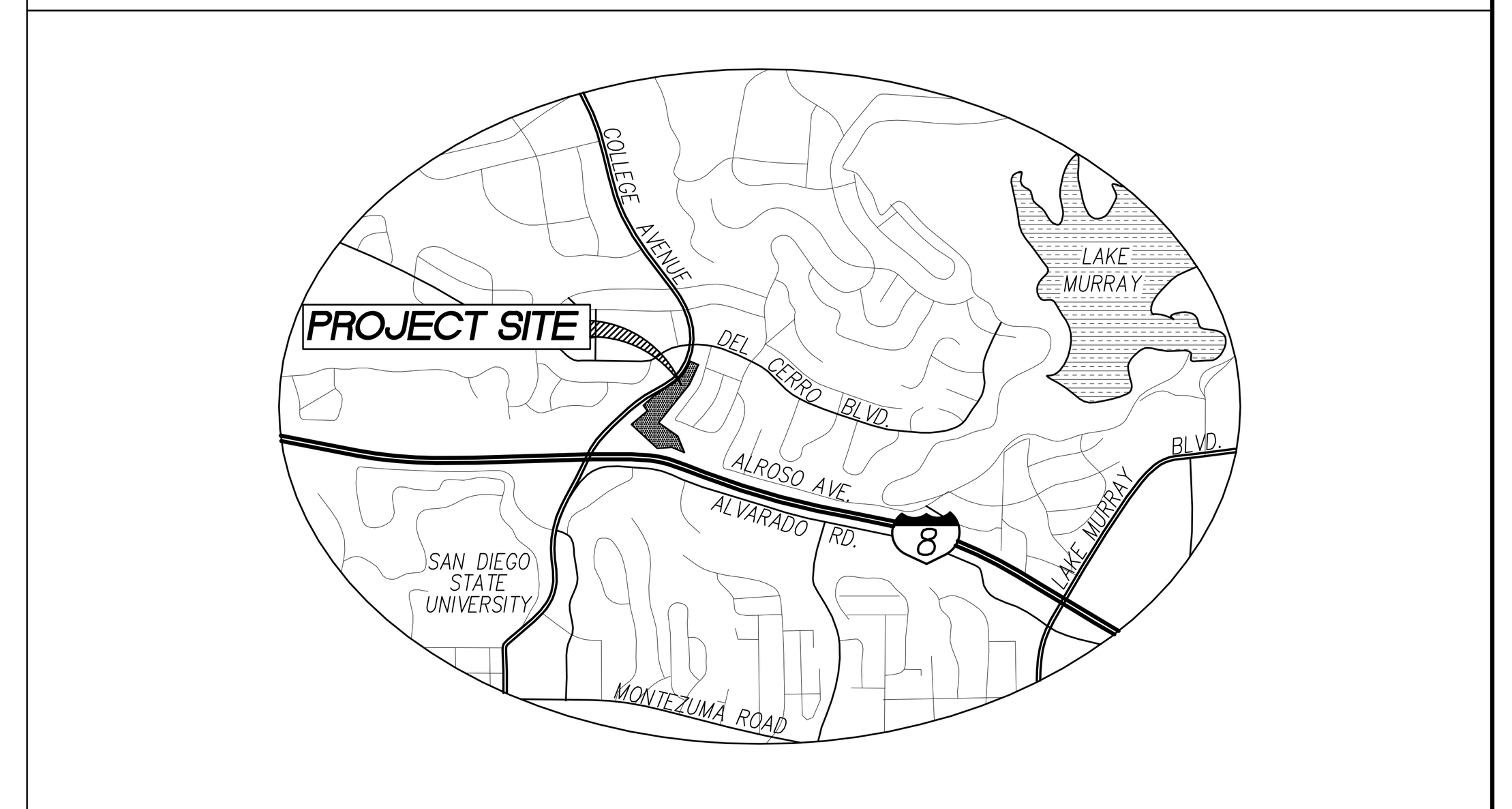
NOTE: THIS EARTHWORK WAS PREPARED USING DIGITIZED TOPOGRAPHY RECEIVED FROM AEROTECH MAPPING AND PROPOSED CONTOURS DESIGNED BY PLSA. THIS EARTHWORK DOES NOT TAKE INTO ACCOUNT SHRINK OR SWELL FACTORS. STREET UNDERCUT AND BIORETENTION BASIN SECTION HAVE BEEN EXCLUDED FROM FILL QUANTITIES.

LOT DATA TABLE

LOT #	AREA (SF)	AREA (AC)	PLAN #	PLAN SQ. FT.	F.A.R	F.A.R. MAX	USE	OWNERSHIP	SYSB (FT)
1	8369.8	0.19	PLAN 2	2023	0.24	0.56	RESIDENTIAL	PRIVATE	4.8
2	5018.7	0.12	PLAN 1	1882	0.37	0.59	RESIDENTIAL	PRIVATE	4.0
3	5050.5	0.12	PLAN 1	1882	0.37	0.59	RESIDENTIAL	PRIVATE	4.1
4	5010.8	0.12	PLAN 1	1882	0.38	0.59	RESIDENTIAL	PRIVATE	4.0
5	5078.0	0.12	PLAN 1	1882	0.37	0.59	RESIDENTIAL	PRIVATE	4.0
6	5173.1	0.12	PLAN 1	1882	0.36	0.59	RESIDENTIAL	PRIVATE	4.0
7	5175.5	0.12	PLAN 3	2309	0.45	0.59	RESIDENTIAL	PRIVATE	4.0
8	5175.6	0.12	PLAN 1	1882	0.36	0.59	RESIDENTIAL	PRIVATE	4.0
9	5175.7	0.12	PLAN 2	2058	0.40	0.59	RESIDENTIAL	PRIVATE	4.0
10	5175.8	0.12	PLAN 1	1882	0.36	0.59	RESIDENTIAL	PRIVATE	4.0
11	5175.9	0.12	PLAN 1	1882	0.36	0.59	RESIDENTIAL	PRIVATE	4.0
12	5176.0	0.12	PLAN 3	2309	0.45	0.59	RESIDENTIAL	PRIVATE	4.0
13	6712.9	0.15	PLAN 1	1882	0.28	0.58	RESIDENTIAL	PRIVATE	4.4
14	7495.3	0.17	PLAN 2	2058	0.27	0.57	RESIDENTIAL	PRIVATE	4.8
15	7901.3	0.18	PLAN 1	1882	0.24	0.57	RESIDENTIAL	PRIVATE	6.2
16	20183.2	0.46	PLAN 1	1882	0.09	0.45	RESIDENTIAL	PRIVATE	7.1
17	10918.2	0.25	PLAN 1	1882	0.17	0.54	RESIDENTIAL	PRIVATE	4.0
18	6116.7	0.14	PLAN 1	1882	0.31	0.58	RESIDENTIAL	PRIVATE	4.0
19	7861.2	0.18	PLAN 1	1882	0.24	0.57	RESIDENTIAL	PRIVATE	5.6
20	5139.6	0.12	PLAN 1	1882	0.37	0.59	RESIDENTIAL	PRIVATE	4.0
21	5036.3	0.12	PLAN 1	1882	0.37	0.59	RESIDENTIAL	PRIVATE	4.0
22	5639.9	0.13	PLAN 1	1882	0.33	0.59	RESIDENTIAL	PRIVATE	4.0
23	6132.6	0.14	PLAN 1	1882	0.31	0.58	RESIDENTIAL	PRIVATE	4.0
24	5675.1	0.13	PLAN 1	1882	0.33	0.59	RESIDENTIAL	PRIVATE	4.0
25	5125.9	0.12	PLAN 1	1882	0.36	0.59	RESIDENTIAL	PRIVATE	4.0
26	8963.5	0.21	PLAN 2	2023	0.22	0.55	RESIDENTIAL	PRIVATE	8.8
A	6717.3	0.15	N/A	N/A	N/A	N/A	PRIVATE OPEN SPACE	HOA	N/A
B	13459.4	0.31	N/A	N/A	N/A	N/A	PRIVATE OPEN SPACE	HOA	N/A
C	25080.8	0.58	N/A	N/A	N/A	N/A	STORMWATER	HOA	N/A
D	3949.2	0.09	N/A	N/A	N/A	N/A	STORMWATER	HOA	N/A
E	37709.6	0.87	N/A	N/A	N/A	N/A	PRIVATE STREET	HOA	N/A

SCALE: 1"=40'

VICINITY MAP



DEVELOPMENT SUMMARY

THE PROPOSED PROJECT IS A 26 SINGLE FAMILY RESIDENTIAL SUBDIVISION IN THE CITY OF SAN DIEGO, CALIFORNIA. THE PROPOSED PROJECT INCLUDES THE CONSTRUCTION A PRIVATE STREET, PRIVATE WATER AND SEWER SYSTEMS, PUBLIC AND PRIVATE STORM DRAIN SYSTEMS, RESIDENTIAL HOMES, RETAINING WALLS, THREE HOA MAINTAINED STORMWATER TREATMENT BASINS, AND ASSOCIATED IMPROVEMENTS. THE PROPOSED PROJECT REQUIRES A TENTATIVE MAP & SITE DEVELOPMENT PERMIT.

SITE DESCRIPTION

APN: 434-010-10-00 SITE AREA: 5.99 ACRES

ABBREVIATED LEGAL DESCRIPTION:
PORTION OF LOT 87 OF RANCHO MISSION OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, AS DESCRIBED IN GRANT DEED RECORDED NOVEMBER 3, 1975 AS DOCUMENT 75-306249, O.R.

SURVEY NOTES:

1) THE BOUNDARIES AND DIMENSIONS OF THE SURVEYED PARCEL SHOWN HEREON ARE BASED ON A FIELD SURVEY. RECORD DIMENSIONS MAY VARY. THE BOUNDARIES OF ADJOINING PARCELS WERE COMPILED FROM RECORDED OR FILED DATA, AND ARE TO BE USED FOR PLANNING PURPOSES ONLY.
BENCHMARK:
BRASS PLUG LOCATED AT THE SOUTHWEST CURB RETURN AT THE INTERSECTION OF DEL CERRO BOULEVARD AND COLLEGE AVENUE AS SHOWN IN THE CITY OF SAN DIEGO BENCH MARK BOOK, ELEVATION 461.997 FEET. DATUM IS MEAN SEA LEVEL PER SAID BENCH MARK BOOK.
2) THE LOCATIONS OF UNDERGROUND UTILITY LINES AND/OR STRUCTURES AS SHOWN HEREON ARE BASED ON OBSERVED ABOVE GROUND EVIDENCE AND RECORD INFORMATION PROVIDED TO THE SURVEYOR. NO EXCAVATIONS WERE MADE DURING THE COURSE OF THIS SURVEY TO LOCATE UNDERGROUND UTILITIES. LOCATIONS OF UNDERGROUND UTILITIES MAY VARY FROM LOCATIONS SHOWN HEREON. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST.
3) MAPPING DATA FLOWN ON FEBRUARY 26,2015 AND PROVIDED BY AEROTECH MAPPING.
4) TITLE COMMITMENT PROVIDED BY FIDELITY NATIONAL TITLE COMPANY, ORDER NO. NCS-581014-SD WITH AN EFFECTIVE DATE OF MAY 27, 2015.

LAMBERT COORDINATES: NAD27 224-1750
CCS83 COORDINATES: NAD83 1864-6311

PROJECT INFORMATION

TOTAL PROJECT OWNERSHIP: 5.99 ACRES
TOTAL GRADED AREA: 5.60 ACRES
PERCENT OF SITE TO BE GRADED: 93%

EXISTING USE: VACANT LAND
PROPOSED USE: 26 SINGLE FAMILY RESIDENTIAL HOMES
EXISTING LOTS: 1
PROPOSED LOTS: 26 RESIDENTIAL LOTS
2 STORMWATER LOTS
2 PRIVATE OPEN SPACE LOTS
1 LOT FOR PRIVATE STREET

EXISTING AND PROPOSED ZONE: RS-1-7
COMMUNITY PLAN: NAVAJO COMMUNITY PLAN AREA
OCCUPANCY TYPE: SINGLE FAMILY RESIDENTIAL
CONSTRUCTION TYPE: RESIDENTIAL
GEOLOGIC HAZARD CATEGORY: 52

INFLUENCE OVERLAY ZONE: MONTGOMERY FIELD

THIS IS A MAP OF A SINGLE FAMILY RESIDENTIAL PROJECT AS DEFINED IN SECTION 8700-8704 OF THE CIVIL CODE OF THE STATE OF CALIFORNIA AND IS FILED PURSUANT TO THE SUBDIVISION MAP ACT.

MINIMUM FRONT YARD SETBACK: 15'
MINIMUM SIDE YARD SETBACK: 0.08 X LOT WIDTH
MINIMUM STREET YARD SETBACK: 0.10 X LOT WIDTH
MINIMUM REAR YARD SETBACK: 13'

SHEET INDEX

PUBLIC SERVICES

GAS AND ELECTRIC:	SDG&E
TELEPHONE:	AT&T
CABLE TELEVISION:	COX COMMUNICATIONS
SEWER AND WATER:	CITY OF SAN DIEGO
DRAINAGE SYSTEM:	CITY OF SAN DIEGO
FIRE DEPARTMENT:	CITY OF SAN DIEGO
SCHOOL DISTRICT:	SAN DIEGO UNIFIED SCHOOL DISTRICT

PROJECT TEAM

OWNER/DEVELOPER:
MARBURN CORPORATION, L.L.C.
110 WEST A STREET
SAN DIEGO, CALIFORNIA 92101
T: (619) 236-1557

CIVIL ENGINEER:
PASCO LARET SUITER AND ASSOCIATES
535 N HWY 101, SUITE A
SOLANA BEACH, CALIFORNIA 92075
T: (858) 259-8212 FAX: (858) 259-4812

ARCHITECT:
MCKINLEY ASSOCIATES - ARCHITECTURE AND PLANNING
1818 FIRST AVENUE
SAN DIEGO, CALIFORNIA 92101
T: (619) 238-1134 FAX: (949) 851-5156

LANDSCAPE ARCHITECT:
GILLESPIE MOODY PATTERSON
4010 SORRENTO VALLEY BOULEVARD, SUITE 200
SAN DIEGO, CALIFORNIA 92121
T: (858) 558-8977

PREPARED BY:

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING
535 North Highway 101, Ste A, Solana Beach, CA 92075
ph 858.259.8212 | fx 858.259.4812 | plsaengineering.com

REGISTERED PROFESSIONAL ENGINEER
WILLIAM GREGG MACK
No. 73620
Exp. 12/31/16
CIVIL
STATE OF CALIFORNIA

WILLIAM GREGG MACK R.C.E. 73620
EXPIRATION: 12/31/2016

DATE

PROJECT NAME: DEL CERRO RESIDENTIAL TENTATIVE MAP AND SITE DEVELOPMENT PERMIT
PROJECT ADDRESS: NORTHEAST CORNER OF COLLEGE AVENUE & INTERSTATE 8, SAN DIEGO, CALIFORNIA 92120
PROJECT TRACKING SYSTEM NUMBER: 435483
INTERNAL ORDER NUMBER: PENDING
SHEET TITLE: SITE PLAN
SHEET NUMBER: C 1.0 OF 23

DRAWN BY: J. VAN RYN
CHECKED BY: W. MACK

ORIGINAL DATE: 07-20-2015
REVISION 1: 11-12-2015
REVISION 2: 03-24-2016
REVISION 3:
REVISION 4:
REVISION 5:
REVISION 6:
REVISION 7:

ADVANCED GEOTECHNICAL SOLUTIONS, INC.
9707 Waples Street, Suite 150
San Diego, California 92121
Telephone: (619) 708-1649 Fax: (714) 409-3287

ColRich
444 West Beech Street, Suite 300
San Diego, California 92101

July 20, 2015
P/W 1411-02
Report No. 1411-02-B-4

Attention: **Mr. Tony Pauker**

Subject: **Preliminary Geotechnical Investigation, Del Cerro Residential Development, College Avenue and Interstate 8, San Diego, California**

Gentlemen:

In accordance with your request, presented herein are the results of Advanced Geotechnical Solutions, Inc.'s (AGS) preliminary geotechnical investigation for the proposed Del Cerro residential development northeast of the intersection of College Avenue and Interstate 8 West, in the City of San Diego, California. It is our understanding that the site will be graded to support twenty-five, one- to two-story single-family residences, supported by post-tensioned slab on grade foundations.

The 40-scale Preliminary Grading and Utility Plan prepared by Pasco Laret Suiter & Associates (PLSA) was used as a basis for this report and geotechnical information gathered during this investigation was added to the plan by AGS and is presented as Plate 1.

The recommendations presented in this report are based on our previous subsurface investigation conducted in December 2014 and our familiarity with other projects in the general vicinity of the site. It is AGS's opinion, from a geotechnical standpoint, that the subject site is suitable for construction of the proposed residential development and associated improvements, provided the recommendations presented in this report are incorporated into the design, planning and construction. Included in this report are: 1) engineering characteristics of the onsite soils; 2) unsuitable soil removal recommendations; 3) preliminary foundation design recommendations.

Advanced Geotechnical Solutions, Inc., appreciates the opportunity to provide you with geotechnical consulting services and professional opinions. If you have questions regarding this report, please contact the undersigned at (619) 850-3980.

Respectfully Submitted,
Advanced Geotechnical Solutions, Inc.

REGISTERED PROFESSIONAL ENGINEER
JEFFREY A. CHANEY
No. 2314
GEOTECHNICAL
STATE OF CALIFORNIA

JEFFREY A. CHANEY, President
RCE 46544/GE 2314, Reg. Exp. 6-30-17

PAUL J. DERISI, Vice President
CEG 2536, Reg. Exp. 5-31-17

PROFESSIONAL GEOLOGIST
PAUL J. DERISI
No. 2536
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Distribution: (3) Addressee
Attachments: Figure 1 – Site Location Map
Figure 2 – City of San Diego Seismic Safety Study
Plate 1 – Geologic Map and Exploration Location Plan
Plate 2 – Geologic Cross Sections
Appendix A - References
Appendix B - Field Data
Appendix C - General Earthwork, Grading Guidelines & Details

PRELIMINARY GEOTECHNICAL INVESTIGATION
DEL CERRO RESIDENTIAL DEVELOPMENT
COLLEGE AVENUE AND INTERSTATE 8
SAN DIEGO, CALIFORNIA

1.0 INTRODUCTION

1.1. Purpose and Background

The purpose of this report is to provide preliminary geotechnical recommendations for the design and construction of the proposed residential development. Pertinent subsurface information is included herein.

1.2. Scope of Work

The scope of our study consisted of the following:

- Review of available geologic and geotechnical literature.
- Perform subsurface exploration of project site which included the excavation and logging of ten (10) trackhoe test pits.
- Provide remedial grading recommendations, including undercuts for building pads and underground improvements.
- Earthwork specifications.
- Estimation of shrink/swell parameters of the various onsite earth materials.
- Use of onsite soils as a foundation medium.
- Bearing and friction values.
- Preliminary foundation design.
- Preliminary pavement design.
- Design parameters for conventional retaining walls.
- Preparation of this report with appropriate exhibits.

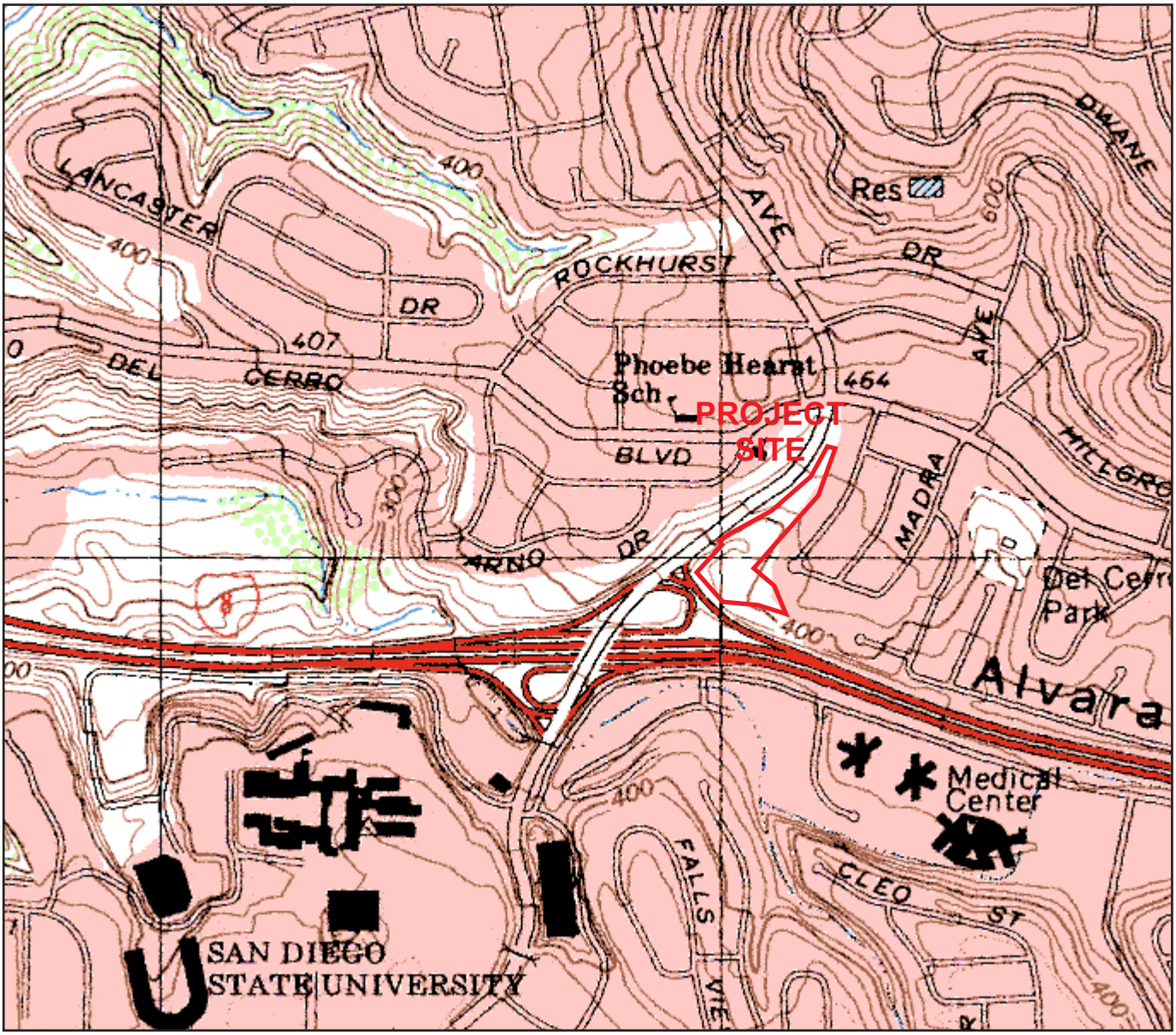
2.0 REPORT LIMITATIONS

The conclusions and recommendations in this report are based on the data developed during our investigations for the site and a review of readily available geologic and geotechnical information for the project site.

The materials immediately adjacent to, or beneath those observed in the exploratory excavations may have different characteristics and no representations are made as to the quality or extent of materials not observed. The recommendations presented herein are specific to the development plans reflected on the current grading plan. Modifications to that design or development plans could necessitate revisions to these recommendations.

3.0 SITE LOCATION AND DESCRIPTION

The irregularly-shaped site is located northeast of the intersection of College Avenue and Interstate 8, in the Del Cerro area of San Diego, California (Figure 1). The site is bounded to the west by College Avenue, to the south by Interstate 8, to the north by an existing gas station, and to the east by existing single-family



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SITE LOCATION MAP
COLLEGE AVENUE AND INTERSTATE 8
SAN DIEGO, CALIFORNIA

P/W 1411-02

FIGURE 1

SOURCE MAP - TOPOGRAPHIC MAP OF THE
LA MESA 7.5 MINUTE QUADRANGLE,
SAN DIEGO COUNTY, CALIFORNIA

AGS
ADVANCED GEOTECHNICAL SOLUTIONS, INC.
9707 Waples Street, Suite 150
San Diego, California 92121
Telephone: (619) 867-0487 Fax: (714) 409-3287

residences. The overall project site encompasses an approximate total area of 5.6 acres. The site is currently vacant, supporting a light growth of seasonal grasses, shrubs, and small trees. Access to the site is via College Avenue.

Topography on site generally slopes down toward the southwest. Approximate elevations onsite range from 356 msl at the southwest corner to 450 msl at the northerly limits of the site. There are existing slopes up to approximately 25 feet high along the northwesterly property boundary ascending to College Avenue. At the southwest corner of the site, there are slopes descending to a minor drainage.

4.0 PREVIOUS DEVELOPMENT

As part of our preliminary investigation several historic aerial photos and topographic maps of the project area were reviewed by representatives of AGS. Based on our review it was determined that the site was previously graded to its current configuration. This grading was likely accomplished in multiple phases. The first phase of grading appears to have occurred in the late 1950's to early 1960's in relation to the construction of the residential development superjacent to the east, College Avenue to the west and Interstate 8 (previously Highway 80) and associated College Avenue off ramp to the south and southwest. Pre-development photos show a moderate sized drainage trending southwest through the approximate central portion of the site. Minor modifications to this drainage occurred during the first phase of grading activity at the site. Subsequently, a second phase of grading appears to have occurred in the mid- to late-1960's. During this phase, the drainage appears to have been filled and a level pad constructed in the southwest portion of the site with graded slopes descending the west and southwest. Based on our review of historic photos and topographic maps it was anticipated that fills on the order of 20 to 30 feet deep were placed in the southwesterly portion of the site. The fill materials placed during this second phase of grading may have been derived from the residential development to the southeast (Del Cerro Court).

5.0 PROPOSED DEVELOPMENT

Based upon the 40-scale Preliminary Grading and Utility Plan (Plate 1), it is our understanding that the subject site will be graded to support 26 residential lots and associated improvements including several bio-retention basins. Access will be provided by a residential cul-de-sac that ties into College Avenue in the northerly portion of the site and terminating at a hammerhead in the southerly portion of the site. It is anticipated that the structures will be wood framed structures, one to two stories in height and supported by post-tensioned slab-on-grade foundation systems.

6.0 SUBSURFACE INVESTIGATION

As part of our investigation, AGS excavated and logged ten (10) exploratory test pits in December 2014. The test pits were excavated with a Caterpillar 328D tracked excavator equipped with a two-foot bucket. The exploratory test pits extended to a maximum depth of 27 feet below existing grade. The approximate locations of the test pits and geologic contacts are plotted on the Preliminary Grading and Utility Plan included herewith as Plate 1.

7.0 ENGINEERING GEOLOGY

7.1. Regional Geologic and Geomorphic Setting

The subject site is situated within the Peninsular Ranges Geomorphic Province. The Peninsular Ranges province occupies the southwestern portion of California and extends southward to the southern tip of Baja California. In general, the province consists of young, steeply sloped, northwest trending mountain ranges underlain by metamorphosed Late Jurassic to Early Cretaceous-aged extrusive volcanic rock and Cretaceous-aged igneous plutonic rock of the Peninsular Ranges Batholith. The westernmost portion of the province, where the subject site is located, is predominantly underlain by younger marine and non-marine sedimentary rocks. The Peninsular Ranges' dominant structural feature is northwest-southeast trending crustal blocks bounded by active faults of the San Andreas transform system.

7.2. Site Geology

A majority of the site is mantled with undocumented fill soils. The undocumented fill is locally underlain by younger and older alluvium where a pre-development drainage was filled in. The fill and alluvial soils are underlain to maximum depths explored by Tertiary-aged Stadium Conglomerate and Cretaceous-age Santiago Peak Volcanics.

A brief description of the earth materials encountered on this site is presented in the following sections. More detailed description of these materials is provided in the test pit logs included in Appendix B.

7.2.1. Artificial Fill - Undocumented (Map Symbol afu)

The site is mantled with undocumented fill soils ranging from 2 to 22 feet in thickness. As encountered, these materials generally consist of fine to coarse grained sand and silty sand with abundant cobbles and some boulders up to 4 feet in diameter. These materials were observed to be in a slightly moist to very moist and loose to medium dense condition. Buried trash debris was encountered in EX-9. An area of large hard rock boulders (shot rock) up to 8 feet in diameter is exposed at the surface in the central portion of the site in proximity to proposed Lots 9 through 12 and Lots 24 through 26.

7.2.2. Alluvium (Qal)

Alluvium was encountered below the undocumented fill in test pits EX-3 and EX-5 at 21 to 22 feet below ground surface. The alluvium encountered ranged from a few feet to as much as four feet thick. As encountered these materials generally consist of brown to gray clayey silt with sand and gravel, very moist, in a firm to stiff state. .

7.2.3. Older Alluvium (Map Symbol Qoa)

Older Alluvium was encountered in EX-4 through EX-7. As encountered these materials generally consist of fine-grained, yellow silty sand in a slightly moist to moist and moderately dense- dense to stiff condition.

7.2.4. Stadium Conglomerate (Map Symbol Tst)

Tertiary aged Stadium Conglomerate was encountered in test pits EX-1, EX-8 and EX-9 below undocumented fill soils. As encountered these materials can generally be described as moderately hard, cobble conglomerate, in a brownish yellow, silty sandstone matrix. Cobbles were generally on the order of 3 to 6 inches in diameter and composed of rounded 'Poway' clasts.

7.2.5. Santiago Peak Volcanics (Map Symbol Ksp)

As encountered, this unit can generally be described as moderately to slightly weathered, moderately hard to hard, metavolcanic bedrock that is reddish brown to brownish yellow on weathered surfaces, and gray on fresh surfaces.

7.3. Geologic Structure

The Stadium Conglomerate non-conformably overlies the basement rocks of the Santiago Peak Volcanics and appears to be confined to the easterly portion of the site. Based on review of historic aerial photos, the original surface contact between the Stadium Conglomerate and Santiago Peak Volcanics appears to coincide with the pre-development drainage that transected the site in a roughly northeast to southwest direction. The Stadium Conglomerate is massively bedded and is anticipated to be near horizontal to very slightly dipping to west in line with the overall regional dip.

7.4. Groundwater

Groundwater was not encountered to the depths explored at the site. Minor Seepage was observed in EX-2 at the fill and bedrock contact. No other natural groundwater condition is known to exist at the site that would impact the proposed site development. However, it should be noted that localized perched groundwater may develop at a later date, most likely at or near fill/bedrock contacts, due to fluctuations in precipitation, irrigation practices, or factors not evident at the time of our field explorations.

7.5. Faulting and Seismicity

The site is located in the tectonically active Southern California area, and will therefore likely experience shaking effects from earthquakes. The type and severity of seismic hazards affecting the site are to a large degree dependent upon the distance to the causative fault, the intensity of the seismic event, and the underlying soil characteristics. The seismic hazard may be primary, such as surface rupture and/or ground shaking, or secondary, such as liquefaction or dynamic settlement. The following is a site-specific discussion of ground motion parameters, earthquake-induced landslide hazards, settlement, and liquefaction. The purpose of this analysis is to identify potential seismic hazards and propose mitigations, if necessary, to reduce the hazard to an acceptable level of risk. The following seismic hazards discussion is guided by the California Building Code (2013), CDMG (2008), and Martin and Lew (1998).

7.5.1. Surface Fault Rupture

No known active faults have been mapped at or near the subject site. The nearest known active surface fault is the Silver Strand section of the Newport-Inglewood-Rose Canyon

fault zone, located approximately 6.7 miles southwest of the site. Accordingly, the potential for fault surface rupture on the subject site is considered very low to remote. This conclusion is based on our literature and map review.

7.5.2. Seismicity

As noted, the site is within the tectonically active southern California area, and is approximately 7 miles from an active fault. Given the close proximity of the site to the nearest active fault the potential exists for strong ground motion that may affect future improvements.

At this point in time, non-critical structures (commercial, residential, and industrial) are usually designed according to the California Building Code (2013) and that of the controlling local agency. However, liquefaction/seismic slope stability analyses, critical structures, water tanks and unusual structural designs will likely require site specific ground motion input.

7.5.3. Liquefaction

Given the dense nature of the formational materials underlying the site, the proposed remedial grading as recommended herein, and the lack of a shallow groundwater table at the project site, the potential for seismically induced liquefaction is considered remote.

7.5.4. Dynamic Settlement

Dynamic settlement occurs in response to an earthquake event in loose sandy earth materials. The potential of dynamic settlement at the subject site is considered to be remote due to the presence of well consolidated/indurated formational materials underlying the site and the proposed removal of loose, sandy soils as recommended herein.

7.5.5. Seismically Induced Landsliding

Evidence of landsliding at the site was not observed during our field observations, nor are there any geomorphic features indicative of landsliding noted in our review of published geologic maps. The nearest known landslide is approximately ¾-mile west of the project and developed within exposures of Friars Formation. If recommendations herewith in this report are followed, the likelihood for seismically induced landsliding is considered to be remote.

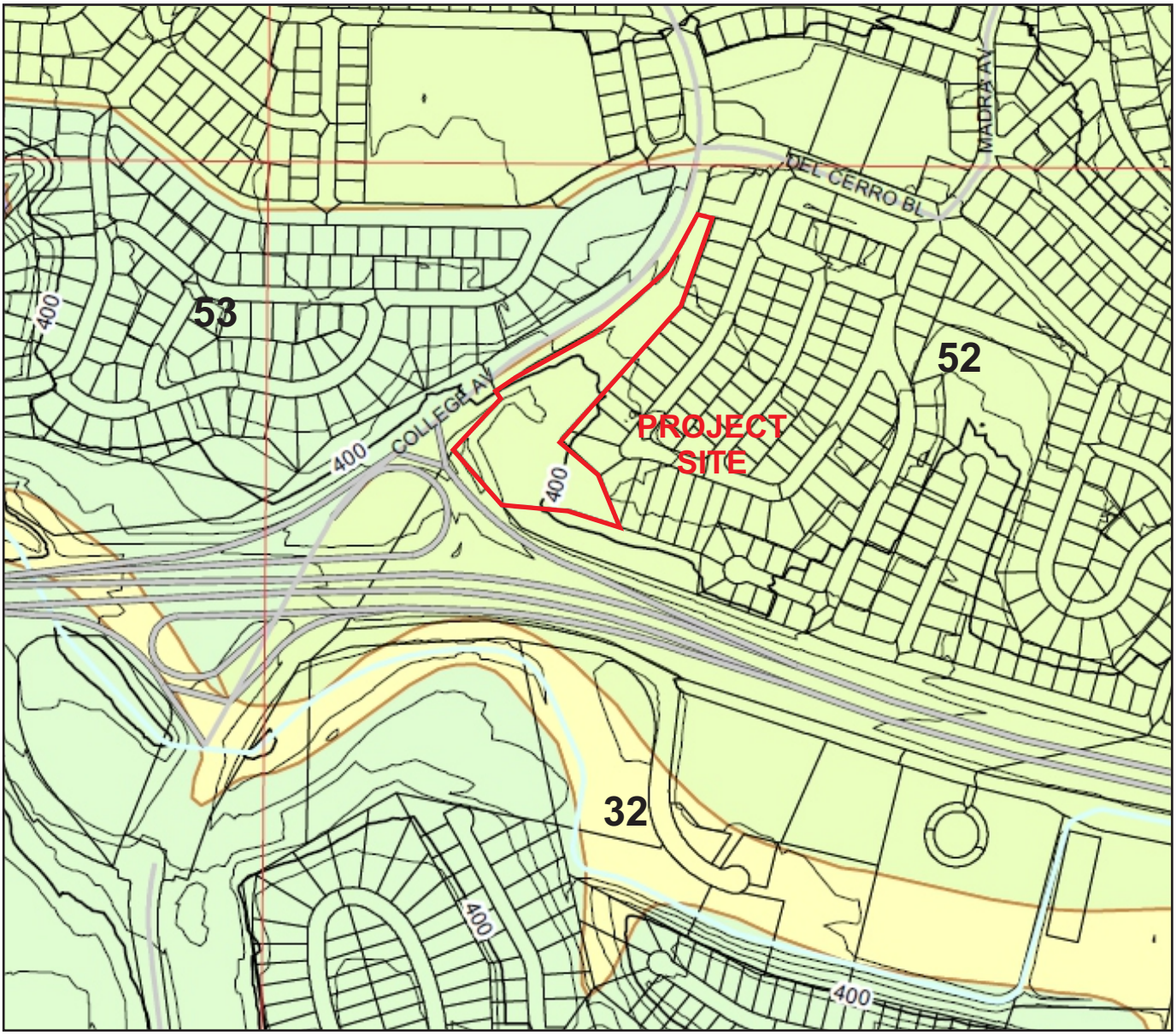
7.5.6. City of San Diego Seismic Safety Study

The site (Figure 2) is located within Grid Tile 22 of the San Diego Seismic Safety Study and is mapped as Geologic Hazard Category 52: Level or sloping terrain, unfavorable geologic structure, "Low to Moderate" risk (of landsliding).

7.6. Non-seismic Geologic Hazards

7.6.1. Mass Wasting

No evidence of mass wasting was observed onsite nor was any noted on the reviewed maps.



N

CITY OF SAN DIEGO
SEISMIC SAFETY STUDY
COLLEVE AVENUE AND INTERSTATE 8
SAN DIEGO, CALIFORNIA

32 Low Potential (liquefaction) – fluctuating groundwater minor drainages.

52 Other level areas, gently sloping to steep terrain, favorable geologic structure, Low risk.

53 Level or sloping Terrain, unfavorable geologic structure, Low to moderate risk.

P/W 1411-02

FIGURE 2

SOURCE MAP - CITY OF SAN DIEGO
SEISMIC SAFETY STUDY, GRID TILE 22
DATED APRIL 3, 2008

AGS
ADVANCED GEOTECHNICAL SOLUTIONS, INC.
9707 Waples Street, Suite 150
San Diego, California 92121
Telephone: (619) 867-0487 Fax: (714) 409-3287

7.6.2. Flooding

According to available FEMA maps, the site is not in a FEMA identified flood hazard area.

7.6.3. Subsidence/Ground Fissuring

Due to the presence of the dense underlying materials, the potential for subsidence and ground fissuring due to settlement is unlikely.

8.0 GEOTECHNICAL ENGINEERING

Presented herein is a general discussion of the geotechnical properties of the various soil types and the analytical methods used in this report.

8.1. Soil Characteristics

The materials found in the area of the proposed improvements consist primarily of previously placed, undocumented fill soils. Once the planned removals of unsuitable soils (artificial fill, younger alluvium, and weathered older alluvium/bedrock) are completed, the proposed structures will be founded upon compacted fill overlying Older Alluvium, Stadium Conglomerate, or Santiago Peak Volcanics. In general these materials exhibit favorable engineering characteristics. Descriptions of the units encountered/anticipated on site can be found in the test pit logs in Appendix B.

8.2. Excavation Characteristics

The onsite soils within the anticipated cut depths should be are anticipated to be excavatable with conventional grading equipment. Excavations in the cobble rich lenses may necessitate moderate to heavy ripping to efficiently excavate. Excavations for deeper utilities and excavations encountering large boulders may require trackhoes for efficient excavation. In the deeper cut areas on lots 16 through 18 moderately hard to hard, metavolcanic bedrock may be encountered necessitating the use of specialized grading techniques (Large Excavators, Bulldozers (Cat D-9) and possibly blasting) may be required to accomplish the mass grading and overexcavation requirements as outlined in this document.

8.3. Groundwater

Groundwater is not expected to affect the proposed development.

8.4. Compressibility

Onsite materials that are significantly compressible in their current condition include undocumented fill soils, topsoil, younger alluvium, and highly weathered older alluvium. These materials will require complete removal prior to placement of fill, and where exposed at design grade. Compressibility of the onsite unweathered older alluvium, Stadium Conglomerate, and Santiago Peak Volcanics is not a geotechnical design concern for the proposed structures. If removals are impossible due to property line restraints, these improvements should be designed for the anticipated total and differential settlement potentials.

8.5. Collapse Potential/Hydro-Consolidation

Given the removal recommendations presented herein and the age and density of the Older Alluvium, Stadium Conglomerate, and Santiago Peak Volcanics, the potential for hydro-consolidation is considered remote at the subject site.

8.6. Expansion Potential

Generally the onsite soils consist of silty sands with abundant cobbles and some boulders; some clayey/silty soils were identified during our subsurface investigation. We anticipate onsite soils will possess expansion potentials ranging between "Very Low" and "Medium" with the majority being "Low". Final determination of expansion potential for foundation design purposes should be based on testing of the as-graded soil conditions.

8.7. Shear Strength Characteristics

Shear strength testing was not conducted as part of this investigation. Based upon our previous experience in the general area with similar soils, the following values presented in Table 7.7 are recommended shear strengths for compacted fill soils and Older Alluvium and the bedrock units on site.

Table 7.7
SHEAR STRENGTH

Material	*Cohesion (psf)*	*Friction Angle (degrees)*
Compacted Artificial Fill	150	31
Older Alluvium	100	32
Bedrock (Tst and Jsp)	400	36

8.8. Earthwork Adjustments

The following Table 8.8 presents bulk/shrink values of the various onsite soils for use in estimating earthwork grading quantities.

Table 8.8
SHRINK/SWELL PARAMETERS

Artificial Fill	Shrink 5-10%
Alluvium	Shrink 6-10%
Older Alluvium	Bulk 2-5%
Stadium Conglomerate	Bulk 5-10%
Santiago Peak Volcanics (Rippable)	Bulk 12-18%
Santiago Peak Volcanics (Non-Rippable)	Bulk 18-25%

These values may be used in an effort to balance the earthwork quantities. As is the case with every project, contingencies should be made to adjust the earthwork balance when grading is in progress and actual conditions are better defined.

8.9. Bearing Capacity and Lateral Earth Pressures

Ultimate bearing capacity values were obtained using the graphs and formulas presented in *NAVFAC DM-7.1*. Allowable bearing was determined by applying a factor of safety of at least three (3) to the ultimate bearing capacity.

Static lateral earth pressures were calculated using *Rankine* methods for active and passive cases. If it is desired to use *Coulomb* forces, a separate analysis specific to the application can be conducted.

8.10. Chemical/Resistivity Analyses

Laboratory testing for sulfates, chlorides, and soil resistivity and pH was not conducted. Final design should be based upon representative sampling of the as-graded soils.

9.0 GRADING RECOMMENDATIONS

Development of the subject site as proposed is considered feasible, from a geotechnical standpoint, provided that the conclusions and recommendations presented herein are incorporated into the design and construction of the project. Presented below are specific issues identified by this study as possibly impacting site development. Recommendations to mitigate these issues are presented in the text of this report.

9.1. Site Preparation and Removals

Grading should be accomplished under the observation and testing of the project soils engineer and engineering geologist or their authorized representative in accordance with the recommendations contained herein, the current grading ordinance of the City of San Diego, and AGS's *Earthwork Specifications* (Appendix D). All topsoil, undocumented artificial fill, younger alluvium, and weathered older alluvium and bedrock should be removed in structural areas planned to receive fill or where exposed at final grade. Localized areas may require removals up to 25 feet deep. Removals should expose competent Older Alluvium or other suitable formational materials (e.g. Stadium Conglomerate or Santiago Peak Volcanics).

In general, soils removed during remedial grading will be suitable for reuse in compacted fills, provided they are properly moisture conditioned and do not contain deleterious materials.

9.1.1. Stripping and Deleterious Material Removal

Existing vegetation, trash, debris, and other deleterious materials should be removed and wasted from the site prior to removal of unsuitable soils and placement of compacted fill.

9.1.2. Topsoil (No Map Symbol)

Topsoil, if encountered, will require complete removal and recompaction to project specifications if encountered where settlement sensitive structures or improvements are planned. Topsoil onsite is anticipated to be approximately one-half to one feet thick.

9.1.3. Artificial Fill - undocumented (Map Symbol afu)

In order to mitigate against potential post construction settlement, all of the artificial fill at the site will require removal and recompaction to project specifications. Estimated depths of removal range from two (2) to 25 feet. It should be anticipated that specialized grading techniques may be required to efficiently excavate and recompact these unsuitable soils due to existing offsite improvements and presence of oversize rock. Where deep removals are required in proximity to existing offsite improvements, it may be necessary to use large excavators to remove the soils in a trench wise fashion due to the limited access. The soils can then be moisture conditioned to near optimum or above, placed and compacted with a sheepsfoot wheel in two (2) foot lifts until design grade is achieved.

9.1.4. Alluvium (Map Symbol Qal)

A thin layer of alluvium covered by undocumented fill was identified in the southwest corner of the site during our initial site investigation. This alluvium will require complete removal and recompaction to project specifications within a 1:1 downward projection from site improvements, where possible. Removal depth of younger alluvium is anticipated to be less than 5 feet. If saturated alluvium is found within the structural fill areas where settlement sensitive structures (residential structures) are proposed these materials can be left-in-place provided that primary settlement is completed prior to the construction of settlement sensitive structures. Monitoring of the settlement may be required with the use of buried or surface settlement monitoring devices. Final determination of alluvium removals and or the monitoring of left-in–place alluvium will be dependent upon field conditions.

9.1.5. Older Alluvium (Map Symbol Qoa)

Older alluvium commonly has a thin highly weathered horizon on the order of 1 to 3 feet thick. The highly weathered portion of the Older Alluvium is unsuitable for structural support or placement of fill. If weathered Older Alluvium is encountered within fill areas or exposed at design grade, this material should be removed and replaced with compacted fill.

9.1.6. Stadium Conglomerate and Santiago Peak Volcanics (Map Symbols Tst and Jsp)

Where these formational materials exhibit a highly weathered horizon, complete removals of the weathered portions will be required within fill areas or where exposed at design grade. Removals are anticipated to be on the order of 1 to 2 feet thick.

9.2. Overexcavation Recommendations

It is advisable that overexcavation of cut/fill transition lots should be conducted during grading. The following general overexcavation recommendations are presented.

9.2.1. Cut/Fill Transitions

Where design grades and/or remedial grading activities create a cut/fill transition, the cut and shallow fill portions of the building pad shall be overexcavated a minimum depth of three feet or 18 inches below the bottom of the proposed footings (whichever is deeper) and replaced with compacted fill. These remedial grading measures are recommended in order to

minimize the potential for differential settlements of residential structures located at the cut and fill transition areas. The undercut should be graded such that a gradient of at least one percent is maintained toward deeper fill areas or the front of the lot. Should steep cut/fill transition lots be created during the remedial grading (where the maximum removal depth (h) exceeds a h/3 design criteria) overexcavation undercut depths may need to be increased and/or a more rigorous foundation design may be required.

9.2.2. Cut Lots Underlain by Hard Rock

In order to facilitate foundation trenching and future homeowner improvements, it is recommended that all cut lots in Stadium Conglomerate or Santiago Peak Volcanics be overexcavated at least three (3) feet and capped with "select" material. Deeper undercuts are recommended in front yard areas in order to facilitate service utility construction. This undercut should have a minimum one (1) percent gradient toward the front of the lots to allow for potential subsurface drainage. "Select" replacement material should be eight- (8) inch minus and be compacted to project specifications as discussed in Section 8.4.

9.2.3. Streets Underlain by Hard Rock

In order to facilitate utility construction consideration should be given to undercutting all street in Stadium Conglomerate or Santiago Peak Volcanics a minimum of one (1) foot below the deepest utility extending approximately the width of the street and then steeping up to a five (5) foot overexcavation at the parkways. A "Select" fill should be placed within the street overexcavation limits consisting of a replacement material with maximum rock size of approximately eight- (8) inch or smaller. This “Select” fill should be compacted to project specifications as discussed in Section 8.4

9.3. Construction Staking and Survey

Removal bottoms, keyways, subdrains and backdrains should be surveyed by the civil engineer after approval by the geotechnical engineer/engineering geologist and prior to the placement of fill. Toe stakes should be provided by the civil engineer in order to verify required key dimensions and locations.

9.4. Earthwork Considerations

9.4.1. Compaction Standards

Fill and processed natural ground shall be compacted to a minimum relative compaction of 90 percent as determined by ASTM Test Method: D 1557. Care should be taken that the ultimate grade be considered when determining the compaction requirements for disposal fill areas. Compaction shall be achieved at slightly above the optimum moisture content, and as generally discussed in the attached Earthwork Specifications (Appendix D).

9.4.2. Documentation of Removals and Drains

Removal bottoms, fill keys, backcuts, backdrains and their outlets should be observed and approved by the engineering geologist and/or geotechnical engineer and documented by the civil engineer prior to fill placement.

9.4.3. Treatment of Removal Bottoms

At the completion of removals, the exposed bottom should be scarified to a practical depth, approximately 8-inches, moisture conditioned to above optimum conditions, and compacted in-place to the standards set forth in this report.

9.4.4. Fill Placement

After removals, scarification, and compaction of in-place materials are completed, additional fill may be placed. Fill should be placed in thin lifts [eight- (8) inch bulk], moisture conditioned to above optimum moisture content, mixed, compacted, and tested as grading progresses until final grades are attained.

9.4.5. Benching

Where the natural slope is steeper than 5-horizontal to 1-vertical, and where designated by the project geotechnical engineer or geologist, compacted fill material should be keyed and benched into competent bedrock or firm natural soil.

9.4.6. Mixing

In order to provide thorough moisture conditioning and proper compaction, processing (mixing) of materials is necessary. Mixing should be accomplished prior to, and as part of the compaction of each fill lift. Water trucks or other water delivery means may be necessary for moisture control. Discing may be required when either excessively dry or wet materials are encountered.

9.4.7. Compaction Equipment

Compaction equipment on the project shall include a combination of rubber-tired and sheepsfoot rollers to achieve proper compaction. Adequate water trucks/pulls should be available to provide sufficient moisture and dust control.

9.4.8. Fill Slope Construction

Fill slopes shall be overfilled to an extent determined by the contractor, but not less than two (2) feet measured perpendicular to the slope face, so that when trimmed back to the compacted core, the required compaction is achieved.

Compaction of each fill lift should extend out to the temporary slope face. Backrolling during mass filling as intervals not exceeding four (4) feet in height is recommended unless more extensive overfill is undertaken.

As an alternative to overfilling, fill slopes may be built to the finish slope face in accordance with the following recommendations:

- Compaction of each fill lift shall extend to the face of the slopes.
- Backrolling during mass grading shall be undertaken at intervals not exceeding four (4) feet in height. Backrolling at more frequent intervals may be required.
- Care should be taken to avoid spillage of loose materials down the face of the slopes during grading.
- At completion of mass filling, the slope surface shall be watered, shaped and compacted first with a sheepsfoot roller or track walked with a bulldozer, such that compaction to project standards is achieved to the face slope.

Proper seeding and planting of the slopes should follow as soon as practical, to inhibit erosion and deterioration of the slope surfaces. Proper moisture control will enhance the long-term stability of the finished slope surface.

9.5. Haul Roads

Haul roads, ramp fills, and tailing areas should be removed prior to placement of fill.

9.6. Import Materials

Import soils are anticipated to achieve design site grades and/or as select material for backfill of site retaining walls. Import materials, should have similar engineering characteristics as the onsite soils and should be approved by the soil engineer at the source prior to importation to the site.

10.0 CONCLUSIONS AND RECOMMENDATIONS

Construction of the proposed single-family residential structures and associated improvements is considered feasible, from a geotechnical standpoint, provided that the conclusions and recommendations presented herein are incorporated into the design and construction of the project. Presented below are specific issues identified by this study as possibly affecting site development. Recommendations to mitigate these issues are presented in the text of this report.

10.1. Design Recommendations

It is our understanding that the proposed foundations will consist of post tensioned slab on grade foundation systems supporting the proposed one- to two-story, wood frame single-family residences. In addition to the structures, associated private access driveways, hardscape and landscape areas are proposed. From a geotechnical perspective these proposed improvements are feasible provided that the following recommendations are incorporated into the design and construction.

10.1.1. Foundation Design Criteria

The single-family residential structures will be supported by shallow, conventionally reinforced, slab on grade foundation systems. The expansion potential of the underlying soils is anticipated to range from “very low” to “medium”. The following preliminary values may be used in the foundation design.

Allowable Bearing:	2000 psf
Lateral Bearing:	250 lbs./sq.ft. at a depth of 12 inches plus 125 lbs./sq.ft. for each additional 12 inches embedment to a maximum of 2000 lbs./sq.ft.
Sliding Coefficient:	0.35
Settlement:	Total = 3/4 inch
Differential:	3/8 inch in 20 feet

The above values may be increased as allowed by Code to resist transient loads such as wind or seismic. Building Code and structural design considerations may govern. Depth and reinforcement requirements should be evaluated by the Structural Engineer

10.1.2. Post Tensioned Foundation Systems

Based on the onsite soil conditions and information supplied by the CBC-2013, preliminary design of post-tensioned foundation systems should be prepared in accordance with Sections 10.1.1 and 10.1.2.

Table 10.1.2
Post Tensioned Design Parameters

Expansion Potential	Lot Category	Center Lift		Edge Lift	
		Em (ft)	Ym (in)	Em (ft)	Ym (in)
Low	I	9	0.23	5.5	0.54
Medium	II	9	0.38	4.6	0.9

PRESATURATION

Very Low to Low Expansion-Minimum of optimum moisture 24 hours prior to placing concrete to a depth.

Medium Expansion-Minimum of 120 percent of optimum moisture 24 hours prior to placing concrete to a depth of 12 inches.

10.1.3. Seismic Design Parameters

The following seismic design parameters are presented to be code compliant to the California Building Code (2013). The project site is considered to be Site Class "D" in accordance with CBC, 2013, Section 1613.3.2 and ASCE 7, Chapter 20. The site is located at Latitude 32.78083˚ N and Longitude 117.06387˚ W. Utilizing this information, the United States Geological Survey (USGS) web tool (http://earthquake.usgs.gov/designmaps) and ASCE 7 criterion, the mapped seismic acceleration parameters S_S, for 0.2 seconds and S_1, for 1.0 second period (CBC, 2013, 1613.3.1) for Risk-Targeted Maximum Considered Earthquake (MCE_R) can be determined. The mapped acceleration parameters are provided for Site Class “B”. Adjustments for other Site Classes are made, as needed, by utilizing Site Coefficients F_a and F_v for determination of MCE_R spectral response acceleration parameters

S_{MS} for short periods and S_{M1} for 1.0 second period (CBC, 2013 1613.3.3). Five-percent damped design spectral response acceleration parameters S_{DS} for short periods and S_{D1} for 1.0 second period can be determined from the equations in CBC, 2013, Section 1613.3.4.

Table 10.1.3
Seismic Design Criteria

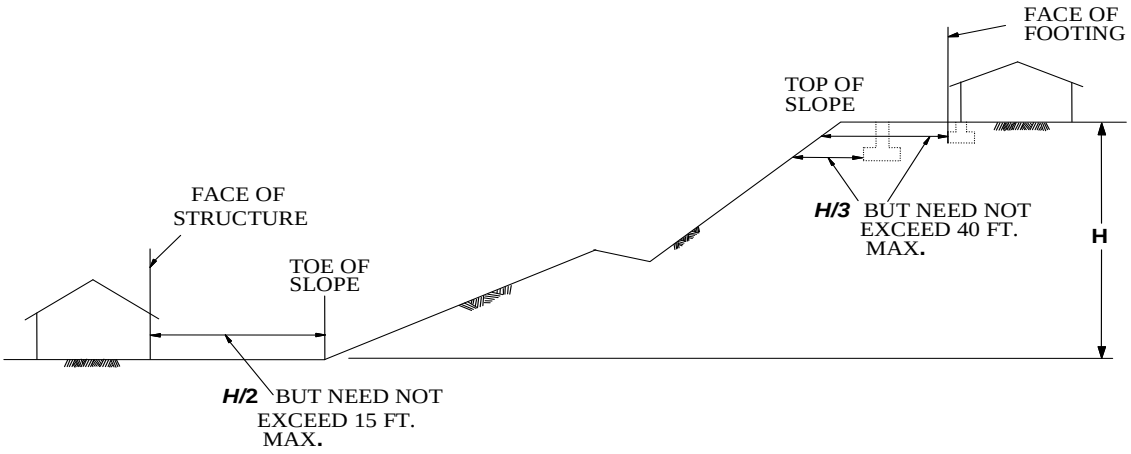
Mapped Spectral Acceleration (0.2 sec Period), S_S	0.914g
Mapped Spectral Acceleration (1.0 sec Period), S_1	0.351g
Site Coefficient, F_a (CBC, 2013, Table 1613.3.3(1))	1.134
Site Coefficient, F_v (CBC, 2013, Table 1613.3.3(2))	1.697
MCE_R Spectral Response Acceleration (0.2 sec Period), S_{MS}	1.037g
MCE_R Spectral Response Acceleration (1.0 sec Period), S_{M1}	0.596g
Design Spectral Response Acceleration (0.2 sec Period), S_{DS}	0.691g
Design Spectral Response Acceleration (1.0 sec Period), S_{D1}	0.398g

Utilizing a probabilistic approach, the CBC recommends that structural design be based on the peak horizontal ground acceleration (PGA) having of 2 percent probability of exceedance in 50 years (approximate return period of 2,475 years) which is defined as the Maximum Considered Earthquake (MCE). Using the United States Geological Survey (USGS) web-based ground motion calculator, the site class modified PGA_M (F_{PGA}*PGA) was determined to be 0.411g. This value does not include near-source factors that may be applicable to the design of structures on site.

