# ARCHAEOLOGICAL SURVEY OF THE LIAGHAT PARCEL

## LA JOLLA, CALIFORNIA

**APN 352-13-003**

**City of San Diego Project No. 503701**

***Submitted to:***

**City of San Diego**
**Development Services Department**
**1222 First Avenue, MS 501**
**San Diego, California 92101**

***Prepared for:***

**Hamid Liaghat**
**1469 Caminito Halago**
**La Jolla, California 92037**

***Prepared by:***

**Brian F. Smith and Associates, Inc.**
**14010 Poway Road, Suite A**
**Poway, California 92064**

***April 13, 2017; Revised June 13, 2017***

# Archaeological Database Information

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***Report Date:*** April 13, 2017; Revised June 13, 2017

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***USGS Quadrangle:*** *La Jolla OE W, California* (7.5 minute)

***Study Area:*** 0.51-acre residential parcel at APN-352-13-003

***Key Words**:* USGS *La Jolla E W* Quadrangle (7.5 minute); Hillside Drive; negative archaeological survey; no mitigation required.

# I. PROJECT DESCRIPTION AND LOCATION

The Liaghat Parcel is a proposed single-family residential project on a vacant lot on Hillside Drive in La Jolla that will include grading and excavation of a steep lot that has not been previously developed. The property is designated as APN 352-13-003, located adjacent to 7520 Hillside Drive, on a west-facing slope overlooking La Jolla Shores (Figure 1 [Appendix B]). Specifically, the property is in the unsectioned Pueblo Lands of San Diego in projected Township 15 South, Range 4 West of the USGS *La Jolla OE W* (7.5 minute) topographic quadrangle (see Figure 2 and Figure 3 [Appendix B]). This project will include the construction of a new, two-story, single-family residence (see Figure 4 [Appendix B]). As required by the City of San Diego for development projects in the area, Brian F. Smith and Associates, Inc. (BFSA) conducted an archaeological survey of the parcel. The archaeological survey was undertaken in order to determine if cultural resources exist within the property and to assess the effect of any proposed development. BFSA conducted the archaeological survey on April 11, 2017. As part of this study, a copy of the report will be submitted to South Coastal Information Center (SCIC) at San Diego State University (SDSU). All investigations conducted by BFSA related to this project conformed to the California Environmental Quality Act (CEQA) and the City of San Diego guidelines.

# 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 Environment***

The natural environment of the La Jolla area in prehistoric times reflected the open ocean and rocky shoreline around La Jolla Cove. Much of this coastal area that had previously been part of a coastal lagoon (Inman 1983; Pierson et al. 1987) has been developed during the modern era to create a residential neighborhoods. On the steep slopes of Mt. Soledad that overlook La Jolla Cove, the biological environmental is characterized as coastal sage scrub with occasional Torrey Pine trees and scrub oak. The present biological regime within the neighborhood consists largely of introduced ornamentals and urban landscaping; however, some remnants of coastal sage scrub still exist on portions of this lot.

### ***Cultural Environment***

The cultures that have been identified in the general vicinity of the project consist of the Archaic and Early Milling Stone Horizons represented by the La Jolla Complex, and most prominently, the Late Prehistoric Kumeyaay culture. Some areas in the La Jolla coastal region were used for farming in the historic period beginning in the late nineteenth century (Randolph

1955). A brief discussion of the cultural elements in the project area is provided in the following subsections.

### ***Prehistory***

The San Dieguito Complex was a group of people who occupied sites in the southern California region between 10,000 and 8,000 years before present (YBP) and were believed to have been related to or contemporaneous with the Paleo Indian groups in the Great Basin area. The artifacts recovered from San Dieguito sites duplicate the typology attributed to the Western Pluvial Lakes Tradition (Moratto 1984; Davis et al. 1969). These artifacts generally consist of scrapers and scraper planes, choppers, and bifacially flaked knives, with few or no milling tools. The absence of grinding or milling stones suggests that cereal grains and nuts were not a primary part of the subsistence pattern. Tools recovered from sites of the San Dieguito Complex, and the general pattern of site locations, indicate that they 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 San Diego County. This is primarily due to the fact that San Dieguito sites rarely contain stratigraphic information or datable material. There is a disagreement among researchers regarding the relationship of the San Dieguito and the subsequent cultural manifestation in the area, the La Jolla Complex. Firm evidence has not yet been discovered to indicate whether the San Dieguito "evolved" into the La Jolla Complex, the La Jolla Complex moved into the area and assimilated the San Dieguito people, or the San Dieguito retreated from the area because of environmental or cultural pressures. Very little evidence of the San Dieguito Complex has been identified within the region of the project area. It is probable that environmental change associated with climatic shifts affected the subsistence base of the San Dieguito Complex, resulting in their exodus from this area sometime before 9,000 YBP.

#### *The La Jolla Complex*

Approximately 9,000 to 8,500 YBP, a second major cultural tradition was established in the San Diego region along the coast as well as the inland valleys. At that time, the shoreline was located farther west than it is currently because the sea level was lower during the end of the last Ice Age. Locally, this cultural tradition has been called the La Jolla Complex, and radiocarbon dates from sites attributed to this culture span a period of over 7,000 years in this region (between 9,000 and 2,000 YBP). 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 1985a, 1985b).

The tool typology of the La Jolla Complex displays a wide range of sophisticated lithic manufacturing techniques. Scrapers, the most common type of flaked tool recovered from La Jolla sites, were created by either splitting cobbles or finely flaking quarried material. La Jolla sites also contain large numbers of milling tools (manos and metates) and utilized flakes that appear to have been used to pry open shellfish (Smith and Moriarty 1985a, 1985b). Inland sites of the La Jolla Complex, sometimes called the Pauma Complex, were situated at a distance from marine food resources and, while sometimes lacking marine-related refuse, contain large quantities of milling tools and food bone, suggesting seasonal migration from the coast to the inland valleys (Smith 1986).

### *The Late Prehistoric Kumeyaay Indians*

The last major migration into the coastal zone occurred approximately 1,500 YBP, when Yuman- and Shoshonean-speaking people moved from the Colorado River Basin to the coast in search of a more plentiful food supply (Moriarty 1969). This group is known locally as the Late Prehistoric Diegueño, or Kumeyaay, culture. Fortunately, ethnographic evidence is available from the period of the earliest Spanish contact to the late 1800s, providing a record of the nonmaterial aspects of this group.

Sites associated with the Kumeyaay are typically focused in the foothills and mountains. Their subsistence pattern was based on the collection of seeds (especially acorns), berries, and bulbs, in addition to the hunting of small game. Artifact collections from Late Prehistoric occupations include milling tools, ceramics, projectile points, beads, shaft straighteners, and hammerstones. Ethnographic information indicates that the culture of the Kumeyaay consisted of a close clan system with definitive religious beliefs and complex trade associations with relatives living in the Colorado River Basin (Kroeber 1976).

The last phase of the Kumeyaay culture began approximately 400 years ago, with the first contact by Europeans (Juan Rodriguez Cabrillo, in 1542). By 1769, at the time of the first European settlement in San Diego, at least 20 permanent or semi-permanent villages had been established near the Pueblo of San Diego. These living sites were located in both coastal and inland locations. For the most part, villages were located close to a supply of fresh water and plant foods. Villages that depended on springs for their water supply were usually located some distance away, so that the animals using them would not be driven off and so they could avoid the insects that frequented the surrounding marshy areas (Moriarty 1961). Historical accounts generally agree that a few villages were located along the bay side of Point Loma, and several were scattered along the shores of Mission Bay. Others were situated in the present area of the city of San Diego and near the mouths of the major streams that emptied into San Diego Bay. Major river valleys, such as the San Diego River Valley, were well populated because of their resources of plant foods and water. Villages were also located in inland valleys east of San Diego.

## ***History***

Historic European settlement of the La Jolla area began perhaps as early as 1869 (Pourade 1964); however, it was not until 1887, when F.T. Botsford purchased land and laid out a townsite plan with lots for auction, that the modern occupation of La Jolla began in earnest (Smythe 1908). Travelers from San Diego reached La Jolla by train with the completion of a railroad line in 1894

(Pourade 1964). Historic settlement began late in the nineteenth century and was initially used for grazing and farmland. During World War II, Camps Roberts and Callan occupied the area. At the end of the war, the military occupation ceased and the area became popular for residential development.

## III. AREA OF POTENTIAL EFFECT (APE)

This archaeological study encompasses the entire residential lot at APN 352-13-003. The property encompasses approximately 0.51-acre. An archaeological survey was conducted to determine if any cultural resources exist on the parcel that would be affected by proposed residential construction project. The property currently is vacant, although a sewer pipeline bisects the property from Hillside Drive on the east to the sewer easement trending northwest and downslope. Due to the presence of recorded prehistoric sites in the vicinity of this property, the potential existed that cultural resources could be present on this property. Based on the site record forms, the nearest recorded site lies northwest of the property. The proposed residential project will impact the majority of the parcel. Maps of the project are provided in Appendix B.

## IV. STUDY METHODS

The archaeological assessment included a reconnaissance of the property and a records search review of previous studies in the area. BFSA reviewed the results of a records search completed by the SCIC at SDSU for the project area to determine if any previously recorded cultural resources are situated on this parcel (Appendix C).

The results of the records search indicated no cultural resources have been previously recorded within the current APE; however, seven cultural resource sites (SDI-18,305, SDI-19,056, SDI-19,057, P-37-018792, P-37-027459, P-37-027460, and P-37-027507) and 11 historic addresses have been recorded within one-quarter mile of the project area. The records search also indicated that 22 cultural resource studies were conducted within a quarter-mile radius of the project, one of which (Rosen 1996) encompasses most of the project area. No cultural resources were identified within the current project area as a result of this study.

A Sacred Lands File search was requested by BFSA from the Native American Heritage Commission (NAHC) that failed to reveal any previously recorded Native American cultural resources in the immediate project area. Tribes that are culturally affiliated with the project APE received a letter from BFSA regarding the project. As of the date of this report, no responses have been received (Appendix D).

BFSA archaeologists conducted an intensive pedestrian survey of the project. 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***

There is documented evidence of the presence of the archaic La Jolla cultural horizon and Late Prehistoric Kumeyaay temporary camps and village sites in the general La Jolla area; however, the background research for the project indicated that the property does not contain any recorded cultural resources associated with the prehistoric occupation of the La Jolla coastal area. The primary prehistoric site in the area is SDI-39, situated downslope near Torrey Pines Road. However, this site is located approximately 483 meters north of the Liaghat Parcel and will not be impacted by the proposed project.

## ***Field Reconnaissance***

Consulting Archaeologist Brian F. Smith performed a pedestrian survey of the Liaghat Parcel on Hillside Drive on March 30, 2017, and a second pedestrian survey was conducted by BFSA staff archaeologist Jeffrey Henry and Rachel Smith, a Native American representative from Red Tail Monitoring, on April 11, 2017. The survey was not limited by any constraints and ground visibility was adequate to thoroughly survey the property. 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.

**Plate 1: Overview of the Liaghat Parcel, facing northwest.**

**Plate 2: Overview of the Liaghat Parcel, facing north.**

***Evaluation***

Archaeological records search results and research indicated that no resources were located on or near the subject property. The reconnaissance of the parcel did not identify any traces of prehistoric or historic resources. Based upon the results of the survey and records search, no cultural resources are located at this parcel. The proposed residential extension improvement project will not result in impacts to any cultural resources.

## VI. RECOMMENDATIONS

The City of San Diego typically requires two tasks for an archaeological study of this nature: assessment of the potential for cultural resources on the property and a visual inspection for the presence of cultural resources. Both of these tasks have been completed and the results indicate no resources are present. The absence of any prehistoric archaeological sites on this property is due, in large part, to the steep terrain that characterizes this property and the adjacent parcels. The slope is too great to have allowed any Native American use other than possible food collection or hunting. Furthermore, the absence of any previously recorded sites near the property demonstrates that the area immediately surrounding the Liaghat Parcel was not utilized by prehistoric populations that occupied the area to the west and north where SDI-39 is recorded. If there was any prehistoric activity at this location, it would have likely occurred on the east side of the property adjacent to Hillside Drive, as this is the only location on the property where the slope is not severe. However, this location has been extensively disturbed by grading for the road as well as a sewer pipeline that crosses the property from southeast to northwest. Therefore, if any evidence of prehistoric use did exist at this location, modern disturbance has removed that evidence. Based upon these findings, no cultural resources will be impacted as a result of this project. Therefore, no mitigation monitoring is necessary.

## VII. SOURCES CONSULTED DATE

| | |
|---|---|
| National Register of Historic Places ☑ | Month and Year: April 2017 |
| California Register of Historical Resources ☑ | Month and Year: April 2017 |
| City of San Diego Historical Resources Register ☑ | Month and Year: April 2017 |
| Archaeological/Historical Site Records:<br>South Coastal Information Center ☑ | Month and Year: April 2017 |
| Other Sources Consulted: NAHC Sacred Lands File Search (Appendix D)<br>References (Appendix 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.

June 13, 2017

Brian F. Smith, M.A.
Consulting Archaeologist

Date

# IX. APPENDIX A

**References**
**Resumes**

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Smith, Brian F. and James R. Moriarty, III

1985a The Archaeological Excavations at Site W-20, Sierra Del Mar. Unpublished report on file at the South Coastal Information Center at San Diego State University, San Diego, California.

1985b An Archaeological Reconnaissance of San Diego Motor Racing Park, Otay Mesa, San Diego. Report on file at the City of San Diego, Environmental Analysis Division.

Smythe, William E.

1908 *History of San Diego, 1542 to 1908: An Account of the Rise and Progress of the Pioneer Settlement on the Pacific Coast of the United States.* San Diego History Company, San Diego.

# Brian F. Smith, MA

## Owner, Principal Investigator

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## Education

**Master of Arts, History, University of San Diego, California** **1982**

**Bachelor of Arts, History, and Anthropology, University of San Diego, California** **1975**

## Professional Memberships

Society for California Archaeology

## Experience

**Principal Investigator** **1977–Present**
**Brian F. Smith and Associates, Inc.** **Poway, California**

Brian F. Smith is the owner and principal historical and archaeological consultant for Brian F. Smith and Associates. Over the past 32 years, he has conducted over 2,500 cultural resource studies in California, Arizona, Nevada, Montana, and Texas. These studies include every possible aspect of archaeology from literature searches and large-scale surveys to intensive data recovery excavations. Reports prepared by Mr. Smith have been submitted to all facets of local, state, and federal review agencies, including the US Army Crops of Engineers, the Bureau of Land Management, the Bureau of Reclamation, the Department of Defense, and the Department of Homeland Security. In addition, Mr. Smith has conducted studies for utility companies (Sempra Energy) and state highway departments (CalTrans).

## Professional Accomplishments

These selected major professional accomplishments represent research efforts that have added significantly to the body of knowledge concerning the prehistoric life ways of cultures once present in the Southern California area and historic settlement since the late 18th century. Mr. Smith has been principal investigator on the following select projects, except where noted.

Downtown San Diego Mitigation and Monitoring Reporting Programs: Large numbers of downtown San Diego mitigation and monitoring projects submitted to the Centre City Development Corporation, some of which included Strata (2008), Hotel Indigo (2008), Lofts at 707 10th Avenue Project (2007), Breeza (2007), Bayside at the Embarcadero (2007), Aria (2007), Icon (2007), Vantage Pointe (2007), Aperture (2007), Sapphire Tower (2007), Lofts at 655 Sixth Avenue (2007), Metrowork (2007), The Legend (2006), The Mark (2006), Smart Corner (2006), Lofts at 677 7th Avenue (2005), Aloft on Cortez Hill (2005), Front and

Beech Apartments (2003), Bella Via Condominiums (2003), Acqua Vista Residential Tower (2003), Northblock Lofts (2003), Westin Park Place Hotel (2001), Parkloft Apartment Complex (2001), Renaissance Park (2001), and Laurel Bay Apartments (2001).

Archaeology at the Padres Ballpark: Involved the analysis of historic resources within a seven-block area of the "East Village" area of San Diego, where occupation spanned a period from the 1870s to the 1940s. Over a period of two years, BFSA recovered over 200,000 artifacts and hundreds of pounds of metal, construction debris, unidentified broken glass, and wood. Collectively, the Ballpark Project and the other downtown mitigation and monitoring projects represent the largest historical archaeological program anywhere in the country in the past decade (2000-2007).

4S Ranch Archaeological and Historical Cultural Resources Study: Data recovery program consisted of the excavation of over 2,000 square meters of archaeological deposits that produced over one million artifacts, containing primarily prehistoric materials. The archaeological program at 4S Ranch is the largest archaeological study ever undertaken in the San Diego County area and has produced data that has exceeded expectations regarding the resolution of long-standing research questions and regional prehistoric settlement patterns.

Charles H. Brown Site: Attracted international attention to the discovery of evidence of the antiquity of man in North America. Site located in Mission Valley, in the city of San Diego.

Del Mar Man Site: Study of the now famous Early Man Site in Del Mar, California, for the San Diego Science Foundation and the San Diego Museum of Man, under the direction of Dr. Spencer Rogers and Dr. James R. Moriarty.

Old Town State Park Projects: Consulting Historical Archaeologist. Projects completed in the Old Town State Park involved development of individual lots for commercial enterprises. The projects completed in Old Town include Archaeological and Historical Site Assessment for the Great Wall Cafe (1992), Archaeological Study for the Old Town Commercial Project (1991), and Cultural Resources Site Survey at the Old San Diego Inn (1988).

Site W-20, Del Mar, California: A two-year-long investigation of a major prehistoric site in the Del Mar area of the city of San Diego. This research effort documented the earliest practice of religious/ceremonial activities in San Diego County (circa 6,000 years ago), facilitated the projection of major non-material aspects of the La Jolla Complex, and revealed the pattern of civilization at this site over a continuous period of 5,000 years. The report for the investigation included over 600 pages, with nearly 500,000 words of text, illustrations, maps, and photographs documenting this major study.

City of San Diego Reclaimed Water Distribution System: A cultural resource study of nearly 400 miles of pipeline in the city and county of San Diego.

Master Environmental Assessment Project, City of Poway: Conducted for the City of Poway to produce a complete inventory of all recorded historic and prehistoric properties within the city. The information was used in conjunction with the City's General Plan Update to produce a map matrix of the city showing areas of high, moderate, and low potential for the presence of cultural resources. The effort also included the development of the City's Cultural Resource Guidelines, which were adopted as City policy.

Draft of the City of Carlsbad Historical and Archaeological Guidelines: Contracted by the City of Carlsbad to produce the draft of the City's historical and archaeological guidelines for use by the Planning Department of the City.

The Mid-Bayfront Project for the City of Chula Vista: Involved a large expanse of undeveloped agricultural land situated between the railroad and San Diego Bay in the northwestern portion of the city. The study included the analysis of some potentially historic features and numerous prehistoric sites.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Audie Murphy Ranch, Riverside County, California: Project manager/director of the investigation of 1,113.4 acres and 43 sites, both prehistoric and historic—included project coordination; direction of field crews; evaluation of sites for significance based on County of Riverside and CEQA guidelines; assessment of cupule, pictograph, and rock shelter sites, co-authoring of cultural resources project report. February-September 2002.

Cultural Resources Evaluation of Sites Within the Proposed Development of the Otay Ranch Village 13 Project, San Diego County, California: Project manager/director of the investigation of 1,947 acres and 76 sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of San Diego and CEQA guidelines; co-authoring of cultural resources project report. May-November 2002.

Cultural Resources Survey for the Remote Video Surveillance Project, El Centro Sector, Imperial County: Project manager/director for a survey of 29 individual sites near the U.S./Mexico Border for proposed video surveillance camera locations associated with the San Diego Border barrier Project—project coordination and budgeting; direction of field crews; site identification and recordation; assessment of potential impacts to cultural resources; meeting and coordinating with U.S. Army Corps of Engineers, U.S. Border Patrol, and other government agencies involved; co-authoring of cultural resources project report. January, February, and July 2002.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee West GPA, Riverside County, California: Project manager/director of the investigation of nine sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of Riverside and CEQA guidelines; historic research; co-authoring of cultural resources project report. January-March 2002.

Mitigation of An Archaic Cultural Resource for the Eastlake III Woods Project for the City of Chula Vista, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program including collection of material for specialized faunal and botanical analyses; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; co-authoring of cultural resources project report, in prep. September 2001-March 2002.

Cultural Resources Survey and Test of Sites Within the Proposed French Valley Specific Plan/EIR, Riverside County, California: Project manager/director of the investigation of two prehistoric and three historic sites—included project coordination and budgeting; survey of project area; Native American consultation; direction of field crews; assessment of sites for significance based on CEQA guidelines; cultural resources project report in prep. July-August 2000.

Cultural Resources Survey and Test of Sites Within the Proposed Lawson Valley Project, San Diego County, California: Project manager/director of the investigation of 28 prehistoric and two historic sites—included project coordination; direction of field crews; assessment of sites for significance based on CEQA guidelines; cultural resources project report in prep. July-August 2000.

Cultural Resource Survey and Geotechnical Monitoring for the Mohyi Residence Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; field survey; assessment of parcel for potentially buried cultural deposits; monitoring of geotechnichal borings; authoring of cultural resources project report. Brian F. Smith and Associates, San Diego, California. June 2000.

Enhanced Cultural Resource Survey and Evaluation for the Prewitt/Schmucker/Cavadias Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; direction of field crews; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. June 2000.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee Ranch, Riverside County, California: Project manager/director of the investigation of one prehistoric and five historic sites—included project coordination and budgeting; direction of field crews; feature recordation; historic structure assessments; assessment of sites for significance based on CEQA guidelines; historic research; co-authoring of cultural resources project report. February-June 2000.

Salvage Mitigation of a Portion of the San Diego Presidio Identified During Water Pipe Construction for the City of San Diego, California: Project archaeologist/director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Tyrian 3 Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Lamont 5 Project, Pacific Beach, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Reiss Residence Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. March-April 2000.

Salvage Mitigation of a Portion of Site SDM-W-95 (CA-SDI-211) for the Poinsettia Shores Santalina Development Project and Caltrans, Carlsbad, California: Project achaeologist/ director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. December 1999-January 2000.

Survey and Testing of Two Prehistoric Cultural Resources for the Airway Truck Parking Project, Otay Mesa, California: Project archaeologist/director—included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; authoring of cultural resources project report, in prep. December 1999-January 2000.

Cultural Resources Phase I and II Investigations for the Tin Can Hill Segment of the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for a survey and testing of a prehistoric quarry site along the border—NRHP eligibility assessment; project coordination and budgeting; direction of field crews; feature recordation; meeting and coordinating with U.S. Army Corps of Engineers; co-authoring of cultural resources project report. December 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Westview High School Project for the City of San Diego, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program including collection of material for specialized faunal and botanical analyses; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; co-authoring of cultural resources project report, in prep. October 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Otay Ranch SPA-One West Project for the City of Chula Vista, California: Project archaeologist/director—included direction of field crews; development of data recovery program; management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report, in prep. September 1999-January 2000.

Monitoring of Grading for the Herschel Place Project, La Jolla, California: Project archaeologist/ monitor—included monitoring of grading activities associated with the development of a single-dwelling parcel. September 1999.

Survey and Testing of a Historic Resource for the Osterkamp Development Project, Valley Center, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program; budget development; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Testing of a Prehistoric Cultural Resource for the Proposed College Boulevard Alignment Project, Carlsbad, California: Project manager/director —included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report, in prep. July-August 1999.

Survey and Evaluation of Cultural Resources for the Palomar Christian Conference Center Project, Palomar Mountain, California: Project archaeologist—included direction of field crews; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Evaluation of Cultural Resources at the Village 2 High School Site, Otay Ranch, City of Chula Vista, California: Project manager/director —management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report. July 1999.

Cultural Resources Phase I, II, and III Investigations for the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for the survey, testing, and mitigation of sites along border—supervision of multiple field crews, NRHP eligibility assessments, Native American consultation, contribution to Environmental Assessment document, lithic and marine shell analysis, authoring of cultural resources project report. August 1997-January 2000.

Phase I, II, and II Investigations for the Scripps Poway Parkway East Project, Poway California: Project archaeologist/project director—included recordation and assessment of multicomponent prehistoric and historic sites; direction of Phase II and III investigations; direction of laboratory analyses including prehistoric and historic collections; curation of collections; data synthesis; coauthorship of final cultural resources report. February 1994; March-September 1994; September-December 1995.

Archaeological Evaluation of Cultural Resources Within the Proposed Corridor for the San Elijo Water Reclamation System Project, San Elijo, California: Project manager/director —test excavations; direction of artifact identification and analysis; graphics production; coauthorship of final cultural resources report. December 1994-July 1995.

Evaluation of Cultural Resources for the Environmental Impact Report for the Rose Canyon Trunk Sewer Project, San Diego, California: Project manager/Director —direction of test excavations; identification and analysis of prehistoric and historic artifact collections; data synthesis; co-authorship of final cultural resources report, San Diego, California. June 1991-March 1992.

## Reports/Papers

Author, coauthor, or contributor to over 2,500 cultural resources management publications, a selection of which are presented below.

2015 An Archaeological/Historical Study for the Safari Highlands Ranch Project, City of Escondido, County of San Diego.

2015 A Phase I and II Cultural Resources Assessment for the Decker Parcels II Project, Planning Case No. 36962, Riverside County, California.

2015 A Phase I and II Cultural Resources Assessment for the Decker Parcels I Project, Planning Case No. 36950, Riverside County, California.

2015 Cultural Resource Data Recovery and Mitigation Monitoring Program for Site SDI-10,237 Locus F, Everly Subdivision Project, El Cajon, California.

2015 Phase I Cultural Resource Survey for the Woodward Street Senior Housing Project, City of San Marcos, California (APN 218-120-31).

2015 An Updated Cultural Resource Survey for the Box Springs Project (TR 33410), APNs 255-230-010, 255-240-005, 255-240-006, and Portions of 257-180-004, 257-180-005, and 257-180-006.

2015 A Phase I and II Cultural Resource Report for the Lake Ranch Project, TR 36730, Riverside County, California.

2015 A Phase II Cultural Resource Assessment for the Munro Valley Solar Project, Inyo County, California.

2014 Cultural Resources Monitoring Report for the Diamond Valley Solar Project, Community of Winchester, County of Riverside.

2014 National Historic Preservation Act Section 106 Compliance for the Proposed Saddleback Estates Project, Riverside County, California.

2014 A Phase II Cultural Resource Evaluation Report for RIV-8137 at the Toscana Project, TR 36593, Riverside County, California.

2014 Cultural Resources Study for the Estates at Del Mar Project, City of Del Mar, San Diego, California (TTM 14-001).

2014 Cultural Resources Study for the Aliso Canyon Major Subdivision Project, Rancho Santa Fe, San Diego County, California.

2014 Cultural Resources Due Diligence Assessment of the Ocean Colony Project, City of Encinitas.

2014 A Phase I and Phase II Cultural Resource Assessment for the Citrus Heights II Project, TTM 36475, Riverside County, California.

2013 A Phase I Cultural Resource Assessment for the Modular Logistics Center, Moreno Valley, Riverside County, California.

2013 A Phase I Cultural Resources Survey of the Ivey Ranch Project, Thousand Palms, Riverside County, California.

2013 Cultural Resources Report for the Emerald Acres Project, Riverside County, California.

2013 A Cultural Resources Records Search and Review for the Pala Del Norte Conservation Bank Project, San Diego County, California.

2013 An Updated Phase I Cultural Resources Assessment for Tentative Tract Maps 36484 and 36485, Audie Murphy Ranch, City of Menifee, County of Riverside.

2013 El Centro Town Center Industrial Development Project (EDA Grant No. 07-01-06386); Result of Cultural Resource Monitoring.

2013 Cultural Resources Survey Report for the Renda Residence Project, 9521 La Jolla Farms Road, La Jolla, California.

2013 A Phase I Cultural Resource Study for the Ballpark Village Project, San Diego, California.

2013 Archaeological Monitoring and Mitigation Program, San Clemente Senior Housing Project, 2350 South El Camino Real, City of San Clemente, Orange County, California (CUP No. 06-065; APN-060-032-04).

2012 Mitigation Monitoring Report for the Los Peñasquitos Recycled Water Pipeline.

2012 Cultural Resources Report for Menifee Heights (Tract 32277).

2012 A Phase I Cultural Resource Study for the Altman Residence at 9696 La Jolla Farms Road, La Jolla, California 92037.

2012 Mission Ranch Project (TM 5290-1/MUP P87-036W3): Results of Cultural Resources Monitoring During Mass Grading.

2012 A Phase I Cultural Resource Study for the Payan Property Project, San Diego, California.

2012 Phase I Archaeological Survey of the Rieger Residence, 13707 Durango Drive, Del Mar, California 92014, APN 300-369-49.

2011 Mission Ranch Project (TM 5290-1/MUP P87-036W3): Results of Cultural Resources Monitoring During Mass Grading.

2011 Mitigation Monitoring Report for the 1887 Viking Way Project, La Jolla, California.

2011 Cultural Resource Monitoring Report for the Sewer Group 714 Project.

2011 Results of Archaeological Monitoring at the 10th Avenue Parking Lot Project, City of San Diego, California (APNs 534-194-02 and 03).

2011 Archaeological Survey of the Pelberg Residence for a Bulletin 560 Permit Application; 8335 Camino Del Oro; La Jolla, California 92037 APN 346-162-01-00 .

2011 A Cultural Resources Survey Update and Evaluation for the Robertson Ranch West Project and an Evaluation of National Register Eligibility of Archaeological sites for Sites for Section 106 Review (NHPA).

2011 Mitigation Monitoring Report for the 43rd and Logan Project.

2011 Mitigation Monitoring Report for the Sewer Group 682 M Project, City of San Diego Project #174116.

2011 A Phase I Cultural Resource Study for the Nooren Residence Project, 8001 Calle de la Plata, La Jolla, California, Project No. 226965.

2011 A Phase I Cultural Resource Study for the Keating Residence Project, 9633 La Jolla Farms Road, La Jolla, California 92037.

2010 Mitigation Monitoring Report for the 15th & Island Project, City of San Diego; APNs 535-365-01, 535-365-02 and 535-392-05 through 535-392-07.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Sewer and Water Group 772 Project, San Diego, California, W.O. Nos. 187861 and 178351.

2010 Pottery Canyon Site Archaeological Evaluation Project, City of San Diego, California, Contract No. H105126.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Racetrack View Drive Project, San Diego, California; Project No. 163216.

2010 A Historical Evaluation of Structures on the Butterfield Trails Property.

2010 Historic Archaeological Significance Evaluation of 1761 Haydn Drive, Encinitas, California (APN 260-276-07-00).

2010 Results of Archaeological Monitoring of the Heller/Nguyen Project, TPM 06-01, Poway, California.

2010 Cultural Resource Survey and Evaluation Program for the Sunday Drive Parcel Project, San Diego County, California, APN 189-281-14.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Emergency Garnet Avenue Storm Drain Replacement Project, San Diego, California, Project No. B10062

2010 An Archaeological Study for the 1912 Spindrift Drive Project

2009 Cultural Resource Assessment of the North Ocean Beach Gateway Project City of San Diego #64A-003A; Project #154116.

2009 Archaeological Constraints Study of the Morgan Valley Wind Assessment Project, Lake County, California.

2008 Results of an Archaeological Review of the Helen Park Lane 3.1-acre Property (APN 314-561-31), Poway, California.

2008 Archaeological Letter Report for a Phase I Archaeological Assessment of the Valley Park Condominium Project, Ramona, California; APN 282-262-75-00.

2007 Archaeology at the Ballpark. Brian F. Smith and Associates, San Diego, California. Submitted to the Centre City Development Corporation.

2007 Result of an Archaeological Survey for the Villages at Promenade Project (APNs 115-180-007-3,115-180-049-1, 115-180-042-4, 115-180-047-9) in the City of Corona, Riverside County.

2007 Monitoring Results for the Capping of Site CA-SDI-6038/SDM-W-5517 within the Katzer Jamul Center Project; P00-017.

2006 Archaeological Assessment for The Johnson Project (APN 322-011-10), Poway, California.

2005 Results of Archaeological Monitoring at the El Camino Del Teatro Accelerated Sewer Replacement Project (Bid No. K041364; WO # 177741; CIP # 46-610.6.

2005 Results of Archaeological Monitoring at the Baltazar Draper Avenue Project (Project No. 15857; APN: 351-040-09).

2004 TM 5325 ER #03-14-043 Cultural Resources.

2004 An Archaeological Survey and an Evaluation of Cultural Resources at the Salt Creek Project. Report on file at Brian F. Smith and Associates.

2003 An Archaeological Assessment for the Hidden Meadows Project, San Diego County, TM 5174, Log No. 99-08-033. Report on file at Brian F. Smith and Associates.

2003 An Archaeological Survey for the Manchester Estates Project, Coastal Development Permit #02-009, Encinitas, California. Report on file at Brian F. Smith and Associates.

2003 Archaeological Investigations at the Manchester Estates Project, Coastal Development Permit #02-009, Encinitas, California. Report on file at Brian F. Smith and Associates.

2003 Archaeological Monitoring of Geological Testing Cores at the Pacific Beach Christian Church Project. Report on file at Brian F. Smith and Associates.

2003 San Juan Creek Drilling Archaeological Monitoring. Report on file at Brian F. Smith and Associates.

2003 Evaluation of Archaeological Resources Within the Spring Canyon Biological Mitigation Area, Otay Mesa, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for the Otay Ranch Village 13 Project (et al.). Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for the Audie Murphy Ranch Project (et al.). Brian F. Smith and Associates, San Diego, California.

2002 Results of an Archaeological Survey for the Remote Video Surveillance Project, El Centro Sector, Imperial County, California. Brian F. Smith and Associates, San Diego, California.

2002 A Cultural Resources Survey and Evaluation for the Proposed Robertson Ranch Project, City of Carlsbad. Brian F. Smith and Associates, San Diego, California.

2002 Archaeological Mitigation of Impacts to Prehistoric Site SDI-7976 for the Eastlake III Woods Project, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for Tract No. 29777, Menifee West GPA Project, Perris Valley, Riverside County. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for Tract No. 29835, Menifee West GPA Project, Perris Valley, Riverside County. Brian F. Smith and Associates, San Diego, California.

2001 An Archaeological Survey and Evaluation of a Cultural Resource for the Moore Property, Poway. Brian F. Smith and Associates, San Diego, California.

2001 An Archaeological Report for the Mitigation, Monitoring, and Reporting Program at the Water and Sewer Group Job 530A, Old Town San Diego. Brian F. Smith and Associates, San Diego, California.

2001 A Cultural Resources Impact Survey for the High Desert Water District Recharge Site 6 Project, Yucca Valley. Brian F. Smith and Associates, San Diego, California.

2001 Archaeological Mitigation of Impacts to Prehistoric Site SDI-13,864 at the Otay Ranch SPA-One West Project. Brian F. Smith and Associates, San Diego, California.

2001 A Cultural Resources Survey and Site Evaluations at the Stewart Subdivision Project, Moreno Valley, County of San Diego. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological/Historical Study for the French Valley Specific Plan/EIR, French Valley, County of Riverside. Brian F. Smith and Associates, San Diego, California.

2000 Results of an Archaeological Survey and the Evaluation of Cultural Resources at The TPM#24003–Lawson Valley Project. Brian F. Smith and Associates, San Diego, California.

2000 Archaeological Mitigation of Impacts to Prehistoric Site SDI-5326 at the Westview High School Project for the Poway Unified School District. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological/Historical Study for the Menifee Ranch Project. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological Survey and Evaluation of Cultural Resources for the Bernardo Mountain Project, Escondido, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Nextel Black Mountain Road Project, San Diego, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Rancho Vista Project, 740 Hilltop Drive, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Poway Creek Project, Poway, California. Brian F. Smith and Associates, San Diego, California.

2000 Cultural Resource Survey and Geotechnical Monitoring for the Mohyi Residence Project. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Prewitt/Schmucker/ Cavadias Project. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Lamont 5 Project. Brian F. Smith and Associates, San Diego, California.

2000 Salvage Excavations at Site SDM-W-95 (CA-SDI-211) for the Poinsettia Shores Santalina Development Project, Carlsbad, California. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Reiss Residence Project, La Jolla, California. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Tyrian 3 Project, La Jolla, California. Brian F. Smith and Associates, San Diego, California.

2000 A Report for an Archaeological Evaluation of Cultural Resources at the Otay Ranch Village Two SPA, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological Evaluation of Cultural Resources for the Airway Truck Parking Project, Otay Mesa, County of San Diego. Brian F. Smith and Associates, San Diego, California.

2000 Results of an Archaeological Survey and Evaluation of a Resource for the Tin Can Hill Segment of the Immigration and Naturalization and Immigration Service Border Road, Fence, and Lighting Project, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey of the Home Creek Village Project, 4600 Block of Home Avenue, San Diego, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey for the Sgobassi Lot Split, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

1999 An Evaluation of Cultural Resources at the Otay Ranch Village 11 Project. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological/Historical Survey and Evaluation of a Cultural Resource for The Osterkamp Development Project, Valley Center, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey and Evaluation of Cultural Resources for the Palomar Christian Conference Center Project, Palomar Mountain, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey and Evaluation of a Cultural Resource for the Proposed College Boulevard Alignment Project. Brian F. Smith and Associates, San Diego, California.

1999 Results of an Archaeological Evaluation for the Anthony's Pizza Acquisition Project in Ocean Beach, City of San Diego (with L. Pierson and B. Smith). Brian F. Smith and Associates, San Diego, California.

1996 An Archaeological Testing Program for the Scripps Poway Parkway East Project. Brian F. Smith and Associates, San Diego, California.

1995 Results of a Cultural Resources Study for the 4S Ranch. Brian F. Smith and Associates, San Diego, California.

1995 Results of an Archaeological Evaluation of Cultural Resources Within the Proposed Corridor for the San Elijo Water Reclamation System. Brian F. Smith and Associates, San Diego, California.

1994 Results of the Cultural Resources Mitigation Programs at Sites SDI-11,044/H and SDI-12,038 at the Salt Creek Ranch Project . Brian F. Smith and Associates, San Diego, California.

1993 Results of an Archaeological Survey and Evaluation of Cultural Resources at the Stallion Oaks Ranch Project. Brian F. Smith and Associates, San Diego, California.

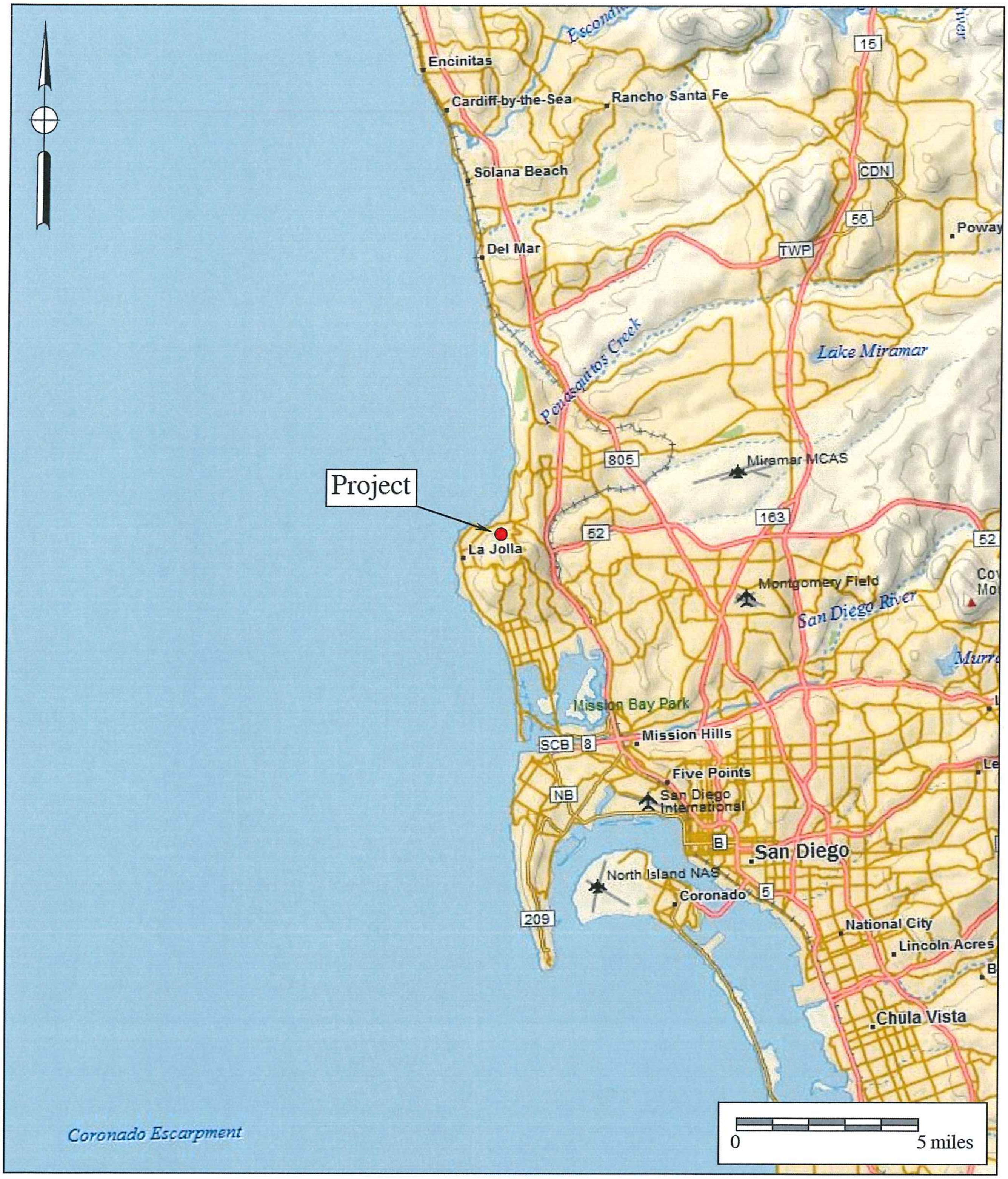
1992 Results of an Archaeological Survey and the Evaluation of Cultural Resources at the Ely Lot Split Project. Brian F. Smith and Associates, San Diego, California.