10.1.4. Deepened Footings and Structural Setbacks

It is generally recognized that improvements constructed in proximity to natural slopes or properly constructed, manufactured slopes can, over a period of time, be affected by natural processes including gravity forces, weathering of surficial soils and long-term (secondary) settlement. Most building codes, including the California Building Code (CBC), require that structures be set back or footings deepened, where subject to the influence of these natural processes.

For the subject site, where foundations for residential structures are to exist in proximity to slopes, the footings should be embedded to satisfy the requirements presented in Figure 3.



10.1.5. Concrete Design

Laboratory testing to determine the sulfate concentration of soils at the subject site was not conducted. Final determination should be based on testing of the as-graded soils. It should be noted that some fertilizers have been known to leach sulfates into soils otherwise containing "negligible" sulfate concentrations and increase the sulfate concentrations to potentially detrimental levels. It is incumbent upon the owner to determine whether additional protective measures are warranted to mitigate the potential for increased sulfate concentrations to onsite soils as a result of the future homeowner's actions.

10.1.6. Corrosion

Resistivity tests were not conducted under the scope of this investigation. Final determination of the corrosivity of onsite soils should be based on testing of the as-graded soils.

It is our understanding that only the last ten feet of the domestic and fire waterlines will be metallic, with the remainder of these lines being non metallic. Further, the proposed plumbing for each structure will not be located under slab but will be located in the walls and roofs. Provided that all metallic piping is wrapped with a suitable corrosion inhibiting material (foam, plastic sleeve, tape, or similar products) and that non-aggressive backfill (sand) soils are placed around all metallic pipe, no other requirements are deemed necessary to address the potential of corrosive soils onsite.

10.2. Retaining Walls

It is our understanding that conventional, MSE, and/or tieback walls may be part of the proposed development. For preliminary wall design purposes, the following soil strengths can be used:

- Unit Weight: 130 pcf, Cohesion: 150 psf, Friction Angle: 31 degrees.

The following earth pressures are recommended for the design of conventional retaining walls onsite utilizing select backfill material having an expansion index of less than 50 and a minimum internal friction angle of 31 degrees.

Static Case

Table 10.2
Lateral Earth Pressures

		Rankine Coefficients	Equivalent Fluid Pressure (psf/lin.ft.)
Level Backfill	Active	$K_a = 0.32$	42
	Passive	$K_p = 3.12$	406
	At Rest	$K_o = 0.48$	63
2:1 Backfill	Active	$K_a = 0.50$	65
	At Rest	$K_o = 0.70$	91

Seismic Case

In addition to the above static pressures, unrestrained retaining walls located should be designed to resist seismic loading as required by the 2013 CBC. The seismic load can be modeled as a thrust load applied at a point 0.6H above the base of the wall, where H is equal to the height of the wall. This seismic load (in pounds per lineal foot of wall) is represented by the following equation:

$Pe = \frac{3}{8} * \gamma * H^2 * k_h$

Where: Pe = Seismic thrust load

H = Height of the wall (feet)

γ = soil density = 130 pcf for compacted fill

k_h = seismic pseudostatic coefficient = 0.5 * peak horizontal ground acceleration / g

The peak horizontal ground acceleration is anticipated to be on the order of 0.411g and is discussed further in Section 9.1.2. Walls should be designed to resist the combined effects of static pressures and the above seismic thrust load.

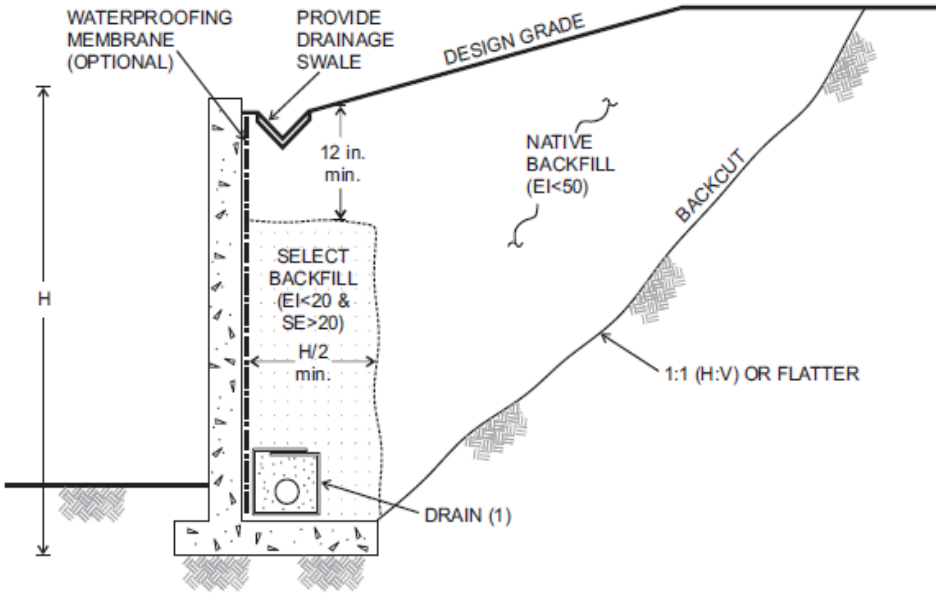
The foundations for retaining walls of appurtenant structures structurally separated from the building structures, may bear on properly compacted fill. A bearing value of 2,000 lbs./sq.ft. may be used for design of retaining walls. Retaining wall footings should be designed to resist the lateral forces by passive soil resistance and/or base friction as recommended for foundation lateral resistance. To relieve the potential for hydrostatic pressure wall backfill should consist of a free draining backfill (sand equivalent "SE" >20) and a heel drain should be constructed (see Figure 4). The heel drain should be placed at the heel of the wall and should consist of a 4-inch diameter perforated pipe

(SDR35 or SCHD 40) surrounded by 4 cubic feet of crushed rock (3/4-inch) per lineal foot, wrapped in filter fabric (Mirafi® 140N or equivalent).

Proper drainage devices should be installed along the top of the wall backfill, which should be properly sloped to prevent surface water ponding adjacent to the wall. In addition to the wall drainage system, for building perimeter walls extending below the finished grade, the wall should be waterproofed and/or damp-proofed to effectively seal the wall from moisture infiltration through the wall section to the interior wall face.

The wall should be backfilled with granular soils placed in loose lifts no greater than 8-inches thick, at or near optimum moisture content, and mechanically compacted to a minimum 90 percent relative compaction as determined by ASTM Test Method D1557. Flooding or jetting of backfill materials generally do not result in the required degree and uniformity of compaction and, therefore, is not recommended. The soils engineer or his representative should observe the retaining wall footings, backdrain installation and be present during placement of the wall backfill to confirm that the walls are properly backfilled and compacted.

FIGURE 4



NOTES: (1) DRAIN: 4-INCH PERFORATED ABS OR PVC PIPE OR APPROVED EQUIVALENT SUBSTITUTE PLACED PERFORATIONS DOWN AND SURROUNDED BY A MINIMUM OF 1 CUBIC FEET OF 3/4 INCH ROCK OR APPROVED EQUIVALENT SUBSTITUTE AND WRAPPED IN MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT SUBSTITUTE

10.3. Utility Trench Excavation

All utility trenches should be shored or laid back in accordance with applicable OSHA standards. Excavations in bedrock areas should be made in consideration of underlying geologic structure. AGS should be consulted on these issues during construction.

10.4. Utility Trench Backfill

Mainline and lateral utility trench backfill should be compacted to at least 90 percent of maximum dry density as determined by ASTM D 1557. Onsite soils will not be suitable for use as bedding material but will be suitable for use in backfill, provided oversized materials are removed. No surcharge loads should be imposed above excavations. This includes spoil piles, lumber, concrete trucks or other construction materials and equipment. Drainage above excavations should be directed away from the banks. Care should be taken to avoid saturation of the soils.

Compaction should be accomplished by mechanical means. Jetting of native soils will not be acceptable.

10.5. Exterior Slabs and Walkways

10.5.1. Subgrade Compaction

The subgrade below exterior slabs, sidewalks, driveways, patios, etc. should be compacted to a minimum of 90 percent relative compaction as determined by ASTM D 1557.

10.5.2. Subgrade Moisture

The subgrade below exterior slabs, sidewalks, driveways, patios, etc. should be moisture conditioned to a minimum of 110 percent of optimum moisture content (low expansive soils) prior to concrete placement, dependent upon the expansion potential of the subgrade soils.

10.5.3. Slab Thickness

Concrete flatwork and driveways should be designed utilizing four-inch minimum thickness.

10.5.4. Control Joints

Weakened plane joints should be installed on walkways at intervals of approximately eight to ten feet. Exterior slabs should be designed to withstand shrinkage of the concrete.

10.5.5. Flatwork Reinforcement

Consideration should be given to reinforcing any exterior flatwork.

10.5.6. Thickened Edge

Consideration should be given to construct a thickened edge (scoop footing) at the perimeter of slabs and walkways adjacent to landscape areas to minimize moisture variation below these improvements. The thickened edge (scoop footing) should extend approximately eight inches below concrete slabs and should be a minimum of six inches wide.

10.6. Preliminary Pavement Design

For preliminary pavement design, the onsite soils are assumed to have an "R" Value of R=30. Utilizing City of San Diego Pavement Design Standards Schedule "J" and assuming the subject site is classified as a "Local Residential" (max ADT=1200) which equates to a Traffic Index TI=6.0 the following pavement sections are presented:

Standard Pavement Section

3-inches AC

over

8.5-inches Aggregate Base*

**compacted to a minimum of 95%*

10.7. Storm Water Basins

Based on the current plans, permanent storm water BMP's are proposed for the project. It is our current understanding that the proposed storm water basins will be lined with an impermeable membrane that prevents active or passive infiltration. As such, infiltration testing was not performed as part of our preliminary investigation.

10.8. Plan Review

Based on our review, the current proposed grading plans are consistent with AGS's recommendations. Once final, approved grading and foundation design plans become available, they should be reviewed by AGS to verify that the design recommendations presented are consistent with the proposed construction.

10.9. Geotechnical Review

As is the case in any grading project, multiple working hypotheses are established utilizing the available data, and the most probable model is used for the analysis. Information collected during the grading and construction operations is intended to evaluate the hypotheses, and some of the assumptions summarized herein may need to be changed as more information becomes available. Some modification of the grading and construction recommendations may become necessary, should the conditions encountered in the field differ significantly than those hypothesized to exist.

AGS should review the pertinent plans and sections of the project specifications, to evaluate conformance with the intent of the recommendations contained in this report.

If the project description or final design varies from that described in this report, AGS must be consulted regarding the applicability of, and the necessity for, any revisions to the recommendations presented herein. AGS accepts no liability for any use of its recommendations if the project description or final design varies and AGS is not consulted regarding the changes.

APPENDIX A

REFERENCES

REFERENCES

American Concrete Institute, 2002, Building Code Requirements for Structural Concrete (ACI318M-02) and Commentary (ACI 318RM-02), ACI International, Farmington Hills, Michigan.

American Society for Testing and Materials (2008), Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, Soil and Rock (I), ASTM International, West Conshohocken, Pennsylvania.

American Society of Civil Engineers, 2013, Minimum Design Loads for Buildings and Other Structures (7-10, third printing).

California Building Standards Commission, 2013, California Building Code, Title 24, Part 2, Volumes 1 and 2.

City of San Diego, 2008, Seismic Safety Study – Geologic Hazards and Faults, Grid Tile 22, Scale 1"=800', dated April 3, 2008.

FEMA, Flood Insurance Rate Maps, San Diego County, California, Maps 06073C1637H, 06073C1641G, and 06073C1639H, dated May 16, 2012, Scale 1"=500'.

Historic Aerial Photography. www.Historicaerials.com. Photos from 1953, 1964, 1966, 1968, 1980, 1989, 1994, 1995, 1996, 2002, 2003, and 2005.

Jennings, C.W., 1994, Fault Activity Map of California and Adjacent Areas: California Geological Survey, California Geologic Data Map No. 6, Scale 1:750,000.

Kennedy, M.P., and Tan, S.S., 2008, Geologic Map of the San Diego 30' x 60' Quadrangle, California Regional Geologic Map Series, Scale 1:100,000, Map No. 3, Sheet 1 of 2.

Pasco, Laret, Suiter, & Associates, 2015, Preliminary Grading and Utility Plan, Interstate 8 and College Avenue, 40-Scale, date July 20, 2015

Tan, S.S., 1995, Landslide Hazards in the Southern Part of the San Diego Metropolitan Area, San Diego County, California, Landslide Hazard Identification Map No. 33, Plate 33A, Division of Mines and Geology, Open File Report 95-03.

United States Geological Survey, U.S. Seismic Design Maps, World Wide Web, http://earthquake.usgs.gov/hazards/designmaps/.

APPENDIX B

SUBSURFACE INVESTIGATION

Project College Ave/I8
Date Excavated Dec. 2014
Logged by FE
Equipment Cat 328D

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
EX-1	0.0 – 2.0	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND with abundant rounded COBBLES to 4-in. diameter, yellowish brown, very moist, loose; some clay.
	2.0 – 9.5		**Stadium Conglomerate (Tst):** COBBLE CONGLOMERATE, rounded volcanic and metamorphic clasts to 6-in. diameter in a SILTY SANDSTONE matrix, light brownish yellow, moderately hard. TOTAL DEPTH 9.5 FT. NO GROUNDWATER, NO CAVING.
EX-2	0.0 – 3.5	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND, light reddish brown, very moist, loose; with some rounded cobbles to 8-in. diameter; minor seepage at 3.5 ft.
	3.5 – 7.0		**Santiago Peak Volcanics (Jsp):** METAVOLCANIC BEDROCK, light gray to gray on fresh surfaces, slightly to moderately weathered, moderately hard to hard; jointed, manganese oxide along joint surfaces. @5 ft. N 60° E, Vertical - Joint N 5° W, 75° SW - Joint @6 ft. Hard, slightly weathered TOTAL DEPTH 7.0 FT. MINOR SEEPAGE AT 3.5 FT., NO CAVING.

Test Pit No.	Depth (ft.)	USCS	Description
EX-3	0.0 – 22.0	SW	**Artificial Fill – Undocumented (afu):** SAND with COBBLES, fine to coarse grained, brown, moist, loose; with some clay and silt.
		SM	@2 ft. SILTY SAND, pale yellow to light gray, slightly moist, moderately dense; abundant rounded COBBLES to 8-in. diameter.
	22.0 – 26.0	CL/ML	**Alluvium (Qal):** CLAYEY SILT, brown, very moist, stiff; some fine grained sand and angular gravel.
	26.0 – 27.0		**Santiago Peak Volcanics (Jsp):** METAVOLCANIC BEDROCK, reddish brown, moderately weathered, hard.
			TOTAL DEPTH 27.0 FT. NO GROUNDWATER, CAVING AT 3 FT.
EX-4	0.0 – 8.0	SW	**Artificial Fill – Undocumented (afu):** SAND with COBBLES, fine to coarse grained, pale yellow, slightly moist, loose. @4 ft. Moderately dense.
	6.5 – 13.0		**Older Alluvium (Qoa):** SILTY SAND, fine grained, yellow, slightly moist to moist, moderately dense to dense; some clay. @10 ft. Some ¼ to ½-in. thick SILTY CLAY lenses, olive, moist, stiff; slightly plastic.
			TOTAL DEPTH 13.0 FT. NO GROUNDWATER, NO CAVING.

Test Pit No.	Depth (ft.)	USCS	Description
EX-5	0.0 – 21.0	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND, reddish brown, moist, loose.
		SW	@2.5 ft. SAND with COBBLES, light gray, slightly moist, medium dense; with some silt and clay.
	21.0 – 22.0	ML	**Alluvium (Qal):** CLAYEY to SANDY SILT, dark grayish brown, moist to very moist, stiff; abundant subangular gravel.
	22.0 – 23.0		**Older Alluvium (Qoa):** SILTY SAND, fine grained, yellow, slightly moist, moderately dense to dense.
			TOTAL DEPTH 23.0 FT. NO GROUNDWATER, NO CAVING.
EX-6	0.0 – 10.0	SW	**Artificial Fill – Undocumented (afu):** SAND with COBBLES, pale yellow to light gray; with some silt and clay.
	10.0 – 15.0		**Older Alluvium (Qoa):** Interbedded CLAYEY fine grained SAND and SILTY CLAY, yellow and olive, moist, dense/stiff.
	15.0 – 15.5		**Santiago Peak Volcanics (Jsp):** METAVOLCANIC BEDROCK, brownish yellow, highly weathered, abundant clay development, soft to moderately hard. @15.5 ft. Slightly weathered, hard.
			TOTAL DEPTH 15.5 FT. NO GROUNDWATER, NO CAVING.

Test Pit No.	Depth (ft.)	USCS	Description
EX-7	0.0 – 20.0	SM	**Artificial Fill – Undocumented (afu):** Angular, gray metavolcanic clasts from 8-in. to 4-ft. diameter in a SILTY SAND matrix, fine to coarse grained, yellowish brown, moist, loose. @6 ft. Some rounded cobbles to 5-in. diameter. @8 ft. Some rounded cobbles to 7-in. diameter. @19 ft. Some rounded cobbles to 10-in. diameter.
	20.0 – 24.5		**Older Alluvium (Qoa):** Fine SANDY SILT, red, slightly moist, stiff; some 1/16-in. paleo root holes. @22 ft. Some clay; no visible porosity.
			TOTAL DEPTH 24.5 FT. NO GROUNDWATER, CAVING AT 5 FT.
EX-8	0.0 – 4.5	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND, fine to coarse grained, reddish brown, moist, loose; abundant rounded cobbles to 3-in. diameter.
	4.5 – 12.5		**Stadium Conglomerate (Tst):** COBBLE CONGLOMERATE, rounded cobbles to 3-in. diameter in a SILTY SANDSTONE matrix, yellow, slightly moist, hard.
			TOTAL DEPTH 12.5 FT. NO GROUNDWATER, NO CAVING.

Test Pit No.	Depth (ft.)	USCS	Description
EX-9	0.0 – 10.0	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND with COBBLES, dark brown and yellowish brown, moist, loose; some 4-in. thick asphalt slabs. @4 ft. Some angular metavolcanic clasts to 2-ft. diameter. @8 ft. Trash debris.
	10.0 – 12.5		**Stadium Conglomerate (Tst):** COBBLE CONGLOMERATE, rounded volcanic and metamorphic clasts to 3-in. diameter, in a SILTY SANDSTONE matrix, light yellow, slightly moist, moderately hard. @11 ft. Hard.
			TOTAL DEPTH 12.5 FT. NO GROUNDWATER, CAVING AT 4 FT.
EX-10	0.0 – 22.0	SW	**Artificial Fill – Undocumented (afu):** GRAVELY SAND, reddish brown, moist, loose; with some rounded cobbles to 3-in. diameter; few metavolcanic clasts to 18-in. diameter.425
		SM-ML	@11 ft. SILTY SAND and CLAYEY SILT, dark gray, moist to very moist, firm to medium dense; some organics.
	22.0 – 22.5		**Santiago Peak Volcanics (Jsp):** METAVOLCANIC BEDROCK, moderately weathered, hard.
			TOTAL DEPTH 15.5 FT. NO GROUNDWATER, CAVING AT 6 FT.

APPENDIX C

GENERAL EARTHWORK SPECIFICATIONS AND GRADING GUIDELINES

GENERAL EARTHWORK SPECIFICATIONS

I. General

A. General procedures and requirements for earthwork and grading are presented herein. The earthwork and grading recommendations provided in the geotechnical report are considered part of these specifications, and where the general specifications provided herein conflict with those provided in the geotechnical report, the recommendations in the geotechnical report shall govern. Recommendations provided herein and in the geotechnical report may need to be modified depending on the conditions encountered during grading.

B. The contractor is responsible for the satisfactory completion of all earthwork in accordance with the project plans, specifications, applicable building codes, and local governing agency requirements. Where these requirements conflict, the stricter requirements shall govern.

C. It is the contractor's responsibility to read and understand the guidelines presented herein and in the geotechnical report as well as the project plans and specifications. Information presented in the geotechnical report is subject to verification during grading. The information presented on the exploration logs depict conditions at the particular time of excavation and at the location of the excavation. Subsurface conditions present at other locations may differ, and the passage of time may result in different subsurface conditions being encountered at the locations of the exploratory excavations. The contractor shall perform an independent investigation and evaluate the nature of the surface and subsurface conditions to be encountered and the procedures and equipment to be used in performing his work.

D. The contractor shall have the responsibility to provide adequate equipment and procedures to accomplish the earthwork in accordance with applicable requirements. When the quality of work is less than that required, the Geotechnical Consultant may reject the work and may recommend that the operations be suspended until the conditions are corrected.

E. Prior to the start of grading, a qualified Geotechnical Consultant should be retained to observe grading procedures and provide testing of the fills for conformance with the project specifications, approved grading plan, and guidelines presented herein. All remedial removals, clean-outs, removal bottoms, keyways, and subdrain installations should be observed and documented by the Geotechnical Consultant prior to placing fill. It is the contractor's responsibility to appraise the Geotechnical Consultant of their schedules and notify the Geotechnical Consultant when those areas are ready for observation.

F. The contractor is responsible for providing a safe environment for the Geotechnical Consultant to observe grading and conduct tests.

II. Site Preparation

A. Clearing and Grubbing: Excessive vegetation and other deleterious material shall be sufficiently removed as required by the Geotechnical Consultant, and such materials shall be properly disposed of offsite in a method acceptable to the owner and governing agencies. Where applicable, the contractor may obtain permission from the Geotechnical Consultant, owner, and governing agencies to dispose of vegetation and other deleterious materials in designated areas onsite.

B. Unsuitable Soils Removals: Earth materials that are deemed unsuitable for the support of fill shall be removed as necessary to the satisfaction of the Geotechnical Consultant.

C. Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipelines, other utilities, or other structures located within the limits of grading shall be removed and/or abandoned in accordance with the requirements of the governing agency and to the satisfaction of the Geotechnical Consultant.

D. Preparation of Areas to Receive Fill: After removals are completed, the exposed surfaces shall be scarified to a depth of approximately 8 inches, watered or dried, as needed, to achieve a generally uniform moisture content that is at or near optimum moisture content. The scarified materials shall then be compacted to the project requirements and tested as specified.

E. All areas receiving fill shall be observed and approved by the Geotechnical Consultant prior to the placement of fill. A licensed surveyor shall provide survey control for determining elevations of processed areas and keyways.

III. Placement of Fill

A. Suitability of fill materials: Any materials, derived onsite or imported, may be utilized as fill provided that the materials have been determined to be suitable by the Geotechnical Consultant. Such materials shall be essentially free of organic matter and other deleterious materials, and be of a gradation, expansion potential, and/or strength that is acceptable to the Geotechnical Consultant. Fill materials shall be tested in a laboratory approved by the Geotechnical Consultant, and import materials shall be tested and approved prior to being imported.

B. Generally, different fill materials shall be thoroughly mixed to provide a relatively uniform blend of materials and prevent abrupt changes in material type. Fill materials derived from benching should be dispersed throughout the fill area instead of placing the materials within only an equipment-width from the cut/fill contact.

C. Oversize Materials: Rocks greater than 8 inches in largest dimension shall be disposed of offsite or be placed in accordance with the recommendations by the Geotechnical Consultant in the areas that are designated as suitable for oversize rock placement. Rocks that are smaller than 8 inches in largest dimension may be utilized in the fill provided that they are not nested and are their quantity and distribution are acceptable to the Geotechnical Consultant.

D. The fill materials shall be placed in thin, horizontal layers such that, when compacted, shall not exceed 6 inches. Each layer shall be spread evenly and shall be thoroughly mixed to obtain a near uniform moisture content and uniform blend of materials.

E. Moisture Content: Fill materials shall be placed at or above the optimum moisture content or as recommended by the geotechnical report. Where the moisture content of the engineered fill is less than recommended, water shall be added, and the fill materials shall be blended so that a near uniform moisture content is achieved. If the moisture content is above the limits specified by the Geotechnical Consultant, the fill materials shall be aerated by discing, blading, or other methods until the moisture content is acceptable.

F. Each layer of fill shall be compacted to the project standards in accordance to the project specifications and recommendations of the Geotechnical Consultant. Unless otherwise specified by the Geotechnical Consultant, the fill shall be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method: D1557-09.

G. Benching: Where placing fill on a slope exceeding a ratio of 5 to 1 (horizontal to vertical), the ground should be keyed or benched. The keyways and benches shall extend through all unsuitable materials into suitable materials such as firm materials or sound bedrock or as recommended by the Geotechnical Consultant. The minimum keyway width shall be 15 feet and extend into suitable materials, or as recommended by the geotechnical report and approved by the Geotechnical Consultant. The minimum keyway width for fill over cut slopes is also 15 feet, or as recommended by the geotechnical report and approved by the Geotechnical Consultant. As a general rule, unless otherwise recommended by the Geotechnical Consultant, the minimum width of the keyway shall be equal to 1/2 the height of the fill slope.

H. Slope Face: The specified minimum relative compaction shall be maintained out to the finish face of fill and stabilization fill slopes. Generally, this may be achieved by overbuilding the slope and cutting back to the compacted core. The actual amount of overbuilding may vary as field conditions dictate. Alternately, this may be achieved by backrolling the slope face with suitable equipment or other methods that produce the designated result. Loose soil should not be allowed to build up on the slope face. If present, loose soils shall be trimmed to expose the compacted slope face.

I. Slope Ratio: Unless otherwise approved by the Geotechnical Consultant and governing agencies, permanent fill slopes shall be designed and constructed no steeper than 2 to 1 (horizontal to vertical).

J. Natural Ground and Cut Areas: Design grades that are in natural ground or in cuts should be evaluated by the Geotechnical Consultant to determine whether scarification and processing of the ground and/or overexcavation is needed.

K. Fill materials shall not be placed, spread, or compacted during unfavorable weather conditions. When grading is interrupted by rain, filing operations shall not resume until the Geotechnical Consultant approves the moisture and density of the previously placed compacted fill.

IV. Cut Slopes

A. The Geotechnical Consultant shall inspect all cut slopes, including fill over cut slopes, and shall be notified by the contractor when cut slopes are started.

B. If adverse or potentially adverse conditions are encountered during grading, the Geotechnical Consultant shall investigate, evaluate, and make recommendations to mitigate the adverse conditions.

C. Unless otherwise stated in the geotechnical report, cut slopes shall not be excavated higher or steeper than the requirements of the local governing agencies. Short-term stability of the cut slopes and other excavations is the contractor's responsibility.

V. Drainage

A. Backdrains and Subdrains: Backdrains and subdrains shall be provided in fill as recommended by the Geotechnical Consultant and shall be constructed in accordance with the governing agency and/or

recommendations of the Geotechnical Consultant. The location of subdrains, especially outlets, shall be surveyed and recorded by the Civil Engineer.

B. Top-of-slope Drainage: Positive drainage shall be established away from the top of slope. Site drainage shall not be permitted to flow over the tops of slopes.

C. Drainage terraces shall be constructed in compliance with the governing agency requirements and/or in accordance with the recommendations of the Geotechnical Consultant.

D. Non-erodible interceptor swales shall be placed at the top of cut slopes that face the same direction as the prevailing drainage.

VI. Erosion Control

A. All finish cut and fill slopes shall be protected from erosion and/or planted in accordance with the project specifications and/or landscape architect's recommendations. Such measures to protect the slope face shall be undertaken as soon as practical after completion of grading.

B. During construction, the contractor shall maintain proper drainage and prevent the ponding of water. The contractor shall take remedial measures to prevent the erosion of graded areas until permanent drainage and erosion control measures have been installed.

VII. Trench Excavation and Backfill

A. Safety: The contractor shall follow all OSHA requirements for safety of trench excavations. Knowing and following these requirements is the contractor's responsibility. All trench excavations or open cuts in excess of 5 feet in depth shall be shored or laid back. Trench excavations and open cuts exposing adverse geologic conditions may require further evaluation by the Geotechnical Consultant. If a contractor fails to provide safe access for compaction testing, backfill not tested due to safety concerns may be subject to removal.

B. Bedding: Bedding materials shall be non-expansive and have a Sand Equivalent greater than 30. Where permitted by the Geotechnical Consultant, the bedding materials can be densified by jetting.

C. Backfill: Jetting of backfill materials is generally not acceptable. Where permitted by the Geotechnical Consultant, the bedding materials can be densified by jetting provided the backfill materials are granular, free-draining and have a Sand Equivalent greater than 30.

VIII. Geotechnical Observation and Testing During Grading

A. Compaction Testing: Fill shall be tested by the Geotechnical Consultant for evaluation of general compliance with the recommended compaction and moisture conditions. The tests shall be taken in the compacted soils beneath the surface if the surficial materials are disturbed. The contractor shall assist the Geotechnical Consultant by excavating suitable test pits for testing of compacted fill.

B. Where tests indicate that the density of a layer of fill is less than required, or the moisture content not within specifications, the Geotechnical Consultant shall notify the contractor of the unsatisfactory conditions of the fill. The portions of the fill that are not within specifications shall be reworked until the required density and/or moisture content has been attained. No additional fill shall be placed until the last lift of fill is tested and found to meet the project specifications and approved by the Geotechnical Consultant.

C. If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as adverse weather, excessive rock or deleterious materials being placed in the fill, insufficient equipment, excessive rate of fill placement, results in a quality of work that is unacceptable, the consultant shall notify the contractor, and the contractor shall rectify the conditions, and if necessary, stop work until conditions are satisfactory.

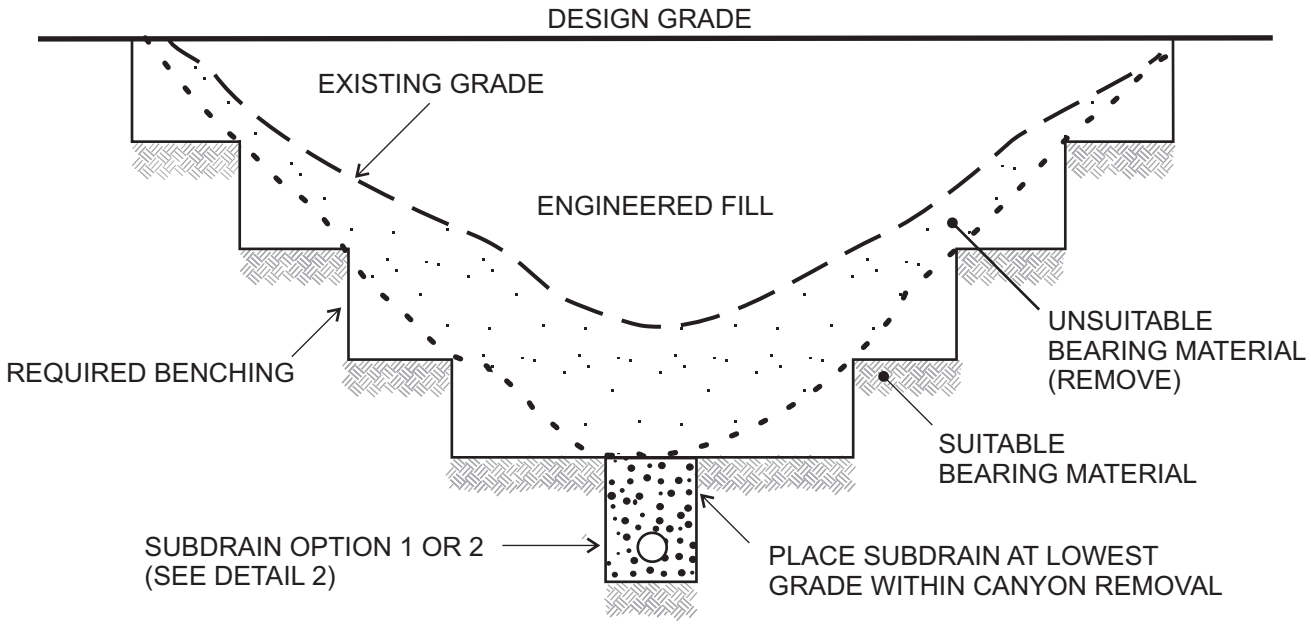
D. Frequency of Compaction Testing: The location and frequency of tests shall be at the Geotechnical Consultant's discretion. Generally, compaction tests shall be taken at intervals not exceeding two feet in fill height and 1,000 cubic yards of fill materials placed.

E. Compaction Test Locations: The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of the compaction test locations. The contractor shall coordinate with the surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations. Alternately, the test locations can be surveyed and the results provided to the Geotechnical Consultant.

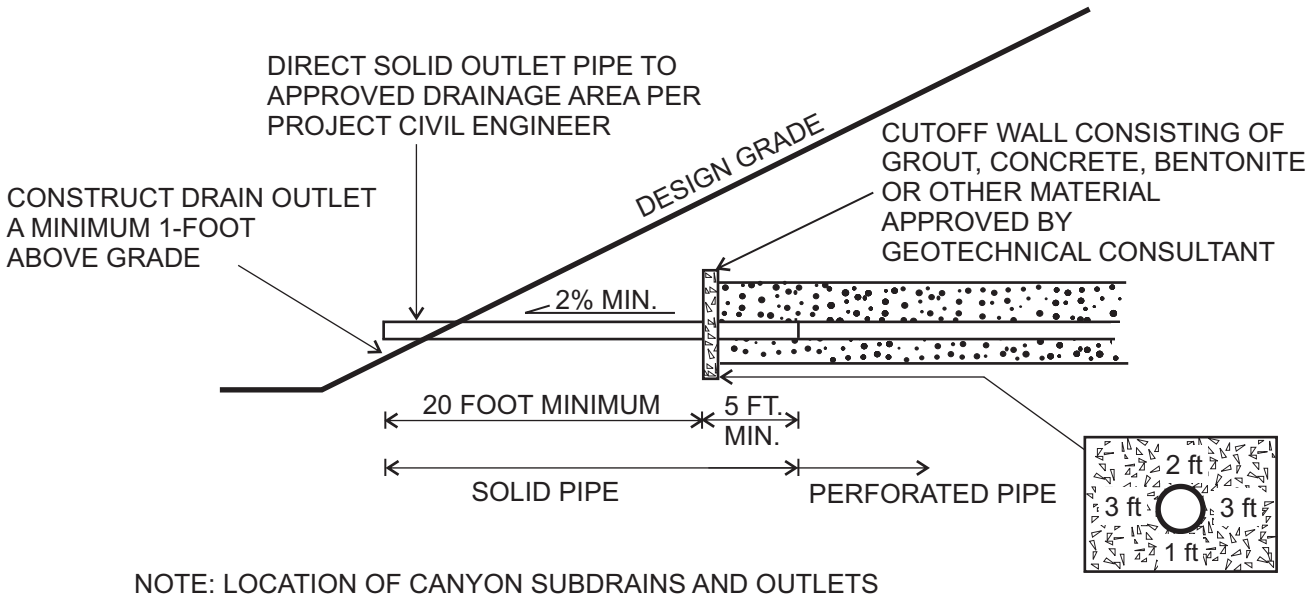
F. Areas of fill that have not been observed or tested by the Geotechnical Consultant may have to be removed and recompacted at the contractor's expense. The depth and extent of removals will be determined by the Geotechnical Consultant.

G. Observation and testing by the Geotechnical Consultant shall be conducted during grading in order for the Geotechnical Consultant to state that, in his opinion, grading has been completed in accordance with the approved geotechnical report and project specifications.

H. Reporting of Test Results: After completion of grading operations, the Geotechnical Consultant shall submit reports documenting their observations during construction and test results. These reports may be subject to review by the local governing agencies.



CANYON SUBDRAIN PROFILE



NOTE: LOCATION OF CANYON SUBDRAINS AND OUTLETS SHOULD BE DOCUMENTED BY PROJECT CIVIL ENGINEER. OUTLETS MUST BE KEPT UNOBSTRUCTED AT ALL TIMES.

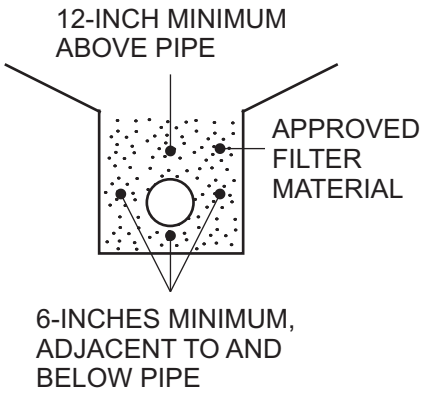
CUTOFF WALL DIMENSIONS

CANYON SUBDRAIN TERMINUS

VER 1.0

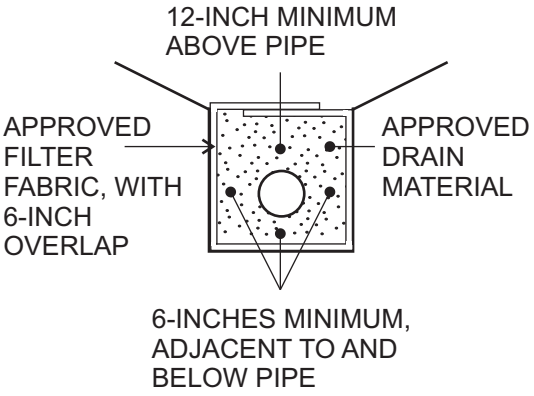
NTS

AGS ADVANCED GEOTECHNICAL SOLUTIONS	CANYON SUBDRAIN	DETAIL 1



OPTION 1

FILTER MATERIAL: MINIMUM VOLUME OF 9 CUBIC FEET PER LINEAL FOOT OF CALTRANS CLASS 2 PERMEABLE MATERIAL



OPTION 2

DRAIN MATERIAL: MINIMUM VOLUME OF 9 CUBIC FEET PER LINEAL FOOT OF 3/4-INCH MAX ROCK OR APPROVED EQUIVALENT SUBSTITUTE

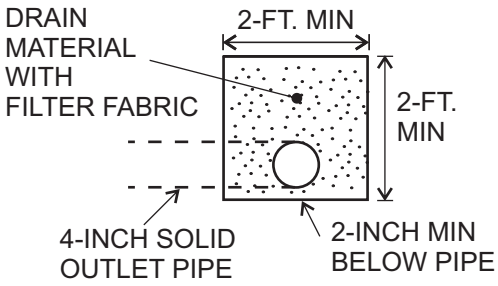
FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT SUBSTITUTE

PIPE: 6 OR 8-INCH ABS OR PVC PIPE OR APPROVED SUBSTITUTE WITH A MINIMUM OF 8 PERFORATIONS (1/4-INCH DIAMETER) PER LINEAL FOOT IN BOTTOM HALF OF PIPE

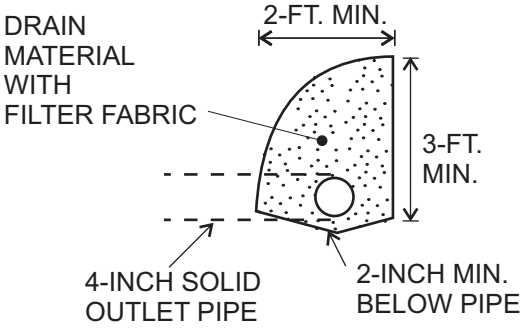
(ASTM D2751, SDR-35 OR ASTM D3034, SDR-35
ASTM D1527, SCHD. 40 OR ASTM D1785, SCHD. 40)

NOTE: CONTINUOUS RUN IN EXCESS OF 5OO FEET REQUIRES 8-INCH DIAMETER PIPE (ASTM D3034, SDR-35, OR ASTM D1785, SCHD. 40)

CANYON SUBDRAIN



OPTION 1



OPTION 2

DRAIN MATERIAL: GRAVEL TRENCH TO BE FILLED WITH 3/4-INCH MAX ROCK OR APPROVED EQUIVALENT SUBSTITUTE

FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR EQUIVALENT SUBSTITUTE WITH A MINIMUM 6-INCH OVERLAP

PIPE: 4-INCH ABS OR PVC PIPE OR APPROVED EQUIVALENT SUBSTITUTE WITH A MINIMUM OF 8 PERFORATIONS (1/4-INCH DIAMETER) PER LINEAL FOOT IN BOTTOM HALF OF PIPE

(ASTM D2751, SDR-35 OR ASTM D3034, SDR-35
ASTM D1527, SCHD. 40 OR ASTM D1785, SCHD. 40)

BUTTRESS/STABILIZATION DRAIN

VER 1.0

NTS

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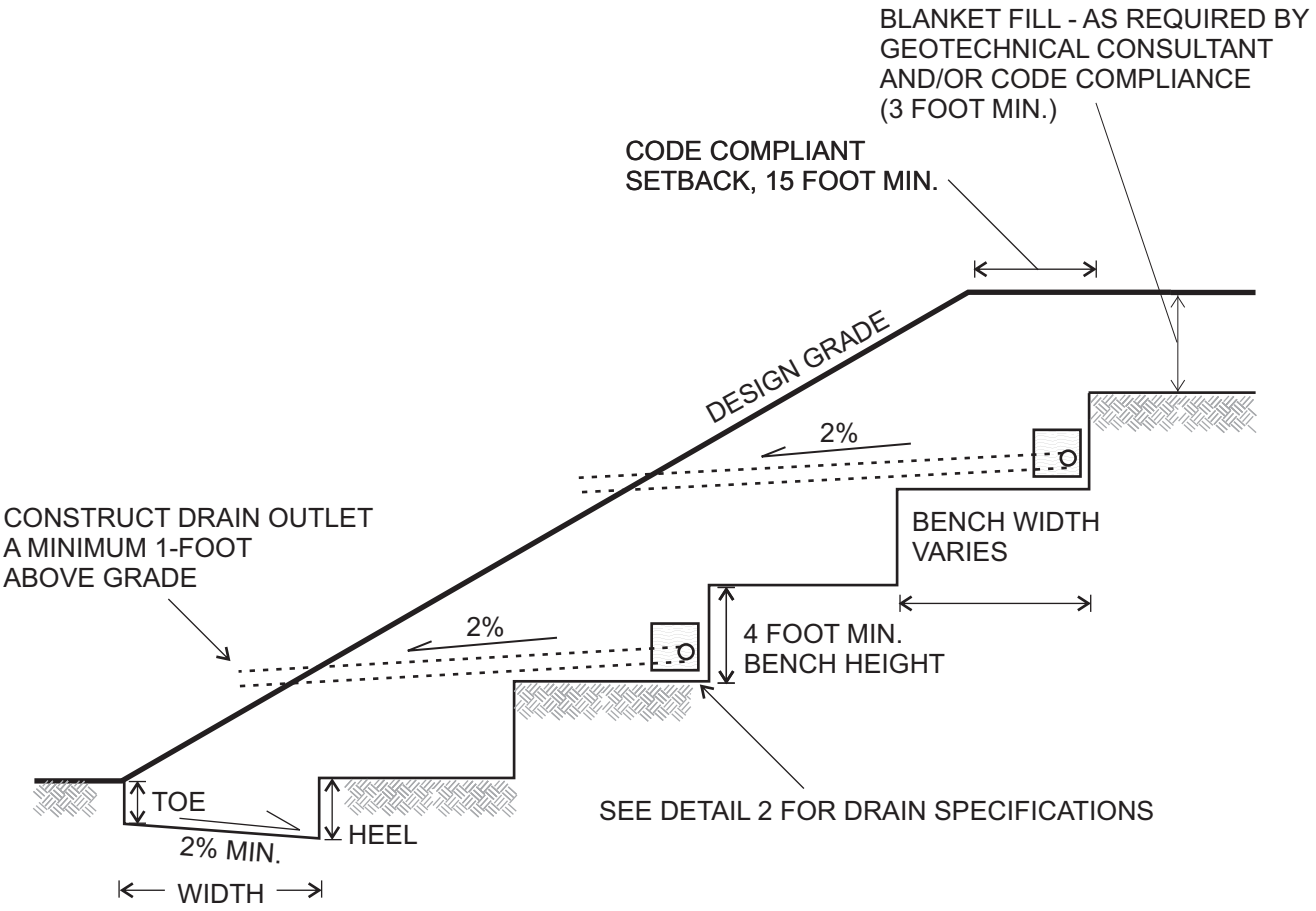
ADVANCED GEOTECHNICAL SOLUTIONS

DRAIN SPECIFICATIONS

DETAIL 2



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

TOE 2 FOOT MIN.
HEEL 3 FOOT MIN.
WIDTH 15 FOOT MIN.

NOTES:

1. DRAIN OUTLETS TO BE PROVIDED EVERY 100 FEET CONNECT TO PERFORATED DRAIN PIPE BY “L” OR “T” AT A MINIMUM 2% GRADIENT.

2. THE NECESSITY AND LOCATION OF ADDITIONAL DRAINS SHALL BE DETERMINED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT. UPPER STAGE OUTLETS SHOULD BE EMPTIED ONTO CONCRETE TERRACE DRAINS.

3. DRAIN PIPE TO EXTEND FULL LENGTH OF STABILIZATION/BUTTRESS WITH A MINIMUM GRADIENT OF 2% TO SOLID OUTLET PIPES.

4. LOCATION OF DRAINS AND OUTLETS SHOULD BE DOCUMENTED BY PROJECT CIVIL ENGINEER. OUTLETS MUST BE KEPT UNOBSTRUCTED AT ALL TIMES.

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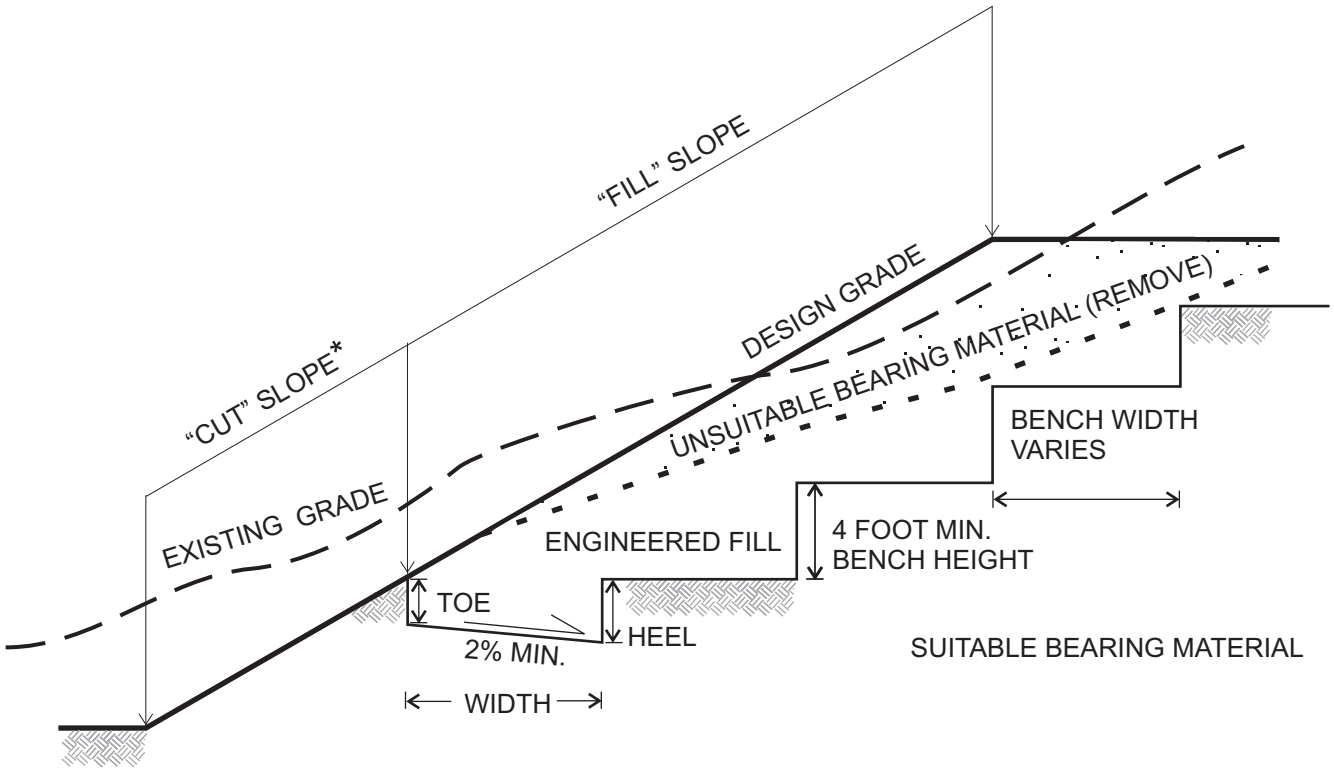
ADVANCED GEOTECHNICAL SOLUTIONS

STABILIZATION/BUTTRESS FILL

DETAIL 3

* THE “CUT” PORTION OF THE SLOPE SHALL BE EXCAVATED AND EVALUATED BY THE GEOTECHNICAL CONSULTANT PRIOR TO CONSTRUCTING THE “FILL” PORTION



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

TOE: 2 FOOT MIN.
HEEL: 3 FOOT MIN.
WIDTH: 15 FOOT MIN.

NOTES:

1. THE NECESSITY AND LOCATION OF DRAINS SHALL BE DETERMINED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT

2. SEE DETAIL 2 FOR DRAIN SPECIFICATIONS

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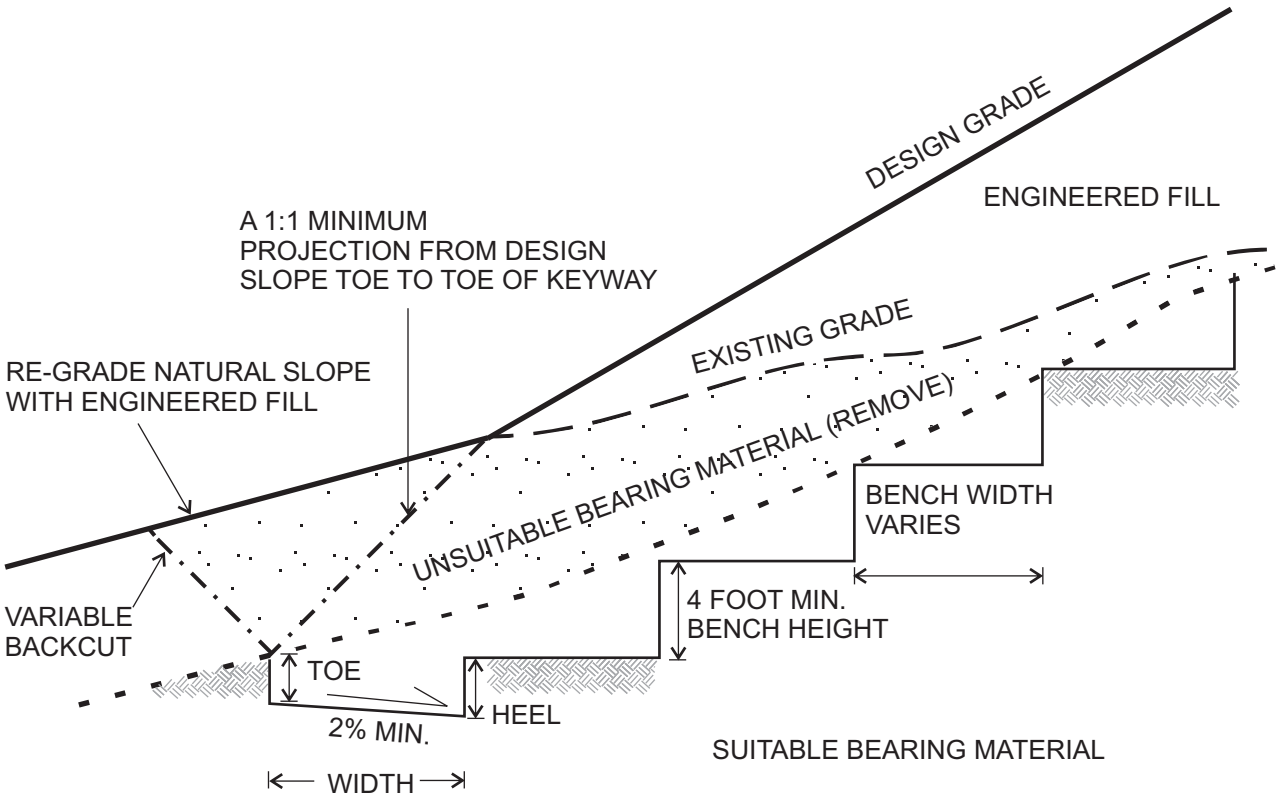
FILL OVER CUT SLOPE

DETAIL 4



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

TOE: 2 FOOT MIN.
HEEL: 3 FOOT MIN.
WIDTH: 15 FOOT MIN.

NOTES:

1. WHEN THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN GRADE SLOPE RATIO, SPECIAL RECOMMENDATIONS ARE NECESSARY BY THE GEOTECHNICAL CONSULTANT

2. THE GEOTECHNICAL CONSULTANT WILL DETERMINE THE REQUIREMENT FOR AND LOCATION OF SUBSURFACE DRAINAGE SYSTEMS.

3. MAINTAIN MINIMUM 15 FOOT HORIZONTAL WIDTH FROM FACE OF SLOPE TO BENCH/BACKCUT

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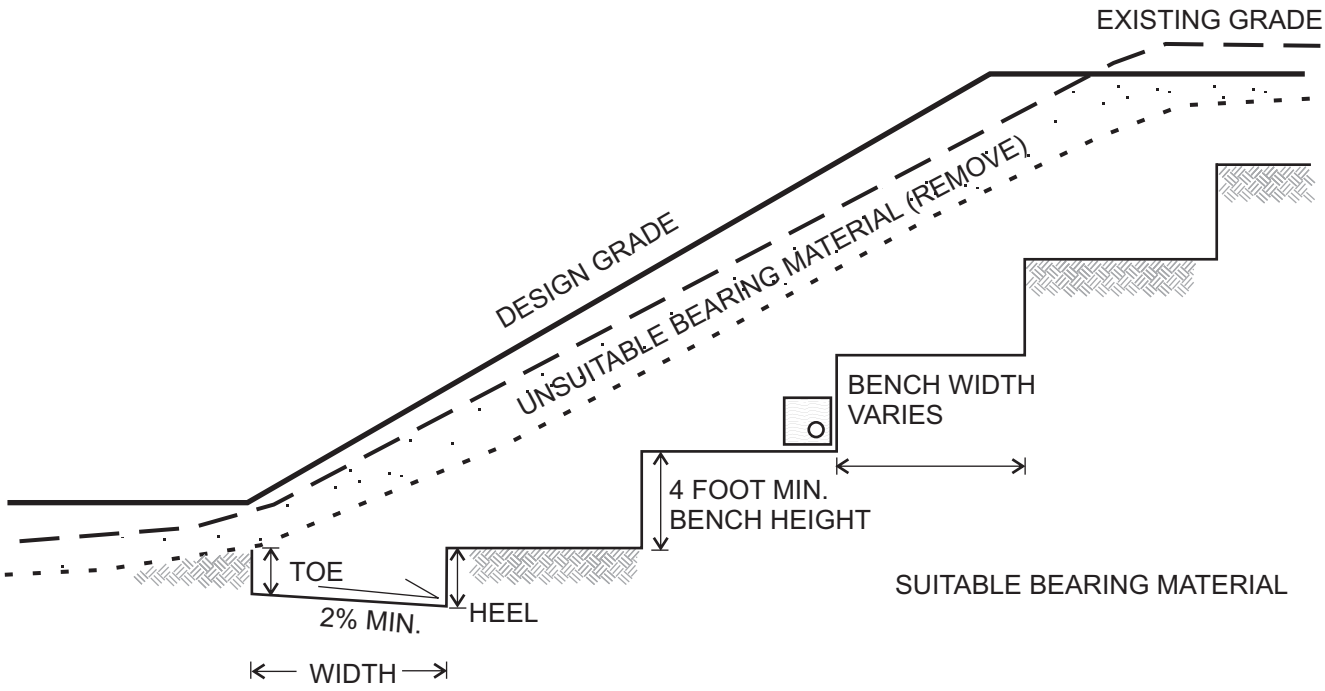
ADVANCED GEOTECHNICAL SOLUTIONS

FILL OVER NATURAL SLOPE

DETAIL 5



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

TOE: 2 FOOT MIN.
HEEL: 3 FOOT MIN.
WIDTH: 15 FOOT MIN.