1991 The Results of an Archaeological Study for the Walton Development Group Project. Brian F. Smith and Associates, San Diego, California.

# X. APPENDIX B

**Project Maps:**

**General Location Map**
**USGS Project Location Map**
**City 800' Project Location Map**
**Site Plan Map**



# Figure 1

## General Location Map

The Liaghat Parcel Project

DeLorme (1:250,000 series)

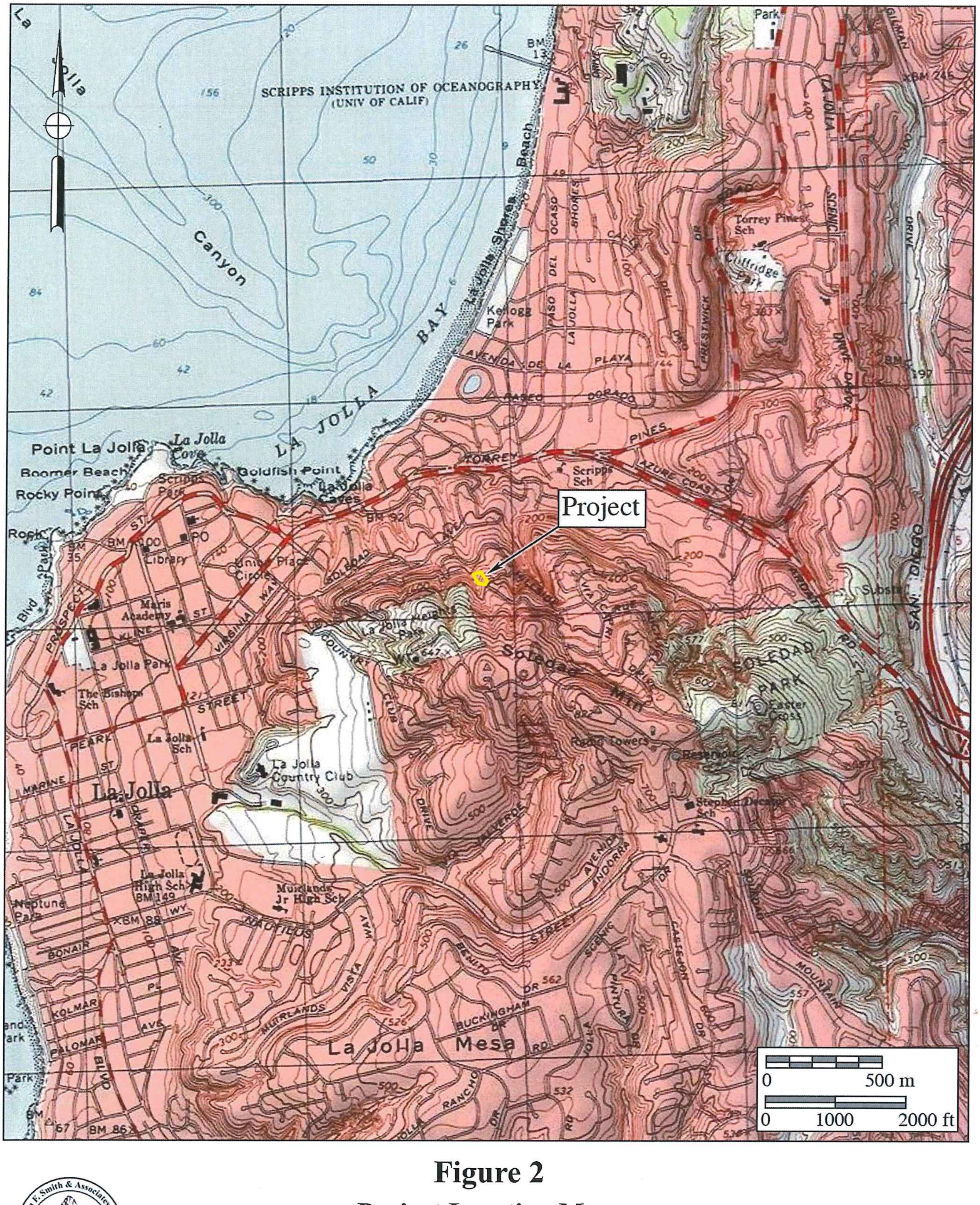


**Figure 2**

**Project Location Map**

The Liaghat Parcel Project

USGS *La Jolla OE W* and *La Jolla* Quadrangles (7.5-minute series)

# Figure 3

## Project Location Map

The Liaghat Parcel Project

Shown on The City of San Diego 1" to 800' Scale Engineering Map

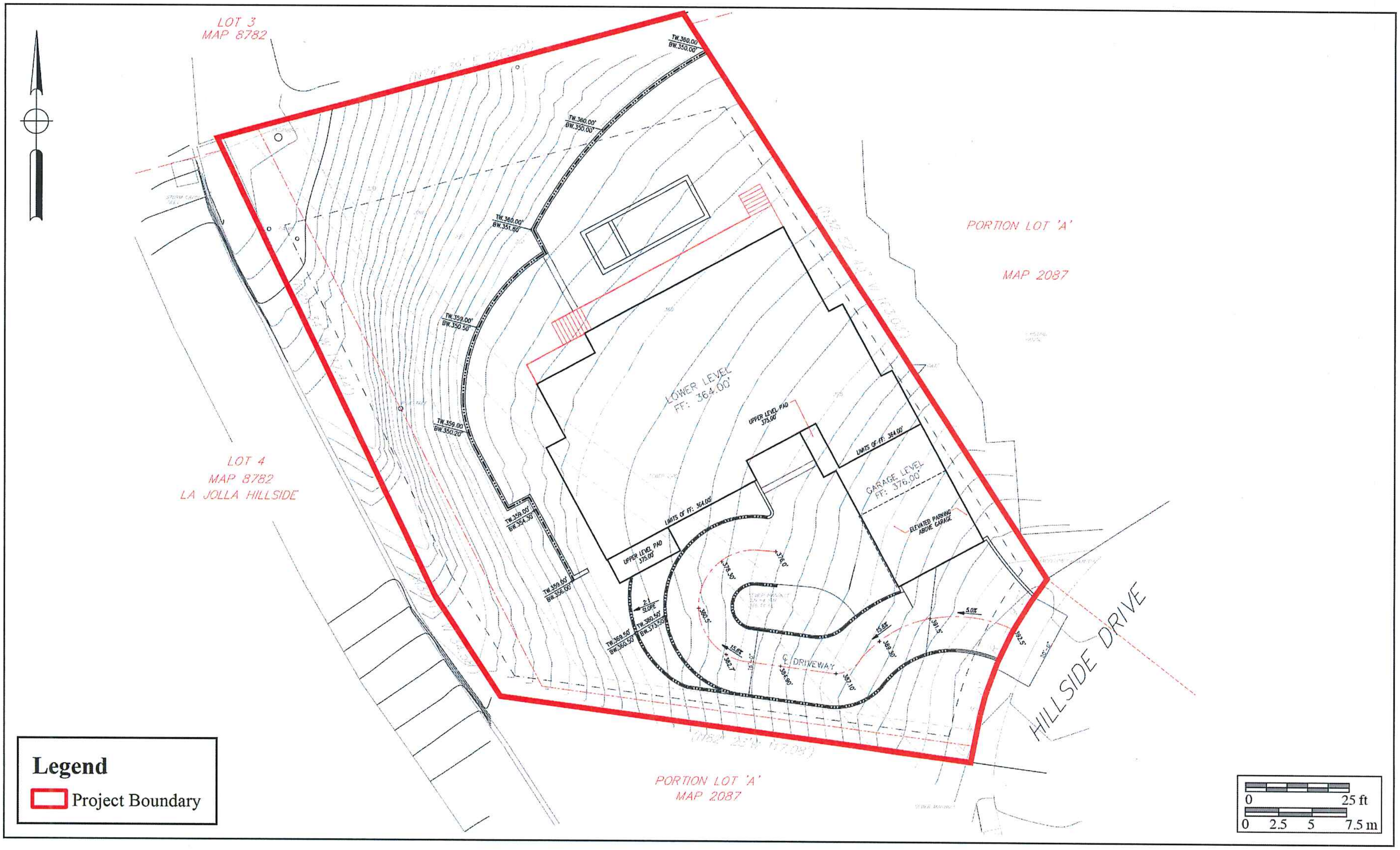


**Figure 4**

**Site Plan**

The Liaghat Parcel Project

# XI. APPENDIX C

## Archaeological Records Search Results

# BRIAN F. SMITH and ASSOCIATES

## CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEMS

## RECORDS SEARCH

| | |
|---|---|
| **Company:** | Brian F. Smith and Associates |
| **Processed By:** | Kris Reinicke |
| **Date Processed:** | 3-31-2017 |
| **Project Identification:** | The Liaghat Hillside Project |
| **Search Radius:** | 1/4 Mile |

**Historical Resources:**

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 reviewed for all recorded sites.

Seven resources have been recorded within the search radius and none are within the project area.

**Previous Survey Report Boundaries:**

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 reviewed.

Twenty-two reports have been recorded within the search area and one (SD-112610) is within the project area.

**Historic Addresses:**

A map and database of historic properties (formerly Geofinder) has been reviewed.

**Historic Maps:**

The historic maps on file at the South Coastal Information Center have been reviewed.

# XII. APPENDIX D

## NAHC Sacred Lands File Search Results

Brian F. Smith and Associates, Inc.
*Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics*

March 31, 2017

For: Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, California 95814

From: Kris Reinicke, M.S.
Brian F. Smith and Associates
14010 Poway Rd. Suite A
Poway, CA 92064

Re: Request for a Sacred Lands File and Native American Contact List for the Liaghat Hillside Project, La Jolla, San Diego County, California.

I am writing to request a record search of the Sacred Lands File and a list of appropriate Native American contacts for my company's project: Liaghat Hillside (Project No. 17-061). This is an archaeological assessment for the development of a single family home on a .51 acre property located directly west of 7550 Hillside in La Jolla, City of San Diego, California (APN 352-13-003). More specifically, the project is located in the Pueblo Land Grant (Township 15 south, Range 4 west, projected), 7.5-minute USGS *La Jolla OE W* California topographic quadrangle. A copy of the project map with the project location has been included for your records.

Sincerely,

Kris Reinicke, M.S.
Archaeologist/GIS Specialist
Phone: 858-484-0915
Email: kris@bfsa-ca.com

Attachments:

USGS *La Jolla OE W* California topographic quadrangle project map

Sacred Lands File Request Form

## 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 Liaghat Hillside Project

County: San Diego

USGS Quadrangle Name: *La Jolla OE W*

Township: 15S Range: 04W *Projected, in the Pueblo Land Grant

Company/Firm/Agency: Brian F. Smith & Associates Inc.

Contact Person: Kris Reinicke, M.S.

Street Address: 14010 Poway Road, Suite A

City: Poway Zip: 92064

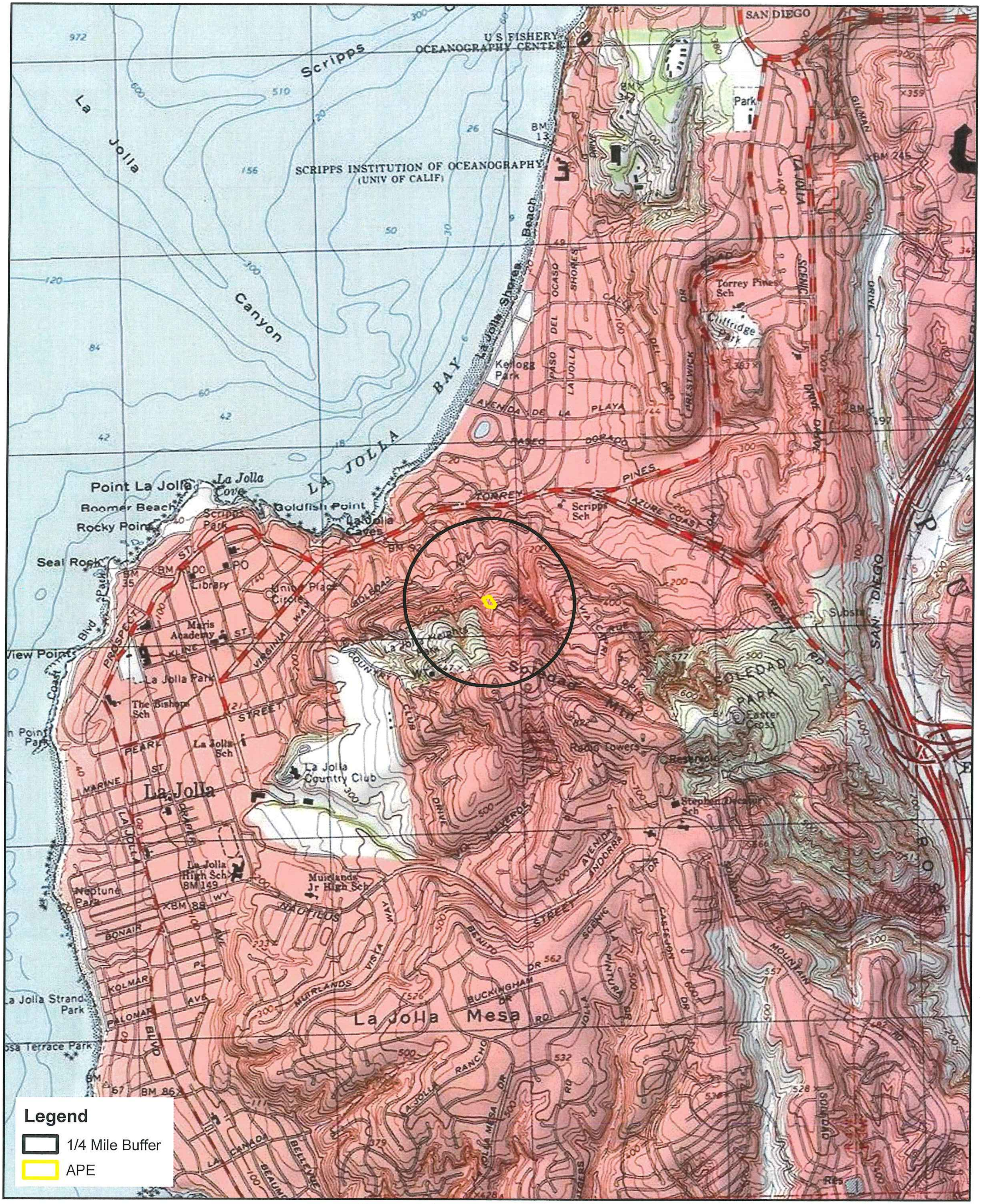
Phone: 858-484-0915

Fax: 858-679-9896

Email: kris@bfsa-ca.com

Project Description:

This records search is for my company's project: Liaghat Hillside (Project No. 17-061). This is an archaeological assessment for the development of a single family home on a .51 acre property located directly west of 7550 Hillside in La Jolla, City of San Diego, California (APN 352-13-003). More specifically, the project is located in the Pueblo Land Grant (Township 15 south, Range 4 west, projected), 7.5-minute USGS *La Jolla OE W* California topographic quadrangle. A copy of the project map with the project location has been included for your records.



0 1,000 2,000
Feet

Record Search Location Map
The Liaghat Hillside Project
USGS La Jolla OE W Quadrangle (7.5-minute series)

N

Revised 3-31-2017

STATE OF CALIFORNIA Edmund G. Brown, Jr., *Governor*

**NATIVE AMERICAN HERITAGE COMMISSION**
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
Fax (916) 373-5471

April 4, 2017

Kris Reinicke
Brian F. Smith & Associates, Inc.

Sent by E-mail: kris@bfsa-ca.com

RE: Proposed Liaghat Hillside Project, Community of La Jolla; La Jolla OE W USGS Quadrangle, San Diego County, California

Dear Ms. Reinicke:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

Attached is a list of tribes culturally affiliated to the project area. I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

## Native American Heritage Commission
## Native American Contact List
## San Diego County
## 4/4/2017

***Barona Group of the Capitan Grande***
Clifford LaChappa, Chairperson
1095 Barona Road
Kumeyaay
Lakeside, CA, 92040
Phone: (619) 443 - 6612
Fax: (619) 443-0681
cloyd@barona-nsn.gov

***Campo Kumeyaay Nation***
Ralph Goff, Chairperson
36190 Church Road, Suite 1
Kumeyaay
Campo, CA, 91906
Phone: (619)478-9046
Fax: (619)478-5818
rgoff@campo-nsn.gov

***Ewiiaapaayp Band of Kumeyaay Indians***
Robert Pinto, Chairperson
4054 Willows Road
Kumeyaay
Alpine, CA, 91901
Phone: (619)445-6315
Fax: (619)445-9126

***Ewiiaapaayp Band of Kumeyaay Indians***
Michael Garcia, Vice Chairperson
4054 Willows Road
Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

***Iipay Nation of Santa Ysabel***
Clint Linton, Director of Cultural Resources
P.O. Box 507
Kumeyaay
Santa Ysabel, CA, 92070
Phone: (760) 803 - 5694
cjlinton73@aol.com

***Iipay Nation of Santa Ysabel***
Virgil Perez, Chairperson
P.O. Box 130
Kumeyaay
Santa Ysabel, CA, 92070
Phone: (760)765-0845
Fax: (760)765-0320

***Inaja Band of Mission Indians***
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd.
Kumeyaay
Escondido, CA, 92025
Phone: (760)737-7628
Fax: (760)747-8568

***Jamul Indian Village of California***
Erica Pinto, Chairperson
P.O. Box 612
Kumeyaay
Jamul, CA, 91935
Phone: (619)669-4785
Fax: (619)669-4817

***Kwaaymii Laguna Band of Mission Indians***
Carmen Lucas,
P.O. Box 775
Kumeyaay
Pine Valley, CA, 91962
Phone: (619)709-4207

***La Posta Band of Diegueno Mission Indians***
Javaughn Miller, Tribal Administrator
8 Crestwood Road
Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

***La Posta Band of Diegueno Mission Indians***
Gwendolyn Parada, Chairperson
8 Crestwood Road
Kumeyaay
Boulevard, CA, 91905
Phone: (619)478-2113
Fax: (619)478-2125
LP13boots@aol.com

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 Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Liaghat Hillside Project, San Diego County.

# Native American Heritage Commission
# Native American Contact List
# San Diego County
# 4/4/2017

***Manzanita Band of the Kumeyaay Nation***
Nick Elliott, Cultural Resources Coordinator
P. O. Box 1302
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957
nickmepa@yahoo.com
Kumeyaay

***Manzanita Band of the Kumeyaay Nation***
Angela Elliott Santos, Chairperson
P.O. Box 1302
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957
Kumeyaay

***Mesa Grande Band of Mission Indians***
Virgil Oyos, Chairperson
P.O Box 270
Santa Ysabel, CA, 92070
Phone: (760)782-3818
Fax: (760)782-9092
mesagrandeband@msn.com
Kumeyaay

***San Pasqual Band of Mission Indians***
Allen E. Lawson, Chairperson
P.O. Box 365
Valley Center, CA, 92082
Phone: (760)749-3200
Fax: (760)749-3876
allenl@sanpasqualtribe.org
Kumeyaay

***San Pasqual Band of Mission Indians***
John Flores, Environmental Coordinator
P. O. Box 365
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
johnf@sanpasqualtribe.org
Kumeyaay

***Sycuan Band of the Kumeyaay Nation***
Lisa Haws, Cultural Resources Manager
1 Kwaaypaay Court
El Cajon, CA, 92019
Phone: (619) 312 - 1935
Kumeyaay

***Sycuan Band of the Kumeyaay Nation***
Cody J. Martinez, Chairperson
1 Kwaaypaay Court
El Cajon, CA, 92019
Phone: (619)445-2613
Fax: (619)445-1927
ssilva@sycuan-nsn.gov
Kumeyaay

***Viejas Band of Kumeyaay Indians***
Julie Hagen,
1 Viejas Grade Road
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov
Kumeyaay

***Viejas Band of Kumeyaay Indians***
Robert J. Welch, Chairperson
1 Viejas Grade Road
Alpine, CA, 91901
Phone: (619)445-3810
Fax: (619)445-5337
jhagen@viejas-nsn.gov
Kumeyaay

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 Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Liaghat Hillside Project, San Diego County.

Brian F. Smith and Associates, Inc.

Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

April 11, 2017

Clifford LaChappa
Chairperson
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, California 92040

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. LaChappa:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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 La Jolla, California, and includes the development of a single-family home on a .51-acre property located directly west of 7550 Hillside in La Jolla, City of San Diego, California. Specifically, this project is located in the unsectioned former Pueblo Land Grant on the USGS 7.5-minute *La Jolla OE W, California* topographic quadrangle (Township 15 South, Range 4 West [Projected]). Please find enclosed sections of the USGS *La Jolla OE W* 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 Liaghat Hillside 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

Tracy A. Stropes, M.A., RPA
Senior Project Archaeologist
tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Jolla OE W, California* topographic map with project area delineated

14010 Poway Road, Suite A, Poway, CA 92064; Phone (858) 679-8218 or (951) 681-9950; Fax (858) 679-9896; www.bfsa-ca.com
Business Office: 14678 Ibex Court, San Diego, CA 92129; Phone (858) 484-0915; Fax (858) 484-0988

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April 11, 2017

Ralph Goff
Chairperson
Campo Kumeyaay Nation
36190 Church Road, Suite 1
Campo, California 91906

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, 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 Liaghat Hillside 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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tstropes@bfsa-ca.com

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April 11, 2017

Robert Pinto
Chairperson
Ewiiaapaayp Band of Kumeyaay Indians
4054 Willows Road
Alpine, California 91901

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. Pinto:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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April 11, 2017

Michael Garcia
Vice Chairperson
Ewiiaapaayp Band of Kumeyaay Indians
4054 Willows Road
Alpine, California 91901

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. Garcia:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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April 11, 2017

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 Liaghat Hillside Project, La Jolla, 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 Liaghat Hillside 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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tstropes@bfsa-ca.com

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April 11, 2017

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 Liaghat Hillside Project, La Jolla, 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 Liaghat Hillside 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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tstropes@bfsa-ca.com

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April 11, 2017

Rebecca Osuna
Chairperson
Inaja Band of Mission Indians
2005 S. Escondido Blvd.
Escondido, California 92025

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Ms. Osuna:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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tstropes@bfsa-ca.com

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Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

April 11, 2017

Erica Pinto
Chairperson
Jamul Indian Village of California
P.O. Box 612
Jamul, California 91935

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, 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 Liaghat Hillside 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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Senior Project Archaeologist
tstropes@bfsa-ca.com

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April 11, 2017

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 Liaghat Hillside Project, La Jolla, 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 Liaghat Hillside 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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April 11, 2017

Javaughn Miller
Tribal Administrator
La Posta Band of Diegueno Mission Indians
8 Crestwood Road
Boulevard, California 91905

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. Miller

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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April 11, 2017

Gwendolyn Parada
Chairperson
La Posta Band of Diegueno Mission Indians
8 Crestwood Road
Boulevard, California 91905

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Ms. Parada:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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April 11, 2017

Nick Elliott
Cultural Resources Coordinator
Manzanita Band of the Kumeyaay Nation
P.O. Box 1302
Boulevard, California 91905

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. Elliott:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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April 11, 2017

Angela Elliott Santos
Chairperson
Manzanita Band of the Kumeyaay Nation
P.O. Box 1302
Boulevard, California 91905

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. Santos:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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April 11, 2017

Virgil Oyos
Chairperson
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, California 92070

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. Oyos:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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 La Jolla, California, and includes the development of a single-family home on a .51-acre property located directly west of 7550 Hillside in La Jolla, City of San Diego, California. Specifically, this project is located in the unsectioned former Pueblo Land Grant on the USGS 7.5-minute *La Jolla OE W, California* topographic quadrangle (Township 15 South, Range 4 West [Projected]). Please find enclosed sections of the USGS *La Jolla OE W* 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 Liaghat Hillside 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 Jolla OE W, California* topographic map with project area delineated

Brian F. Smith and Associates, Inc.
*Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics*

April 11, 2017

Allen E. Lawson
Chairperson
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, California 92082

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. Lawson:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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Brian F. Smith and Associates, Inc.
*Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics*

April 11, 2017

John Flores
Environmental Coordinator
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, California  92082

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Mr. Flores:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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tstropes@bfsa-ca.com

Attachment:
USGS 7.5-minute *La Jolla OE W, California* topographic map with project area delineated

14010 Poway Road, Suite A, Poway, CA 92064; Phone (858) 679-8218 or (951) 681-9950; Fax (858) 679-9896; www.bfsa-ca.com
Business Office: 14678 Ibex Court, San Diego, CA 92129; Phone (858) 484-0915; Fax (858) 484-0988

Brian F. Smith and Associates, Inc.
*Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics*

April 11, 2017

Lisa Haws
Cultural Resources Manager
Sycuan Band of the Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, California 92019

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Ms. Haws:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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tstropes@bfsa-ca.com

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Brian F. Smith and Associates, Inc.
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April 11, 2017

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 Liaghat Hillside Project, La Jolla, 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 Liaghat Hillside 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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tstropes@bfsa-ca.com

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Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

April 11, 2017

Julie Hagen
Viejas Band of Kumeyaay Indians
1 Viejas Grade Road
Alpine, California 91901

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, San Diego County, California

Dear Ms. Hagen:

This inquiry is requesting information you may have regarding the existence of Native American cultural resources on or near the Liaghat Hillside 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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Brian F. Smith and Associates, Inc.
*Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics*

April 11, 2017

Robert J. Welch
Chairperson
Viejas Band of Kumeyaay Indians
1 Viejas Grade Road
Alpine, California 91901

Subject: Information regarding Native American cultural resources on or near the Liaghat Hillside Project, La Jolla, 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 Liaghat Hillside 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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**Pacific Southwest Biological Services, Inc.**
P.O. Box 985, National City, California 91951-0985 • (619) 477-5333 • FAX (619) 477-5380

# 7540 HILLSIDE DRIVE, LA JOLLA
# CITY OF SAN DIEGO, CALIFORNIA

## BIOLOGICAL TECHNICAL REPORT

**City Project Tracking No. 503 701**

**APN 352-130-03-00**

**Coastal Development Permit, Site Development Permit**

**& MHPA Boundary Line Adjustment**

*Prepared for:*

Mr. Hamid Liaghat 1469 Caminito Halago La Jolla CA 92037 858 717 5375

Hamid.Liaghat@abam.com

*Prepared by:*

Pacific Southwest Biological Services, Inc.

Post Office Box 985 National City, CA 91951-0985

Telephone (619) 477-5333

Facsimile (619) 477-5380 E-mail: bio@psbs.com

PSBS #W398

12 January 2018

R. Mitchel Beauchamp, M. Sc., President

## 7540 HILLSIDE DRIVE, LA JOLLA CITY OF SAN DIEGO, CALIFORNIA

### Coastal Development Permit & Neighborhood Development Permit

## BIOLOGICAL TECHNICAL REPORT

12 January 2018

### SUMMARY

A survey of the biotic resources at 7540 Hillside Drive in La Jolla indicated a 22,396 sqft (0.514ac) parcel disturbed by prior landscaping. Vegetation in the upper, eastern portion of the parcel retains former landscaping by the adjacent neighbor. Mixed within this landscaped area are elements of Diegan Coastal Sage Scrub. The project requires a Site Development Permit for Environmentally Sensitive Lands (ESL), i.e. steep slopes and sensitive vegetation. A Boundary Line Adjustment is part of this Assessment to correct the location of the Multi-Habitat Planning Area (MHPA) boundary due to the proposed residential development and relocation of an existing public sewer line.

### INTRODUCTION PURPOSE OF THE STUDY

The purpose of the biotic survey was to determine the extent of biotic impact from the realignment of a trunk sewer line through the parcel and construction of a single-family residence over a 15,990sqft (0.367ac) footprint of the site. An area of native scrub vegetation in this same area, would be impacted by the development footprint as well as Brush Management Zones 2 (6,800sqft / 0.156ac). Diegan Coastal Sage Scrub is considered a sensitive habitat and, therefore, would require mitigation per the City of San Diego's Biology Guidelines. The ESL issue of steep slopes is not addressed in this document since it is an engineering issue that is complicated by the prior grading on the site associated with Hillside Drive and public sewer line construction and is avoided by project design.

### PROJECT LOCATION

The site is located at 7540 Hillside Drive, in the La Jolla Community Plan area. It is bounded on the north and east sides by developed residences and on the south by native vegetation of a partially developed residential parcel which currently features an access driveway and tall retaining wall along the western boundary. Coordinates of the site are 32.84°N; 117.26°W and 3,633,950 N; 476, 000 E.

The site is shown as non-City owned lands of the Multi-Habitat Planning Area (MHPA) of the Multiple Species Conservation Plan (MSCP) (San Diego 1997). It lies near to the eastern boundary of the La Jolla Natural Park as Map CE-2 of the Conservation Element of the City of San Diego General Plan. Due to the MHPA designation, Environmentally Sensitive Lands issues and Land Use Adjacency Guidelines apply.

### PROJECT DESCRIPTION

The project is the realignment of a sewer line through the parcel, construction of a single- family residence and adjustment of the MHPA boundary to the south and west.

## METHODS AND SURVEY LIMITATIONS

R. Mitchel Beauchamp surveyed the biotic conditions at the Hillside Drive site in La Jolla in December 2015, and May and October 2016. The site was accessible by the upper and lower access points along Hillside Drive.

The development regulations for Sensitive Biological Resources require that a site- specific analysis be conducted by a qualified biologist in accordance with Biological Guidelines in the Land Development Manual. The impact analysis is to evaluate impacts to sensitive biological resources and CEQA sensitive species. The analysis shall determine the corresponding mitigation, where appropriate, and the requirement for protection and management. The recommendations of this analysis will be reviewed by the Environmental Analyst for the project to determine any appropriate mitigation.

The project, a Coastal Development and Site Development Permit for Environmental Sensitive Lands proposes to construct a 7,884sqft single-family residence on the site. The project would comply with the City of San Diego Brush Management ordinance (see discussion under Brush Management).

## METHODS

Prior to the field survey, a search was made of the California Department of Fish and Game's (CDFG) California Natural Diversity Data Base (CNDDB) for the USGS 7.5' La Jolla, California topographic quadrangle for sensitive flora and fauna potentially occurring on the site.

This search revealed several federally- or state-listed species that may occur on or in the vicinity of the property (Appendices 3 and 4).

Table 1. Summary of Field Survey Conditions

| Date | Personnel | Survey Type | Time | Conditions |
|---|---|---|---|---|
| 12/24/15 | Beauchamp | General Biological Assessment and Spring Survey | 1000-1110 | 63°F. Skies cloudy. Winds calm to 1-3 mph W. |
| 5/8/16 | Beauchamp | Avian Survey | 0800-0900 | 65°F, overcast, calm |
| 5/13/16 | Beauchamp | General Biological Assessment | 1030-1130 | 74°F clear skies, winds calm to 3 mph from west |
| 10/16/16 | Beauchamp | General Biological Assessment Fall | 1000-1115 | 76°F clear skies, winds calm |

### SURVEY LIMITATIONS

Complete biological inventories of sites often require a large number of field hours during different seasons, as well as nocturnal sampling for some animal groups such as small mammals. Depending on the season during which the field visit is conducted, amphibians, snakes, many mammals, owls and other nocturnal birds, and annual plants are groups that can be difficult to inventory. Many groups of vertebrates are difficult to find during short-term field surveys. Some, such as migratory or nomadic birds, may be absent from the site while the fieldwork is being conducted. Other species occur at low densities and may easily have been missed. Species that are declining or have naturally patchy distribution may not be present in areas of what appears to be suitable habitat. However, through literature review, study of museum records, and knowledge of the habitat requirements and distribution patterns of individual species, the probability of a given species being present on a site can often be quite accurately predicted. The survey period corresponded with the breeding season for local birds (avifauna), and would have identified year-round resident and summer (breeding) birds, as well as spring and fall migrants, and winter visitors.

## DEFINITIONS

### Vegetation Communities

Vegetation habitats or communities are assemblages of plant species that usually coexist in the same area. The classification of vegetation communities is based upon the life form of the dominant species within the community and the associated flora. The nomenclature for vegetation communities is as follows Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California (1986), as modified by Oberbauer (1996 and Oberbauer, Kelly and Buegge 2008).

**Species Nomenclature**

The scientific nomenclature used in this report is from the following standard references: vascular plants (Beauchamp 1986, Hickman 2012); vegetation communities (Holland 1986, Oberbauer 1996, Oberbauer, Kelly and Buegge 2008); amphibians and reptiles (Crother 2000); birds (American Ornithologists' Union 1998 and 2006); and mammals (Jameson and Peeters 2004).

## SURVEY RESULTS

### PHYSICAL CHARACTERISTICS OF THE SITE

The site lies on the northern mid-slope of Mount Soledad and is one of the few open lots suitable for construction of a private residence along this canyon area. The site is mapped as Altamont clay soils 30 to 50 percent slopes (Bowman 1973). Elevation range is from 301' to 394'. Geological base of the site is mapped as Upper Cretaceous Point Loma Formation of the Rosario Group of marine sandstone and shale (Kennedy 1975).

Forensic work (Geotechnical Exploration 2017) indicates that the upper portion of the site has been modified by the grading of Hillside Drive. The northwest descending slope is an approximately 10-foot-high, 1.5:1.0 fill slope which transitions into a natural slope in the lower portion of the lot. Evidence of soil disturbance in the upper and lower portions of the slope consists of 2 to 3 feet of fill soil and broken concrete/brick retaining walls down to approximately elevation 380'. In addition, significant excavation and soil disturbance was observed in the area of the sewer main, sewer lateral and low slopes adjacent to the new driveway providing access to the adjacent, western residential lot. Also, it appears that the central portion of the lot was disturbed in the past for gardening and was planted with non-native vegetation. It is estimated that 80% of the lot has been disturbed by excavation and placement of fill soils to achieve the current grades. The age of this disturbance appears to have been as early as 1979.

### BIOLOGICAL RESOURCES

The vegetation in the upper, eastern portion of the property has been previously landscaped but apparently abandoned for several years. A population of Giant Cane (*Arundo donax*) and Century Plant (*Agave americana*) persists in this upper area of the parcel. Although there are elements of Coastal Sage Scrub, they do not represent a functional vegetation type due to the limited extent and dominance of non-native species.

**Botanical Resources: Vegetation Communities Observed On-site**

Urban/Developed Lands (Holland Code #12000) 0.3ac (13,089sqft)

The upper eastern portion of the site is dominated by a stand of Giant Cane (*Arundo donax*) and Century Plant (*Agave americana*). In addition, planted Iron Bark Eucalyptus (*Eucalyptus sideroxylon*) trees occur with Ivy (*Hedera helix)* and Oleander (*Neriumoleander*).

Disturbed Habitat #11200 0.011ac (489sqft)

The area of disturbed habitat lies along the western off-site concrete drainage channel and driveway and is dominated by Pampas grass (*Cortaderia jubata*).

Diegan Coastal Sage Scrub #32500 0.046ac (1,993sqft)

A narrow remnant of native vegetation persists on the western side of the site, Diegan Coastal Sage Scrub elements of Flat-top Buckwheat (*Erigonum fasciculatum*) and Coastal Sage (*Artemisia californica*).

Diegan Coastal Sage Scrub - Rhus Phase #325000.156ac (6,825sqft)

Further down the western slope as well as off-site to the south is a dominant cover of Lemonade berry (*Rhus integrifolia*) and few Toyons (*Heteromeles arbutifolia*). The vegetation is incorrectly portrayed as Chaparral #37000 in the SanGIS mapping of the area.

To the south, up slope of the site, lies intact native Rhus-phase of Diegan Coastal Sage Scrub vegetation. A review of the present conditions failed to support this Chaparral opinion or data source in the MHPA data base for this area. The site does not now meet the criteria of SDMC, section 113.0103.

Due to remnant DCSS species in the urban/developed land (existing sewer alignment and Hillside Drive fill area) and disturbed habitat (land) area, the above classification of vegetation notwithstanding, for the purpose of calculating the impact of the project on the site vegetation, City staff and the biological consultant agreed to address all vegetation impacts as involving Tier II, un-occupied by CA gnatcatcher, Diegan Coastal Sage Scrub, being 0.14 acre (22,396sqft).

Existing Vegetation

| | |
|---|---|
| Urban Developed | 0.3ac (13,089sqft) |
| Disturbed | 0.011ac (489sqft) |
| Diegan Coastal Sage Scrub | 0.046ac (1,993sqft) |
| DCSS- Rhus phase | .156ac (6,825sqft) |

**Botanical Resources: Flora**

Appendix 1 indicates the plants observed on the site. The lower, western portion of the site is a stand of Lemonade berry that has no understory but is becoming infested with non-native Pampas grass (*Cortaderia jubata*) from an associated, off-site channelized drainage.

The upper, eastern portion of the lot is dominated by Pampas grass. Elements of the Sage Scrub persist but as a plant community, the site is best described as Urban/Develop lands due to the nature of the non-native weed species and prior landscaping plant material still present.

**Rare, Threatened, Endangered, Endemic and/or Sensitive Plant Species**

No sensitive plants were observed on the project site.

**Special Plant Status Species**

The observed flora of the site is listed in Appendix 1. Due to the prior disturbance of the site, no sensitive plants are anticipated. The diversity of the shrub vegetation on the site is rather low, perhaps due to the prior disturbance.

Based on the review of potential sensitive special status/sensitive species from the City of San Diego's MSCP and CNDDB and the field assessment, no sensitive/special status plants were detected within 100 feet of the project site (see Appendix 3).

None of the City's listed Narrow Endemics*, including Shot-leaved Live-forever, occur on the site, i.e.:

*Acanthomintha ilicifolia* San Diego Thornmint

*Agave shawii* Shaw's Agave

*Ambrosia pumila* San Diego Ambrosia

*Aphanisma blitoides* Aphanisma

*Astragalus tener var. titi* Coastal Dunes Milk Vetch

*Baccharis vanessae* Encinitas Baccharis

*Dudleya blochmaniae ssp. brevifolia* Short-leaved Live-forever

*Dudleya variegata* Variegated Dudleya

*Eryngium aristulatum* ssp *parishii* San Diego Button Celery *Hemizonia (Deinandra) conjugens* Otay Tarplant *Navarretia fossalis* Prostrate Navarretia

*Opuntia parryi (californica) var. serpentina* Snake Cholla

*Orcuttia californica* Orcuttgrass *Pogogyne abramsii* San Diego Mesa Mint *Pogogyne nudiuscula* Otay Mesa Mint

*None of the above Narrow Endemic Plant Taxa were noted on the parcel due to the lack of habitat and the prior disturbance. Appendix 3 further addresses the likelihood of presence / absence on the project site.

## ZOOLOGICAL RESOURCES - Fauna

The fauna noted on the site (Appendix 2) during the survey was that typical found in urban, heavily landscaped setting in the San Diego region. Activity and the number of animals observed were low due to the active house construction and urban nature of the site.

### Rare, Threatened, Endangered, Endemic and/or Sensitive Animal Species or MSCP- Covered Species

No sensitive fauna was anticipated due to the disturbed conditions of the site. The on-site patch of Sage Scrub is too small and precludes the likelihood to support Coastal California Gnatcatcher. The observed animals are representative of commonly expected species within urban canyons, and none have special status or are considered sensitive by federal, state or city policies. Prior assessment of the same canyon habitat to the adjacent south did not indicated the presence of the Gnatcatcher. The combined contiguous areas of DCSS have not demonstrated occupancy by Coastal California Gnatcatcher during the past 12 years (PSBS 2005, 2010).

Nevertheless, the vegetation is structurally adequate to permit occupancy and a pre-construction survey for this bird’s presence is warranted. There were no other sensitive/special-status animals detected on-site, nor are any others expected (Appendix 4).

## REGULATORY SETTING

### Federal Regulations

### Federal Endangered Species Act

The federal Endangered Species Act (ESA) was enacted in 1973 to provide protection to threatened and endangered species and their associated ecosystems. “Take” of a listed species is prohibited except when specific authorization has been granted through a USFWS permit under Section 4(d), 7, or 10(a) of the ESA. “Take” is defined as to harass, harm, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of these activities without a permit.

### Federal Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) was enacted in 1918. Its purpose is to prohibit the kill or transport of native migratory birds, or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA. A list of migratory bird species that are protected by the MBTA is maintained by the USFWS, which also regulates most aspects of the taking, possession, transportation, sale, purchase, barter, exportation, and importation of migratory birds.

### Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act was first enacted in 1940 to prohibit the take, transport, or sale of bald eagles (*Haliaeetus leucocephalus*), their eggs, or any part of an eagle except when permitted by Secretary of Interior. In 1962, the act was amended to afford the same level of protection to the golden eagle (*Aquila chrysaetos*). The act also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, or activities that interfere with or interrupt normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

### Clean Water Act

In 1948, Congress first passed the Federal Water Pollution Control Act. This act was amended in 1972 and became known as the Clean Water Act (CWA), which regulates the discharge of pollutants into the waters of the United States (WoUS). Under Section 404, permits need to be obtained from the U.S. Army Corps of Engineers (USACE) for discharge of dredge or fill material into jurisdictional WoUS. USACE-regulated activities under Section 404 involve a discharge of dredged or fill material including, but not limited to, grading, placing of riprap for erosion control, pouring concrete, laying sod, and stockpiling excavated material into WoUS. Activities that generally do not involve a regulated discharge (if performed specifically in a manner to avoid discharges) include driving pilings, some drainage channel maintenance activities, constructing temporary mining and farm/forest roads, and excavating without stockpiling. USACE issues Nationwide Permits (NWPs) for activities that require discretionary authority and do not exceed specific impact requirements (e.g., less than 0.5 acre of impacts, no impacts on special aquatic sites, etc.) and requires individual permits for activities that exceed the requirements of NWPs. Under Section 401 of the act, Water Quality Certification from the Regional Water Quality Control Board (RWQCB) needs to be obtained if an action would potentially result in any impacts on jurisdictional WoUS.

## State Regulations

### California Environmental Quality Act

CEQA requires that biological resources be considered when assessing the environmental impacts resulting from proposed actions. In accordance with State CEQA Guidelines Section 15065, the lead agency needs to determine if a project has the potential to substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

### California Endangered Species Act

CESA prohibits the take of any species that the California Fish and Game Commission determines to be a threatened or endangered species. The act is administered by CDFG. Incidental take of these listed species can be approved by the CDFG.

### California Coastal Act of 1976

The California Coastal Act (CCA), administered by the California Coastal Commission (CCC), includes policies for development proposed within the coastal zone and recognizes California ports, harbors, and coastline beaches as economic and coastal resources. Decisions to implement specific development, where feasible, are to be based on consideration of alternative locations and designs in order to minimize any adverse environmental impacts. The CCC regulates all jurisdictional wetlands that are under the joint jurisdiction of USACE and RWQCBs, as well as riparian habitat under the jurisdiction of CDFG, and considers vernal pools within the City jurisdictional wetlands.

### California State Fish and Game Code – Streambed Alteration Program

The California Fish and Game Code concludes that it is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds, without first notifying the department of such activity. CDFG jurisdiction includes ephemeral, intermittent, and perennial watercourses (including dry washes) and lakes characterized by the presence of (1) definable bed and banks and (2) existing fish or wildlife resources. Furthermore, CDFG jurisdiction is often extended to habitats adjacent to watercourses, such as oak woodlands in canyon bottoms or willow woodlands that function hydrologically as part of the riparian system. Under the CDFG definition, a watercourse need not exhibit evidence of an Ordinary High Water Mark (OHWM) to be claimed as jurisdiction. Under current California Fish and Game Code Sections 1600–1616, CDFG has the authority to regulate work that will substantially divert or obstruct the natural flow of, change, or use any material from the bed, channel, or bank of any river, stream, or lake. The CDFG also has authority to regulate work that will deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. This regulation takes the form of a requirement for a Section 1602 Lake or Streambed Alteration Agreement (SAA) and is applicable to all projects involving state or local government discretionary approvals.

**California Fish & Game Code (3503, 3503.5, 3505, 3800, 3801.6)**

These Fish and Game Code sections protect all native birds, birds of prey, and all nongame birds, including eggs and nests, that are not already listed as fully protected and which occur naturally within the state. Section 3503 of the code states that 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.

**BIOLOGICAL RESOURCE EVALUATION LOCAL CONTEXT**

San Diego Municipal code of May 2016 provides for the following measure relative to sensitive lands:

§143.0101 Purpose of Environmentally Sensitive Lands Regulations. The purpose of these regulations is to protect, preserve and, where damaged restore, the environmentally sensitive lands of San Diego and the viability of the species supported by those lands. These regulations are intended to assure that development, including, but not limited to coastal development in the Coastal Overlay Zone, occurs in a manner that protects the overall quality of the resources and the natural and topographic character of the area, encourages a sensitive form of development, retains biodiversity and interconnected habitats, maximizes physical and visual public access to and along the shoreline, and reduces hazards due to flooding in specific areas while minimizing the need for construction of flood control facilities. These regulations are intended to protect the public health, safety, and welfare while employing regulations that are consistent with sound resource conservation principles and the rights of private property owners. It is further intended for the Development Regulations for Environmentally Sensitive Lands and accompanying Biology, Steep Hillside, and Coastal Bluffs and Beaches Guidelines to serve as standards for the determination of impacts and mitigation under the California Environmental Quality Act and the California Coastal Act. These standards will also serve to implement the Multiple Species Conservation Program by placing priority on the preservation of biological resources within the Multiple Habitat Planning Area, as identified in the City of San Diego Subarea Plan. The habitat based level of protection which will result through implementation of the Multiple Habitat Planning Area is intended to meet the mitigation obligations of the Covered Species addressed. In certain circumstances, this level of protection may satisfy mitigation obligations for other species not covered under the Multiple Species Conservation Program but determined to be sensitive pursuant to the CEQA review process. This determination will be addressed in the environmental documentation.

The site is one of the remaining undeveloped remnants accessing the adjacent naturally vegetated slopes above Hillside Drive. The construction of the proposed residential structure will allow access along the adjacent, western parcel that has a massive retaining wall but is still otherwise undeveloped, allowing functional biotic use of the site.

The project site lies within a mapped Multi-Habitat Planning Area (MHPA) of the City of San Diego’s Multiple Species Conservation Plan (MSCP) Subarea. Development of the site is not anticipated to affect any sensitive and/or MSCP-listed plant or animal species.

The site consists of a single parcel to be developed for residential use as a single-family dwelling. Existing residences occur on the east and north and a vacant parcel lies to the south, up slope of the site. The project site has been previously developed as a landscaped area and a regional sewer trunk line angles through the parcel. The impact to native habitats would be from implementation of the construction of the residence and Brush Management Zone 1, i.e. 0-10 ft from the dwelling unit edge. This includes Urban / Developed Habitat and Rhus shrub land; whereas Brush Management Zone 2, i.e., 10 ft-ca 45 ft from the dwelling unit edge, is Impact Neutral and does not require mitigation but also cannot be used for mitigation purposes.

Proposed MHPA Boundary Line Adjustment

A Boundary Line Adjustment Equivalency Analysis (PSBS revised January 11, 2018) was submitted to the Wildlife Agencies via email and was agreed upon by all parties. The proposed BLA is as follows:

BLA CALCULATIONS

Total area of parcel =22,396. sq ft, 0.514 acre,100%

Existing Area outside MHPA =6,326 sq ft, 0.145 acre,28%

Existing area within MHPA = 16,070 sq ft,0.369 acre, 72%

Allowed MHPA encroachment for a site 100% encumbered by MHPA would be30% (25% allowed for residence and 5% for public utility)

As the site already is 28% outside the MHPA, an additional 2% encroachment would be allowed into the MHPA without a BLA

In this case, the applicant is proposing to increase the area outside the MHPA to 0.22acre, or 43%

(Area outside the MHPA includes most of the southern public sewer leg)

The proposed BLA is therefore (based on 43% proposed additional encroachment

+ 28% already outside the MHPA to be developed -30% allowed encroachment for

a site 100% encumbered =) 41% or 0.06314 acre . A 4:1 HAF payment is proposed as compensation to make the MHPA whole.

Multi-Habitat Planning Area and Environmentally Sensitive Lands Adjacency Issues

Land Use Adjacency Guidelines (LUAGs)

Land uses planned in and adjacent to the MHPA are a public sewer line and a single residential structure respectively. MSCP Subarea Plan, Section 1.4.3 LUAGs followed by project specific compliance measures, which are part of the Site Development Permit, are presented below:

1. Drainage:

All developed areas in and adjacent to the MSCP preserve must not drain directly into the MHPA. All developed and paved areas must prevent the release of toxins, chemicals, petroleum products, exotic plant material, and other elements that might degrade or harm the natural environment or ecosystem processes within the MHPA. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. These systems should be maintained approximately once a year, or as often as needed, to ensure proper functioning. Maintenance should include dredging out sediments if needed, removing exotic plant materials, and adding chemical-neutralizing compounds (e.g. clay compounds) when necessary and appropriate.

Consistency: Drainage from the residence is engineered to flow to on-site treatment and dissipation devices before release. BMP's are implemented according to the project's Water Quality Technical Report.

2. Toxics:

Land uses, such as recreation and agriculture, that use chemicals or generate byproducts such as manure, that are potentially toxic or impactive to wildlife, sensitive species, habitat, or water quality need to incorporate measures to reduce impacts caused by the application and/or drainage of such materials into the MHPA. Such measures should include drainage/detention basins, swales, or holding areas with non-invasive grasses or wetland-type native vegetation to filter out the toxic materials. Regular maintenance should be provided. Where applicable, this requirement should be incorporated into leases on publicly owned property as leases come up for renewal.

Consistency: The residential project would not introduce excessive toxic substances to the project area.

3. Lighting:

Lighting of all developed areas adjacent to the MHPA should be directed away from the MHPA. Where necessary, development should provide adequate shielding with non- invasive plant materials (preferably native), berming, and/or other methods to protect the MHPA and sensitive species from night lighting.

Consistency: All construction would be carried out during daylight hours and post- construction outdoor lighting would be shielded from the MHPA and otherwise not allowed to shine off-site per City code lighting ordinance.

4. Noise:

Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas, recreational areas, and any other use that may introduce noises that could impact or interfere with wildlife utilization of the MHPA. Excessively noisy uses or activities adjacent to breeding areas must incorporate noise reduction measures and be curtailed during the breeding season of sensitive species. Adequate noise reduction measures should also be incorporated for the remainder of the year.

Consistency: Construction is anticipated to introduce temporary mechanical construction noise. A pre-grading bird survey would be required with appropriate mitigating follow up measures if positive for CAGN and other native birds if construction would occur during the general February 1- September 15 breeding season. If construction is scheduled outside the breeding season, no survey would be required. Barriers:

5. Barriers

New development adjacent to the MHPA may be required to provide barriers (e.g., non- invasive vegetation, rocks/boulders, fences, walls, and/or signage) along the MHPA boundaries to direct public access to appropriate locations and reduce domestic animal predation.

Consistency: The project would include a retaining wall and fence to preclude impacts from the development.

6. Landscaping / Invasives:

No invasive non-native plant species shall be introduced into areas adjacent to the MHPA.

Consistency: Existing invasive species will be removed from the site per the landscape plan (Exhibit A) and replaced with appropriate native species within the MHPA along the sewer easements and in BMZ2. Landscape species in BMZ1 have been revised to exclude potential invasive species from being planted adjacent to the MHPA.

7. Brush Management:

Consistency: Clearing of vegetation within the adjusted MHPA zone is addressed in the Brush Management Plans L-1 & L-2 that accompany the project submittals.

8. Grading/Land Development

Manufactured slopes associated with site development shall be included within the development footprint for projects within or adjacent to the MHPA.

Consistency: All graded areas for the residential development will occur in the development footprint. The sewer line would be a compatible use in the MHPA and would be graded and revegetated with native species within the MHPA.

The below Land Use Adjacency Guidelines will be included as part of the Site Development Permit and Coastal Development Permit

**MSCP SUBAREA PLAN -LAND USE ADJACENCY GUIDELINES**

I. Prior to issuance of any construction permit or notice to proceed, DSD/ LDR, and/or MSCP staff shall verify the Applicant has accurately represented the project’s design in or on the Construction Documents (CD’s/CD’s consist of Construction Plan Sets for Private Projects and Contract Specifications for Public Projects) are in conformance with the associated discretionary permit conditions and Exhibit “A”, and also the City’s Multi-Species Conservation Program (MSCP) Multi-Habitat Planning Area (MHPA) Land Use Adjacency Guidelines. The applicant shall provide an implementing plan and include references on/in CD’s of the following:

A. **Grading/Land Development/MHPA Boundaries**

MHPA boundaries on-site and adjacent properties shall be delineated on the CDs. DSD Planning and/or MSCP staff shall ensure that all grading is included within the development footprint, specifically manufactured slopes, disturbance, and development within or adjacent to the MHPA. For projects within or adjacent to the MHPA, all manufactured slopes associated with site development shall be included within the development footprint.

B. **Drainage**

All new and proposed parking lots and developed areas in and adjacent to the MHPA shall be designed so they do not drain directly into the MHPA. All developed and paved areas must prevent the release of toxins, chemicals, petroleum products, exotic plant materials prior to release by incorporating the use of filtration devices, planted swales and/or planted detention/desiltation basins, or other approved permanent methods that are designed to minimize negative impacts, such as excessive water and toxins into the ecosystems of the MHPA.

### C. Toxics/Project Staging Areas/Equipment Storage

Projects that use chemicals or generate by-products such as pesticides, herbicides, and animal waste, and other substances that are potentially toxic or impactive to native habitats/flora/fauna (including water) shall incorporate measures to reduce impacts caused by the application and/or drainage of such materials into the MHPA. No trash, oil, parking, or other construction/development-related material/activities shall be allowed outside any approved construction limits. Where applicable, this requirement shall be incorporated into leases on publicly-owned property when applications for renewal occur. Provide a note in/on the CD's that states: *"All construction related activity that may have potential for leakage or intrusion shall be monitored by the Qualified Biologist/Owners Representative or Resident Engineer to ensure there is no impact to the MHPA."*

### D. Lighting

Lighting within or adjacent to the MHPA shall be directed away/shielded from the MHPA and be subject to City Outdoor Lighting Regulations per LDC Section 142.0740.

### E. Barriers

New development within or adjacent to the MHPA shall be required to provide barriers (e.g., non-invasive vegetation; rocks/boulders; 6-foot high, vinyl-coated chain link or equivalent fences/walls; and/or signage) along the MHPA boundaries to direct public access to appropriate locations, reduce domestic animal predation, protect wildlife in the preserve, and provide adequate noise reduction where needed.

### F. Invasives

No invasive non-native plant species shall be introduced into areas within or adjacent to the MHPA.

### G. Brush Management

New development adjacent to the MHPA shall be set back from the MHPA to provide required Brush Management Zone 1 area on the building pad outside of the MHPA. Zone 2 may be located within the MHPA provided the Zone 2 management will be the responsibility of an HOA or other private entity except where narrow wildlife corridors require it to be located outside of the MHPA. Brush management zones will not be greater in size than currently required by the City's regulations, the amount of woody vegetation clearing shall not exceed 50 percent of the vegetation existing when the initial clearing is done and vegetation clearing shall be prohibited within native coastal sage scrub and chaparral habitats from March 1-August 15 except where the City ADD/MMC has documented the thinning would be consist with the City's MSCP Subarea Plan. Existing and approved projects are subject to current requirements of Municipal Code Section 142.0412.

### H. Noise

Due to the site's location adjacent to or within the MHPA where the Qualified Biologist has identified potential nesting habitat for listed avian species, construction noise that exceeds the maximum levels allowed shall be avoided during the breeding seasons for the following: California Gnatcatcher (3/1-8/15). If construction is proposed during the breeding season for the species, U.S. Fish and Wildlife Service protocol surveys shall be required in order to determine species presence/absence. If protocol surveys are not conducted in suitable habitat during the breeding season for the aforementioned listed species, presence shall be assumed with implementation of noise attenuation and biological monitoring.

When applicable (i.e., habitat is occupied or if presence of the covered species is assumed), adequate noise reduction measures shall be incorporated as follows:

**COASTAL CALIFORNIA GNATCATCHER (State Species of Special Concern/Federally Threatened)**

I. Prior to the preconstruction meeting, the City Manager (or appointed designee) shall verify that the following project requirements regarding the least Bell's vireo are shown on the construction plans:

No mechanized clearing, grubbing, grading, or other construction activities shall occur between March 1 and August 15, the breeding season of the Coastal California gnatcatcher until the following requirements have been met to the satisfaction of the City Manager:

A. A qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(a) Recovery Permit) shall survey those habitat areas within the MHPA that would be subject to construction noise levels exceeding 60 decibels [db(a)] hourly average for the presence of the Coastal California gnatcatcher. Surveys for the Coastal California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the U.S. Fish and Wildlife Service within the breeding season prior to the commencement of any construction. If gnatcatchers are present, then the following conditions must be met:

1. Between March 1 and August 15, no construction activities shall occur within any portion of the site where construction activities would result in noise levels exceeding 60 db(a) hourly average at the edge of occupied gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 db(a) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the city manager at least two weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; or

2. At least two weeks prior to the commencement of construction activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 db(a) hourly average at the edge of habitat occupied by the Coastal California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring* shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 db(a) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16).

* Construction noise monitoring shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the construction activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the City Manager, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.

B. If coastal California gnatcatchers are not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the city manager and applicable resource agencies which demonstrates whether or not mitigation measures such as noise walls are necessary between March 1 and August 15 as follows:

1. If this evidence indicates the potential is high for coastal California gnatcatcher to be present based on historical records or site conditions, then condition A.III shall be adhered to as specified above.

2. If this evidence concludes that no impacts to this species are anticipated, no further mitigation measures are necessary.

**PROJECT IMPACT ANALYSIS**

Lands containing Tier I, II, Iliac and IIIb [(see Table 3 of City‘s Biology Guidelines (July 2012)] and all wetlands [see Table 2 of City‘s Biology Guidelines (July 2012)] are considered sensitive and declining habitats. As such, impacts to these resources may be considered significant. Lands designated as Tier IV are not considered to have significant habitat value and impacts would not be considered significant. It is to be noted that: (a) Total upland impacts (Tiers I- IIIB) involving more than 0.1 acre are considered significant and require mitigation (San Diego 2011).

Development of this former landscaped yard will involve impacts to intact native, vegetation from down slope brush management actions. In addition to the eucalyptus trees, fuel loading on the slope has reached a stage where any conflagration would be supported, so brush modification is recommended, especially removal of the eucalyptus trees and reducing native shrub density. Construction of the proposed residence and associated brush management actions will have an adverse impact to biological resources since the impact exceeds 0.1 acre of sensitive ESL vegetation.

Development of the site (including the project footprint and Brush Management Zone 1) would impact .308 acre of Diegan Coastal Sage Scrub . This vegetation is considered a Tier II habitat. There is an additional impact to 0.156 acre of Diegan Coastal Sage Scrub that occur within Brush Management Zone (BMZ) 2. Impacts within BMZ 2 are impact neutral and would not require mitigation.

Table 2. Summary of Impact and Mitigation

| Vegetation Type | Acreage impact outside the MHPA | Required Mitigation within the MHPA (1:1) (HAF Payment) |
|---|---|---|
| Tier II, Diegan Coastal Sage Scrub | .308 acres | .308 acres |

**Brush Management**

The construction of the proposed dwelling unit considers the threat of fire from the western and southern natural areas and incorporates architectural measures to resist any flames for a specific period of time. The reduction of fuel load on the lower slopes is considered in the Zone 1 is usually 0-35 ft, but alternative compliance for brush management has been developed in conjunction with City fire staff. Alternative compliance results in a 16-40 feet deep BMZ1 and BMZ2 ranging from 25-65 feet deep per sheets L-1 & L-2

The project impact, including the sewer line relocation impact to 13,454sqft of Coastal Sage Scrub, amounts to 0.308acre, exceeds the 0.1acre threshold.

The treatments for purposes of landscaping and erosion control are addressed by the project Landscape Architect and have been assessed for potential invasive plant potential by the project biologist.

It is to be noted that brush management activities are prohibited within shrub land habitats of federally protected species, from 1 March to 15 August, except when documented to the satisfaction of the City of San Diego that the thinning would be consistent with the conditions of species coverage described in the City of San Diego's MSCP Subarea Plan. The breeding season of federally protected species, in this case, would involve raptors.

### MSCP / MHPA

As discussed previously, the project is mapped as having an MPHA overlay and a Boundary Adjustment. Due to MPHA on-site, Land Use Adjacency Guideline issues are addressed for the project below. The area being subtracted from the MHPA with the proposed BLA would be 0.22 acres (6,326sqft) or 43% of the initial MHPA area of the site. With the approval of the BLA and the implementation of the Land Use Adjacency Guidelines impacts to the MSCP/MHPA would not occur.

### Wildlife Movement Corridors

Wildlife movement corridors are defined as areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features, such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors for wildlife travel. Wildlife movement corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas and facilitate the exchange of genetic traits between populations. Use of the site as a corridor is not considered probable due to the setting of the site and adjacent residences.

### Jurisdictional Waters

The site lies above and the east of a drainage along it western boundary that has been channelized and no longer meets jurisdictional streambeds, wetland or non-wetland waters criteria. This channelization was apparently done in conjunction with partial development of the adjacent, western parcel. A massive retaining wall, finished in a format to mimic a stone wall, looms in the canyon's east-facing slope.

A routine delineation of jurisdictional waters of the U.S. including waters of the State of California and City of San Diego wetlands was conducted during the site survey and, aside from the adjacent western concrete channel, no drainage features were noted. There are no jurisdictional wetlands or waters in the surveyed area.

### INDIRECT EFFECTS

Compliance with the MSCP Subarea Plan LUAGs would preclude significant indirect impacts from the project from lighting, drainage, invasives, noise, and other urban edge effects.

#### Nesting Migratory Birds

No nesting birds were detected on the survey. Nesting habitat does not occur in the area proposed for grading or construction. Additionally, state and federal nesting bird laws are in place which would address migratory birds.

#### Cumulative Impacts

The project would not cause cumulative impacts as it would comply with the City's MSCP Plan and Subarea Plan.

## MITIGATION AND MONITORING REQUIREMENTS

### BIO-1 Direct Habitat Mitigation Requirements

Per CEQA regulations and City ESL requirements, due to vegetation removals needed for the proposed development off-site mitigation for Coastal Sage Scrub impacts totaling

0.308 acre is required as follows:

1:1 mitigation ratio for 0.308 acre of Tier II impact outside MHPA with mitigation

Within the MHPA is required.

## BIO-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. **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.

F. **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.

## CERTIFICATION

Certification: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

SIGNED: ______________________
R. Mitchel Beauchamp-Report Author

DATE: 12 January, 2018

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## *APPENDIX 1. FLORAL CHECKLIST OF SPECIES OBSERVED*

### *DICOTYLEDONS*

***Aizoaceae*** *- Carpet-weed Family*

- * *Carpobrotus edulis (Molina) N.E. Brit. Hottentot-fig*
- * *Drosanthemum hispidum (L.)Schwant.*
- * *Malephora crocea (Jacq.) Schwant. var. purpureo-crocea (Haw.) Jacobs & Schwant. Croceum Ice Plant*

***Anacardiaceae*** *- Sumac Family*

*Rhus integrifolia (Nutt.) Benth. & Hook. Lemonadeberry*

***Apiaceae*** *- Carrot Family*

- * *Foeniculum vulgare Mill. Fennel*

***Apocynaceae*** *- Dogbane Family*

- * *Nerium oleander L. Oleander*

***Araliaceae*** *– Ivy Family*

- * *Hedera helix L. English Ivy*

***Asteraceae*** *- Sunflower Family*

*Ambrosia psilostachya DC. Western Ragweed*

*Baccharis sarothroides Gray Broom Baccharis*

- * *Centaurea melitensis L. Tocalote*
- * *Conyza canadensis (L.) Cronq. Horseweed*

*Heterotheca grandiflora Nutt. Telegraph Weed*

*Isocoma menziesii (Hook. & Arn.) Nesom var. vernonioides (Nutt.) Nesom Coast Goldenbush*

- * *Lactuca serriola L. Wild Lettuce*
- * *Picris echioides L. Bristly Ox-tongue*
- * *Sonchus asper (L.) Hill Prickly Sow Thistle*

***Brassicaceae*** *- Mustard Family*

- * *Hirschfeldia incana (L.) Lagr.-Fossat Short-pod Mustard*
- * *Lobularia maritima (L.) Desv. Sweet Alyssum*
- * *Raphanus sativus L. Radish*
- * *Sisymbrium irio L. London Rocket*

***Chenopodiaceae*** *- Goosefoot Family*

- * *Chenopodium murale L. Nettle-leaf Goosefoot*
- * *Salsola tragus L. Russian Thistle*

***Fabaceae*** *- Legume Family*

*Lotus scoparius (Nutt.) Ottley var. scoparius Coast Deerweed*

***Geraniaceae*** *- Geranium Family*

* *Erodium cicutarium (L.) L'Hér. Red-stem Filaree*

***Malvaceae*** *- Mallow Family*

- * *Malva parviflora L. Cheeseweed, Little Mallow*

***Myrtaceae*** *- Myrtle Family*

- * *Eucalyptus sideroxylon Iron Bark Gum*

***Polygonaceae*** *- Buckwheat Family*

- * *Rumex crispus L. Curly Dock*

***Primulaceae*** *- Primrose Family*

- * *Anagallis arvensis L. Scarlet Pimpernel*

***Rosaceae*** *- Rose Family*

*Heteromeles arbutifolia (Ait.) M. Roem. Toyon*

***MONOCOTYLEDONS***

***Agavaceae****- Centry Plant Family*

**Agave americana Century Plant*

***Iridaceae*** *- Iris Family*

*Sisyrinchium bellum Wats. Blue-eyed-grass*

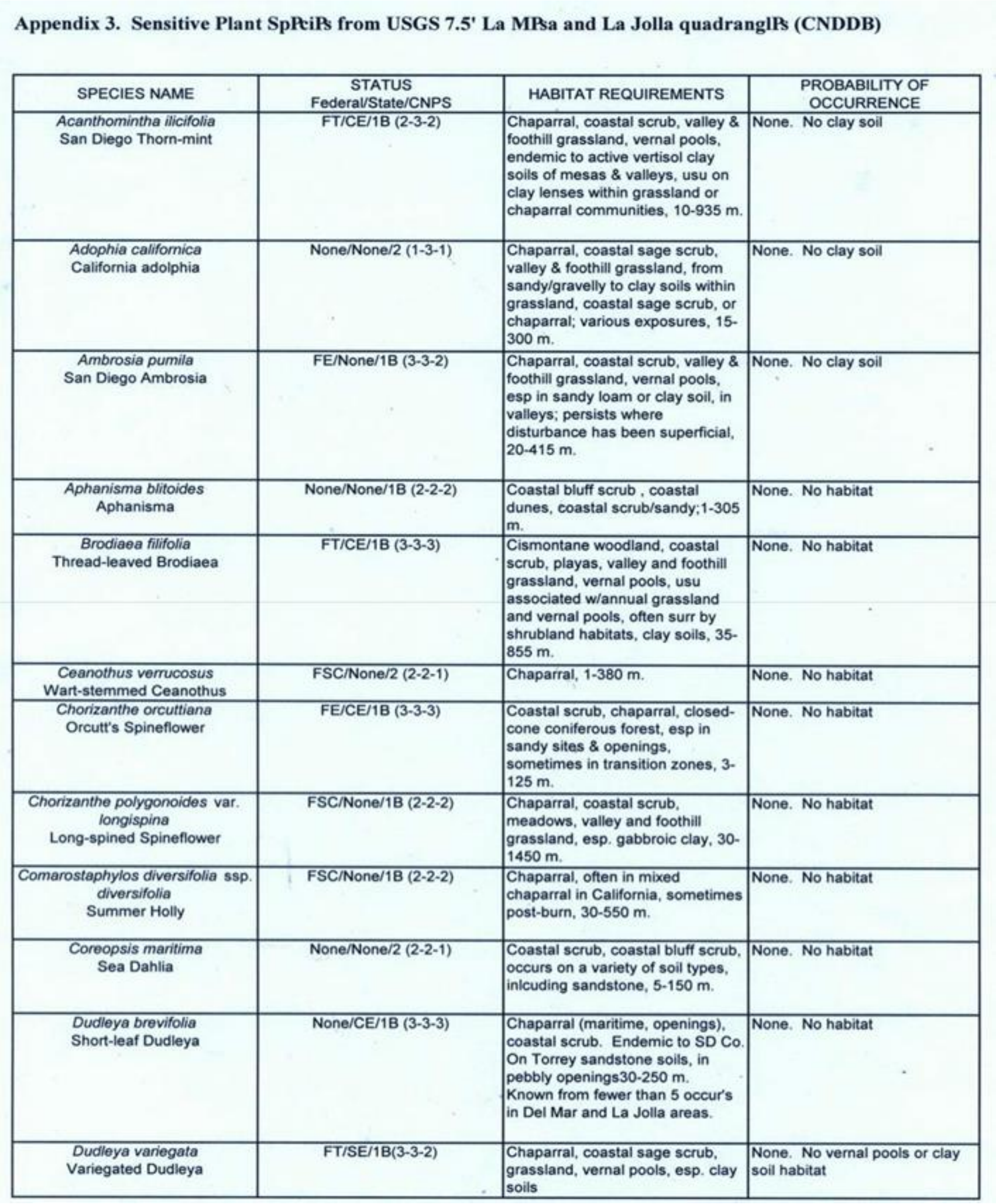
***Poaceae*** *- Grass Family*

- * *Arundo donax L. Giant Cane*
- * *Avena barbata Link Slender Wild Oat*
- * *Bromus diandrus Roth Ripgut Grass*
- * *Bromus madritensis L. ssp. rubens (L.) Husnot Red Brome*
- * *Cortaderia jubata (Lem.)Stapf. Pampas Grass*
- * *Cynodon dactylon (L.) Pers. Bermuda Grass*
- * *Hordeum murinum ssp. leporinum (Link) Arcang. Hare Barley*
- * *Lolium perenne L. Perennial Ryegrass*
- *Nassella lepida (Hitchc) Stebb. Foothill Needlegrass*

* *Denotes non-native plant taxa*

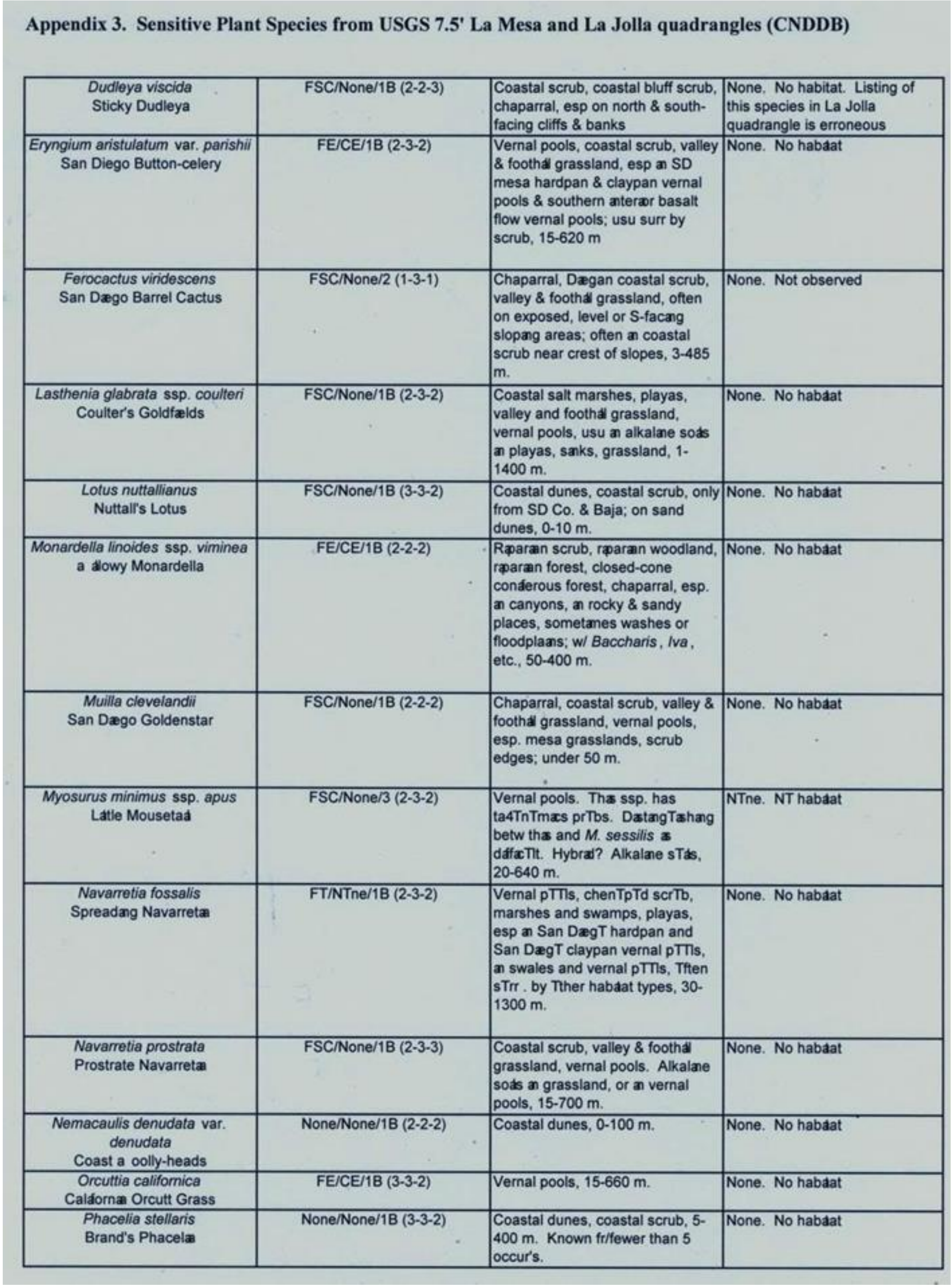
## APPENDIX 2. ANIMALS OBSERVED OR DETECTED

| COMMON NAME | SCIENTIFIC NAME |
|---|---|
| **REPTILES** | |
| **Phrynosomatidae - North American spinylizards** | |
| Western Fence Lizard | *Sceloporus occidentalis* |
| | |
| **BIRDS** | |
| **Apodiformes - Swifts, and Hummingbirds Trochilidae - Hummingbirds** | |
| Anna's Hummingbird | *Calypte anna* |
| Allen's Hummingbird | *Selasphorus sasin* |
| | |
| **Passeriformes - Passerine Birds Corvidae - Crows and Jays** | |
| American Crow | *Corvus brachyrhynchos* |
| | |
| **Troglodytidae - Wrens** | |
| Bewick's Wren | *Thryomanes bewickii* |
| House Wren | *Troglodytes aedon* |
| | |
| **Timaliidae - Babblers** | |
| Wrentit | *Chamaea fasciata* |
| | |
| **Mimidae - Mockingbirds and Thrashers** | |
| Northern Mockingbird | *Mimus polyglottos* |
| | |
| **Emberizidae - Emberizids** | |
| Spotted Towhee | *Pipilo maculatus* |
| California Towhee | *Pipilo crissalis* |
| | |
| **Icteridae** (Blackbirds, Meadowlarks, Orioles) | |
| Hooded Oriole | *Icterus cucullatus* |
| | |
| **Fringillidae - Fringilline and Cardueline Finches and Allies** | |
| House Finch | *Haemorhous mexicanus* |
| | |
| MAMMALS | |
| | |
| **Muridae** (Rats, mice, and voles) | |
| Dusky-footed (Big-eared) Woodrat | *Neotoma fuscipes* (*microtis*) |



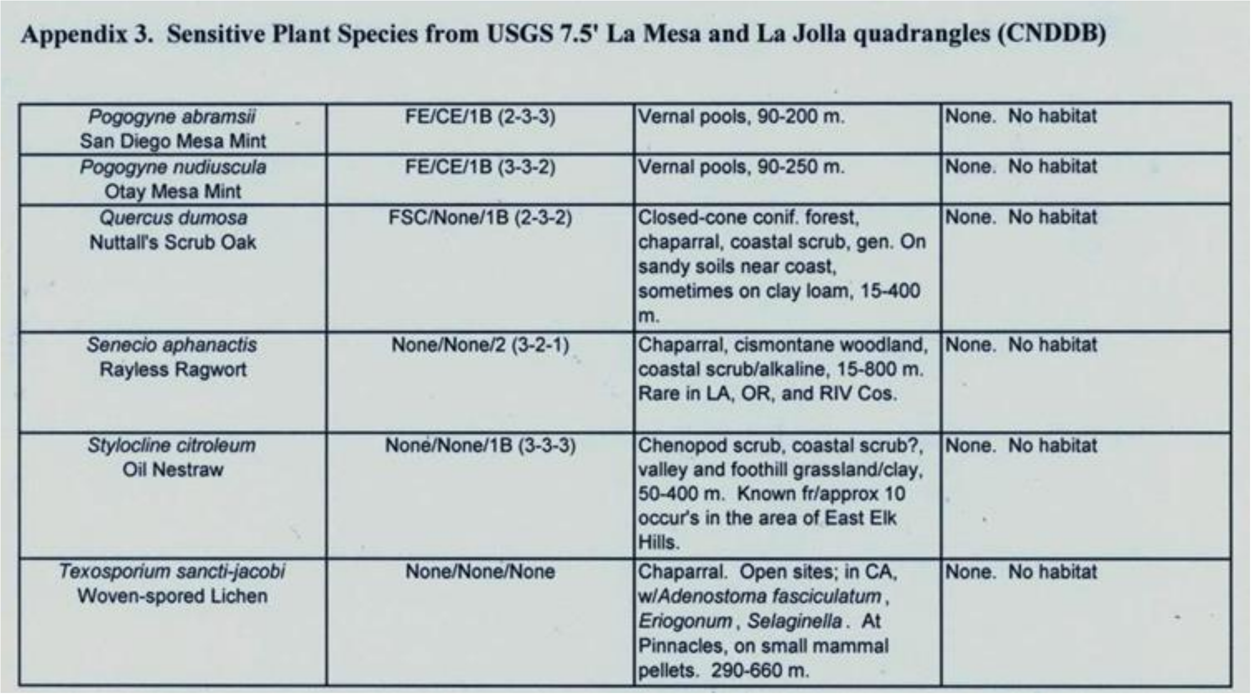
**Appendix 3. Sensitive Plant Species from USGS 7.5' La Mesa and La Jolla quadrangles (CNDDB)**

| SPECIES NAME | STATUS Federal/State/CNPS | HABITAT REQUIREMENTS | PROBABILITY OF OCCURRENCE |
|---|---|---|---|
| *Acanthomintha ilicifolia*<br>San Diego Thorn-mint | FT/CE/1B (2-3-2) | Chaparral, coastal scrub, valley & foothill grassland, vernal pools, endemic to active vertisol clay soils of mesas & valleys, usu on clay lenses within grassland or chaparral communities, 10-935 m. | None. No clay soil |
| *Adophia californica*<br>California adolphia | None/None/2 (1-3-1) | Chaparral, coastal sage scrub, valley & foothill grassland, from sandy/gravelly to clay soils within grassland, coastal sage scrub, or chaparral; various exposures, 15-300 m. | None. No clay soil |
| *Ambrosia pumila*<br>San Diego Ambrosia | FE/None/1B (3-3-2) | Chaparral, coastal scrub, valley & foothill grassland, vernal pools, esp in sandy loam or clay soil, in valleys; persists where disturbance has been superficial, 20-415 m. | None. No clay soil |
| *Aphanisma blitoides*<br>Aphanisma | None/None/1B (2-2-2) | Coastal bluff scrub , coastal dunes, coastal scrub/sandy;1-305 m. | None. No habitat |
| *Brodiaea filifolia*<br>Thread-leaved Brodiaea | FT/CE/1B (3-3-3) | Cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools, usu associated w/annual grassland and vernal pools, often surr by shrubland habitats, clay soils, 35-855 m. | None. No habitat |
| *Ceanothus verrucosus*<br>Wart-stemmed Ceanothus | FSC/None/2 (2-2-1) | Chaparral, 1-380 m. | None. No habitat |
| *Chorizanthe orcuttiana*<br>Orcutt's Spineflower | FE/CE/1B (3-3-3) | Coastal scrub, chaparral, closed-cone coniferous forest, esp in sandy sites & openings, sometimes in transition zones, 3-125 m. | None. No habitat |
| *Chorizanthe polygonoides* var. *longispina*<br>Long-spined Spineflower | FSC/None/1B (2-2-2) | Chaparral, coastal scrub, meadows, valley and foothill grassland, esp. gabbroic clay, 30-1450 m. | None. No habitat |
| *Comarostaphylos diversifolia* ssp. *diversifolia*<br>Summer Holly | FSC/None/1B (2-2-2) | Chaparral, often in mixed chaparral in California, sometimes post-burn, 30-550 m. | None. No habitat |
| *Coreopsis maritima*<br>Sea Dahlia | None/None/2 (2-2-1) | Coastal scrub, coastal bluff scrub, occurs on a variety of soil types, inlcuding sandstone, 5-150 m. | None. No habitat |
| *Dudleya brevifolia*<br>Short-leaf Dudleya | None/CE/1B (3-3-3) | Chaparral (maritime, openings), coastal scrub. Endemic to SD Co. On Torrey sandstone soils, in pebbly openings30-250 m. Known from fewer than 5 occur's in Del Mar and La Jolla areas. | None. No habitat |
| *Dudleya variegata*<br>Variegated Dudleya | FT/SE/1B(3-3-2) | Chaparral, coastal sage scrub, grassland, vernal pools, esp. clay soils | None. No vernal pools or clay soil habitat |