NOTES:

1. MAINTAIN MINIMUM 15 FOOT HORIZONTAL WIDTH FROM FACE OF SLOPE TO BENCH/BACKCUT

2. SEE DETAIL 2 FOR DRAIN SPECIFICATIONS

VER 1.0

NTS

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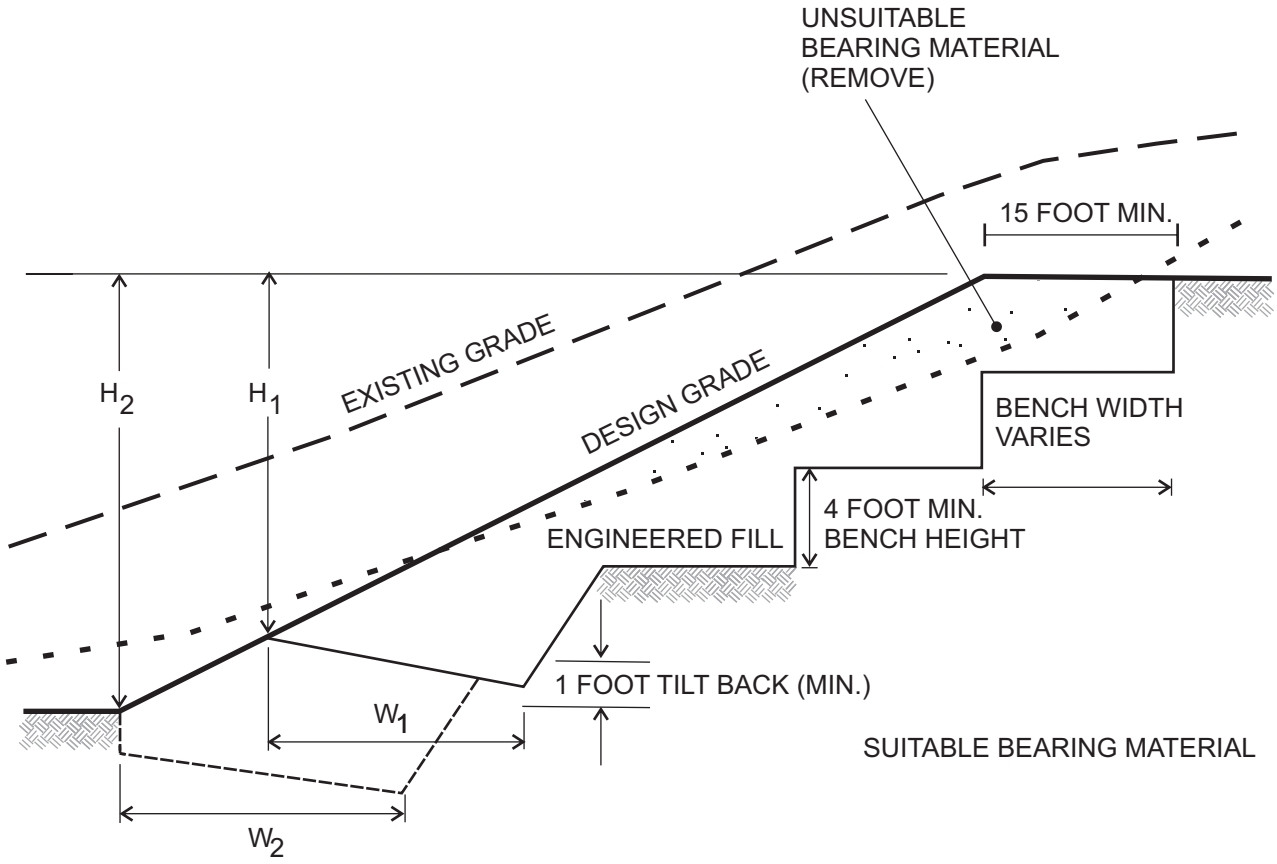
ADVANCED GEOTECHNICAL SOLUTIONS

SKIN FILL CONDITION

DETAIL 6



NOTES:

1. IF RECOMMENDED BY THE GEOTECHNICAL CONSULTANT, THE REMAINING CUT PORTION OF THE SLOPE MAY REQUIRE REMOVAL AND REPLACEMENT WITH AN ENGINEERED FILL

2. "W" SHALL BE EQUIPMENT WIDTH (15 FEET) FOR SLOPE HEIGHT LESS THAN 25 FEET. FOR SLOPES GREATER THAN 25 FEET, "W" SHALL BE DETERMINED BY THE GEOTECHNICAL CONSULTANT. AT NO TIME SHALL "W" BE LESS THAN H/2

3. DRAINS WILL BE REQUIRED (SEE DETAIL 2)

VER 1.0

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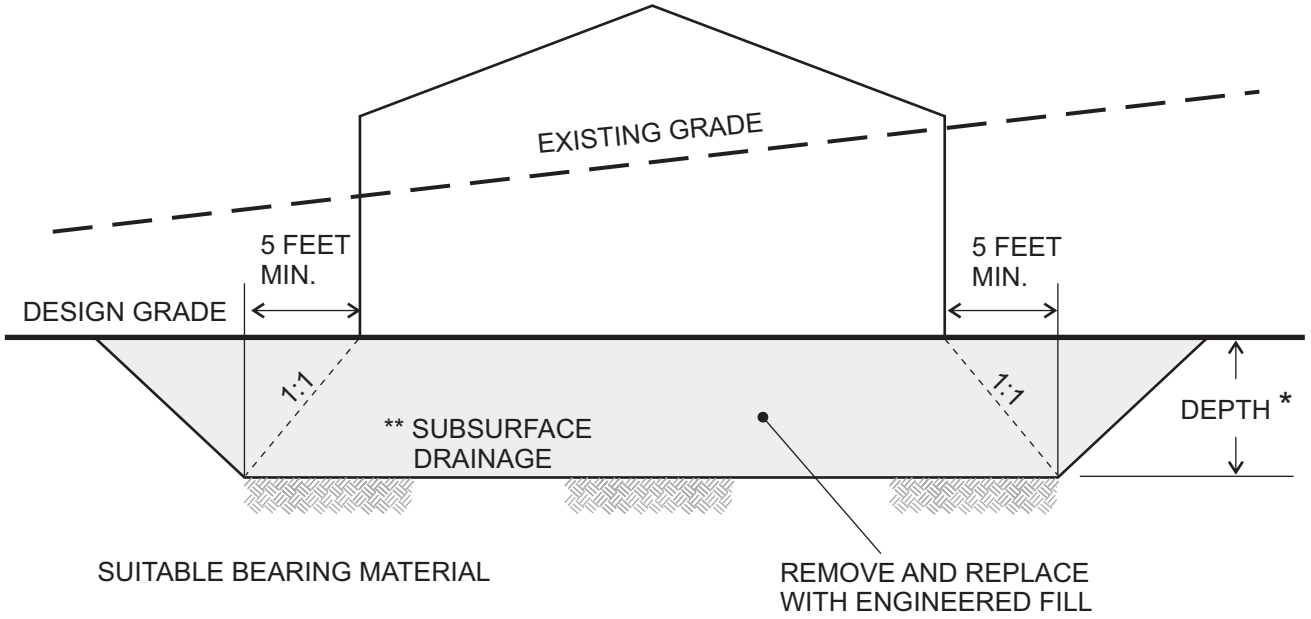
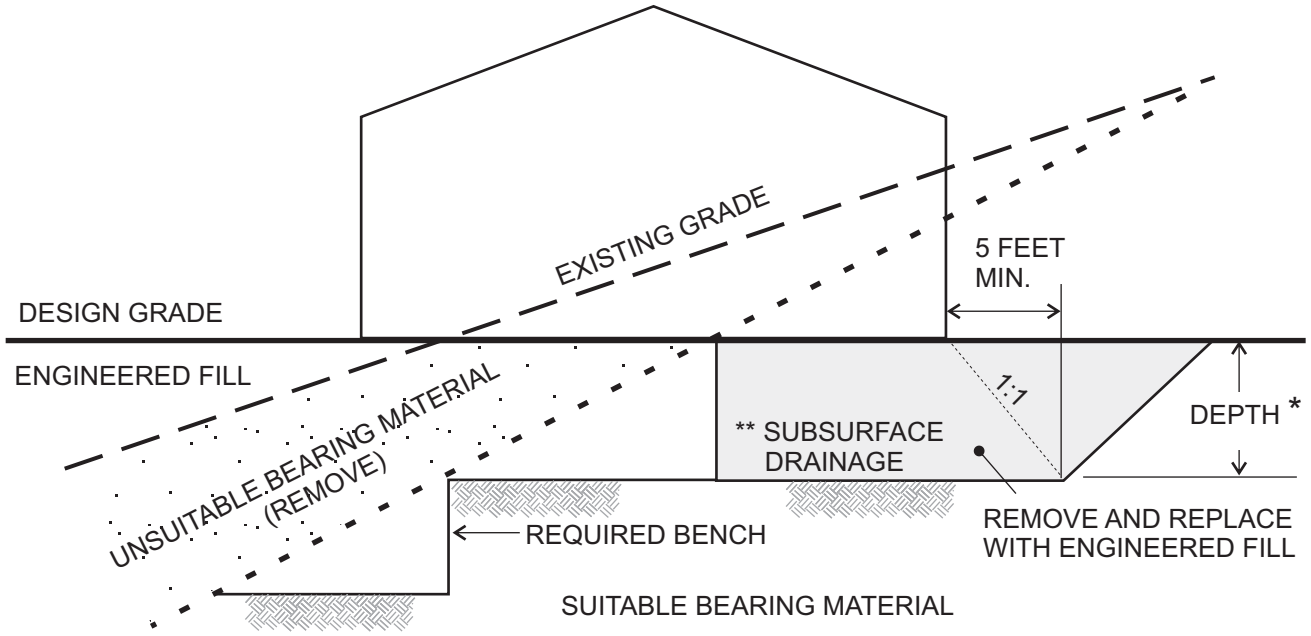
ADVANCED GEOTECHNICAL SOLUTIONS

PARTIAL CUT SLOPE STABILIZATION

DETAIL 7



CUT LOT OVEREXCAVATION



CUT-FILL LOT OVEREXCAVATION

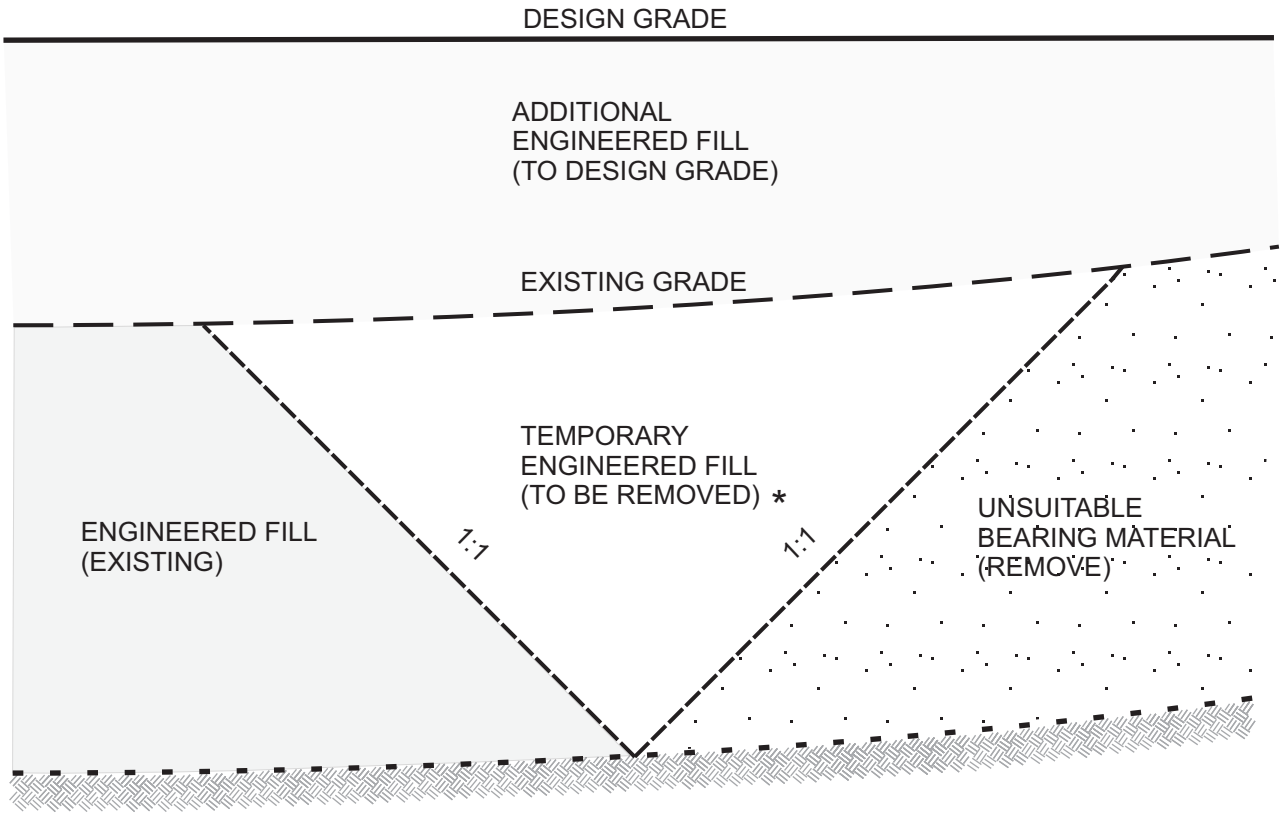
NOTES:

* SEE REPORT FOR RECOMMENDED DEPTHS, DEEPER OVEREXCAVATION MAY BE REQUIRED BY THE GEOTECHNICAL CONSULTANT BASED ON EXPOSED FIELD CONDITIONS

** CONSTRUCT EXCAVATION TO PROVIDE FOR POSITIVE DRAINAGE TOWARDS STREETS, DEEPER FILL AREAS OR APPROVED DRAINAGE DEVICES BASED ON FIELD CONDITIONS

VER 1.0 NTS

AGS ADVANCED GEOTECHNICAL SOLUTIONS	CUT & CUT-FILL LOT OVEREXCAVATION	DETAIL 8



* REMOVE BEFORE PLACING ADDITIONAL ENGINEERED FILL

TYPICAL UP-CANYON PROFILE

VER 1.0

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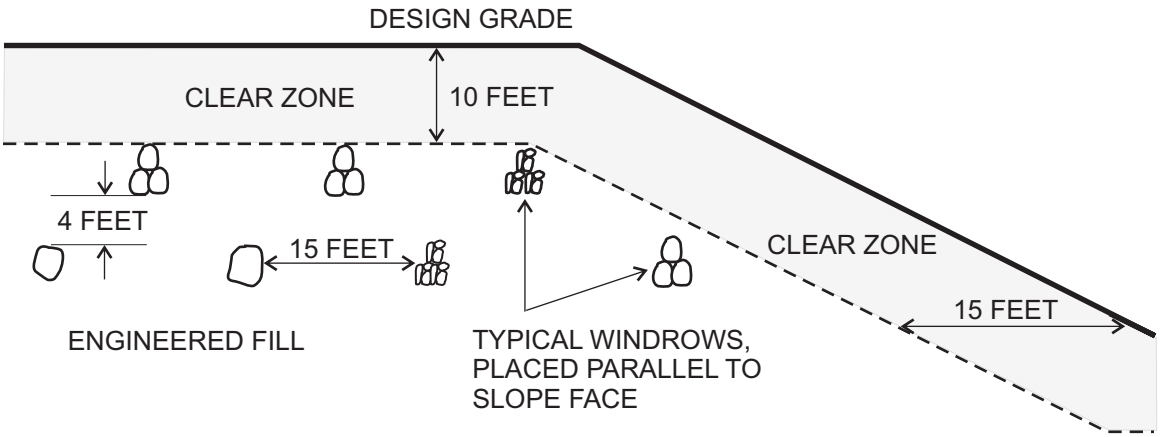
ADVANCED GEOTECHNICAL SOLUTIONS

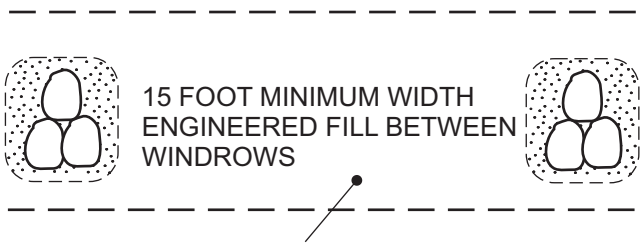
REMOVAL ADJACENT TO EXISTING FILL

DETAIL 9



CLEAR ZONE DIMENSIONS FOR REFERENCE ONLY, ACTUAL DEPTH, WIDTH, WINDROW LENGTH, ETC. TO BE BASED ON ELEVATIONS OF FOUNDATIONS, UTILITIES OR OTHER STRUCTURES PER THE GEOTECHNICAL CONSULTANT OR GOVERNING AGENCY APPROVAL

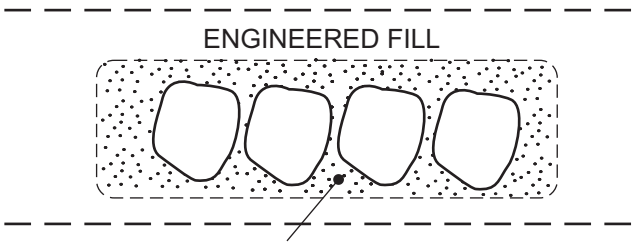
OVERSIZED MATERIAL DISPOSAL PROFILE



HORIZONTALLY PLACED ENGINEERED FILL, FREE OF OVERSIZED MATERIALS AND COMPACTED TO MINIMUM PROJECT STANDARDS

COMPACT ENGINEERED FILL ABOVE OVERSIZED MATERIALS TO FACILITATE "TRENCH" CONDITION PRIOR TO FLOODING GRANULAR MATERIALS

WINDROW CROSS-SECTION



WINDROW PROFILE

VER 1.0

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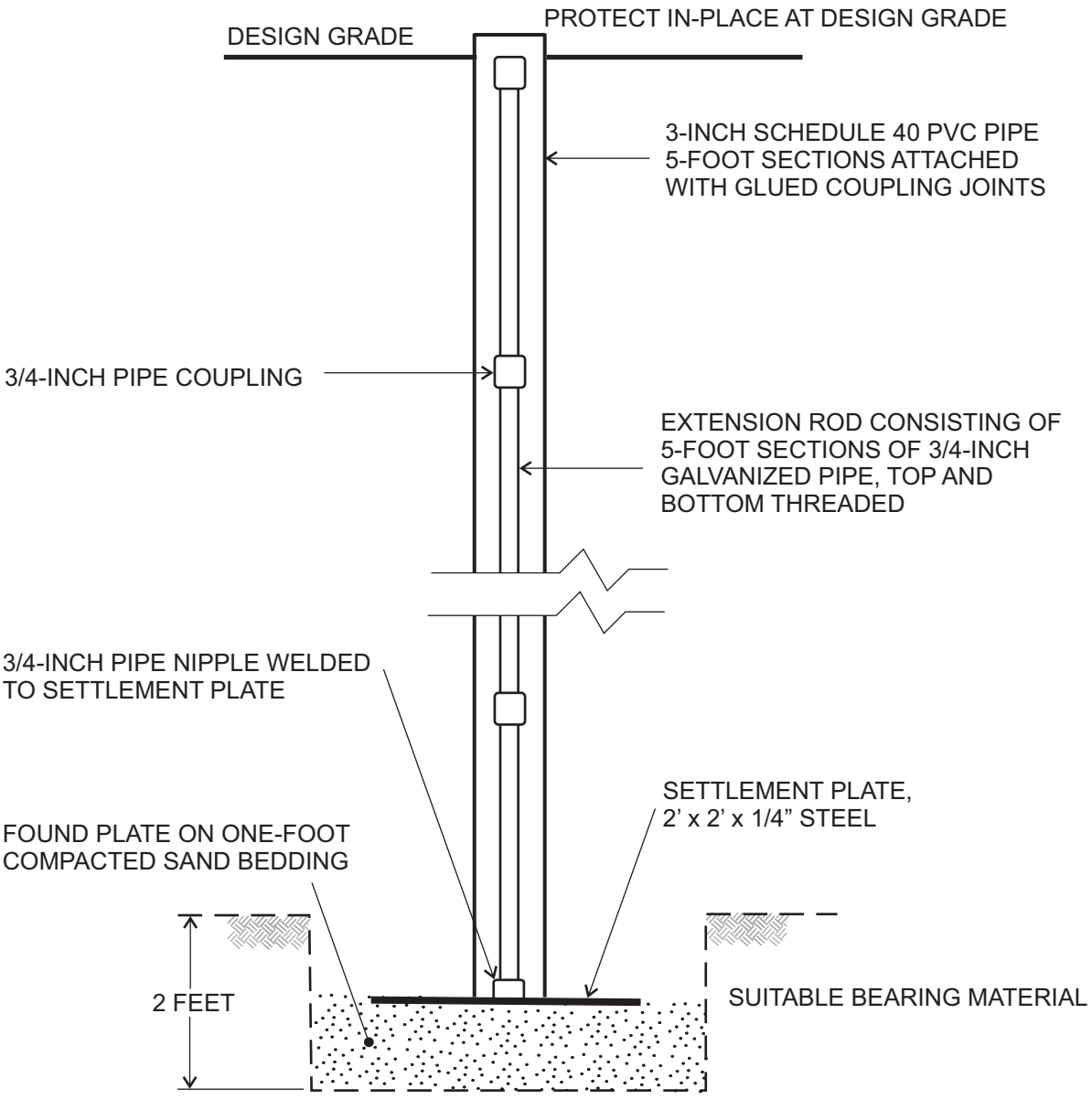
ADVANCED GEOTECHNICAL SOLUTIONS

OVERSIZED MATERIAL DISPOSAL CRITERIA

DETAIL 10



NOTES:

1. SETTLEMENT PLATE LOCATIONS SHALL BE SUFFICIENTLY IDENTIFIED BY THE CONTRACTOR AND BE READILY VISIBLE TO EQUIPMENT OPERATORS.

2. CONTRACTOR SHALL MAINTAIN ADEQUATE HORIZONTAL CLEARANCE FOR EQUIPMENT OPERATION AND SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO SETTLEMENT PLATE DURING SITE CONSTRUCTION.

3. A MINIMUM 5-FOOT ZONE ADJACENT TO SETTLEMENT PLATE/EXTENSION RODS SHALL BE ESTABLISHED FOR HAND-HELD MECHANICAL COMPACTION OF ENGINEERED FILL. ENGINEERED FILL SHALL BE COMPACTED TO MINIMUM PROJECT STANDARD.

4. ELEVATIONS OF SETTLEMENT PLATE AND ALL EXTENSION ROD PLACEMENT SHALL BE DOCUMENTED BY PROJECT CIVIL ENGINEER OR SURVEYOR.

VER 1.0

NTS

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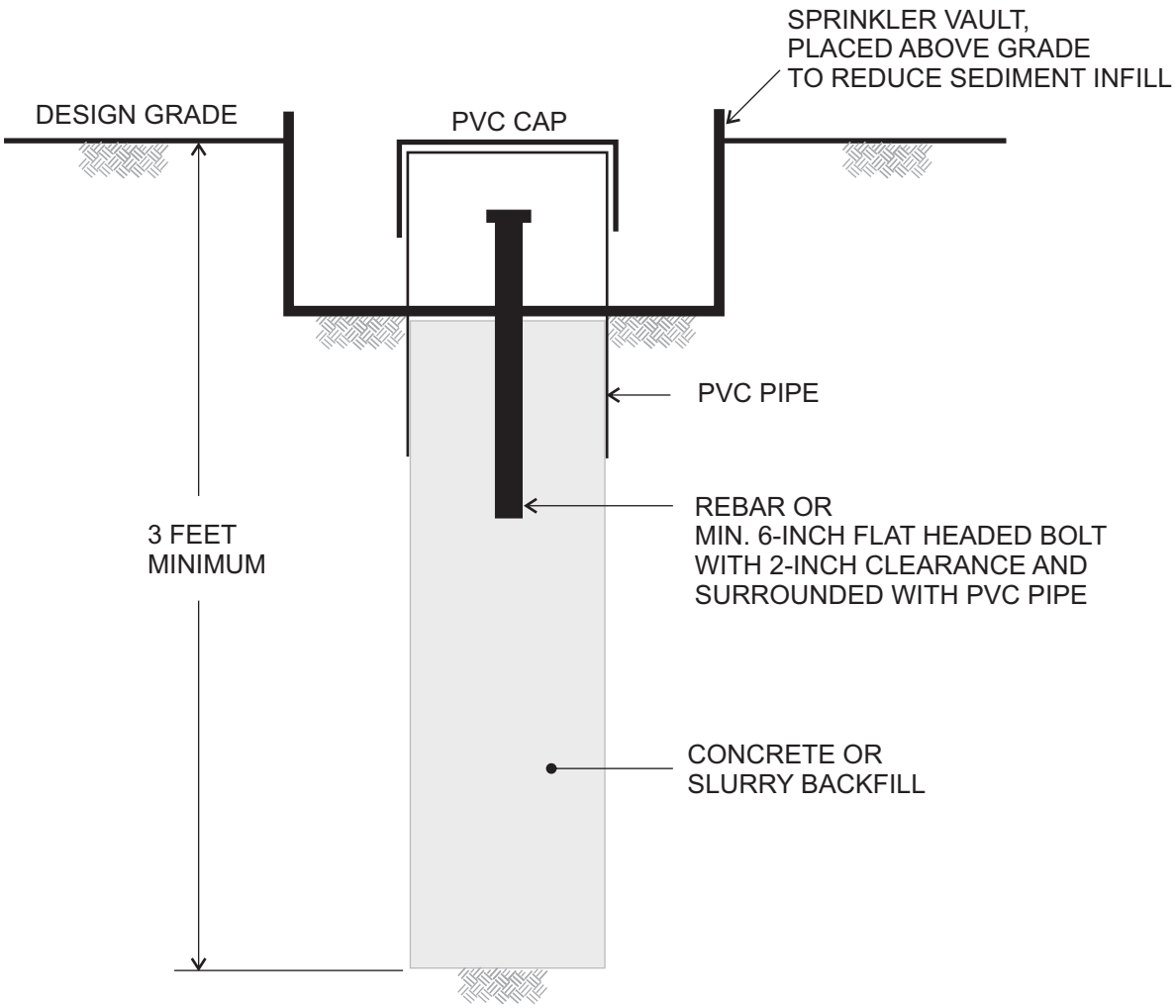
ADVANCED GEOTECHNICAL SOLUTIONS

SETTLEMENT PLATE

DETAIL 11

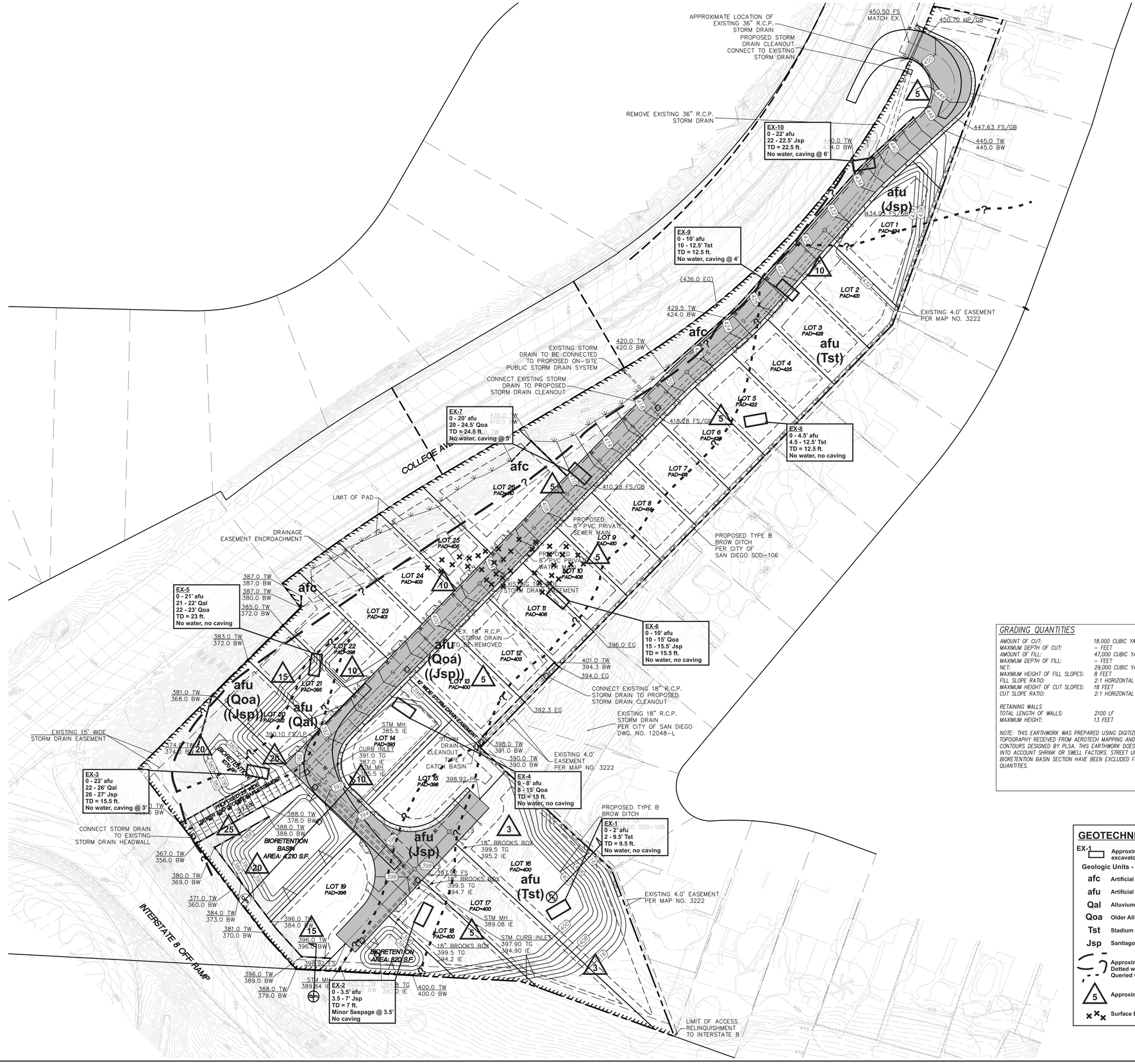


NOTES:

1. SETTLEMENT MONUMENT LOCATIONS SHALL BE SUFFICIENTLY IDENTIFIED AND BE READILY VISIBLE TO EQUIPMENT OPERATORS.

2. ELEVATIONS OF SURFACE MONUMENTS SHALL BE DOCUMENTED BY PROJECT CIVIL ENGINEER OR SURVEYOR.

PRELIMINARY GRADING AND UTILITY PLAN
TENTATIVE MAP / PLANNED DEVELOPMENT PERMIT
PARKVIEW TERRACE



LEGEND

EXISTING IMPROVEMENTS	
BOUNDARY LINE	
EXISTING CONTOURS	139
EXISTING CURB AND GUTTER	
EXISTING STREET CENTERLINE	
EXISTING SEWER MAIN	S
EXISTING STORM DRAIN MAIN	SD
EXISTING CURB INLET	
EXISTING WATER MAIN	W
EXISTING WATER VALVE	
EXISTING FIRE HYDRANT	
EXISTING 48" BONITA PIPELINE (RAW WATER LINE)	W
EXISTING STREET LIGHT	
EXISTING STRUCTURE	
EXISTING VEGETATION	
PROPOSED IMPROVEMENTS	
RIGHT OF WAY	
LOT LINE	
PUBLIC STREET CENTERLINE	
CUT/FILL LINE	C / F
LIMIT OF WORK LINE	
CURB AND GUTTER	
AC PAVEMENT	
P.C.C. PAVEMENT	
RESIDENTIAL DRIVEWAY (WIDTH VARIES)	
ADA ACCESSIBLE RAMP	
PROPOSED CONTOURS	146
PROPOSED SPOT ELEVATION	FS=145.0
RETAINING WALL	
TYPE "B" BROW DITCH	
LOT DRAINAGE FLOW LINE	
BIORETENTION BASIN	
STORM DRAIN HEADWALL	
18" HDPE STORM DRAIN	
STORM DRAIN CLEANOUT	
CURB INLET	
CURB OUTLET	
8" SEWER MAIN	S
SEWER MANHOLE	
SEWER CLEANOUT	
SEWER SERVICE	S
WATER SERVICE	W
8" A.C. WATER MAIN	W
GATE VALVE	
FIRE HYDRANT	
12" DIA. ATRIUM GRATE	
RIP RAP ENERGY DISSIPATOR PER SDD-104	
4" DIA. PVC STORM DRAIN	

GRADING QUANTITIES

AMOUNT OF CUT:	18,000 CUBIC YARDS*
MAXIMUM DEPTH OF CUT:	– FEET
AMOUNT OF FILL:	47,000 CUBIC YARDS*
MAXIMUM DEPTH OF FILL:	– FEET
NET:	29,000 CUBIC YARDS IMPORT
MAXIMUM HEIGHT OF FILL SLOPES:	8 FEET
FILL SLOPE RATIO:	2:1 HORIZONTAL TO VERTICAL
MAXIMUM HEIGHT OF CUT SLOPES:	18 FEET
CUT SLOPE RATIO:	2:1 HORIZONTAL TO VERTICAL
RETAINING WALLS	
TOTAL LENGTH OF WALLS:	2100 LF
MAXIMUM HEIGHT:	13 FEET

NOTE: THIS EARTHWORK WAS PREPARED USING DIGITIZED TOPOGRAPHY RECEIVED FROM AEROTECH MAPPING AND PROPOSED CONTOURS DESIGNED BY PLSA. THIS EARTHWORK DOES NOT TAKE INTO ACCOUNT SHRINK OR SWELL FACTORS, STREET UNDEROUT AND BIORETENTION BASIN SECTION HAVE BEEN EXCLUDED FROM FILL QUANTITIES.

GEOTECHNIAL LEGEND:

EX-1 — Approximate location of excavator test pit (AGS 2014)

Geologic Units - Bracketed where buried

afc	Artificial fill - compacted
afu	Artificial Fill - undocumented
Qal	Alluvium
Qoa	Older Alluvium
Tst	Stadium Conglomerate
Jsp	Santiago Peak Volcanics

Approximate Location of Geologic Contact
Dotted where buried,
Queried where uncertain

5 — Approximate Depth of Anticipated Removal

Surface Boulders

BENCHMARK:
SEBP AT PARKSIDE AVENUE & SABINA DRIVE
ELEVATION: 137.776
DATUM: MSL
PER CITY OF SAN DIEGO VERTICAL CONTROL BENCHBOOK

WATER UTILITY NOTE:
ALL WATER SERVICES TO THE SITE, INCLUDING DOMESTIC, IRRIGATION AND FIRE, WILL REQUIRE PRIVATE, ABOVE GROUND BACKFLOW PREVENTION DEVICES BACKFLOW PREVENTION DEVICES SHALL BE LOCATED ON PRIVATE PROPERTY, IN LINE WITH THE SERVICE AND IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY. THE PUBLIC UTILITIES DEPARTMENT WILL NOT PERMIT THE REQUIRED BACKFLOW PREVENTION DEVICES TO BE LOCATED BELOW GRADE OR WITHIN THE STRUCTURE.

N

SCALE: 1"=40'
40' 0 40' 80' 120'

PREPARED BY:

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING
535 North Highway 101, Ste A, Solana Beach, CA 92075
ph 858.259.8212 | fx 858.259.4812 | plsaengineering.com

REGISTERED PROFESSIONAL ENGINEER — WILLIAM GREGG MACK — No. 73620 Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

WILLIAM GREGG MACK R.C.E. 73620 — DATE
EXPIRATION: 12/31/2016

PROJECT NAME:
DEL CERRO RESIDENTIAL TENTATIVE MAP

PROJECT ADDRESS:
NORTHEAST CORNER OF COLLEGE AVENUE & INTERSTATE 8
SAN DIEGO, CALIFORNIA 92120

PROJECT TRACKING SYSTEM NUMBER:
PENDING

INTERNAL ORDER NUMBER:
PENDING

SHEET TITLE:
PRELIMINARY GRADING AND UTILITY PLAN

SHEET NUMBER:
C 2.0 OF 5

DRAWN BY: C. JACKSON, J. CATANESE
CHECKED BY: W. MACK

ORIGINAL DATE: 07-20-2015
REVISION 1:

PLATE 1
Geologic Map and Exploration Location Plan

AGS
ADVANCED GEOTECHNICAL SOLUTIONS, INC.

Project:	Report:	Date:
P/W 1411-02	1411-02-B-4	July 2015

ADVANCED GEOTECHNICAL SOLUTIONS, INC.
485 Corporate Drive, Suite B
Escondido, CA 92029
Telephone: (619) 867-0487

ColRich
444 West Beech Street, Suite 300
San Diego, California 92101

May 31, 2016
P/W 1411-02
Report No. 1411-02-B-6

Attention: **Mr. Jason Shepard**

Subject: **Geotechnical Addendum, Infiltration Testing for Proposed Storm Water BMP Basins, Proposed Del Cerro Single-Family Residential Development, City of San Diego, California**

Gentlemen:
In accordance with your request, Advanced Geotechnical Solutions, Inc. (AGS) has prepared this geotechnical addendum for the proposed Del Cerro residential development, City of San Diego, California. This addendum addresses new infiltration testing requirements and provides an evaluation of the feasibility for storm water infiltration in accordance with the recently adopted Storm Water Standards – BMP Design Manual. A discussion of our field testing and findings are presented below. Worksheet C.4-1 and associated supporting worksheets and data are presented in Appendix A.

1.0 SITE DESCRIPTION

The irregularly-shaped site is located northeast of the intersection of College Avenue and Interstate 8, in the Del Cerro area of San Diego, California. The site is bounded to the west by College Avenue, to the south by Interstate 8, to the north by an existing gas station, and to the east by existing single-family residences. The overall project site encompasses an approximate total area of 5.6 acres. The site is currently vacant, supporting a light growth of seasonal grasses, shrubs, and small trees. Access to the site is via College Avenue.

Topography on site generally slopes down toward the southwest. Approximate elevations onsite range from 356 msl at the southwest corner to 450 msl at the northerly limits of the site. There are existing slopes up to approximately 25 feet high along the northwesterly property boundary ascending to College Avenue. At the southwest corner of the site, there are slopes descending to a minor drainage.

Several bioretention basins are proposed in the southern portion of the site, with approximate areas ranging from 820 sq.ft. to 4,200 sq.ft.

2.0 SITE GEOLOGY

As part of our referenced preliminary geotechnical investigation (AGS, 2015), AGS excavated and logged ten (10) exploratory test pits with a Caterpillar 328D tracked excavator equipped with a two-foot bucket. The exploratory test pits extended to a maximum depth of 27 feet below existing grade. The approximate locations of the test pits and geologic contacts are shown on Plate 1 included herewith. Based on our subsurface investigation and review of published geologic maps, the site is underlain at depth by Cretaceous aged Santiago Peak Volcanics and Tertiary aged Stadium Conglomerate. These bedrock units are mantled by veneers of surficial soils consisting primarily of alluvium and locally derived undocumented fill soils. As encountered, these surficial soils ranged in thickness from less than three (3)

feet to in excess of 25 feet. In areas of proposed development, the surficial soils will be removed and replaced with engineered fill.

3.0 TESTING METHODS AND PROCEDURES

To evaluate feasibility for infiltration of storm water and to provide preliminary design infiltration rates, four (4) borehole percolation tests were performed in general conformance with Appendix D, Section D.3.3.2 of the recently adopted BMP Design Manual. Based on the current design, the basins will be constructed in areas of compacted fill on the order 15 to 30 feet deep. Due to the proposed basin locations and depth of fill, infiltration testing in the area of the proposed basins was not feasible. Test locations were selected in several portions of the site where the bedrock units would be encountered closer to the surface. This included locations in the southerly portion of the site in proximity to the proposed basins, as well as the central and northerly portions of the site to determine preliminary infiltration rates, evaluate uniformity of the bedrock conditions, and possibly identify other area onsite that are suitable for infiltration.

To provide representative continuous soil/geologic logs for the percolation test holes, the percolation test borings were continuously logged during excavation and were located in proximity to trackhoe excavations that were previously logged as part of our preliminary geotechnical investigation for the site (AGS, 2015). Locations of the percolation test holes and all exploratory trenches are shown on Plate 1, included herewith.

The percolation boreholes (P-1 through P-4) were excavated to refusal with a 12-inch diameter flight auger attached to a Case 580 rubber tire backhoe and extended to depths ranging between 32 to 74 inches below ground surface. These borings extended approximately 2 to 2.5 feet into bedrock. Boreholes P-1 and P-2 extended through undocumented artificial fill to Stadium Conglomerate, and Boreholes P-3 and P-4 extended through undocumented fill to Santiago Peak Volcanics. The Stadium Conglomerate can generally be described as a cobble conglomerate with rounded cobbles up to 8 to 10 inches in a yellowish brown silty sand matrix, in a slightly moist and hard condition. The Santiago Peak Volcanics can generally be described as a metavolcanic sandstone that is moderately weathered, well jointed, and moderately hard.

The resulting test holes were cleaned of loose debris then successively filled with several gallons of potable water and allowed to pre-soak overnight. The following day the test holes were cleaned of sediment and the bottom was lined with approximately 2-inches of washed gravel prior to percolation testing. A series of falling head percolation tests were performed. The test holes were filled with, potable water to approximately 26 to 28 inches above infiltration surface and allowed to infiltrate. The water level was allowed to drop for a 30-minute period, the water level was then measured and the drop rate calculated in inches per hour. The test hole was then refilled with water as necessary and the test procedure was repeated over the course of 6 hours until a stabilized percolation rate was recorded. The stabilized percolation rate was then converted to an infiltration rate based on the "Porchet Method" utilizing the following equation:

$$I_t = \frac{\Delta H\, \pi r^2 60}{\Delta t(\pi r^2 + 2\pi r H_{avg})} = \frac{\Delta H\, 60\, r}{\Delta t(r + 2H_{avg})}$$

Where:

I_t = tested infiltration rate, inches/hour
ΔH = change in head over the time interval, inches
Δt = time interval, minutes
r = effective radius of test hole
H_{avg} = average head over the time interval, inches

Logs of the field testing and graphical representations of the test data presented as infiltration versus time interval are included in Appendix A as supporting documents for Worksheet C.4-1.

4.0 TEST RESULTS AND PRELIMINARY DESIGN VALUES

The results of our testing are summarized in Table 1 below.

TABLE 1
SUMMARY OF INFILTRATION/PERCOLATION TEST RESULTS

Test Hole No.	Depth of Test Hole	Approximate Test Elevation	Geologic Unit	Description	Tested Infiltration Rate (inches/hour)
P-1	74" (6'-2")	427.8 msl	Tst	Cobble Conglomerate in Silty Sand Matrix	0.10
P-2	32" (2'-8")	412.3 msl	Tst	Cobble Conglomerate in Silty Sand Matrix	0.10
P-3	47" (3'-11")	384.1 msl	Jsp	Metavolcanic Sandstone	0.35
P-4	65" (5'-5")	394.1 msl	Jsp	Metavolcanic Sandstone	0.39

In accordance with Appendix D, Section D.5. of the BMP Design Manual, a 'Factor of Safety' should be applied to the tested infiltration rates to determine the design infiltration rates. The factor of safety is determined by Worksheet D.5-1 and possesses a numerical value between 2 and 9. For the proposed project site, the factor of safety worksheet yielded a Combined Factor of Safety (S_{total}) of 3.5. However, for the purposes of feasibility screening, it is recommended that a Factor of Safety of 2.0 be utilized. Table 2 below summarizes the design infiltration rates for the subject test holes utilizing a factor of safety of 2.0.

TABLE 2
SUMMARY OF DESIGN INFILTRATION RATES

Test Hole No.	Tested Infiltration Rate (in./hr.)	Factor of Safety	Design Infiltration Rate (in./hr.)
P-1	0.10	2.0	**0.05**
P-2	0.10	2.0	**0.05**
P-3	0.35	2.0	**0.17**
P-4	0.39	2.0	**0.19**

5.0 DESIGN CONSIDERATIONS

5.1. Groundwater

No shallow groundwater was observed in the test borings nor in the test pits excavated onsite. Figure C.5-3 Groundwater Table Elevation Exhibit depicts the average depths to groundwater at various locations in San Diego. The closest data points to the project site indicate that groundwater depths are greater than fifteen feet. It is our opinion that the seasonal high groundwater elevation is greater than ten feet below the base of the proposed basin.

5.2. Geotechnical Hazards

Slopes greater than 25% are present onsite, and after development, graded slopes and retaining walls will be present subjacent to the basins. The infiltration of storm water could result in daylight seepage on slope faces, the potential for destabilization of slopes, and the buildup of hydrostatic pressure behind retaining walls. Furthermore, in consideration of the proximity of the proposed basin to existing utilities, and there is a potential for water intrusion into utility trenches and soil piping.

5.3. Soil and Groundwater Contamination

During our recent site investigation, no evidence of soil contamination was observed, nor is any contamination known to exist onsite. Groundwater was not encountered during out subsurface investigations, and is not anticipated to be contaminated. Based on Figure C.5-4 Contaminated Sites Exhibit, no contaminated sites are located within the project vicinity. A gas station located northerly superjacent to the project, which could be a future source of soil/groundwater contamination. (do we want to give approximate distances from gas station to basins???????)

5.4. Pretreatment

At this time, it is our understanding that the no pretreatment such as sedimentation or filtration prior to infiltration into stormwater basins is planned.

5.5. Soil Characteristics and Anticipated Flow Paths

The infiltration surfaces are in Stadium Conglomerate and Santiago Peak Volcanics. As encountered, these materials can generally be described as cobble conglomerate in a silty sand matrix and metavolcanic bedrock, respectively. Infiltration rates within the Stadium Conglomerate are *very low*. Infiltration rates within the Santiago Peak Volcanics are slightly higher, but based on our observations it is our opinion that the water is travelling along fractures in the bedrock rather than infiltrating. Due to the dense nature of the bedrock units onsite it is anticipated that the majority of stormwater infiltration will encounter these bedrock contacts and move laterally or follow fractures rather than infiltrating vertically.

5.6. Proximity to water supply wells

No water supply wells are known to exist within 100 feet of the proposed basin.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our preliminary infiltration testing, the onsite soils possess design infiltration rates ranging between 0.05 and 0.19 inches/hour, with an average infiltration rate of less than 0.12 inches/hour. The design infiltration rates for the project site are significantly below 0.50 inches/hour and full infiltration at the project is not feasible. Further, in consideration of the relatively low design infiltration rates (less than 0.2 in/hr), and the hazards associated with infiltration superjacent to retaining walls and slopes it is our opinion that the screening feasibility category is "No Infiltration." It is our recommendation that the basins remain in proximity to currently planned locations and be lined with an impermeable liner.

Advanced Geotechnical Solutions, Inc. appreciates the opportunity to provide you with geotechnical consulting services and professional opinions. If you have any questions, please contact the undersigned at (619) 867-0487.

Respectfully Submitted,
Advanced Geotechnical Solutions, Inc.

PHILLIP W. MADRID, EIT
Staff Engineer

JEFFREY A. CHANEY, President
RCE 46544 / RGE 2314, Reg. Exp. 6-30-17

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CEG 2536, Reg. Exp. 5-31-17

Distribution: (6) Addressee

Attachments: References
Plate 1 – Geologic Map and Exploration Location Plan
Appendix A- Storm Water Standards BMP Design Manual - Worksheet Form C-4.1, Support Documents and Field Data

REFERENCES

Advanced Geotechnical Solutions, Inc. (2016), Geotechnical Addendum, Response to Cycle Review Comments, LDR-Geology, Regarding Preliminary Geotechnical Investigation, Del Cerro Residential Development, College Avenue and Interstate 8, San Diego, California, Report No. 1411-02-B-5, dated March 14, 2016.

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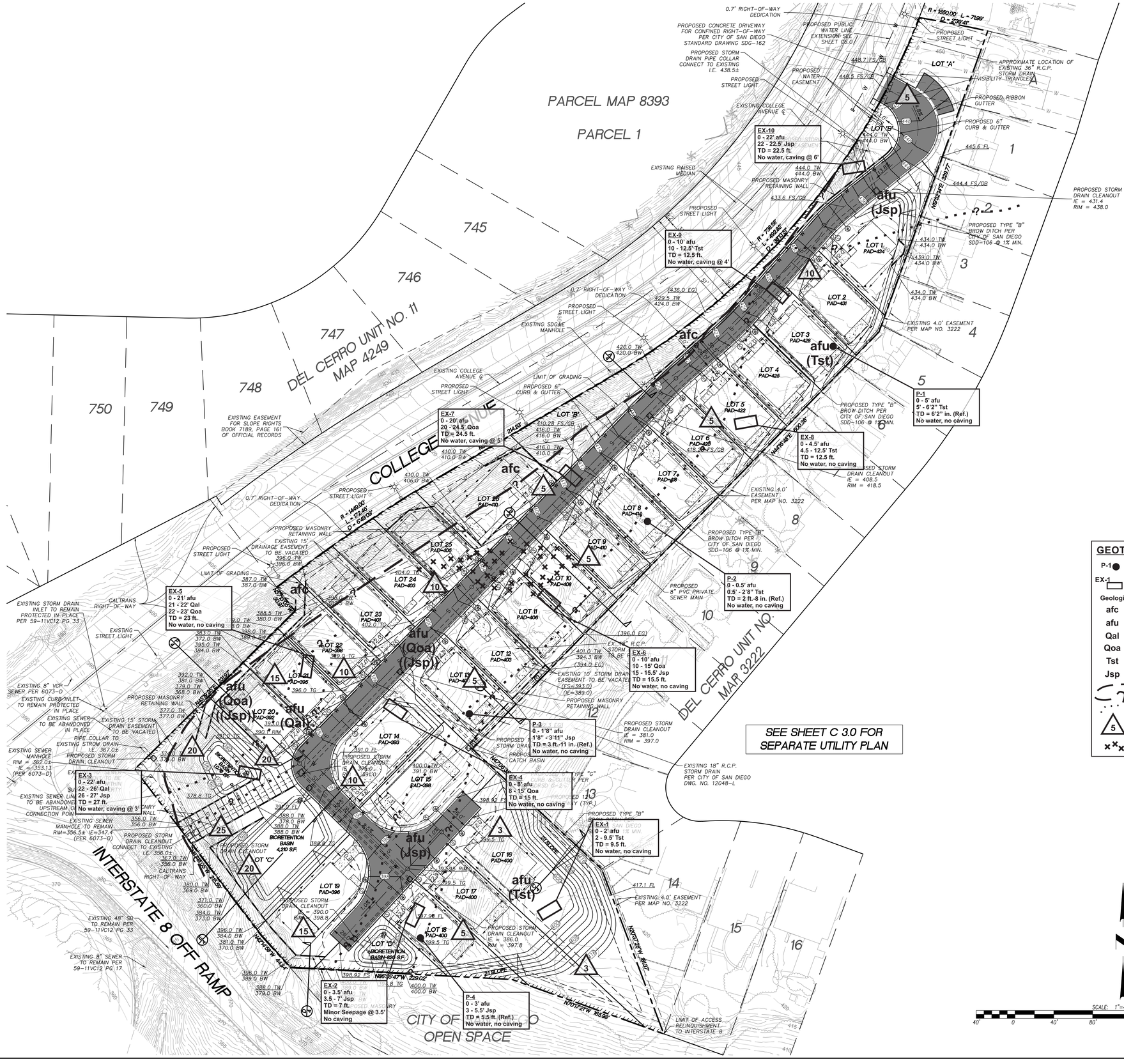
PRELIMINARY GRADING PLAN
TENTATIVE MAP AND SITE DEVELOPMENT PERMIT
DEL CERRO RESIDENTIAL



LEGEND

EXISTING IMPROVEMENTS
BOUNDARY LINE
EXISTING CONTOURS
EXISTING CURB AND GUTTER
EXISTING STREET CENTERLINE
EXISTING SEWER MAIN
EXISTING STORM DRAIN MAIN
EXISTING CURB INLET
EXISTING WATER MAIN
EXISTING WATER VALVE
EXISTING FIRE HYDRANT
EXISTING STREET LIGHT
EXISTING STRUCTURE
EXISTING VEGETATION
PROPOSED IMPROVEMENTS
PROPOSED LOT LINE
PUBLIC RIGHT-OF-WAY CENTERLINE
LIMIT OF WORK LINE
CURB AND GUTTER
AC PAVEMENT
P.C.C. PAVEMENT
RESIDENTIAL DRIVEWAY (WIDTH VARIES)
PROPOSED CONTOURS
PROPOSED SPOT ELEVATION
RETAINING WALL
TYPE "B" BROW DITCH
LOT DRAINAGE FLOW LINE
BIORETENTION BASIN
STORM DRAIN HEADWALL
18" HDPE STORM DRAIN
STORM DRAIN CLEANOUT
CURB INLET
CURB OUTLET
RIP RAP ENERGY DISSIPATOR PER SDD-104
4" DIA. PVC STORM DRAIN
8" SEWER MAIN (PRIVATE)
SEWER MANHOLE (PRIVATE)
SEWER CLEANOUT (PRIVATE)
SEWER LATERAL (PRIVATE)
WATER SERVICE (PRIVATE)
8" P.V.C. WATER MAIN (PRIVATE) UNLESS OTHERWISE NOTED
GATE VALVE
FIRE HYDRANT (PRIVATE)
12" DIA. ATRIUM GRATE
STREET LIGHT
ROOF DOWNSPOUT

GEOTECHNIAL LEGEND:

P-1 ● Approximate location of percolation test boring (AGS, 2016)
EX-1 ▭ Approximate location of excavator test pit (AGS 2014)

Geologic Units - Bracketed where buried

afc Artificial fill - compacted
afu Artificial Fill - undocumented
Qal Alluvium
Qoa Older Alluvium
Tst Stadium Conglomerate
Jsp Santiago Peak Volcanics
Approximate Location of Geologic Contact Dotted where buried, Queried where uncertain
5 Approximate Depth of Anticipated Removal
Surface Boulders

BENCHMARK:
STATION P472
ELEVATION: 732.17
DATUM: NAVD 88
PER CITY OF SAN DIEGO VERTICAL CONTROL BENCHBOOK

PLATE 1
Geologic Map and Exploration Location Plan

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

Project:	Report:	Date:
P/W 1411-02	1411-02-B-6	May 2016

PREPARED BY:

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REGISTERED PROFESSIONAL ENGINEER WILLIAM GREGG MACK No. 73620 Exp. 12/31/16 CIVIL STATE OF CALIFORNIA

WILLIAM GREGG MACK R.C.E. 73620 — DATE
EXPIRATION: 12/31/2016

PROJECT NAME: DEL CERRO RESIDENTIAL TENTATIVE MAP AND SITE DEVELOPMENT PERMIT
PROJECT ADDRESS: NORTHEAST CORNER OF COLLEGE AVENUE & INTERSTATE 8, SAN DIEGO, CALIFORNIA 92120
PROJECT TRACKING SYSTEM NUMBER: 435483
INTERNAL ORDER NUMBER: PENDING
SHEET TITLE: PRELIMINARY GRADING PLAN
SHEET NUMBER: C 2.0 OF 23

DRAWN BY: J. VAN RYN
CHECKED BY: W. MACK

ORIGINAL DATE: 07-20-2015
REVISION 1: 11-12-2015
REVISION 2: 03-24-2016
REVISION 3:
REVISION 4:
REVISION 5:
REVISION 6:
REVISION 7:

APPENDIX A

STORM WATER STANDARDS BMP DESIGN MANUAL – WORKSHEET FORM C-4.1

SUPPORT DOCUMENTS AND FIELD DATA

Categorization of Infiltration Feasibility Condition	Worksheet C.4-1

Part 1 - Full Infiltration Feasibility Screening Criteria
Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	☐	☒

Provide basis:
See Attached Response.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	☐	☐

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Basis for Criteria No. 1:

To evaluate feasibility for infiltration of the proposed onsite water quality basins and to provide preliminary design infiltration rates, four (4) borehole percolation tests were performed in general conformance with Appendix D, Section D.3.3.2 of the recently adopted BMP Design Manual. To provide representative continuous soil/geologic logs for the percolation test holes, the percolation test borings were continuously logged during excavation and were located in proximity to trackhoe excavations that were previously logged as part of our preliminary geotechnical investigation for the site (AGS, 2015). Locations of the percolation test holes and exploratory trenches are shown on Plate 1, included herewith.

The percolation boreholes (P-1 through P-4) were excavated to drilling refusal with a 12-inch diameter flight auger connected to a Case 580 rubber tire backhoe and extended to depths ranging between 32" to 74" below ground surface. These borings extended approximately 2 to 2.5 feet into bedrock. Boreholes P-1 and P-2 extended through undocumented artificial fill to Stadium Conglomerate, and Boreholes P-3 and P-4 extended through undocumented fill to Santiago Peak Volcanics. The Stadium Conglomerate can generally be described as a slightly moist, hard, cobble conglomerate with rounded cobbles up to 10 inches in diameter in a yellowish brown silty sand matrix. The Santiago Peak Volcanics can generally be described as metavolcaniclastic bedrock that is moderately weathered, well jointed, and moderately hard to hard.