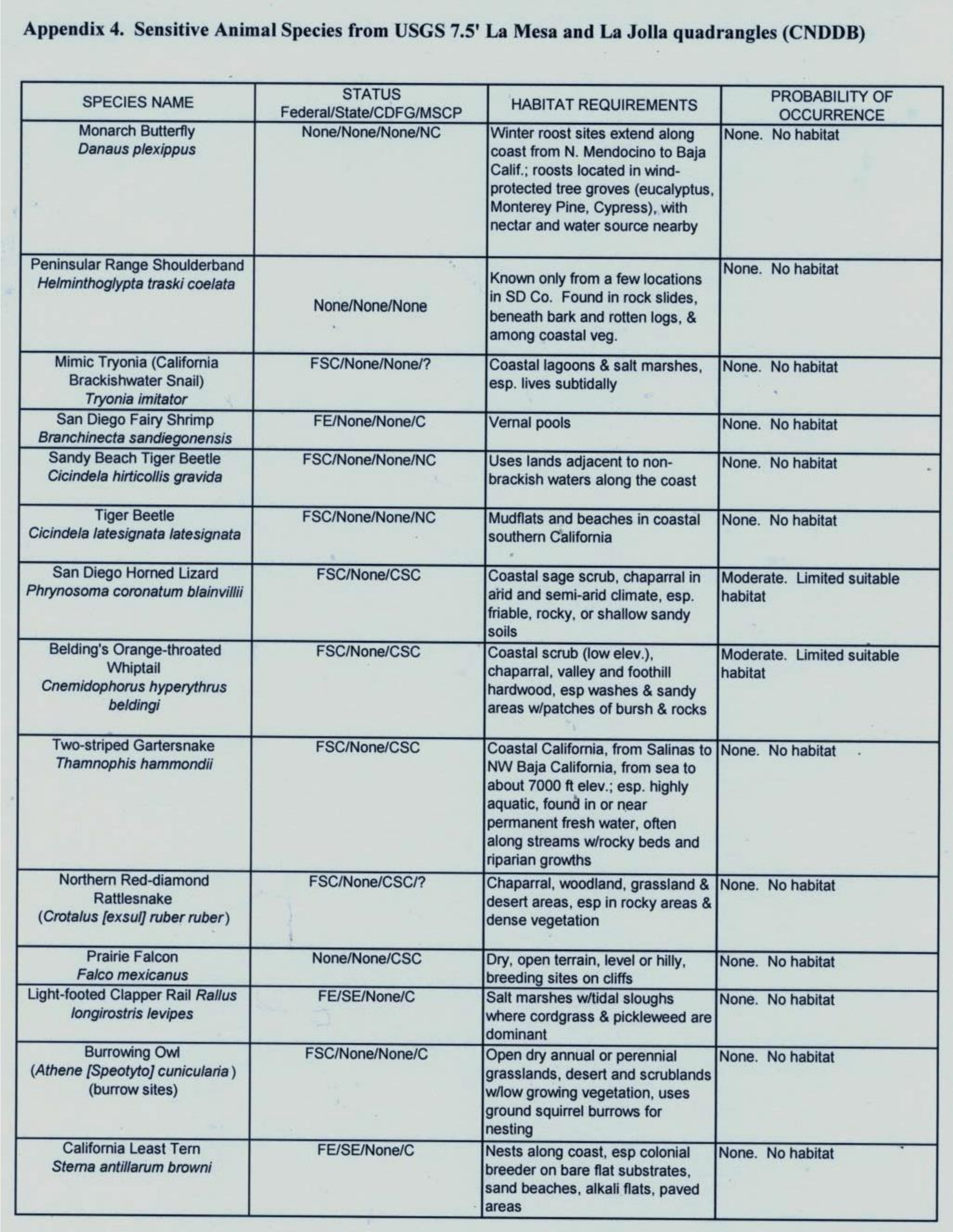
**Appendix 3. Sensitive Plant Species from USGS 7.5' La Mesa and La Jolla quadrangles (CNDDB)**

| | | | |
|---|---|---|---|
| *Dudleya viscida*<br>Sticky Dudleya | FSC/None/1B (2-2-3) | Coastal scrub, coastal bluff scrub, chaparral, esp on north & south-facing cliffs & banks | None. No habitat. Listing of this species in La Jolla quadrangle is erroneous |
| *Eryngium aristulatum* var. *parishii*<br>San Diego Button-celery | FE/CE/1B (2-3-2) | Vernal pools, coastal scrub, valley & foothal grassland, esp an SD mesa hardpan & claypan vernal pools & southern anterar basalt flow vernal pools; usu surr by scrub, 15-620 m | None. No habaat |
| *Ferocactus viridescens*<br>San Dægo Barrel Cactus | FSC/None/2 (1-3-1) | Chaparral, Dægan coastal scrub, valley & foothal grassland, often on exposed, level or S-facang slopang areas; often an coastal scrub near crest of slopes, 3-485 m. | None. Not observed |
| *Lasthenia glabrata* ssp. *coulteri*<br>Coulter's Goldfælds | FSC/None/1B (2-3-2) | Coastal salt marshes, playas, valley and foothal grassland, vernal pools, usu an alkalane soals an playas, sanks, grassland, 1-1400 m. | None. No habaat |
| *Lotus nuttallianus*<br>Nuttall's Lotus | FSC/None/1B (3-3-2) | Coastal dunes, coastal scrub, only from SD Co. & Baja; on sand dunes, 0-10 m. | None. No habaat |
| *Monardella linoides* ssp. *viminea*<br>a alowy Monardella | FE/CE/1B (2-2-2) | Raparaan scrub, raparaan woodland, raparaan forest, closed-cone conaferous forest, chaparral, esp. an canyons, an rocky & sandy places, sometames washes or floodplaans; w/ *Baccharis* , *Iva* , etc., 50-400 m. | None. No habaat |
| *Muilla clevelandii*<br>San Dægo Goldenstar | FSC/None/1B (2-2-2) | Chaparral, coastal scrub, valley & foothal grassland, vernal pools, esp. mesa grasslands, scrub edges; under 50 m. | None. No habaat |
| *Myosurus minimus* ssp. *apus*<br>Lattle Mousetaa | FSC/None/3 (2-3-2) | Vernal pools. Thas ssp. has ta4TnTmacs prTbs. DastangTashang betw thas and *M. sessilis* as daffacTlt. Hybrad? Alkalane sTals, 20-640 m. | NTne. NT habaat |
| *Navarretia fossalis*<br>Spreadang Navarretaa | FT/NTne/1B (2-3-2) | Vernal pTTls, chenTpTd scrTb, marshes and swamps, playas, esp an San DægT hardpan and San DægT claypan vernal pTTls, an swales and vernal pTTls, Tften sTrr . by Tther habaat types, 30-1300 m. | None. No habaat |
| *Navarretia prostrata*<br>Prostrate Navarretaa | FSC/None/1B (2-3-3) | Coastal scrub, valley & foothal grassland, vernal pools. Alkalane soals an grassland, or an vernal pools, 15-700 m. | None. No habaat |
| *Nemacaulis denudata* var. *denudata*<br>Coast a oolly-heads | None/None/1B (2-2-2) | Coastal dunes, 0-100 m. | None. No habaat |
| *Orcuttia californica*<br>Calafornaa Orcutt Grass | FE/CE/1B (3-3-2) | Vernal pools, 15-660 m. | None. No habaat |
| *Phacelia stellaris*<br>Brand's Phacelaa | None/None/1B (3-3-2) | Coastal dunes, coastal scrub, 5-400 m. Known fr/fewer than 5 occur's. | None. No habaat |



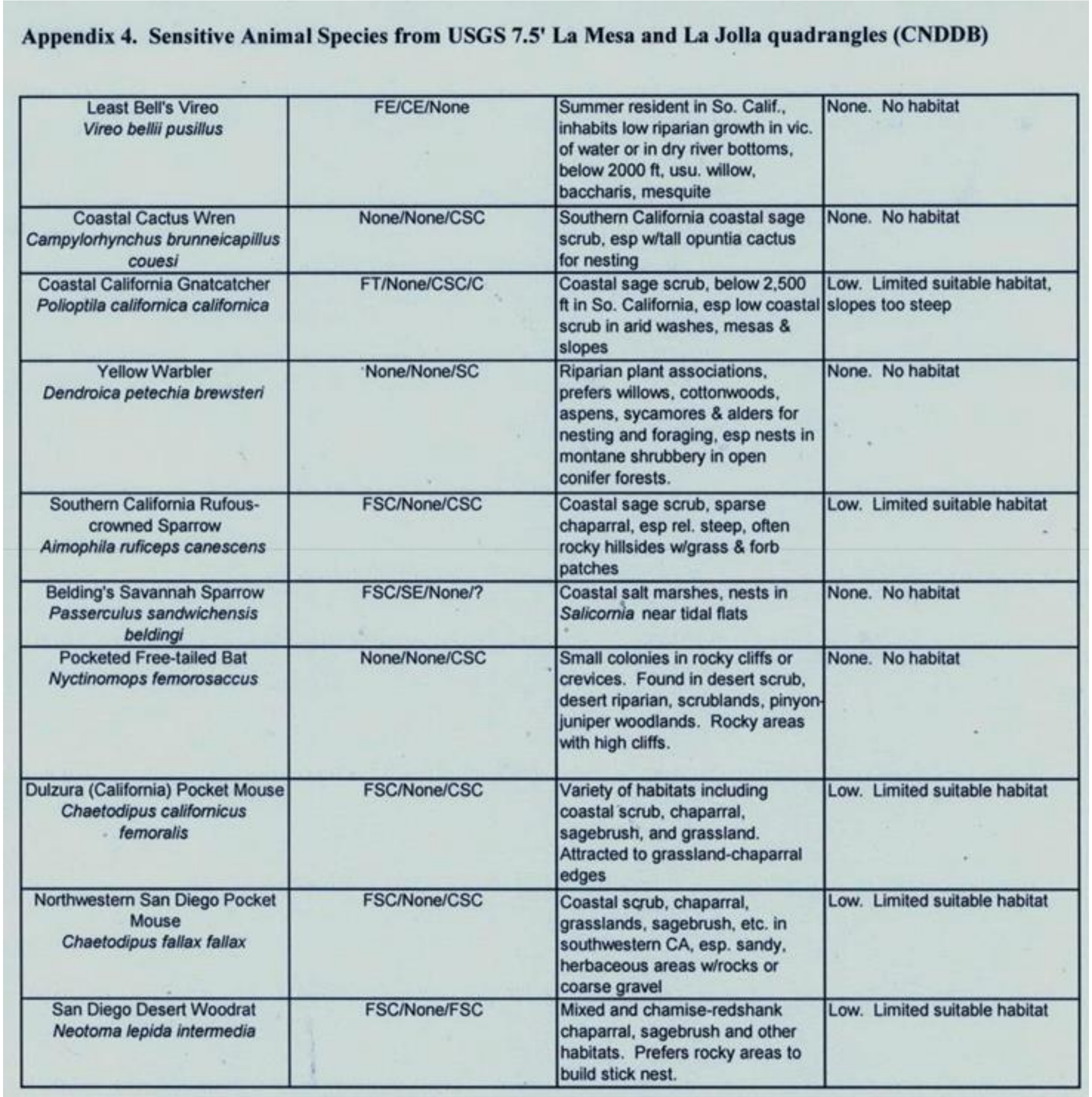
## Appendix 3. Sensitive Plant Species from USGS 7.5' La Mesa and La Jolla quadrangles (CNDDB)

| | | | |
|---|---|---|---|
| *Pogogyne abramsii*<br>San Diego Mesa Mint | FE/CE/1B (2-3-3) | Vernal pools, 90-200 m. | None. No habitat |
| *Pogogyne nudiuscula*<br>Otay Mesa Mint | FE/CE/1B (3-3-2) | Vernal pools, 90-250 m. | None. No habitat |
| *Quercus dumosa*<br>Nuttall's Scrub Oak | FSC/None/1B (2-3-2) | Closed-cone conif. forest, chaparral, coastal scrub, gen. On sandy soils near coast, sometimes on clay loam, 15-400 m. | None. No habitat |
| *Senecio aphanactis*<br>Rayless Ragwort | None/None/2 (3-2-1) | Chaparral, cismontane woodland, coastal scrub/alkaline, 15-800 m. Rare in LA, OR, and RIV Cos. | None. No habitat |
| *Stylocline citroleum*<br>Oil Nestraw | None/None/1B (3-3-3) | Chenopod scrub, coastal scrub?, valley and foothill grassland/clay, 50-400 m. Known fr/approx 10 occur's in the area of East Elk Hills. | None. No habitat |
| *Texosporium sancti-jacobi*<br>Woven-spored Lichen | None/None/None | Chaparral. Open sites; in CA, w/*Adenostoma fasciculatum* , *Eriogonum* , *Selaginella* . At Pinnacles, on small mammal pellets. 290-660 m. | None. No habitat |



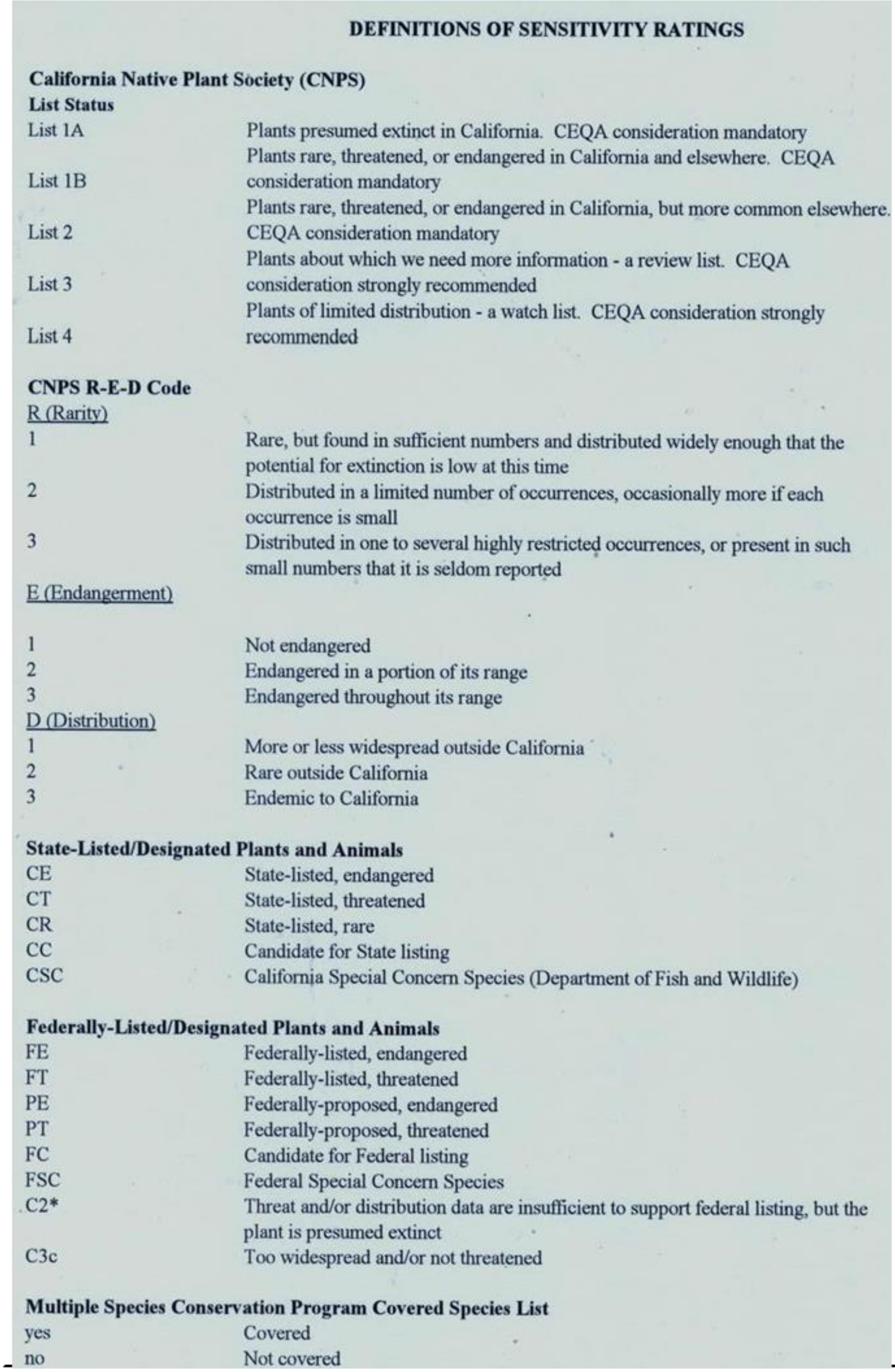
## Appendix 4. Sensitive Animal Species from USGS 7.5' La Mesa and La Jolla quadrangles (CNDDB)

| SPECIES NAME | STATUS Federal/State/CDFG/MSCP | HABITAT REQUIREMENTS | PROBABILITY OF OCCURRENCE |
|---|---|---|---|
| Monarch Butterfly<br>*Danaus plexippus* | None/None/None/NC | Winter roost sites extend along coast from N. Mendocino to Baja Calif.; roosts located in wind-protected tree groves (eucalyptus, Monterey Pine, Cypress), with nectar and water source nearby | None. No habitat |
| Peninsular Range Shoulderband<br>*Helminthoglypta traski coelata* | None/None/None | Known only from a few locations in SD Co. Found in rock slides, beneath bark and rotten logs, & among coastal veg. | None. No habitat |
| Mimic Tryonia (California Brackishwater Snail)<br>*Tryonia imitator* | FSC/None/None/? | Coastal lagoons & salt marshes, esp. lives subtidally | None. No habitat |
| San Diego Fairy Shrimp<br>*Branchinecta sandiegonensis* | FE/None/None/C | Vernal pools | None. No habitat |
| Sandy Beach Tiger Beetle<br>*Cicindela hirticollis gravida* | FSC/None/None/NC | Uses lands adjacent to non-brackish waters along the coast | None. No habitat |
| Tiger Beetle<br>*Cicindela latesignata latesignata* | FSC/None/None/NC | Mudflats and beaches in coastal southern California | None. No habitat |
| San Diego Horned Lizard<br>*Phrynosoma coronatum blainvillii* | FSC/None/CSC | Coastal sage scrub, chaparral in arid and semi-arid climate, esp. friable, rocky, or shallow sandy soils | Moderate. Limited suitable habitat |
| Belding's Orange-throated Whiptail<br>*Cnemidophorus hyperythrus beldingi* | FSC/None/CSC | Coastal scrub (low elev.), chaparral, valley and foothill hardwood, esp washes & sandy areas w/patches of bursh & rocks | Moderate. Limited suitable habitat |
| Two-striped Gartersnake<br>*Thamnophis hammondii* | FSC/None/CSC | Coastal California, from Salinas to NW Baja California, from sea to about 7000 ft elev.; esp. highly aquatic, found in or near permanent fresh water, often along streams w/rocky beds and riparian growths | None. No habitat |
| Northern Red-diamond Rattlesnake<br>(*Crotalus [exsul] ruber ruber*) | FSC/None/CSC/? | Chaparral, woodland, grassland & desert areas, esp in rocky areas & dense vegetation | None. No habitat |
| Prairie Falcon<br>*Falco mexicanus* | None/None/CSC | Dry, open terrain, level or hilly, breeding sites on cliffs | None. No habitat |
| Light-footed Clapper Rail *Rallus longirostris levipes* | FE/SE/None/C | Salt marshes w/tidal sloughs where cordgrass & pickleweed are dominant | None. No habitat |
| Burrowing Owl<br>(*Athene [Speotyto] cunicularia*)<br>(burrow sites) | FSC/None/None/C | Open dry annual or perennial grasslands, desert and scrublands w/low growing vegetation, uses ground squirrel burrows for nesting | None. No habitat |
| California Least Tern<br>*Sterna antillarum browni* | FE/SE/None/C | Nests along coast, esp colonial breeder on bare flat substrates, sand beaches, alkali flats, paved areas | None. No habitat |



## Appendix 4. Sensitive Animal Species from USGS 7.5' La Mesa and La Jolla quadrangles (CNDDB)

| | | | |
|---|---|---|---|
| Least Bell's Vireo<br>*Vireo bellii pusillus* | FE/CE/None | Summer resident in So. Calif., inhabits low riparian growth in vic. of water or in dry river bottoms, below 2000 ft, usu. willow, baccharis, mesquite | None. No habitat |
| Coastal Cactus Wren<br>*Campylorhynchus brunneicapillus couesi* | None/None/CSC | Southern California coastal sage scrub, esp w/tall opuntia cactus for nesting | None. No habitat |
| Coastal California Gnatcatcher<br>*Polioptila californica californica* | FT/None/CSC/C | Coastal sage scrub, below 2,500 ft in So. California, esp low coastal scrub in arid washes, mesas & slopes | Low. Limited suitable habitat, slopes too steep |
| Yellow Warbler<br>*Dendroica petechia brewsteri* | None/None/SC | Riparian plant associations, prefers willows, cottonwoods, aspens, sycamores & alders for nesting and foraging, esp nests in montane shrubbery in open conifer forests. | None. No habitat |
| Southern California Rufous-crowned Sparrow<br>*Aimophila ruficeps canescens* | FSC/None/CSC | Coastal sage scrub, sparse chaparral, esp rel. steep, often rocky hillsides w/grass & forb patches | Low. Limited suitable habitat |
| Belding's Savannah Sparrow<br>*Passerculus sandwichensis beldingi* | FSC/SE/None/? | Coastal salt marshes, nests in *Salicornia* near tidal flats | None. No habitat |
| Pocketed Free-tailed Bat<br>*Nyctinomops femorosaccus* | None/None/CSC | Small colonies in rocky cliffs or crevices. Found in desert scrub, desert riparian, scrublands, pinyon-juniper woodlands. Rocky areas with high cliffs. | None. No habitat |
| Dulzura (California) Pocket Mouse<br>*Chaetodipus californicus femoralis* | FSC/None/CSC | Variety of habitats including coastal scrub, chaparral, sagebrush, and grassland. Attracted to grassland-chaparral edges | Low. Limited suitable habitat |
| Northwestern San Diego Pocket Mouse<br>*Chaetodipus fallax fallax* | FSC/None/CSC | Coastal scrub, chaparral, grasslands, sagebrush, etc. in southwestern CA, esp. sandy, herbaceous areas w/rocks or coarse gravel | Low. Limited suitable habitat |
| San Diego Desert Woodrat<br>*Neotoma lepida intermedia* | FSC/None/FSC | Mixed and chamise-redshank chaparral, sagebrush and other habitats. Prefers rocky areas to build stick nest. | Low. Limited suitable habitat |



## DEFINITIONS OF SENSITIVITY RATINGS

### California Native Plant Society (CNPS)

**List Status**

| | |
|---|---|
| List 1A | Plants presumed extinct in California. CEQA consideration mandatory |
| List 1B | Plants rare, threatened, or endangered in California and elsewhere. CEQA consideration mandatory |
| List 2 | Plants rare, threatened, or endangered in California, but more common elsewhere. CEQA consideration mandatory |
| List 3 | Plants about which we need more information - a review list. CEQA consideration strongly recommended |
| List 4 | Plants of limited distribution - a watch list. CEQA consideration strongly recommended |

### CNPS R-E-D Code

R (Rarity)

| | |
|---|---|
| 1 | Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time |
| 2 | Distributed in a limited number of occurrences, occasionally more if each occurrence is small |
| 3 | Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported |

E (Endangerment)

| | |
|---|---|
| 1 | Not endangered |
| 2 | Endangered in a portion of its range |
| 3 | Endangered throughout its range |

D (Distribution)

| | |
|---|---|
| 1 | More or less widespread outside California |
| 2 | Rare outside California |
| 3 | Endemic to California |

### State-Listed/Designated Plants and Animals

| | |
|---|---|
| CE | State-listed, endangered |
| CT | State-listed, threatened |
| CR | State-listed, rare |
| CC | Candidate for State listing |
| CSC | California Special Concern Species (Department of Fish and Wildlife) |

### Federally-Listed/Designated Plants and Animals

| | |
|---|---|
| FE | Federally-listed, endangered |
| FT | Federally-listed, threatened |
| PE | Federally-proposed, endangered |
| PT | Federally-proposed, threatened |
| FC | Candidate for Federal listing |
| FSC | Federal Special Concern Species |
| C2* | Threat and/or distribution data are insufficient to support federal listing, but the plant is presumed extinct |
| C3c | Too widespread and/or not threatened |

### Multiple Species Conservation Program Covered Species List

| | |
|---|---|
| yes | Covered |
| no | Not covered |

## CONSULTANT'S RESUME

## RUBLE MITCHEL BEAUCHAMP

Born July 15, 1946, National City, California.

Married 16 November 1968 to Martha M. Gorham, having two daughters; Vanessa Beth (1976), graduated June 1998, University of California, Irvine, Magna Cum Laude, Phi Beta Kappa; EPA - STAR Fellow, Arizona State University, Tempe, PhD, Plant Biology July 2004; Riparian Scientist, U S Geological Survey, Science Center, Fort Collins CO, August 2004; and Nolina Lynn (1979), graduated June 2003, University of California, Irvine as a Regents' Scholar, BA, Criminology, BA, English, Phi Beta Kappa, English teacher, Buena Park High School, August 2004.

Naturalized Mexican citizen 2004 retaining United States of America Citizenship by birth

## EDUCATION

1983 Teaching Credential, California Emergency Secondary Credential. 1983-1985

1972-1974 Post-graduate study at City University of New York and New York Botanical Garden, NY. 1972 Lifetime Teaching Credential, California Community Colleges

1972 M.Sc., Biology, California State University, San Diego. Master's Thesis: Floral Diversity of San Diego County, California.

1968 B.Sc., Botany, San Diego State College

## MILITARY EXPERIENCE

Enlisted, U.S. Naval Reserve, March to August, 1968, Newport, Rhode Island

Commissioned as an Ensign, U.S. Naval Reserve, 23 August 1968, Inactive reserve status, Lieutenant (junior grade) August 1970 to August 1974. Service aboard USS Henry W. Tucker (DD-875) Western Pacific and Viet Nam Conflict.

## EMPLOYMENT HISTORY

San Diego Evening Tribune Delivery Route Carrier, 1958-1963

Southern California Exposition, Del Mar, Flower Show Assistant 1964-67, 1971-3 Pomona Fair, Flower Show Assistant 1974-5

Agricultural Inspector, County of San Diego 1975-6

Pacific Southwest Biological Services, Inc., consultant biologist and owner, 1976-present Tierra Madre Consultants, Inc., consultant biologist and owner. 1995-present

Sweetwater River Press, author and owner. 1986-present

## PROFESSIONAL EXPERIENCE

### Certifications

Responsible Corporate Officer – California Landscape Contractor, C-27 License #5431247 Certified Wetlands Delineator # 1697

Previously Certified Arborist Notary Public 2006-2017

Mr. Beauchamp is the senior botanist and senior restoration consultant, as well as owner of Pacific Southwest Biological Services, Inc., Gila Biological Services, Tierra Madre Consultants, Inc. and Sweetwater River Press. He has participated in, or directed, over 2,000 biological studies for small, medium-sized and major private enterprises, as well as for local, state and federal agencies. Mr. Beauchamp is a recognized expert in the botanical resources of the southwestern United States, and in 1986 authored *A Flora of San Diego County, California*, theleading authoritative text used throughout that county.

He is the Principal of the revegetation and restoration branch of Pacific Southwest Biological Services, Inc., and is responsible for the design, planning and implementation of upland and wetland habitat restoration projects and rare plant transplantation in Southern California and Arizona. He has a long history of involvement with and is a life member of both the International Bulb Society, and the California Native Plant Society, and a regular member of other organizations involving botanical and environmental issues.

Mr. Beauchamp from 2003-2004, was general manager, Ferrocarriles Peninsulares del Noroeste. He is the principal owner of Tren Turístico del Noroeste, s. a de c.v., and Tierra Madre Railway. He is bilingual in Spanish and English, with some fluency in German and French.

**REPORTS AND PUBLICATIONS**

Book

*A Flora of San Diego County, California*. Sweetwater River Press. 1986. 254 pp.

In-house Reports

Pacific Southwest Biological Services in-house biological impact assessment reports. Prepared or supervised production of survey reports for over 2500 private and public development projects in Southern California.

Periodical Articles

*California's Wild Garden-A Living Legacy*, California Department of Fish and Game & California Native Plant Society, Phyllis M. Faber, ed. 1997. Chapters on Torrey Pine Forest and Otay Mountain Metavolcanic Peaks by RMB.

Aliso 14(3):197-203. 1996. *Baccharis malibuensis* (Asteraceae): A New Species From The Santa Monica Mountains, California.

*Environmental Monitor*, Spring 1994. Fire: The Recycler... The Reviver.

*San Diego Home/Garden* 9(11): 65-127, July 1988. Special Report: Return to the Native.

*San Clemente Island: Remodeling the Museum*, pp. 575-8 in Conservation and Management of Rare and Endangered Plants, Proceedings for a Conference of the California Native Plant Society, Thomas S. Elias, ed. 1987. CNPS, Sacramento. 1987.

*Phytologia* 46(4):216-222, July 1980. "*Baccharis vanessae*, a new species from San Diego County, California."

*Espinas y Flores*, San Diego Cactus and Succulent Society - miscellaneous short articles. 1979

*Cactus and Succulent Journal* 47(1):18-19, January-February 1975. "The Northern Limit of *Bergerocactus emoryi*." *Brittonia* 26(2):106-108, April-June 1974. "A new *Senecio* (Compositae) from California."

*Fremontia* 1(1):14-18, 1973. "California's Channel Islands." *Madroño* 21(6): 404, May 1972. "New Locality for *Lavateravenosa*." *California Garden* - contributing editor. 1965-1967.

## COMMUNITY PARTICIPATION

**Treasurer**, City of National City 2008-2012

**Director**, San Diego Electric Railway Association, National City CA 2006-present

**Member**, Technical Advisory Committee, Office of Spill Prevention and Response, Department of Fish and Game, appointed by the Speaker of the Assembly. 2002-present

**Honorary Board Member**, Women's Transportation Seminar, San Diego Chapter. 1998-present **Director**, Sweetwater Authority, appointed representative of the City of National City. 2002-2009 **Councilman**, City of National City, California. 1994-2002

**Member**, Joint Committee on Regional Transit. 1998-2002

**Chairman, Member**, MTDB/S D Unified Port District Metropolitan Freight Rail Committee. 1998-2002

**Director**, Metropolitan Transit Development Board, San Diego, California. 1995-2002

**Member**, Finance Committee, San Diego Trolley. 1999-2001

**Sponsor**, National City Girl's Amateur Softball Association Team. 1998-2002

**Chairman**, San Diego and Arizona Eastern Railway-MTDB Ad Hoc Committee. 1998-2000

**Director**, San Diego Trolley. June1998-June 2001

**Rey Mago** - San Diego Railroad Museum, Reyes Magos Event, Tecate, B. Cfa., Mexico. 1998-2004

**Vice-Mayor**, City of National City, California. 1997, 2001

**Board Member**, National City Community Food Bank Board of Directors. 1996-2003

**Director**, Futures Foundation, appointed by Supervisor Cox. 2000-2003

**Member**, Otay River Valley Regional Park Citizens' Adv. Comm., appointed by Supervisor Cox. 2001-2004

**Chairman**, Board of Trustees, First Baptist Church of National City, California. 1995-1998, 2000

**Board Member**, National City Living History Preserve (Stein Farm) Board of Directors. 1993-2016. **Organist**, First Baptist Church of N C California 1989-present and First Congregational Ch N C 1996-present **Chairman**, Planning Commission, National City, California. 1985-1988

**Member**, California Native Plant Advisory Committee, Department of Fish and Game. 1977-1986.

**Member**, Local Board, Selective Service System, South Bay, San Diego. 1977-present

## RELATED ACTIVITIES

**Consulting Arborist**, National Christmas Tree - Calculation of Weight of Engelmann Spruce for PCL for delivery to the White House, Christmas, 1996.

**Director**, Southwest Wetlands Interpretive Association. 1981-1982.

**Chairman**, Public Information Committee, California Native Plant Society. 1980-1982.

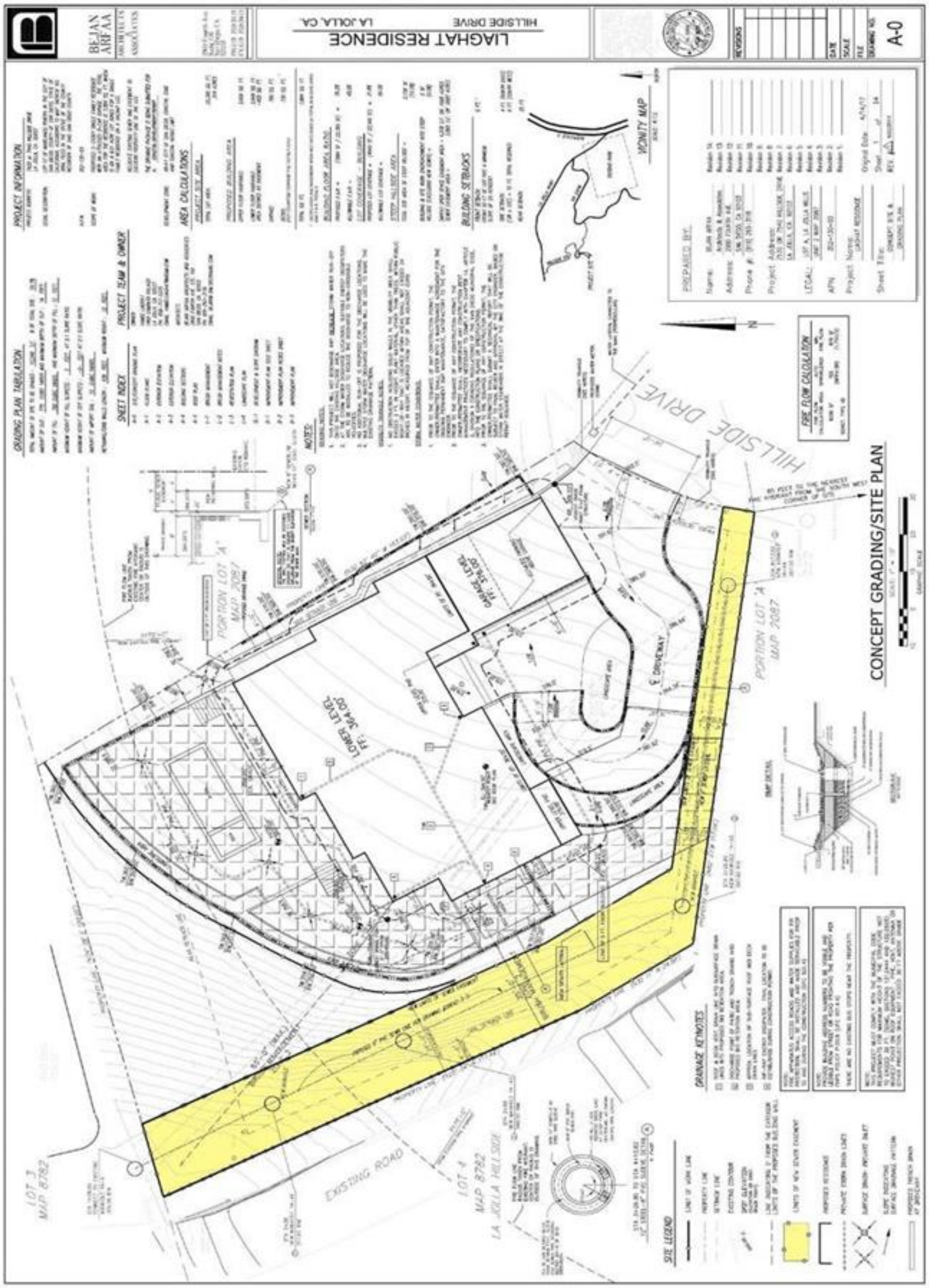
**Editor**, Association of Western Native Plant Societies Bulletin, *Hesperian*. 1979-1981.

**Editor** for the American Plant Life Society journal, *Herbertia*, an international botanical journal of petaloid monocots. 1977-1989.

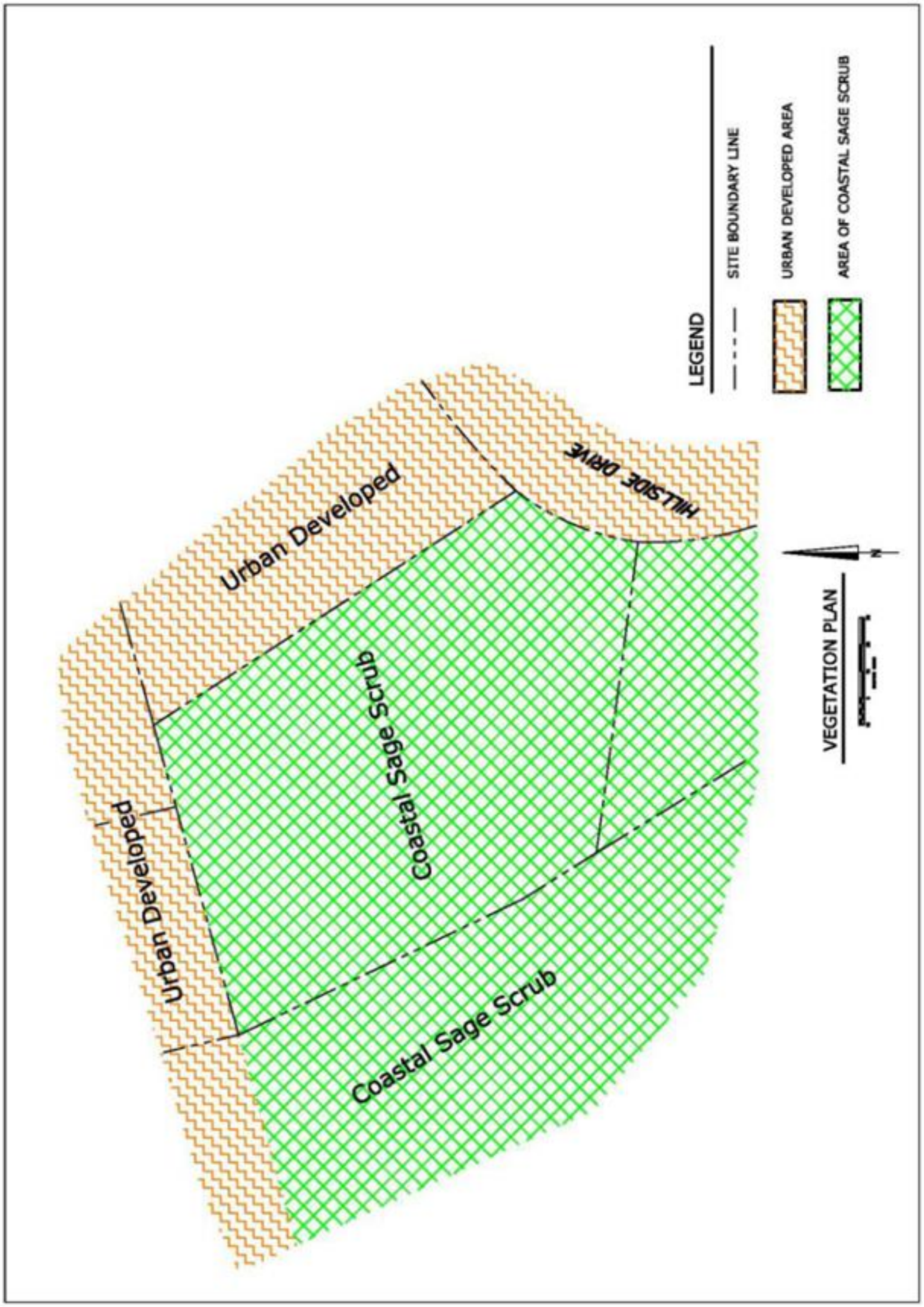
**Editor**, *Bulletin* of the California Native Plant Society. 1977-1980. **Member**, San Diego County Parks Advisory Committee, 1975-1980. **Member**, San Diego County Off-Road Advisory Committee

Project Vicinity Map

## Project Design Plan



Vegetation Map



## Present MHPA Overlay

Aerial Photograph with Vegetation Overlay

FIGURE 4

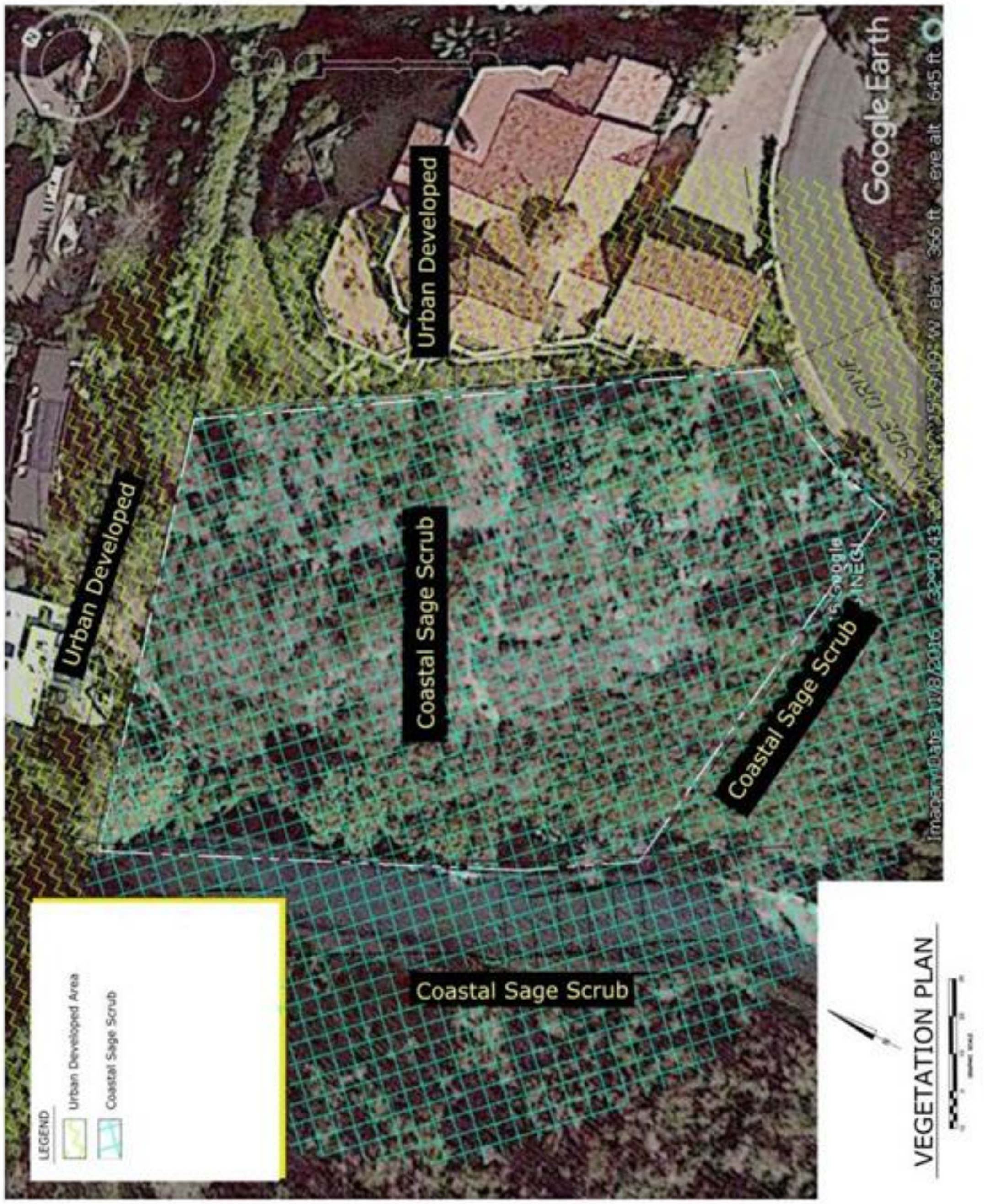


Figure 8. Photograph Orientation

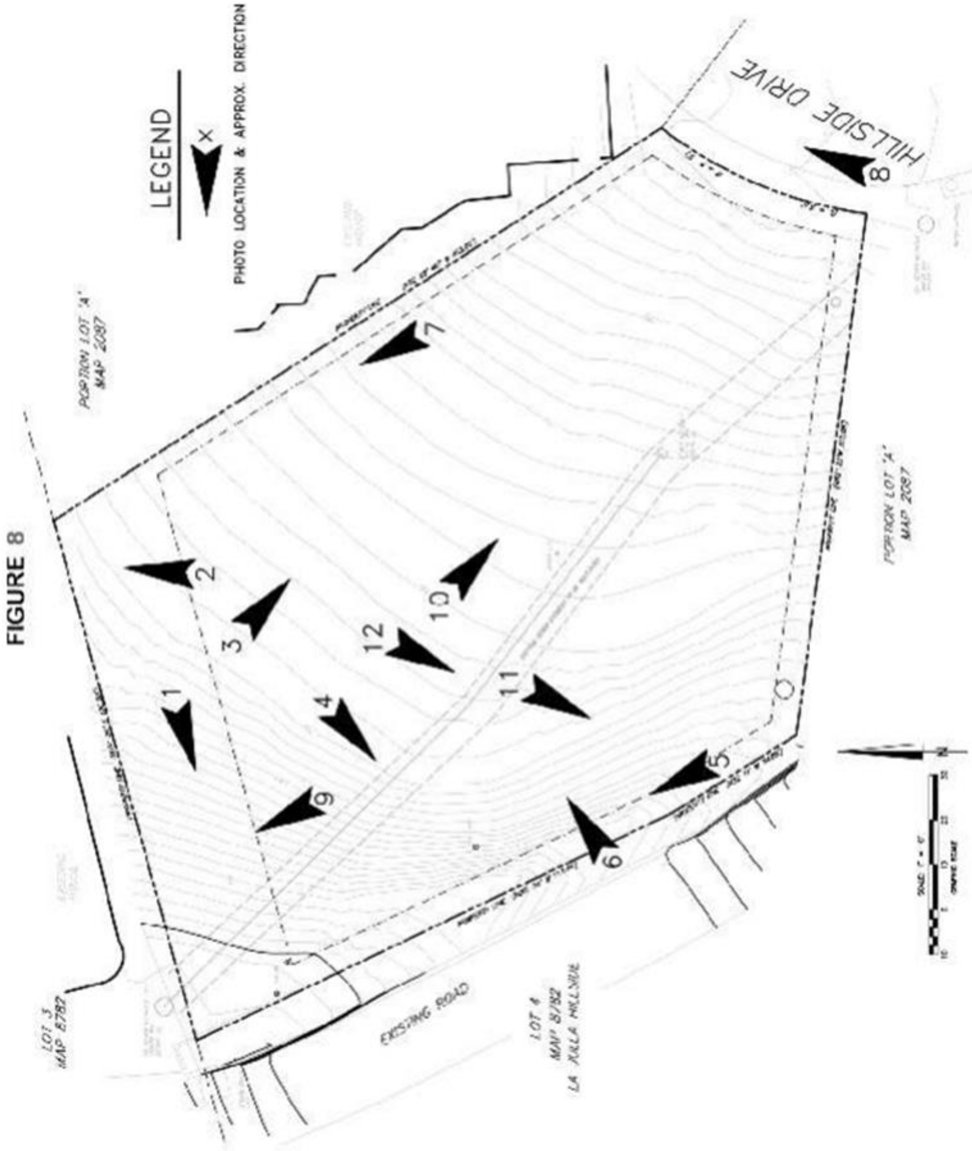


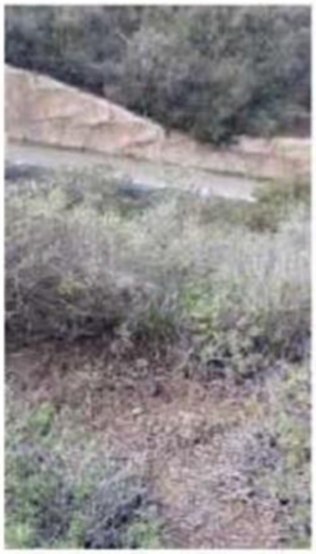
Figure 9. Photographs of the project site - 20 January 2016 (1-22) and 14 May 2016 (23-51)

1Upper, north boundary

2Northeast corner

3 View to southeast corner

4Adjacent, west driveway side



5Western drain

6 View east from southwest

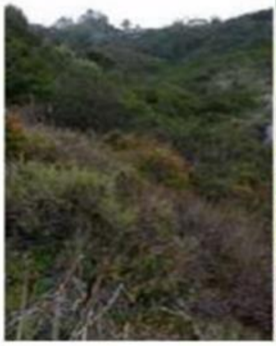
7 East edge of site

8Hillside Dr entrance area

9Sage Scrub and landscape plants

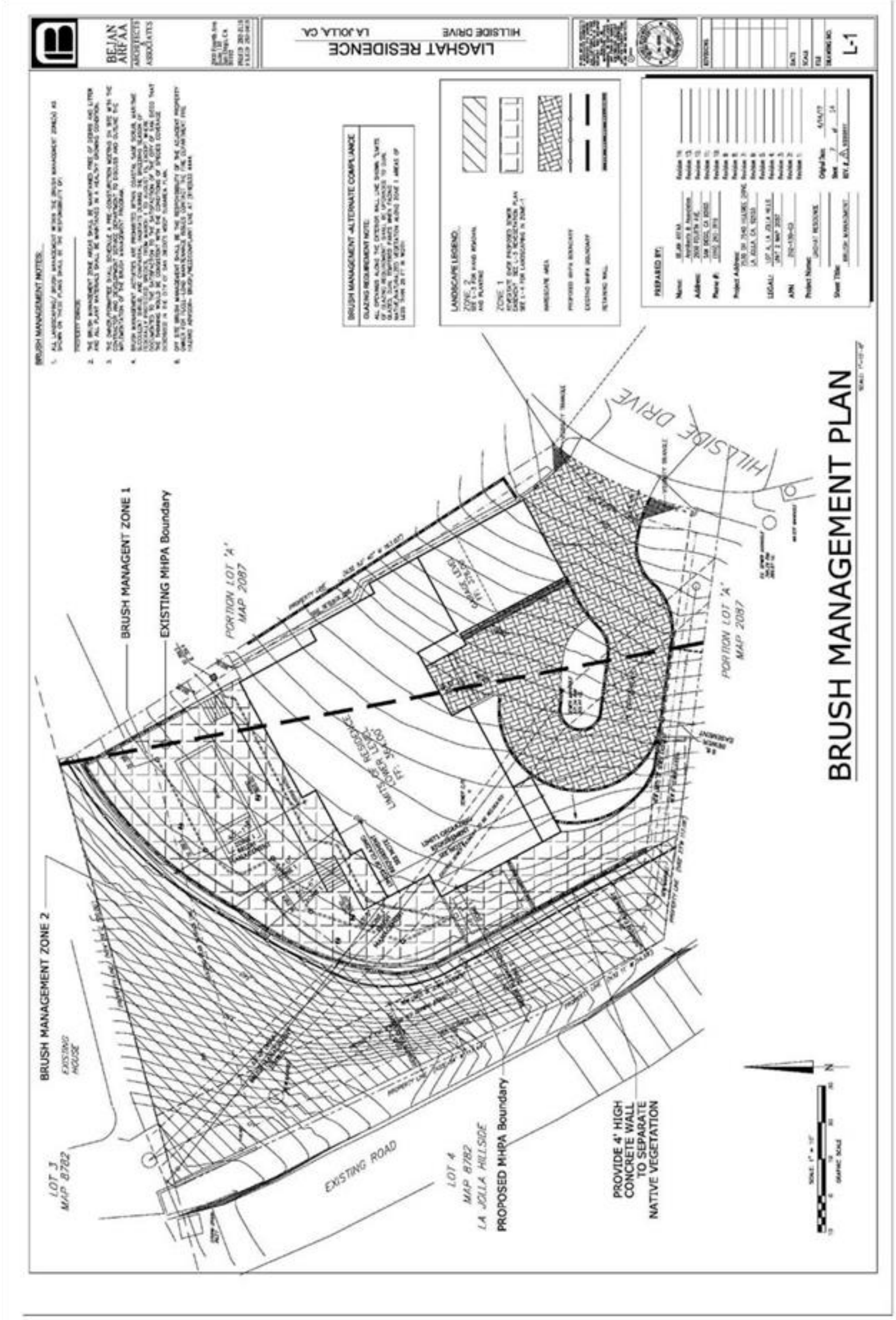
10 Sewer Access Port

11View to south, off-site



12Scrub and Landscaping

# Brush Management Plan



# Hydrology Report

for

## Grading and Development

At

## Hillside Drive
## La Jolla, California 92037

**Drawing # xxxxx-D**
**Project # 503701**
**IO # xxxxxxxx**
**APN # 352-130-03-00**

***PREPARED FOR:***

**Hamid Liaghat**
**1469 Caminito Halago**
**La Jolla, CA 92037**

***PREPARED BY:***

**Meriam Chihwaro**

**April 8, 2017**

# Table of Contents

# 1.0 GENERAL PROJECT INFORMATION

## A. Project Site Information

Project Name: Liaghat Hillside Drive Residence
Analyzed Area: 0.52 acres
Project Address: 7500 Block of Hillside Drive, La Jolla, California 92037
Latitude/Longitude: 32.845460, -117.258110
Expected Duration of the project: TBD
Flood Plain Status: Zone "X" per FEMA Map Number 06073C1582G, Panel 1582 of 2375, dated May 16th 2012 Areas determined to be outside the 0.2% annual chance flood.

## C. Existing Conditions

The Liaghat Hillside Drive Residence project is located in the City of San Diego, San Diego County, California. The project site consists of a portion of Lot A of Map 2087 of La Jolla Hills Unit 2. The site is bordered by residential homes to the north and east, and undeveloped natural hills to the south and west. The existing site is currently undeveloped and consists of natural vegetation, shrubbery and a few mature trees. The site is 100% pervious. The runoff coefficient, C was determined based on Table 2 of the City of San Diego Drainage Design Manual.

Runoff currently sheet flows offsite northwest towards the hillside where it is picked up by an existing storm drain inlet and ditch.

## D. Proposed Conditions

The proposed project will require clearing and grubbing the existing site to grade for a new building pad. This building pad will be approximately 5,000 sf and will consist of a new two-story residential home with a basement with all associated hardscape and paving. A new driveway will be constructed to approach the home from Hillside Drive, sloping down from Hillside Drive and down towards the site.

A new 2'-10' high varying retaining wall will be constructed along the east to west ends of the home. Drainage beyond the wall will continue to follow existing conditions by draining northwest towards the existing storm drain inlet and ditch. Runoff from the buildings will be picked up by roof drains and conveyed via new storm drains (locations of POC's and storm drain connections TBD). The method of capture of the runoff from around the building at the proposed deck, driveway and all hardscape is yet TBD.

The proposed project site will be approximately 55% impervious and 45% pervious.

The runoff coefficient, C was determined based on Table 2 of the City of San Diego Drainage Design Manual.

**E. Project Site Soils**

Please refer to Tab F for the site soils information provided by the "Report of Preliminary Geotechnical Investigation, Liaghat Residential Lot West of 7550 Hillside Drive, La Jolla, California", prepared by Geotechnical Exploration, Inc., and dated April 6, 2017.

## 2.0 DESIGN CRITERIA

Since the project site is less than 320 acres (0.5 square mile), the Rational Method will be used to calculate the runoff rate, as indicated in the City of San Diego Drainage Design Manual.

**The Rational Method**

Rational Method equation:

$$Q = CIA$$

Where:

Q= Peak Rate of Flow, cfs
C= Runoff Coefficient
I= Average Rainfall Intensity, inches/hour, corresponding with the Time of Concentration
A= Drainage Area, acres

Runoff Coefficient:

A runoff coefficient, C=0.50 will be used for the existing 100% pervious conditions of the Liaghat Hillside Residence Project, and a runoff coefficient, C=55 will be used for the proposed conditions of the project, per the City of San Diego Drainage Design Manual, dated April 1984.

**Table 2.** Runoff coefficients (Rational Method)

| Developed Areas (Urban) | |
|---|---|
| Land Use | Coefficient, C Soil Type D |
| Residential: | |
| **Single Family** | **.55** |
| Multi-Units | .70 |
| Mobile Homes | .65 |
| Rural (lots greater than 0.5 acre) | .45 |
| | |
| Commercial | |
| 80% Impervious | .85* |
| | |
| Industrial | |
| 90% Impervious | .95 |

Notes:

1. (1) Type D soil to be used for all areas
2. (2) Where actual conditions deviate, significantly from the tabulated imperviousness values of 80% or 90%, the values given for the coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in no case shall the final coefficient be less than 0.50.

Time of Concentration equation:

The Time of Concentration is the time required for runoff to flow from the most remote part of the watershed to the outlet point under consideration.
The Time of Concentration can be determined using the Urban Areas Overland Time of Flow curves of the City of San Diego Drainage Design Manual.

For the purposes of this report, Time of Concentration was calculated using the following equation:

$$T_C = \left[ \frac{1.8 * (1.1 - C) * \sqrt{D}}{\sqrt[3]{s}} \right]$$

Where:

$T_C$ = Time of Concentration, minutes
C = Runoff Coefficient
D = Watercourse Distance (D), ft
S = Slope

The spreadsheet for the Time of Concentration calculation has been set up such that its value cannot be less than five minutes. This results from the small size of the drainage areas, which results in short hydraulic lengths.

Rainfall Intensity:
Rainfall intensity is determined using the Intensity-Duration-Frequency Curves from the City of San Diego Drainage Design Manual.

# 3.0 EXAMPLE HYDROLOGY CALCULATIONS

## Sample area peak flow calculation for Drainage Basin 1 (50-Year Storm Event)

- **Runoff Coefficient (C) = 0.50** (See Table 2 in Tab B)
- **I = 4.00 in/hr** ( See Rainfall Intensity-Duration-Frequency Curve in Tab B)
- **Area** = 0.52 acres

Q = 0.55* 4.00 in/hr * 0.52 acres = **1.04 cfs**

## 4.0 Conclusions

Per the Rational Method, the 50-yr storm runoff flow under existing conditions is 1.04 cfs. Per the Rational Method, the 50-yr storm runoff flow under proposed conditions is 1.10 cfs. Due to the fact that the proposed site poses an increase in impervious surfaces, the proposed runoff value is 0.06 cfs greater than the existing runoff (≈6% increase).

The project runoff discharges into exempt waters, therefore this project does not require any hydromidifcation analysis.

| Summary of Drainage Calculations | | |
|---|---|---|
| | **Existing Conditions** | **Proposed Conditions** |
| **50-Year Storm** | 1.04 cfs | 1.10 cfs |

## References

1. Gupta, Ram S., *Hydrology and Hydraulic Systems*, Waveland Press, Inc., Illinois, 1989.
2. City of San Diego Drainage Design Manual, April 1984
3. "Report of Preliminary Geotechnical Investigation, Liaghat Residential Lot West of 7550 Hillside Drive, La Jolla, California", prepared by Geotechnical Exploration, Inc., and dated April 6, 2017.

# TAB A

TAB B

# TABLE 2

## RUNOFF COEFFICIENTS (RATIONAL METHOD)

### DEVELOPED AREAS (URBAN)

| Land Use | Coefficient, C<br>Soil Type (1) |
|---|---|
| Residential: | D |
| Single Family | .55 |
| Multi-Units | .70 |
| Mobile Homes | .65 |
| Rural (lots greater than 1/2 acre) | .45 |
| Commercial (2) | |
| 80% Impervious | .85 |
| Industrial (2) | |
| 90% Impervious | .95 |

NOTES:

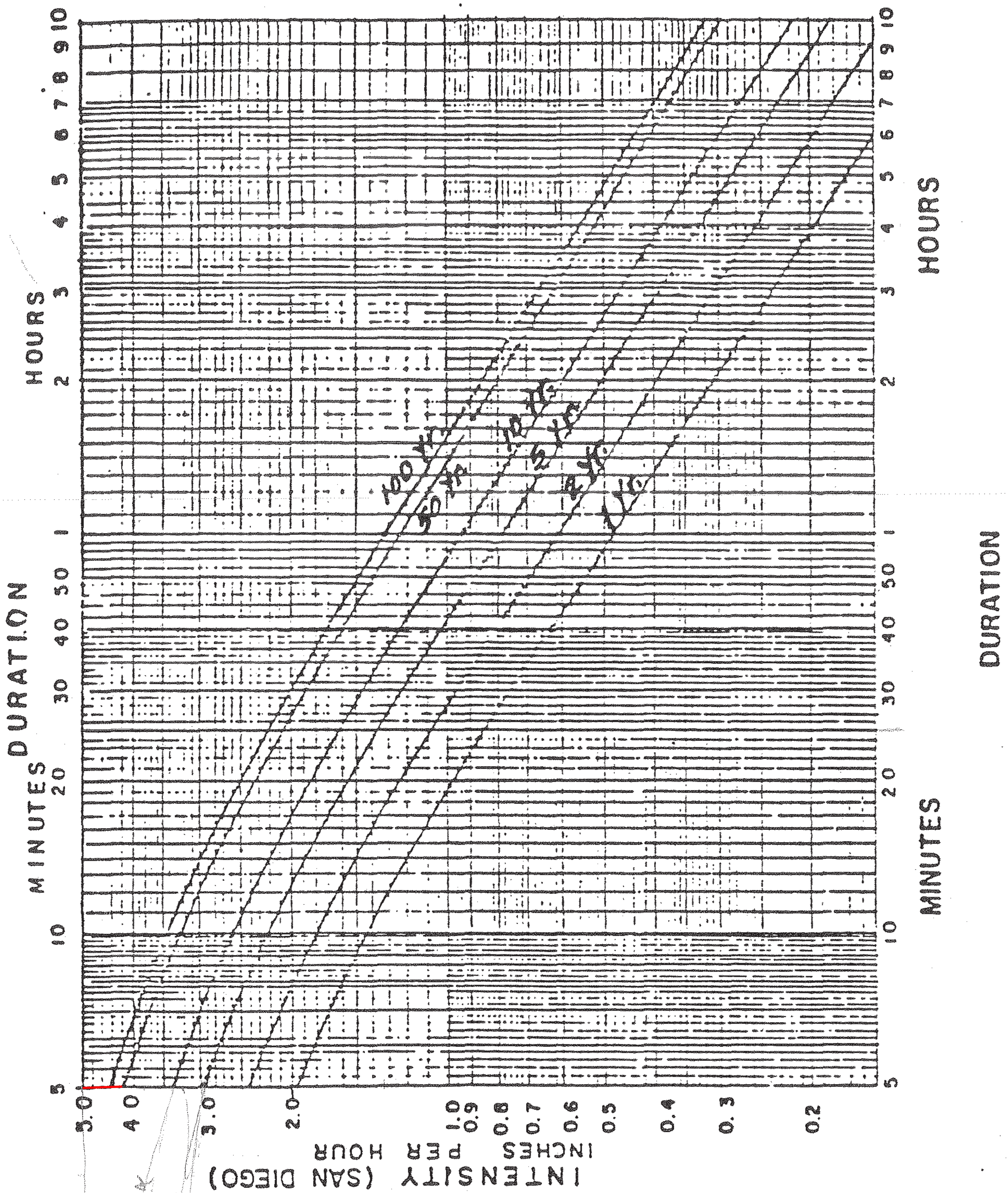
(1) Type D soil to be used for all areas.

(2) Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in no case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%

Tabulated imperviousness = 80%

$$\text{Revised C} = \frac{50}{80} \times 0.85 = 0.53$$



I = 4.0 in/hr

| ELEV. | FACTOR |
|---|---|
| 0–1500 | 1.00 |
| 1500–3000 | 1.25 |
| 3000–4000 | 1.42 |
| 4000–5000 | 1.60 |
| 5000–6000 | 1.70 |
| DESERT | 1.25 |

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

# RAINFALL
# INTENSITY – DURATION – FREQUENC
# CURVES
# for
# COUNTY OF SAN DIEGO

APPENDIX

# Existing Conditions - Liaghat Hillside Residence
## Drainage Basin Hydrology: 50 Yr-Storm

| Drainage Basin # | Total Area (sf) | Total Area (acres) | Pervious Area (acres) | Impervious Area (acres) | Impervious Area (%) | Pervious Area (%) | *Runoff Coefficient, C | Hydraulic Length (ft) | Change in Elevation ($\Delta$H) | Time of Concentration, Tc (min.) | Slope of Basin (%) | $P_{6,}$ 50-yr Storm | Intensity, $I_{50}$ (in/hr) | Flow, $Q_{50}$ (cfs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 22562 | 0.52 | 0.52 | 0.00 | 0.00 | 100.00 | 0.50 | 210 | 86.0 | 5.0 | 41.0 | 1.8 | 4.00 | 1.04 |
|  | 22562 | 0.52 | 0.52 | 0.00 | 0.00 | 100.00 |  |  |  |  |  |  |  | 1.04 |

**APPLICABLE EQUATIONS:**

**Time of Concentration:**

Minimum allowable $T_C$= 5.0 minutes

See report text for equation.

**Expected Runoff/Flow from Drainage Basin (cfs):**

Q=C*I*A

# Proposed Conditions - Liaghat Hillside Residence
# Drainage Basin Hydrology: 50 Yr-Storm

| Drainage Basin # | Total Area (sf) | Total Area (acres) | Pervious Area (acres) | Impervious Area (acres) | Impervious Area (%) | Pervious Area (%) | *Runoff Coefficient, C | Hydraulic Length (ft) | Change in Elevation ($\Delta$H) | Time of Concentration, Tc (min.) | Slope of Basin (%) | $P_{6,}$ 50-yr Storm | Intensity, $I_{50}$ (in/hr) | Flow, $Q_{50}$ (cfs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8800 | 0.20 | 0.20 | 0.00 | 0.00 | 100.00 | 0.50 | 61 | 44.0 | 5.0 | 72.1 | 1.8 | 4.00 | 0.40 |
| **2** | 8850 | 0.20 | 0.02 | 0.18 | 89.17 | 10.8 | 0.55 | 60 | 11 | 5.0 | 18.3 | 1.8 | 4.00 | 0.45 |
| **3** | 4912 | 0.11 | 0.01 | 0.10 | 90.16 | 9.8 | 0.55 | 136 | 16 | 5.1 | 11.8 | 1.8 | 4.00 | 0.25 |
|  | 22562 | 0.52 | 0.24 | 0.28 | 54.6 | 45.4 |  |  |  |  |  |  |  | 1.10 |

## APPLICABLE EQUATIONS:

**Time of Concentration:**

Minimum allowable $T_C$= 5.0 minutes

See report text for equation.

**Expected Runoff/Flow from Drainage Basin (cfs):**

Q=C*I*A

# TAB C

# VICINITY MAP

Liaghat Hillside Residence
7500 Block of Hillside Drive
La Jolla, California 92037

MRC

DATE: April 2017

FIG 1

TAB D

# NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations (BFEs)** shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 11. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

**Base map** information shown on this FIRM was provided in digital format by the USDA National Agriculture Imagery Program (NAIP). this information was photogrammetrically compiled at a scale of 1:24,000 from aerial photography dated 2009.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

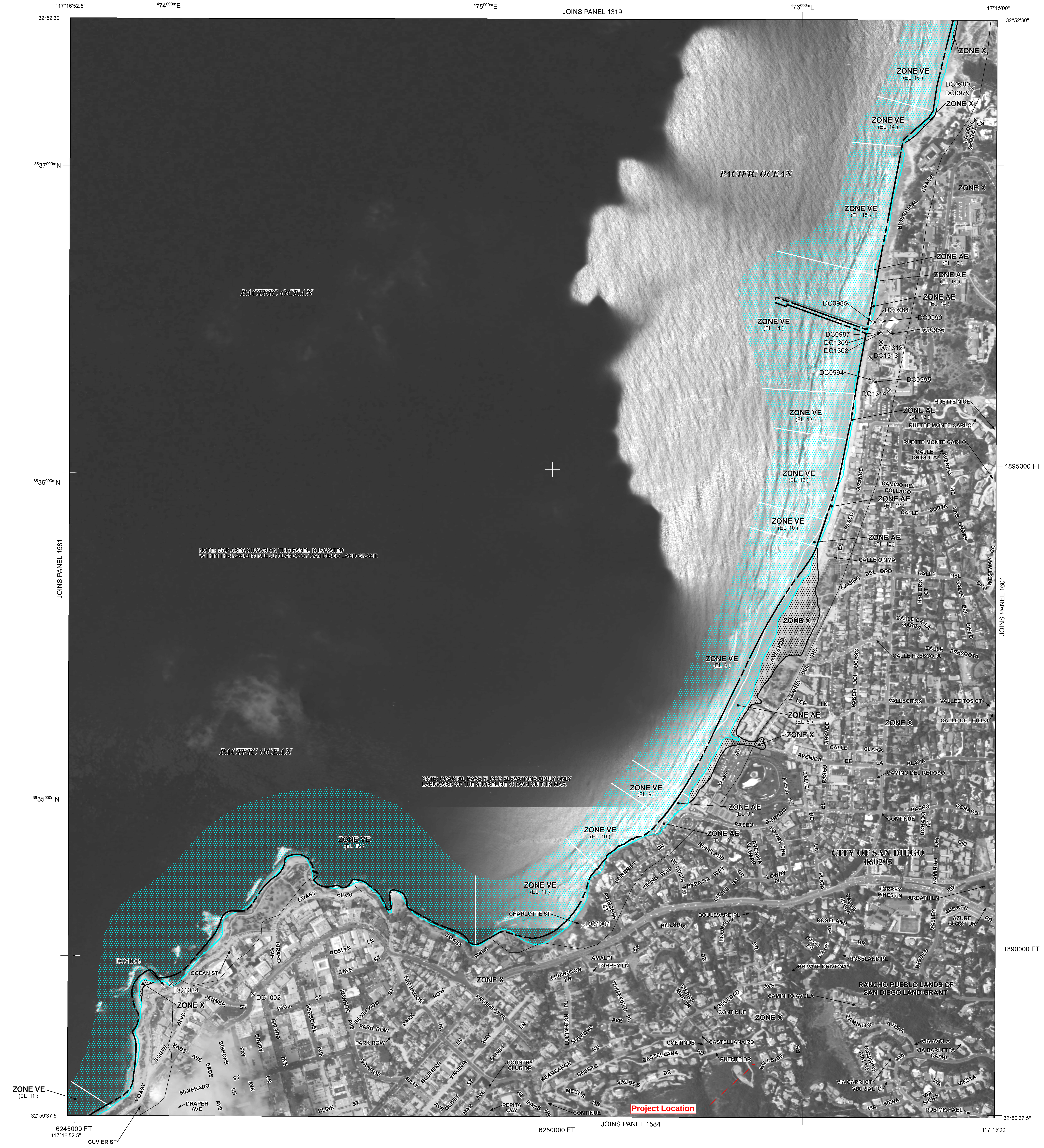
**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-877-FEMA MAP (1-877-336-2627) for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

The **"profile base lines"** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.



# LEGEND

▨ SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

| | |
|---|---|
| **ZONE A** | No Base Flood Elevations determined. |
| **ZONE AE** | Base Flood Elevations determined. |
| **ZONE AH** | Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined. |
| **ZONE AO** | Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined. |
| **ZONE AR** | Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood. |
| **ZONE A99** | Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined. |
| **ZONE V** | Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined. |
| **ZONE VE** | Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined. |

▨ FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

▒ OTHER FLOOD AREAS

| | |
|---|---|
| **ZONE X** | Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood. |

☐ OTHER AREAS

| | |
|---|---|
| **ZONE X** | Areas determined to be outside the 0.2% annual chance floodplain. |
| **ZONE D** | Areas in which flood hazards are undetermined, but possible. |

▧ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▧ OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

| | |
|---|---|
| ━━━━ | 1% annual chance floodplain boundary |
| ━━━━ | 0.2% annual chance floodplain boundary |
| — — — — | Floodway boundary |
| — — — | Zone D boundary |
| •••••••• | CBRS and OPA boundary |
| ▨ ← | Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities |
| ~~~ 513 ~~~ | Base Flood Elevation line and value; elevation in feet* |
| (EL 987) | Base Flood Elevation value where uniform within zone; elevation in feet* |

* Referenced to the North American Vertical Datum of 1988

| | |
|---|---|
| (A)———(A) | Cross section line |
| (23)- - - -(23) | Transect line |
| 97°07'30", 32°22'30" | Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere |
| 4275000mE | 1000-meter Universal Transverse Mercator grid ticks, zone 11 |
| 6000000 FT | 5000-foot grid values: California State Plane coordinate system, Zone VI (FIPSZONE = 406), Lambert projection |
| DX5510× | Bench mark (see explanation in Notes to Users section of this FIRM panel) |
| ● M1.5 | River Mile |

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 19, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
May 16, 2012 – to update corporate limits, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to update map elevations to North American Vertical Datum of 1988.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

**MAP SCALE 1" = 500'**

| | | | | | | |
|---|---|---|---|---|---|---|
| 250 | 0 | 250 | 500 | 750 | 1,000 | FEET |
| 150 | 0 | 150 | 300 | | | METERS |

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

**PANEL 1582G**

# FIRM

## FLOOD INSURANCE RATE MAP

## SAN DIEGO COUNTY, CALIFORNIA

## AND INCORPORATED AREAS

**PANEL 1582 OF 2375**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| SAN DIEGO, CITY OF | 060295 | 1582 | G |

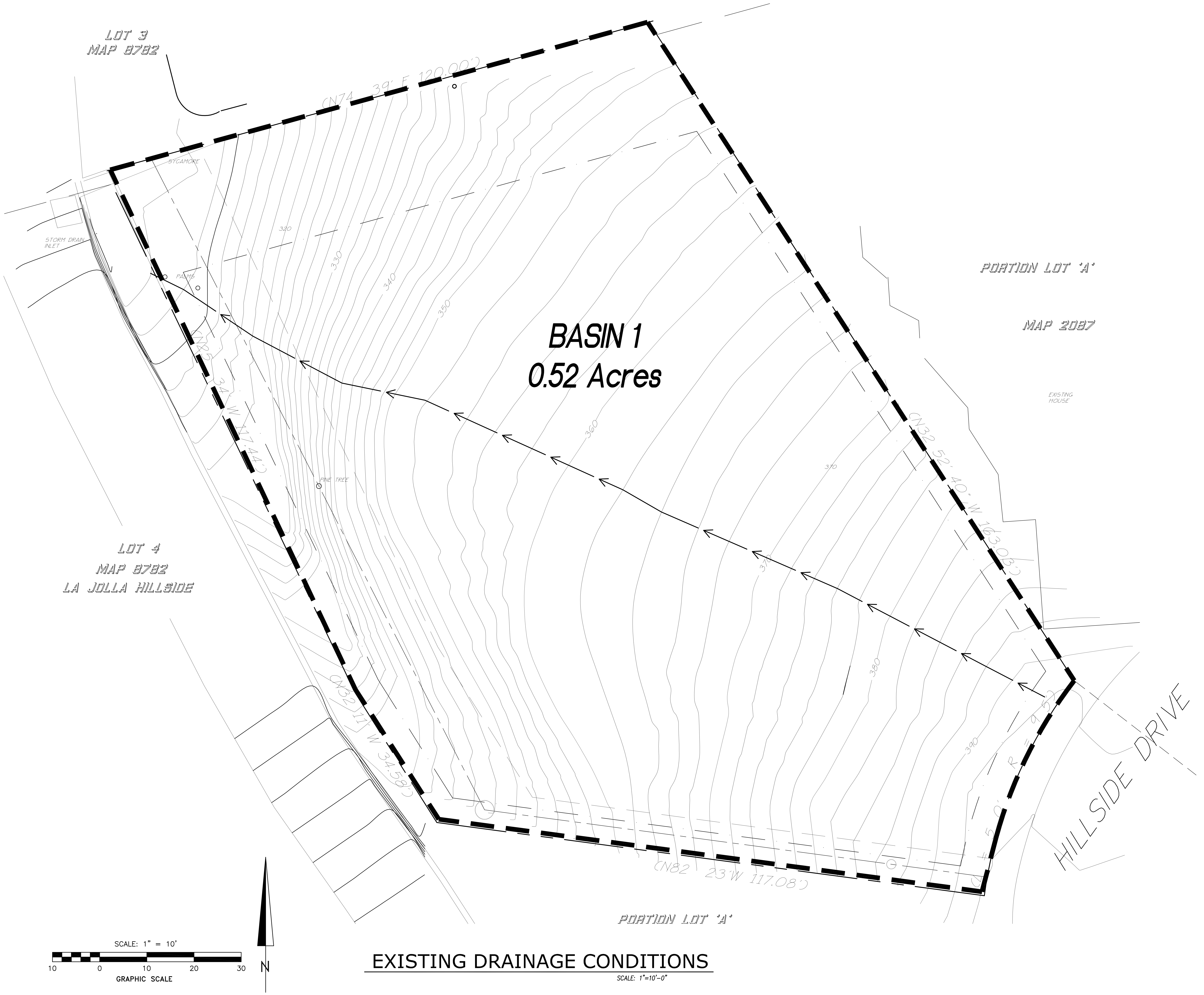
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**06073C1582G**

**MAP REVISED**
**MAY 16, 2012**

**Federal Emergency Management Agency**

# TAB E



EXISTING DRAINAGE CONDITIONS

SCALE: 1"=10'-0"

PRIVATE CONTRACT

**LIAGHAT - HILLSIDE RESIDENCE**

**PORTION OF LOT A LA JOLLA HILLS UNIT 2 MAP 2087**

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET **1** OF **2** SHEETS

I.O. NO. ______
PROJECT NO. ______

______ FOR CITY ENGINEER ______ DATE

V.T.M. ______

| DESCRIPTION | BY | APPROVED | DATE | FILMED |
|---|---|---|---|---|
| ORIGINAL | XXX | | | |
| | | | | |
| | | | | |
| | | | | |
| AS-BUILTS | | | | |

XXXX-XXXX
NAD83 COORDINATES

XXX-XXXX
LAMBERT COORDINATES

CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

**XXXXX- -D**

| | |
|---|---|
| — — — — | Property Line |
| — · — · — | Setback Limits |
| ▬ ▬ ▬ ▬ | Drainage Basin |
| → → — | Flow Line |

## PROPOSED DRAINAGE CONDITIONS

SCALE: 1"=10'-0"

PRIVATE CONTRACT

**LIAGHAT - HILLSIDE RESIDENCE**

**PORTION OF LOT A LA JOLLA HILLS UNIT 2 MAP 2087**

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET **2** OF **2** SHEETS

I.O. NO. ________
PROJECT NO. ________

________ FOR CITY ENGINEER ________ DATE

V.T.M. ________

| DESCRIPTION | BY | APPROVED | DATE | FILMED |
|---|---|---|---|---|
| ORIGINAL | XXX | | | |
| | | | | |
| | | | | |
| | | | | |
| AS-BUILTS | | | | |

XXXX-XXXX
NAD83 COORDINATES

XXX-XXXX
LAMBERT COORDINATES

CONTRACTOR ________ DATE STARTED ________
INSPECTOR ________ DATE COMPLETED ________

**XXXXX- -D**

TAB F

# REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, California

**JOB NO. 16-11019**
06 April 2017

Prepared for:

***Mr. Hamid Liaghat***

**Geotechnical Exploration, Inc.**

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

06 April 2017

Mr. Hamid Liaghat
10525 Vista Sorrento Parkway, Suite 350
San Diego, CA 92121

**Job No. 16-11019**

Subject: **Report of Preliminary Geotechnical Investigation**
Proposed Liaghat Residential Lot Development
West of 7550 Hillside Drive
La Jolla, California

Dear Mr. Liaghat:

In accordance with your request, and our proposal of February 1, 2016, ***Geotechnical Exploration, Inc.*** has performed an investigation of the geotechnical and general geologic conditions at the location of the proposed residential lot. The field work was performed on March 2, 2016.

If the conclusions and recommendations presented in this report are incorporated into the design and construction of the proposed residential development and associated improvements, it is our opinion that the site is suitable for the proposed project.

This opportunity to be of service is sincerely appreciated. Should you have any questions concerning the following report, please do not hesitate to contact us. Reference to our **Job No. 16-11019** will expedite a response to your inquiries.

Respectfully submitted,

**GEOTECHNICAL EXPLORATION, INC.**

Jaime A. Cerros, P.E.
R.C.E. 34422/G.E. 2007
Senior Geotechnical Engineer

Jay K. Heiser
Senior Project Geologist

7420 TRADE STREET ● SAN DIEGO, CA. 92121 ● (858) 549-7222 ● FAX: (858) 549-1604 ● EMAIL: geotech@gei-sd.com

# TABLE OF CONTENTS

# REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, California

## Job No. 16-11019

The following report presents the findings and recommendations of ***Geotechnical Exploration, Inc.*** for the subject project.

## I. PROJECT SUMMARY

It is our understanding, based on communications with you, that the existing undeveloped residential lot will be developed to receive a new two-story, single-family residence and associated improvements. It is assumed that the planned new residential structure will utilize conventional foundations.

Construction and conceptual plans for the proposed residential development have not been provided to us during the preparation of this report. We recommend that they be provided to us for review as they are developed.

## II. SCOPE OF WORK

The scope of work performed for this investigation included a review of available published information pertaining to the site geology, a site reconnaissance and subsurface exploration program, laboratory testing, geotechnical engineering analysis of the research, field and laboratory data, and the preparation of this report. The data obtained and the analyses performed were for the purpose of providing preliminary design and construction criteria for the project earthwork, building foundations, and slab on-grade floors.

## III. SUMMARY OF GEOTECHNICAL & GEOLOGIC FINDINGS

Our subsurface investigation and site reconnaissance revealed that the site is underlain at depth by very stiff to hard, adequate bearing sandy clay of the Point Loma Formation (Kp), overlain with approximately 2¾ to 4½ feet of sandy clay slopewash materials. The slopewash soils are of variable density and will not provide a stable soil base for the proposed residential structure or associated improvements. As such, it is recommended that either new foundations be founded into the underlying formational soils utilizing a deepened footing foundation system or the existing slopewash soils be removed and recompacted.

The on-site soils should provide adequate bearing strength for new slab on-grade exterior improvements, after proper removal and recompaction of the existing shallow surface soils. As such, we recommend that the existing slopewash soils (2 to 3 feet) be removed and recompacted as part of site preparation prior to placement of slab on-grade exterior improvements in these areas.

In our opinion, the site is suited for the proposed residential construction provided the following recommendations are implemented during site development. Conventional construction techniques and materials can be utilized. Detailed construction plans have not been provided to us for the preparation of this report, however, when completed they should be made available for our review for new or modified recommendations. In addition, the proposed work will not, in our opinion, destabilize or result in settlement of adjacent property if the recommendations presented in this report are implemented.

## IV. SITE DESCRIPTION

The approximately 0.5-acre site is more particularly referred to as Assessor's Parcel No. 352-130-03-00, Portion of Lot A of La Jolla Hills Unit No. 2, according to Recorded Map 2087, in the La Jolla area of the City and County of San Diego, State of California. For the location of the site, refer to the Vicinity Map, Figure No. I.

The property is bordered on the north and east by existing residential properties, on the west by partially developed land and on the south by Hillside Drive. Elevations across the property range from approximately 302 feet above Mean Sea Level (AMSL) at the northwest corner, to 390 feet AMSL at the southeast corner. Information concerning approximate elevations across the site was obtained from the City of San Diego Topographic maps and Google Earth Imagery. Refer to the Plot Plan, Figure No. II.

Vegetation at the site consists primarily of weeds, native shrubbery and a few mature trees. The lot is undeveloped with the exception a sewer easement running through the western portion of the lot.

## V. FIELD INVESTIGATION

Three exploratory borings were advanced in the vicinity, and most likely area where the proposed residential structure would be located, and where access and soil conditions allowed (for excavation locations, refer to the Plot Plan and Site-specific Geologic Map, Figure No. II). All three borings were drilled to a maximum depth of 10 feet in order to obtain representative soil samples and to define a soil profile across the project area.

The soil conditions encountered in the borings were logged by our field representative and samples were taken of the predominant soils throughout the field operation. Exploratory boring logs have been prepared on the basis of our observations and laboratory testing, Figure Nos. IIIa-c. The predominant soils have been classified per applicable portions of the Unified Soil Classification System.

## VI. FIELD AND LABORATORY TESTS & SOIL INFORMATION

### *A. Field Tests*

Standard Penetration Tests were performed in the borings by using a 140-pound weight falling 30 inches to drive a 2-inch O.D. by 1⅜-inch I.D. sampler tube a distance of 18 inches. The number of blows required to drive the sampler the last 12 inches was recorded for use in evaluation of the soil consistency. The following chart provides an in-house correlation between the number of blows and the consistency of the soil for the Standard Penetration Test and the 3-inch O.D. ("Cal") sampler.

| ***Soil*** | ***Density Designation*** | ***2-inch O.D. Sampler Blows/Foot*** | ***3-inch O.D. Sampler Blows/Foot*** |
|---|---|---|---|
| Sand and Non-plastic Silt | Very loose | 0-4 | 0-7 |
| | Loose | 5-10 | 8-20 |
| | Medium | 11-30 | 21-53 |
| | Dense | 31-50 | 54-98 |
| | Very Dense | Over 50 | Over 98 |
| Clay and Plastic Silt | Very soft | 0-2 | 0-2 |
| | Soft | 3-4 | 3-4 |
| | Firm | 5-8 | 5-9 |
| | Stiff | 9-15 | 10-18 |
| | Very Stiff | 15-30 | 19-45 |
| | Hard | 31-60 | 46-90 |
| | Very Hard | Over 60 | Over 90 |

Bulk (disturbed) and relatively undisturbed (ring) samples were retrieved, sealed and transported to the laboratory for testing.