The resulting test holes were cleaned of loose debris then successively filled with several gallons of clean, potable water and allowed to pre-soak overnight. The following day the test holes were cleaned of sediment and the bottom was lined with approximately 2-inches of washed gravel prior to percolation testing. A series of falling head percolation tests were performed. The test holes were filled with clean, potable water to approximately 26 to 28 inches above infiltration surface and allowed to infiltrate. The water level was allowed to drop for a 30-minute period, the water level was then measured and the drop rate calculated in inches per hour. The test hole was then refilled with water as necessary and the test procedure was repeated over the course of 6 hours until a stabilized percolation rate was recorded. The stabilized percolation rate was then converted to an infiltration rate based on the "Porchet Method" utilizing the following equation:

$$I_t = \frac{\Delta H\, \pi r^2 60}{\Delta t(\pi r^2 + 2\pi r H_{avg})} = \frac{\Delta H\, 60\, r}{\Delta t(r + 2H_{avg})}$$

Where:

I_t = tested infiltration rate, inches/hour
ΔH = change in head over the time interval, inches
Δt = time interval, minutes
r = effective radius of test hole
H_{avg} = average head over the time interval, inches

Logs of the field testing and graphical representations of the test data presented as infiltration versus time interval are included herewith. The results of our testing are summarized in Table 1 below.

TABLE 1
SUMMARY OF INFILTRATION/PERCOLATION TEST RESULTS

Test Hole No.	Depth of Test Hole	Approximate Test Elevation	Geologic Unit	Description	Tested Infiltration Rate (inches/hour)
P-1	74" (6'-2")	428 msl	Tst	Cobble Conglomerate in Silty Sand Matrix	0.10
P-2	32" (2'-8")	412 msl	Tst	Cobble Conglomerate in Silty Sand Matrix	0.10
P-3	47" (3'-11")	384 msl	Jsp	Metavolcanic Bedrock	0.35
P-4	65" (5'-5")	394 msl	Jsp	Metavolcanic Bedrock	0.39

In accordance with Appendix D, Section D.5. of the BMP Design Manual, a 'Factor of Safety' should be applied to the tested infiltration rates to determine the design infiltration rates. The factor of safety is determined by Worksheet D.5-1 and possesses a numerical value between 2 and 9. For the proposed project site, the factor of safety worksheet yielded a Combined Factor of Safety (S_{total}) of 3.5. However, for the purposes of feasibility screening, it is recommended that a Factor of Safety of 2.0 be utilized. Table 2 below summarizes the design infiltration rates for the subject test holes utilizing a factor of safety of 2.0.

TABLE 2
SUMMARY OF DESIGN INFILTRATION RATES

Test Hole No.	Tested Infiltration Rate (in./hr.)	Factor of Safety	Design Infiltration Rate (in./hr.)
P-1	0.10	2.0	**0.05**
P-2	0.10	2.0	**0.05**
P-3	0.35	2.0	**0.17**
P-4	0.39	2.0	**0.19**

Based on the results of our preliminary infiltration testing, the onsite soils possess design infiltration rates ranging between 0.05 and 0.19 inches/hour, with an average infiltration rate of less than 0.12 inches/hour. The design infiltration rates for the project site are significantly below 0.50 inches/hour and full infiltration at the project is not feasible.

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	**0.5**
		Predominant soil texture	0.25	2	**0.5**
		Site soil variability	0.25	2	**0.5**
		Depth to groundwater / impervious layer	0.25	1	**0.25**
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			**1.75**
B	Design	Level of pretreatment/ expected sediment loads	0.5	2	**1**
		Redundancy/resiliency	0.25	2	**0.5**
		Compaction during construction	0.25	2	**0.5**
		Design Safety Factor, $S_B = \Sigma p$			**2**
Combined Safety Factor, $S_{total}=S_A$ x S_B					**3.5**
Observed Infiltration Rate, in/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					

Supporting Data

Briefly Describe infiltration test and provide reference to test forms:

Site specific field testing was performed using borehole percolation tests and accompanying continuous soil/bedrock log. The percolation data was converted to infiltration rates utilizing the Porchet method. A more detailed discussion of the field testing and associated calculations are presented in the geotechnical addendum and attached Form C.4-1 worksheet. Percolation test logs and soil/bedrock logs are presented in Appendix A, included herewith. The Combined Safety Factor, S_{total}, as calculated in Worksheet D.5-1 yielded a Combined Factor of Safety of 3.5. However, we have defaulted to a the recommended maximum factor of safety of 2.0 for infiltration feasibility screening.

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☐	☐
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☐	☐
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1-4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

**To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City Engineer to substantiate findings*

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria
Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	☐	☒

Provide basis:
Preliminary design infiltration rates in the Stadium Conglomerate were determined to be 0.05 inches per hour. Infiltration in any appreciable rate or volume in this geologic unit is not anticipated.

Preliminary rates in the Santiago Peak Volcanics were determined to be 0.17 to 0.19 in/hr. However, based on our observations and experience with this bedrock unit, the bedrock itself is virtually impermeable. It is our opinion that during our testing, water was infiltrating along fractures in the bedrock. The bedrock becomes very hard and joint/fracture spacing typically widens at depth which will significantly lower infiltration where remedial grading or design cuts are performed. In addition, weathering along joint/fracture faces leads to clay development and fine sediment (silts and clay) may collect in fracture spaces over time significantly reducing flow through fractures. Infiltration in any appreciable rate or volume in the Santiago Peak Volcanics is not anticipated.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low

6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	☐	☒

Provide basis:

It is our opinion that infiltration in any appreciable quantity cannot be allowed without increasing the risk of geotechnical hazards. Specifically, the basins are proposed to be located superjacent to retaining walls and slopes steeper than 25%, with single family residences and associated utilities and improvements constructed in the vicinity.

Over the design life of the slopes, retaining walls, residential structures, and improvements, it is our opinion that the risk of geotechnical hazards cannot be mitigated to an acceptable level. Potential hazards include: slope instability, daylight seepage on slope faces, buildup of hydrostatic pressure behind retaining walls, settlement of nearby structures, and water intrusion in utility trenches.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☐	☐
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☐	☐
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 5-8 are "Yes", then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is "No", then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.		

**To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City Engineer to substantiate findings*

PERCOLATION TEST DATA SHEET

Project: Del Cerro | Project No.: 1411-02 | Date: 5/17/2016

Test Hole No.: P-1 | Tested By: PWM/FE | Water Temp.: 60°

Depth of Test Hole: 74 | USCS: Geo Unit: Tst | Air Temp.: 63°

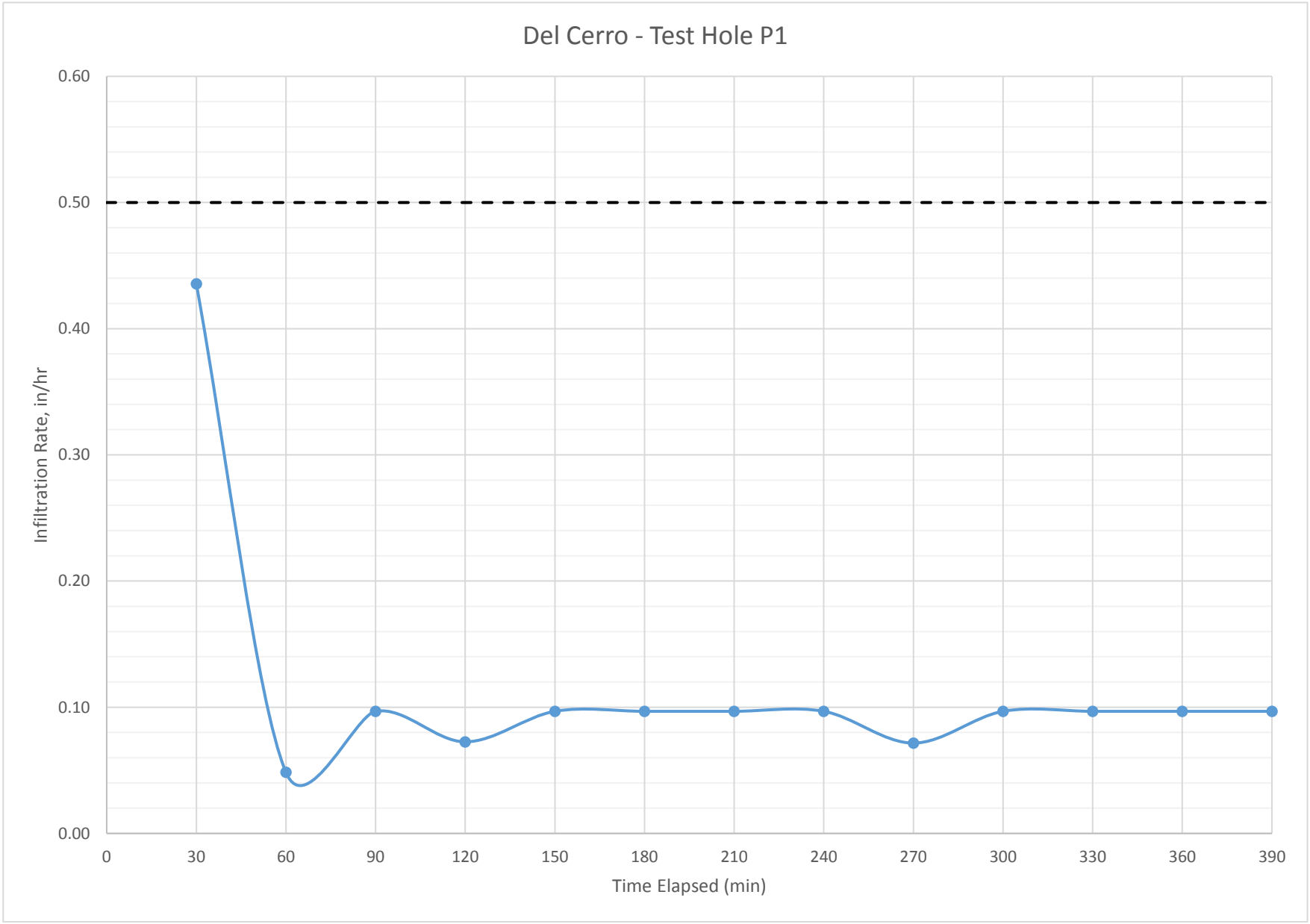
Test Hole Dimensions (Inches)

Length 74 | Width | Diameter 12 | Avg. Water Column 28

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches)			Perc Rate (in./hr.)	Infiltration Rate* (in./hr.)	Notes
				Start Depth	End Depth	Depth Change			
1	6:57	7:27	30	50.00	52.25	2.25	4.50	0.44	
2	7:27	7:57	30	52.25	52.50	0.25	0.50	0.05	
3	7:57	8:27	30	52.50	53.00	0.50	1.00	0.10	
4	8:27	8:57	30	53.00	53.38	0.38	0.75	0.07	
5	8:58	9:28	30	50.50	51.00	0.50	1.00	0.10	
6	9:28	9:58	30	51.00	51.50	0.50	1.00	0.10	
7	9:58	10:28	30	51.50	52.00	0.50	1.00	0.10	
8	10:29	10:59	30	51.13	51.63	0.50	1.00	0.10	
9	11:00	11:30	30	51.63	52.00	0.37	0.74	0.07	
10	11:30	12:00	30	52.00	52.50	0.50	1.00	0.10	
11	12:01	12:31	30	50.75	51.25	0.50	1.00	0.10	
12	12:32	13:02	30	50.50	51.00	0.50	1.00	0.10	
13	13:03	13:33	30	51.00	51.50	0.50	1.00	0.10	
14									
15									

*Calculated via Porchet Method


Del Cerro - Test Hole P1
Infiltration Rate, in/hr
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0
30
60
90
120
150
180
210
240
270
300
330
360
390
Time Elapsed (min)

PERCOLATION TEST DATA SHEET

Project: Del Cerro | Project No.: 1411-02 | Date: 5/17/2016

Test Hole No.: P-2 | Tested By: PWM/FE | Water Temp.: 60°

Depth of Test Hole: 32 | USCS: Geo Unit: Tst | Air Temp.: 63°

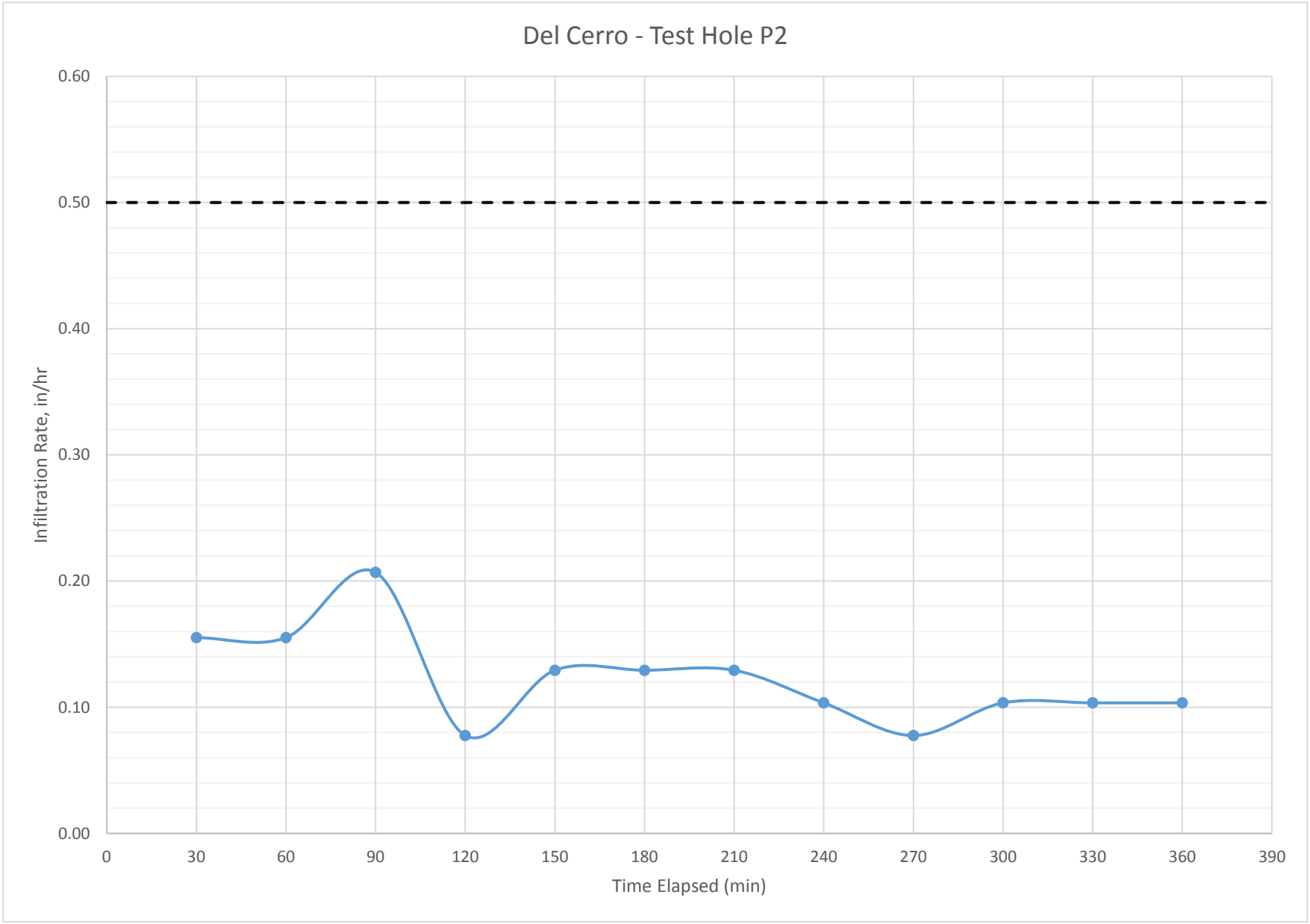
Test Hole Dimensions (Inches)

Length 32 | Width | Diameter 12 | Avg. Water Column 26

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches)			Perc Rate (in./hr.)	Infiltration Rate* (in./hr.)	Notes
				Start Depth	End Depth	Depth Change			
1	7:02	7:32	30	37.00	37.75	0.75	1.50	0.16	
2	7:33	8:03	30	34.00	34.75	0.75	1.50	0.16	
3	8:03	8:33	30	34.75	35.75	1.00	2.00	0.21	
4	8:33	9:03	30	35.75	36.13	0.38	0.75	0.08	
5	9:03	9:33	30	36.13	36.75	0.63	1.25	0.13	
6	9:33	10:03	30	36.75	37.38	0.63	1.25	0.13	
7	10:04	10:34	30	35.25	35.88	0.63	1.25	0.13	
8	10:34	11:04	30	35.88	36.38	0.50	1.00	0.10	
9	11:05	11:35	30	35.50	35.88	0.38	0.75	0.08	
10	11:35	12:05	30	35.88	36.38	0.50	1.00	0.10	
11	12:06	12:36	30	35.50	36.00	0.50	1.00	0.10	
12	12:37	13:07	30	35.00	35.50	0.50	1.00	0.10	
13									
14									
15									

*Calculated via Porchet Method


Del Cerro - Test Hole P2
Infiltration Rate, in/hr
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0
30
60
90
120
150
180
210
240
270
300
330
360
390
Time Elapsed (min)

PERCOLATION TEST DATA SHEET

Project: Del Cerro | Project No.: 1411-02 | Date: 5/17/2016

Test Hole No.: P-3 | Tested By: PWM/FE | Water Temp.: 60°

Depth of Test Hole: 47 | USCS: Geo Unit: Jsp | Air Temp.: 63°

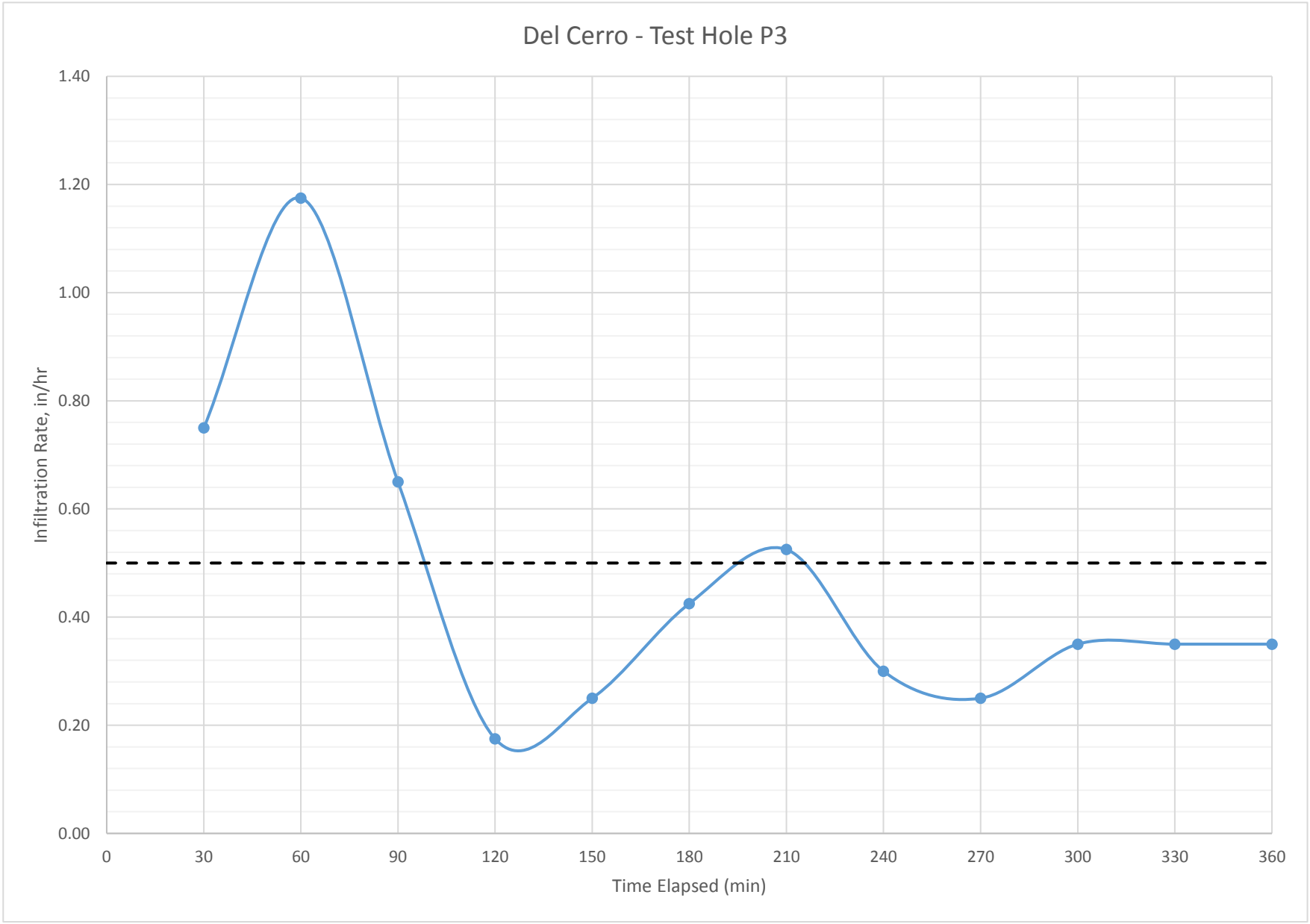
Test Hole Dimensions (Inches)

Length 47 | Width | Diameter 12 | Avg. Water Column 27

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches)			Perc Rate (in./hr.)	Infiltration Rate* (in./hr.)	Notes
				Start Depth	End Depth	Depth Change			
1	7:06	7:36	30	30.25	34.00	3.75	7.50	0.75	
2	7:37	8:07	30	27.00	32.88	5.88	11.75	1.18	
3	8:08	8:38	30	31.00	34.25	3.25	6.50	0.65	
4	8:38	9:08	30	34.25	35.13	0.88	1.75	0.18	
5	9:08	9:38	30	35.13	36.38	1.25	2.50	0.25	
6	9:39	10:09	30	32.63	34.75	2.13	4.25	0.43	
7	10:10	10:40	30	31.25	33.88	2.63	5.25	0.53	
8	10:41	11:11	30	32.75	34.25	1.50	3.00	0.30	
9	11:11	11:41	30	34.75	36.00	1.25	2.50	0.25	
10	11:41	12:11	30	33.00	34.75	1.75	3.50	0.35	
11	12:12	12:42	30	33.13	34.88	1.75	3.50	0.35	
12	12:43	13:13	30	32.25	34.00	1.75	3.50	0.35	
13									
14									
15									

*Calculated via Porchet Method


Del Cerro - Test Hole P3
Infiltration Rate, in/hr
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0
30
60
90
120
150
180
210
240
270
300
330
360
Time Elapsed (min)

PERCOLATION TEST DATA SHEET

Project: Del Cerro | Project No.: 1411-02 | Date: 5/17/2016

Test Hole No.: P-4 | Tested By: PWM/FE | Water Temp.: 60°

Depth of Test Hole: 65 | USCS: Geo Unit: Jsp | Air Temp.: 63°

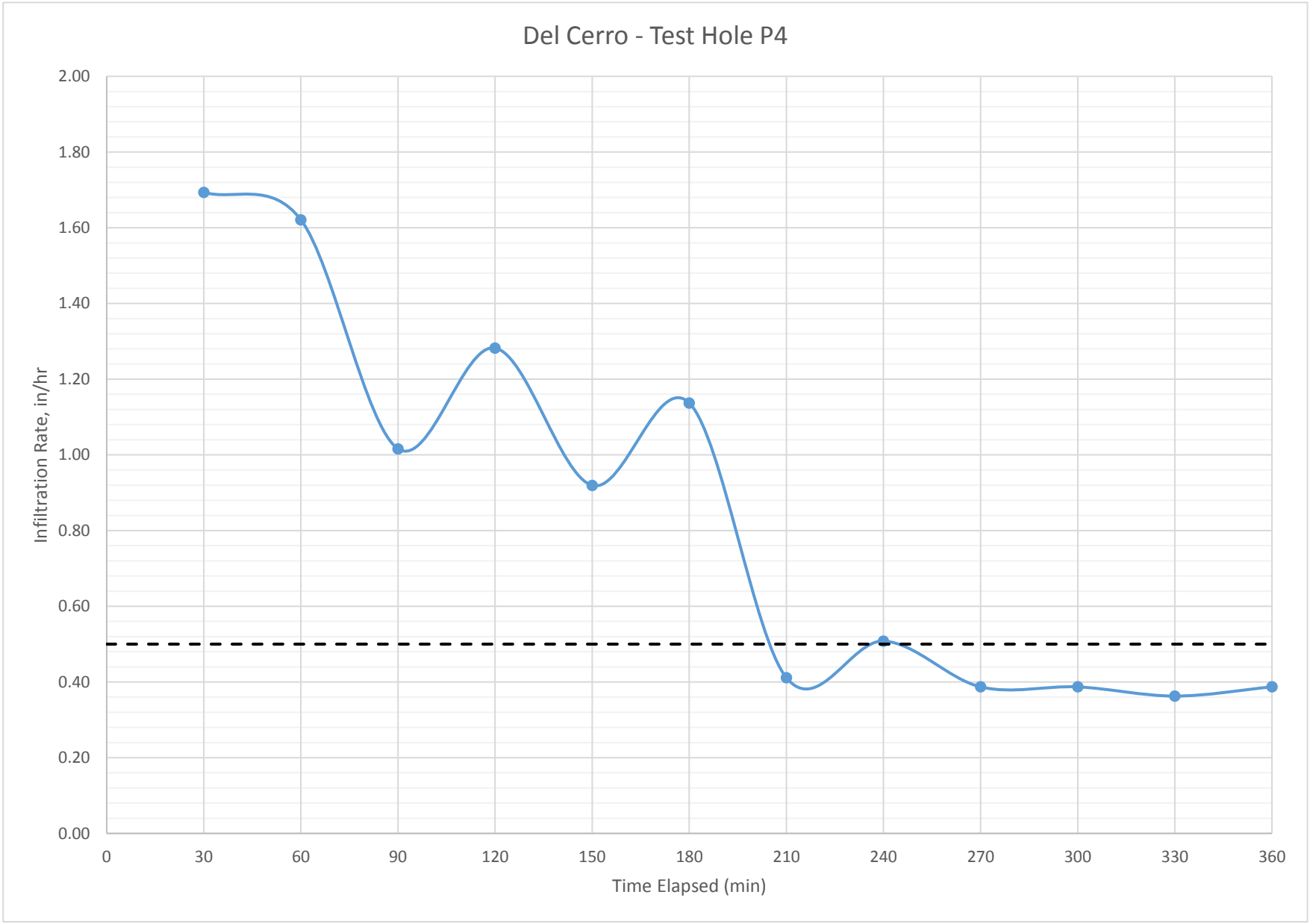
Test Hole Dimensions (Inches)

Length 65 | Width | Diameter 12 | Avg. Water Column 28

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches)			Perc Rate (in./hr.)	Infiltration Rate* (in./hr.)	Notes
				Start Depth	End Depth	Depth Change			
1	7:12	7:42	30	52.50	61.25	8.75	17.50	1.69	
2	7:43	8:13	30	52.25	60.63	8.38	16.75	1.62	
3	8:14	8:44	30	55.63	60.88	5.25	10.50	1.02	
4	8:45	9:15	30	55.00	61.63	6.63	13.25	1.28	
5	9:16	9:46	30	58.38	63.13	4.75	9.50	0.92	
6	9:47	10:17	30	56.50	62.38	5.88	11.75	1.14	
7	10:19	10:49	30	59.13	61.25	2.13	4.25	0.41	
8	10:49	11:19	30	63.25	65.88	2.63	5.25	0.51	
9	11:20	11:50	30	62.25	64.25	2.00	4.00	0.39	
10	11:51	12:21	30	60.63	62.63	2.00	4.00	0.39	
11	12:21	12:51	30	59.13	61.00	1.88	3.75	0.36	
12	12:51	13:21	30	61.00	63.00	2.00	4.00	0.39	
13									
14									
15									

*Calculated via Porchet Method


Del Cerro - Test Hole P4
Infiltration Rate, in/hr
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0
30
60
90
120
150
180
210
240
270
300
330
360
Time Elapsed (min)

Project Del Cerro Res. Development
Date Excavated May 17, 2016
Logged by PWM
Equipment Case 580 Backhoe with 12in. Auger

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
P-1	0.0 – 5.0	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND, fine to coarse grained, brown to reddish brown, dry to slightly moist, loose; abundant rounded gravel and cobbles to 8-in. diameter.
	5.0 – 6.17		**Stadium Conglomerate (Tst):** COBBLE CONGLOMERATE, rounded cobbles to 10-in. diameter in a SILTY SAND matrix, yellowish brown, slightly moist, hard.
			TOTAL DEPTH 6.17 FT. (REFUSAL) NO GROUNDWATER, NO CAVING.
P-2	0.0 – 0.5	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND, light brown, dry, loose; with some rounded gravel and cobbles to 4-in. diameter.
	0.5 – 2.67		**Stadium Conglomerate (Tst):** COBBLE CONGLOMERATE, rounded cobbles to 6-in. diameter in a SILTY SAND matrix, yellowish brown, slightly moist, hard.
			TOTAL DEPTH 2.67 FT. (REFUSAL) NO GROUNDWATER, NO CAVING.
P-3	0.0 – 1.67	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND, fine to medium grained, light brown, dry, loose; with some rounded gravel and cobbles to 6-in. diameter.
	1.67 – 3.92		**Santiago Peak Volcanics (Jsp):** METAVOLCANIC BEDROCK, light gray to gray on fresh surfaces, moderately weathered, moderately hard to hard, well jointed.
			TOTAL DEPTH 3.92 FT. (REFUSAL) NO GROUNDWATER, NO CAVING.

Test Pit No.	Depth (ft.)	USCS	Description
P-4	0.0 – 3.0	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND, fine to coarse grained, light brown, dry, loose; with some rounded gravel and cobbles to 6-in. diameter.
	3.0 – 5.542		**Santiago Peak Volcanics (Jsp):** METAVOLCANIC BEDROCK, light gray to gray on fresh surfaces, moderately weathered, moderately hard to hard, well jointed.
			TOTAL DEPTH 5.42 FT. (REFUSAL) NO GROUNDWATER, NO CAVING.

ADVANCED GEOTECHNICAL SOLUTIONS, INC.
485 Corporate Drive, Suite B
Escondido, California 92029
Telephone: (619) 867-0487

ColRich
444 West Beech Street, Suite 300
San Diego, California 92101

December 21, 2016
P/W 1411-02
Report No. 1411-02-B-7

Attention: **Mr. Jason Shepard**

Subject: **Geotechnical Addendum, Response to Cycle 13 Review Comments, LDR-Geology, Del Cerro Residential Development, College Avenue and Interstate 8, City of San Diego, California**

References: see Appendix A

Gentlemen:

In accordance with your request, Advanced Geotechnical Solutions, Inc. (AGS) has prepared this response to LDR-Geology Cycle Review comments from the City of San Diego regarding the proposed single-family residential development in the City of San Diego, California. In preparing this response to cycle review comments we have first presented the review comment followed by our response. Specifically, AGS has prepared responses to Item 5 from Cycle 3 and Items 13 through 17 from Cycle 13 LDR-Geology comments.

- ***Item 5 (Cycle 3)*** ***-City of San Diego-*** *The geotechnical consultant must indicate if the site is suitable for the proposed development as designed or provide recommendations to mitigate the geologic hazards to an acceptable level.*

  AGS response – As discussed in our referenced geotechnical report (AGS, 2015) and subsequent addenda reports, development of the subject site as proposed is considered feasible, from a geotechnical standpoint, provided that the conclusions and recommendations presented the reference geotechnical documents are incorporated into the design and construction of the project.

- ***Item 13 (Cycle 13)*** ***-City of San Diego-*** *The previous review comments that have not been cleared remain applicable.*

  AGS response – Noted. A response to the one outstanding comment (Item 5) is provided above.

- ***Item 14 (Cycle 13)*** ***-City of San Diego-*** *Submit an addendum geotechnical report or update letter and an updated C.4-1 Worksheet that specifically addresses the following comments:*

  AGS response – This geotechnical addendum report and updated C.4-1 Worksheet, included herewith, serve to address this comment.

- ***Item 15 (Cycle 13)*** ***-City of San Diego-*** *The project's geotechnical consultant must provide summarized responses for the Criteria on Worksheet C.4-1.*

  AGS response – Worksheet C.4-1 has been updated to include a brief summary for each Criteria. The detailed discussion previously provided for Criterion 1 has been modified to a brief summary with reference to our Geotechnical Addendum – Infiltration Testing for Proposed Storm Water BMP Basins, Proposed Del Cerro Single Family Residential Development (Report No. 1411-02-B-6 dated May 31, 2016). The updated Worksheet C.4-1 is included herewith in Appendix A.

- ***Item 16 (Cycle 13)*** ***-City of San Diego-*** *The project's geotechnical consultant has indicated No in their response to Criterion 5; however, a review of the percolation test data indicate results which are considered partial infiltration.*

  AGS response – It is recommended that a preliminary design infiltration rate of **0.18 inches/hour** be utilized. The response to Criteria 5 has been modified to 'Yes.' The updated Worksheet C.4-1 is included herewith in Appendix A.

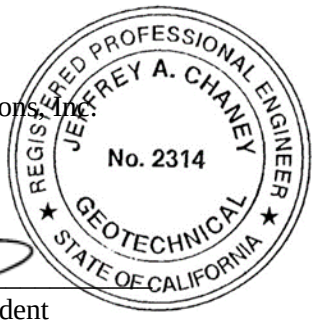
- ***Item 17 (Cycle 13)*** ***-City of San Diego-*** *The project's geotechnical consultant must address the specific geologic or geotechnical hazard associated with any amount of storm water infiltration that cannot be mitigated to an acceptable level for each proposed storm water BMP. The analyses and supporting documentation should be submitted for review. Note that a geotechnical condition created by the proposed grading may not be considered a valid geotechnical hazard.*

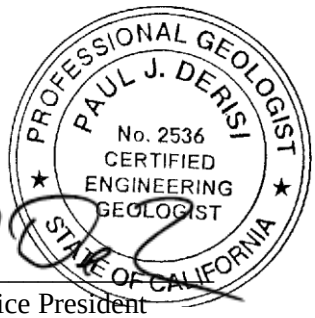
  AGS response – It is our opinion that infiltration in any appreciable quantity will increase the risk of geotechnical hazards. Specifically, the basins are proposed to be located superjacent to retaining walls and slopes steeper than 25 percent, with single family residences and associated utilities and improvements constructed in the vicinity. In addition, the two proposed BMP basins are located in areas of deep undocumented fill soils. These fill soils are compressible and prone to hydro-consolidation in their current condition. As such, remedial grading will be required in these areas to support the proposed settlement sensitive improvements and addition fills. At the conclusion project grading, the two proposed BMP basins will be underlain by artificial fill soils on the order of 20 to 30 feet thick.

  Based on this review comment and conversations with City staff, geotechnical hazards created by the proposed development cannot be considered when evaluating the feasibility of utilizing infiltration type BMPs. As such, mitigation of potential geotechnical hazards to an acceptable level of risk will be necessary. The fill soils placed beneath the basins will need to be select permeable soils to allow for transmission to the underlying bedrock/infiltration surface. Onsite soils are not anticipated to be suitable as select fill in these areas. Select soils will likely need to be imported to achieve a suitable 'conduit' to the underlying infiltration surface. In addition, the sides of the basin will need to be lined with an impermeable membrane minimally extending from the top of the ponding area down to the select fill/bedrock contact (infiltration surface).

Advanced Geotechnical Solutions, Inc. appreciates the opportunity to provide you with geotechnical consulting services and professional opinions. If you have any questions, please contact the undersigned at (619) 867-0487.

Respectfully Submitted,
Advanced Geotechnical Solutions, Inc.





JEFFREY A. CHANEY, President
RCE 46544 / RGE 2314, Reg. Exp. 6-30-17

PAUL J. DERISI, Vice President
CEG 2536, Reg. Exp. 5-31-17

Distribution: (3) Addressee
Attachments: Worksheet C.4-1
Appendix A- References

Categorization of Infiltration Feasibility Condition	Worksheet C.4-1

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	☐	☒

Provide basis:

Four (4) borehole percolation tests were performed onsite to evaluate infiltration feasibility. Testing was performed in general conformance with Appendix D, Section D.3.3.2 of the BMP Design Manual. The stabilized percolation rates were then converted to infiltration rates based on the "Porchet Method". The tested infiltration rates ranged between 0.10 and 0.39 inches/hour. Using a factor of safety of 2 for feasibility screening purposes yielded preliminary design infiltration rates of 0.05 and 0.19 inches/hour, which are less than 0.5 inches/hour. A more detailed discussion of the testing and findings are presented in our Geotechnical Addendum, Infiltration Testing for Proposed Storm Water BMP Basins, Proposed Del Cerro Single-Family Residential Development, City of San Diego, California, Report No. 1411-02-B-6, dated May 31, 2016.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	☐	☒

Provide basis:

Tested infiltration rates at the project site are less than 0.5 inches/hour. Infiltration at a rate greater than 0.5 inches/hour is not feasible for this project. As such, this screening question does not control the feasibility of infiltration at the project site and is not applicable.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☐	☒
Provide basis: Tested infiltration rates at the project site are less than 0.5 inches/hour. Infiltration at a rate greater than 0.5 inches/hour is not feasible for this project. As such, this screening question does not control the feasibility of infiltration at the project site and is not applicable. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☐	☒
Provide basis: The average tested infiltration rates at the project site is less than 0.5 inches/hour. Infiltration at a rate greater than 0.5 inches/hour is not feasible for this project. As such, this screening question does not control the feasibility of infiltration at the project site. Per Section C.4.4 of the BMP Design Manual, final determination should be made by the project design engineer. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1-4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

**To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City Engineer to substantiate findings*

Worksheet C.4-1 Page 3 of 4			
Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	☒	☐
Provide basis: Preliminary design infiltration rates utilizing a Factor of Safety of 2.0 were determined to be 0.05 inches per hour in the Stadium Conglomerate and 0.17 to 0.19 inches per hour in the Santiago Peak Volcanics. Based on review of the project development plans, both proposed BMP basins are located in areas underlain by Santiago Peak Volcanics at depth. An average preliminary design infiltration rate of 0.18 inches per hour can be used for preliminary design purposes. It should be noted that the bedrock itself is virtually impermeable and that 'infiltration' occurred as water flowing along/through fractures in the bedrock rather than infiltrating vertically through the bedrock. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	☒	☐
Provide basis: It is our opinion that infiltration in any appreciable quantity will increase the risk of geotechnical hazards. Specifically, the basins are proposed to be located superjacent to retaining walls and slopes steeper than 25%, with single family residences and associated utilities and improvements constructed in the vicinity. Based on review comments and conversations with City staff, geotechnical hazards created by the proposed development cannot be considered when evaluating the feasibility of utilizing infiltration type BMPs. As such, mitigation of potential geotechnical hazards to an acceptable level of risk will be necessary. The two proposed BMP basins are located in areas that will be underlain by artificial fill on the order of 20 to 30 feet thick. The fill soils placed beneath the basins will need to be select permeable soils to allow for transmission to the underlying bedrock/infiltration surface. Onsite soils are not anticipated to be suitable as select fill in these areas. Select soils will likely need to be imported to achieve a suitable 'conduit' to the underlying infiltration surface. In addition, the sides of the basin will need to be lined with an impermeable membrane minimally extending from the top of the ponding area down to the select fill/bedrock contact (infiltration surface). Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☒	☐
Provide basis: It is our opinion that partial infiltration can be allowed without posing significant risk for groundwater related concerns. Based on our review of the State Water Resources Control Board – GeoTracker website, the subject site is located southerly adjacent to a previously contaminated site (6301 Del Cerro Blvd.). The cleanup status is 'Completed – Case Closed as of 1/29/1993'. In addition, the proposed BMP basins are located in excess of 1,000 feet away and approximately 70 vertical feet below the previously contaminated site. As such, it is not anticipated that infiltration in the proposed BMP basins will have no effect on the dispersion or distribution of known contaminants. Based on the proposed design grades, the project site will have adequate separation (10 feet) to seasonal high groundwater. There are no known water supply wells within 100 feet of the project site. Land use in the project vicinity is predominantly residential with locally interspersed commercial/retail. Proposed land use at the project site is single-family residential. There are no known contamination risks from current land use activities. As such, we do not anticipate that construction of infiltrations BMPs will adversely impact receiving channels in the project vicinity. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	☒	☐
Provide basis: The project site is graded and is located in a developed neighborhood with impermeable surfaces where surface waters are controlled and directed to storm drain inlets. There is no apparent evidence that construction of BMP basins would divert or otherwise preclude flow to downstream water bodies. As such, we do not anticipate that construction of the proposed BMP basins will violate downstream water rights. Per Section C.4.4 of the BMP Design Manual, final determination should be made by the project design engineer. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 5-8 are "Yes", then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is "No", then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.		

**To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City Engineer to substantiate findings*

REFERENCES

Advanced Geotechnical Solutions, Inc., 2016(b), Geotechnical Addendum, Infiltration Testing for Proposed Storm Water BMP Basins, Proposed Del Cerro Single-Family Residential Development, City of San Diego, California, Report No. 1411-02-B-6, dated May 31, 2016.

Advanced Geotechnical Solutions, Inc., 2016(a), Preliminary Geotechnical Investigation, Del Cerro Residential Development, College Avenue and Interstate 8, San Diego, California, Report No. 1411-02-B-4, dated July 20, 2015.

Advanced Geotechnical Solutions, Inc., 2015, Geotechnical Addendum, Response to Cycle Review Comments, LDR-Geology, Regarding Preliminary Geotechnical Investigatio, Del Cerro Residential Development, College Avenue and Interstate 8, San Diego, California, Report No. 1411-02-B-5, dated March 14, 2016.

American Society for Testing and Materials (2008), Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, Soil and Rock (I), ASTM International, West Conshohocken, Pennsylvania.

American Society of Civil Engineers, 2013, Minimum Design Loads for Buildings and Other Structures (7-10, third printing).

California Building Standards Commission, 2013, California Building Code, Title 24, Part 2, Volumes 1 and 2.

City of San Diego, 2008, Seismic Safety Study – Geologic Hazards and Faults, Grid Tile 22, Scale 1"=800', dated April 3, 2008.

FEMA, Flood Insurance Rate Maps, San Diego County, California, Maps 06073C1637H, 06073C1641G, and 06073C1639H, dated May 16, 2012, Scale 1"=500'.

Historic Aerial Photography. www.Historicaerials.com. Photos from 1953, 1964, 1966, 1968, 1980, 1989, 1994, 1995, 1996, 2002, 2003, and 2005.

Jennings, C.W., 1994, Fault Activity Map of California and Adjacent Areas: California Geological Survey, California Geologic Data Map No. 6, Scale 1:750,000.

Kennedy, M.P., and Tan, S.S., 2008, Geologic Map of the San Diego 30' x 60' Quadrangle, California Regional Geologic Map Series, Scale 1:100,000, Map No. 3, Sheet 1 of 2.

Pasco, Laret, Suiter, & Associates, 2016, Preliminary Grading Plan, Sheet C2.0 of 23, Northeast Corner of College Avenue and Interstate 8, 40-Scale, date October 26, 2016.

Tan, S.S., 1995, Landslide Hazards in the Southern Part of the San Diego Metropolitan Area, San Diego County, California, Landslide Hazard Identification Map No. 33, Plate 33A, Division of Mines and Geology, Open File Report 95-03.

United States Geological Survey, U.S. Seismic Design Maps, World Wide Web, http://earthquake.usgs.gov/hazards/designmaps/.

ADVANCED GEOTECHNICAL SOLUTIONS, INC.
9707 Waples Street, Suite 150
San Diego, California 92121
Telephone: (619) 867-0487 Fax: (714) 409-3287

ColRich
444 West Beech Street, Suite 300
San Diego, California 92101

February 8, 2017
P/W 1411-02
Report No. 1411-02-B-8

Attention: **Mr. Seth Dorros**

Subject: **Geotechnical Addendum, Response to Cycle 16 Review Comments, LDR-Geology, Del Cerro Residential Development, College Avenue and Interstate 8, San Diego, California**

References: see Appendix A

Gentlemen:

In accordance with your request, Advanced Geotechnical Solutions, Inc. (AGS) has prepared this response to LDR-Geology Cycle Review comments from the City of San Diego regarding the proposed single-family residential development in the City of San Diego, California. In preparing this response to cycle review comments we have first presented the review comment followed by our response. Specifically, AGS has prepared responses to Item 19 of LDR-Geology comments.

- ***Item 19*** ***-City of San Diego-*** *The project's geotechnical consultant has indicated that development of the site is considered feasible from a geotechnical standpoint. However, as previously requested for the purposes of environmental review, the geotechnical consultant must indicate if the site is suitable for the proposed development as designed or provide recommendations to mitigate the geologic hazards to an acceptable level.*

  AGS response – It is our opinion that the site is suitable for the proposed development as designed.

Advanced Geotechnical Solutions, Inc. appreciates the opportunity to provide you with geotechnical consulting services and professional opinions. If you have any questions, please contact the undersigned at (619) 867-0487.

Respectfully Submitted,
Advanced Geotechnical Solutions, Inc.

REGISTERED PROFESSIONAL ENGINEER
JEFFREY A. CHANEY
No. 2314
GEOTECHNICAL
STATE OF CALIFORNIA

JEFFREY A. CHANEY, President
RCE 46544 / RGE 2314, Reg. Exp. 6-30-17

PROFESSIONAL GEOLOGIST
PAUL J. DERISI
No. 2536
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PAUL J. DERISI, Vice President
CEG 2536, Reg. Exp. 5-31-17

Distribution: (3) Addressee

APPENDIX A

REFERENCES

Advanced Geotechnical Solutions, Inc., 2016(c), Geotechnical Addendum, Response to Cycle 13 Review Comments, LDR-Geology, Del Cerro Residential Development, College Avenue and Interstate 8, City of San Diego, California, Report No. 1411-02-B-7, dated December 21, 2016.

Advanced Geotechnical Solutions, Inc., 2016(b), Geotechnical Addendum, Infiltration Testing for Proposed Storm Water BMP Basins, Proposed Del Cerro Single-Family Residential Development, City of San Diego, California, Report No. 1411-02-B-6, dated May 31, 2016.

Advanced Geotechnical Solutions, Inc., 2016(a), Preliminary Geotechnical Investigation, Del Cerro Residential Development, College Avenue and Interstate 8, San Diego, California, Report No. 1411-02-B-4, dated July 20, 2015.

Advanced Geotechnical Solutions, Inc., 2015, Geotechnical Addendum, Response to Cycle Review Comments, LDR-Geology, Regarding Preliminary Geotechnical Investigation, Del Cerro Residential Development, College Avenue and Interstate 8, San Diego, California, Report No. 1411-02-B-5, dated March 14, 2016.

American Society for Testing and Materials (2008), Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, Soil and Rock (I), ASTM International, West Conshohocken, Pennsylvania.

American Society of Civil Engineers, 2013, Minimum Design Loads for Buildings and Other Structures (7-10, third printing).

California Building Standards Commission, 2013, California Building Code, Title 24, Part 2, Volumes 1 and 2.

City of San Diego, 2008, Seismic Safety Study – Geologic Hazards and Faults, Grid Tile 22, Scale 1"=800', dated April 3, 2008.

Jennings, C.W., 1994, Fault Activity Map of California and Adjacent Areas: California Geological Survey, California Geologic Data Map No. 6, Scale 1:750,000.

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Tan, S.S., 1995, Landslide Hazards in the Southern Part of the San Diego Metropolitan Area, San Diego County, California, Landslide Hazard Identification Map No. 33, Plate 33A, Division of Mines and Geology, Open File Report 95-03.

United States Geological Survey, U.S. Seismic Design Maps, World Wide Web, http://earthquake.usgs.gov/hazards/designmaps/.

Davy

& Associates, Inc.
Consultants in Acoustics

608 Twenty Third Street • Manhattan Beach, CA 90266 • Tel: 310-721-6117 • e-mail: davyassoc@aol.com

JN2015-04D

December 16, 2016

Mr. Seth Dorros
ColRich
444 West Beech Street
Suite 300
San Diego, CA 92101

SUBJECT: ACOUSTICAL ANALYSIS
Del Cerro Residential, San Diego, California

Dear Seth:

Enclosed are copies of our acoustical analysis for the Del Cerro Residential project in San Diego, California.

The results of the analysis indicate the project will comply with the requirements of the City of San Diego with all northwest facing perimeter windows and glass doors in the buildings on Lots A & B, Lots 1-9, Lot C and Lots 20-26 glazed with STC 29 glazing. Also, all southwest facing perimeter windows and glass doors in the buildings on Lots C, & D and on Lots 16-19 must be glazed with STC 29 glazing.

STC 29 glazing can be provided with a dual pane assembly with a 1/2" airspace. The glazing supplier should submit test reports documenting the STC ratings. The test reports should be prepared in an independent, accredited testing laboratory in accordance with ASTM E-90.

The analysis we have completed is intended only to satisfy the environmental requirements of the plan check agency. We assume no responsibility for details of construction or final noise levels following completion of the proposed project.

In the City's Remaining Cycle Issues, Issues 39-43 are from Cycle 11 and have been addressed in the next Cycle.

Issues 69 and 70 do not require a response.

Issue 71 has been corrected to remove the inconsistency in Paragraph 5 of the introduction.

Issue 72 does not require a response.

Issue 73 has been complied with. Two scaled maps have been included in the report as requested.

Issue 74 requests whether Figure 2 is the most current site plan. According to Will Mack of PLSA this is the current site plan.

Issues 75 and 76 request an expansion of future conditions including a discussion of the type of noise source and proximity to potentially impacted areas. This discussion is in Section 2.0 of the report including distances to Equal Noise Contours affecting the site as listed in Tables 3 and 4.

Issue 77 does not require a response.

Issue 78 is discussed on page 4 of the report.

Issue 79 has been addressed on page 7 of the report.

Issues 80 and 81 have been addressed in Section 7.0 of the report.

If you have any questions concerning the enclosed revised report, please call me. It has been a pleasure working with you on this project.

Sincerely,

DAVY & ASSOCIATES, INC.

Bruce A. Davy
President

BD/kbd

Davy

& Associates, Inc.
Consultants in Acoustics

608 Twenty Third Street • Manhattan Beach, CA 90266 • Tel: 310-721-6117 • e-mail: davyassoc@aol.com

JN2015-04D

ACOUSTICAL ANALYSIS

Del Cerro Residential Project
Project Tracking Number 435483
San Diego, California

FOR

ColRich
San Diego, California

December, 2016

1.0 Introduction

At the direction of **ColRich, Davy & Associates, Inc.** has completed an acoustical analysis of the Del Cerro Residential project in San Diego, California.

The project will consist of 24 single family homes on a 5.6 acre parcel located on the northeast corner of College Avenue and the I-8 westbound off-ramp. The PTS number is 435483.

The project site is currently undeveloped land. The property to the north is an operating Chevron gas station. There are single family houses to the southeast and single family houses to the northwest. The northwestern property line is bounded by College Avenue and the south property line is bounded by the I-8 Freeway.off-ramp.

The existing conditions in the project area with adjacent land uses, receptors and noise sources identified are shown in a scaled map Figure 1. College Avenue is the only major noise source at the site. The future conditions with the proposed project and proposed land uses, receptors and noise sources identified are shown in scaled map Figure 2.

Section 2.0 of this report contains the results of measurements and calculations of the future exterior noise environment at the site to determine compliance with these Noise Element requirements.

Section 3.0 lists recommendations for complying with the City of San Diego interior noise level requirements. Section 3.0 lists mitigation for traffic noise impacts and Section 4.0 lists recommendations for construction of the houses.

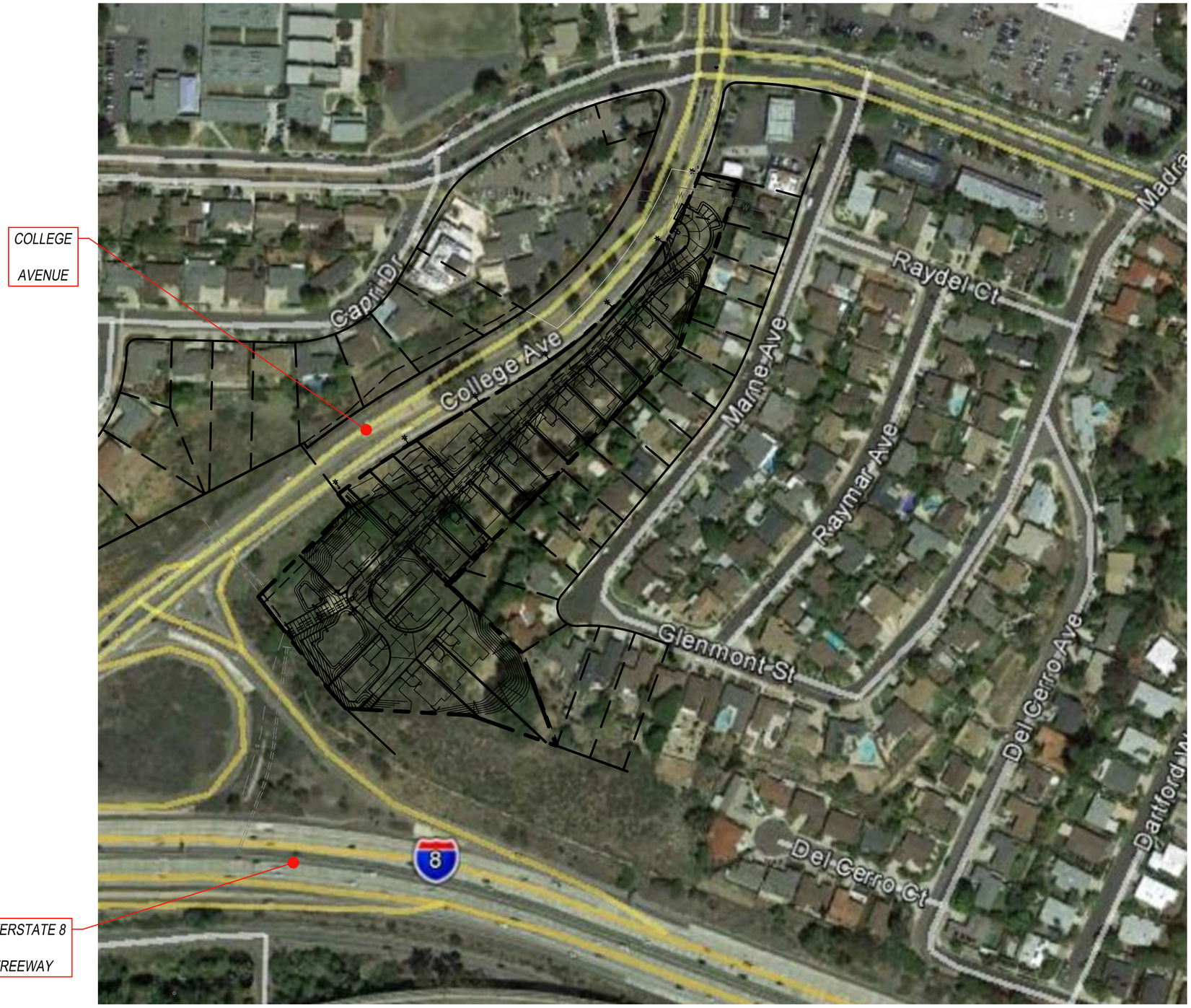
Section 5.0 of this report contains the requirements of the State Building Code concerning ventilation and Section 6.0 discusses noise in Exterior Living Spaces and Section 7.0 analyzes construction noise impacts.

Section 8.0 discusses on-site stationary noise sources and Section 9.0 is a Summary of Results which is as follows:

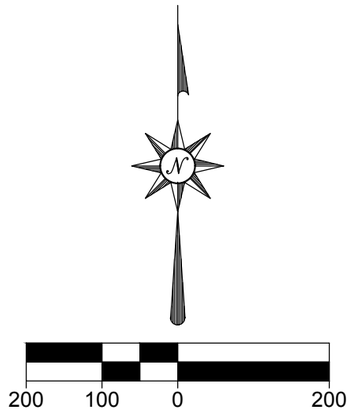
The results of this analysis show that the proposed project complies with the requirements of the San Diego General Plan and Noise Element and also with the requirements of the San Diego Municipal Code Article 9.5 Noise Abatement and Control if all southwest and northwest facing perimeter windows and glass doors in all buildings glazed with STC 29 glazing.

EXISTING CONDITION
EXHIBIT

FIGURE 1.



The only major noise sources that impact the site are traffic on College Avenue and traffic on the I-8 Freeway



FUTURE CONDITION EXHIBIT

FIGURE 2.

STC 29 glazing can be provided with a dual pane assembly with a 1/2" airspace. The glazing supplier should submit test reports documenting the STC ratings. The test reports should be prepared in an independent, accredited testing laboratory in accordance with ASTM E-90.

The City's Initial Study Checklist Questions related to Significance Thresholds include the following to determine if the project would:

1. Result in a significant increase in existing ambient noise levels.

2. Expose people to noise that exceeds the City's adopted Noise Ordinance or is incompatible with Table K-2.

3. Expose people to current or future transportation noise levels that exceed standards established in the Transportation Element of the General Plan or any adopted adjacent Comprehensive Land Use Plan.

4. Result in land uses not compatible with aircraft noise levels as defined by an adopted airport Comprehensive Land Use Plan (CLUP).

Table K-2 entitled Traffic Noise Significance Thresholds states that residential land use is compatible for and exterior usable space of CNEL 65 or less.

The project is not within the Airport Environs Overlay Zone (AEOZ) in accordance with Chapter 13, Article 2, Division 3 of the San Diego Municipal Code.

The California Supreme Court recently ruled unanimously that CEQA review should be focused on a projects impact on the environment and not the environments impact on the project. The case was California Building Industry Association v. Bay Area Air Quality Management District (CBIA v. BAAQMD, December 17, 2015, Case No. S213478). This decision will probably effect many environmental reports prepared under CEQA. The Court ruled that a new residential project was not required to mitigate for existing impacts but only to mitigate the impacts of the new project on the environment.

The ruling could effect the review of environmental reports concerning noise impacts. However, the Court also ruled that the impacts of the environment on the project should be properly addressed through planning and zoning laws and environmental laws.

A traffic study was conducted for the project by LOS Engineering, Inc. Their report dated February 3, 2016 indicated that the PM peak hour volumes on College Avenue would be 2242 vehicles under existing conditions and 2259 vehicles for existing conditions plus project. These volumes were converted to Average Daily Traffic (ADT) volumes.

An analysis of these volumes indicated that the noise level generated by increased traffic due to the project will be 0.03 dB. This noise level increase will not be noticeable by residents of the residential single family homes to the east of College Avenue or to the west of College Avenue.

2.0 Exterior and Future Acoustical Environment

Environmental noise levels were monitored at the site in San Diego, California on June 1, 2015 between the hours of 2:00 p.m. and 4:00 p.m. The location of the site is shown in Figure 3. Noise measurements were made at the northwest building line and also at the south building line.

Noise levels at the site are dominated by traffic on College Avenue to the northwest and by traffic on I-8 to the south. No other significant sources of noise were noted during the site visit.

Environmental noise levels were measured with a precision integrating LD 820 sound level meter that had been calibrated with a B&K 4230 Acoustical Calibrator immediately prior to use. The sound level meter measures and displays the equivalent noise level (LEQ), as well as the maximum and the minimum noise levels during the measurement period. A copy of the analysis of the acoustical data is attached to this report.

The data thus collected were analyzed to determine the CNEL levels at the measurement locations. The CNEL value was determined by measuring the equivalent noise level (LEQ) for the measurement hour and then calculating the equivalent noise level for each of the other 23 hours in the day based on Caltrans projections for traffic volumes on California highways .[1] This CNEL approach has been utilized extensively. The accuracy of this procedure has been established with automatic 24-hour measurements at the same location. The procedure has always been within acceptable accuracy limits. The results of the monitoring and calculations are summarized below in Table 1.

Table 1

Measured Ambient Noise Levels in dB

Location	Peak Hour LEQ	CNEL
NW Bldg Line	67.4 dB	68.4 dB
South Bldg Line	63.6	67.6

Section 3501.(c) of the State Building Code states the following:

> Worst-case noise levels either existing or future, shall be used as the basis for determining compliance with this Section. Future noise levels shall be predicted for period of at least 10 years from the time of building permit application.

CALTRANS, Division of Traffic Operations publishes an annual traffic volume book that contains previous traffic trends. The 2013 traffic volumes on the California State Highway System Book (the latest edition available) lists an average annual increase of 0.2% per year in annual traffic volumes for the years 2008 through 2013. Assuming that this annual increase of 0.2% would hold for this site, it was projected that traffic volumes would increase by a factor 0.092 by the year 2025.

This traffic volume increase over the next 10 years would result in a 0.09 dB traffic noise increase. Therefore, the projected future year noise levels are summarized in Table 2.

Table 2

Exterior 2025 CNEL Values at the Site in dB

Location	CNEL
NW Bldg Line	68.5 dB
South Bldg Line	67.7

The distance from the centerline of College Avenue to the southwest to various Equal Noise Contours were calculated based on standard engineering procedures to determine decrease of noise levels with increased distance from a noise source such as a road or freeway. These Equal Noise Contours will run parallel to the centerline of College Avenue. The results of this analysis are summarized in Table 3.

Table 3

Distances to Equal Noise Contours along College Avenue

CNEL	Distance
68 dBA	30 feet
65	50
60	105

A similar analysis was completed to determine the distances to Equal Noise Contours running parallel to the I-8 offramp. The results of this analysis are summarized in Table 4.

Table 4

Distances to Equal Noise Contours along the I-8 Offramp

CNEL	Distance
68 dBA	90 feet
65	145
60	315

With an exterior noise level of CNEL 68.5, the buildings must provide an A-weighted noise reduction value of at least 23.5 dB to achieve an interior CNEL 45 value.

With all northwest facing perimeter windows and glass doors in the buildings on Lots A & B, Lots 1-9, Lot C and Lots 20-26 and all southwest facing perimeter windows and glass doors in the buildings on Lots C, & D and on Lots 16-19 glazed with STC 29 glazing the noise reduction of the buildings will be approximately 27 dB.

STC 29 glazing can be provided with a dual pane assembly with a 1/2" airspace. The glazing supplier should submit test reports documenting the STC ratings. The test reports should be prepared in an independent, accredited testing laboratory in accordance with ASTM E-90.

Therefore, with all northwest facing perimeter windows and glass doors in the buildings on Lots A & B, Lots 1-9, Lot C and Lots 20-26 and all southwest facing perimeter windows and glass doors in the buildings on Lots C, & D and on Lots 16-19 glazed with STC 29 glazing the buildings will comply with the requirements of the California Noise Insulation Standards as contained in the City of San Diego Noise Element.

It is unlikely that there will be significant future development around the site as this project is strictly in-fill.

[1] See, for example, "Insulation of Buildings Against Highway Noise," Bruce Davy and Steven Skale, Federal Highway Administration FHWA-TS-77-202.

3.0 Traffic Noise Mitigation Measures

3.1 All northwest facing perimeter windows and glass doors in the buildings on Lots A & B, Lots 1-9, Lot C and Lots 20-26 and all southwest facing perimeter windows and glass doors in the buildings on Lots C, & D and on Lots 16-19 will be glazed with STC 29 glazing

4.0 Construction Recommendations

4.1 Roof ceiling construction will be roofing on plywood. Batt insulation will be installed in joist spaces. The ceilings will be one layer of gypboard.

4.2 All exterior walls will be 2x4 studs 16" o.c. with batt insulation in the stud spaces. Exteriors will be exterior plaster or stucco. The interiors will be gypboard.

4.3 All entrance doors should be solid core with with vinyl bulb weatherstripping seals on the sides and top.

5.0 Ventilation Requirements

The California Noise Insulation Standards (Title 24) states the following paragraph concerning ventilation:

"If interior allowable noise levels are met by requiring that windows be unopenable or closed, the design for the structure must also specify a ventilation or air-conditioning system to provide a habitable interior environment. The ventilation system must not compromise the dwelling unit or guest room noise reduction."

With windows open, typical noise reduction values will be in the 12 dB range. This means that a ventilation system must be provided for the buildings. This can normally be supplied with an FAU with a summer switch. Outside air intake must be in compliance with the Uniform Building Code.

6.0 Exterior Living Spaces

Table NE-3 Land Use-Noise Compatibility Guidelines of the City of San Diego Noise Element sets the upper limit For Conditionally Compatible Outdoor Uses at CNEL65 for Single Unit residential projects. .

As can be seen in Table 2 of this report, the maximum exterior noise level exposure for this site is CNEL 68.5. Therefore, the site is Conditionally Acceptable as defined by the San Diego Noise Element.

7.0 Construction Noise Impacts

Construction will consist of development of several buildings on the existing site. There also may be some grading and pavement work.

It is anticipated that construction equipment will include bulldozers, front-end loaders, dump trucks, scrapers, trenchers, excavators, and water trucks.

Noise measurements have been conducted on various pieces of construction equipment on other projects. This data has been maintained in our files. Noise measurements were generally made at a distance of 50 feet from the operating equipment. Other distances were required for some of the pieces of equipment, and this data was extrapolated to a 50 foot standard distance. These measured noise levels are summarized for the proposed equipment schedule as follows:

Construction Equipment	A-Weighted Noise Levels at 50 Feet
D5 Dozers	77 dBA
Front-end Loader	75
Dump Trucks	75
Scraper	76
Tractor	81
Trencher	75

Actual noise levels associated with construction of the project will vary widely during the course of construction depending on where the equipment is located and what pieces of equipment are in use at any one time.

To reduce construction noise impacts to a level of insignificance, it is recommended that the following Noise Reduction Best Management Practices mitigation be followed.

Proposed Noise Reduction Best Management Practices for Construction Noise

The San Diego Municipal Code Section 59.5.0404 prohibits construction between 7:00 pm and 7:00 am the next day or on legal holidays (except Columbus Day and Washington's Birthday). Additionally, it is unlawful to conduct any construction activity that result in an average noise level greater than 75 dBA during the 12-hour period from 7:00 am to 7:00 pm.

Although there are no noise reduction best management practices that will completely eliminate this potential annoyance, it is recommended that the following Noise Reduction Best Management practices be adopted to reduce noise impacts to less than significant levels.

1. Restrict grading and construction activities to daily operation between 7 a.m. and 7 p.m. Monday through Friday. There should be no work on Saturdays, Sundays or holidays.

2. Ensure that all construction and grading equipment is properly maintained. All vehicles and compressors should utilize exhaust mufflers, and engine enclosure covers as designed by the manufacturer should be in place at all times.

With these Noise Reduction Best Management practices followed, construction noise for this project is considered to be less than significant.

Proposed Construction Noise Mitigation Measures

Noise levels due to construction can never be totally eliminated at a construction site. However, construction noise impacts can be minimized with noise control mitigation measures. It is recommended that the following mitigation measures be implemented.

1. All pneumatic tools, vehicles and compressors should have intake and exhaust mufflers as recommended by the manufacturer. Ensure that all construction and grading equipment is properly maintained.

2. Provide a temporary shielding wall along the north property line of the construction site. This shielding wall should be sound blankets or plywood on poles or a wood frame. The shielding wall should have a minimum surface weight of 1.0 psf.

3. Turn off all idling equipment when not in use. Utilize newer diesel generators and compressors that are listed as "quiet units".

4. Locate stationary equipment and stockpile areas as far away from residential areas to the north as feasible. Use pavement saws during demolition of the existing asphalt where feasible.

5. Disconnect back-up alarms on vehicles that require them. Use signal men as required by the Federal Department of Transportation.

6. Restrict grading and construction activities to daily operation between7 a.m. to 5 p.m. Monday through Friday. There should be no work on Saturdays, Sundays or legal holidays in accordance with Section 59.5.0404 of the San Diego Municipal Code. Provide construction activity schedules to the Mission Ridge Condominium Association.

It is estimated that implementation of these construction noise mitigation measures will provide a noise reduction of approximately 10 dB.

8.0 On-Site Stationary Noise Impacts

On-site noise sources will include condensers for the air-conditioning system. These condensers will be air-cooled, pad-mounted or roof-top exterior units. They wil be sized so that approximately 1 ton of conditioning wil be utilized for every 1000 square feet of living space in the units. The maximum square footage of the units will be 1800 to 2200 square feet so the exterior condensers will probably be 2.5 ton units.

The San Diego Municipal Code (Article 59.5.0401 Sound Level Limits requires that all stationary noise sources produce a noise level that does not exceed 40 dBA at the closest single family residential property between 10:00 pm and 7:00 am.

The closest single family residential property to the site is located to the southeast at a distance of approximately 130 feet.

Using published sound power data for air-cooled 2.5 ton condensers, noise levels were calculated at 130 feet - the distance to the closest residential property. The results of this analysis are listed in Table 3.

Table 3

Calculated Noise Level for a 2.5 ton Condenser in dB

Location	Noise Level
130 feet	38.9 dBA

Based on this analysis, on-site stationary noise sources will not be a significant impact on the surrounding area.

9.0 Summary of Results

The results of this analysis show that the proposed project complies with the requirements of the San Diego Noise Element and also with the requirements of the San Diego Municipal Code Article 9.5 Noise Abatement and Control.

Bruce A. Davy
Davy & Associates, Inc.

SITE MONITORING NOISE ANALYSIS

JN2015-04

PROJECT:	Del Cerro Residential
LOCATION:	NorthWest Bldg Line
TEST DATE:	June 1, 2015
START TIME:	2:00 P.M.
END TIME:	3:00 P.M.
EQUIPMENT USED:	LD 820 SLM 1/2" Random Incidence Mic Windscreen B&K 4230 Calibrator Tripod Wind Speed Indicator Micronta Thermometer/Hygrometer
TEMPERATURE:	78 °f
RELATIVE HUMIDITY:	50%
WIND:	0-2 mph

LEQ:	67.4	L90:	59.3
LMAX:	77.2	L50:	63.5
LMIN:	55.8	L25:	67.5
CNEL:	68.4	L8:	71.0
LDN:	68.4	L2:	73.3
		L1:	74.5

DAVY
& ASSOCIATES, INC.
Consultants in Acoustics

SITE MONITORING NOISE ANALYSIS

JN2015-04

PROJECT:	Del Cerro Residential
LOCATION:	South Bldg Line
TEST DATE:	June 1, 2015
START TIME:	3:00 P.M.
END TIME:	4:00 P.M.
EQUIPMENT USED:	LD 820 SLM 1/2" Random Incidence Mic Windscreen B&K 4230 Calibrator Tripod Wind Speed Indicator Micronta Thermometer/Hygrometer
TEMPERATURE:	77 °f
RELATIVE HUMIDITY:	50%
WIND:	0-2 mph

LEQ:	63.6	L90:	50.3
LMAX:	71.3	L50:	55.8
LMIN:	49.4	L25:	62.7
CNEL:	67.6	L8:	65.7
LDN:	67.6	L2:	68.9
		L1:	70.4

DAVY
& ASSOCIATES, INC.
Consultants in Acoustics

Biological Technical Report for the Del Cerro Project in the City of San Diego, California

(Project Number 435483)

December 12, 2016

Prepared for:

ColRich Communities
444 West Beech Street Suite 300
San Diego, CA 92101

Prepared by:

Alden Environmental, Inc.
3245 University Avenue, #1188
San Diego, CA 92104

Principal Investigator:

Greg Mason, Senior Biologist

ALDEN
ENVIRONMENTAL, INC

Del Cerro Project
Biological Technical Report

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MANAGEMENT SUMMARY/EXTRACT

ColRich Communities proposes to develop a six-acre site in the City of San Diego (City) that is north of Interstate 8 and east of College Avenue. The site is not within, nor is it adjacent to, the City's Multiple Species Conservation Program (MSCP) preserve, the Multi-habitat Planning Area. The proposed project would include 24 single-family detached homes with a private access road and associated utilities.

Vegetation communities including Diegan coastal sage scrub, non-native grassland, disturbed habitat, eucalyptus woodland, and ornamental are present on the site. Diegan coastal sage scrub and non-native grassland are considered sensitive. Three sensitive plant species and one sensitive animal species were found on site: ashy spike-moss (*Selaginella cinerascens*), graceful tarplant (*Holocarpha virgata* ssp. *elongata*), San Diego County sunflower (*Bahiopsis laciniata*), and orange-throated whiptail (*Aspidoscelis hyperythra beldingi*). No waters of the U.S., waters of the State, or City wetlands are present on site.

Development of the site would significantly impact 3.0 acres of Diegan coastal sage scrub and 0.6 acre of non-native grassland through removal. Mitigation for these impacts is proposed to be in the form of payment into the City's Habitat Acquisition Fund.

Development of the site would impact all three sensitive plant species through removal, but this impact would be less than significant because each of these species has a California Rare Plant Rank of 4 (i.e., a very low level of sensitivity); no mitigation would be required. Development of the site would also impact the orange-throated whiptail, perhaps directly through injury or mortality and/or through habitat loss, but the impacts would be less than significant, and no mitigation would be required because the orange-throated whiptail is a Covered Species under the City's MSCP Subarea Plan.

1.0 INTRODUCTION

This report describes the existing biological conditions on the Del Cerro Project (Project) site and provides the City of San Diego (City), resources agencies, and Project applicant with information necessary to assess impacts to biological resources under the California Environmental Quality Act (CEQA), City's Biology Guidelines (City 2012), and applicable federal and State of California (State) regulations.

1.1 PROJECT LOCATION

The Project is located on an approximately six-acre parcel (APN 463-010-10) north of Interstate 8 and east of College Avenue in the City. The Project site is located on the U.S. Geological Survey (USGS) La Mesa Quadrangle in Township 16S, Range 2W. Marne Avenue and residential development lie east of the site (Figures 1 and 2).

1.2 PROJECT DESCRIPTION

ColRich Communities, the Project applicant, proposes to develop 24 single-family detached homes on lots that are a minimum of 5,000 square feet and conform to the RS 1-7 zone and the Navajo Community Plan. Access to the development would be off of College Avenue via a new private road. The Project includes on-site water quality basins to treat storm water runoff and a sewer/storm water connection to existing City facilities. There would be no off-site staging during Project construction.

2.0 METHODS

2.1 LITERATURE REVIEW

Prior to conducting field investigations, Alden Environmental, Inc. (Alden) performed a search of the California Natural Diversity Database and the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (CNPS 2015) for information regarding sensitive species known to occur within the Project vicinity. Additional sources of information include that compiled as part of the Multiple Species Conservation Program (MSCP).

2.2 BIOLOGICAL SURVEYS

Vegetation mapping and a jurisdictional delineation were conducted on site on October 14, 2014. A sensitive plant survey was conducted on April 9, 2015. No other focused surveys are required for the Project site according to the Biology Guidelines (City 2012) nor were any conducted. Incidental plant and animal observations were noted during each survey. During the sensitive plant survey, special attention was given to MSCP Narrow Endemic species potentially occurring on site. Table 1 lists the survey dates, types, personnel, and time/weather conditions (where available). The survey methods used are presented in the sections following the table.

Table 1 SURVEY INFORMATION			
Survey Date	**Survey Type**	**Personnel**	**Time/Weather Conditions (Start/Stop)**
10/14/14	Vegetation mapping/ jurisdictional delineation	Lee Ripma	N/A
04/09/15	Sensitive Plant Species Survey	Greg Mason	0920, 61 degrees Fahrenheit, clear, wind 0-3 miles per hour/1125, 65 degrees Fahrenheit, clear, wind 0-3 miles per hour

2.2.1 Vegetation Mapping

Vegetation communities were mapped according to Oberbauer et al. (2008) on recent aerial photography at a scale of one inch equals 150 feet.

2.2.2 Jurisdictional Delineation

A delineation of potential jurisdictional areas on the Project site was performed on October 14, 2014 (Table 1). All on-site areas with depressions or drainage channels were evaluated for the presence of U.S. Army Corps of Engineers (Corps), California Department of Fish and Wildlife (CDFW), and City wetlands, as well as non-wetland waters of the U.S. (WUS) and non-wetland waters of the State (WS). Corps wetlands were determined/delineated using the Wetlands Delineation Manual (Environmental Laboratory 1987) and the Arid West Supplement (Corps 2008). Corps non-wetland WUS (e.g., ephemeral drainages) were determined/delineated by the presence of bed and bank within unvegetated drainage courses. CDFW jurisdiction (wetland and non-wetland WS) was determined by the presence of streambeds, channels, and wetland/riparian vegetation.

2.2.3 Sensitive Plant Species

A sensitive plant survey was conducted on April 9, 2015, which is during the blooming period of sensitive species with potential to occur on site. The entire site was walked, and sensitive plant species observed were mapped.

Sensitive plant species are those that are considered federal, State, or CNPS rare, threatened, or endangered (i.e., CNPS Rare Plant Rank 1 or 2); MSCP Covered Species; or MSCP Narrow Endemic species. More specifically, if a species is designated with any of the following statuses (a-c below), it is considered sensitive per City Municipal Code (Chapter 11, Article 3, Division 1):

(a) A species or subspecies is listed as rare, endangered, or threatened under Section 670.2 or 670.5, Title 14, California Code of Regulations, or the federal Endangered Species Act, Title 50, Code of Federal Regulations, Section 17.11 or 17.12, or candidate species under the California Code of Regulations;

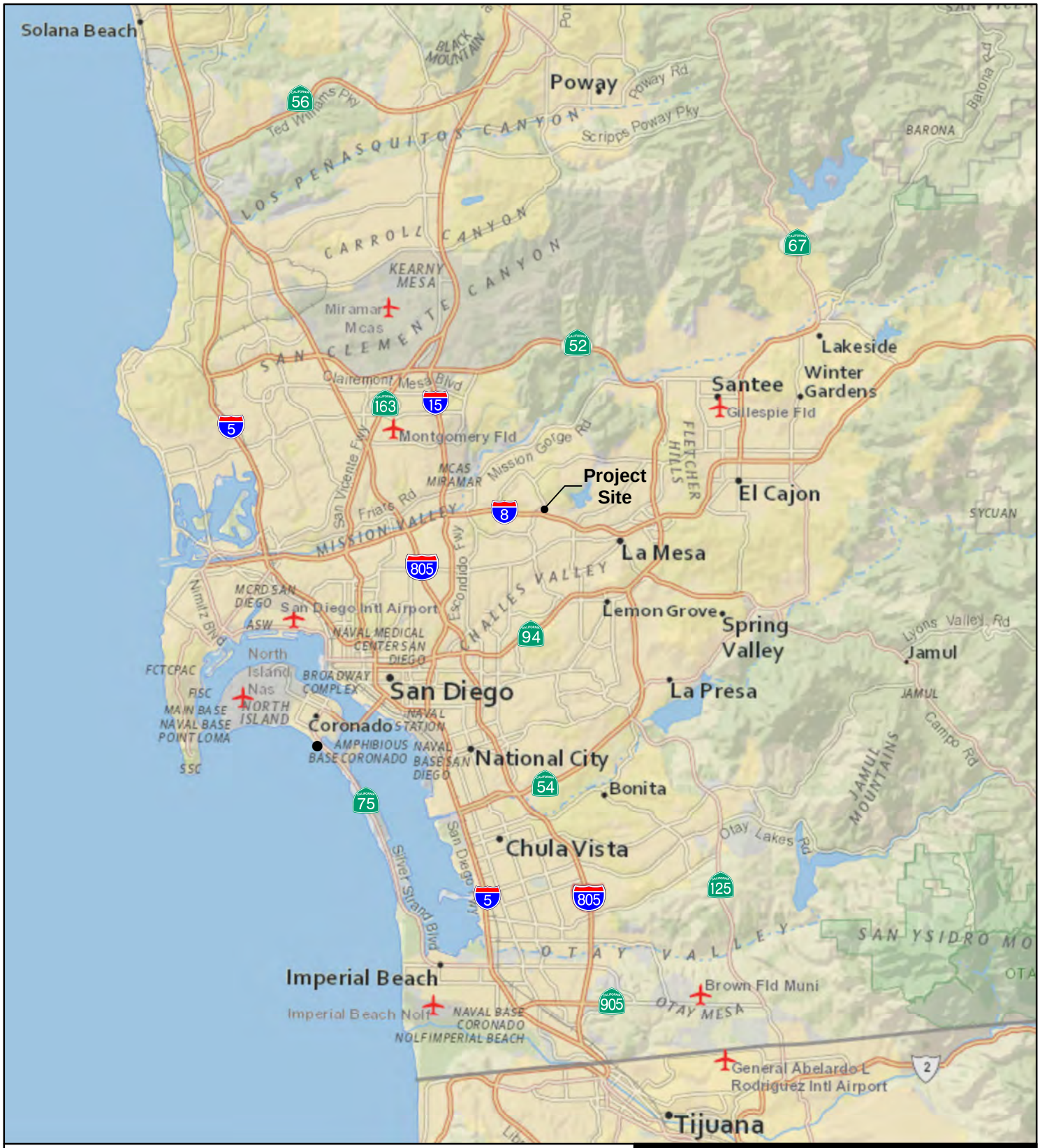

Figure 1

Regional Location

DEL CERRO PROJECT

N
W E
S

0 2 4 Miles

ALDEN ENVIRONMENTAL, INC

Imagery ©2016

Figure 2

Project Location

DEL CERRO PROJECT

N
W E
S
0 500 1,000
Feet

ALDEN ENVIRONMENTAL, INC

(b) A species is a Narrow Endemic as listed in the Biology Guidelines in the Land Development Manual (City 2012); and/or

(c) A species is a Covered Species as listed in the Biology Guidelines in the Land Development Manual (City 2012).

A species may also be considered sensitive if it is included in the CNPS Inventory of Rare and Endangered Plants (CNPS 2015).

Sensitive plant status is often based on one or more of three distributional attributes: geographic range, habitat specificity, and/or population size. A species that exhibits a small or restricted geographic range (such as those endemic to the region) is geographically rare. A species may be more or less abundant but occur only in very specific habitats. Lastly, a species may be widespread but exists naturally in small populations.

2.2.4 Survey Limitations

While 2015 was a drought year, the only sensitive plant species not found were those with low or no potential to occur (see Section 4.2.2). And, since a sensitive, annual, herbaceous species was found on site during the April 2015 survey, it is believed that the drought conditions did not significantly affect the sensitive plant species survey results.

Noted animal species were identified by direct observation, vocalizations, or the observance of scat, tracks, or other signs. However, the animal species observed or detected do not necessarily represent a comprehensive account of all species that utilize the site because species that are nocturnal, secretive, or seasonally restricted may not have been observed/detected. Those species that are sensitive and have potential to occur are addressed in this report in Section 4.2.3.

2.2.5 Nomenclature

Nomenclature used in this report is from the following sources: City Biology Guidelines (City 2012) and the MSCP (City 1997a); Oberbauer, et al. (2008); Hickman, ed. (1993); CNPS (2015); Jepson Flora Project (2014); Crother (2008); The American Ornithologists' Union (2015); Jones, et al. (1992); and CDFW (2016).

3.0 SURVEY RESULTS

3.1 PHYSICAL CHARACTERISTICS

The Project site is irregularly shaped with variable topography. Elevation on site ranges from 354 to 452 feet above mean sea level. The soil types on site consist of Escondido very fine sandy loam (9 to 15 percent slopes, eroded), Diablo urban land complex (15 to 50 percent slopes), and Friant rocky fine sandy loam (9 to 30 percent slopes; Bowman 1973). The site is bounded to the north by commercial development, to the west by College Avenue, to the south by Interstate 8, and to the east by residential development (Figure 2).

3.2 VEGETATION COMMUNITIES

Six vegetation communities (three upland and three other upland) occur on the Project site (Figure 3). Table 2 presents a list of these communities and their respective acreage totals.

Table 2
EXISTING VEGETATION COMMUNITIES ON SITE

Vegetation Community[1]	Acre(s)
Upland	
Diegan coastal sage scrub (Tier II)	2.3
Diegan coastal sage scrub-disturbed (Tier II)	0.9
Non-native grassland (Tier IIIB)	0.8
Other Upland (Tier IV)	
Disturbed habitat	1.2
Eucalyptus woodland	0.3
Ornamental	0.5
Total	**6.0**

[1]Upland vegetation communities are divided into five tiers of sensitivity (the first includes the most sensitive, the fifth the least sensitive) based on rarity and ecological importance (City 2012). Tier I includes rare uplands. Tier II includes uncommon uplands. Tiers IIIA and IIIB include common uplands. Tier IV includes other uplands.

3.2.1 Upland Vegetation Communities

Diegan Coastal Sage Scrub (including -disturbed; Tier II)

Coastal sage scrub is one of two major shrub types that occur in California. This community occupies xeric sites characterized by shallow soils. Coastal sage scrub is dominated by subshrubs whose leaves abscise during drought. This adaptation allows these species to better withstand the prolonged dry period in the summer and fall. Coastal sage scrub species have relatively shallow root systems and open canopies, which may allow for the occurrence of a substantial herbaceous component. Four floristic associations are recognized within the coastal sage scrub plant formation, and these occur in distinct geographic areas along the California coast with the Diegan association occupying the area from Orange County to northwestern coastal Baja California, Mexico (O'Leary 1990).

Diegan coastal sage scrub on site contains a diverse suite of plant species including California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), lemonadeberry (*Rhus integrifolia*), and laurel sumac (*Malosma laurina*). This community on site also supports small patches of mule fat (*Baccharis salicifolia*) in an entirely upland situation. Diegan coastal sage scrub-disturbed contains many of the same shrub species as the undisturbed community but is more sparse, has a higher proportion of non-native species (principally non-native grasses), and shows signs of previous disturbance. Diegan coastal sage scrub (including –disturbed) is a Tier II (uncommon upland) community (City 2012). Approximately 3.2 acres of this community occurs on the Project site (Table 2; Figure 3).

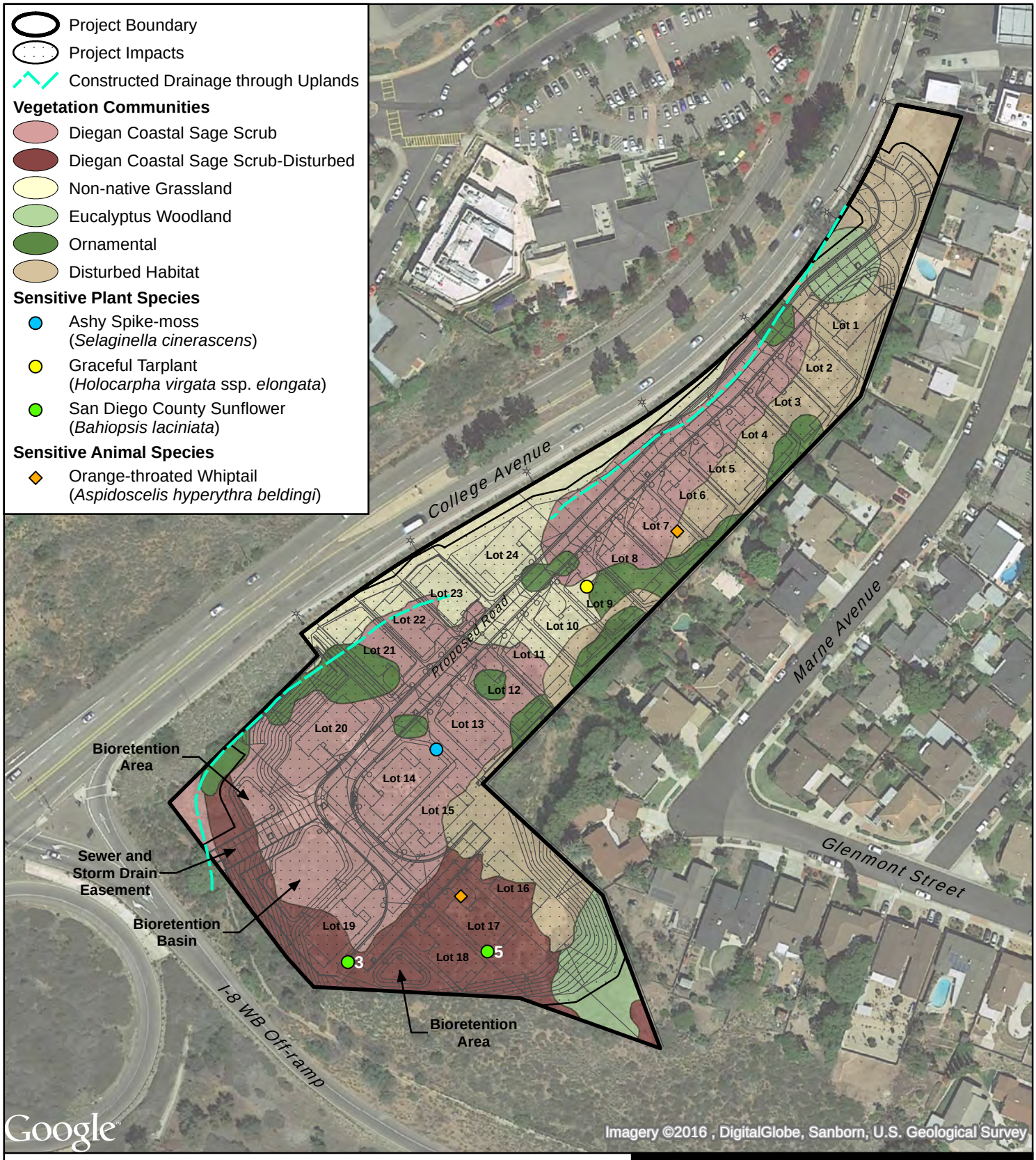

Figure 3

Vegetation and Sensitive Species/Impacts

DEL CERRO PROJECT

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ALDEN ENVIRONMENTAL, INC

Non-Native Grassland (Tier IIIB)

Non-native grassland is comprised of a dense to sparse cover of non-native grasses, sometimes associated with species of showy-flowered, native, annual forbs (Holland 1986). This community characteristically occurs on gradual slopes with deep, fine-textured, usually clay soils. Characteristic species on site include oats (*Avena* spp.), filaree (*Erodium* spp.), red brome (*Bromus madritensis* ssp. *rubens*), and ripgut grass (*Bromus diandrus*). Most of the annual, introduced species that comprise the majority of species and biomass within non-native grassland originated from the Mediterranean region, an area with a long history of agriculture and a climate similar to California. These two factors, in addition to intensive grazing and agricultural practices in conjunction with droughts, contributed to the successful invasion and establishment of these species and the replacement of native grasses with annual-dominated, non-native grassland (Jackson 1985). Non-native grassland is a Tier IIIB upland vegetation community (common upland; City 2012). Approximately 0.8 acre of non-native grassland occurs on site (Table 2; Figure 3).

3.2.2 Other Uplands

Disturbed Habitat (Tier IV)

Disturbed habitat includes land cleared of vegetation, land containing a preponderance of non-native plant species, or land showing signs of past or present usage that removes its capability of providing viable wildlife habitat. Such areas include dirt roads, graded areas, and dump sites where no native or naturalized species remain. Approximately 1.2 acres of disturbed habitat occurs on site (Table 2; Figure 3). Disturbed habitat is a Tier IV other upland (City 2012).

Eucalyptus Woodland (Tier IV)

Eucalyptus woodland is dominated by eucalyptus (*Eucalyptus* spp.), an introduced genus that has been planted for wind blocking, ornamental, or hardwood production purposes. The understory within well-established groves is usually very sparse due to the closed canopy and allelopathic nature of the abundant leaf and bark litter. The sparse understory offers only limited wildlife habitat; however, as a wildlife habitat, these woodlands can provide nesting sites for raptors. During winter migrations, a variety of warblers may be found feeding on the insects that are attracted to the eucalyptus flowers. Approximately 0.3 acre of eucalyptus woodland occurs on site (Table 2; Figure 3). Eucalyptus woodland is a Tier IV other upland (City 2012).

Ornamental (Tier IV)

Ornamental is where non-native landscaping has been planted. Ornamental landscaping occurs on approximately 0.5 acre of the Project site (Table 2; Figure 3) and includes species such as pine (*Pinus* sp.) and pepper (*Schinus* spp.) trees. Ornamental is a Tier IV other upland (City 2012).

3.2.3 Wetland/Riparian Vegetation Communities

There are no wetland/riparian vegetation communities on the site.

3.3 JURISDICTIONAL FEATURES

3.3.1 Corps Jurisdictional Features

No Corps jurisdictional wetland or non-wetland WUS occur on the site. A non-historic, constructed, drainage channel does occur along the western border of the site and runs parallel to College Avenue (Figure 3), but this channel serves as an above-ground component of the City's storm water system and does not support wetland vegetation. Storm water exits an existing outfall on the northern end of the site, runs through the channel, and re-enters the City's piped system at the southern end of the site. A review of historic aerial photographs and USGS topographic maps shows that there was no channel in this location prior to the construction of College Avenue.

3.3.2 CDFW Jurisdictional Features

For the same reasons outlined in Section 3.3.1, there are no CDFW wetland or non-wetland WS on site.

3.3.3 City Wetlands

The City's Municipal Code Land Development Procedures (§113.0101) define wetlands as areas that are characterized by any of the following summarized conditions. The boundaries of City wetlands are determined following these conditions.

1. All areas persistently or periodically containing naturally occurring wetland vegetation communities;
2. Areas that have hydric soils or wetland hydrology and lack naturally occurring wetland vegetation communities;
3. Areas lacking wetland vegetation communities, hydric soils, and wetland hydrology due to non-permitted filling of previously existing wetlands;
4. Areas mapped as wetlands on Map No. C-713 as shown in Chapter 13, Article 2, Division 6 (Sensitive Coastal Overlay Zone).

Based on the absence of these conditions, the Project site does not support City wetlands.

3.4 PLANT SPECIES OBSERVED

Eighty-three plant species were observed on the Project site. A list of these species is presented in Appendix A.

3.5 ANIMAL SPECIES OBSERVED

Seventeen animal species were observed or detected on the Project site. A list these species is presented in Appendix B.

4.0 SENSITIVE RESOURCES

4.1 SENSITIVE VEGETATION COMMUNITIES

Sensitive vegetation communities are considered rare within the region or sensitive by CDFW (Holland 1986) or the City (2012). These communities in any form (including, for example, -disturbed) are considered sensitive because they have been historically depleted, are naturally uncommon, or support sensitive species. The Project site supports two sensitive vegetation communities: Diegan coastal sage scrub (including -disturbed; Tier II; City 2012) and non-native grassland (Tier IIIB; City 2012).

4.2 SENSITIVE SPECIES

This section addresses sensitive plant and animal species observed on site and those evaluated for their potential to occur.

4.2.1 Sensitive Plant Species Observed

Three sensitive plant species were observed on site (Figure 3). They include graceful tarplant (*Holocarpha virgata* ssp. *elongata*), San Diego County sunflower (*Bahiopsis laciniata*), and ashy spike-moss (*Selaginella cinerascens*) as described below.

Graceful tarplant (*Holocarpha virgata* ssp. *elongata*)
Sensitivity: CNPS Rare Plant Rank 4.2 (a watch list species; Appendix C)
Distribution: Orange, Riverside, and San Diego counties.
Habitat(s): Chaparral, valley grassland, foothill woodland, coastal sage scrub.
Presence on site: Scattered individuals were found within non-native grassland on site.

San Diego County sunflower (*Bahiopsis laciniata*)
Sensitivity: CNPS Rare Plant Rank 4.2 (a watch list species; Appendix C)
Distribution: San Diego and Orange counties; Baja California, Mexico.
Habitat(s): Diegan coastal sage scrub is the habitat of this perennial shrub.
Presence on site: Eight individuals of this species were found in Diegan coastal sage scrub-disturbed on site.

Ashy spike moss (*Selaginella cinerascens*)
Sensitivity: CNPS Rare Plant Rank 4.1 (a watch list species; Appendix C)
Distribution: Orange and San Diego counties; northwestern Baja California, Mexico.
Habitat(s): Open areas on flat mesas in coastal sage scrub and chaparral.
Presence on site: A small patch of this species was found in Diegan coastal sage scrub on site.

4.2.2 Sensitive Plant Species Not Observed and Their Potential to Occur

All City Narrow Endemic plant species were evaluated for their potential to occur on site as described in Table 3 and were looked for during the sensitive plant survey. Additional sensitive plant species that were not observed but that may have potential to occur on site based on the literature review of the Project vicinity are addressed in Table 4.

Table 3 MSCP NARROW ENDEMIC PLANT SPECIES POTENTIAL TO OCCUR				
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State CNPS**	**HABITAT(S)/ DISTRIBUTION**	**BLOOM PERIOD**	**POTENTIAL TO OCCUR**
San Diego thornmint (*Acanthomintha ilicifolia*)	FT/SE CNPS Rare Plant Rank 1B.1	Occurs on clay lenses in grassy openings in chaparral or sage scrub. Prefers friable or broken, clay soils. Range limited to coastal areas of San Diego County and Baja California, Mexico.	April to June	Very low. Soils not suitable.
Shaw's agave (*Agave shawii*)	--/-- CNPS Rare Plant Rank 2B.1	Occurs in coastal sage scrub and coastal bluff scrub. Range limited to coastal areas of San Diego County and Baja California, Mexico.	September to May	Very low. A perennial leaf succulent that would have been observed if present.
San Diego ambrosia (*Ambrosia pumila*)	FE/-- CNPS Rare Plant Rank 1B.1	Found in disturbed areas within chaparral, coastal sage scrub, and grasslands. Range includes San Diego and Riverside counties south to Baja California, Mexico.	June to September	Very low. Not known from Project vicinity.
Aphanisma (*Aphanisma blitoides*)	--/-- CNPS Rare Plant Rank 1B.2	Occurs in sandy areas along the coast. Range includes islands off the southern California coast from San Onofre to Imperial Beach in San Diego County.	April to May	Very low. No known populations in MSCP Plan Area (City 1997a).
Coastal dunes milk-vetch (Astragalus tener var. titi)	FE/SE CNPS Rare Plant Rank 1B.1	Occurs in sandy places along the coast, including coastal dunes. Range includes coastal areas of Monterey, Los Angeles, and San Diego counties.	March to May	Very low. Occurs on coastal dunes, and range does not include the Project area.

Table 3 (continued)
MSCP NARROW ENDEMIC PLANT SPECIES POTENTIAL TO OCCUR

SPECIES	LISTING OR SENSITIVITY[1] Federal/State CNPS	HABITAT(S)/ DISTRIBUTION	BLOOM PERIOD	POTENTIAL TO OCCUR
Snake cholla (*Cylindropuntia californica* var. *californica*)	--/-- CNPS Rare Plant Rank 1B.1	Found in open patches in coastal sage scrub, primarily in southern portion of San Diego County and in Florida Canyon.	April to June	Very low. A perennial stem succulent that would have been observed if present.
Otay tarplant (*Deinandra conjugens)*	FT/SE CNPS Rare Plant Rank 1B.1	Occurs in disturbed areas and patches of coastal sage scrub in the Otay Mesa area.	June to August	Very low. Occurs in Otay Mesa; not known from Project vicinity.
Short-leaved dudleya (*Dudleya blochmaniae* ssp. *brevifolia*)	--/SE CNPS Rare Plant Rank 1B.1	Occurs on Torrey sandstone soils in chaparral and coastal scrub.	April	None. Suitable soils not present.
Variegated dudleya (*Dudleya variegata*)	--/-- CNPS Rare Plant Rank 1B.2	Occurs on dry hillsides and mesas in chaparral, coastal sage scrub, grasslands, and near vernal pools. Ranges from San Diego County south to Baja California, Mexico.	May to June	Very low. Not known from Project vicinity.
Spreading navarretia (*Navarretia fossalis*)	FT/-- CNPS Rare Plant Rank 1B.1	Occurs in marshes and swamps (assorted freshwater habitats), playas, and vernal pools.	April to June	None. No suitable habitat present.
California Orcutt grass (*Orcuttia californica*)	FT/SE CNPS Rare Plant Rank 1B.1	Occurs within and adjacent to vernal pools.	April to June	None. No suitable habitat present.
San Diego mesa mint (Pogogyne abramsii)	FE/SE CNPS Rare Plant Rank 1B.1	Occurs within and adjacent to vernal pools.	March to July	None. No suitable habitat present.
Otay Mesa mint (*Pogogyne nudiuscula*)	FE/SE CNPS Rare Plant Rank 1B.1	Occurs within and adjacent to vernal pools on Otay Mesa.	March to July	None. No suitable habitat present. Not known from Project vicinity.

[1]See Appendix C for an explanation of listing/sensitivity codes.

Table 4 OTHER SENSITIVE PLANT SPECIES AND THEIR POTENTIAL TO OCCUR				
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State CNPS City**	**HABITAT(S)/ DISTRIBUTION**	**BLOOM PERIOD**	**POTENTIAL TO OCCUR**
California adolphia (*Adolphia californica*)	--/-- CNPS Rare Plant Rank 2B.1 --	Occurs in chaparral, valley grassland, and coastal sage scrub in Los Angeles and San Diego counties.	December to May	None. A perennial shrub that would have been observed if present.
San Diego goldenstar (*Bloomeria clevelandii*)	--/-- CNPS Rare Plant Rank 1B.1 Covered Species	Found on clay soils in chaparral, coastal scrub, vernal pools, and valley and foothill grassland in Riverside and San Diego counties	April to May	Very low. Suitable habitat and soils not present.
Palmer's goldenbush (*Ericameria palmeri* var. *palmeri*)	--/-- CNPS Rare Plant Rank 1B.1 Covered Species	Associated with coastal sage scrub and chaparral habitats.	September to November	None. A perennial, evergreen shrub that would have been observed if present.
San Diego barrel cactus (*Ferocactus viridescens*)	--/-- CNPS Rare Plant Rank 2B.1 Covered Species	Associated with coastal sage scrub and chaparral habitats.	May to June	None. A perennial stem succulent that would have been observed if present.
Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)	--/-- CNPS Rare Plant Rank 4.3 --	Associated with coastal sage scrub and chaparral habitats.	January to July	Low. Survey was conducted at the middle of the bloom period; therefore, it is expected it would have been found if present.

Table 4 (continued) **OTHER SENSITIVE PLANT SPECIES AND THEIR POTENTIAL TO OCCUR**				
SPECIES	**SENSITIVITY[1]** **Federal/State** **CNPS** **City**	**HABITAT(S)/ DISTRIBUTION**	**BLOOM PERIOD**	**POTENTIAL TO OCCUR**
Golden-rayed pentachaeta (*Pentachaeta aurea* ssp. *aurea*)	--/-- CNPS Rare Plant Rank 4.2 --	Found in mesic montane grasslands and sage scrub in Riverside, San Bernardino, Orange, Los Angeles, and San Diego counties; Baja California, Mexico.	March to July	Low. Survey was conducted during the bloom period; therefore, it is expected it would have been found if present.
Purple stemodia (*Stemodia durantifolia*)	--/-- CNPS Rare Plant Rank 2B.1 --	Associated with wetland/riparian habitats.	January to December	None. Suitable habitat not present.
Oil neststraw (*Stylocline citroleum*)	--/-- CNPS Rare Plant Rank 1B.1 --	Associated with coastal sage scrub, chenopod scrub, and grasslands in clay soils.	March to April	Very low. Soils on site not suitable.

[1]See Appendix C for an explanation of listing/sensitivity codes.

4.2.3 Sensitive Animal Species Observed or Detected

One sensitive animal species, orange-throated whiptail (*Aspidoscelis hyperythra beldingi*), was observed on site (Figure 3). This species is described below.

Orange-throated whiptail (*Aspidoscelis hyperythra beldingi*)
Sensitivity: State Species of Special Concern; MSCP Covered Species (Appendix C)
Distribution: Southern Orange and San Bernardino counties, south to the cape of Baja California, Mexico.
Habitat(s): Coastal sage scrub, chaparral, edges of riparian woodlands and washes. Also found in weedy, disturbed areas adjacent to these habitats. Important habitat requirements include open, sunny areas, shaded areas, and abundant invertebrate prey base, particularly termites (*Reticulitermes* sp.).
Presence on site: This species was observed within Diegan coastal sage scrub/disturbed habitat on site.

4.2.4 Sensitive Animal Species Not Observed and Their Potential to Occur

Sensitive animal species that were not observed or detected but that may have potential to occur on site based on the literature review for the Project vicinity are listed in Table 5. In general, the potential for many sensitive animal species to occur on site is limited due to the site's small size, its isolation (i.e., surrounded by development), and its location in an urban environment.

Table 5
SENSITIVE ANIMAL SPECIES AND THEIR POTENTIAL TO OCCUR

SPECIES	LISTING OR SENSITIVITY[1] Federal/State City	HABITAT(S)/ DISTRIBUTION	POTENTIAL TO OCCUR
INVERTEBRATES			
San Diego fairy shrimp (*Branchinecta sandiegonensis*)	FE/-- --	Found in shallow vernal pools and ephemeral wetlands in southern coastal California and northern Baja California, Mexico.	None. No suitable habitat on site.
Quino checkerspot butterfly (*Euphydryas editha quino*)	FE/-- --	The primary larval host plant of this species in San Diego is dwarf plantain (*Plantago erecta*). Owl's clover (*Castilleja exserta*) may serve as host plant if primary host plants have senesced. Potential habitat includes areas of low-growing and sparse vegetation. Exists only as several, probably isolated, colonies in southwestern Riverside County, southern San Diego County, and northern Baja California, Mexico.	Very low. Host plant not observed on site. Site is outside the recommended survey area for the species (USFWS 2014).
Hermes copper butterfly (*Lycaena hermes*)	FC/-- --	Occurs in southern mixed chaparral and coastal sage scrub with mature specimens of its larval host plant, spiny redberry (*Rhamnus crocea*). Range is San Diego County, south of Fallbrook, to northern Baja California, Mexico.	Very low due to site's small size and location in an urban setting.
Salt marsh skipper (*Panoquina errans*)	--/-- Covered Species	Found in coastal salt and brackish marshes, occasionally nearby fields and wood edges.	None. No suitable habitat on site.
Riverside fairy shrimp (*Streptocephalus woottoni*)	FE/-- --	Found in moderate to deep (generally ranging from 10 inches to 5-10 feet in depth), longer-lived vernal pools and ephemeral wetlands in southern coastal California and northern Baja California, Mexico.	None. No suitable habitat on site.

Table 5 (continued) **SENSITIVE ANIMAL SPECIES AND THEIR POTENTIAL TO OCCUR**			
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State City**	**HABITAT(S)/ DISTRIBUTION**	**POTENTIAL TO OCCUR**
VERTEBRATES			
Amphibians and Reptiles			
Silvery legless lizard (*Anniella pulchra pulchra*)	--/SSC --	Occurs in areas with loose, sandy soil. Generally found in leaf litter, under rocks, logs, or driftwood in oak woodland, chaparral, and desert scrub. Occurs from the Bay Area south through the Coast and Peninsular ranges to northern Baja California, Mexico.	Low due to site's small size and location in an urban setting.
Arroyo toad (*Anaxyrus californicus*)	FE/SSC Covered Species	Found in washes, streams, and arroyos in semiarid areas. Prefer shallow pools and open, sandy stream terraces or sand bars with cottonwoods (*Populus* spp.), willows (*Salix* spp.), or sycamores (*Platanus* spp.). Breeds in shallow pools along stream edges with sand/gravel flats between March and June. Adults use sage scrub, mixed chaparral, and oak woodland habitats up to within one mile of breeding sites.	None. No suitable habitat on site.
Western pond turtle (*Emys marmorata*)	--/SSC Covered Species	Found in both permanent and intermittent waters, including marshes, streams, rivers, ponds, and lakes throughout Oregon, California, and Baja California, Mexico.	None. No suitable habitat on site.
Red-diamond rattlesnake (*Crotalus ruber*)	--/SSC --	Found in chaparral, coastal sage scrub, and along creek banks, particularly among rock outcrops or piles of debris supporting rodents. Ranges from extreme southeastern Los Angeles County (Diamond Bar) into southern San Bernardino County, and south into southern Baja California, Mexico.	Low due to site's small size and location in an urban setting.

Table 5 (continued) **SENSITIVE ANIMAL SPECIES AND THEIR POTENTIAL TO OCCUR**			
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State City**	**HABITAT(S)/ DISTRIBUTION**	**POTENTIAL TO OCCUR**
VERTEBRATES (continued)			
Amphibians and Reptiles (continued)			
Coast horned lizard (*Phrynosoma blainvillii*)	--/SSC Covered Species	Occurs in scrubland, grassland, coniferous woods, and broadleaf woodlands, typically in area with sandy soil, scattered shrubs, and native ant colonies.	Low due to the presence of Argentine ants that out-compete the species' native ant prey and the site's location.
Coronado skink (*Plestiodon skiltonianus interparietalis*)	--/SSC --	Inhabits grasslands, coastal sage scrub, open chaparral, pine oak woodland and coniferous forests. Prefers areas where there is abundant leaf litter or low, herbaceous growth. Occurs in inland southern California south through the north Pacific coast region of northern Baja California Norte, Mexico.	Low due to site's small size and location in an urban setting.
Western spadefoot toad *(Spea hammondii)*	--/SSC --	Inhabits floodplains, washes, and low hills. Southern California habitats include coastal sage scrub, chaparral and grassland. Important habitat components include temporary pools (which form during winter and spring rains) for breeding and friable soils for burrowing.	None. No suitable habitat present.
Two-striped garter snake (*Thamnophis hammondii*)	--/SSC --	Found in permanent fresh water, inhabiting streams, ponds, and vernal pools. Occupies adjacent coastal sage scrub and grasslands during the winter.	None. No suitable habitat present.

Table 5 (continued) **SENSITIVE ANIMAL SPECIES AND THEIR POTENTIAL TO OCCUR**			
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State City**	**HABITAT(S)/ DISTRIBUTION**	**POTENTIAL TO OCCUR**
VERTEBRATES (continued)			
Birds			
Cooper's hawk (*Accipiter cooperii*)	--/WL Covered Species	Occurs throughout the continental U.S. (excluding Alaska) and parts of both Montana and the Dakotas. Winters south to Mexico and Honduras. In San Diego County, tends to inhabit lowland riparian areas and oak woodlands in proximity to suitable foraging areas such as scrubland or fields. Unitt (2004) noted, however, that in the 1980s Cooper's hawks began adapting to urban environments in San Diego County and nesting in eucalyptus trees and other urban trees.	Low potential to forage and nest on site due to the site's location in an urban setting adjacent to a College Avenue and Interstate 8.
Tri-colored blackbird (*Agelaius tricolor*)	BCC/SC --	Occurs mostly in coastal lowland grasslands and wetlands, as well as freshwater marshes agricultural areas, lakeshores, parks.	None. No suitable habitat present.
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)	--/WL Covered Species	Inhabits coastal sage scrub and open chaparral as well as shrubby grasslands. Occur throughout the coastal lowlands and foothills of San Diego County.	Low due to site's small size and location in an urban setting adjacent to a College Avenue and Interstate 8.
Grasshopper sparrow (*Ammodramus savannarum*)	--/SSC --	Open grasslands in the eastern U.S. and plains areas as well as coastal California. Typical habitat is dense grasslands that have little or no shrub cover.	Very low due to site's small size and location in an urban setting adjacent to a College Avenue and Interstate 8.
Bell's sage sparrow (*Artemesiospiza belli belli*)	BCC/WL --	Found in chaparral and sage scrub with modest leaf litter. Patchy distribution throughout San Diego County, which often shifts to include partially recovered burned areas.	Low due to site's small size and location in an urban setting adjacent to a College Avenue and Interstate 8.

Table 5 (continued) **SENSITIVE ANIMAL SPECIES AND THEIR POTENTIAL TO OCCUR**			
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State City**	**HABITAT(S)/ DISTRIBUTION**	**POTENTIAL TO OCCUR**
VERTEBRATES (continued)			
Birds (continued)			
Golden eagle (*Aquila chrysaetos*)	BCC/FP, WL Covered Species	Requires vast foraging areas in grassland, broken chaparral, or sage scrub. Nest in cliffs and boulders.	None due to site's small size and location in an urban setting. Golden eagles are sensitive to anthropogenic presence (Palmer 1988 *in* USFWS 2010).
Burrowing owl (*Athene cunicularia*)	BCC/SSC Covered Species	Declining species occurring in grassland or open scrub habitats. In 2003, there were an estimated 25 to 30 resident pairs of in San Diego County located primarily in the southern quarter of the county and on North Island (Lincer and Bloom 2007).	Very low. Not known from Project vicinity but is typically addressed at City's request.
Ferruginous hawk (*Buteo regalis*)	BCC/WL --	Found in arid and semiarid regions of North America. Grasslands, rock outcrops, shallow canyons, and gullies may characterize some habitats.	None. Suitable habitat does not occur on site.
Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegonensis*)	BCC/SSC Covered Species	Occurs in arid and semiarid regions from the southwestern U.S. to southern Mexico. Occurs in coastal sage scrub with large cacti for nesting.	Very low. No cacti suitable for nesting are present.
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT/SSC Covered Species	Found on sandy coasts and in brackish inland lakes up the Pacific coastline. Utilizes sandy beaches, dried mudflats, and saltpans.	None. No suitable habitat present.