In general, the tests performed in the field included the Standard Practice for Soil Investigation and Sampling by Auger Borings (ASTM D1452), Test Method for Penetration Test and Split-barrel Sampling of Soils (ASTM D1586), and Standard Practice for Ring-lined Barrel Sampling of Soils (ASTM D3550).

## *B.* ***Laboratory Tests***

Laboratory tests were performed on retrieved soil samples in order to evaluate their physical and mechanical properties and their ability to support the proposed remodel, additions and improvements. Test results are presented on Figure Nos. III and IV. The following tests were conducted on representative soil samples:

1. *Moisture Content (ASTM D2216-10)*
2. *Density Measurements (ASTM D2937-10)*
3. *Laboratory Compaction Characteristics (ASTM D1557-12)*
4. *Determination of Percentage of Particles Smaller than #200 Sieve (ASTM D1140-14)*
5. *Standard Test Method for Expansion Test (ASTM D4829-11)*
6. *Standard Test Method for Direct Shear Test of Soils under Consolidated Drained Conditions (ASTM D3080-11)*

The moisture content of a soil sample (ASTM D2216) is a measure of the water content, expressed as a percentage of the dry weight of the sample. Moisture content and density measurements (ASTM D2937) were performed to establish the in situ moisture and density of samples retrieved from the exploratory excavations. The dry soil weights were compared to the laboratory maximum dry density of the same soil to determine relative compaction.

Laboratory compaction values (ASTM D1557) establish the optimum moisture content and the laboratory maximum dry density of the tested soils. The relationship between the moisture and density of remolded soil samples helps to establish the relative compaction of the existing fill soils and soil compaction conditions to be anticipated during any future grading operation.

The –200 sieve size analysis helps to more precisely classify the tested soils based on their fine material content, and provide qualitative information related to engineering characteristics such as expansion potential, permeability, and shear strength.

The expansion potential of soils is determined, when necessary, utilizing the Standard Test Method for Expansion Index of Soils. In accordance with the Standard (Table 5.3), potentially expansive soils are classified as follows:

| ***EXPANSION INDEX*** | ***POTENTIAL EXPANSION*** |
|---|---|
| 0 to 20 | Very low |
| 21 to 50 | Low |
| 51 to 90 | Medium |
| 91 to 130 | High |
| Above 130 | Very high |

Based on the test results, the existing sandy clay slopewash and formational soils have a medium to high expansion potential, with a maximum measured expansion index of 91 and 87, respectively.

Two direct shear tests (ASTM D3080) were performed in order to evaluate strength characteristics of the soils comprising the descending slope. The shear tests were performed with a constant strain rate direct shear machine. The specimens tested were saturated and then sheared under various normal loads.

Based on the field and laboratory test data, our observations of the primary soil types on the project, and our previous experience with laboratory testing of similar soils, our Geotechnical Engineer has assigned values for friction angle, coefficient of friction, and cohesion for those soils which will have significant lateral support or load bearing functions on the project. These values have been utilized in determining the recommended bearing value as well as active and passive earth pressure design criteria.

### *C. Slope Observations*

The stability of the existing slopes should not be affected by the planned residential construction if proper drainage conditions are implemented and maintained. Existing slopes range from approximately 1.2:1.0 to 2.8:1.0 (horizontal to vertical) on the western portion of the property, to approximately 1.8:1.0 to 2.4:1.0 (horizontal to vertical) on the eastern portion of the property. The lot generally slopes to the northwest. Overall, the steeper slope on the western portion of the lot was observed to be in generally good condition with no evidence of instability or prior slope failure.

## VII. REGIONAL GEOLOGIC DESCRIPTION

San Diego County has been divided into three major geomorphic provinces: the Coastal Plain, the Peninsular Ranges and the Salton Trough. The Coastal Plain

exists west of the Peninsular Ranges. The Salton Trough is east of the Peninsular Ranges. These divisions are the result of the basic geologic distinctions between the areas. Mesozoic metavolcanic, metasedimentary and plutonic rocks predominate in the Peninsular Ranges with primarily Cenozoic sedimentary rocks to the west and east of this central mountain range (Demere, 1997).

In the Coastal Plain region, where the subject property is located, the "basement" consists of Mesozoic crystalline rocks. Basement rocks are also exposed as high relief areas (e.g., Black Mountain northeast of the subject property and Cowles Mountain near the San Carlos area of San Diego). Younger Cretaceous and Tertiary sediments lap up against these older features. The Cretaceous sediments form the local basement rocks on the Point Loma area. These sediments form a "layer cake" sequence of marine and non-marine sedimentary rock units, with some formations up to 140 million years old. Faulting related to the La Nacion and Rose Canyon Fault zones has broken up this sequence into a number of distinct fault blocks in the southwestern part of the county. Northwestern portions of the county are relatively undeformed by faulting (Demere, 1997).

The Peninsular Ranges form the granitic spine of San Diego County. These rocks are primarily plutonic, forming at depth beneath the earth's crust 140 to 90 million years ago as the result of the subduction of an oceanic crustal plate beneath the North American continent. These rocks formed the much larger Southern California batholith. Metamorphism associated with the intrusion of these great granitic masses affected the much older sediments that existed near the surface over that period of time. These metasedimentary rocks remain as roof pendants of marble, schist, slate, quartzite and gneiss throughout the Peninsular Ranges. Locally, Miocene-age volcanic rocks and flows have also accumulated within these mountains (e.g., Jacumba Valley). Regional tectonic forces and erosion over time

have uplifted and unroofed these granitic rocks to expose them at the surface (Demere, 1997).

The Salton Trough is the northerly extension of the Gulf of California. This zone is undergoing active deformation related to faulting along the Elsinore and San Jacinto Fault Zones, which are part of the major regional tectonic feature in the southwestern portion of California, the San Andreas Fault Zone. Translational movement along these fault zones has resulted in crustal rifting and subsidence. The Salton Trough, also referred to as the Colorado Desert, has been filled with sediments to depth of approximately 5 miles since the movement began in the early Miocene, 24 million years ago. The source of these sediments has been the local mountains as well as the ancestral and modern Colorado River (Demere, 1997).

As indicated previously, the San Diego area is part of a seismically active region of California. It is on the eastern boundary of the Southern California Continental Borderland, part of the Peninsular Ranges Geomorphic Province. This region is part of a broad tectonic boundary between the North American and Pacific Plates. The actual plate boundary is characterized by a complex system of active, major, right-lateral strike-slip faults, trending northwest/southeast. This fault system extends eastward to the San Andreas Fault (approximately 70 miles from San Diego) and westward to the San Clemente Fault (approximately 50 miles off-shore from San Diego) (Berger and Schug, 1991).

In California, major earthquakes can generally be correlated with movement on active faults. As defined by the California Division of Mines and Geology (Hart, E.W., 1980), an "active" fault is one that has had ground surface displacement within Holocene time (about the last 11,000 years). Additionally, faults along which

major historical earthquakes have occurred (about the last 210 years in California) are also considered to be active (Association of Engineering Geologist, 1973). The California Division of Mines and Geology (now the California Geological Survey) defines a *"potentially active"* fault as one that has had ground surface displacement during Quaternary time, that is, between 11,000 and 1.6 million years (Hart, E.W., 1980).

During recent history, prior to April 2010, the San Diego County area has been relatively quiet seismically. No fault ruptures or major earthquakes had been experienced in historic time within the greater San Diego area. Since earthquakes have been recorded by instruments (since the 1930s), the San Diego area has experienced scattered seismic events with Richter magnitudes generally less than M4.0. During June 1985, a series of small earthquakes occurred beneath San Diego Bay, three of which were recorded at M4.0 to M4.2. In addition, the Oceanside earthquake of July 13, 1986, located approximately 26 miles offshore of the City of Oceanside, had a magnitude of M5.3 (Hauksson and Jones, 1988).

On June 15, 2004, a M5.3 earthquake occurred approximately 45 miles southwest of downtown San Diego (26 miles west of Rosarito, Mexico). Although this earthquake was widely felt, no significant damage was reported. Another widely felt earthquake on a distant southern California fault was a M5.4 event that took place on July 29, 2008, west-southwest of the Chino Hills area of Riverside County.

Several earthquakes ranging from M5.0 to M6.0 occurred in northern Baja California, centered in the Gulf of California on August 3, 2009. These were felt in San Diego but no injuries or damage was reported. A M5.8 earthquake followed by a M4.9 aftershock occurred on December 30, 2009, centered about 20 miles south

of the Mexican border city of Mexicali. These were also felt in San Diego, swaying high-rise buildings, but again no significant damage or injuries were reported.

On Easter Sunday April 4, 2010, a large earthquake occurred in Baja California, Mexico. It was widely felt throughout the southwest including Phoenix, Arizona and San Diego in California. This M7.2 event, the Sierra El Mayor earthquake, occurred in northern Baja California, approximately 40 miles south of the Mexico-USA border at shallow depth along the principal plate boundary between the North American and Pacific plates. According to the U. S. Geological Survey this is an area with a high level of historical seismicity, and it has recently also been seismically active, though this is the largest event to strike in this area since 1892. The April 4, 2010, earthquake appears to have been larger than the M6.9 earthquake in 1940 or any of the early 20th century events (e.g., 1915 and 1934) in this region of northern Baja California. The event caused widespread damage to structures, closure of businesses, government offices and schools, power outages, displacement of people from their homes and injuries in the nearby major metropolitan areas of Mexicali in Mexico and Calexico in Southern California. Estimates of the cost of the damage range to $100 million.

This event's aftershock zone extends significantly to the northwest, overlapping with the portion of the fault system that is thought to have ruptured in 1892. Some structures in the San Diego area experienced minor damage and there were some injuries. Ground motions for the April 4, 2010, main event, recorded at stations in San Diego and reported by the California Strong Motion Instrumentation Program (CSMIP), ranged up to 0.058g. Aftershocks from this event continue to the date of this report along the trend northwest and south of the original event, including within San Diego County, closer to the San Diego metropolitan area. There have been hundreds of these earthquakes including events up to M5.7.

On July 7, 2010, a M5.4 earthquake occurred in Southern California at 4:53 pm (Pacific Time) about 30 miles south of Palm Springs, 25 miles southwest of Indio, and 13 miles north-northwest of Borrego Springs. The earthquake occurred near the Coyote Creek segment of the San Jacinto Fault. The earthquake exhibited right lateral slip to the northwest, consistent with the direction of movement on the San Jacinto Fault. The earthquake was felt throughout Southern California, with strong shaking near the epicenter. It was followed by more than 60 aftershocks of M1.3 and greater during the first hour. Seismologists expect continued aftershock activity.

In the last 50 years, there have been four other earthquakes in the magnitude M5.0 range within 20 kilometers of the Coyote Creek segment: M5.8 in 1968, M5.3 on 2/25/1980, M5.0 on 10/31/2001, and M5.2 on 6/12/2005. The biggest earthquake near this location was the M6.0 Buck Ridge earthquake on 3/25/1937.

## VIII. SITE-SPECIFIC SOIL & GEOLOGIC DESCRIPTION

### *A. Stratigraphy*

Our field work, reconnaissance and review of the *"Geologic Map of the La Jolla Quadrangle"* contained within California Division of Mines and Geology (now the California Geological Survey) Bulletin 200 *"Geology of the San Diego Metropolitan Area, California"* (Michael P. Kennedy, 1975) and the updated geologic maps by Kennedy and Tan, 2005 and 2008, *"Geologic Map of San Diego, 30'x60' Quadrangle, CA,"* indicate that the site is underlain by Cretaceous-age Point Loma (Kp) formational materials and landslide deposits. The formational soils are overlain by approximately 2¾ to 4½ feet of slopewash soils where the assumed building pad would be located (refer to the boring logs, Figure Nos. IIIa-c). Figure

No. V presents a plan view geologic map (Kennedy and Tan, 2008) of the general area of the site and Figure No. VI displays the geologic hazards of the area.

*Slopewash (Qsw):* Slopewash materials were encountered in all of our exploratory boring locations. The slopewash soils consist of dark gray to dark brown sandy clay with angular gravel to ¾-inch in diameter. The encountered slopewash soils were generally stiff to very stiff, moist condition and are considered to have a high expansion potential. Refer to Figure Nos. IIIa-c for details.

*Point Loma Formation (Kp):* Formational soils of the Point Loma Formation were encountered in all of our exploratory borings underlying the slopewash soils. The Point Loma Formational soils consist of dark gray sandy clay with some iron oxide staining on fracture surfaces, trace caliche, trace manganese staining and were somewhat disturbed and blocky to approximately 7 feet. The encountered formational soils were generally very stiff to hard, moist condition and are considered to have a high expansion potential. Refer to Figure Nos. IIIa-c for details. These soils have good bearing strength characteristics.

*Landslide (Qls):* According to Kennedy and Tan, 2008 "*Geologic Map of San Diego, 30'x60' Quadrangle, CA,*" the site is underlain by Quaternary-age Landslide debris. Landslide deposits were not encountered in our relatively shallow exploratory borings.

Although the Point Loma Formation observed in our exploratory borings was blocky and somewhat disturbed to approximately 7 feet, it is our opinion, that this is not part of the landslide deposits as mapped by Kennedy and Tan. In addition, according to the City of San Diego Seismic Safety Study, Geologic Hazards Map Sheet No. 29 indicates that the site is located in a low to moderate risk geologic

category. An excerpted portion of the Geologic Hazards Map Sheet 29 and the legend are presented as Figure No. VI.

The following is a discussion of the geologic conditions and hazards common to this area of the City of San Diego, as well as project-specific geologic information relating to development of the subject property.

## *A. Local and Regional Faults*

Reference to the geologic map of the area, Figure No. V (Kennedy and Tan, 2008), and the City of San Diego Seismic Safety Study, Geologic Hazards Map No. 29, Figure No. VI, indicates that no faults are mapped on the site. In our explicit professional opinion, neither an active fault nor a potentially active fault underlies the site.

*Rose Canyon Fault*: The Rose Canyon Fault Zone (Mount Soledad and Rose Canyon Faults) is mapped ¼ mile southwest of the subject site. The Rose Canyon Fault is mapped trending north-south from Oceanside to downtown San Diego, from where it appears to head southward into San Diego Bay, through Coronado and offshore. The Rose Canyon Fault Zone is considered to be a complex zone of onshore and offshore, en echelon strike slip, oblique reverse, and oblique normal faults. The Rose Canyon Fault is considered to be capable of generating an M7.2 earthquake and is considered microseismically active, although no significant recent earthquakes are known to have occurred on the fault.

Investigative work on faults that are part of the Rose Canyon Fault Zone at the Police Administration and Technical Center in downtown San Diego, at the SDG&E facility in Rose Canyon, and within San Diego Bay and elsewhere within downtown

San Diego, has encountered offsets in Holocene (geologically recent) sediments. These findings confirm Holocene displacement on the Rose Canyon Fault, which was designated an "active" fault in November 1991 (California Division of Mines and Geology -- Fault Rupture Hazard Zones in California, 1999).

*Coronado Bank Fault*: The Coronado Bank Fault is located approximately 12 miles southwest of the site. Evidence for this fault is based upon geophysical data (acoustic profiles) and the general alignment of epicenters of recorded seismic activity (Greene, 1979). The Oceanside earthquake of M5.3 recorded July 13, 1986, is known to have been centered on the fault or within the Coronado Bank Fault Zone. Although this fault is considered active, due to the seismicity within the fault zone, it is significantly less active seismically than the Elsinore Fault (Hileman, 1973). It is postulated that the Coronado Bank Fault is capable of generating a M7.6 earthquake and is of great interest due to its close proximity to the greater San Diego metropolitan area.

*Newport-Inglewood Fault:* The Newport-Inglewood Fault Zone is located approximately 22 miles northwest of the site. A significant earthquake (M6.4) occurred along this fault on March 10, 1933. Since then no additional significant events have occurred. The fault is believed to have a slip rate of approximately 0.6 mm/yr with an unknown recurrence interval. This fault is believed capable of producing an earthquake of M6.0 to M7.4 (SCEC, 2004).

*Elsinore Fault*: The Elsinore Fault is located approximately 37 to 54 miles east and northeast of the site. The fault extends approximately 200 km (125 miles) from the Mexican border to the northern end of the Santa Ana Mountains. The Elsinore Fault zone is a 1- to 4-mile-wide, northwest-southeast-trending zone of discontinuous and en echelon faults extending through portions of Orange,

Riverside, San Diego, and Imperial Counties. Individual faults within the Elsinore Fault Zone range from less than 1 mile to 16 miles in length. The trend, length and geomorphic expression of the Elsinore Fault Zone identify it as being a part of the highly active San Andreas Fault system.

Like the other faults in the San Andreas system, the Elsinore Fault is a transverse fault showing predominantly right-lateral movement. According to Hart, et al. (1979), this movement averages less than 1 centimeter per year. Along most of its length, the Elsinore Fault Zone is marked by a bold topographic expression consisting of linearly aligned ridges, swales and hallows. Faulted Holocene alluvial deposits (believed to be less than 11,000 years old) found along several segments of the fault zone suggest that at least part of the zone is currently active.

Although the Elsinore Fault Zone belongs to the San Andreas set of active, northwest-trending, right-slip faults in the southern California area (Crowell, 1962), it has not been the site of a major earthquake in historic time, other than a M6.0 earthquake near the town of Elsinore in 1910 (Richter, 1958; Toppozada and Parke, 1982). However, based on length and evidence of late-Pleistocene or Holocene displacement, Greensfelder (1974) has estimated that the Elsinore Fault Zone is reasonably capable of generating an earthquake ranging from M6.8 to M7.1. Faulting evidence exposed in trenches placed in Glen Ivy Marsh across the Glen Ivy North Fault (a strand of the Elsinore Fault Zone between Corona and Lake Elsinore), suggest a maximum earthquake recurrence interval of 300 years, and when combined with previous estimates of the long-term horizontal slip rate of 0.8 to 7.0 mm/year, suggest typical earthquakes of M6.0 to M7.0 (Rockwell, 1985).

*San Jacinto Fault*: The San Jacinto Fault is located 59 to 80 miles to the northeast of the site. The San Jacinto Fault Zone consists of a series of closely spaced faults,

including the Coyote Creek Fault, that form the western margin of the San Jacinto Mountains. The fault zone extends from its junction with the San Andreas Fault in San Bernardino, southeasterly toward the Brawley area, where it continues south of the international border as the Imperial Transform Fault (Earth Consultants International [ECI], 2009).

The San Jacinto Fault zone has a high level of historical seismic activity, with at least 10 damaging earthquakes (M6.0 to M7.0) having occurred on this fault zone between 1890 and 1986. Earthquakes on the San Jacinto Fault in 1899 and 1918 caused fatalities in the Riverside County area. Offset across this fault is predominantly right-lateral, similar to the San Andreas Fault, although some investigators have suggested that dip-slip motion contributes up to 10% of the net slip (ECI, 2009).

The segments of the San Jacinto Fault that are of most concern to major metropolitan areas are the San Bernardino, San Jacinto Valley and Anza segments. Fault slip rates on the various segments of the San Jacinto are less well constrained than for the San Andreas Fault, but the available data suggest slip rates of 12 ±6 mm/yr for the northern segments of the fault, and slip rates of 4 ±2 mm/yr for the southern segments. For large ground-rupturing earthquakes on the San Jacinto fault, various investigators have suggested a recurrence interval of 150 to 300 years. The Working Group on California Earthquake Probabilities (WGCEP, 2008) has estimated that there is a 31 percent probability that an earthquake of M6.7 or greater will occur within 30 years on this fault. Maximum credible earthquakes of M6.7, M6.9 and M7.2 are expected on the San Bernardino, San Jacinto Valley and Anza segments, respectively, capable of generating peak horizontal ground accelerations of 0.48 to 0.53 g in the County of Riverside, (ECI, 2009). A M5.4 earthquake occurred on the San Jacinto Fault on July 7, 2010.

The United States Geological Survey has issued the following statements with respect to the recent seismic activity on southern California faults:

> The San Jacinto fault, along with the Elsinore, San Andreas, and other faults, is part of the plate boundary that accommodates about 2 inches/year of motion as the Pacific plate moves northwest relative to the North American plate. The largest recent earthquake on the San Jacinto fault, near this location, the M6.5 1968 Borrego Mountain earthquake April 8, 1968, occurred about 25 miles southeast of the July 7, 2010, M5.4 earthquake.
>
> This M5.4 earthquake follows the 4th of April 2010, Easter Sunday, Mw7.2 earthquake, located about 125 miles to the south, well south of the US Mexico international border. A M4.9 earthquake occurred in the same area on June 12th at 8:08 pm (Pacific Time). Thus this section of the San Jacinto fault remains active.
>
> Seismologists are watching two major earthquake faults in southern California. The San Jacinto fault, the most active earthquake fault in southern California, extends for more than 100 miles from the international border into San Bernardino and Riverside, a major metropolitan area often called the Inland Empire. The Elsinore fault is more than 110 miles long, and extends into the Orange County and Los Angeles area as the Whittier fault. The Elsinore fault is capable of a major earthquake that would significantly affect the large metropolitan areas of southern California. The Elsinore fault has not hosted a major earthquake in more than 100 years. The occurrence of these earthquakes along the San Jacinto fault and continued aftershocks demonstrates that the earthquake activity in the region remains at an elevated level. The San Jacinto fault is known as the most active earthquake fault in southern California. Caltech and USGS seismologist continue to monitor the ongoing earthquake activity using the Caltech/USGS Southern California Seismic Network and a GPS network of more than 100 stations.

## *B. Other Geologic Hazards*

*Ground Rupture*: Ground rupture is characterized by bedrock slippage along an established fault and may result in displacement of the ground surface. For ground rupture to occur along a fault, an earthquake usually exceeds M5.0. If a M5.0 earthquake were to take place on a local fault, an estimated surface-rupture length 1 mile long could be expected (Greensfelder, 1974). Our investigation indicates that the subject site is not directly on a known active fault trace and, therefore, the risk of ground rupture is remote.

*Ground Shaking*: Structural damage caused by seismically induced ground shaking is a detrimental effect directly related to faulting and earthquake activity. Ground shaking is considered to be the greatest seismic hazard in San Diego County. The intensity of ground shaking is dependent on the magnitude of the earthquake, the distance from the earthquake, and the seismic response characteristics of underlying soils and geologic units. Earthquakes of M5.0 or greater are generally associated with significant damage. It is our opinion that the most serious damage to the site would be caused by a large earthquake originating on a nearby strand of the Rose Canyon Fault Zone. Although the chance of such an event is remote, it could occur within the useful life of the structure.

*Landslides*: Based upon our geotechnical investigation, review of the geologic map (Kennedy and Tan, 2008), review of the referenced City of San Diego Seismic Safety Study -- Geologic Hazards Map Sheet 29 and stereo-pair aerial photographs (4-11-53, AXN-8M-1 and 2), we did not identify or encounter the landslide as indicated on (Kennedy and Tan, 2008), geologic map.

*Slope Stability*: We performed slope stability analysis based on the laboratory test results from retrieved soil samples collected during the exploratory excavations, our field review of site conditions, our review of aerial photos, review of pertinent documents and geologic maps, and our experience with similar formational units in the La Jolla area of San Diego. We utilized a computer program titled *SLIDE6* using Bishops Simplified method and conventional equations for gross and shallow stability. Based on our slope stability analysis, a factor of safety (FS) less than 1.5 against gross or shallow slope failure does not exist at any location across the property. In our professional opinion, the site will have a factor of safety of 1.5 or greater following the proposed construction (refer to Appendix C for details).

*Liquefaction*: The liquefaction of saturated sands during earthquakes can be a major cause of damage to buildings. Liquefaction is the process by which soils are transformed into a viscous fluid that will flow as a liquid when unconfined. It occurs primarily in loose, saturated sands and silts when they are sufficiently shaken by an earthquake.

On this site, the risk of liquefaction of foundation materials due to seismic shaking is also considered to be remote due to the dense nature of the natural-ground material, the anticipated high density of the proposed recompacted fill, and the lack of a shallow static groundwater surface under the site. No soil liquefaction or soil strength loss is anticipated to occur due to a seismic event.

*Tsunami*: The risk of a tsunami affecting the site is considered low as the site is situated at an elevation of at least 302 feet above mean sea level and approximately 2,400 feet from an exposed beach.

In general, the orientation of the southern California coastline and the bathymetry of the offshore southern California borderland have, during historical times, combined to protect the shoreline from any large magnitude tsunami height increases, as shown by records of tsunami occurrences that have been observed and/or recorded along the southern California shoreline since 1810 (Lander et al, 1993). For this segment of the California coastline (south of Santa Monica) there is no evidence of any high magnitude tsunamis generated during the last 200 years by large-scale regional sea floor movements (Gayman, 1998).

*Geologic Hazards Summary*: It is our opinion, based upon a review of the available geologic maps and our site investigation, that the site is underlain by relatively stable formational materials, and is suited for the proposed residential structure and associated improvements provided the recommendations herein are implemented.

The most significant geologic hazard at the site is anticipated ground shaking from earthquakes on active Southern California and Baja California faults. The United States Geologic Survey has issued statements indicating that seismic activity in Southern California may continue at elevated levels with increased risk to major metropolitan areas near the Elsinore and San Jacinto faults. These faults are too far from the subject property to present a seismic risk.

To date, the nearest known "active" faults to the subject site are the northwest-trending Rose Canyon Fault, Coronado Bank Fault and the Elsinore Fault. There are no known significant geologic hazards on or near the site that would prevent the proposed construction.

## X. GROUNDWATER

Groundwater and/or perched water conditions were not encountered at the shallow excavation locations and we do not expect significant groundwater problems to develop in the future ***if proper drainage is maintained on the property***. The potential does exist for perched water conditions to occur if rainwater and irrigation waters are allowed to infiltrate through the upper, more permeable fill soils and encounter less permeable natural ground materials.

It should be kept in mind that construction operations may change surface drainage patterns and/or reduce permeabilities due to the densification of compacted soils. Such changes of surface and subsurface hydrologic conditions, plus irrigation of landscaping or significant increases in rainfall, may result in the appearance of surface or near-surface water at locations where none existed previously. The appearance of such water is expected to be localized and cosmetic in nature, if good positive drainage is implemented, as recommended in this report, during and at the completion of construction.

On properties such as the subject site where dense, low permeability soils exist at shallow depths, even normal landscape irrigation practices on the property or neighboring properties, or periods of extended rainfall, can result in shallow "perched" water conditions. The perching (shallow depth) accumulation of water on a low permeability surface can result in areas of persistent wetting and drowning of lawns, plants and trees. Resolution of such conditions, should they occur, may require site-specific design and construction of subdrain and shallow "wick" drain dewatering systems.

Subsurface drainage with a properly designed and constructed subdrain system will be required behind proposed below-ground building retaining walls. Additional recommendations may be required at the time of construction.

It must be understood that unless discovered during initial site exploration or encountered during site construction operations, it is extremely difficult to predict if or where perched or true groundwater conditions may appear in the future. When site fill or formational soils are fine-grained and of low permeability, water problems may not become apparent for extended periods of time.

Water conditions, where suspected or encountered during construction, should be evaluated and remedied by the project civil and geotechnical consultants. The project developer and property owner, however, must realize that post-construction appearances of groundwater may have to be dealt with on a site-specific basis.

## XII. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based upon the practical field investigation conducted by our firm, and resulting laboratory tests, in conjunction with our knowledge and experience with similar soils in the La Jolla area. The opinions, conclusions, and recommendations presented in this report are contingent upon ***Geotechnical Exploration, Inc.*** being retained to review the final plans and specifications as they are developed and to observe the site earthwork and installation of foundations.

## A. *Seismic Design Criteria*

1. *Seismic Design Criteria:* The proposed structure and/or additions should be designed in accordance with Section 1613 of the 2010 CBC, which incorporates by reference the ASCE 7-05 for seismic design. We recommend the following parameters be utilized. We have determined the mapped spectral acceleration values for the site based on a latitude of 32.8452 degrees and longitude of -117.2578 degrees, utilizing a program titled "*Seismic Hazard Curves, Response Parameters and Design Parameters-v5.0.8*," provided by the USGS, which provides a solution for ASCE 7-05 (Section 1613 of the 2010 CBC) utilizing digitized files for the Spectral Acceleration maps. In addition, we have assigned a Site Classification of $S_D$. The response parameters for design are presented in the following table. The design Spectrum Acceleration (SA) vs. Period (T) is shown on Appendix B.

### TABLE I
### *Mapped Spectral Acceleration Values and Design Parameters*

| $S_s$ | $S_1$ | $F_a$ | $F_v$ | $S_{ms}$ | $S_{m1}$ | $S_{ds}$ | $S_{d1}$ |
|---|---|---|---|---|---|---|---|
| 1.292 | 0.500 | 1.0 | 1.50 | 1.292 | 0.750 | 0.862 | 0.500 |

## B. *Preparation of Soils for Site Development*

2. *Clearing and Stripping:* Vegetation and improvements should be removed prior to the preparation of the building pad for areas to receive new structures, additions, or improvements. This includes any roots from existing trees and shrubbery. Holes resulting from the removal of root systems or other buried obstructions that extend below the planned grades should be cleared and backfilled with properly compacted fill.

3. *Treatment of Existing Slopewash Soils or Loose Soils:* In order to provide suitable support for the proposed new residence, basement and associated improvements such as decking, sidewalks and driveways, we recommend that all existing fill, slopewash and colluvium soils be removed and replaced as structural fill compacted to a minimum degree of compaction of 90 percent. The limits of recompaction should extend at least 10 feet beyond the perimeter limits of all new improvements, where feasible. The recompaction work should consist of: (a) removing all existing fill, slopewash and colluvium soils down to the underlying undisturbed formational materials; (b) scarifying, moisture conditioning, and compacting the exposed natural subgrade soils; and (c) replacing the materials as compacted structural fill. The areal extent and depths required to remove the existing fill, slopewash and colluvium should be determined by our representative during the excavation work based on their examination of the soils being exposed and physical constraints.

   In addition, we recommend that, if encountered, any low expansion soil from the required removals be selectively stockpiled for use as capping material and wall backfills as recommended below in Recommendation Nos. 4 and 8.

4. *Subgrade Preparation:* After areas to receive new improvements have been cleared, stripped, and the required excavations made, the exposed subgrade soils in areas to receive fill and/or building improvements should be scarified to a depth of 6 inches, moisture conditioned, and compacted to the requirements for structural fill. The near-surface moisture content of clayey soils should be maintained by periodic sprinkling until within 48 hours prior to concrete placement.

5. *Expansive Soil Conditions:* We do anticipate that significant quantities of highly expansive clay soils will be encountered during grading. Encountered clayey fill soils are of generally high moisture content. Should such soils (of lower moisture content) be encountered and used as fill, however, they should be moisture conditioned or dried to no greater than 5 percent above Optimum Moisture content, compacted to 88 to 92 percent, and preferably placed outside building areas. Soils of medium or greater expansion potential should not be used as retaining wall backfill soils.

6. *Material for Fill:* Any required imported fill material should be a low-expansion potential (Expansion Index of 50 or less per ASTM D4829-11). In addition, both imported and existing on-site materials for use as fill should not contain rocks or lumps more than 6 inches in greatest dimension. All materials for use as fill should be approved by our firm prior to filling.

7. *Fill Compaction:* All structural fill to receive the new foundations and slabs should be compacted to a minimum degree of compaction of 90 percent based upon ASTM D1557-12. Fill material should be spread and compacted in uniform horizontal lifts not exceeding 8 inches in uncompacted thickness. Before compaction begins, the fill should be brought to a moisture content that will permit proper compaction by either: (1) aerating and drying the fill if it is too wet, or (2) moistening the fill with water if it is too dry. Each lift should be thoroughly mixed before compaction to ensure a uniform distribution of moisture. For low expansive soils, the moisture content should be within 2 percent of optimum. As an alternative to fill soil recompaction, deepened foundations and raised wood floors or structural slabs may be considered.

No uncontrolled fill soils should remain on the site after completion of the site work. In the event that temporary ramps or pads are constructed of uncontrolled fill soils, the loose fill soils should be removed and/or recompacted prior to completion of the grading operation.

8. *Trench and Retaining/Basement Wall Backfill:* All backfill soils placed in utility trenches or behind retaining/basement walls should be compacted to a minimum degree of compaction of 90 percent at the Optimum Moisture content. Backfill material should be placed in lift thicknesses appropriate to the type of compaction equipment utilized and compacted to a minimum degree of 90 percent by mechanical means. In pavement areas, that portion of the trench backfill within the pavement section should conform to the material and compaction requirements of the adjacent pavement section. In addition, the low-expansion potential fill layer around the pipe should be maintained in utility trench backfill within the building and adjoining exterior slab areas. Trench backfill on top of the low-expansion fill layer should consist of on-site soils in order to minimize the potential for migration of water below the perimeter footings at the trench locations.

Our experience has shown that even shallow, narrow trenches, such as for irrigation and electrical lines, that are not properly compacted can result in problems, particularly with respect to shallow groundwater accumulation and migration.

Backfill soils placed behind retaining/basement walls should be installed as early as the retaining walls are capable of supporting lateral loads. Backfill soils behind retaining/basement walls should be low expansive, with an Expansion Index equal to or lower than 50.

## *C. Design Parameters for Proposed Foundations*

9. *Deepened Footings:* If the existing surface is not removed and recompacted, deepened footings for proposed residence should be founded at least 3 feet below the lowest adjacent finished grade and penetrate at least 12 inches in dense or stiff formational soils and have a minimum width of 15 inches. The deepened footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. The final dimensions and reinforcing should be specified by the structural engineer. A minimum clearance of 3 inches should be maintained between steel reinforcement and the bottom or sides of the footing.

   Since slab on-grade are most likely planned for both interior and exterior improvements, soil grading and proper moisture conditioning will be required prior to constructing the slabs and shallow footings.

   *NOTE: The project Civil/Structural Engineer should review all reinforcing schedules. The reinforcing minimums recommended herein are not to be construed as structural designs, but merely as minimum reinforcement to reduce the potential for cracking and separations.*

10. Shallow Footings: Shallow footings should bear on undisturbed formational materials or properly compacted fill soils. The footings should be founded at least 24 inches below the lowest adjacent finished grade when founded into properly compacted fill (or 24 inches into formational material). Footings located adjacent to utility trenches should have their bearing surfaces situated below an imaginary 1.5:1.0 plane projected upward from the bottom edge of the adjacent utility trench.

11. *Bearing Values*: At the recommended depths, footings on native, medium dense formational soil or properly compacted fill soil may be designed for allowable bearing pressures of 2,500 pounds per square foot (psf) for combined dead and live loads and increased one-third for all loads, including wind or seismic. The footings should have a minimum width of 12 inches.

12. *Footing Reinforcement*: All continuous footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. We recommend that a minimum of two No. 5 top and two No. 5 bottom reinforcing bars be provided in the footings. A minimum clearance of 3 inches should be maintained between steel reinforcement and the bottom or sides of the footing. Isolated square footings should contain, as a minimum, a grid of three No. 4 steel bars on 12-inch centers, both ways. In order for us to offer an opinion as to whether the footings are founded on soils of sufficient load bearing capacity, it is essential that our representative inspect the footing excavations prior to the placement of reinforcing steel or concrete.

    *NOTE: The project Civil/Structural Engineer should review all reinforcing schedules. The reinforcing minimums recommended herein are not to be construed as structural designs, but merely as minimum reinforcement to reduce the potential for cracking and separations.*

13. *Lateral Loads:* Lateral load resistance for structure foundations may be developed in friction between the foundation bottoms and the supporting subgrade. An allowable friction coefficient of 0.35 is considered applicable. An additional allowable passive resistance equal to an equivalent fluid weight of 300 pounds per cubic foot (pcf) acting against the foundations may be

used in design provided the footings are poured neat against the adjacent undisturbed formational materials and/or properly compacted fill materials. Due to the highly expansive soil conditions, the upper 1 foot of soil should not count in providing passive resistance.

In areas where existing fill soils are present in front of foundations (i.e., within 3 times the depth of embedment), the allowable passive resistance should be reduced to 150 pcf and friction coefficient to 0.30. These lateral resistance values assume a level surface in front of the footing for a minimum distance of three times the embedment depth of the footing.

14. *Settlement:* Settlements under building loads are expected to be within tolerable limits for the proposed additions. For footings designed in accordance with the recommendations presented in the preceding paragraphs, we anticipate that total settlements should not exceed 1 inch and that post-construction differential angular rotation should be less than 1/240.

## *D. Concrete Slab On-grade Criteria*

Slabs on-grade may only be used on new, properly compacted fill or when bearing on dense natural soils at a moisture content of 5 percent over optimum and compacted to between 88 and 92 percent of relative compaction. If concrete slabs are planned on existing fills or slopewash, they should be designed as structural slabs spanning between foundations bearing in formational soils.

15. *Minimum Floor Slab Reinforcement:* Based on our experience, we have found that, for various reasons, floor slabs occasionally crack. Therefore, we recommend that all slabs-on-grade contain at least a minimum amount of reinforcing steel to reduce the separation of cracks, should they occur. Slab subgrade soil should be verified by a ***Geotechnical Exploration, Inc***. representative to have the proper moisture content within 48 hours prior to placement of the vapor barrier and pouring of concrete.

    15.1 New interior floor slabs should be a minimum of 5 inches actual thickness and be reinforced with No. 4 bars on 18-inch centers, both ways, placed at midheight in the slab. *The slabs should be underlain by a 4-inch-thick layer of compacted crushed rock gravel overlying or underlying a moisture retardant membrane (15-mil StegoWrap).* Slab subgrade soil should be verified by a ***Geotechnical Exploration, Inc.*** representative to have the proper moisture content within 48 hours prior to placement of the vapor barrier and pouring of concrete.

16. *Slab Moisture Protection and Vapor Barrier Membrane:* Although it is not the responsibility of geotechnical engineering firms to provide moisture protection recommendations, as a service to our clients we provide the following discussion and suggested minimum protection criteria. Actual recommendations should be provided by the architect and waterproofing consultants or product manufacturer.

    Soil moisture vapor can result in damage to moisture-sensitive floors, some floor sealers, or sensitive equipment in direct contact with the floor, in addition to mold and staining on slabs, walls, and carpets. The common practice in Southern California is to place vapor retarders made of PVC, or of

polyethylene. PVC retarders are made in thickness ranging from 10- to 60-mil. Polyethylene retarders, called visqueen, range from 5- to 10-mil in thickness. These products are no longer considered adequate for moisture protection and can actually deteriorate over time.

Specialty vapor retarding products possess higher tensile strength and are more specifically designed for and intended to retard moisture transmission into and through concrete slabs. The use of such products is highly recommended for reduction of floor slab moisture emission.

The following American Society for Testing and Materials (ASTM) and American Concrete Institute (ACI) sections address the issue of moisture transmission into and through concrete slabs: ASTM E1745-97 (2009) Standard Specification for Plastic Water Vapor Retarders Used in Contact Concrete Slabs; ASTM E154-88 (2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth; ASTM E96-95 Standard Test Methods for Water Vapor Transmission of Materials; ASTM E1643-98 (2009) Standard Practice for Installation of Water Vapor Retarders Used in Contact Under Concrete Slabs; and ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

16.1 Based on the above, we recommend that the vapor barrier consist of a minimum 15-mil extruded polyolefin plastic (no recycled content or woven materials permitted). Permeance as tested before and after mandatory conditioning (ASTM E1745 Section 7.1 and sub-paragraphs 7.1.1-7.1.5) should be less than 0.01 perms (grains/square foot/hour in Hg) and comply with the ASTM E1745 Class A requirements. Installation of vapor barriers should be in accordance with ASTM

E1643. The basis of design is Stego wrap vapor barrier 15-mil. The vapor barrier should be placed in accordance with the manufacturer's specifications.

16.2 Common to all acceptable products, vapor retarder/barrier joints must be lapped and sealed with mastic or the manufacturer's recommended tape or sealing products. In actual practice, stakes are often driven through the retarder material, equipment is dragged or rolled across the retarder, overlapping or jointing is not properly implemented, etc. All these construction deficiencies reduce the retarder's effectiveness. In no case should retarder/barrier products be punctured or gaps be allowed to form prior to or during concrete placement.

16.3 Following placement of concrete floor slabs, sufficient drying time must be allowed prior to placement of any floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials.

17. *Concrete Isolation Joints:* We recommend the project Civil/Structural Engineer incorporate isolation joints and sawcuts to at least one-fourth the thickness of the slab in any floor designs. The joints and cuts, if properly placed, should reduce the potential for and help control floor slab cracking. We recommend that concrete shrinkage joints be spaced no farther than approximately 20 feet apart, and also at re-entrant corners. However, due to a number of reasons (such as base preparation, construction techniques, curing procedures, and normal shrinkage of concrete), some cracking of slabs can be expected.

18. Exterior Slab Reinforcement: Exterior concrete slabs should be at least 4 inches thick. As a minimum for protection of on-site improvements, we recommend that all nonstructural concrete slabs (such as patios, sidewalks, etc.), be founded on properly compacted and tested fill or dense native formation and be underlain by 2 inches and no more than 3 inches of clean leveling sand, with No. 4 bars at 18-inch centers, both ways, at the center of the slab. Exterior slabs should contain adequate isolation and control joints.

The performance of on-site improvements can be greatly affected by soil base preparation and the quality of construction. It is therefore important that all improvements are properly designed and constructed for the existing soil conditions. The improvements should not be built on loose soils or fills placed without our observation and testing. The subgrade of exterior improvements should be verified as properly prepared within 48 hours prior to concrete placement. A minimum thickness of 2 feet of properly recompacted soils should underlie the secondary exterior slabs on-grade or be built on properly moisture conditioned dense formational soils.

For exterior slabs with the minimum shrinkage reinforcement, control joints should be placed at spaces no farther than 15 feet apart or the width of the slab, whichever is less, and also at re-entrant corners. Control and isolation joints in exterior slabs should be sealed with elastomeric joint sealant. The sealant should be inspected every 6 months and be properly maintained.