Table 5 (continued) **SENSITIVE ANIMAL SPECIES AND THEIR POTENTIAL TO OCCUR**			
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State City**	**HABITAT(S)/ DISTRIBUTION**	**POTENTIAL TO OCCUR**
VERTEBRATES (continued)			
Birds (continued)			
Northern harrier (*Circus cyaneus*)	--/SSC Covered Species	Utilizes coastal, salt, and freshwater marshlands; grasslands; and prairies. Widespread throughout the temperate regions of North America and Eurasia. The species winters and migrates throughout California from below sea level in Death Valley to an elevation of 9,800 feet. Known breeding areas in San Diego County include Torrey Pines, the Tijuana River Valley, and Camp Pendleton.	Very low due to site's small size and location in an urban setting adjacent to a College Avenue and Interstate 8.
White-tailed kite (*Elanus leucurus*)	--/FP --	Occurs in riparian woodlands and oak or sycamore groves and adjacent grasslands on coastal slopes in San Diego County. Nests in the crowns of trees, especially coast live oak (*Quercus agrifolia*).	None. Suitable habitat not present.
Southwestern willow flycatcher (*Empidonax traillii extimus*)	FE/SE Covered Species	This flycatcher typically breeds in patchy to dense, well-developed riparian woodlands along streams, rivers, lakes, or other wetlands, composed of native riparian species such as willows and mule fat.	None. No suitable habitat present.
California horned lark (*Eremophila alpestris actia*)	--/WL --	Inhabits sandy beaches, agricultural fields, grasslands and open areas on coastal slopes, and in lowlands from Sonoma County to northern Baja California, Mexico.	Low due to due to limited habitat and location in an urban setting adjacent to a College Avenue and Interstate 8.
American peregrine falcon (*Falco peregrinus*)	BCC/FP Covered Species	Found in coastal sage scrub and chaparral with rock outcrops. Ranges from San Luis Obispo south through Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego counties and into Baja California, Mexico.	Very low. Rare fall and winter visitor. Prefers various coastal habitats for foraging and breeding.

Table 5 (continued) **SENSITIVE ANIMAL SPECIES AND THEIR POTENTIAL TO OCCUR**			
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State City**	**HABITAT(S)/ DISTRIBUTION**	**POTENTIAL TO OCCUR**
VERTEBRATES (continued)			
Birds (continued)			
Loggerhead shrike (*Lanius ludovicianus*)	BCC/SSC --	Found in grassland, open sage scrub, chaparral, and desert scrub. Uncommon year-round resident observed in lower elevations of San Diego County.	Very low due to site's small size and location in an urban setting adjacent to a College Avenue and Interstate 8.
Long-billed curlew (*Numenius amaericanus*)	BCC/WL Covered Species	Occurs on tidal mudflats and open coastal grassland.	None. No suitable habitat present.
Coastal California gnatcatcher (*Polioptila californica californica*)	FT/SSC Covered Species	Occurs in coastal sage scrub and very open chaparral.	Low. Would likely have been observed if present.
Ridgeway's rail (*Rallus obsoletus*) formerly light-footed clapper rail (*Rallus longirostris levipes*)	FE/SE, FP Covered Species	Occurs in the lower littoral zone of coastal salt marshes where cordgrass (*Spartina* sp.) is present; however, all marsh habitats and adjacent uplands are used to some extent.	None. No suitable habitat present.
California least tern (*Sterna antillarum browni*)	FE/SE, FP Covered Species	Occurs on open sand, salt pans, or dried mudflats near lagoons or estuaries along the coast.	None. No suitable habitat present.
Least Bell's vireo (*Vireo bellii pusillus*)	FE/SE Covered Species	Occurs where there is dense, stratified canopy within willow-dominated woodland or scrub, baccharis scrub, mixed oak/willow woodland, mesquite woodland, or elderberry scrub in riparian habitat.	None. No suitable habitat present.
Mammals			
Dulzura pocket mouse (*Chaetodipus californicus femoralis*)	--/SSC --	Primarily associated with mature chaparral. It has, however, been trapped in mule fat scrub and is known to occur in coastal sage scrub. Has been reported from the mouth of the Santa Margarita River south into northern Baja California, Mexico. In San Diego County, it ranges eastward to the desert transition zone.	Low due to site's small size and location in an urban setting.

Table 5 (continued) **SENSITIVE ANIMAL SPECIES AND THEIR POTENTIAL TO OCCUR**			
SPECIES	**LISTING OR SENSITIVITY[1] Federal/State City**	**HABITAT(S)/ DISTRIBUTION**	**POTENTIAL TO OCCUR**
VERTEBRATES (continued)			
Mammals (continued)			
Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)	--/SSC --	Occurs in open areas of coastal sage scrub and weedy growth, often on sandy substrates. Ranges from Los Angeles County and southern San Bernardino County south into west-central Baja California, Mexico.	Low due to site's small size and location in an urban setting.
Western mastiff bat (*Eumops perotis californicus*)	--/SSC --	Occurs in chaparral, coastal and desert scrub, coniferous and deciduous forest, and woodland habitats. Most roost sites are in crevices in cliffs.	Low to forage on site; unlikely to roost due to the site's small size, location in an urban setting, and absence of cliffs.
San Diego desert woodrat (*Neotoma lepida intermedia*)	--/SSC --	Occurs in open chaparral and coastal sage scrub, often building large, stick nests in rock outcrops or around clumps of cactus or yucca. Occurs along the coastal slope of southern California from San Luis Obispo County south into coastal northwestern Baja California, Mexico.	Low. Nests likely would have been observed if present.
Southern grasshopper mouse (*Onychomys torridus ramona*)	--/SSC --	Generally found in desert habitats with loose, friable soils.	Very low due to site's small size and location in an urban setting.
Pacific pocket mouse (*Perognathus longimembris pacificus*)	FE/SSC --	Endemic to the immediate coast (within approximately 2.5 to 3.7 miles of the Pacific coast; Spencer 2005) of southern California from Marina del Rey and El Segundo in Los Angeles County, south to the vicinity of the Mexican border in San Diego County. Found in coastal sage scrub but more often in sandy washes.	None. Site is too far inland. Known currently from one location in Orange County and three on Camp Pendleton. Site is also outside of species' current range.
American badger (*Taxidea taxus*)	--/SSC Covered Species	Occurs in drier, open stages of shrub steppes, agricultural fields, open woodland forests, and large grass and sagebrush meadows and valleys with friable soils.	None. Suitable habitat not present.

[1]See Appendix C for an explanation of listing and sensitivity codes.

4.2.5 Wildlife Corridors and Nursery Sites

Wildlife corridors represent areas where wildlife movement is concentrated due to natural or anthropogenic constraints. Wildlife corridors can be local or regional in scale; their functions may vary temporally and spatially based on conditions and species presence. Local corridors provide access to resources such as food, water, and shelter. Animals use local corridors, which are often hillsides or tributary drainages, to move between different habitats. Regional corridors provide these functions but also link two or more large habitat areas. Regional corridors provide avenues for wildlife dispersal, migration, and contact between otherwise distinct populations. The Project site is located in an urbanized area of the City and is not located within or adjacent to any wildlife corridor areas, including the MHPA.

A wildlife nursery site is a specific, established location often used repeatedly for breeding purposes, such as a heron rookery or bat maternal colony roost. No such wildlife nursery sites were observed, and due to the small size of the Project site and its urbanized location, none is expected to occur.

4.2.6 Nesting Birds

Eight resident bird species were observed on the Project site, and several have potential to nest there. Nesting birds are protected by federal and State law (see Sections 5.1 and 5.2).

5.0 REGULATORY CONTEXT

Biological resources on the Project site are subject to regulatory administration by the federal government and State as follows.

5.1 FEDERAL

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA; 16 U.S. Code Sections 703-711) includes provisions for protection of migratory birds, including the non-permitted take of migratory birds. The MBTA regulates or prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50 Code of Federal Regulations Section 10.13. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and many others. Disturbance that causes nest abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is considered a "take." The MBTA is an international treaty for the conservation and management of bird species that migrate through more than one country, and is enforced in the United States by the USFWS. The MBTA was amended in 1972 to include protection for migratory birds of prey (raptors).

5.2 STATE OF CALIFORNIA

California Environmental Quality Act

Primary environmental legislation in California is found in the CEQA and its implementing guidelines (State CEQA Guidelines), requiring that projects with potential adverse effects or impacts on the environment undergo environmental review. Adverse impacts to the environment are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

California Fish and Game Code

Pursuant to California Fish and Game Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Raptors and owls and their active nests are protected by California Fish and Game Code Section 3503.5, which states that it is unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird unless authorized by the CDFW. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the MBTA. These regulations could require that construction activities (particularly vegetation removal or construction near nests) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by CDFW and/or USFWS.

5.3 CITY OF SAN DIEGO

Environmentally Sensitive Lands Regulations

Mitigation requirements for sensitive biological resources follow the requirements of the City's Biology Guidelines (2012) as outlined in the City's Municipal Code Environmentally Sensitive Lands (ESL) Regulations (Chapter 14, Article 3, Division 1). ESL Regulations serve as standards for the determination of biological impacts and mitigation under CEQA in the City. ESL include sensitive biological resources, steep hillsides, coastal beaches, sensitive coastal bluffs and 100-year floodplains (San Diego Municipal Code [SDMC] 143.0110).

The purpose of the ESL Regulations is to, "protect, preserve and, where damaged, restore the ESL of San Diego and the viability of the species supported by those lands" (SDMC 143.0101). The ESL regulations specify development requirements inside and outside of the MHPA. Inside the MHPA, development must be located in the least sensitive portion of a given site; outside of the MHPA, development must avoid wetlands and non-Covered Species (City 2012). The ESL regulations further require that impacts to sensitive biological resources must be assessed and mitigation provided where necessary, as required by Section III of the City's Biology Guidelines. The MSCP and MHPA are further discussed in Section 6.0.

Biology Guidelines

The City's Biology Guidelines (2012) have been formulated by the Development Services Department to aid in the implementation and interpretation of the ESL Regulations; San Diego Land Development Code, Chapter 14, Division 1, Section 143.0101 et seq; and the Open Space Residential (OR-1-2) Zone, Chapter 13, Division 2, Section 131.0201 et seq. Section III of the Biology Guidelines (Biological Impact Analysis and Mitigation Procedures) also serves as standards for the determination of impact and mitigation under CEQA and the Coastal Act. The Biology Guidelines are the baseline biological standards for processing Neighborhood Development Permits, Site Development Permits, and Coastal Development Permits issued pursuant to ESL Regulations.

6.0 REGIONAL CONTEXT

6.1 MSCP EVALUATION

The City's MSCP Subarea Plan (City 1997a) was prepared to meet the requirements of the California Natural Communities Conservation Planning (NCCP) Act of 1992. The City's Subarea Plan forms the basis for the MSCP Implementing Agreement (City 1997b), which is the contract between the City, USFWS, and CDFW. The Implementing Agreement ensures implementation of the City's Subarea Plan and thereby allows the City to issue "take" permits under the federal and State Endangered Species acts to address impacts at the local level.

Pursuant to its MSCP permit, the City has incidental "take" authority over 85 rare, threatened, and endangered species including regionally sensitive species that it aims to conserve (i.e., "Covered Species"). "Covered" refers to species that are covered by the City's Incidental Take Permit, and most are considered to be adequately protected within the MHPA. Special conditions apply to Covered Species that would be potentially impacted by a project including designing a project to avoid impacts to Covered Species in the MHPA where feasible. Outside the MHPA, projects must incorporate measures (i.e., Area Specific Management Directives) for the protection of Covered Species as identified in Appendix A of the City's Subarea Plan. There is one Covered Species, the orange-throated whiptail, on the Project site.

In addition to identifying preserve areas within the City (and guiding implementation of the MSCP within its corporate boundaries), the City's Subarea Plan also regulates effects on natural communities throughout the City. Additional discussion of the MHPA as it relates to the Project is provided in Section 6.1.1.

6.1.1 Multi-Habitat Planning Area

The MHPA was developed by the City in cooperation with the USFWS, CDFW, property owners, developers, and environmental groups using the Preserve Design Criteria contained in the Final MSCP Plan and the City Council-adopted criteria for the creation of the MHPA.

MHPA lands are large blocks of native habitat that have the ability to support a diversity of plant and animal life and, therefore, have been included within the City's Subarea Plan for conservation. The MHPA also delineates core biological resource areas and corridors targeted

for conservation as these lands have been determined to provide the necessary habitat quality, quantity, and connectivity to sustain the unique biodiversity of the San Diego region. The Project site is not within or adjacent to the MHPA.

6.1.2 MHPA Land Use Adjacency Guidelines

Development adjacent to the MHPA is subject to special conditions to ensure that indirect impacts to the MHPA are minimized. Section 1.4.3 of the City's Subarea Plan outlines the requirements to address indirect effects related to drainage and toxics, lighting, noise, public access, invasive plant species, brush management, and grading/land development. The Project site is not adjacent to the MHPA, however, so these adjacency guidelines would not apply.

6.1.3 Specific Management Directives

Section 1.5.7 of the City's Subarea Plan contains specific requirements for certain areas within the MHPA. The Project site is not within the MHPA; therefore, there are no specific management directives for the Project site.

6.1.4 Overall Management Policies and Directives

Section 1.5.7 of the City's Subarea Plan also contains requirements and goals for all MHPA areas. The Project site is not within the MHPA; therefore, there are no overall management policies and directives for the Project site.

7.0 PROJECT IMPACT ANALYSIS

This section analyzes the Project's effects on the sensitive biological resources. The City's CEQA Significance Determination Thresholds (City 2012) are used to establish whether or not there is a significant effect. A significant effect is defined as a "substantial or potentially substantial adverse change in the environment." Appendix G of the CEQA Guidelines further indicate that there may be a significant effect on biological resources if a project will:

A. Substantially affect an endangered, rare, or threatened species of animal or plant or the habitat of the species;

B. Interfere substantially with the movement of any resident or migratory fish or wildlife species; or

C. Substantially diminish habitat for fish, wildlife, or plants.

Impacts to biological resources are evaluated by City staff through the CEQA review process, the ESL Regulations and Biology Guidelines, and through the review of a project's consistency with the City's MSCP Subarea Plan.

For projects within the City or carried out by the City which may affect sensitive biological resources, potential impacts to such sensitive biological resources must be evaluated using the following significance criteria:

1. Would the project result in substantial adverse impacts, either directly or through habitat modifications, to any species identified as a candidate, sensitive or special status species in the MSCP or other local or regional plans, policies or regulations, of by the CDFW or USFWS?

2. Would the project result in a substantial adverse impacts on any Tier I, Tier II, Tier IIIA or Tier IIIB habitats as identified in the Biology Guidelines of the Land Development Code or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS?

3. Would the project result in a substantial adverse impact on wetlands (including, but not limited to, marsh, vernal pools, riparian areas, etc.) through direct removal, filling, hydrological interruption, or other means?

   There are no wetlands (or non-wetlands) on the Project site; therefore, there would be no impacts to these features, and this significance criterion is not addressed further.

4. Would the project substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, including linkages identified in the MSCP Plan, or impede the use of native wildlife nursery sites?

   There are no wildlife movement corridors or habitat linkages on, or adjacent to, the Project site, and there are no native wildlife nursery sites on the Project site. Therefore, the Project would not interfere with wildlife or impede the use of native wildlife nursery sites, and this significance criterion is not addressed further.

5. Would the project conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Conservation Community Plan (NCCP) or other approved local, regional or state habitat conservation plan, either within the MSCP plan area or in the surrounding region?

6. Would the project introduce a land use within an area adjacent to the MHPA that would result in adverse edge effects?

   The Project site is not adjacent to the MHPA, so it would not result in edge effects to the MHPA, and this significance criterion is not addressed further.

7. Would the project conflict with any local policies or ordinances protecting biological resources?

8. Would the project introduce invasive species of plants into natural open space?

   The Project site is surrounded by existing urban development, so it would not introduce invasive species of plants into natural open space, and this significance criterion is not addressed further.

7.1 DIRECT IMPACTS

7.1.1 Vegetation Communities

Approximately 5.4 acres of vegetation would be directly impacted through removal upon implementation of Project construction as presented in Table 6.

Table 6
IMPACTS TO VEGETATION COMMUNITIES

Vegetation Community	Impacts[1]
Upland	
Diegan coastal sage scrub (Tier II)	2.2
Diegan coastal sage scrub (disturbed) (Tier II)	0.8
Non-native grassland (Tier IIIB)	0.6
Other Upland (Tier IV)	
Disturbed habitat	1.1
Eucalyptus woodland	0.2
Ornamental	0.5
Total	**5.4**

[1]In acres, numbers reflect rounding.

Upland Vegetation Communities

Diegan Coastal Sage Scrub (including –disturbed; Tier II)

Approximately 3.0 acres of Diegan coastal sage scrub (including -disturbed) would be directly impacted through removal during Project construction. Since Diegan coastal sage scrub (including –disturbed) is a Tier II community, the impact would be substantial and adverse (Significance Criterion 2) and, therefore, significant. Mitigation would be required. The mitigation (see Section 8.1) would be consistent with Section III of the City's Biology Guidelines (2012), so the Project would not conflict with any local policies or ordinances (ESL Regulations) protecting biological resources (Significance Criterion 7).

Non-native Grassland (Tier IIIB)

Approximately 0.6 acre of non-native grassland would be directly impacted through removal during Project construction. Since non-native grassland is a Tier IIIB community, the impact would be substantial and adverse (Significance Criterion 2) and, therefore, significant. Mitigation would be required. The mitigation (see Section 8.1) would be consistent with Section III of the City's Biology Guidelines (2012), so the Project would not conflict with any local policies or ordinances (ESL Regulations) protecting biological resources (Significance Criterion 7).

Other Uplands (Tier IV)

Disturbed Habitat, Eucalyptus Woodland, and Ornamental

Approximately 1.1 acres of disturbed habitat, 0.3 acre of eucalyptus woodland, and 0.5 acre of ornamental landscaping would be directly impacted through removal during Project construction. Since these communities are not Tier I, Tier II, Tier IIIA or Tier IIIB habitats, and they are not sensitive natural communities identified in local or regional plans, policies, regulations or by the CDFW or USFWS, impacts to these communities would be less than significant (Significance Criterion 2). No mitigation would be required.

7.1.2 Sensitive Plant Species

Construction of the Project would result in the direct removal of CNPS Rare Plant Rank 4 (Watch List) graceful tarplant, San Diego sunflower, and ashy spike-moss. Since none of these species is federal or State Listed, a Narrow Endemic, a CNPS Rare Plant Rank 1 or 2 species, or an MSCP Covered Species (i.e., each has a very low level of sensitivity), the impact would be less than significant (Significance Criterion 1). No mitigation would be required.

7.1.3 Sensitive Animal Species

Orange-throated Whiptail

Construction of the Project could result in direct injury or mortality to the orange-throated whiptail and would result in direct loss of its habitat. Although the orange-throated whiptail is a State Species of Special Concern (Appendix C), it is also an MSCP Covered Species, which means that the City has take authority for it, and it is adequately conserved in the MHPA.

As stated in Section 6.1, outside the MHPA, projects must incorporate measures (i.e., Area Specific Management Directives) for the protection of Covered Species as identified in Appendix A of the City's Subarea Plan. Area Specific Management Directives for the orange-throated whiptail must address edge effects. Since the Project is surrounded by existing urban development, however, there would be no edge effects to address.

Therefore, impacts to the orange-throated whiptail (which would occur outside the MHPA) would be less than significant (Significance Criterion 1) and would not conflict with the provisions of the MSCP (Significance Criterion 5), and no mitigation would be required.

Nesting Birds

Potential impacts to protected nesting birds could result if clearing of vegetation or construction occurs during the breeding season (February 1 to September 15). Clearing of vegetation or construction activities could cause destruction or abandonment of active nests or mortality of adults, young, or eggs.

Impacts to protected nesting birds would be considered significant according to Significance Criterion 1 (substantial adverse impacts, either directly or through habitat modifications, to special status species). Mitigation would be required.

7.1.4 Sensitive Plant and Animal Species Not Observed

As shown in Tables 6 and 7, the potential for additional sensitive plant and animal species to occur on site is none to low. Therefore, these species are not expected to be present on site or impacted by the Project. Therefore, no mitigation would be required.

7.2 INDIRECT IMPACTS

Potential indirect impacts consist of secondary effects of a project such as habitat insularization, drainage/water quality issues, lighting, noise, and nuisance animals. The magnitude of an indirect impact can be the same as a direct impact, but the effect usually takes a longer time to become apparent.

Habitat Insularization

Habitat insularization is the fragmentation of large habitat areas into smaller "islands" effectively isolated from one another. Such fragmentation presents barriers to wildlife movement and breeding, splits animal and plant populations, and increases edge effects. The Project site is surrounded by development in an urbanized portion of the City. Development of the site would not, therefore, increase habitat insularization, and no mitigation would be required.

Drainage/Water Quality

Landscaping and irrigation associated with proposed development may result in increased runoff. Runoff due to irrigation is often associated with increased erosion, sedimentation, and pollution, which can significantly impact water quality. However, all runoff water from the Project would be collected and treated on site in the bio-retention locations and discharged into the City storm water system (Figure 3). Based on the Project's drainage and water quality design features, no significant impacts resulting from drainage or impaired water quality would occur, and no mitigation would be required.

Lighting

Night lighting exposes adjacent wildlife species to an unnatural light regime, may alter their behavior patterns, and consequently result in a loss of species diversity. The Project's surrounding landscape consists of existing development in an urban setting. As such, no significant lighting impacts to wildlife would occur, and no mitigation would be required.

Noise

The Project's surrounding landscape consists of existing development in an urban setting. As such, construction-related noise from such sources as clearing, grading, and vehicular traffic associated with Project construction would not result in a significant impact to wildlife. No mitigation would be required.

Nuisance Animals

Residential projects have the potential for domestic animals to impact native wildlife. In particular, free-roaming cats are known to harm native rodent and bird populations in locations where they have access to natural areas. The Project's surrounding landscape, however, consists of existing development in an urban setting. As such, no significant impacts to native wildlife would occur from nuisance animals, and no mitigation would be required.

8.0 MITIGATION MEASURES

This section includes the proposed measures to mitigate for significant impacts that would occur from the Project to sensitive vegetation communities. There are no other significant direct or indirect impacts associated with the Project.

8.1 SENSITIVE VEGETATION COMMUNITIES

The following mitigation measures have been formulated to satisfy the requirements of the City's Subarea Plan (City 1997a), ESL Regulations, and Biology Guidelines (City 2012). The mitigation ratios used in this report follow the City's ESL categorized five-tier system for impacts to sensitive upland communities as outlined in the Biology Guidelines:

- **Tier I**: There are no Tier I communities on site.
- **Tier II**: Coastal sage scrub and coastal sage scrub/chaparral ecotone (1:1 to 1.5:1)
- **Tier IIIA**: There are no Tier IIIA communities on site.
- **Tier IIIB**: Non-native grasslands (0.5:1 to 1:1)
- **Tier IV**: Disturbed, agricultural, and eucalyptus (0:1) While there are Tier IV communities on site, mitigation is not required for impacts to them.

Mitigation for impacts to Diegan coastal sage scrub and Diegan coastal sage scrub-disturbed are proposed to be mitigated at a ratio of 1:1 where the impact occurs outside the MHPA, and the mitigation occurs inside the MHPA. Mitigation for impacts to non-native grassland are proposed to be mitigated at a ratio of 0.5:1 (for habitat not occupied by the burrowing owl) where the impact occurs outside the MHPA, and the mitigation occurs inside the MHPA.

The Project proposes to provide 3.3 acres of mitigation (Table 7) and would accomplish this through payment into the City's Habitat Acquisition Fund, which the City uses to acquire habitat critical for biodiversity preservation and the success of the MSCP. According to the Biology Guidelines (City 2012), the Habitat Acquisition Fund is intended to be used for the mitigation of impacts to small (generally less than five acres), isolated sites with lower long-term conservation value. The Project's impacts that require mitigation total 3.6 acres, and the site is surrounded by existing urban development (i.e., it has low long-term conservation value).

Table 7 MITIGATION FOR IMPACTS TO SENSITIVE VEGETATION COMMUNITIES (acres)			
Vegetation Community	**Impact**	**Ratio**	**Mitigation**
Diegan coastal sage scrub (including disturbed) (Tier II)	3.0	1:1	3.0
Non-native grassland (Tier IIIB)	0.6	0.5:1[1]	0.3
TOTAL	**3.6**		**3.3**

[1]Non-burrowing owl occupied

On-site preservation of the remaining 0.2 acre of non-native grassland and 0.2 acre of Diegan coastal sage scrub (including –disturbed) on site would not be a feasible partial mitigation option. The remaining non-native grassland would occur in a narrow strip adjacent to College Boulevard and would be hemmed in between College Boulevard and the new residential development (Figure 3). Similarly, the Diegan coastal sage scrub (including –disturbed) occurs just upslope from the Interstate 8 westbound off-ramp at College Boulevard and would be adjacent to a bioretention basin and sewer and storm drain easement associated with the new residential development (Figure 3). The location of these communities in an area that is already urbanized coupled with proposed development immediately adjacent to them further reduces their already low long-term conservation value.

The measures outlined in Section 8.2 below are also required to ensure that the Project's impacts do not exceed the limits analyzed in this report.

8.2 BIOLOGICAL RESOURCE PROTECTION DURING CONSTRUCTION

I. Prior to Construction

A. **Biologist Verification** –The owner/permittee shall provide a letter to the City's Mitigation Monitoring Coordination (MMC) section stating that a Project Biologist (Qualified Biologist) as defined in the City of San Diego's Biological Guidelines (2012), has been retained to implement the project's biological monitoring program. The letter shall include the names and contact information of all persons involved in the biological monitoring of the project.

B. **Preconstruction Meeting –** The Qualified Biologist shall attend the preconstruction meeting, discuss the project's biological monitoring program, and arrange to perform any follow up mitigation measures and reporting including site-specific monitoring, restoration or revegetation, and additional fauna/flora surveys/salvage.

C. **Biological Documents –** The Qualified Biologist shall submit all required documentation to MMC verifying that any special mitigation reports including but not limited to, maps, plans, surveys, survey timelines, or buffers are completed or scheduled per City Biology Guidelines, Multiple Species Conservation Program (MSCP), Environmentally Sensitive Lands Ordinance (ESL), project permit conditions; California Environmental Quality Act (CEQA); endangered species acts (ESAs); and/or other local, state or federal requirements.

D. **BCME –**The Qualified Biologist shall present a Biological Construction Mitigation/Monitoring Exhibit (BCME) which includes the biological documents in C above. In addition, include: restoration/revegetation plans, plant salvage/relocation requirements (e.g., coastal cactus wren plant salvage, burrowing owl exclusions, etc.), avian or other wildlife surveys/survey schedules (including general avian nesting and USFWS protocol), timing of surveys, wetland buffers, avian construction avoidance areas/noise buffers/ barriers, other impact avoidance areas, and any subsequent requirements determined by the Qualified Biologist and the City ADD/MMC. The BCME shall include a site plan, written and graphic depiction of the project's biological mitigation/monitoring program, and a schedule. The BCME shall be approved by MMC and referenced in the construction documents.

E. **Avian Protection Requirements -** To avoid any direct impacts to raptors and/or any native/migratory birds, removal of habitat that supports active nests in the proposed area of disturbance should occur outside of the breeding season for these species (February 1 to September 15). If removal of habitat in the proposed area of disturbance must occur during the breeding season, the Qualified Biologist shall conduct a pre-construction survey to determine the presence or absence of nesting birds on the proposed area of disturbance. The pre-construction survey shall be conducted within 10 calendar days prior to the start of construction activities (including removal of vegetation). The applicant shall submit the results of the pre-construction survey to City Development Services Department for review and approval prior to initiating any construction activities. If nesting birds are detected, a letter report or mitigation plan in conformance with the City's Biology Guidelines and applicable State and Federal Law (i.e. appropriate follow up surveys, monitoring schedules, construction and noise barriers/buffers, etc.) shall be prepared and include proposed measures to be implemented to ensure that take of birds or eggs or disturbance of breeding activities is avoided. The report or mitigation plan shall be submitted to the City for review and approval and implemented to the satisfaction of the City. The City's MMC Section or Resident Engineer, and Biologist shall verify and approve that all measures identified in the report or mitigation plan are in place prior to and/or during construction.

F. **Resource Delineation -** Prior to construction activities, the Qualified Biologist shall supervise the placement of orange construction fencing or equivalent along the limits of disturbance adjacent to sensitive biological habitats and verify compliance with any other project conditions as shown on the BCME. This phase shall include flagging plant specimens and delimiting buffers to protect sensitive biological resources (e.g., habitats/flora & fauna species, including nesting birds) during construction. Appropriate steps/care should be taken to minimize attraction of nest predators to the site.

G. **Education –**Prior to commencement of construction activities, the Qualified Biologist shall meet with the owner/permittee or designee and the construction crew and conduct an on-site educational session regarding the need to avoid impacts outside of the approved construction area and to protect sensitive flora and fauna (e.g., explain the avian and wetland buffers, flag system for removal of invasive species or retention of sensitive plants, and clarify acceptable access routes/methods and staging areas, etc.).

II. During Construction

A. **Monitoring**- All construction (including access/staging areas) shall be restricted to areas previously identified, proposed for development/staging, or previously disturbed as shown on "Exhibit A" and/or the BCME. The Qualified Biologist shall monitor construction activities as needed to ensure that construction activities do not encroach into biologically sensitive areas, or cause other similar damage, and that the work plan has been amended to accommodate any sensitive species located during the pre-construction surveys. In addition, the Qualified Biologist shall document field activity via the Consultant Site Visit Record (CSVR). The CSVR shall be e-mailed to MMC on the 1st day of monitoring, the 1st week of each month, the last day of monitoring, and immediately in the case of any undocumented condition or discovery.

B. **Subsequent Resource Identification -** The Qualified Biologist shall note/act to prevent any new disturbances to habitat, flora, and/or fauna onsite (e.g., flag plant specimens for avoidance during access, etc). If active nests or other previously unknown sensitive resources are detected, all project activities that directly impact the resource shall be delayed until species specific local, state or federal regulations have been determined and applied by the Qualified Biologist.

III. Post Construction Measures

A. In the event that impacts exceed previously allowed amounts, additional impacts shall be mitigated in accordance with City Biology Guidelines, ESL and MSCP, State CEQA, and other applicable local, state and federal law. The Qualified Biologist shall submit a final BCME/report to the satisfaction of the City ADD/MMC within 30 days of construction completion.

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Appendix A

Plant Species Observed

Appendix A
PLANT SPECIES OBSERVED

SCIENTIFIC NAME	COMMON NAME	VEGETATION COMMUNITY
ANGIOSPERMAE – DICOTYLEDONEAE		
Adoxaceae – Elderberry Family		
Sambucus nigra ssp. *caerulea*	blue elderberry	DCSS
Aizoaceae – Ice Plant Family		
Carpobrotus edulis[3]	hottentot fig	DH
Anacardiaceae – Sumac Family		
Malosma laurina	laurel sumac	DCSS
Rhus integrifolia	lemonadeberry	DCSS
Schinus molle[3]	Peruvian pepper tree	DH, ORN
Schinus terebinthifolius[3]	Brazilian pepper tree	DH, ORN
Toxicodendron diversilobum	poison oak	DCSS
Apiaceae – Parsley Family		
Foeniculum vulgare[3]	sweet fennel	DH, NNG
Asteraceae (Compositae) – Sunflower Family		
Ambrosia psilostachya	western ragweed	NNG
Artemisia californica	coastal sagebrush	DCSS
Baccharis pilularis	coyote brush	DCSS
Baccharis salicifolia	mule fat	DCSS
Baccharis sarothroides	broom baccharis	DCSS
Bahiopsis laciniata[2]	San Diego County sunflower	DCSS
Centaurea melitensis[3]	tocalote	DH, NNG
Corethrogyne filaginifolia	sand-aster	DCSS
Cynara cardunculus ssp. *flavescens*[3]	artichoke thistle, cardoon	DH, NNG
Deinandra fasciculata	tarweed	DCSS, NNG
Encelia californica	California encelia	DCSS
Eriophyllum confertiflorum var. *confertiflorum*	long-stem golden-yarrow	DCSS, NNG
Gutierrezia californica	California matchweed	DCSS
Hazardia squarrosa var. *grindelioides*	southern saw-tooth goldenbush	DCSS
Hedypnois rhagadioloides[3]	Crete hedypnois	DH, ORN
Helminthotheca echioides[3]	bristly ox-tongue	DCSS-D

Appendix A (continued)
PLANT SPECIES OBSERVED

SCIENTIFIC NAME	COMMON NAME	VEGETATION
Holocarpha virgata ssp. *elongata*[2]	graceful tarplant	NNG
Isocoma menziesii var. *menziesii*	spreading goldenbush	DCSS
Lactuca serriola[3]	prickly lettuce	DH
Logfia arizonica	Arizona filago	DH, NNG
Pseudognaphalium californicum	California everlasting	DCSS
Psilocarphus tenellus	slender wooly-heads	DCSS
Sonchus asper ssp. *asper*[3]	prickly sow-thistle	DH
Xanthium strumarium	cocklebur	DH
Boraginaceae – Borage Family		
Amsinckia intermedia	rancher's fiddleneck	NNG
Brassicaceae – Mustard Family		
Brassica nigra[3]	black mustard	DH, DCSS
Hirschfeldia incana[3]	perennial mustard	DH, NNG
Lepidium nitidum[3]	peppergrass	DCSS
Raphanus sativus[3]	wild radish	DH, NNG
Cactaceae – Cactus Family		
Opuntia littoralis	coastal prickly pear	NNG, DCSS
Capparaceae – Caper Family		
Cleome arborea	bladderpod	DH
Chenopodiaceae – Goosefoot Family		
Salsola australis[3]	Russian thistle	DH, NNG
Convolvulaceae – Morning Glory Family		
Calystegia macrostegia ssp. *tenuifolia*	San Diego morning glory	DCSS, NNG
Crassulaceae – Stonecrop Family		
Crassula connata	pygmyweed	DCSS
Crassula ovata[3]	jade plant	DH, ORN
Cucurbitaceae – Gourd Family		
Marah macrocarpa	chilicothe	DCSS

Appendix A (continued)
PLANT SPECIES OBSERVED

SCIENTIFIC NAME	COMMON NAME	VEGETATION
Euphorbiaceae – Spurge Family		
Euphorbia maculata[3]	spotted spurge	DH
Fabaceae – Legume Family		
Acmispon glaber var. *glaber*	deerweed	DCSS
Medicago polymorpha[3]	burclover	DH
Geraniaceae – Geranium Family		
Erodium botrys[3]	storksbill	DH, DCSS
Erodium cicutarium[3]	red-stem filaree	DH
Lamiaceae – Mint Family		
Marrubium vulgare[3]	horehound	DH
Salvia mellifera	black sage	DCSS
Myrtaceae – Myrtle Family		
Eucalyptus globulus[3]	Tasmanian bluegum	EW, ORN
Eucalyptus sideroxylon[3]	red ironbark	EW
Nyctaginaceae – Four O'Clock Family		
Bougainvillea sp.[3]	bougainvillea	ORN
Mirabilis laevis var. crassifolia	coastal wishbone plant	DCSS
Oxalidaceae – Wood Sorrel Family		
Oxalis pes-caprae[3]	Bermuda buttercup	DH, ORN
Phyrmaceae – Lopseed Family		
Mimulus aurantiacus	monkey flower bush	DCSS
Polemoniaceae – Flox Family		
Navarretia hamata	skunk weed	DCSS
Polygonaceae - Buckwheat Family		
Eriogonum fasciculatum ssp. *fasciculatum*	California buckwheat	DCSS
Polygonum aviculare[3]	knotweed	DH
Primulaceae – Primrose Family		
Anagallis arvensis[3]	scarlet pimpernel	DH

Appendix A (continued)
PLANT SPECIES OBSERVED

SCIENTIFIC NAME	COMMON NAME	VEGETATION
Rhamnaceae – Buckthorn Family		
Rhamnus crocea	spiny redberry	DCSS
Rosaceae – Buckthorn Family		
Heteromeles arbutifolia	toyon, Christmas berry	DCSS
Solanaceae – Nightshade Family		
Nicotiana glauca[3]	tree tobacco	DH
Solanum parishii	Parish's nightshade	DCSS
Tamaricaceae – Tamarisk Family		
Tamarix ramosissima[3]	saltcedar	DH
ANGIOSPERMAE – MONOCOTYLEDONEAE		
Arecaceae – Palm Family		
Washingtonia robusta[3]	Mexican fan palm	ORN
Phoenix canariensis[3]	Canary Island date palm	ORN
Asphodelaceae – Aloe Family		
Aloe vera[3]	aloe vera	ORN
Cyperaceae – Sedge Family		
Cyperus papyrus[3]	papyrus sedge	ORN
Poaceae – Grass Family		
Avena barbata[3]	slender wild oat	NNG, DCSS
Avena fatua[3]	wild oat	NNG, DCSS
Bromus diandrus[3]	ripgut grass	NNG
Bromus madritensis ssp. *rubens*[3]	foxtail chess, red brome	NNG
Cortaderia selloana[3]	selloa pampas grass	NNG, DH
Cynodon dactylon[3]	Bermuda grass	NNG
Lamarckia aurea[3]	goldentop	NNG, DH, DCSS
Paspalum dilatatum[3]	dallis grass	NNG, DH
Pennisetum setaceum[3]	crimson fountain grass	NNG, DCSS
Schismus barbatus[3]	Mediterranean schismus	NNG
Stipa pulchra	purple needlegrass	DCSS

Appendix A (continued)
PLANT SPECIES OBSERVED

SCIENTIFIC NAME	COMMON NAME	VEGETATION
GYMNOSPERMAE		
Pinaceae – Pine Family		
Pinus sp.[3]	ornamental pine	ORN
LYCOPODIAE		
Selaginellaceae – Spike-Moss Family		
Selaginella cinerascens[2]	ashy spike-moss	DCSS

[1]DH=disturbed habitat; DCSS=Diegan coastal sage scrub; DCSS-D=Diegan coastal sage scrub-disturbed; EW=eucalyptus woodland; NNG=non-native grassland; ORN=ornamental

[2] Sensitive species

[3] Non-native species

Appendix B

Animal Species Observed or Detected

Appendix B
ANIMAL SPECIES OBSERVED OR DETECTED

SCIENTIFIC NAME	COMMON NAME	WHERE OBSERVED[1]
INVERTEBRATES		
Hymenoptera – Ants, Bees, Wasps, Sawflies		
Linepithema humile	Argentine ant	DH, DCSS
Apis mellifera	honey bee	DCSS, DH, ORN
Bombus sp.	bumble bee	DCSS
Lepidoptera - Butterflies and Moths		
Pieris rapae	common white butterfly	NNG
Nymphalis antiopa	mourning cloak butterfly	DH
VERTEBRATES		
Herpetofauna		
Phrynosomatidae - Lizards		
Aspidoscelis hyperythra beldingi[2]	orange-throated whiptail	DCSS/DH
Sceloporus occidentalis	western fence lizard	DH, DCSS
Birds		
Aegithalidae - Bushtits		
Psaltriparus minimus	bushtit	DCSS
Corvidae -Jays, Magpies, Crows, Ravens		
Corvus corax	common raven	ORN
Emberizidae - Sparrows, Longspurs, Emberiza Buntings		
Melospiza melodia	song sparrow	DCSS
Pipilo crissalis	California towhee	DCSS
Fringillidae- Finches		
Carpodacus mexicanus	house finch	ORN, DCSS
Carduelis psaltria	lesser goldfinch	ORN
Mimidae- Thrashers, Mockingbirds, Tremblers, Catbirds		
Mimus polyglottos	northern mockingbird	ORN

Appendix B (continued)
ANIMAL SPECIES OBSERVED OR DETECTED

SCIENTIFIC NAME	COMMON NAME	WHERE OBSERVED[1]
Birds		
Trochilidae- Hummingbirds		
Calypte anna	Anna's hummingbird	DCSS
Mammals		
Canidae – Dogs, Wolves, Foxes, Jackals		
Canis latrans	coyote (scat)	DH
Leporidae - Rabbits and Hares		
Sylvilagus auduboni	desert cottontail	DCSS, NNG, DH

[1]DH=disturbed habitat; DCSS=Diegan coastal sage scrub; NNG=non-native grassland; ORN=ornamental
[2]Sensitive species

Appendix C

Explanation of Listing or Status Codes for Plant and Animal Species

Appendix C

EXPLANATION OF LISTING/SENSITIVITY CODES FOR PLANT AND ANIMAL SPECIES

U.S. Fish and Wildlife Service (USFWS)

FE Federally Listed Endangered

FT Federally Listed Threatened

FC Candidate for Federal Endangered Species Act Protection

BCC Bird of Conservation Concern—Represents USFWS' highest conservation priorities and draw attention to species in need of conservation action.

California Department of Fish and Wildlife (CDFW)

SE State Listed Endangered

SSC State Species of Special Concern—Declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

WL Watch List—Birds that are/were: a) not on the current list of species of special concern but were on previous lists and have not been State listed under the California Endangered Species Act; b) previously State or federally listed and now are on neither list; or c) on the list of "Fully Protected" species.

FP Fully Protected refers to all vertebrate and invertebrate taxa of concern to the California Natural Diversity Data Base regardless of legal or protection status. These species may not be taken or possessed without a permit from the Fish and Game Commission and/or CDFW.

City of San Diego

MSCP Covered Species Covered Species are those species included in the Incidental Take Authorization issued to the City by the USFWS and CDFW as part of the City's MSCP Subarea Plan.

MSCP Narrow Endemic Species A species that is confined to a specific geographic region, soil type, and/or habitat. Narrow Endemic species are a subset of Covered Species.

EXPLANATION OF LISTING OR STATUS CODES FOR PLANT AND ANIMAL SPECIES

California Native Plant Society (CNPS)

California Rare Plant Rank

1A = Presumed extirpated in California and either rare or extinct elsewhere.

1B = Rare, threatened, or endangered in California and elsewhere.

2A= Presumed extirpated in California but more common elsewhere.

2B= Rare, threatened, or endangered in California but more common elsewhere.

3 = More information is needed.

4 = A watch list for species of limited distribution.

Threat Rank

.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)

.2 = Moderately endangered in California (20 to 80 percent occurrences threatened/moderate degree and immediacy of threat)

.3 = Not very threatened in California (less than 20 percent of occurrences threatened/ low degree and immediacy of threat or no current threats known)

PHASE I CULTURAL RESOURCE SURVEY FOR THE DEL CERRO PROJECT

CITY OF SAN DIEGO

Project No. 435483
APN 463-010-10

Submitted to:

City of San Diego
Development Services Department
1222 First Avenue, MS 501
San Diego, California 92101

Prepared for:

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Prepared by:

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April 12, 2016

Archaeological Database Information

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Report Date:	April 12, 2016
Report Title:	Phase I Cultural Resource Survey for the Del Cerro Project, City of San Diego
Prepared for:	ColRich 444 West Beach Street, Suite 300 San Diego, California 92101
Submitted to:	City of San Diego Development Services Department 1222 First Avenue, MS 501 San Diego, California 92101
Prepared by:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064
USGS Quadrangle:	*La Mesa, California* (7.5 minute)
Study Area:	APN 463-010-10
Lead Agency Identifier:	Project No. 435483
Key Words:	Phase I survey; negative; City of San Diego; monitoring recommended.

I. PROJECT DESCRIPTION AND LOCATION

As requested by the City of San Diego, Brian F. Smith and Associates, Inc. (BFSA) conducted a Phase I archaeological records search review and pedestrian survey of the approximately 5.99-acre Del Cerro Project (Marburn Corp TM Project; City of San Diego Project Number 435483) located on an undeveloped lot at the southeast portion of the intersection of College Avenue and Del Cerro Boulevard, in the Navaho Community Plan Area, in the Del Cerro neighborhood of San Diego, California (Assessor's Parcel Number [APN] 463-010-10). Specifically, this project is located in the unsectioned Mission San Diego Land Grant on the USGS 7.5-minute La Mesa, California topographic quadrangle (Township 16 South, Range 2 West [projected]) (Figures 1 through 3 [Attachment B]). The project proposes to subdivide one existing, vacant, 5.99-acre parcel into 26 residential single-family lots and four homeowner association lots (Figure 4 [Attachment B]).

The records search was compiled from information gathered at the South Coastal Information Center (SCIC) at San Diego State University (SDSU) and the BFSA archives to determine if any recorded cultural resources are present within the project area. The SCIC records search identified the presence of 12 recorded sites within a one-mile radius of the project area. However, no cultural resources were identified within the current Area of Potential Effect (APE). The field survey took place on March 11, 2016. No cultural resources were identified within the project area. As a result, the proposed development and related infrastructure developments can be implemented without further archaeological study.

II. SETTING

The project setting includes both physical and biological contexts of the proposed project, as well as the cultural setting of prehistoric and historic human activities in the general area.

Natural Setting

The project is situated in an area of urbanized development that is geologically mapped as the Lindavista Formation, which is underlain by the Mission Valley Formation and the San Diego Formation. Vegetation within the project area is classified as primarily urban/developed, including various non-native grasses, ground cover, trees, and shrubs. Native coastal sage scrub vegetation was likely common to the area during prehistoric times (Beauchamp 1986; Randolph 1955). The coastal sage scrub and chamise chaparral plant communities comprised major food resources for prehistoric inhabitants (Bean and Saubel 1972), as did the rocky foreshore and sand beach marine communities of nearby coastal environs.

Plate 1: Overview of the project area, facing south.

Cultural Setting

The cultures that have been identified in the general vicinity of the project consist of a possible Paleo Indian manifestation of the San Dieguito Complex, the Archaic and Early Milling Stone horizons represented by the La Jolla Complex, and the Late Prehistoric Kumeyaay culture. The area was used for ranching and farming following the Hispanic intrusion into the region, continuing through the historic period. A brief discussion of the cultural elements in the project area is provided in the following sections.

Paleoenvironment

Because of the close relationship between prehistoric settlement and subsistence patterns and the environment, it is necessary to understand the setting in which these systems operated. At the end of the final period of glaciation, approximately 11,000 to 10,000 years before the present (YBP), the sea level was considerably lower than it is now; the coastline at that time would have been between two and two and a half miles west of its present location (Smith and Moriarty 1985). At approximately 7,000 YBP, the sea level rose rapidly, filling in many coastal canyons that had been dry during the glacial period. The period between 7,000 and 4,000 YBP was characterized by conditions that were drier and warmer than they were previously, followed by a cooler, moister environment (Robbins-Wade 1990). Changes in sea level and coastal topography are often manifested in archaeological sites through the types of shellfish that were utilized by prehistoric groups. Different species of shellfish prefer certain types of environments, and dated sites that contain shellfish remains reflect the setting that was exploited

by the prehistoric occupants.

Unfortunately, pollen studies have not been conducted for this section of San Diego; however, studies in other areas of southern California, such as Santa Barbara, indicate that the coastal plains supported a pine forest between approximately 12,000 and 8,000 YBP (Robbins-Wade 1990). After 8,000 YBP, this environment was replaced by more open habitats, which supported oak and non-arboreal communities. The coastal sage scrub and chaparral environments of today appear to have become dominant after 2,200 YBP (Robbins-Wade 1990).

Prehistory

In general, the prehistoric record of San Diego County has been documented in many reports and studies, several of which represent the earliest scientific works concerning the recognition and interpretation of the archaeological manifestations present in this region. Geographer Malcolm Rogers initiated the recordation of sites in the area during the 1920s and 1930s, using his field notes to construct the first cultural sequences based upon artifact assemblages and stratigraphy (Rogers 1966). Subsequent scholars expanded the information gathered by Rogers and offered more academic interpretations of the prehistoric record. Moriarty (1966, 1967, 1969), Warren (1964, 1966), and True (1958, 1966) all produced seminal works that critically defined the various prehistoric cultural phenomena present in this region (Moratto 1984). Additional studies have sought to refine these earlier works to a greater extent (Cardenas 1986; Moratto 1984; Moriarty 1966, 1967; True 1970, 1980, 1986; True and Beemer 1982; True and Pankey 1985; Waugh 1986). In sharp contrast, the current trend in San Diego prehistory has also resulted in a revisionist group that rejects the established cultural historical sequence for San Diego. This revisionist group (Warren et al. 1998) has replaced the concepts of La Jolla, San Dieguito, and all of their other manifestations with an extensive, all-encompassing, chronologically undifferentiated cultural unit that ranges from the initial occupation of southern California to around A.D. 1000 (Bull 1983, 1987; Ezell 1983, 1987; Gallegos 1987; Kyle et al. 1990; Stropes 2007). For the present study, the prehistory of the region is divided into four major periods: Early Man, Paleo Indian, Early Archaic, and Late Prehistoric.

Early Man Period (Prior to 8500 B.C.)

At the present time, there has been no concrete archaeological evidence to support the occupation of San Diego County prior to 10,500 YBP. Some archaeologists, such as Carter (1957, 1980) and Minshall (1976), have been proponents of Native American occupation of the region as early as 100,000 YBP. However, their evidence for such claims is sparse at best and has lost much support over the years as more precise dating techniques have become available for skeletal remains thought to represent early man in San Diego. In addition, many of the "artifacts" initially identified as products of early man in the region have since been rejected as natural products of geologic activity. Some of the local proposed Early Man Period sites include Texas Street, Mission Valley (San Diego River Valley), Del Mar, La Jolla, Buchanan Canyon,

and Brown (Bada et al. 1974; Carter 1957, 1980; Minshall 1976, 1989; Moriarty and Minshall 1972; Reeves 1985; Reeves et al. 1986).

Paleo Indian Period (8500 to 6000 B.C.)

For the region, it is generally accepted that the earliest identifiable culture in the archaeological record is represented by the material remains of the Paleo Indian Period San Dieguito Complex. The San Dieguito Complex was thought to represent the remains of a group of people who occupied sites in this region between 10,500 and 8,000 YBP, and who were related to or contemporaneous with groups in the Great Basin. As of yet, no absolute dates have been forthcoming to support the great age attributed to this cultural phenomenon. The artifacts recovered from San Dieguito Complex sites duplicate the typology attributed to the Western Pluvial Lakes Tradition (Moratto 1984; Davis et al. 1969). These artifacts generally include scrapers, choppers, large bifaces, large projectile points, and few milling tools. Tools recovered from San Dieguito Complex sites, along with the general pattern of their site locations, led early researchers to believe that the people of the San Dieguito Complex were a wandering, hunting, and gathering society (Moriarty 1969; Rogers 1966).

The San Dieguito Complex is the least understood of the cultures that have inhabited the San Diego County region. This is due to an overall lack of stratigraphic information and/or datable materials recovered from sites identified as the San Dieguito Complex. Currently, controversy exists among researchers regarding the relationship of the San Dieguito Complex and the subsequent cultural manifestation in the area, the La Jolla Complex. Although, firm evidence has not been recovered to indicate whether the San Dieguito Complex "evolved" into the La Jolla Complex, the people of the La Jolla Complex moved into the area and assimilated with the people of the San Dieguito Complex, or the people of the San Dieguito Complex retreated from the area due to environmental or cultural pressures.

Early Archaic Period (6000 B.C. to A.D. 0)

Based upon evidence suggesting climatic shifts and archaeologically observable changes in subsistence strategies, a new cultural pattern is believed to have emerged in the San Diego region around 6000 B.C. This Archaic Period pattern is believed by archaeologists to have evolved from or replaced the San Dieguito Complex culture, resulting in a pattern referred to as the Encinitas Tradition. In San Diego, the Encinitas Tradition is thought to be represented by the coastal La Jolla Complex and its inland manifestation, the Pauma Complex. The La Jolla Complex is best recognized for its pattern of shell middens, grinding tools closely associated with marine resources, and flexed burials (Shumway et al. 1961; Smith and Moriarty 1985). Increasing numbers of inland sites have been identified as dating to the Archaic Period, focusing upon terrestrial subsistence (Cardenas 1986; Smith 1996; Raven-Jennings and Smith 1999a, 1999b).

The tool typology of the La Jolla Complex displays a wide range of sophistication in the

lithic manufacturing techniques used to create the tools found at their sites. Scrapers, the dominant flaked tool type, were created by either splitting cobbles or by finely flaking quarried material. Evidence suggests that after about 8,200 YBP, milling tools began to appear in La Jolla Complex sites. Inland sites of the Encinitas Tradition (Pauma Complex) exhibit a reduced quantity of marine-related food refuse and contain large quantities of milling tools and food bone. The lithic tool assemblage shifts slightly to encompass the procurement and processing of terrestrial resources, suggesting seasonal migration from the coast to the inland valleys (Smith 1996). At the present time, the transition from the Archaic Period to the Late Prehistoric Period is not well understood. Many questions remain concerning cultural transformation between periods, possibilities of ethnic replacement, and/or a possible hiatus from the western portion of the county.

Late Prehistoric Period (A.D. 0 to 1769)

The transition into the Late Prehistoric Period in the project area is primarily represented by a marked change in archaeological patterning known as the Yuman Tradition. This tradition is primarily represented by the Cuyamaca Complex, which is believed to be derived from the mountains of southern San Diego County. The people of the Cuyamaca Complex are considered as ancestral to the ethnohistoric Kumeyaay (Diegueño). Although several archaeologists consider the local Native American tribes to be latecomers, the traditional stories and histories that are orally passed down by the local Native American groups speak both presently and ethnographically to tribal presence in the region as being since the time of creation.

The Kumeyaay Native Americans were a seasonal hunting and gathering people with cultural elements that were very distinct from the people of the La Jolla Complex. Noted variations in material culture included cremation, the use of the bow and arrow, and adaptation to the use of the acorn as a main food staple (Moratto 1984). Along the coast, the Kumeyaay made use of marine resources by fishing and collecting shellfish for food. Game and seasonally available plant food resources (including acorns) were sources of nourishment for the Kumeyaay. By far, though, the most important food resource for these people was the acorn. The acorn represented a storable surplus, which in turn allowed for seasonal sedentism and its attendant expansion of social phenomena.

Firm evidence has not been recovered to indicate whether the people of the La Jolla Complex were present when the Kumeyaay Native Americans migrated into the coastal zone. However, stratigraphic information recovered from Site SDI-4609 in Sorrento Valley suggests a possible hiatus of 650 ± 100 years between the occupation of the coastal area by the La Jolla Complex (1,730 ± 75 YBP is the youngest date for the La Jolla Complex inhabitants at SDI-4609) and Late Prehistoric cultures (Smith and Moriarty 1983). More recently, a reevaluation of two prone burials at the Spindrift Site excavated by Moriarty (1965) and radiocarbon dates of a pre-ceramic phase of Yuman occupation near the San Diego suburb of Santee suggest a commingling of the latest La Jolla Complex inhabitants and the earliest Yuman inhabitants about

2,000 YBP (Kyle and Gallegos 1993).

History

Exploration Period (1530 to 1769)

The historic period around San Diego Bay began with the landing of Juan Rodriguez Cabrillo and his men in 1542 (Chapman 1925). Sixty years after the Cabrillo expeditions (1602 to 1603), Sebastian Vizcaíno made an extensive and thorough exploration of the Pacific coast. Although his voyage did not extend beyond the northern limits of the Cabrillo track, Vizcaíno had the most lasting effect on the nomenclature of the coast. Many of the names Vizcaíno gave to various locations throughout the region have survived to the present time, whereas nearly every one of Cabrillo's has faded from use. For example, Cabrillo gave the name "San Miguel" to the first port he stopped at in what is now the United States; 60 years later, Vizcaíno changed the port name to "San Diego" (Rolle 1969).

Spanish Colonial Period (1769 to 1821)

The Spanish occupation of the claimed territory of Alta California took place during the reign of King Carlos III of Spain (Engelhardt 1920). Jose de Gálvez, a powerful representative of the king in Mexico, conceived the plan to colonize Alta California and thereby secure the area for the Spanish Crown (Rolle 1969). The effort involved both a military and religious contingent, where the overall intent of establishing forts and missions was to gain control of the land and the native inhabitants through conversion. Actual colonization of the San Diego area began on July 16, 1769, when the first Spanish exploring party, commanded by Gaspar de Portolá (with Father Junípero Serra in charge of religious conversion of the native populations), arrived by the overland route to San Diego to secure California for the Spanish Crown (Palou 1926). The natural attraction of the harbor at San Diego and the establishment of a military presence in the area solidified the importance of San Diego to the Spanish colonization of the region and the growth of the civilian population. Missions were constructed from San Diego to as far north as San Francisco. The mission locations were based upon important territorial, military, and religious considerations. Grants of land were made to persons who applied, but many tracts reverted back to the government for lack of use. As an extension of territorial control by the Spanish Empire, each mission was placed so as to command as much territory and as large a population as possible. While primary access to California during the Spanish Period was by sea, the route of El Camino Real served as the land route for transportation, commercial, and military activities within the colony. This route was considered to be the most direct path between the missions (Rolle 1969; Caughey 1970). As increasing numbers of Spanish and Mexican peoples, as well as the later Americans during the Gold Rush, settled in the area, the Native American populations diminished as they were displaced or decimated by disease (Carrico and Taylor 1983).

Mexican Period (1821 to 1846)

On September 16, 1810, the priest Father Miguel Hidalgo y Costilla started a revolt against Spanish rule. He and his untrained Native American followers fought against the Spanish, but his revolt was unsuccessful and Father Hidalgo was executed. After this setback, Father José Morales led the revolutionaries, but he too failed and was executed. These two men are still symbols of Mexican liberty and patriotism. After the Mexican-born Spanish and the Catholic Church joined the Revolution, Spain was finally defeated in 1821. Mexican Independence Day is celebrated on September 16 of each year, signifying the anniversary of the start of Father Hidalgo's revolt. The revolution had repercussions in the northern territories, and by 1834, all of the mission lands had been removed from the control of the Franciscan Order under the Acts of Secularization. Without proper maintenance, the missions quickly began to disintegrate, and after 1836, missionaries ceased to make regular visits inland to minister to the needs of the Native Americans (Engelhardt 1920). Large tracts of land continued to be granted to persons who applied for them or who had gained favor with the Mexican government. Grants of land were also made to settle government debts and the Mexican government was called upon to reaffirm some older Spanish land grants shortly before the Mexican-American War of 1846 (Moyer 1969).

Anglo-American Period (1846 to Present)

California was invaded by United States troops during the Mexican-American War from 1846 to 1848. The acquisition of strategic Pacific ports and California land was one of the principal objectives of the war (Price 1967). At the time, the inhabitants of California were practically defenseless, and they quickly surrendered to the United States Navy in July of 1847 (Bancroft 1886).

The cattle ranchers of the "counties" of southern California prospered during the cattle boom of the early 1850s. They were able to "reap windfall profit … pay taxes and lawyer's bills … and generally live according to custom" (Pitt 1966). However, cattle ranching soon declined, contributing to the expansion of agriculture. With the passage of the "No Fence Act," San Diego's economy shifted from raising cattle to farming (Robinson 1948). The act allowed for the expansion of unfenced farms, which was crucial in an area where fencing material was practically unavailable. Five years after its passage, most of the arable lands in San Diego County had been patented as either ranchos or homesteads, and growing grain crops replaced raising cattle in many of the county's inland valleys (Blick 1976; Elliot 1883 [1965]).

By 1870, farmers had learned to dry farm and were coping with some of the peculiarities of San Diego County's climate (*San Diego Union,* February 6, 1868; Van Dyke 1886). Between 1869 and 1871, the amount of cultivated acreage in the county rose from less than 5,000, to more than 20,000 acres (*San Diego Union,* January 2, 1872). Of course, droughts continued to hinder the development of agriculture (Crouch 1915; *San Diego Union,* November 10, 1870; Shipek 1977). Large-scale farming in San Diego County was limited by a lack of water and the small

size of arable valleys. The small urban population and poor roads also restricted commercial crop growing. Meanwhile, cattle continued to be grazed in parts of inland San Diego County. In the Otay Mesa area, for example, the "No Fence Act" had little effect on cattle farmers because ranches were spaced far apart and natural ridges kept the cattle out of nearby growing crops (Gordinier 1966).

During the first two decades of the twentieth century, the population of San Diego County continued to grow. The population of the inland county declined during the 1890s, but between 1900 and 1910, it rose by about 70 percent. The pioneering efforts were over, the railroads had broken the relative isolation of southern California, and life in San Diego County had become similar to other communities throughout the west. After World War I, the history of San Diego County was primarily determined by the growth of San Diego Bay. In 1919, the United States Navy decided to make the bay the home base for the Pacific Fleet (Pourade 1967), as did the aircraft industry during the 1920s (Heiges 1976). The establishment of these industries led to the growth of the county as a whole; however, most of the civilian population growth occurred in the north county coastal areas, where the population almost tripled between 1920 and 1930. During this time period, the history of inland San Diego County was subsidiary to that of the city of San Diego, which had become a Navy center and an industrial city (Heiges 1976). In inland San Diego County, agriculture became specialized and recreational areas were established in the mountain and desert areas. Just before World War II, urbanization began to spread to the inland parts of the county.

III. AREA OF POTENTIAL EFFECT

This archaeological review encompassed the entire project parcel (APN 463-010-10) located near the intersection of College Avenue and Del Cerro Boulevard. The APE can be characterized as largely undeveloped land covered by a mix of native vegetation, introduced grasses, and trees. A large drainage runs through the project area from the northern section of the current APE, trending southwest, dominating the north and west portions of the property. The north area, adjacent to College Boulevard to the south, consists of a steep slope associated with the road. The vegetation primarily consists of what looks to be introduced Chinese fountain grass and sumac.

Plate 2: Overview of the Del Cerro Project, facing west.

However, sage scrub vegetation increases along the western portion of the project. Eucalyptus trees, palm trees, three oak trees, a few castor bean plants, and a single pepper tree were also located within the APE. A roughly graded, pushed dirt road exists on the east side of the APE, running from the northern boundary to an area of riprap situated within the approximate center of the project. The proposed development for the project includes the construction of 26 single-family home lots and four homeowner association lots on 5.99 acres (Figure 4 [Attachment B]).

IV. STUDY METHODS

An archaeological records search was completed for the project by the SCIC on March 22, 2016 (Attachment C). The SCIC reported that no previously recorded archaeological sites are recorded within the project boundaries. However, 12 cultural resource locations have been recorded within a one-mile radius of the project area. These sites include two prehistoric artifact scatters, two prehistoric milling feature sites with associated artifacts, one prehistoric shell scatter, one prehistoric isolate, five historic structures (including the Aztec Bowl), and one unknown. The majority of the historic properties are related to SDSU. Sixty-six cultural resource studies have been conducted within a one-mile radius of the proposed project area, none of which significantly overlap the APE; however, two studies partially touch the edge of the APE. These are large general overview studies and do not contain any information specific to the project APE. BFSA also reviewed the following historic sources:

- The National Register of Historic Places Index
- The Office of Historic Preservation, Archaeological Determinations of Eligibility
- The Office of Historic Preservation, Directory of Properties in the Historic Property Data File
- The 1:24,000-scale USGS *La Mesa* (1953) topographic map
- San Diego County 1872 map

These sources did not indicate the presence of cultural resources within or immediately adjacent to the project. Only the archaeological records search from the SCIC documented prehistoric sites near the project boundaries.

In addition, a Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC). The NAHC SLF search did not indicate the presence of any Native American cultural resources in the immediate vicinity of the Del Cerro Project. In accordance with the recommendation of the NAHC, BFSA contacted all of the tribal contacts that were provided. To date, one response has been received from Mr. Clint Linton of the Iipay Nation of Santa Ysabel, who requests that a Kumeyaay Native American monitor be present for all ground-disturbing activities related to the project. Original correspondence can be found in Attachment D.

A BFSA archaeologist conducted an intensive pedestrian survey of the project. Aerial photographs and development maps permitted orientation and location of project boundaries. Where possible, the archaeologist employed narrow transect paths to ensure maximum survey coverage. All exposed ground was inspected for cultural materials. A survey form, field notes, and photographs documented the survey work undertaken.

V. RESULTS OF THE STUDY

Background Research

The areas of the Del Cerro neighborhood to the west and further east of the project have yielded cultural remains that document prehistoric occupation. For example, a few miles to the west, sites such as SDI-18,327 represent early milling sites (Early Archaic La Jolla Complex and Late Prehistoric Kumeyaay) beginning approximately 5,000 YBP.

Field Reconnaissance

On March 11, 2016, Principal Investigator Brian F. Smith directed the field survey of the property with the assistance of archaeological field crew supervisor Clarence Hoff. Some visibility constraints were encountered during the survey, as only 50 percent of the ground surface was visible due to heavy vegetation, which included introduced Chinese fountain grass, sumac, and sage scrub. A large drainage was noted in the western and southwestern portions of the project. Three oak trees, eucalyptus trees, palm trees, a few castor bean plants, and a single pepper tree were also identified within the APE. Exposed ground surfaces (eroded slopes, disturbed ground, and rodent burrows) were carefully inspected. The survey did not result in the discovery of any artifacts, cultural ecofacts, or other materials related to the prehistoric or historic land use within the project boundaries. No midden soils or cultural resources were observed.

Evaluation

The Phase I archaeological assessment for the Del Cerro Project was negative for the presence of previously recorded cultural resources. In addition, no cultural resources were identified as a result of the current study. The background research indicates that prehistoric and historic resources are frequent in the surrounding area of the APE. Based upon the high frequency of prehistoric archaeological sites surrounding the APE and the low ground visibility encountered during the survey, it is recommended that the project be allowed to proceed with a Mitigation Monitoring and Reporting Program (MMRP) made as a condition of approval based upon the potential for undiscovered/buried resources.

VI. RECOMMENDATIONS

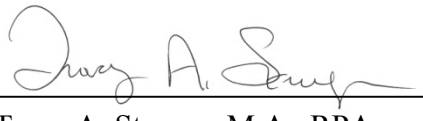
The City of San Diego typically requires two tasks for an archaeological study of this nature: an assessment of the potential for cultural resources on the property and a visual inspection for the presence of cultural resources. As noted previously, no evidence of any prehistoric cultural resources was identified within the property during the survey. However, due to the presence of recorded cultural resources within a one-mile radius of the project area and the limited visibility encountered during the archaeological survey, the potential exists that buried cultural deposits may be present. Based upon the potential to encounter buried archaeological deposits or artifacts, as well as the historic use and development of the region since the late 1800s, archaeological and Native American monitoring of all earth-moving activities are recommended for the Del Cerro Project.

VII. SOURCES CONSULTED DATE

National Register of Historic Places ☑	Month and Year: March 2016
California Register of Historical Resources ☑	Month and Year: March 2016
City of San Diego Historical Resources Register ☑	Month and Year: March 2016
Archaeological/Historical Site Records: South Coastal Information Center ☑	Month and Year: March 2016
Other Sources Consulted: NAHC Sacred Lands File Search (Attachment D) References (Attachment A)	

VIII. CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this archaeological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief, and have been compiled in accordance with the California Environmental Quality Act (CEQA) criteria as defined in Section 15064.5 and City of San Diego Historical Resources Guidelines.



April 12, 2016

Tracy A. Stropes, M.A., RPA
Senior Archaeologist

Date

IX. ATTACHMENT A

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Project Management of all phases of archaeological investigations for local, state, and federal agencies, field supervision, lithic analysis, National Register of Historic Places (NRHP) and California Environmental Quality Act (CEQA) site evaluations, and authoring/coauthoring of cultural resource management reports.

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2007 Cultural Resource Inventory for Empire Homes (APN 104-180-04), Lake Forest, California. Prepared for Empire Homes.

2007 Phase I Archaeological Assessment for APN 104-200-09, Beumont, California. Prepared for Mary Chan.

2007 Cultural Resource Inventory for Empire Homes (APN 104-180-04), Lake Forest, California. Prepared for Empire Homes.

2006 Carlsbad Municipal Golf Course Data Recovery Program for CA-SDI-8694, and Indexing and Preservation Program Study for CA-SDI-8303 and CA-SDI-8797 Locus C, City of Carlsbad, CA. Prepared for City of Carlsbad.

2005 Grand Pacific Resorts Data Recovery and Index Sample Program for CA-SDI-8797, Area A, City of Carlsbad, CA. Prepared for Grand Pacific Resorts Inc.

2004 "Near the Harris Site Quarry" Cultural Resource Data Recovery and Preservation Program for CA-SDI-13028, San Diego County, California. Prepared for Harbrecht Development, L.P.

2004 Cultural Resource Survey and Boundary Test Report for the Lilac Ranch Project, San Diego County, California. Prepared for Empire Companies.

2003 Cultural Resource Data Recovery and Preservation Program for CA-SDI-12027, San Diego County, California. Prepared for Harbrecht Development Inc.

2002 Data Recovery Program for the Pacbell Site CA-SDI-5633, San Marcos, California. Prepared for Joseph Wong Design Associates.

2001 McCrink Ranch Cultural Resource Test Program Additional Information for Selected Sites, San Diego County, California. Prepared for Shapouri & Associates.

2001 The Quail Ridge Project Cultural Resource Test Program, San Diego County, California. Prepared for Helix Environmental Planning, Inc.

2000 Cultural Resource Survey and Evaluation for the North Sand Sheet Full Buildout Program, Owens Lake, California. Prepared for CH2MHill.

1995 Final Report: Archaeological Investigations Conducted for the Abalone Cove Dewatering Wells, City of Rancho Palos Verdes Los Angeles County, California. Prepared for the City of Rancho Palos Verdes, Environmental Services.

1995 Final Report: A Class III Intensive Survey of a 100-Acre Sand and Gravel Mining Area, Imperial County, California. Prepared for the Lilburn Corporation.

1994 Final Report: Data Recovery Excavations at Five Late Prehistoric Archaeological Sites Along the Los Trancos Access Road, Newport Coast Planned Community, Orange County, California. Prepared for the Coastal Community Builders, a division of The Irvine Company.

Contributing Author

2008 Lithic Analysis for Thirteen Sites Along the Transwestern Phoenix Expansion Project, Loops A and B. Prepared for Transwestern Pipeline Company, LLC.

2005 Cultural Resource Survey and Testing for the Star Ranch Property, San Diego, California.

2004 Cultural Resource Test Report for the Palomar Point Project: Site CA-SDI-16205, Carlsbad, California. Prepared for Lanikai Management Corp.

2004 Cultural Resource Survey and Test Report for the Canyon View Project, Carlsbad, California. Prepared for Shapouri & Associates.

2004 Cultural Resource Test Report for the Yamamoto Property: Site SDM-W-2046, Carlsbad, California. Prepared for Cunningham Consultants, Inc.

2004 Historical Resources Report for the Kuta and Mascari Properties, Otay Mesa, California. Prepared for Centex Homes.

2004 Cultural Resource Monitor and Test Report for the Encina Power Plant Project, Carlsbad, California. Prepared for Haley & Aldrich, Inc.

2004 Cultural Resource Test Report for Site CA-SDI-16788, Otay Mesa, California. Prepared for Otay Mesa Property, L.P.

2004 Cultural Resource Survey and Test Report for the Lonestar Project, Otay Mesa, San Diego County, California. Prepared for Otay Mesa Property, L.P.

2003 Cultural Resource Mitigation Program for the Torrey Ranch Site CA-SDI-5325, San Diego, California. Prepared for Garden Communities.

2003 Cultural Resource Survey and Test Report for the Johnson Canyon Parcel, Otay Mesa, San Diego County, California. Prepared for Otay Mesa Property, L.P.

2002 Cultural Resource Data Recovery Plan for the Shaw Project: Sites CA-SDI-13025 and CA-SDI-13067, San Diego County, California. Prepared for Shapouri & Associates.

2001 Archaeological Test Program for CA-SDI-14112 Mesa Norte Project, San Diego, California. Prepared for Hunsaker & Associates.

2001 The Vista-Oceanside Cultural Resource Survey and Test Program, Vista, California. Prepared for Shapouri & Associates.

2001 Cultural Resource Test Program for the Wilson Property, Carlsbad, California. Prepared for the City of Carlsbad.

2001 Cultural Resource Test Plan for the Oceanside-Escondido Project, County of San Diego, California. Prepared for Dudek & Associates.

2001 Cultural Resource Test Program for the Kramer Junction Expansion Project Adelanto, California. Prepared for AMEC.

2001 Cultural Resource Test Program for CA-SDI-12508 San Diego, California (LDR. No. 99-1331). Prepared for Garden Communities.

2000 Archaeological Testing of Prehistoric Sites CASDI-14115 and CA-SDI-14116 for The Mesa Grande Project, San Diego, California. Prepared for Solana Mesa Partners, LLC.

2000 Cultural Resource Survey and Test Report for the Wetmore Property, Otay Mesa, San Diego County, California. Prepared for Mr. Andy Campbell.

2000 The Torrey Ranch Cultural Resource Test Program, San Diego County, California. Prepared for Garden Communities.

2000 Cultural Resource Test Results for the Otay Mesa Generating Project. Prepared for the California Energy Commission and Otay Mesa Generating Company, LCC.

2000 The Eternal Hills Cultural Resource Survey and Test Program, City of Oceanside, California. Prepared for Eternal Hills Memorial Park.

2000 The Quail Ridge Cultural Resource Test Program, San Diego County, California. Prepared for Helix Environmental Planning Inc.

2000 Cultural Resource Testing Program for CA-SDI-5652/H and CA-SDI-9474H SR 78/Rancho Del Oro Interchange Project, Oceanside, California. Prepared for Tetratech Inc.

2000 Cultural Resource Test Results for a Portion of CA-SDI-8654 (Kuebler Ranch) Otay Mesa, San Diego County, California. Prepared for Shapouri & Associates.

2000 Historical/Archaeological Monitoring and Data Recovery Program for Prehistoric Site CA-SDI-48, Locus C Naval Base Point Loma, San Diego, California. Prepared for Department of the Navy, Southwest Division.

2000 Cultural Resource Evaluation Report for the Palomar College Science Building Project San Marcos, California. Prepared for Parsons Engineering Science Inc.

1999 Cultural Resource Monitoring Report for the Village of Ystagua Water Main Break City of San Diego, California. Prepared for the City of San Diego Water Department.

1999 The Effect of Projectile Point Size on Atlatl Dart Efficiency in Lithic Technology Vol. 24, No 1 p (27-37).

1999 Cultural Resource Evaluation Report for the Oceanside-Escondido Bikeway Project, San Marcos, California. Prepared for City of San Marcos.

1999 5000 Years of Occupation: Cultural Resource Inventory and Assessment Program for the Carlsbad Municipal Golf Course Project City of Carlsbad, California. Prepared or Cotton/Beland/Associates, Inc.

1999 Silver Oaks Estates Cultural Resource Enhanced Survey and Test Report for a Portion of CA-SDI-7202 San Diego, California. Prepared for Helix Environmental Planning Inc.

1999 Historical Archaeological Test of a portion of CA-SDI-8303 for the Faraday Road Extension Carlsbad, California. Prepared for the City of Carlsbad.

1999 Cultural Resource Literature Review for the North Coast Transportation Study Arterial Streets Alternative San Diego County, California. Prepared for MLF/San Diego Association of Govt.

1998 Archaeological Test Report for a Portion of CA-SDI-9115/SDM-W-122 Carlsbad, California. Prepared for Industrial Developments International.

1998 Rainforest Ranch Cultural Resource Survey and Significance Test for Prehistoric Sites CA-SDI-14932, CA-SDI-14937, CA-SDI-14938, and CA-SDI-14946 County of San Diego, California. Prepared for Boys and Girls Club of Inland North County.

1998 Cultural Resource Evaluation Report for the Oceanside-Escondido Bikeway Project San Marcos, California.

1998 Final Report: Cultural Resource Survey Report for the Sterling Property, Carlsbad, California. Prepared for SPT Holdings LCC.

1996 Final Report: Archaeological Survey and Test for the Huber Property Carlsbad, California. Prepared for Gene Huber.

1996 Final Report: Results of Phase II Test Excavations and Phase III Data Recovery Excavations at Nine Archaeological Sites Within the Newport Coast Planned Community Phase III Entitlement Area, San Joaquin Hills, Orange County, California. Prepared for Coastal Community Builders, a division of The Irvine Company.

1995 Preliminary Report: Phase II Test Results From Nine Prehistoric Archaeological Sites Within The Proposed Upper Newport Bay Regional County Park. Prepared for EDAW, Inc.

1995 Final Report: A Phase II Test Excavation at CA-ORA-136, Block 800 City of Newport Beach, Orange County California. Prepared for the Irvine Apartment Communities, a division of The Irvine Company.

Presentations

2004 Guest Lecturer and Flintknapping Demonstration Mission San Luis Rey Band of Mission Indians Annual Inter-tribal Pow-Wow. Mark Mojado, Tribal Contact.

2003 Steep Edge Unifacial Tools of Otay Mesa: An Analysis of Edge Types from CA SDI-7215 SCA Southern California Data Sharing Meetings

2001 Identification of Late Period Behavior Patterns in Elfin Forest: Three Sites in Northern San Diego County.

2001 Society for California Archaeology Data Sharing Meetings, San Luis Obispo, California.

1996 Trans-Tehachapian Lithic Trade at the Canebreak/Sawtooth Transition. Thirteenth Annual Meeting, Society of California Archaeology, Bakersfield, California.

1994 Point Size and Atlatl Dart Efficiency. Twenty Fourth Annual Meeting, Great Basin Anthropological Conference, Elko, Nevada.

1994/96 Guest Lecturer and Flint Knapping Instruction - Archaeological Field Class Fall Semester ,Cypress College, Cypress, California. Paul Langenwalter/Henry C. Koerper, Directors.

1994/95 Annual Guest Lecturer - "Living History Days" at the Mission, Mission San Juan Capistrano, San Juan Capistrano, California.

X. ATTACHMENT B

Project Maps:

General Location Map
USGS Project Location Map
800' Scale City Engineering Map
Project Development Map

Figure 1

General Location Map

The Del Cerro Project

DeLorme World Base Map Service (1:250,000 series)

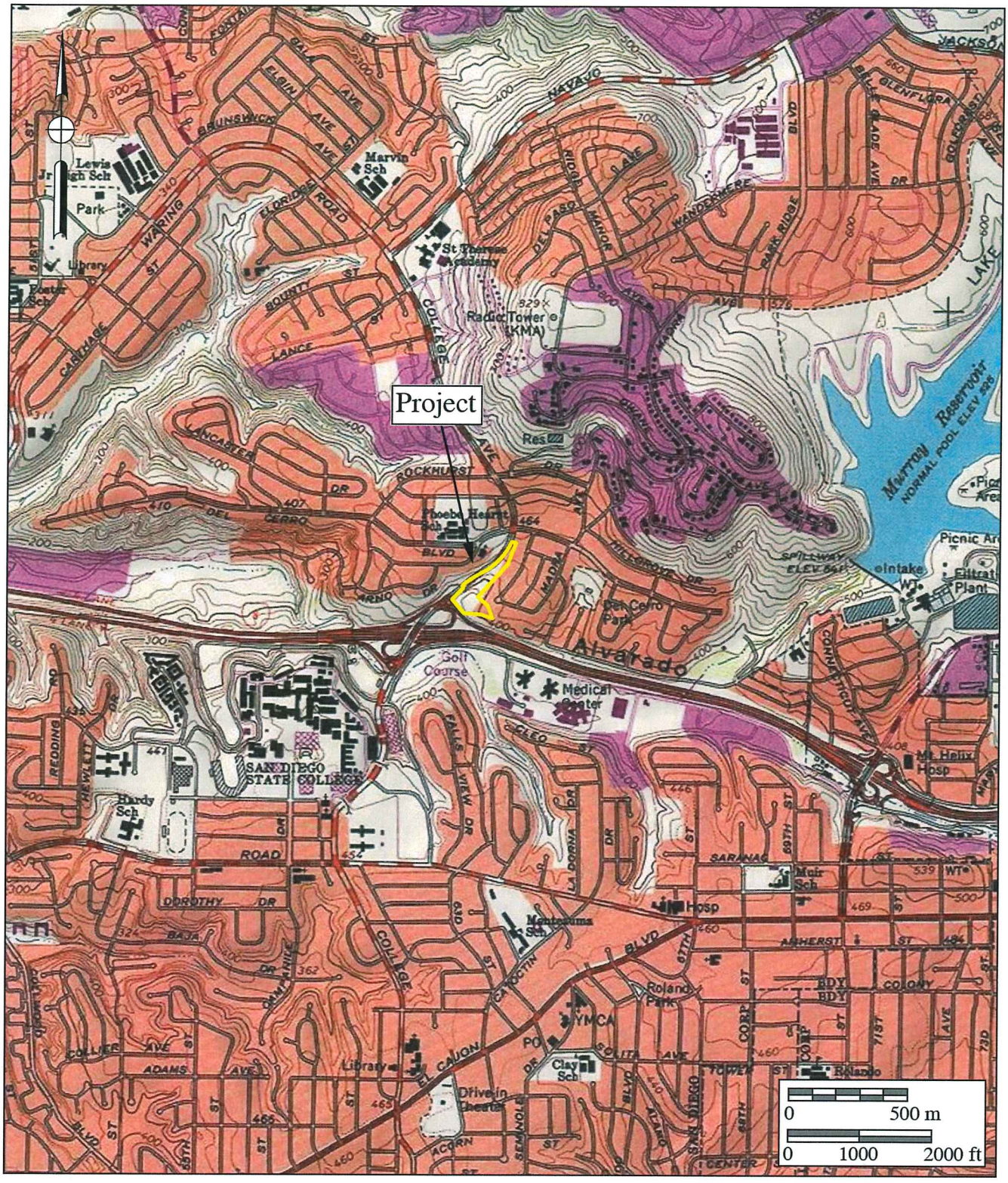


Figure 2

Project Location Map

The Del Cerro Project

USGS *La Mesa* Quadrangle (7.5-minute series)

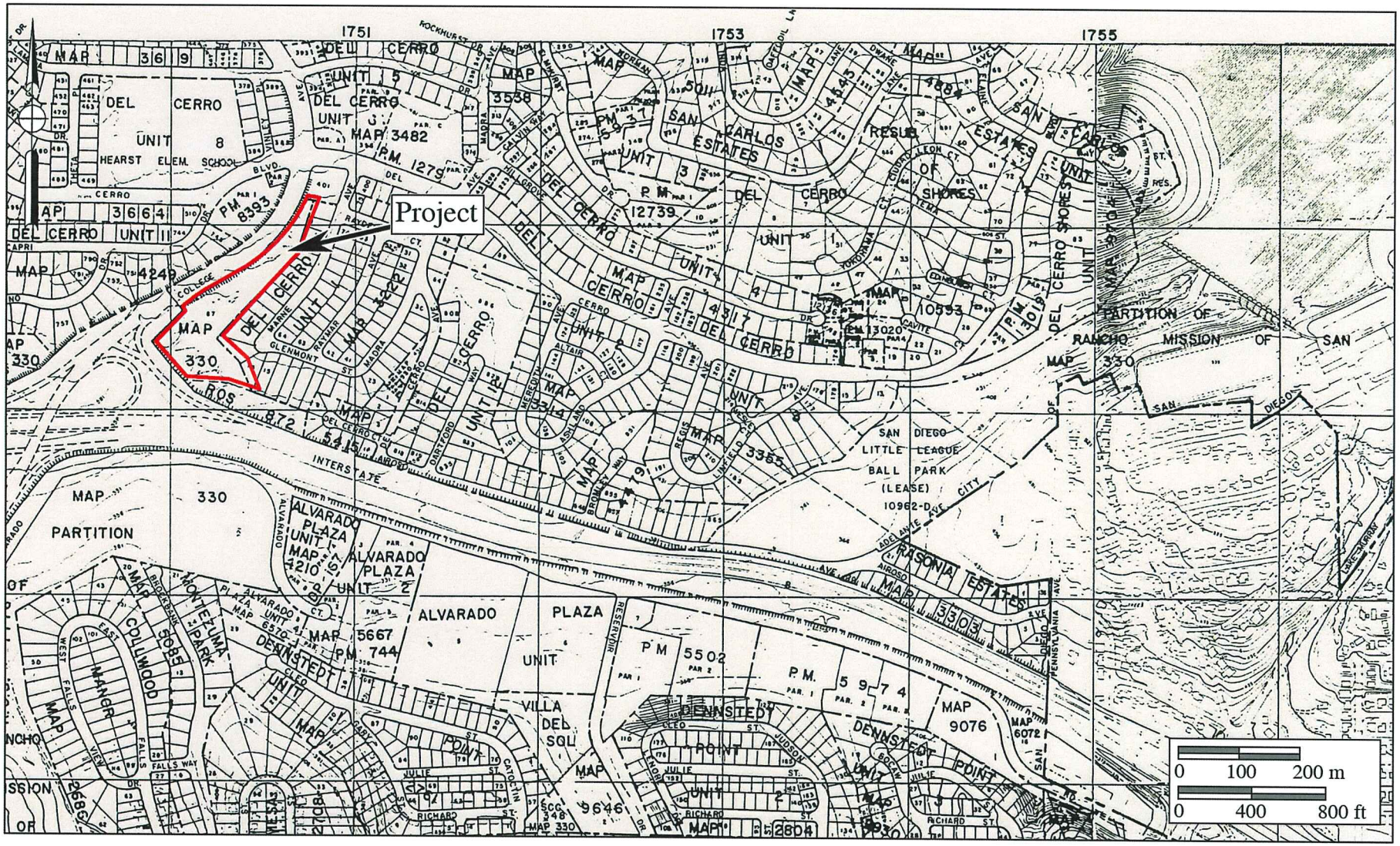


Figure 3

Project Location Map

The Del Cerro Project

Shown on The City of San Diego 1" to 800' Scale Engineering Map

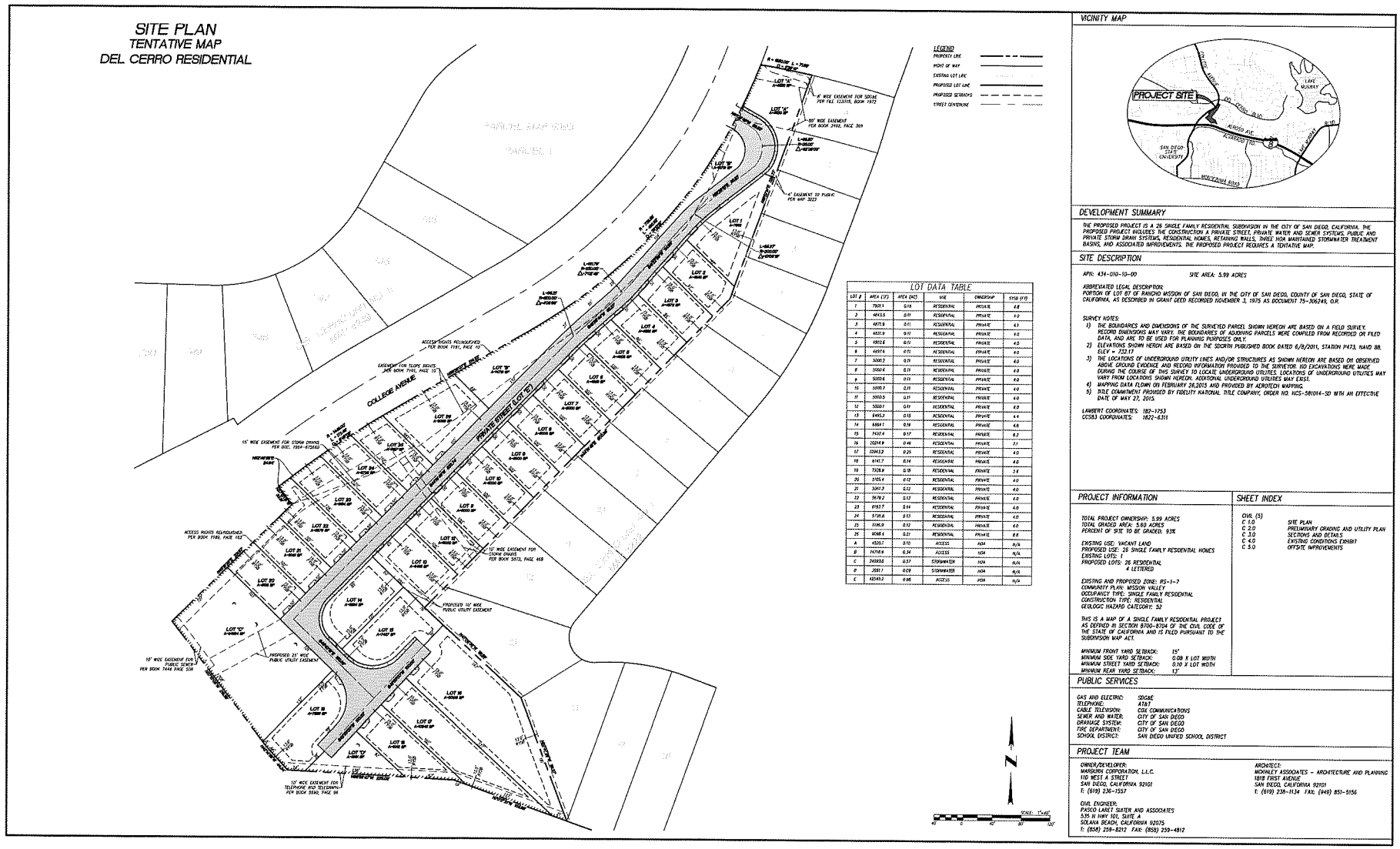


Figure 4

Project Development Map

The Del Cerro Project

XI. ATTACHMENT C

Archaeological Records Search Results

South Coastal Information Center
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-5320
Office: (619) 594-5682
www.scic.org
nick@scic.org

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM RECORDS SEARCH

Company: Brian F. Smith & Associates Inc

Company Representative: Eric Rodriguez

Date Processed: 3/22/2016

Project Identification: Del Cerro 16-046

Search Radius: 1 mile

Historical Resources: YES

Trinomial and Primary site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Previous Survey Report Boundaries: YES

Project boundary maps have been reviewed. National Archaeological Database (NADB) citations for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Addresses: YES

A map and database of historic properties (formerly Geofinder) has been included.

Historic Maps: YES

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Summary of SHRC Approved CHRIS IC Records Search Elements	
RSID:	2258
RUSH:	no
Hours:	1
Spatial Features:	82
Address-Mapped Shapes:	yes
Digital Database Records:	64
Quads:	1
Aerial Photos:	0
PDFs:	Yes
PDF Pages:	138

This is not an invoice. Please pay from the monthly billing statement

XII. ATTACHMENT D

NAHC Sacred Lands File Search Results

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

March 7, 2016

For: Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, California 95814

From: Eric A Rodriguez, M.A., RPA
Brian F. Smith and Associates Inc.
14010 Poway Rd. Suite A
Poway, CA 92064

Re: Request for a Sacred Lands File records search for the Del Cerro Project in San Diego, California.

I am writing to request a record search of the Sacred Lands File and a list of appropriate Native American contacts for the Del Cerro Project. The project is for an archaeological assessment by the City of San Diego. The project is located in San Diego County at the southeast portion of the intersection of College Avenue and Del Cerro Boulevard in the Del Cerro neighborhood of San Diego, California. Specifically, the property is located in the unsectioned Mission San Diego land grant, Township 16 South and Range 02 West (Projected) in the USGS *La Mesa* Quadrangle (APNs: 463-010-10). A copy of the project map showing the project area and a 1 mile search radius buffer as well as the corresponding shapefile depicted thereon, has been included for your records.

Sincerely,

Eric A. Rodriguez, M.A., RPA
Archaeologist/GIS Specialist
Phone: 858-484-0915 ext
Email: erodriguez@bfsa-ca.com

Attachments:
-USGS 7.5 *La Mesa,* California topographic maps with project area delineated.
-Project Area Shapefile (.zip)

Sacred Lands File & Native American Contacts List Request
NATIVE AMERICAN HERITAGE COMMISSION

□915 Capitol Mall, RM 364 □Sacramento, CA 95814□(916) 653-4082 □
(916) 657-5390 – Fax□
nahc@pacbell.net

Information Below is Required for a Sacred Lands File Search

Project: The Del Cerro Project

County: San Diego

USGS Quadrangle Name: *La Mesa*

Township: 16S Range: 02W (Projected)

Company/Firm/Agency: Brian F. Smith & Associates

Contact Person: Eric A. Rodriguez, RPA

Street Address: 14010 Poway Road, Suite A

City: Poway Zip: 92064

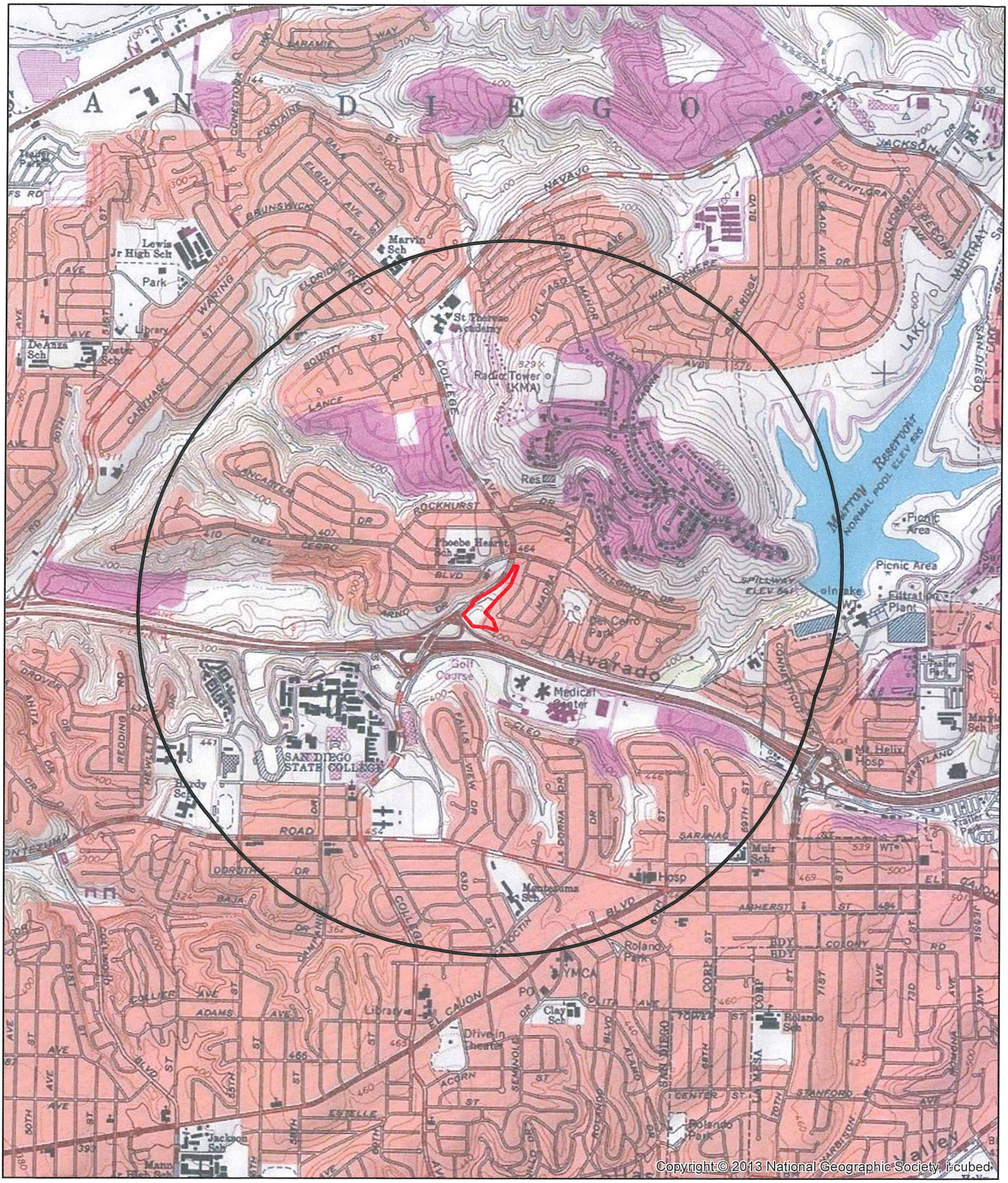
Phone: 858-484-0915

Fax: 858-679-9896

Email: erodriguez@bfsa-ca.com

Project Description:

The project is for an archaeological assessment by the City of San Diego. The project is located in San Diego County at the southeast portion of the intersection of College Avenue and Del Cerro Boulevard in the Del Cerro neighborhood of San Diego, California. Specifically, the property is located in the unsectioned Mission San Diego land grant, Township 16 South and Range 06 West (Projected) in the USGS *La Mesa* Quadrangle (APNs: 463-010-10). A copy of the project map showing the project area and a 1 mile search radius buffer as well as the corresponding shapefile depicted thereon, has been included for your records.



Records Search Location Map
The Del Cerro Project
USGS *La Mesa* Quadrangle (7.5-minute series)

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 FAX

March 8, 2016

Eric Rodriguez
Brian F. Smith & Associates

Sent via e-mail: erodriguez@bfsa-ca.com
Number of pages: 3

RE: Proposed Del Cerro Project, City of San Diego, La Mesa USGS Quadrangle, San Diego County, California

Dear Mr. Rodriguez:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. Please note that the intent above reference codes is to mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects.

As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 require public agencies to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

> Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.3.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.3.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

   - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
   - If the probability is low, moderate, or high that cultural resources are located in the APE.
   - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and
   - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. A search of the SFL was completed for the USGS quadrangle information provided with negative results.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand well help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton
Associate Governmental Project Analyst

Native American Heritage Commission
Tribal Consultation List
San Diego County
March 8, 2016

Sycuan Band of the Kumeyaay Nation
Cody J. Martinez, Chairperson
1 Kwaaypaay Court — Diegueno/Kumeyaay
El Cajon , CA 92019
ssilva@sycuan-nsn.gov
(619) 445-2613

Viejas Band of Kumeyaay Indians
Robert J. Welch, Sr., Chairperson
1 Viejas Grade Road — Diegueno/Kumeyaay
Alpine , CA 91901
jhagen@viejas-nsn.gov
(619) 445-3810

Campo Band of Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno/Kumeyaay
Campo , CA 91906
rgoff@campo-nsn.gov
(619) 478-9046

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Diegueno/Kumeyaay
Jamul , CA 91935
(619) 669-4785

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas
P.O. Box 775 — Diegueno-Kwaaymii
Pine Valley , CA 91962 — Kumeyaay
(619) 709-4207

Iipay Nation of Santa Ysabel
Clint Linton, Director of Cultural Resources
P.O. Box 507 — Diegueno/Kumeyaay
Santa Ysabel , CA 92070
cjlinton73@aol.com
(760) 803-5694

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 — Diegueno/Kumeyaay
Santa Ysabel , CA 92070
(760) 765-0845

This list is current only as of the date of this document.
Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list applicable only for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Del Cerro Project, City of San Diego, San Diego County, California.

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

March 10, 2016

Carmen Lucas
Kwaaymii Laguna Band of Mission Indians
P.O. Box 775
Pine Valley, California 91962

Subject: Information regarding Native American cultural resources on or near the Del Cerro Project, San Diego County, California

Dear Ms. Lucas:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Del Cerro Project. The information you provide will be used to assess areas of potential adverse impact within the proposed project's Area of Potential Effect (APE). Any information you might provide will be kept confidential and will not be divulged to the public.

The project is in San Diego County, California. The project area can be found at the southeast portion of the intersection of College Avenue and Del Cerro Boulevard in the Del Cerro neighborhood of San Diego, California (APN 463-010-10). Specifically, this project is located in the unsectioned Mission San Diego Land Grant on the USGS 7.5-minute *La Mesa, California* topographic quadrangle (Township 16 South, Range 2 West [Projected]). The project proposes to subdivide one existing vacant 5.99-acre parcel into 26 family residential lots and four homeowner association lots. Please find enclosed sections of the USGS *La Mesa* Quadrangle map on which the project is delineated.

Although a records search of the Sacred Lands File has failed to indicate the presence of Native American cultural resources in the immediate Del Cerro Project area, the Native American Heritage Commission requested that we consult with you directly regarding the potential for the presence of Native American cultural resources that may be impacted by this project. If you do have information to provide regarding any resources on or near the project, please contact Brian Smith or myself at (858) 484-0915, or contact the City of San Diego directly. We would like to extend our thanks for your response regarding this issue.

Sincerely,

Tracy A. Stropes, M.A., RPA
Senior Project Archaeologist
tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Mesa, California* topographic map with project area delineated

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

March 10, 2016

Clint Linton
Director of Cultural Resources
Iipay Nation of Santa Ysabel
P.O. Box 507
Santa Ysabel, California 92070

Subject: Information regarding Native American cultural resources on or near the Del Cerro Project, San Diego County, California

Dear Mr. Linton:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Del Cerro Project. The information you provide will be used to assess areas of potential adverse impact within the proposed project's Area of Potential Effect (APE). Any information you might provide will be kept confidential and will not be divulged to the public.

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Sincerely,

Tracy A. Stropes, M.A., RPA
Senior Project Archaeologist
tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Mesa, California* topographic map with project area delineated

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

March 10, 2016

Cody J. Martinez
Chairperson
Sycuan Band of the Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, California 92019

Subject: Information regarding Native American cultural resources on or near the Del Cerro Project, San Diego County, California

Dear Mr. Martinez:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Del Cerro Project. The information you provide will be used to assess areas of potential adverse impact within the proposed project's Area of Potential Effect (APE). Any information you might provide will be kept confidential and will not be divulged to the public.

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Sincerely,

Tracy A. Stropes, M.A., RPA
Senior Project Archaeologist
tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Mesa, California* topographic map with project area delineated

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

March 10, 2016

Erica Pinto
Chairperson
Jamul Indian Village
P.O. Box 612
Jamul, California 91935

Subject: Information regarding Native American cultural resources on or near the Del Cerro Project, San Diego County, California

Dear Ms. Pinto:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Del Cerro Project. The information you provide will be used to assess areas of potential adverse impact within the proposed project's Area of Potential Effect (APE). Any information you might provide will be kept confidential and will not be divulged to the public.

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Although a records search of the Sacred Lands File has failed to indicate the presence of Native American cultural resources in the immediate Del Cerro Project area, the Native American Heritage Commission requested that we consult with you directly regarding the potential for the presence of Native American cultural resources that may be impacted by this project. If you do have information to provide regarding any resources on or near the project, please contact Brian Smith or myself at (858) 484-0915, or contact the City of San Diego directly. We would like to extend our thanks for your response regarding this issue.

Sincerely,

Tracy A. Stropes, M.A., RPA
Senior Project Archaeologist
tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Mesa, California* topographic map with project area delineated

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

March 10, 2016

Ralph Goff
Chairperson
Campo Band of Mission Indians
36190 Church Road, Suite 1
Campo, California 91906

Subject: Information regarding Native American cultural resources on or near the Del Cerro Project, San Diego County, California

Dear Mr. Goff:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Del Cerro Project. The information you provide will be used to assess areas of potential adverse impact within the proposed project's Area of Potential Effect (APE). Any information you might provide will be kept confidential and will not be divulged to the public.

The project is in San Diego County, California. The project area can be found at the southeast portion of the intersection of College Avenue and Del Cerro Boulevard in the Del Cerro neighborhood of San Diego, California (APN 463-010-10). Specifically, this project is located in the unsectioned Mission San Diego Land Grant on the USGS 7.5-minute *La Mesa, California* topographic quadrangle (Township 16 South, Range 2 West [Projected]). The project proposes to subdivide one existing vacant 5.99-acre parcel into 26 family residential lots and four homeowner association lots. Please find enclosed sections of the USGS *La Mesa* Quadrangle map on which the project is delineated.

Although a records search of the Sacred Lands File has failed to indicate the presence of Native American cultural resources in the immediate Del Cerro Project area, the Native American Heritage Commission requested that we consult with you directly regarding the potential for the presence of Native American cultural resources that may be impacted by this project. If you do have information to provide regarding any resources on or near the project, please contact Brian Smith or myself at (858) 484-0915, or contact the City of San Diego directly. We would like to extend our thanks for your response regarding this issue.

Sincerely,

Tracy A. Stropes, M.A., RPA
Senior Project Archaeologist
tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Mesa, California* topographic map with project area delineated

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

March 10, 2016

Robert J. Welch, Sr.
Chairperson
Viejas Band of Kumeyaay Indians
1 Viejas Grade Road
Alpine, California 91901

Subject: Information regarding Native American cultural resources on or near the Del Cerro Project, San Diego County, California

Dear Mr. Welch:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Del Cerro Project. The information you provide will be used to assess areas of potential adverse impact within the proposed project's Area of Potential Effect (APE). Any information you might provide will be kept confidential and will not be divulged to the public.

The project is in San Diego County, California. The project area can be found at the southeast portion of the intersection of College Avenue and Del Cerro Boulevard in the Del Cerro neighborhood of San Diego, California (APN 463-010-10). Specifically, this project is located in the unsectioned Mission San Diego Land Grant on the USGS 7.5-minute *La Mesa, California* topographic quadrangle (Township 16 South, Range 2 West [Projected]). The project proposes to subdivide one existing vacant 5.99-acre parcel into 26 family residential lots and four homeowner association lots. Please find enclosed sections of the USGS *La Mesa* Quadrangle map on which the project is delineated.

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Sincerely,

Tracy A. Stropes, M.A., RPA
Senior Project Archaeologist
tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Mesa, California* topographic map with project area delineated

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

March 10, 2016

Virgil Perez
Chairperson
Iipay Nation of Santa Ysabel
P.O. Box 130
Santa Ysabel, California 92070

Subject: Information regarding Native American cultural resources on or near the Del Cerro Project, San Diego County, California

Dear Mr. Perez:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Del Cerro Project. The information you provide will be used to assess areas of potential adverse impact within the proposed project's Area of Potential Effect (APE). Any information you might provide will be kept confidential and will not be divulged to the public.

The project is in San Diego County, California. The project area can be found at the southeast portion of the intersection of College Avenue and Del Cerro Boulevard in the Del Cerro neighborhood of San Diego, California (APN 463-010-10). Specifically, this project is located in the unsectioned Mission San Diego Land Grant on the USGS 7.5-minute *La Mesa, California* topographic quadrangle (Township 16 South, Range 2 West [Projected]). The project proposes to subdivide one existing vacant 5.99-acre parcel into 26 family residential lots and four homeowner association lots. Please find enclosed sections of the USGS *La Mesa* Quadrangle map on which the project is delineated.

Although a records search of the Sacred Lands File has failed to indicate the presence of Native American cultural resources in the immediate Del Cerro Project area, the Native American Heritage Commission requested that we consult with you directly regarding the potential for the presence of Native American cultural resources that may be impacted by this project. If you do have information to provide regarding any resources on or near the project, please contact Brian Smith or myself at (858) 484-0915, or contact the City of San Diego directly. We would like to extend our thanks for your response regarding this issue.

Sincerely,

Tracy A. Stropes, M.A., RPA
Senior Project Archaeologist
tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Mesa, California* topographic map with project area delineated

Tracy Stropes

From: cjlinton73@aol.com
Sent: Monday, March 21, 2016 9:39 PM
To: tstropes@bfsa-ca.com
Subject: Del Cerro Project

Dear Mr. Stropes,

With regard to the above referenced project I have the following comments:

Please have a Kumeyaay NAM on site for survey and all ground disturbing activities related to this project.

Thank you,

Clint

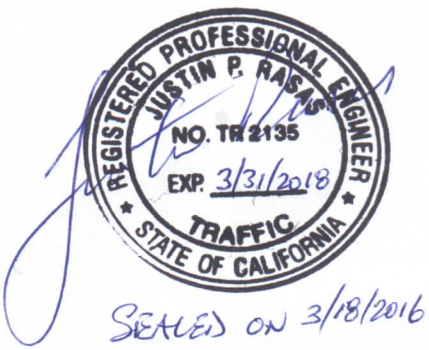
Del Cerro Residential Project
Access to College Avenue South of Del Cerro
City of San Diego (Navajo Community)

August 18, 2014
Revised November 5, 2015
Revised February 3, 2016

Traffic Access Analysis

Prepared for:

ColRich
444 West Beach Street, STE 300
San Diego, CA 92101



SEALED ON 3/18/2016

Prepared by Justin Rasas (RCE 60690) a principal with:

LOS Engineering, Inc.
11622 El Camino Real, Suite 100, San Diego, CA 92130
Phone 619-890-1253, Fax 619-374-7247

Job #1417

City of San Diego
M E M O R A N D U M

DATE: March 16, 2016

TO: Justin Rasa, LOS Engineering, Inc.

FROM: Ismail Elhamad, Associate Traffic Engineer

SUBJECT: Review of Traffic Access Analysis for Del Cerro Residential Project (TM/SDP, IO # 24006076, PTS 435483)

We have reviewed the draft traffic access analysis for Del Cerro Residential project prepared by LOS Engineering, Inc. dated February 3, 2016. The traffic access analysis is acceptable and adequate for release.

If you have any questions, please call me at 619-446-5494.

Ismail Elhamad
Associate Traffic Engineer, RTE

CC:

John Fisher, Development Project Manager
Courtney Holowach, Environmental Analysis Section
Ann Gonsalves, Transportation Development Section

H:\Del Cerro Residential 3 .doc

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Appendices

Executive Summary

The proposed project consists of 26 residential dwelling units located on an infill parcel located on the northeast corner of College Avenue and Interstate 8 (I-8) in the City of San Diego, California.

Access is proposed from the only fronting street, College Avenue. A right-in/right-out driveway is proposed on College Avenue at the north end of the parcel to which sufficient corner sight distance was field observed for the 85th percentile speed of 46 MPH (posted speed is 40 MPH) using the American Association of State and Highway Transportation Officials (AASHTO) standards (6th Edition, 2011).

The residential project is calculated to generate 260 ADT with 21 AM peak hour trips (4 inbound and 17 outbound) and 26 PM peak hour trips (18 inbound and 8 outbound). This is below the threshold requirement for a traffic study; however, at the request of City staff, this report is provided to document the right-in/right-out corner sight distance and to determine if the left turn storage bay capacities used by project traffic conducting U-turns would be adversely affected by the addition of project traffic.

Four scenarios were analyzed, which included Existing, Existing plus Project, Near-term, and Near-Term plus Project. Even though the intersection operations are not required as part of this analysis, they are summarized below because they show how the study intersections are operating. Findings by scenario are summarized below:

1) Under existing conditions, all of the study intersections were calculated to operate at LOS D or better.
2) Under existing with project conditions, all of the study intersections were calculated to operate at LOS D or better with no significant direct project impacts. The project is not calculated to significantly increase the 95th percentile queues (ranging between 0 feet and 8 feet [equivalent of 0.3 vehicles]).
3) Under near term conditions, all of the study intersections were calculated to operate at LOS D or better.
4) Under near term with project conditions, all of the study intersections were calculated to operate at LOS D or better with no significant direct project impacts. The project is not calculated to significantly increase the 95th percentile queues (ranging between 0 feet and 8 feet [equivalent of 0.3 vehicles]).

There are no significance criteria thresholds that identify if a measureable change in queue length would result in an impact if an intersection is operating at LOS D or better condition. Therefore, no project traffic impacts were calculated and no mitigation measures are recommended. However, it is recommended that a northbound right turn lane on College Avenue be striped for the project driveway.