## *E. Retaining Wall Design Criteria*

19. *Static Design Parameters:* Retaining walls must be designed to resist lateral earth pressures and any additional lateral pressures caused by surcharge

loads on the adjoining retained surface, plus an additional seismic soil increment when applicable. We recommend that restrained retaining walls with level, low-expansive imported backfill be designed for an equivalent fluid pressure of 38 pcf. Wherever restrained walls will be subjected to surcharge loads, they should also be designed for an additional uniform lateral pressure of 0.31 times the anticipated surcharge pressure for unrestrained walls (and 0.58 times for restrained walls) supporting level, low-expansive backfill.

Exterior unrestrained retaining walls supporting a 1.5:1.0 (h:v) backfill may be designed for an equivalent fluid weight of 62 pcf (using low expansive soils) and 85 pcf for on-site expansive soils with a 2.0:1.0 (h:v) sloping backfill. Restrained retaining walls supporting a 2.0:1.0 (h:v) backfill of low expansive soils should be designed with a soil pressure of 55 pcf (100 pcf for on-site expansive soils supporting a 2.0:1.0 sloping backfill).

Backfill placed behind the walls should be compacted to a minimum degree of compaction of 90 percent using light compaction equipment. If heavy equipment is used, the walls should be appropriately temporarily braced.

20. *Retaining Wall Seismic Earth Pressures:* If seismic loading is considered for retaining walls more than 6 feet in height, they should be designed for seismic earth pressures in addition to the normal static pressures. For the retaining wall (restrained) with level backfill, we recommend that the seismic pressure increment be taken as an additional fluid pressure distribution (zero pressure at the ground surface and maximum pressure at the base) utilizing an equivalent fluid weight of 16 pounds per cubic foot (pcf). A Kh value of 0.17 may be used is a computer program such as "*Retaining Wall Pro*" or a

similar program is used for wall design. The soil pressure described above may be used for the design of shoring structures.

21. *Wall Drainage:* The preceding design pressures assume that the walls are backfilled with the on-site soils or imported low-expansive soils, and that there is sufficient drainage behind the walls to prevent the build-up of hydrostatic pressures from surface water infiltration. We recommend that drainage be provided by a composite drainage material such as Miradrain 6000/6200 or equivalent. The drain material should terminate 3 inches below the finish surface where the surface is covered by pavements or slabs or 6 inches below the finish surface in landscape areas (see Figure No. IX for Retaining Wall Drainage schematic). Waterproofing should extend from the bottom to the top of the wall.

    ***Geotechnical Exploration, Inc.*** will assume no liability for damage to structures or improvements that is attributable to poor drainage. The architectural plans should clearly indicate that subdrains for any lower-level walls be placed at an elevation at least 1 foot below the bottom of the lower-level slabs. At least 0.5-percent gradient should be provided to the subdrain. The subdrain should be placed in an envelope of crushed rock gravel up to 1 inch in maximum diameter, and be wrapped with Mirafi 140N filter or equivalent. A sump pump may be needed if the subdrain does not outlet via gravity. The collected water should be taken to an approved drainage facility.

22. *Drainage Quality Control*: It must be understood that it is not within the scope of our services to provide quality control oversight for surface or subsurface drainage construction or retaining wall sealing and base of wall

drain construction. It is the responsibility of the contractor to verify proper wall sealing, geofabric installation, protection board (if needed), drain depth below interior floor or yard surface, pipe percent slope to the outlet, etc.

## *F.* <u>Slopes</u>

It is our understanding that no large permanent slopes are proposed. Temporary slopes may be required during site preparation and construction.

23. <u>*Slope Observations:*</u> A representative of ***Geotechnical Exploration, Inc.*** must observe any steep temporary slopes *during construction.* In the event that soils and formational material comprising a slope are not as anticipated, any required slope design changes would be presented at that time.

24. <u>*Permanent Slopes*</u>: Any new cut or fill slopes up to 10 feet in height should be constructed at an inclination of 2.0:1.0 (horizontal to vertical). Permanent slopes at a 2.0:1.0 slope should possess a factor of safety of 1.5 against deep and shallow failure. Existing on-site slopes have also been found to possess a factor of safety of at least 1.5 against gross and shallow slope failure.

25. <u>*Temporary Slopes*</u>: Based on our subsurface investigation work, laboratory test results, and engineering analysis, temporary slopes should be stable for a maximum slope height of up to 12 feet and may be cut at a slope ratio of 1.0:1.0 in properly compacted fill soils and at 0.75:1.0 in medium dense natural soils. Some localized sloughing or raveling of the soils exposed on the slopes, however, may occur.

Since the stability of temporary construction slopes will depend largely on the contractor's activities and safety precautions (storage and equipment loadings near the tops of cut slopes, surface drainage provisions, etc.), it should be the contractor's responsibility to establish and maintain all temporary construction slopes at a safe inclination appropriate to his methods of operation. No soil stockpiles or surcharge may be placed within a horizontal distance of 10 feet from the excavation.

If these recommendations are not feasible due to space constraints, temporary shoring may be required for safety and to protect adjacent property improvements. Similarly, footings near temporary cuts should be underpinned or protected with shoring.

26. *Cal-OSHA*: Where not superseded by specific recommendations presented in this report, trenches, excavations, and temporary slopes at the subject site should be constructed in accordance with Title 8, Construction Safety Orders, issued by Cal-OSHA.

## G. ***Site Drainage Considerations***

27. *Erosion Control*: Appropriate erosion control measures should be taken at all times during and after construction to prevent surface runoff waters from entering footing excavations or ponding on finished building pad areas.

28. *Surface Drainage:* Adequate measures should be taken to properly finish-grade the lot after the additions and other improvements are in place. Drainage waters from this site and adjacent properties should be directed away from the footings, floor slabs, and slopes, onto the natural drainage

direction for this area or into properly designed and approved drainage facilities provided by the project civil engineer. Roof gutters and downspouts should be installed on the residence, with the runoff directed away from the foundations via closed drainage lines. Proper subsurface and surface drainage will help minimize the potential for waters to seek the level of the bearing soils under the footings and floor slabs.

Failure to observe this recommendation could result in undermining and possible differential settlement of the structure or other improvements on the site or cause other moisture-related problems. Currently, the California Building Code requires a minimum 1-percent surface gradient for proper drainage of building pads unless waived by the building official. Concrete pavement may have a minimum gradient of 0.5-percent.

29. *Planter Drainage:* Planter areas, flower beds and planter boxes should be sloped to drain away from the footings and floor slabs at a gradient of at least 5 percent within 5 feet from the perimeter walls. Any planter areas adjacent to the residence or surrounded by concrete improvements should be provided with sufficient area drains to help with rapid runoff disposal. No water should be allowed to pond adjacent to the residence or other improvements or anywhere on the site.

## *H. General Recommendations*

30. *Project Start Up Notification:* In order to reduce work delays during site development, this firm should be contacted 48 hours prior to any need for observation of footing excavations or field density testing of compacted fill soils. If possible, placement of formwork and steel reinforcement in footing

excavations should not occur prior to observing the excavations; in the event that our observations reveal the need for deepening or redesigning foundation structures at any locations, any formwork or steel reinforcement in the affected footing excavation areas would have to be removed prior to correction of the observed problem (i.e., deepening the footing excavation, recompacting soil in the bottom of the excavation, etc.).

31. *Construction Best Management Practices (BMPs):* Construction BMPs must be implemented in accordance with the requirements of the controlling jurisdiction. Sufficient BMPs must be installed to prevent silt, mud or other construction debris from being tracked into the adjacent street(s) or storm water conveyance systems due to construction vehicles or any other construction activity. The contractor is responsible for cleaning any such debris that may be in the street at the end of each work day or after a storm event that causes breach in the installed construction BMPs.

All stockpiles of uncompacted soil and/or building materials that are intended to be left unprotected for a period greater than 7 days are to be provided with erosion and sediment controls. Such soil must be protected each day when the probability of rain is 40% or greater. A concrete washout should be provided on all projects that propose the construction of any concrete improvements that are to be poured in place. All erosion/sediment control devices should be maintained in working order at all times. All slopes that are created or disturbed by construction activity must be protected against erosion and sediment transport at all times. The storage of all construction materials and equipment must be protected against any potential release of pollutants into the environment.

## XII. GRADING NOTES

***Geotechnical Exploration, Inc.*** recommends that we be retained to verify the actual soil conditions revealed during site grading work and footing excavation to be as anticipated in this "*Report of Preliminary Geotechnical Investigation*" for the project. In addition, the compaction of any fill soils placed during site grading work must be observed and tested by the soil engineer.

It is the responsibility of the grading contractor to comply with the requirements on the grading plans as well as the local grading ordinance. All retaining wall and trench backfill should be properly compacted. ***Geotechnical Exploration, Inc.*** will assume no liability for damage occurring due to improperly or uncompacted backfill placed without our observations and testing.

## XIII. LIMITATIONS

Our conclusions and recommendations have been based on available data obtained from our field investigation and laboratory analysis, as well as our experience with similar soils and formational materials located in this area of San Diego. Of necessity, we must assume a certain degree of continuity between exploratory excavations and/or natural exposures. It is, therefore, necessary that all observations, conclusions, and recommendations be verified at the time grading operations begin or when footing excavations are placed. In the event discrepancies are noted, additional recommendations may be issued, if required.

The work performed and recommendations presented herein are the result of an investigation and analysis that meet the contemporary standard of care in our profession within the County of San Diego. No warranty is provided.

As stated previously, it is not within the scope of our services to provide quality control oversight for surface or subsurface drainage construction or retaining wall sealing and base of wall drain construction. It is the responsibility of the contractor to verify proper wall sealing, geofabric installation, protection board installation (if needed), drain depth below interior floor or yard surfaces; pipe percent slope to the outlet, etc.

This report should be considered valid for a period of two (2) years, and is subject to review by our firm following that time. If significant modifications are made to the building plans, especially with respect to the height and location of any proposed structures, this report must be presented to us for immediate review and possible revision.

It is the responsibility of the owner and/or developer to ensure that the recommendations summarized in this report are carried out in the field operations and that our recommendations for design of this project are incorporated in the structural plans. We should be retained to review the project plans once they are available, to verify that our recommendations are adequately incorporated in the plans. Additional or modified recommendations may be issued if warranted after plan review.

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations, and we cannot be responsible for the safety of personnel other than our own on the site; the safety of others is the responsibility of the contractor. The contractor should notify the owner if he considered any of the recommended actions presented herein to be unsafe.

The firm of ***Geotechnical Exploration, Inc.*** shall not be held responsible for changes to the physical condition of the property, such as addition of fill soils or changing drainage patterns, which occur subsequent to issuance of this report and the changes are made without our observations, testing, and approval.

Once again, should any questions arise concerning this report, please feel free to contact the undersigned. Reference to our **Job No. 16-11019** will expedite a reply to your inquiries.

Respectfully submitted,

**GEOTECHNICAL EXPLORATION, INC.**

Jay K. Heiser
Senior Project Geologist

Jaime A. Cerros, P.E.
R.C.E. 34422/G.E. 2007
Senior Geotechnical Engineer

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C.E.G. 2615/P.G. 9012
Senior Project Geologist

JAIME A. CERROS
No. 002007
Exp 9/30/17

JONATHAN A. BROWNING
No. 2615
CERTIFIED ENGINEERING GEOLOGIST

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## JOB NO. 16-11019

## March 2016

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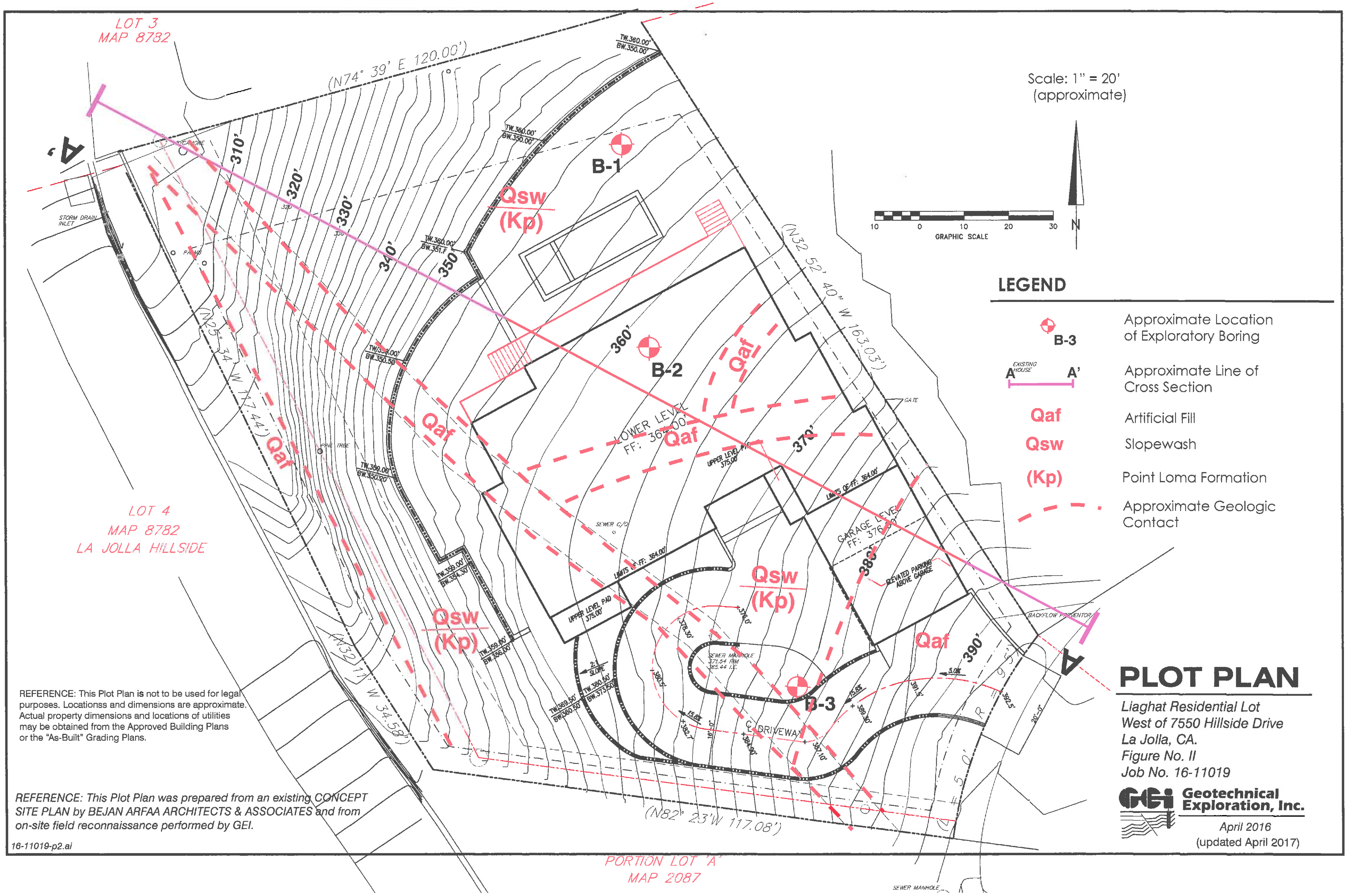
# VICINITY MAP

Thomas Bros Guide San Diego County pg 1227-H6

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

*Figure No. I*
*Job No. 16-11019*



## LEGEND

| | |
|---|---|
| B-3 | Approximate Location of Exploratory Boring |
| A EXISTING HOUSE A' | Approximate Line of Cross Section |
| Qaf | Artificial Fill |
| Qsw | Slopewash |
| (Kp) | Point Loma Formation |
| - - - | Approximate Geologic Contact |

REFERENCE: This Plot Plan is not to be used for legal purposes. Locationss and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

*REFERENCE: This Plot Plan was prepared from an existing CONCEPT SITE PLAN by BEJAN ARFAA ARCHITECTS & ASSOCIATES and from on-site field reconnaissance performed by GEI.*

*16-11019-p2.ai*

# PLOT PLAN

*Liaghat Residential Lot*
*West of 7550 Hillside Drive*
*La Jolla, CA.*
*Figure No. II*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

April 2016
(updated April 2017)

| EQUIPMENT | DIMENSION & TYPE OF EXCAVATION | DATE LOGGED |
|---|---|---|
| **Limited Access Auger Drill Rig** | **6-inch diameter Boring** | **3-2-16** |
| SURFACE ELEVATION | GROUNDWATER/ SEEPAGE DEPTH | LOGGED BY |
| **± 350' Mean Sea Level** | **Not Encountered** | **JAB** |

| DEPTH (feet) | SYMBOL | SAMPLE | FIELD DESCRIPTION AND CLASSIFICATION<br>DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | EXPANSION INDEX | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **SANDY CLAY**, fine- to medium-grained sand, trace subangular gravel to 3/4" in diameter. Stiff. Moist. Dark gray to dark brown. | CL | | | | | | | | | |
| | | 1 | **SLOPEWASH (Qsw)**<br>-- 75% passing #200 sieve. | | 19.6 | | | | | | 91 | | |
| 2 | | ■ | | | | | | | | | | | |
| | | | | | 18.6 | 97.6 | | | | | | 22 | 3" |
| 4 | | ▨ | | | | | | | | | | 12 | 2" |
| | | | **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Very stiff. Moist. Dark gray. | CL | | | | | | | | | |
| 6 | | | **POINT LOMA FORMATION (Kp)** | | | | | | | | | | |
| | | ■ | | | 19.4 | 103.4 | | | | | 87 | 34 | 3" |
| 8 | | | Bulk bag sample from 7'- 10'. | | | | | | | | | | |
| | | ▨ | | | | | | | | | | 21 | 2" |
| 10 | | | | | | | | | | | | | |
| | | | Bottom @ 10' | | | | | | | | | | |

- ▼ PERCHED WATER TABLE
- ☒ BULK BAG SAMPLE
- 1 IN-PLACE SAMPLE
- ■ MODIFIED CALIFORNIA SAMPLE
- S NUCLEAR FIELD DENSITY TEST
- ▨ STANDARD PENETRATION TEST

JOB NAME
**Liaghat Residential Lot**

SITE LOCATION
**West of 7550 Hillside Drive, La Jolla, CA**

| JOB NUMBER | REVIEWED BY | LOG No. |
|---|---|---|
| **16-11019** | **LDR/JAC** | **B-1** |
| FIGURE NUMBER | Geotechnical Exploration, Inc. | |
| **IIIa** | | |

| EQUIPMENT | DIMENSION & TYPE OF EXCAVATION | DATE LOGGED |
|---|---|---|
| **Limited Access Auger Drill Rig** | **6-inch diameter Boring** | **3-2-16** |
| SURFACE ELEVATION | GROUNDWATER/ SEEPAGE DEPTH | LOGGED BY |
| **± 362' Mean Sea Level** | **Not Encountered** | **JAB** |

| DEPTH (feet) | SYMBOL | SAMPLE | FIELD DESCRIPTION AND CLASSIFICATION<br>DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **SANDY CLAY**, fine- to medium-grained sand. Very stiff. Moist. Dark brown.<br>**SLOPEWASH (Qsw)** | CL | | | | | | | | |
| 2 | | | | | | | | | | | 24 | 3" |
| | | | **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Very stiff. Moist. Dark gray.<br>**POINT LOMA FORMATION (Kp)** | CL | | | | | | | | |
| 4 | | | | | | | | | | | 18 | 2" |
| 6 | | | | | | | | | | | | |
| | | | -- becomes hard, less disturbed. | | | | | | | | | |
| 8 | | | | | 19.1 | 108.1 | | | | | 75 | 3" |
| | | | | | | | | | | | 49 | 2" |
| 10 | | | | | | | | | | | | |
| | | | Bottom @ 10' | | | | | | | | | |

▼ PERCHED WATER TABLE

☒ BULK BAG SAMPLE

1 IN-PLACE SAMPLE

■ MODIFIED CALIFORNIA SAMPLE

S NUCLEAR FIELD DENSITY TEST

▨ STANDARD PENETRATION TEST

JOB NAME
**Liaghat Residential Lot**

SITE LOCATION
**West of 7550 Hillside Drive, La Jolla, CA**

JOB NUMBER
**16-11019**

REVIEWED BY
**LDR/JAC**

Geotechnical Exploration, Inc.

FIGURE NUMBER
**IIIb**

LOG No.
**B-2**

| EQUIPMENT | DIMENSION & TYPE OF EXCAVATION | DATE LOGGED |
|---|---|---|
| **Limited Access Auger Drill Rig** | **6-inch diameter Boring** | **3-2-16** |
| SURFACE ELEVATION | GROUNDWATER/ SEEPAGE DEPTH | LOGGED BY |
| **± 381' Mean Sea Level** | **Not Encountered** | **JAB** |

| DEPTH (feet) | SYMBOL | SAMPLE | FIELD DESCRIPTION AND CLASSIFICATION<br>DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ▨ | ☒ | **SANDY CLAY**, fine- to medium-grained sand, with abundant roots to 1.5 feet. Stiff. Moist. Dark yellow-brown to dark brown.<br>**SLOPEWASH (Qsw)** | CL | | | | | | | | |
| 2 | ▨ | ■ | | | | | | | | | | |
| | ▨ | ■ | **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Stiff. Moist. Dark gray.<br>**POINT LOMA FORMATION (Kp)** | CL | 13.7 | 86.9 | | | | | 13 | 3" |
| 4 | ▨ | ▨ | | | | | | | | | 15 | 2" |
| 6 | ▨ | ☒ | -- Bulk bag sample from 4'- 7'.<br>-- 93% passing #200 sieve. | | | | 15.5 | 111.3 | | | | |
| | ▨ | ■ | -- becomes hard, less disturbed. | | | | | | | | | |
| 8 | ▨ | ■ | | | | | | | | | 50 | 3" |
| | ▨ | ▨ | | | | | | | | | 50 | 2" |
| 10 | | | Bottom @ 10' | | | | | | | | | |

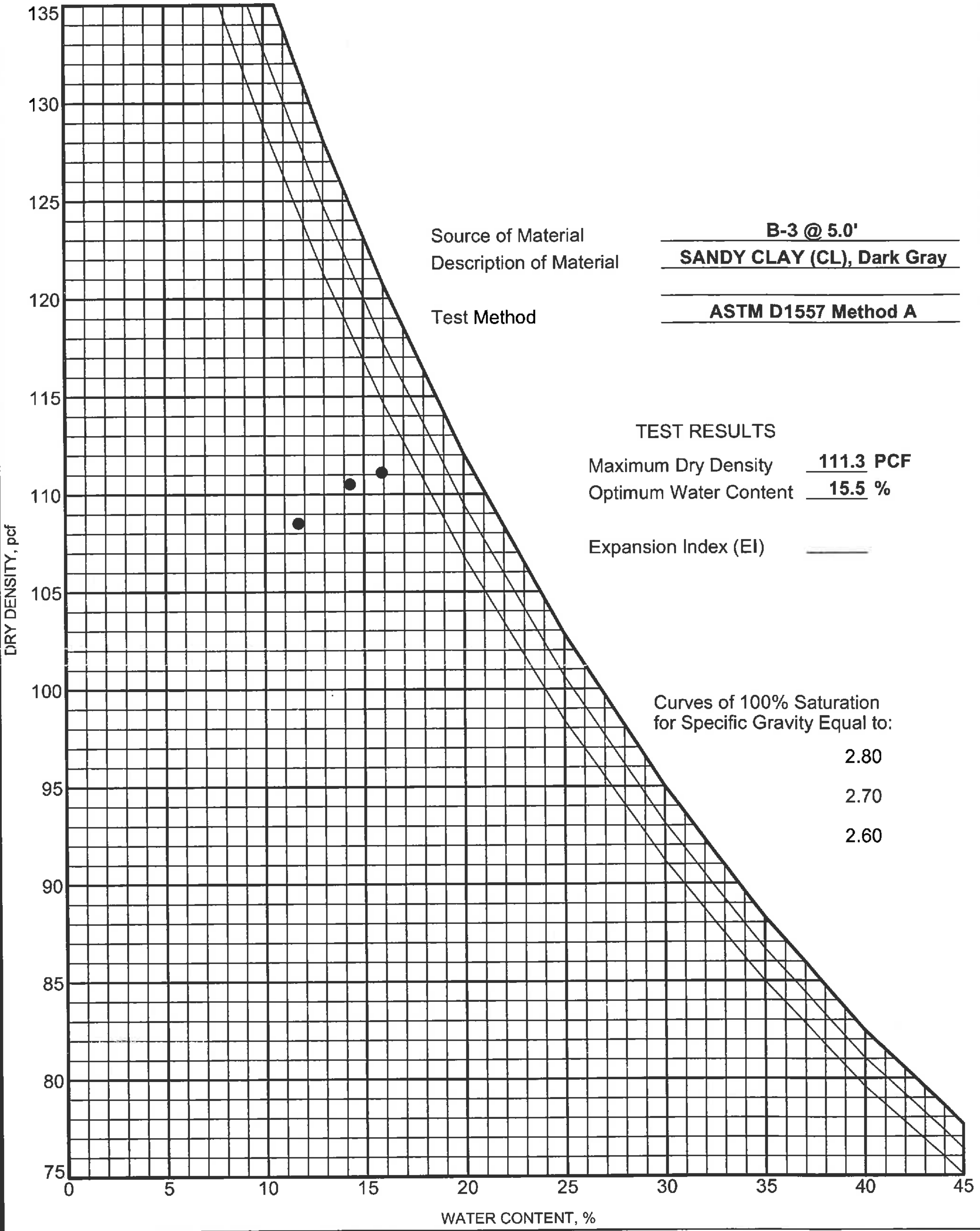
- ▼ PERCHED WATER TABLE
- ☒ BULK BAG SAMPLE
- 1 IN-PLACE SAMPLE
- ■ MODIFIED CALIFORNIA SAMPLE
- S NUCLEAR FIELD DENSITY TEST
- ▨ STANDARD PENETRATION TEST

JOB NAME
**Liaghat Residential Lot**

SITE LOCATION
**West of 7550 Hillside Drive, La Jolla, CA**

| JOB NUMBER | REVIEWED BY | LOG No. |
|---|---|---|
| **16-11019** | **LDR/JAC** | **B-3** |
| FIGURE NUMBER | Geotechnical Exploration, Inc. | |
| **IIIc** | | |

EXPLORATION LOG 11019 LIAGHAT.GPJ GEO_EXPL.GDT 3/14/16



Source of Material: B-3 @ 5.0'

Description of Material: SANDY CLAY (CL), Dark Gray

Test Method: ASTM D1557 Method A

TEST RESULTS

Maximum Dry Density: 111.3 PCF

Optimum Water Content: 15.5 %

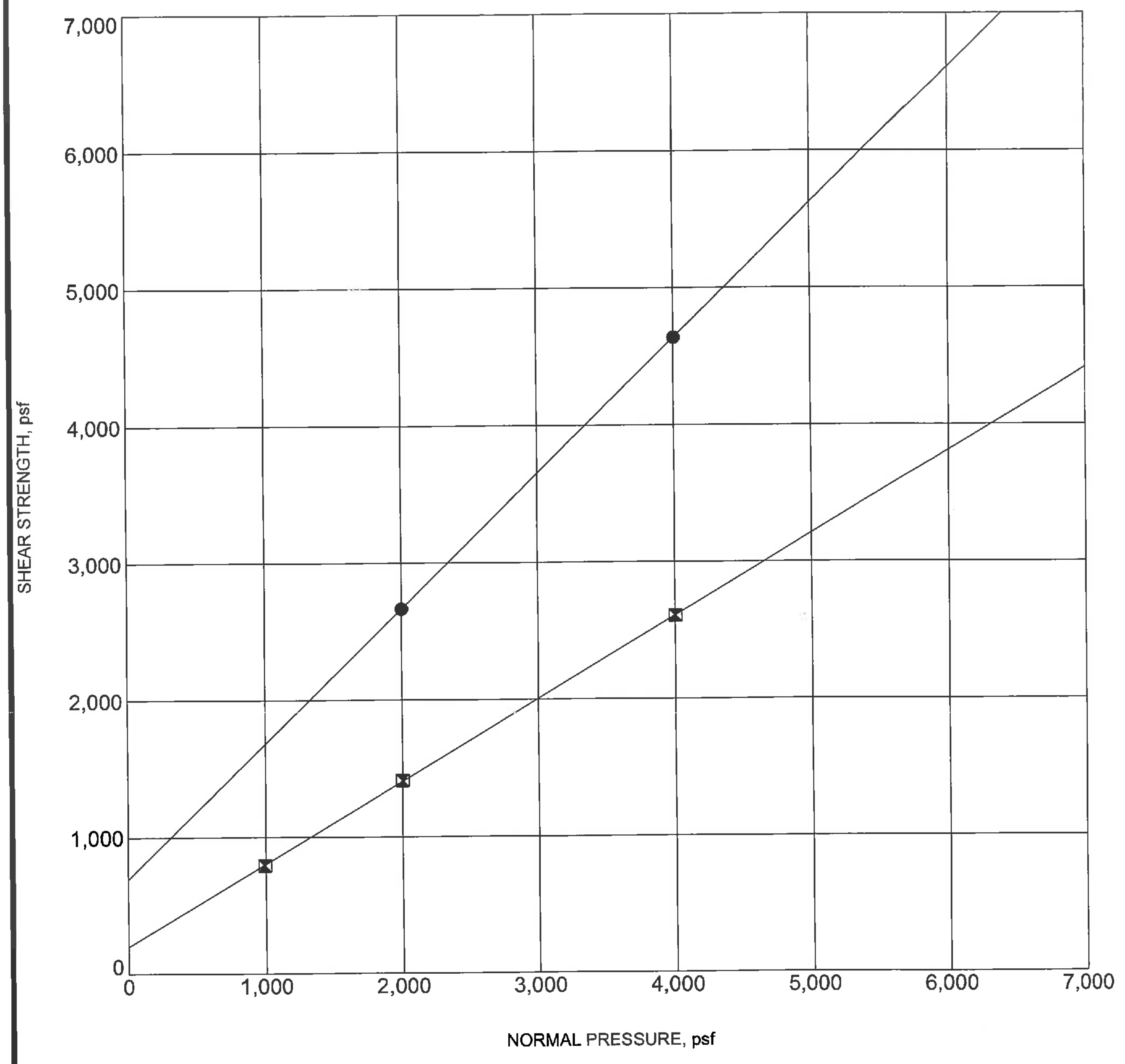
Expansion Index (EI): ______

**Geotechnical Exploration, Inc.**

# MOISTURE-DENSITY RELATIONSHIP

Figure Number: IVa
Job Name: Liaghat Residential Lot
Site Location: West of 7550 Hillside Drive, La Jolla, CA
Job Number: 16-11019

COMPACTION + EI DARK GRID 11019 LIAGHAT.GPJ GEI FEB06.GDT 3/14/16



| Specimen Identification | | Classification | $\gamma_d$ | MC% | c | $\phi$ |
|---|---|---|---|---|---|---|
| ● | **B-2 @ 8.0'** | **SANDY CLAY (CL), Dark Gray** | | | **691** | **45** |
| ☒ | **B-3 @ 3.0'** | **SANDY CLAY (CL), Dark Gray** | | | **199** | **31** |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Geotechnical Exploration, Inc.**

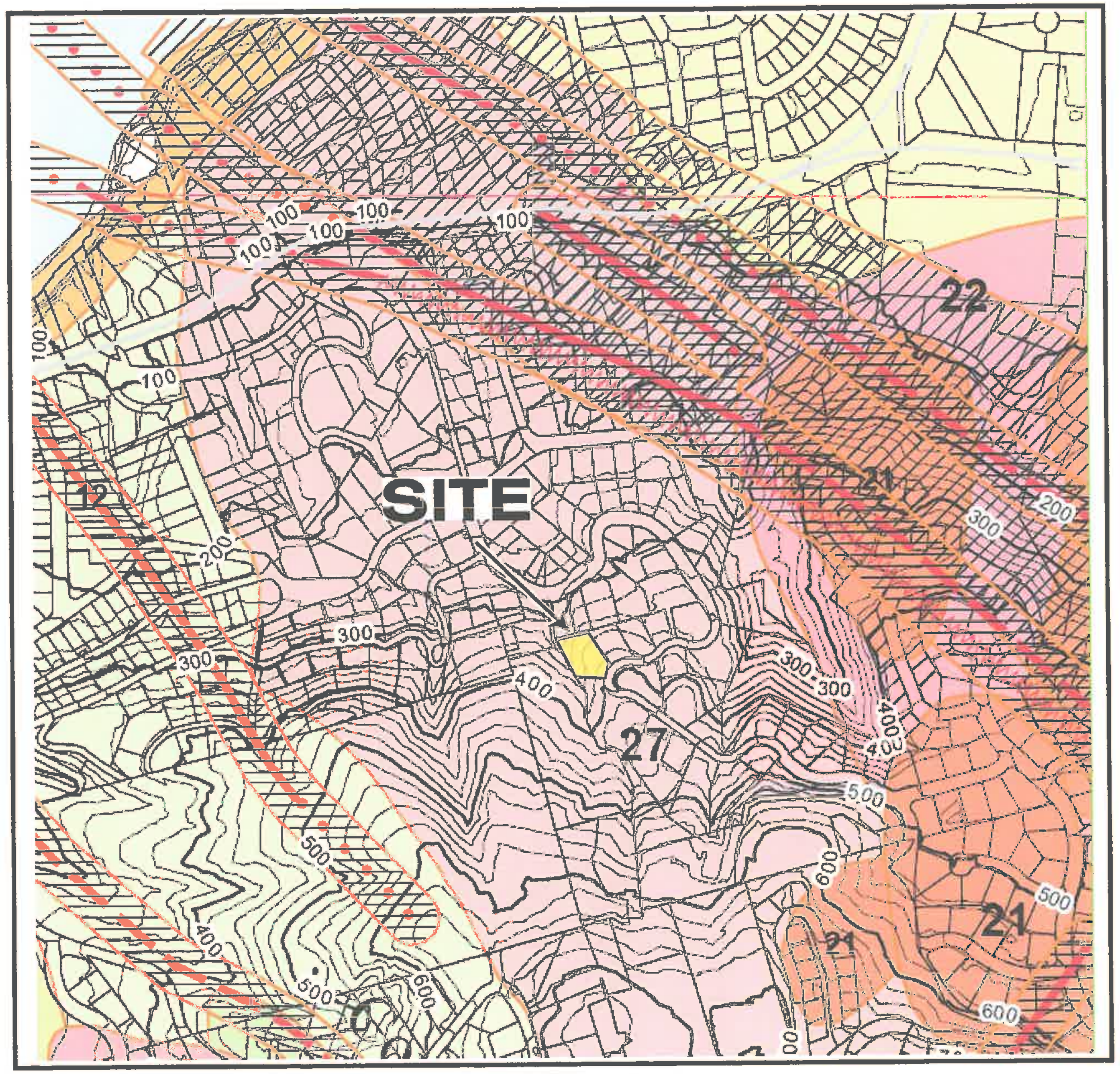
# DIRECT SHEAR TEST

Figure Number: IVb
Job Name: Liaghat Residential Lot
Site Location: West of 7550 Hillside Drive, La Jolla, CA
Job Number: 16-11019

# Geologic Hazards Map Excerpt
# from City of San Diego
# Geologic Hazards and Fault Map
# Sheet 29

Development Services Department

DATE: 4/3/2008



Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

## *LEGEND*

### *Geologic Hazard Categories*

***FAULT ZONES***

- ▨ 11 Active, Alquist-Priolo Earthquake Fault Zone
- ▤ 12 Potentially Active,
  Inactive, Presumed Inactive, or Activity Unknown
- ■ 13 Downtown special fault zone

***LANDSLIDES***

- ■ 21 Confirmed, known, or highly suspected
- ■ 22 Possible or conjectured

***SLIDE-PRONE FORMATIONS***

- ■ 23 Friars: neutral or favorable geologic structure
- ■ 24 Friars: unfavorable geologic structure
- ■ 25 Ardath: neutral or favorable geologic structure
- ■ 26 Ardath: unfavorable geologic structure
- ■ 27 Otay, Sweetwater, and others

***LIQUEFACTION***

- ■ 31 High Potential -- shallow groundwater
  major drainages, hydraulic fills
- □ 32 Low Potential -- fluctuating groundwater
  minor drainages

***COASTAL BLUFFS***

- □ 41 Generally unstable
  Numerous landslides, high steep bluffs,
  severe erosion, unfavorable geologic structure
- □ 42 Generally unstable
  Unfavorable bedding plains, high erosion
- ■ 43 Generally unstable
  Unfavorable jointing, local high erosion
- ■ 44 Moderately stable
  Mostly stable formations, local high erosion
- ■ 45 Moderately stable
  Some minor landslides, minor erosion
- ■ 46 Moderately stable
  Some unfavorable geologic structure, minor or no erosion
- ■ 47 Generally stable
  Favorable geologic structure, minor or no erosion,
  no landslides
- □ 48 Generally stable
  Broad beach areas, developed harbor

***OTHER TERRAIN***

- □ 51 Level mesas -- underlain by terrace deposits and bedrock
  nominal risk
- □ 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
- ■ 54 Steeply sloping terrain, unfavorable or fault controlled
  geologic structure, Moderate risk
- ■ 55 Modified terrain (graded sites)
  Nominal risk

***Water (Bays and Lakes)***

- □

***FAULTS***

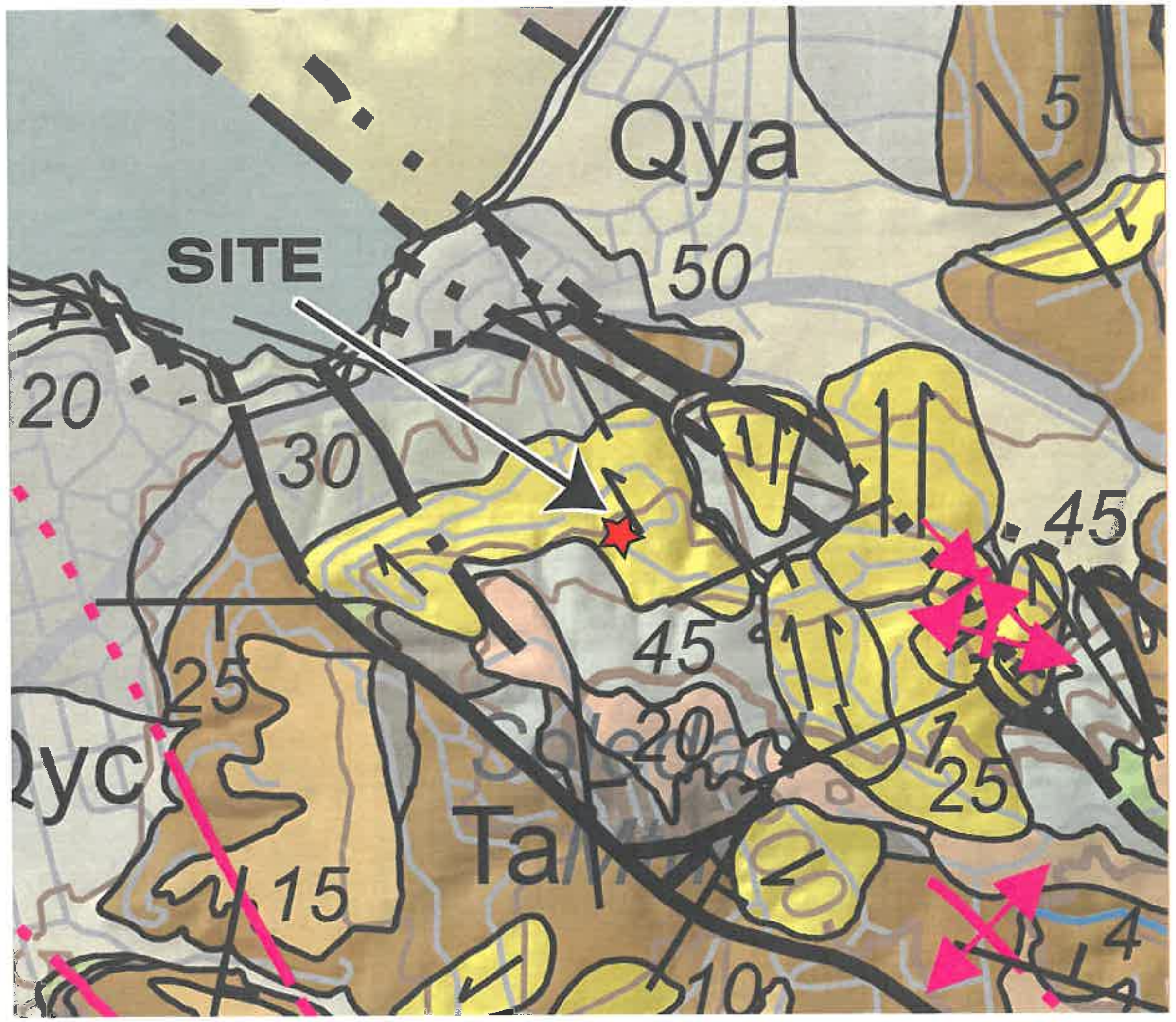
- ⁄⁄ Fault
- ⁄ ⁄ Inferred Fault
- · · Concealed Fault
- ✱ Shear Zone

*Figure No. V*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

April 2016

Liaghat-seis-combo.ai



Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

# EXCERPT FROM GEOLOGIC MAP OF THE SAN DIEGO 30' x 60' QUADRANGLE, CALIFORNIA

By
Michael P. Kennedy[1] and Siang S. Tan[1]
2008
Digital preparation by
Kelly R. Bovard[2], Anne G. Garcia[2], Diane Burns[2], and Carlos I. Gutierrez[1]
1. Department of Conservation, California Geological Survey
2. U.S. Geological Survey, Department of Earth Sciences, University of California, Riverside

## ONSHORE MAP SYMBOLS

Contact - Contact between geologic units; dotted where concealed.