1.0 Introduction

This report documents the corner sight distance analysis of a right-in/right-out project driveway and U-turn operations of three intersections from a proposed project with 26 residential dwelling units located on an infill parcel located on the northeast corner of College Avenue and Interstate 8 (I-8) in the City of San Diego, California. The location of the project is shown in **Figure 1**. A site plan is shown in **Figure 2**. This report includes the following chapters:

1.0 Introduction
2.0 Analysis Methodology
3.0 Existing Conditions
4.0 Project Description
5.0 Existing with Project Conditions
6.0 Near Term Conditions
7.0 Near Term with Project Conditions
8.0 Project Access
9.0 Potential Traffic Impacts and Project Features
10.0 Conclusion and Recommendations
11.0 References and List of Prepares

Figure 1: Project Location

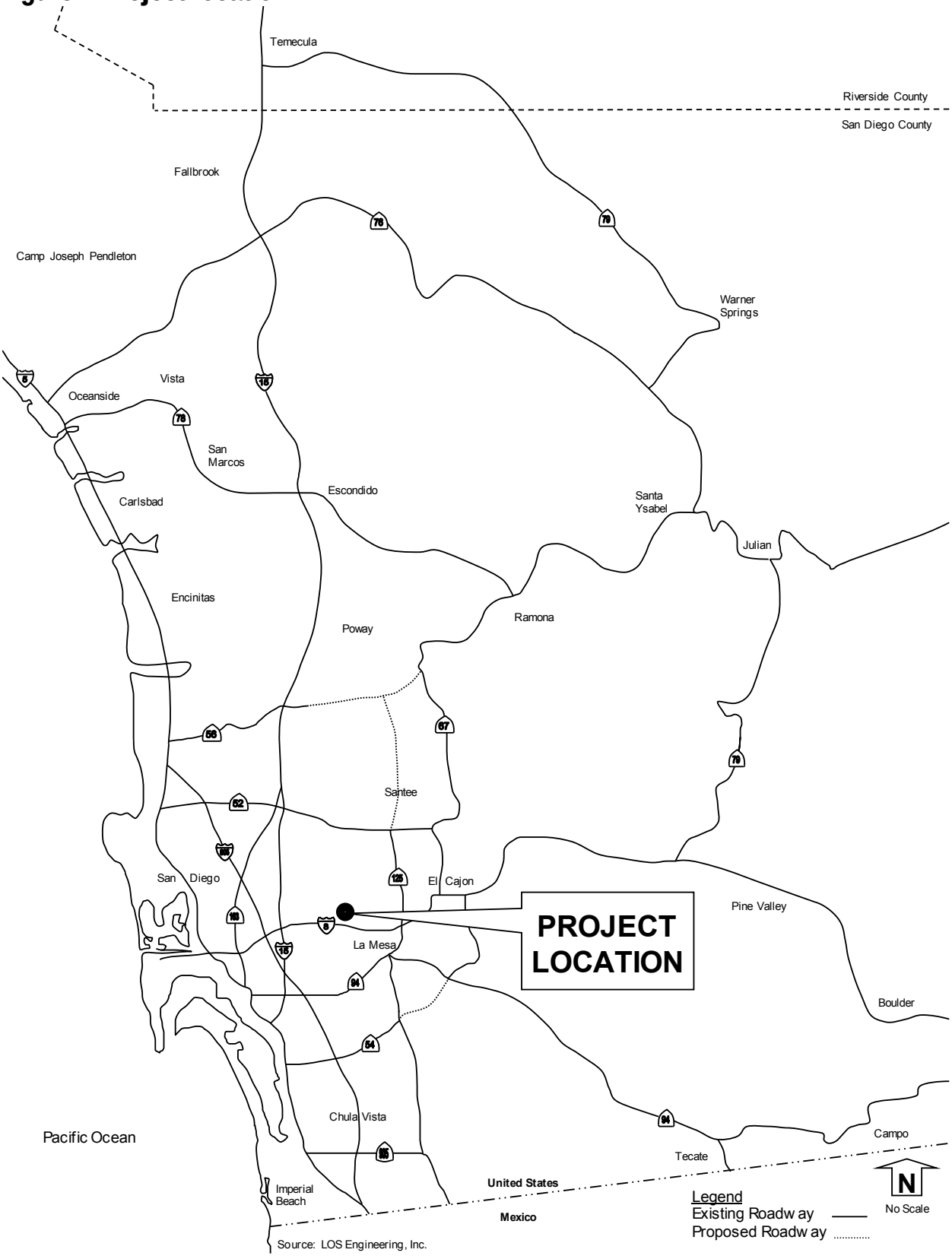
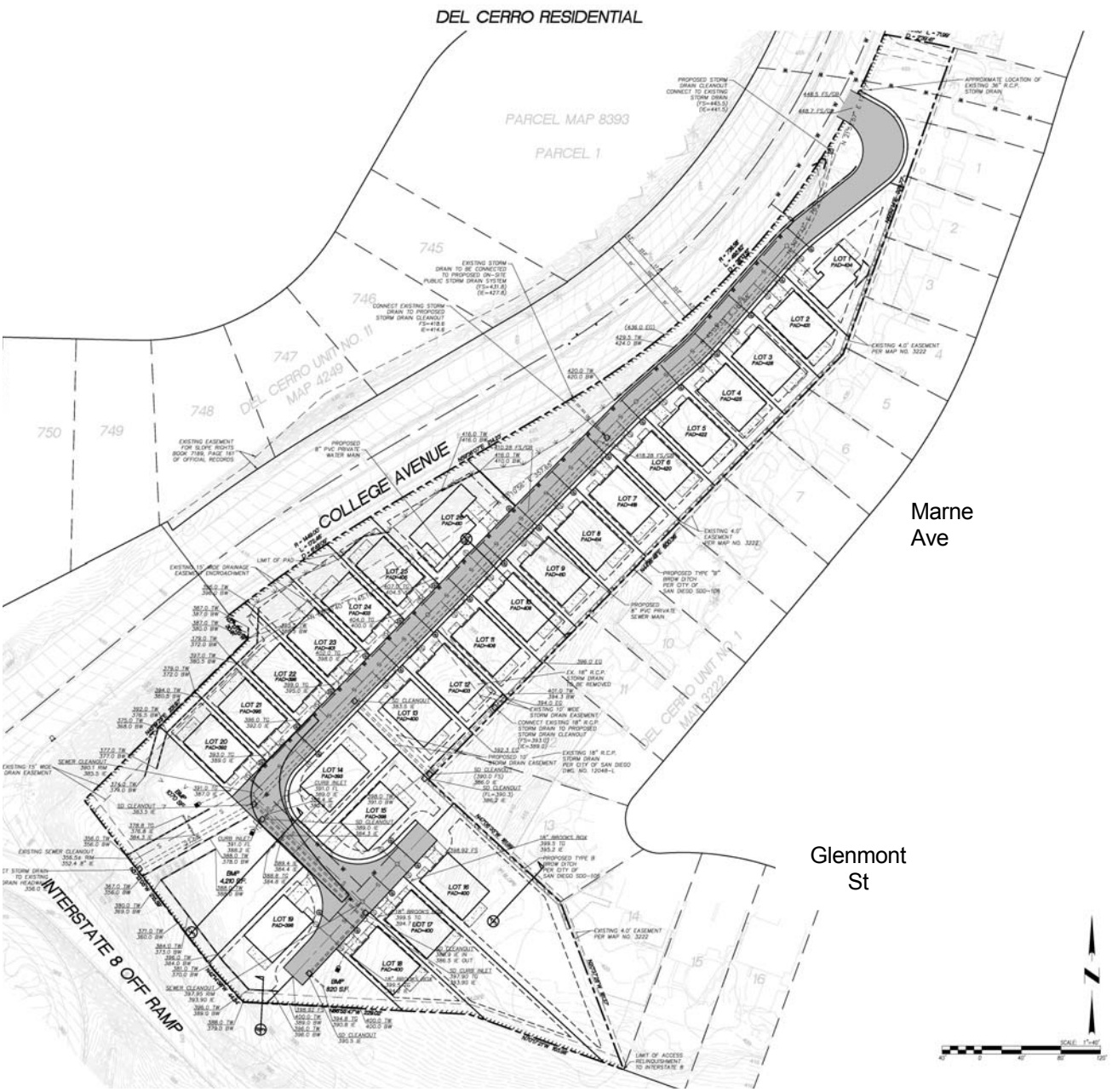


Figure 2: Site Plan



Source: ColRich Communities

2.0 Analysis Methodology

The parameters by which this access analysis was prepared included the determination of what transportation facilities are to be analyzed, the scenarios to be analyzed and the methods required for analysis. The criteria for each of these parameters are included herein.

2.1.1 Study Area Criteria

The project study area was determined based on discussion with the City of San Diego Traffic Engineer to account for where the project traffic would most likely conduct U-turns resulting from a right-in/right-out project driveway on College Avenue. For this project, the following intersections were included for analysis (count data included in **Appendix A**):

1) College Ave at Rockhurst Dr (un-signalized): first allowable U-turn north of project.
2) College Ave at Del Cerro Blvd (signalized): first left turn north of project
3) College Ave at Lindo Paseo (signalized): first allowable U-turn south of project

2.1.2 Scenario Criteria

For this project, the following study scenarios were included:

1) Existing Conditions
2) Existing plus Project Conditions
3) Near Term Conditions
4) Near Term plus Project Conditions

2.1.3 Traffic Analysis Criteria

The traffic analyses prepared for this study were based on the *2000 Highway Capacity Manual* (HCM) operations analysis using Level of Service (LOS) evaluation criteria. The operating conditions of the study intersections and street segments were measured using the HCM LOS designations, which ranges from A through F. LOS A represents the best operating condition and LOS F denotes the worst operating condition. The LOS criteria for each roadway component are described below.

2.1.3.1 Intersections

The study intersections were analyzed based on the **operational analysis** outlined in the 2000 HCM. This process defines LOS in terms of **average control delay** per vehicle, which is measured in seconds. LOS at the intersections were calculated using the computer software program Synchro 8.0 (Trafficware Corporation). The HCM LOS for the range of delay by seconds for un-signalized and signalized intersections is described in **Table 1**.

TABLE 1: UN-SIGNALIZED AND SIGNALIZED INTERSECTION LEVEL OF SERVICE (HCM 2000)

Level of Service	Un-Signalized Average Control Delay (seconds/vehicle)	Signalized Average Control Delay (seconds/vehicle)
A	0-10	0-10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

Source: Highway Capacity Manual 2000.

2.1.4 Traffic Significance Criteria

A project is considered to have caused a significant impact if the new project traffic degrades a facility from acceptable LOS to unacceptable LOS or decreases the operations on the surrounding roadways by the City of San Diego defined thresholds as shown in **Table 2**.

TABLE 2: CITY OF SAN DIEGO TRAFFIC IMPACT SIGNIFICANCE THRESHOLDS

Level of Service with Project	Allowable Increase Due to Project Impacts[1]		
	Roadway Segments		Intersections
	V/C	Speed (mph)	Delay (sec.)
E[2]	0.02	1.0	2.0
F[2]	0.01	0.5	1.0

Source: City of San Diego. Notes: [1] If a proposed project's traffic impacts exceed the values shown in the table, then the impacts are deemed "significant." If the project traffic causes an acceptable LOS (i.e. A-C) to degrade to LOS E or F, then the impact is deemed "significant". The project applicant shall identify "feasible mitigations" to achieve LOS D or better. [2] The acceptable Level of Service (LOS) standard for roadways and intersections in San Diego is LOS D. However, for undeveloped locations, the goal is to achieve a LOS C. Delay measured in seconds. V/C = Volume to Capacity Ratio (capacity at LOS E should be used). Speed = Arterial speed measured in miles per hour for CMP

If a significant impact is calculated due to the addition of project traffic, then feasible mitigation is required to return the facility to the pre-project conditions or better. If the mitigation does not return the facility to pre-project conditions, the impact is considered significant and unmitigated.

3.0 Existing Conditions

This section describes the study area street system, AM and PM peak hour intersection volumes, and existing LOS.

3.1.1 Existing Street System

The project is proposed with right-in/right-out access on College Avenue. College Avenue is classified as a *Four Lane Major Street* in the Navajo Community Plan (excerpts from the community plan update traffic study are included in **Appendix B**). Along the project frontage, College Avenue is generally constructed with a raised median and two travel lanes in each direction. Along the same project frontage in the northbound travel direction, there is an eight foot solid striped lane with faded red curb prohibiting parking. The posted speed limit in the northbound direction along this section is 40 Miles Per Hour (MPH). The 85th percentile speed along the project frontage in the northbound direction is 46 MPH (data included in **Appendix C**).

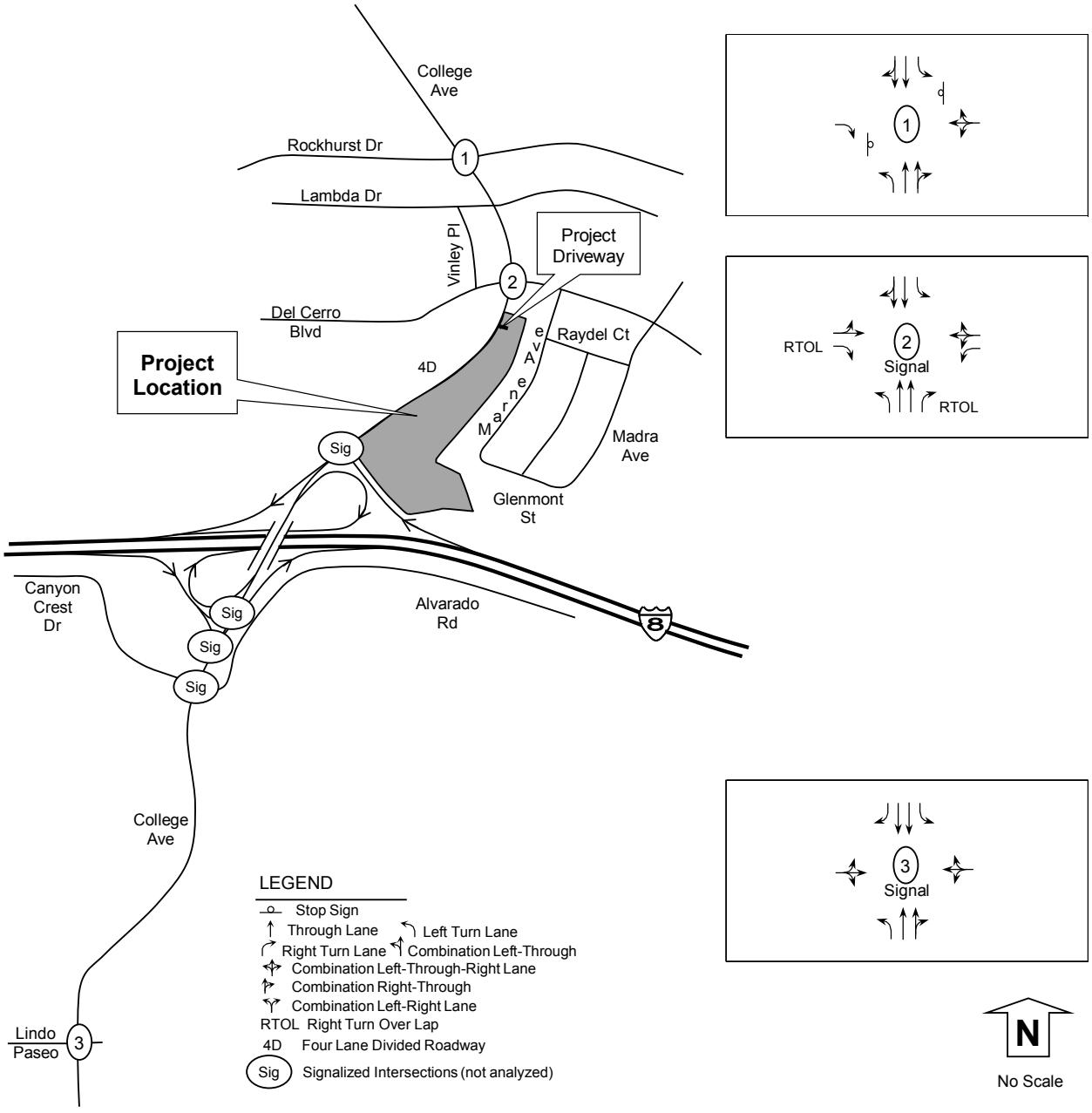
3.1.2 Existing Public Transit and Other Transportation Modes

Metropolitan Transit System Bus Route 14 and 115 serve College Avenue along the project frontage as shown in Figure 3. Bus stops are located in the vicinity of College Avenue/Del Cerro Boulevard and on College Avenue/Rockhurst Drive. The times and frequency of service for Bus Routes 14 and 115 are included in **Appendix D**.

According to the City of San Diego *Bicycle Master Plan Update*, July 2013, there are proposed Class II or Class III bike network classifications on College Avenue along the project frontage. The Navajo Community Plan describes a proposed bike route along Del Cerro in the project vicinity and a proposed bike route on College Avenue along the project frontage. The SANDAG *San Diego Regional Bicycle Plan Riding to 2050*, April 2010, does not identify any regional bike plans for College Avenue along the project frontage. Excerpts from the City of San Diego *Bicycle Master Plan Update,* the Navajo Community Plan, and SANDAG *San Diego Regional Bicycle Plan Riding to 2050* are included in **Appendix E**.

The existing roadway conditions along with transit details are shown in **Figure 3.**

Figure 3: Existing Roadway Conditions



3.1.3 Existing Traffic Volumes and LOS Analyses

Existing AM and PM peak hour traffic volumes were obtained for the following intersections with the count dates noted in parentheses:

1) College Avenue at Rockhurst Drive (Thursday, 9/25/2014)
2) College Avenue at Del Cerro Boulevard (Thursday, 9/25/2014)
3) College Avenue at Lindo Paseo (Thursday, 9/25/2014)

The existing AM and PM volumes are shown in **Figure 4**. The LOS calculated for the study roadway elements are shown in **Table 3**. LOS calculations are included in **Appendix F**.

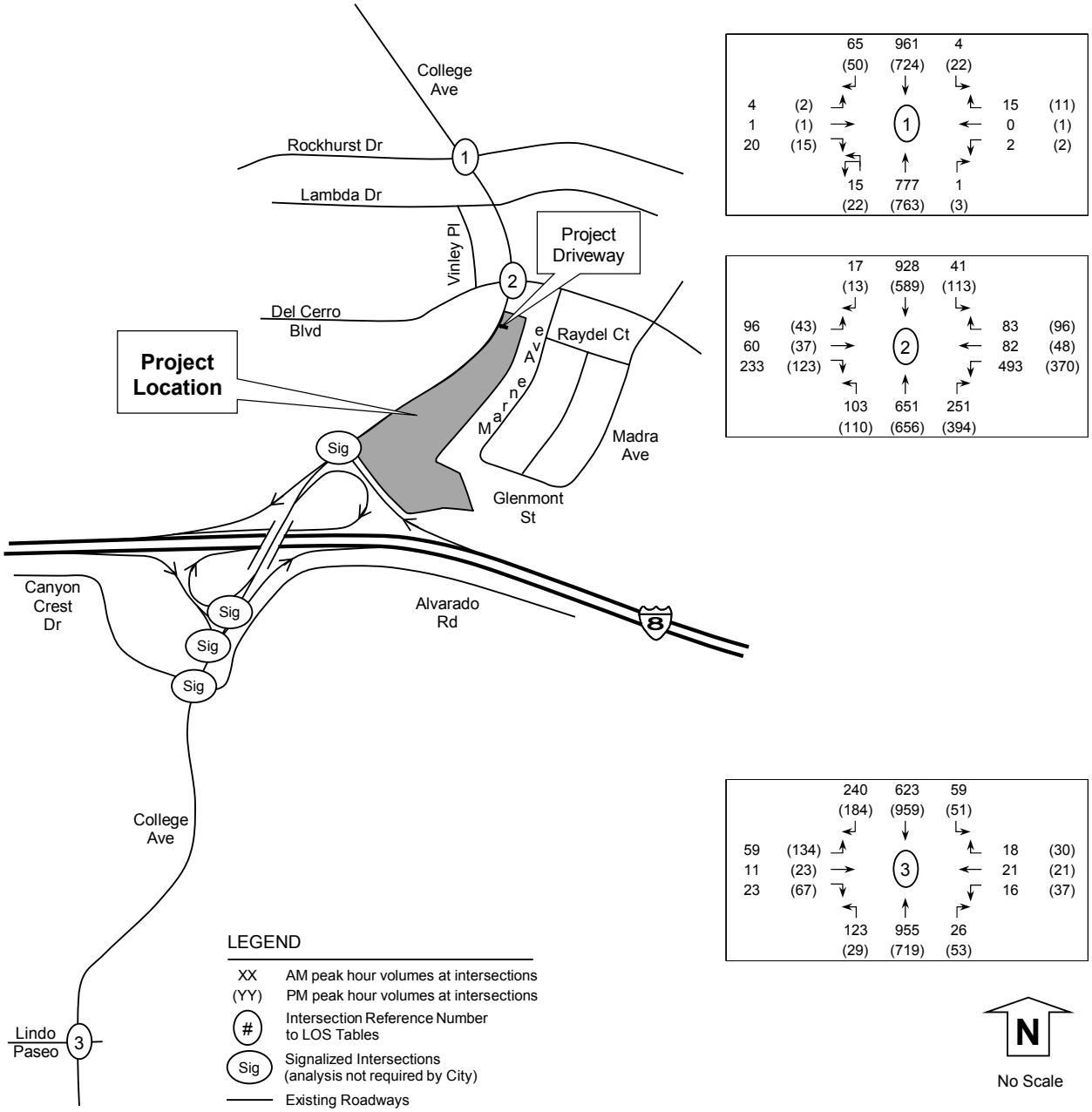
TABLE 3: EXISTING INTERSECTION LEVEL OF SERVICE AND LEFT TURN QUEUES

Intersection and (Analysis)[1]	Movement	Peak Hour	Existing Delay[2]	Existing LOS[3] /Feet
1) College Ave at	EB LTR	AM	21.5	C
Rockhurst Dr (U)	EB LTR	PM	15.7	C
95th Percentile Queue	NB L	AM	1	Foot
95th Percentile Queue	NB L	PM	2	Feet
Available Storage	NB L	AM & PM	90	Feet
2) College Ave at	All	AM	40.6	D
Del Cerro Blvd (S)	All	PM	25.9	C
95th Percentile Queue	NB L	AM	162	Feet
95th Percentile Queue	NB L	PM	132	Feet
Available Storage	NB L	AM & PM	90	Feet
3) College Ave at	All	AM	14.1	B
Lindo Paseo (S)	All	PM	15.2	B
95th Percentile Queue	SB L	AM	57	Feet
95th Percentile Queue	SB L	PM	52	Feet
Available Storage	SB L	AM & PM	90	Feet

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds.
3) LOS: Level of Service.

Under existing conditions, all of the studied roadway facilities were calculated to operate at LOS D or better. The left turn storage queuing was within the available storage for the location noted above except for College Avenue/Del Cerro Boulevard under the AM & PM 95th percentile condition (i.e. the calculated 95th percentile queue/spill back exceeded the available storage); however, the calculated queue/spill back was not observed during data collection.

Figure 4: Existing Volumes



4.0 Project Description

The proposed project consists of 26 residential dwelling units. The project is consistent with the land use of residential as shown in the Community Plan zoning map included in **Appendix G**.

4.1 Trip Generation

The trip generation was calculated using trip rates from the City of San Diego *Trip Generation Manual*, May 2003. The residential project with 26 dwelling units is calculated to generate 260 ADT with 21 AM peak hour trips (4 inbound and 17 outbound) and 26 PM peak hour trips (18 inbound and 8 outbound) as shown in **Table 4**.

TABLE 4: PROJECT TRIP GENERATION

Proposed							AM				PM	
Land Use	Rate	Size & Units	ADT	%	Split		IN	OUT	%	Split	IN	OUT
Residential - Single Family	10 /DU	26 DU	**260**	8%	0.2	0.8	**4**	**17**	10%	0.7 0.3	**18**	**8**

Source: City of San Diego *Trip Generation Manual* , May 2003. Notes: DU = Dwelling Unit. ADT=Average Daily Traffic. Split=percent inbound and outbound.

4.2 Distribution and Assignment

The vehicular trip distribution for the project was based on a review of surrounding traffic patterns, land uses, and proximity to I-8. There are several ways a driver may choose to conduct a U-turn when leaving the project site to match the overall distribution; however, there are two possible choices that appear to be the reasonable based on driving the surrounding roadways. Upon leaving the right-in/right-out driveway, drivers needing to make a U-turn are anticipated to:

1) Travel north past Del Cerro and make the first allowable U-Turn at Rockhurst Dr (there is a small no u-turn sign at Lambda Dr, which is the preceding street); therefore, this option was assigned 60% due to the higher green time for through movements at Del Cerro [30 seconds] vs. left turns [15 seconds – timing sheets included in **Appendix H**], or
2) Take a left at Del Cerro followed by a right turn on Vinley Pl, then a right on Lambda Dr and a right back on to southbound College Ave (this option was assigned 30% due to less green time for left turns at Del Cerro and due to the Hearst Elementary School on Del Cerro that may discourage drivers from wanting to mix with morning school traffic or no desire to make an illegal northbound U-turn maneuver at Del Cerro).
3) The remaining 10% are not required to make a U-turn upon leaving as they are anticipated to travel to/from the north on College Avenue. The returning 10% distribution is anticipated to make a U-turn at College Avenue/Lindo Paseo.

The project distribution is shown in **Figure 5** with the assignment shown in **Figure 6**.

Figure 5: Project Distribution

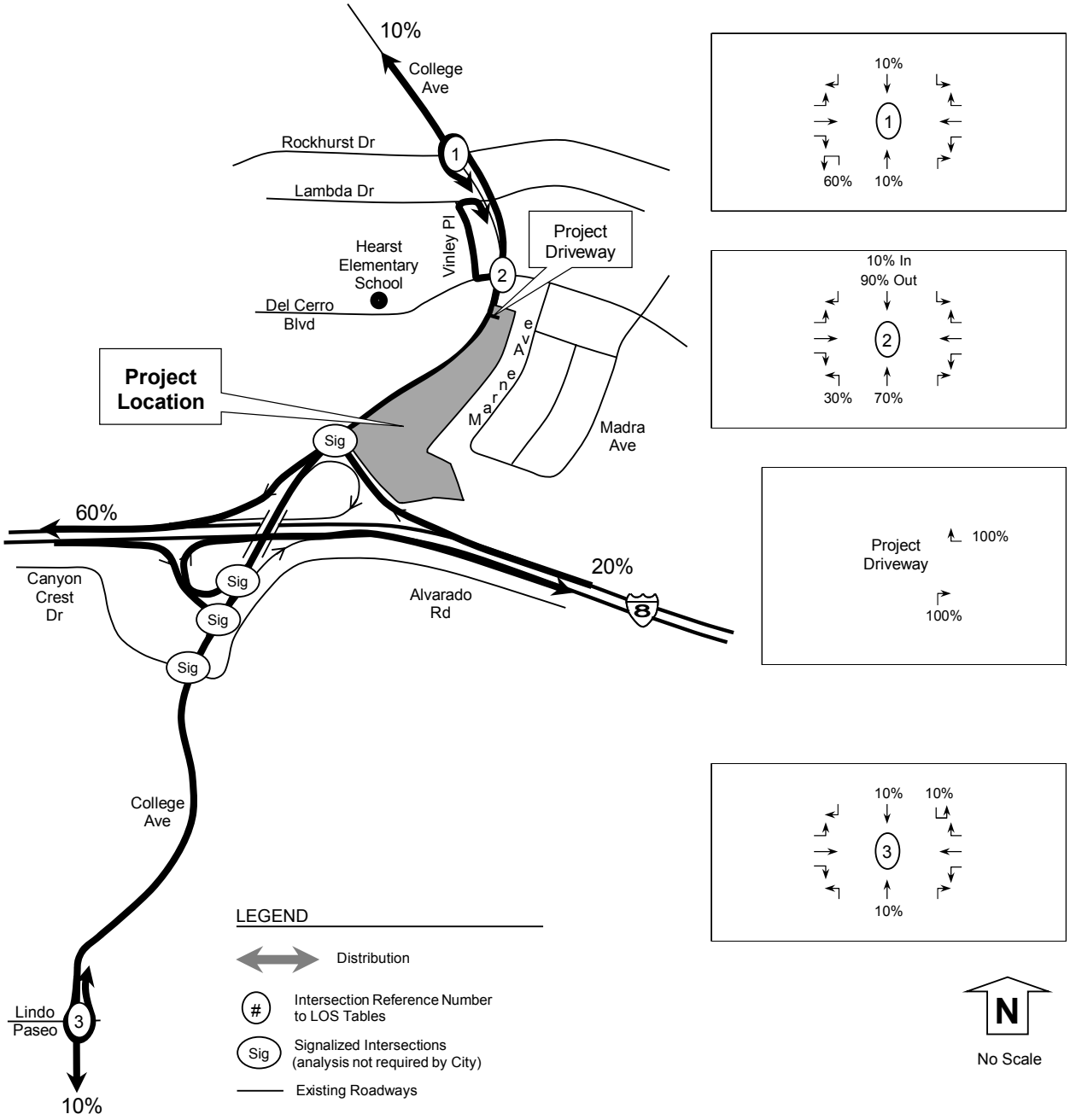
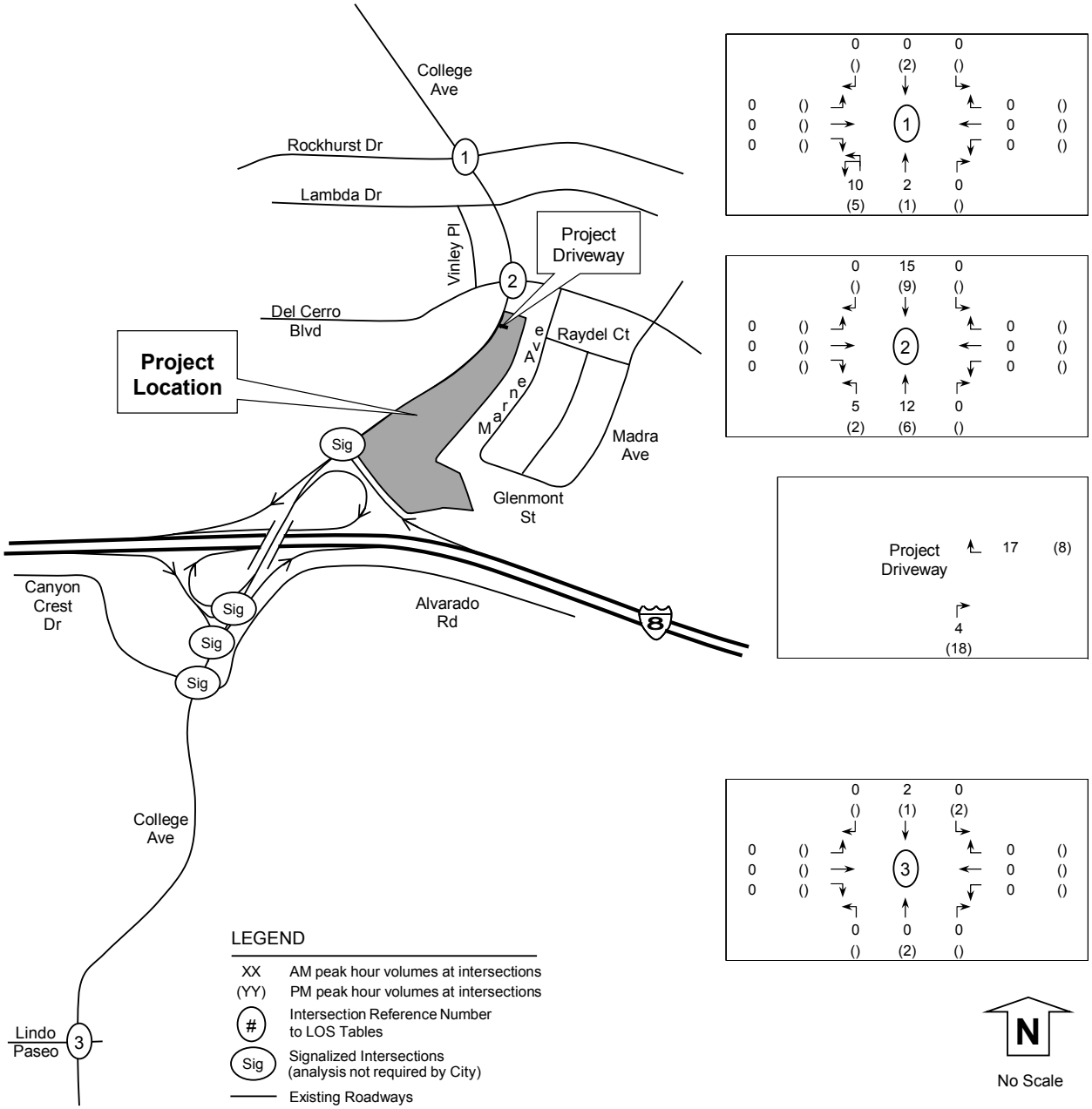


Figure 6: Project Assignment



5.0 Existing with Project Conditions

This scenario documents the addition of project traffic onto existing traffic for AM and PM conditions. The intersection volumes are shown in **Figure 7**. LOS for existing with project conditions are shown in **Table 5**. LOS calculations are included in **Appendix I**.

TABLE 5: EXISTING WITH PROJECT INTERSECTION LEVEL OF SERVICE AND LEFT TURN QUEUES

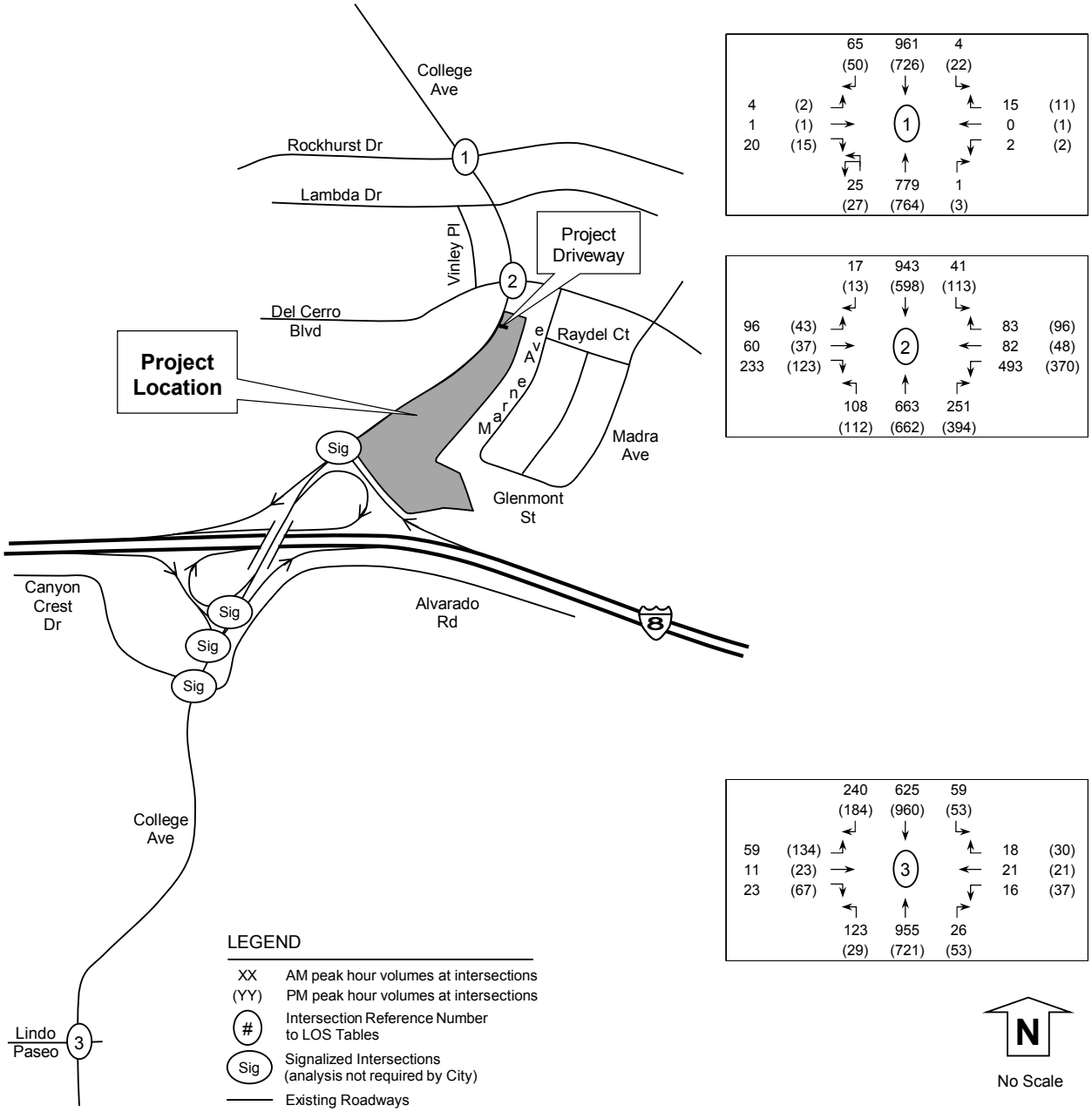
Intersection &	Move-	Peak	Existing		Existing + Project			
(Analysis)[1]	ment	Hour	Delay[2]	LOS[3]	Delay[2]	LOS[3] /Ft	Delta[4]	Sig[5]
1) College Ave at	EB LTR	AM	21.5	C	21.5	C	0.0	No
Rockhurst Dr (U)	EB LTR	PM	15.7	C	15.7	C	0.0	No
95th Percentile Queue	NB L	AM	1	Foot	1	Foot	0	No
95th Percentile Queue	NB L	PM	2	Feet	2	Feet	0	No
Available Storage	NB L	AM & PM	90	Feet	90	Feet		
2) College Ave at	All	AM	40.6	D	41.5	D	0.9	No
Del Cerro Blvd (S)	All	PM	25.9	C	26.0	C	0.1	No
95th Percentile Queue	NB L	AM	162	Feet	170	Feet	8	No
95th Percentile Queue	NB L	PM	132	Feet	135	Feet	3	No
Available Storage	NB L	AM & PM	90	Feet	90	Feet		
3) College Ave at	All	AM	14.1	B	14.1	B	0.0	No
Lindo Paseo (S)	All	PM	15.2	B	15.2	B	0.0	No
95th Percentile Queue	SB L	AM	57	Feet	57	Feet	0	No
95th Percentile Queue	SB L	PM	52	Feet	54	Feet	2	No
Available Storage	SB L	AM & PM	90	Feet	90	Feet		

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds.
3) LOS: Level of Service. 4) Delta is the increase in delay from project or distance in ft. 5) Significant Impact? (yes or no).

Under existing with project conditions, all of the study intersections were calculated to operate at LOS D or better with no significant direct project impacts.

The project is not calculated to significantly increase the 95th percentile queues (ranging between 0 feet and 8 feet [equivalent of 0.3 vehicles]). There are no significance criteria thresholds that identify if a measureable change in queue length would result in an impact if an intersection is operating at LOS D or better condition.

Figure 7: Existing with Project Volumes



6.0 Near Term Conditions

Near term conditions represent the addition of cumulative project traffic on top of existing volumes. City staff requested the analysis of near term conditions to include the cumulative project known as Plaza Linda Verde, which is a San Diego State University mixed-use development featuring ground-floor commercial and upper-floor student housing, student apartments, and additional parking facilities to accommodate increased parking demand within the area. A traffic assignment for Plaza Linda Verde is included in **Appendix T**. Cumulative volumes (Plaza Linda Verde) are shown in **Figure 8** and near-term intersection volumes (existing + Plaza Linda Verde) are shown in **Figure 9.** LOS for near-term conditions are shown in **Table 6**. LOS calculations are included in **Appendix J**.

TABLE 6: NEAR-TERM INTERSECTION LEVEL OF SERVICE AND LEFT TURN QUEUES

Intersection and (Analysis)[1]	Movement	Peak Hour	Near Term Delay[2]	Near Term LOS[3] /Feet
1) College Ave at	EB LTR	AM	22.3	C
Rockhurst Dr (U)	EB LTR	PM	16.6	C
95th Percentile Queue	NB L	AM	2	Feet
95th Percentile Queue	NB L	PM	2	Feet
Available Storage	NB L	AM & PM	90	Feet
2) College Ave at	All	AM	41.4	D
Del Cerro Blvd (S)	All	PM	26.1	C
95th Percentile Queue	NB L	AM	157	Feet
95th Percentile Queue	NB L	PM	132	Feet
Available Storage	NB L	AM & PM	90	Feet
3) College Ave at	All	AM	21.0	C
Lindo Paseo (S)	All	PM	28.8	C
95th Percentile Queue	SB L	AM	128	Feet
95th Percentile Queue	SB L	PM	162	Feet
Available Storage	SB L	AM & PM	90	Feet

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds.
3) LOS: Level of Service.

Under near term conditions, all of the study intersections were calculated to operate at LOS D or better. The left turn storage queues were within the available storage for the locations noted above except for College Avenue/Del Cerro Boulevard and at College Avenue/Lindo Paseo under the AM & PM 95th percentile conditions. At College Avenue/Del Cerro Boulevard, the calculated north bound left turn 95th percentile queue/spill back exceeded the available storage; however, the calculated queue/spill back was not observed during data collection under existing conditions. At College Avenue/Lindo Paseo, the calculated south bound left turn 95th percentile queue/spill back exceeds the available storage due to the addition of cumulative project traffic.

Figure 8: Cumulative Volumes

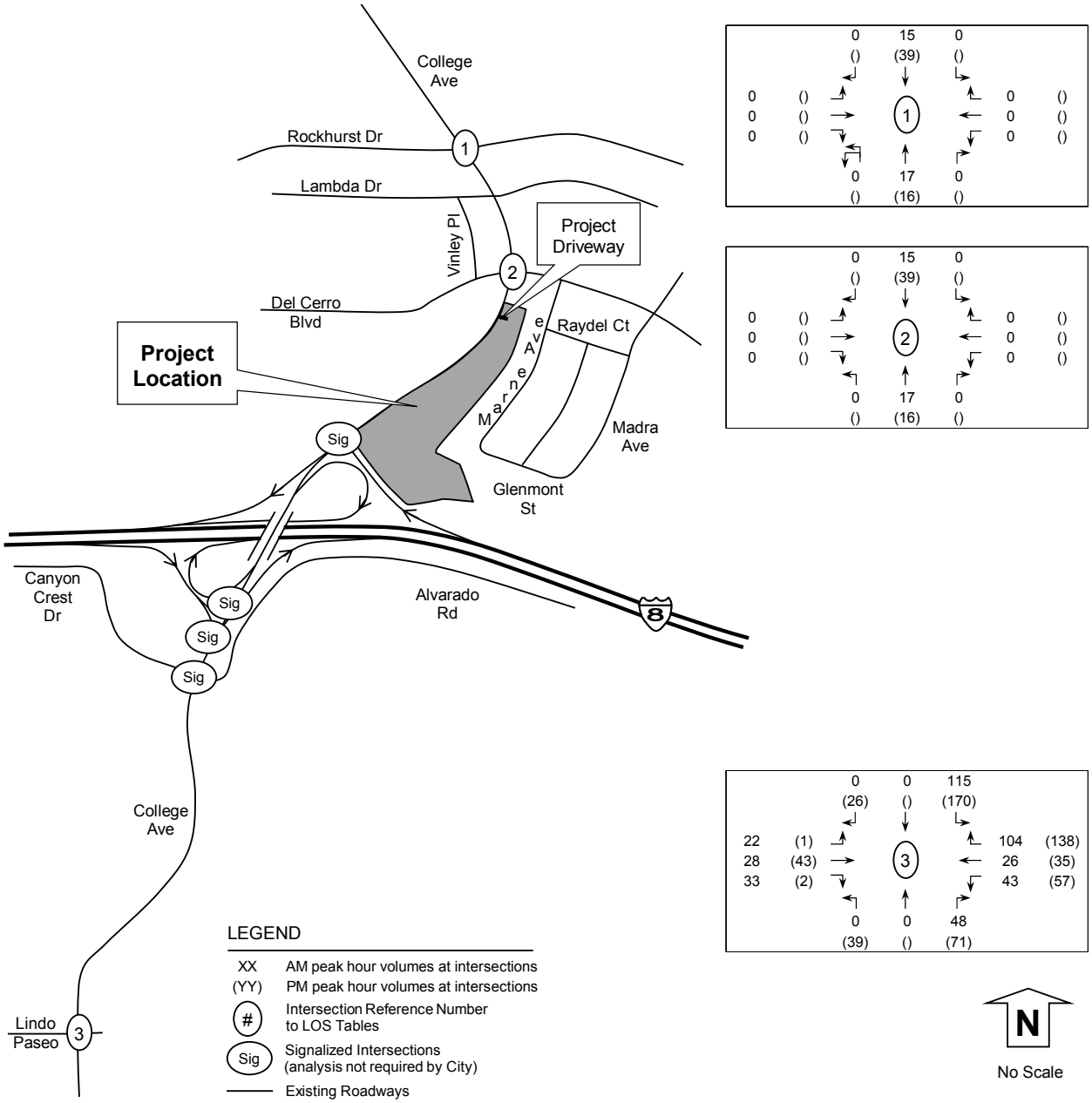
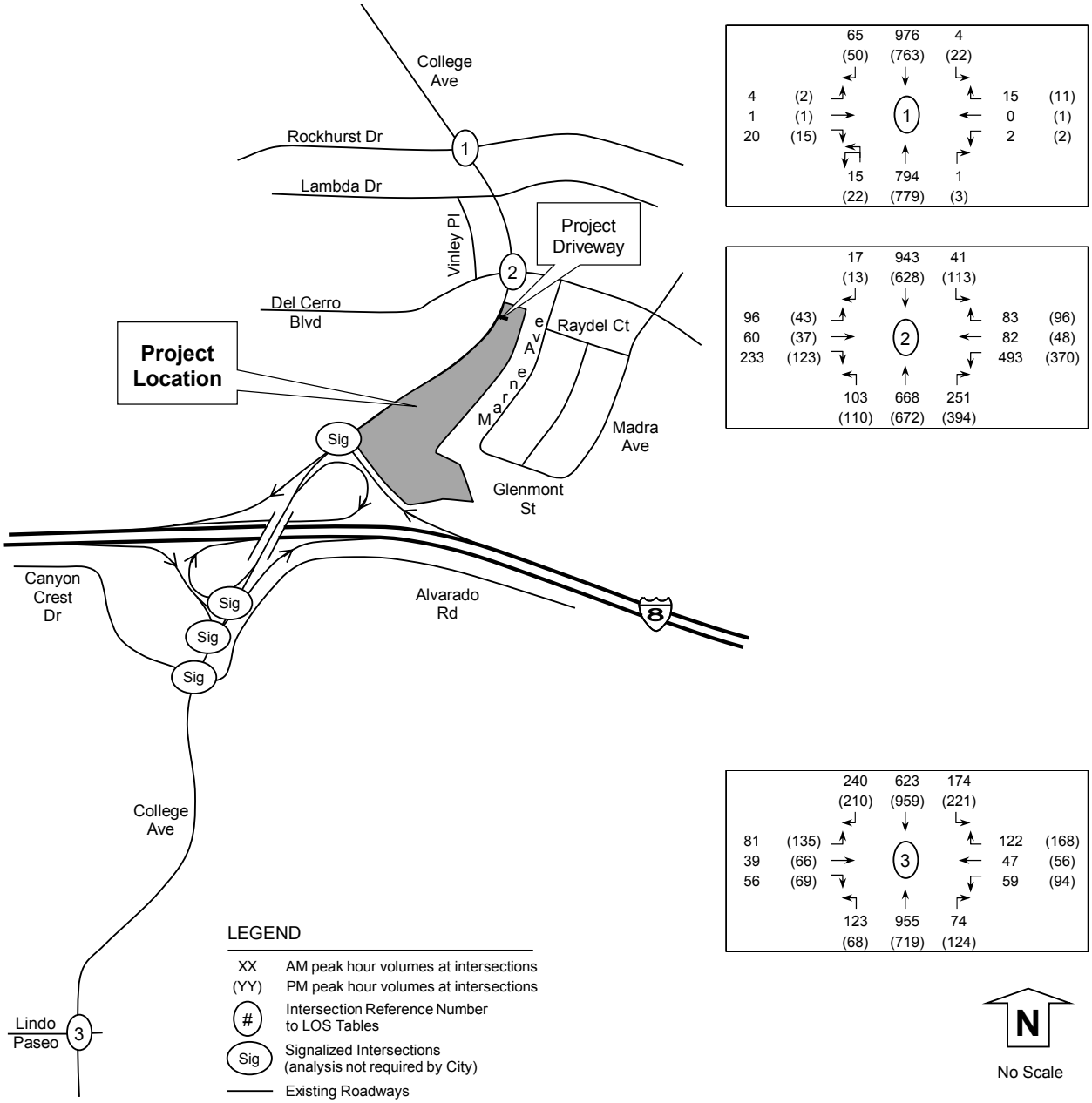


Figure 9: Near Term (Existing + Cumulative) Volumes



7.0 Near Term with Project Conditions

The near term with project conditions describe the anticipated roadway operations that include cumulative traffic along with project traffic. Near term with project intersection volumes are shown in **Figure 10.** LOS for near term with project conditions are shown in **Table 7**. LOS calculations are included in **Appendix K**.

TABLE 7: NEAR TERM WITH PROJECT INTERSECTION LEVEL OF SERVICE AND LEFT TURN QUEUES

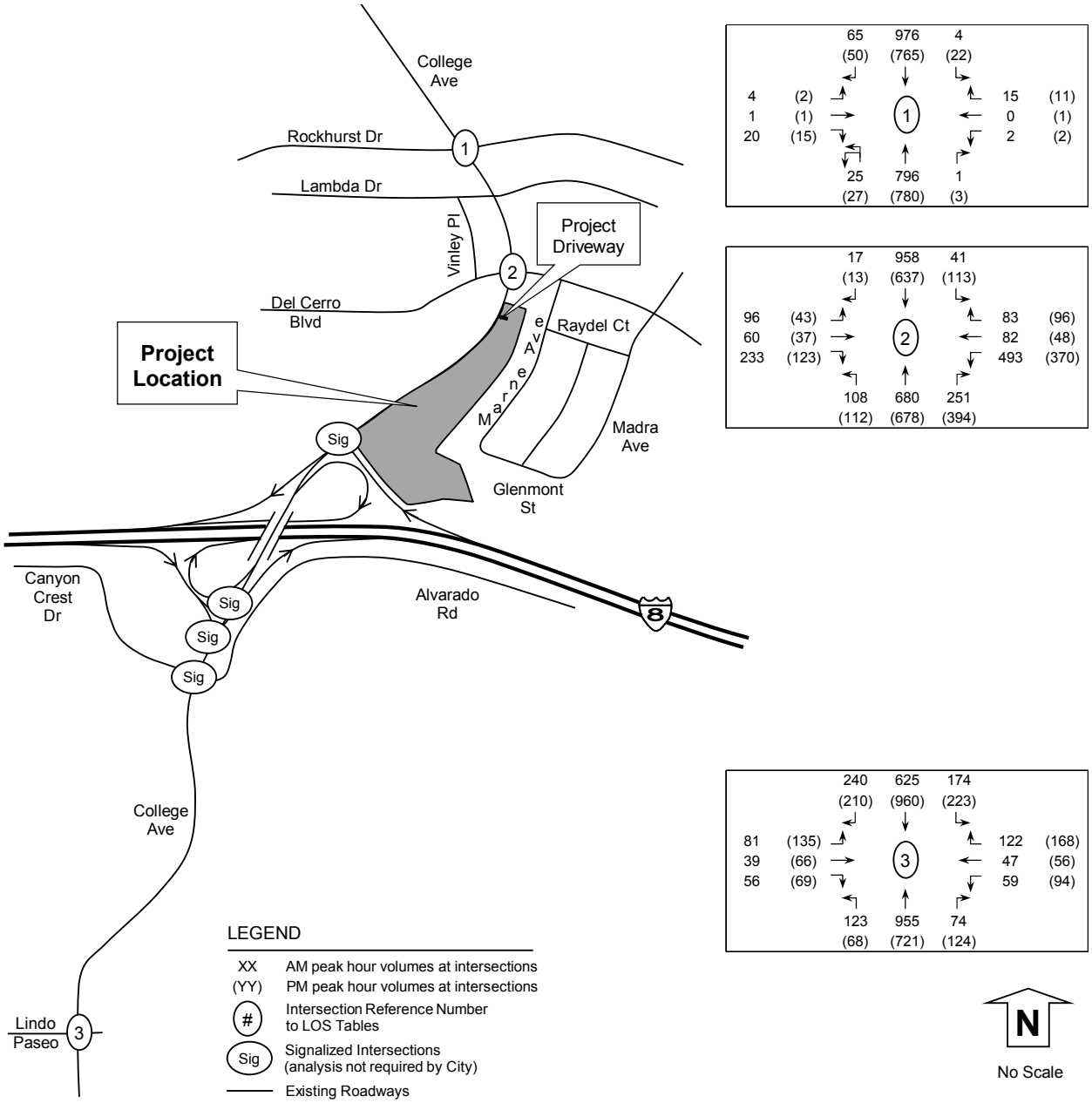
Intersection &	Move-	Peak	Near Term		Near Term + Project			
(Analysis)[1]	ment	Hour	Delay[2]	LOS[3]	Delay[2]	LOS[3] /Ft	Delta[4]	Sig[5]
1) College Ave at	EB LTR	AM	22.3	C	22.9	C	0.6	No
Rockhurst Dr (U)	EB LTR	PM	16.6	C	16.8	C	0.2	No
95th Percentile Queue	NB L	AM	2	Feet	4	Feet	2	No
95th Percentile Queue	NB L	PM	2	Feet	3	Feet	1	No
Available Storage	NB L	AM & PM	90	Feet	90	Feet		
2) College Ave at	All	AM	41.4	D	42.3	D	0.9	No
Del Cerro Blvd (S)	All	PM	26.1	C	26.3	C	0.2	No
95th Percentile Queue	NB L	AM	157	Feet	165	Feet	8	No
95th Percentile Queue	NB L	PM	132	Feet	135	Feet	3	No
Available Storage	NB L	AM & PM	90	Feet	90	Feet		
3) College Ave at	All	AM	21.0	C	21.0	C	0.0	No
Lindo Paseo (S)	All	PM	28.8	C	28.9	C	0.1	No
95th Percentile Queue	SB L	AM	128	Feet	128	Feet	0	No
95th Percentile Queue	SB L	PM	162	Feet	163	Feet	1	No
Available Storage	SB L	AM & PM	90	Feet	90	Feet		

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds.
3) LOS: Level of Service. 4) Delta is the increase in delay from project or distance in ft. 5) Significant Impact? (yes or no).

Under near term with project conditions, all of the study intersections were calculated to operate at LOS D or better with no significant direct project impacts.

The project is not calculated to significantly increase the 95th percentile queues (ranging between 0 feet and 8 feet [equivalent of 0.3 vehicles]). There are no significance criteria thresholds that identify if a measureable change in queue length would result in an impact if an intersection is operating at LOS D or better condition.

Figure 10: Near Term with Project Volumes



8.0 Project Access

The project site has limited access options with one possible location for a right-in/right-out driveway on College Avenue. At the request of City staff, a corner sight distance analysis was prepared for the proposed driveway on College Avenue to determine if there would be adequate vertical and horizontal sight distances for passenger vehicles. The corner sight distance analysis was prepared using the more conservative method between *A Policy on Geometric Design of Streets and Highways*, 2011 6th Edition by the American Association of State Highway and Transportation Officials (AASHTO) and the Caltrans Highway Design Manual (HDM) dated May 7, 2012. College Avenue has a raised median along the project frontage; therefore, the corner sight distance analysis was reviewed for the egress movement turning right onto College Boulevard.

According to Caltrans' HDM, for existing facilities design speeds should reflect operating speeds; therefore, the design speed was taken as the higher between the operating speed of 46 MPH (85th percentile) and posted speed of 40 MPH. According to AASHTO, the sight triangle (defined as the area required to be clear of sight obstructions) is measured from a distance of 14.5 feet back from the edge of the major-road traveled way (this represents the typical position of the minor-road driver's eye position). Additionally, according to AASHTO, the driver's eye position is taken at 3.5 feet above the roadway surface and the object to be seen is 3.5 feet above the surface of the intersecting road. Excerpts from Caltrans' HDM and AASHTO are included in **Appendix L**.

The City of San Diego *Street Design Manual*, 2002 notes that the sight distance on vertical curves shall be determine from Caltrans' HDM using stopping sight distance and for driveways using AASHTO standards. As shown in **Table 8** below, there is at least 440 feet of observed line of sight which meets AASHTO requirements and exceeds CALATRANS requirements (field pictures and driveway location with line of site are included in **Appendix M**).

TABLE 8: PROJECT DRIVEWAY EGRESS CORNER SIGHT DISTANCE SUMMARY

Sight Distance Criteria	Posted Speed Limit 40 MPH	85th Percentile Speed 46 MPH	Field Observation
Caltrans HDM Stopping Sight Distance (ft)	300 feet	374 feet	440 feet line of sight observed to the number 1 and 2 travel lanes
AASHTO Intersection Sight Distance (ft)	385 feet	440 feet	440 feet line of sight observed to the number 1 and 2 travel lanes

9.0 Project Feature

Project access will require a curb cut and restriping of the solid outside lane to provide a right turn lane into the project site. An example is shown in **Figure 11**; however, a final design would be submitted under separate cover.

Figure 11: Recommended Re-Striping of College Ave for Proposed Project Driveway

Source: Google Maps

10.0 Conclusion and Recommendations

The proposed project consists of 26 residential dwelling units located on an infill parcel located on the northeast corner of College Avenue and I-8 in the City of San Diego, California.

Access is proposed from the only fronting street, College Avenue. A right-in/right-out driveway is proposed on College Avenue at the north end of the parcel to which sufficient corner sight distance was field observed for the 85th percentile speed of 46 MPH (posted speed is 40 MPH) using AASHTO standard standards (6th Edition, 2011).

The residential project is calculated to generate 260 ADT with 21 AM peak hour trips (4 inbound and 17 outbound) and 26 PM peak hour trips (18 inbound and 8 outbound). This is below the threshold requirement for a traffic study; however, at the request of City staff, this report is provided to document the right-in/right-out corner sight distance and to determine if the left turn storage bay capacities used by project traffic conducting U-turns would be adversely affected by the addition of project traffic.

Two scenarios were analyzed, which included Existing and Existing plus Project. Even though the intersection operations are not required as part of this analysis, they are summarized below because they show how the study intersections are operating. Findings by scenario are summarized below:

1) Under existing conditions, all of the study intersections and segments were calculated to operate at LOS D or better.
2) Under existing with project conditions, all of the study intersections were calculated to operate at LOS D or better with no significant direct project impacts. The project is not calculated to significantly increase the 95th percentile queues (ranging between 0 feet and 8 feet [equivalent of 0.3 vehicles]).
3) Under near term conditions, all of the study intersections were calculated to operate at LOS D or better.
4) Under near term with project conditions, all of the study intersections were calculated to operate at LOS D or better with no significant direct project impacts. The project is not calculated to significantly increase the 95th percentile queues (ranging between 0 feet and 8 feet [equivalent of 0.3 vehicles]).

There are no significance criteria thresholds that identify if a measureable change in queue length would result in an impact if an intersection is operating at LOS D or better condition. Therefore, no project traffic impacts were calculated and no mitigation measures are recommended. However, it is recommended that a northbound right turn lane on College Avenue be striped for the project driveway.

11.0 References and List of Preparers

11.1 References

City of San Diego *Traffic Impact Study Manual,* July 1998.

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11.2 List of Preparers

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