70 U D Fault - Solid where accurately located; dashed where approximately located; dotted where concealed. U = upthrown block, D = downthrown block. Arrow and number indicate direction and angle of dip of fault plane.

Anticline - Solid where accurately located; dashed where approximately located; dotted where concealed. Arrow indicates direction of axial plunge.

Syncline - Solid where accurately located; dotted where concealed. Arrow indicates direction of axial plunge.

Qls? Landslide - Arrows indicate principal direction of movement. Queried where existence is questionable.

Strike and dip of beds

70 Inclined

Strike and dip of igneous joints

80 Inclined

Vertical

Strike and dip of metamorphic foliation

55 Inclined

## DESCRIPTION OF MAP UNITS

| | |
|---|---|
| Qls | **Landslide deposits undivided (Holocene and Pleistocene)**—Highly fragmented to largely coherent landslide deposits. Unconsolidated to moderately well consolidated. Most mapped landslides contain scarp area as well as slide deposit. Many Pleistocene age landslides were reactivated in part or entirely during late Holocene |

Base Map

Onshore base (hypsography, hydrography and transportation) from U.S.G.S. digital line graph (DLG) data, San Diego 30' x 60' metric quadrangle. Shaded topographic base from U.S.G.S. digital elevation models (DEM's). Offshore bathymetric contours and shaded bathymetry from N.O.A.A. single and multibeam data. Projection is UTM, zone 11, North American Datum 1927.

This map was funded in part by the U.S. Geological Survey National Cooperative Geologic Mapping Program, STATEMAP Award no. 98HQAG2048.

Prepared in cooperation with the U.S. Geological Survey, Southern California Areal Mapping Project.

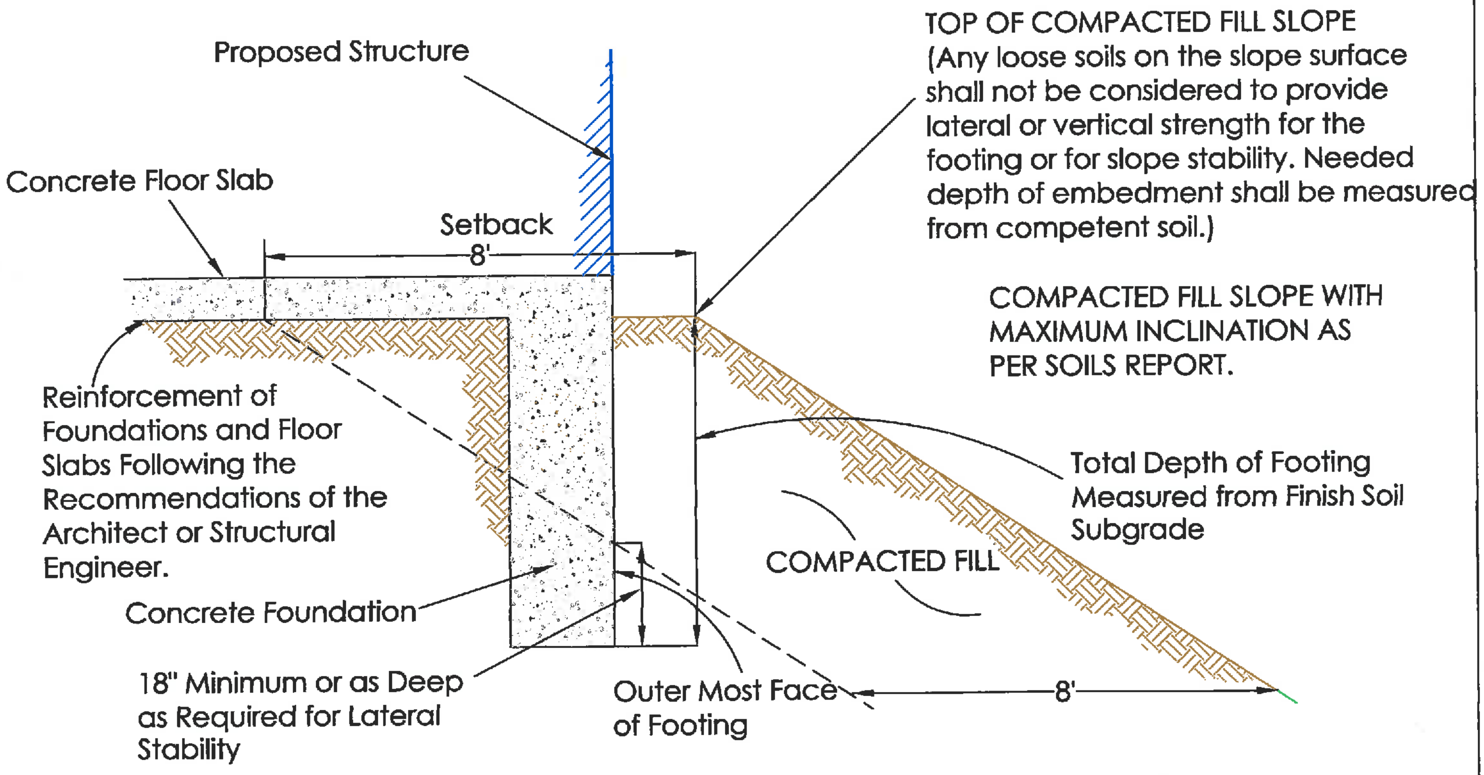
Liaghat-2008-geo.ai

*Figure No. VI*
*Job No. 16-11019*

Geotechnical Exploration, Inc.

April 2016

# FOUNDATION REQUIREMENTS NEAR SLOPES



## TYPICAL SECTION

( Showing Proposed Foundation Located Within 8 Feet of Top of Slope )

## 18" FOOTING / 8' SETBACK

Total Depth of Footing

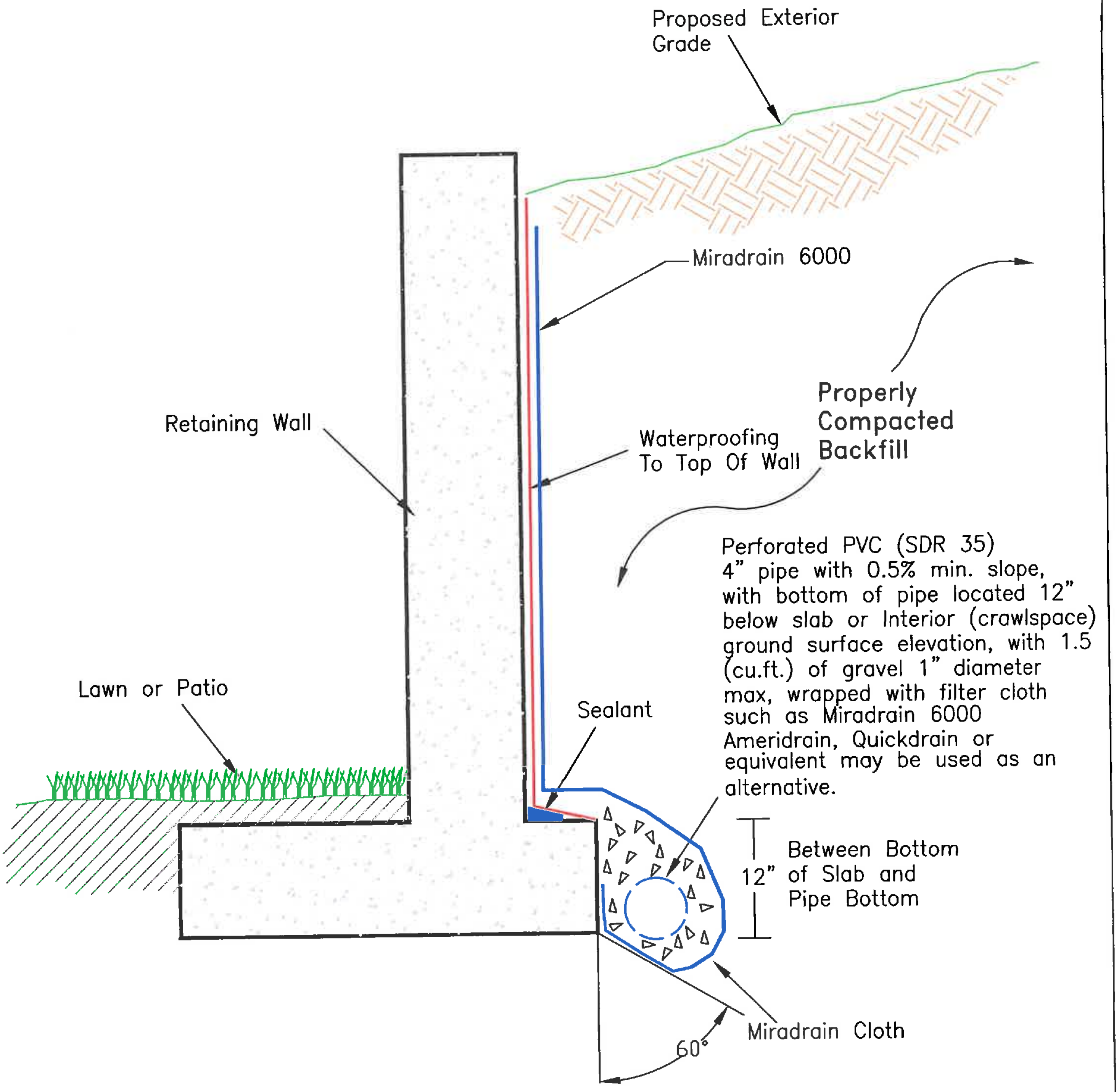
| Distance From Top of Slope | 1.5:1.0 SLOPE * | 2.0:1.0 SLOPE |
|---|---|---|
| 0 | 82" | 66" |
| 2' | 66" | 54" |
| 4' | 51" | 42" |
| 6' | 34" | 30" |
| 8' | 18" | 18" |

* when applicable

*Figure No. VIII*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

# SCHEMATIC RETAINING WALL SUBDRAIN RECOMMENDATIONS



Perforated PVC (SDR 35) 4" pipe with 0.5% min. slope, with bottom of pipe located 12" below slab or Interior (crawlspace) ground surface elevation, with 1.5 (cu.ft.) of gravel 1" diameter max, wrapped with filter cloth such as Miradrain 6000 Ameridrain, Quickdrain or equivalent may be used as an alternative.

**NOT TO SCALE**

*Figure No. IX*
*Job No. 16-11019*

NOTE: As an option to Miradrain 6000, Gravel or Crushed rock 3/4" maximum diameter may be used with a minimum 12" thickness along the interior face of the wall and 2.0 cu.ft./ft. of pipe gravel envelope.

**Geotechnical Exploration, Inc.**

*April 2016*

# APPENDIX A
# UNIFIED SOIL CLASSIFICATION CHART
# SOIL DESCRIPTION

**Coarse-grained (More than half of material is larger than a No. 200 sieve)**

| | | |
|---|---|---|
| GRAVELS, CLEAN GRAVELS (More than half of coarse fraction is larger than No. 4 sieve size, but smaller than 3") | GW | Well-graded gravels, gravel and sand mixtures, little or no fines. |
| | GP | Poorly graded gravels, gravel and sand mixtures, little or no fines. |
| GRAVELS WITH FINES (Appreciable amount) | GC | Clay gravels, poorly graded gravel-sand-silt mixtures |
| SANDS, CLEAN SANDS (More than half of coarse fraction is smaller than a No. 4 sieve) | SW | Well-graded sand, gravelly sands, little or no fines |
| | SP | Poorly graded sands, gravelly sands, little or no fines. |
| SANDS WITH FINES (Appreciable amount) | SM | Silty sands, poorly graded sand and silty mixtures. |
| | SC | Clayey sands, poorly graded sand and clay mixtures. |

**Fine-grained (More than half of material is smaller than a No. 200 sieve)**

SILTS AND CLAYS

| | | |
|---|---|---|
| *Liquid Limit Less than 50* | ML | Inorganic silts and very fine sands, rock flour, sandy silt and clayey-silt sand mixtures with a slight plasticity |
| | CL | Inorganic clays of low to medium plasticity, gravelly clays, silty clays, clean clays. |
| | OL | Organic silts and organic silty clays of low plasticity. |
| *Liquid Limit Greater than 50* | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. |
| | CH | Inorganic clays of high plasticity, fat clays. |
| | OH | Organic clays of medium to high plasticity. |
| HIGHLY ORGANIC SOILS | PT | Peat and other highly organic soils |

(rev. 6/05)

# USGS Design Maps Summary Report

## User–Specified Input

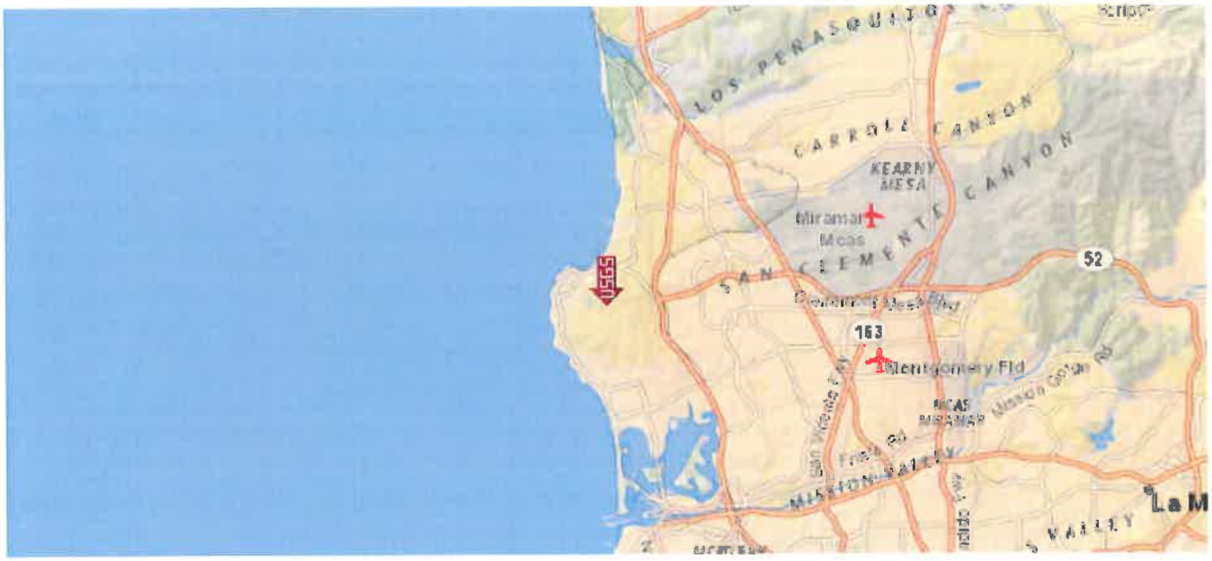
**Report Title** Liaghat Residential Lot
Thu March 17, 2016 22:05:53 UTC

**Building Code Reference Document** ASCE 7-10 Standard
(which utilizes USGS hazard data available in 2008)

**Site Coordinates** 32.8452°N, 117.2578°W

**Site Soil Classification** Site Class D – "Stiff Soil"

**Risk Category** I/II/III

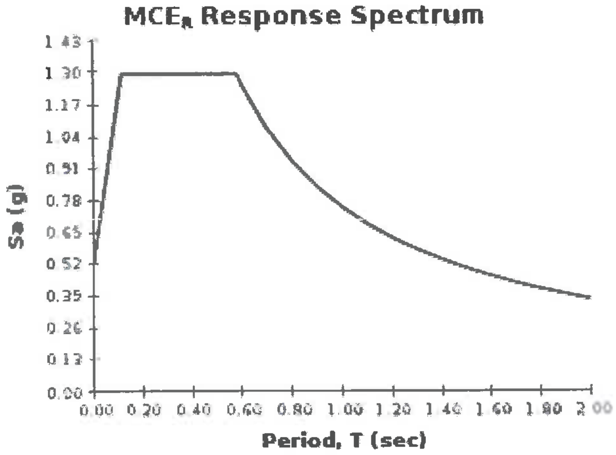


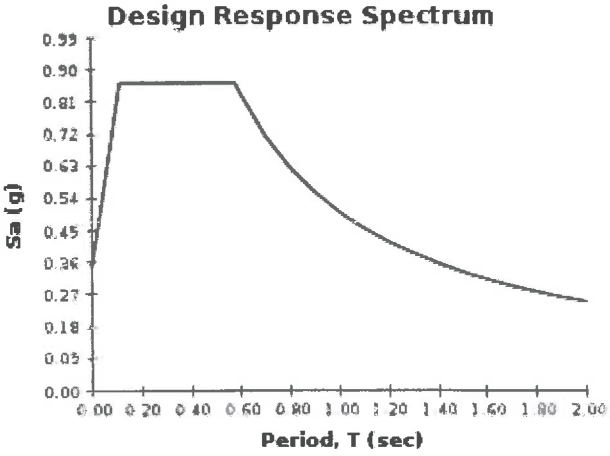
## USGS–Provided Output

$S_S =$ 1.292 g    $S_{MS} =$ 1.292 g    $S_{DS} =$ 0.862 g

$S_1 =$ 0.500 g    $S_{M1} =$ 0.750 g    $S_{D1} =$ 0.500 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.

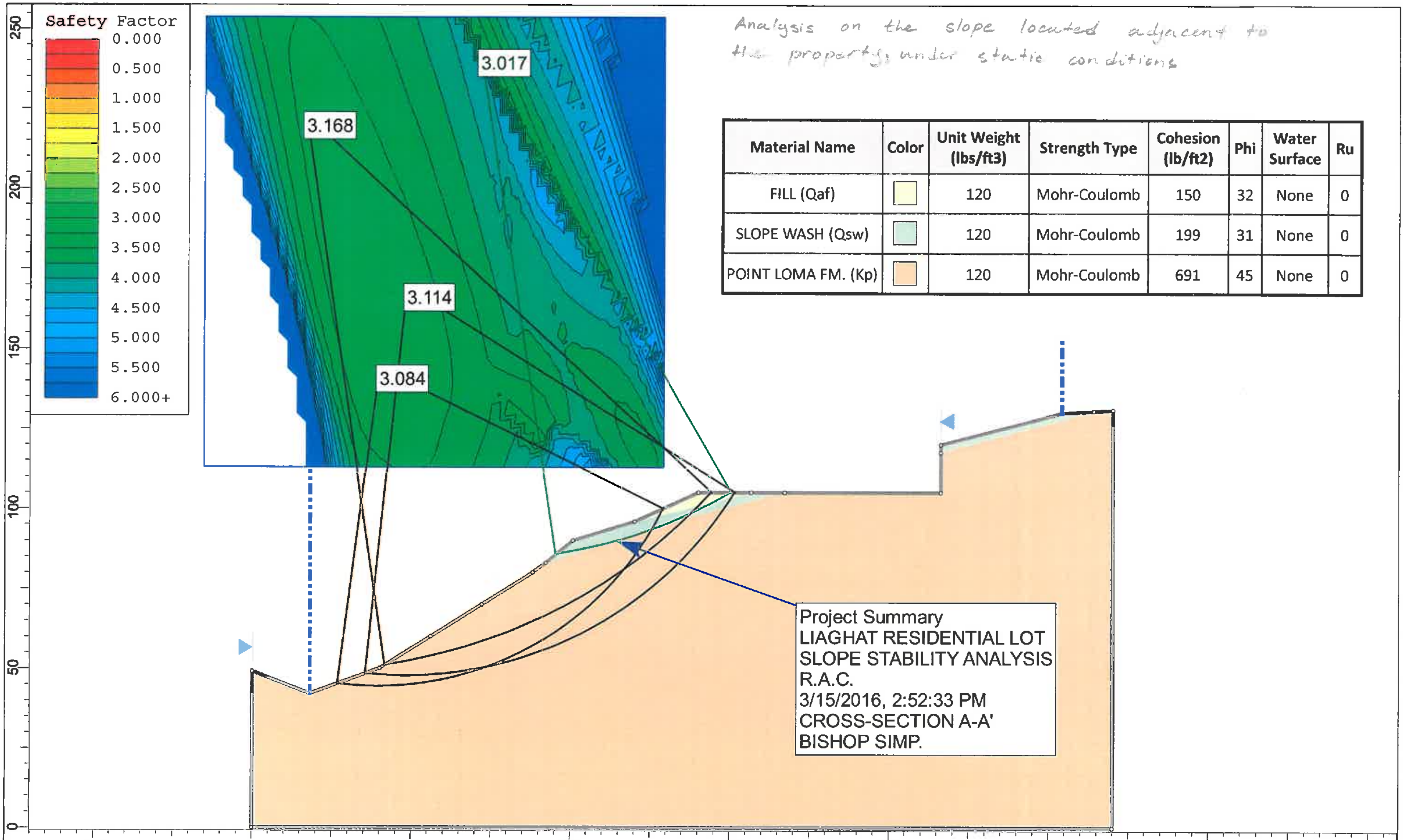




For $PGA_M$, $T_L$, $C_{RS}$, and $C_{R1}$ values, please view the detailed report.

# APPENDIX C

Analysis on the slope located adjacent to the property under static conditions

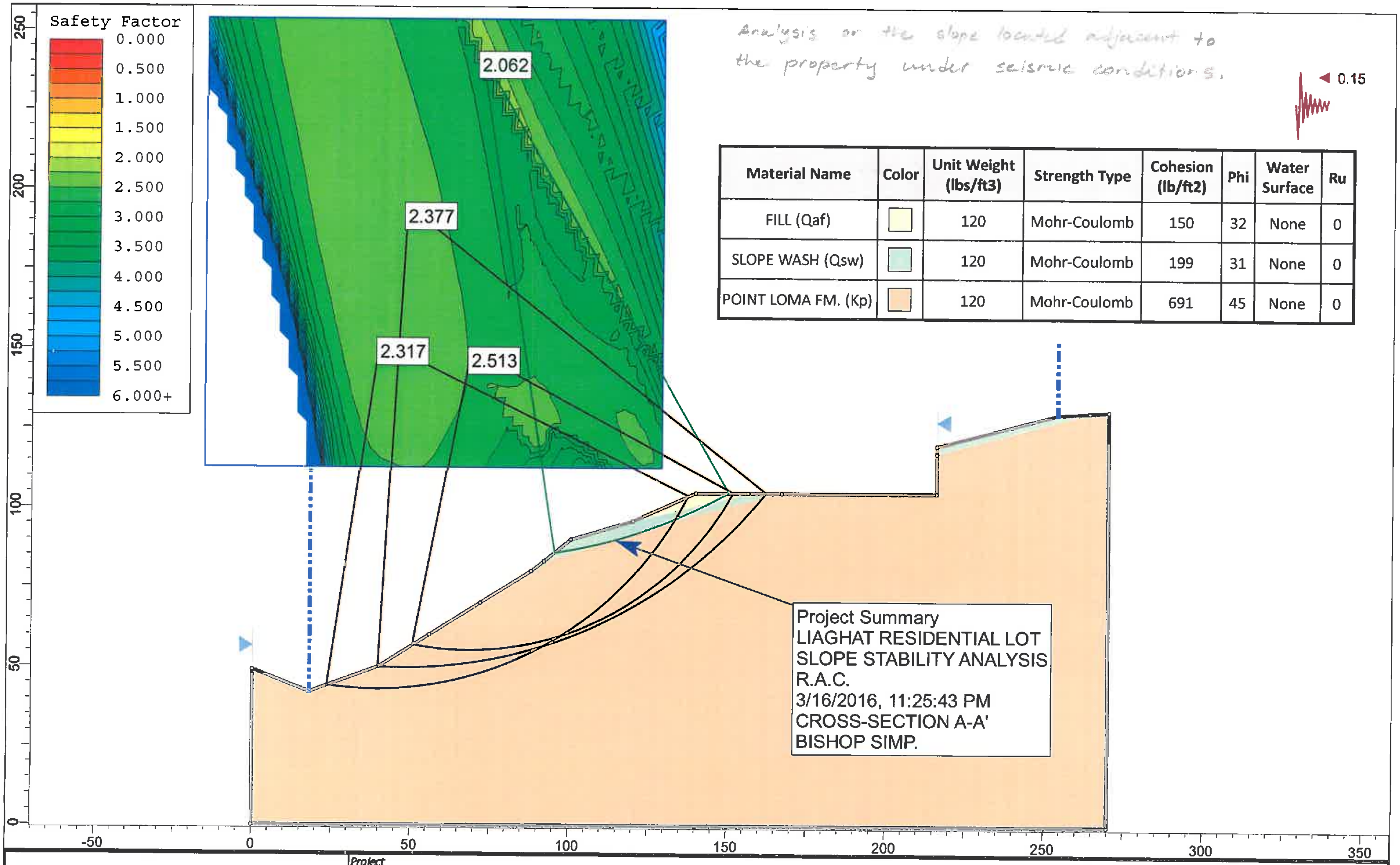


| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/15/2016, 2:52:33 PM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience
SLIDEINTERPRET 6.005

Project
LIAGHAT RESIDENTIAL LOT
Analysis Description
SLOPE STABILITY ANALYSIS
Drawn By R.A.C.
Scale 1:500
Company
Date 3/15/2016, 2:52:33 PM
File Name JOB NO. 16-11019A01.slim



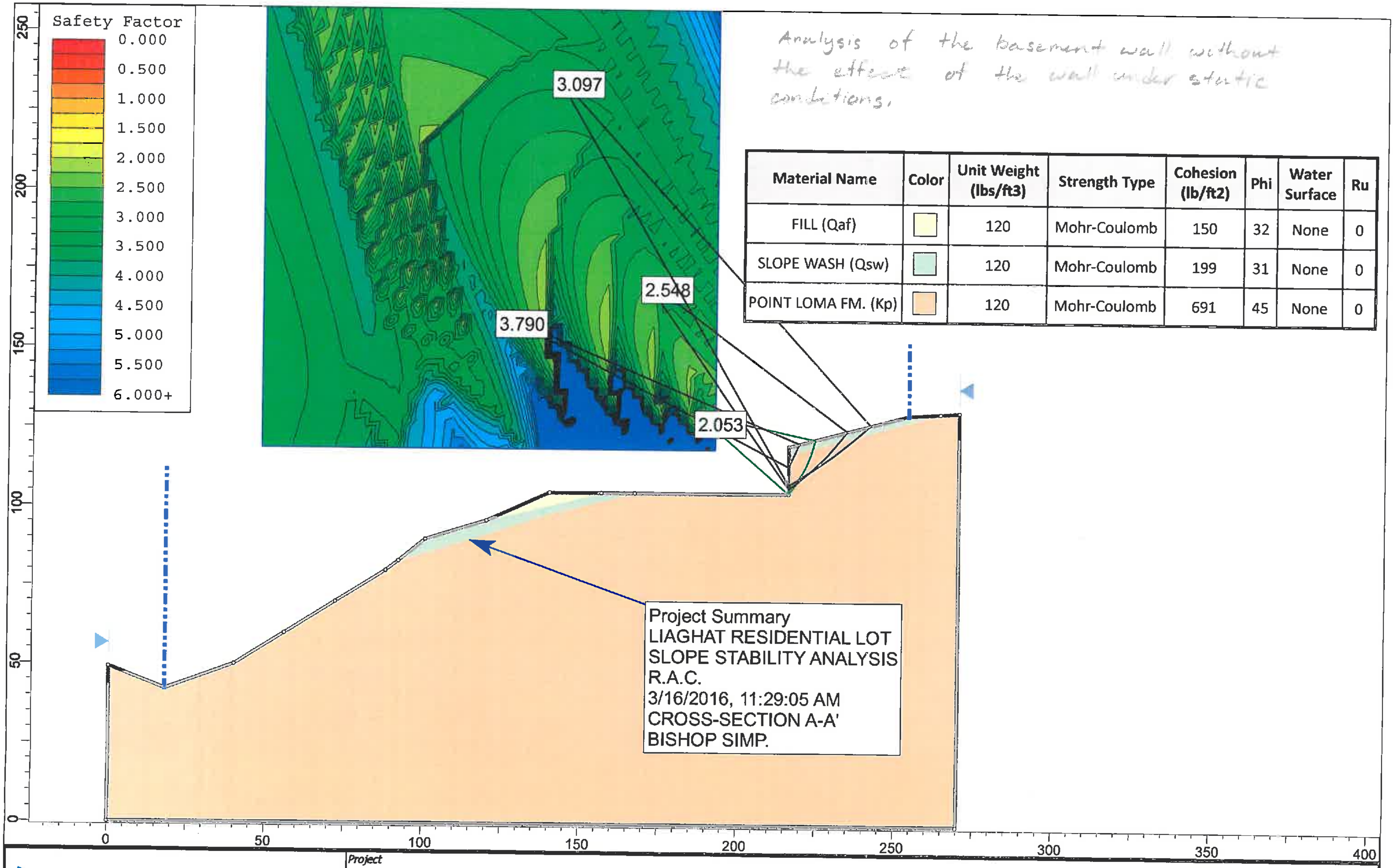
Analysis on the slope located adjacent to the property under seismic conditions.

| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | ☐ | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | ☐ | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | ☐ | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:25:43 PM
CROSS-SECTION A-A'
BISHOP SIMP.

| | |
|---|---|
| Project | LIAGHAT RESIDENTIAL LOT |
| Analysis Description | SLOPE STABILITY ANALYSIS |
| Drawn By | R.A.C. |
| Scale | 1:500 |
| Company | |
| Date | 3/16/2016, 11:25:43 PM |
| File Name | JOB NO. 16-11019A01w_0.15gSHAKE.slim |

SLIDEINTERPRET 6.005



Analysis of the basement wall without the effect of the wall under static conditions.

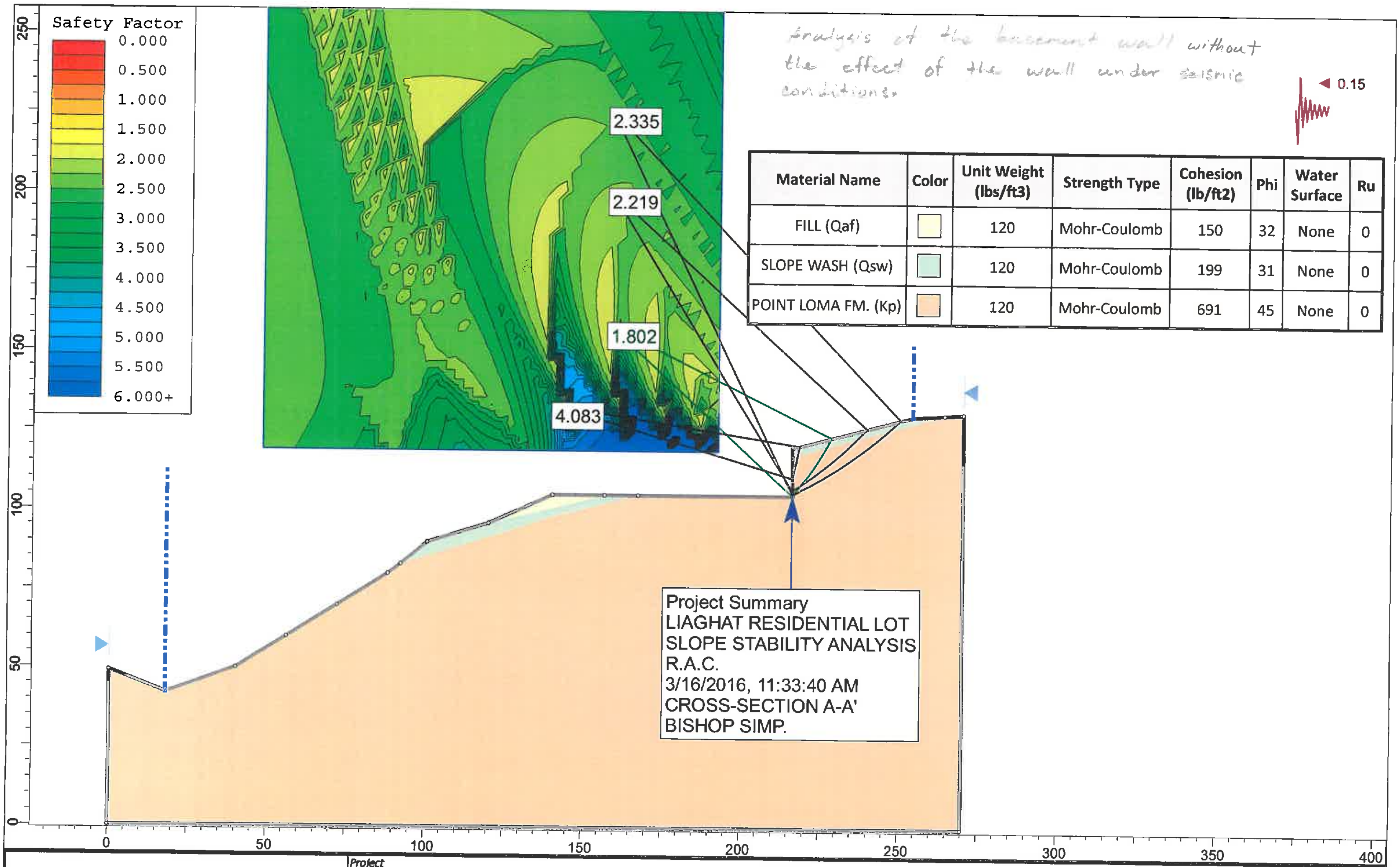
| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:29:05 AM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

SLIDEINTERPRET 6.005

Project: LIAGHAT RESIDENTIAL LOT
Analysis Description: SLOPE STABILITY ANALYSIS
Drawn By: R.A.C.
Scale: 1:500
Company:
Date: 3/16/2016, 11:29:05 AM
File Name: JOB NO. 16-11019A02.slim



Analysis of the basement wall without the effect of the wall under seismic conditions.

| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

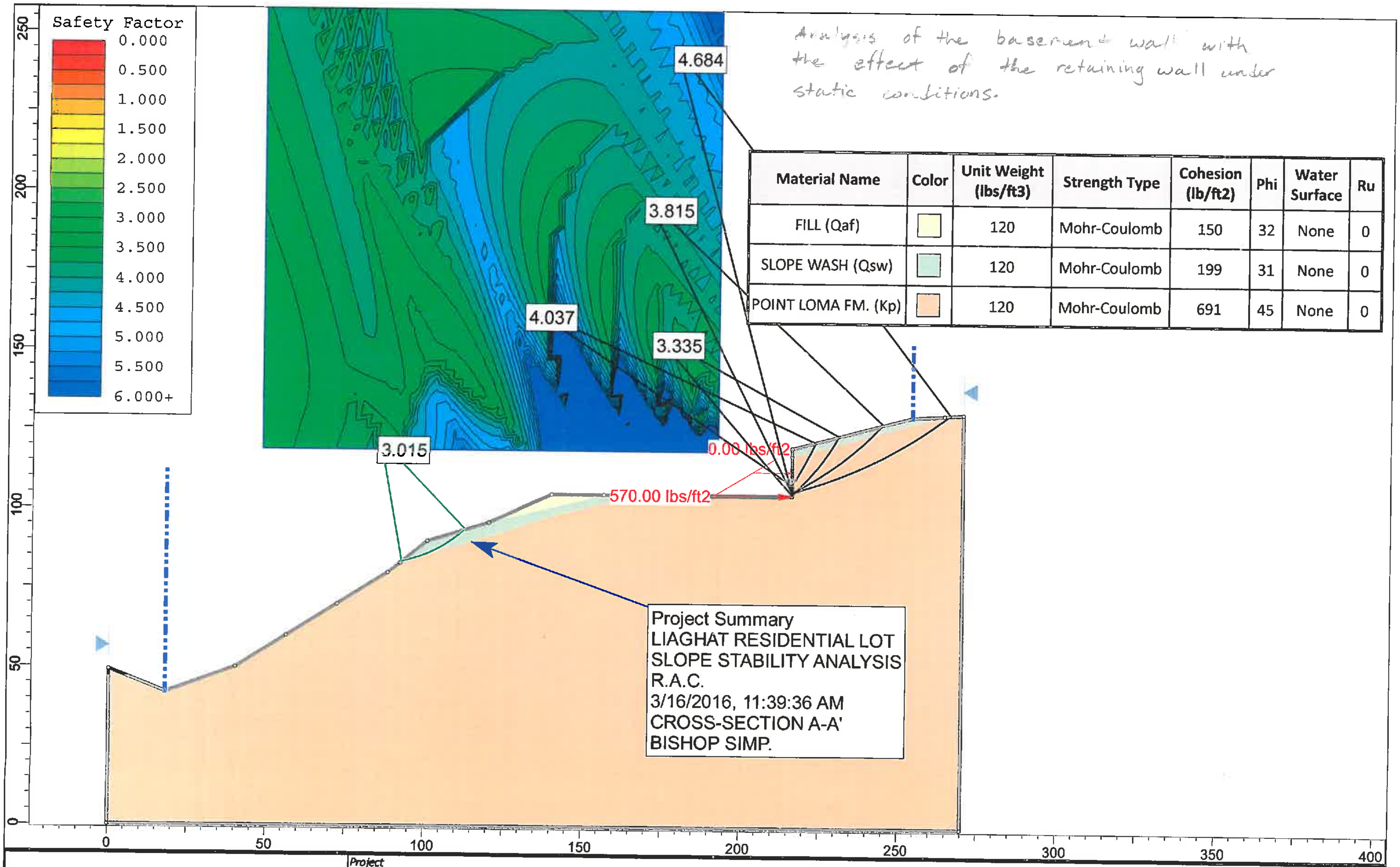
Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:33:40 AM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

SLIDEINTERPRET 6.005

| | | | |
|---|---|---|---|
| Project | LIAGHAT RESIDENTIAL LOT | | |
| Analysis Description | SLOPE STABILITY ANALYSIS | | |
| Drawn By R.A.C. | Scale 1:500 | Company | |
| Date 3/16/2016, 11:33:40 AM | | File Name | JOB NO. 16-11019A02w_0.15gSHAKE.slim |

Analysis of the basement wall with the effect of the retaining wall under static conditions.



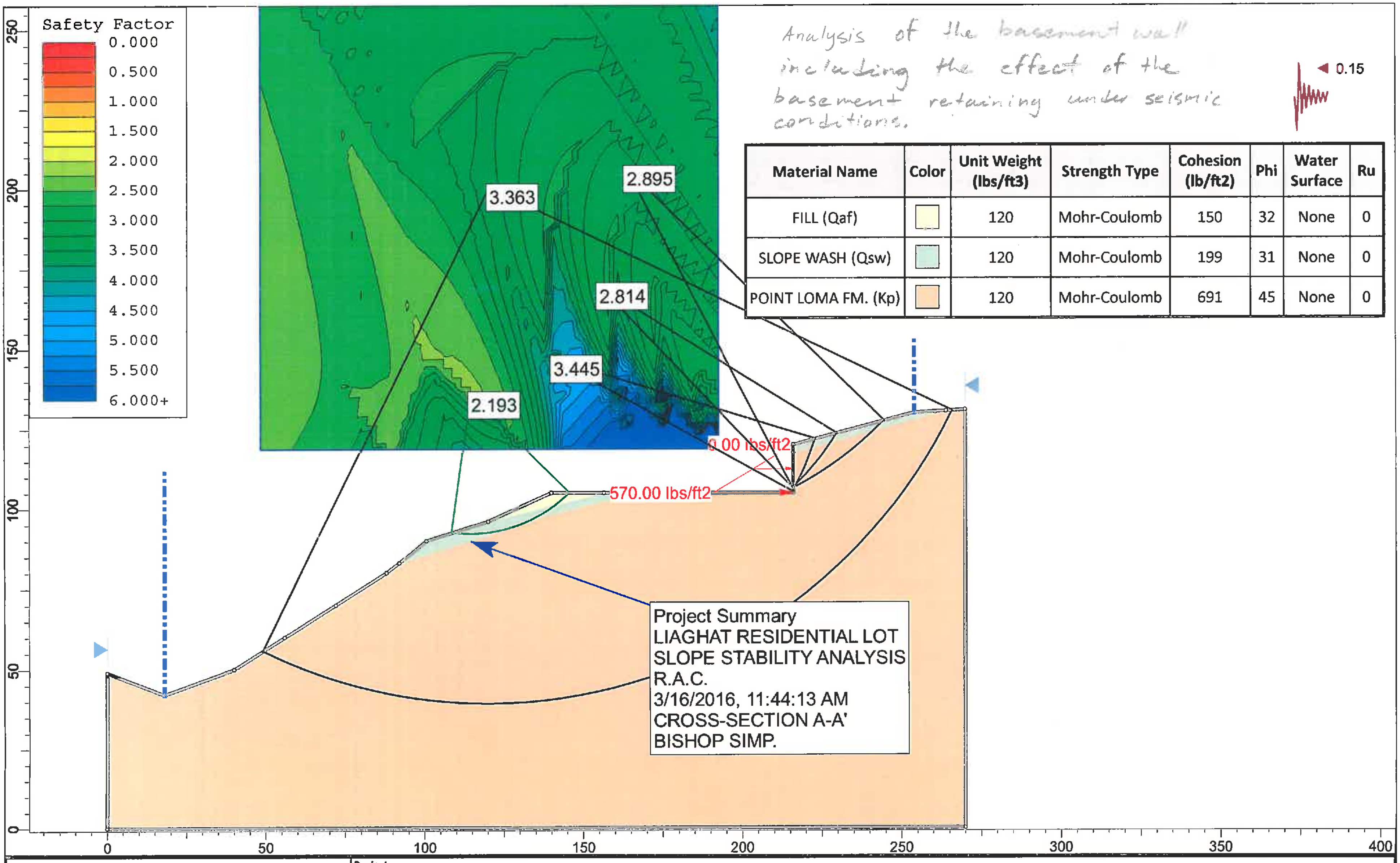
| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:39:36 AM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

SLIDEINTERPRET 6.005

| | | | |
|---|---|---|---|
| *Project* | LIAGHAT RESIDENTIAL LOT | | |
| *Analysis Description* | SLOPE STABILITY ANALYSIS | | |
| *Drawn By* | R.A.C. | *Scale* 1:500 | *Company* |
| *Date* | 3/16/2016, 11:39:36 AM | *File Name* | JOB NO. 16-11019A03.slim |



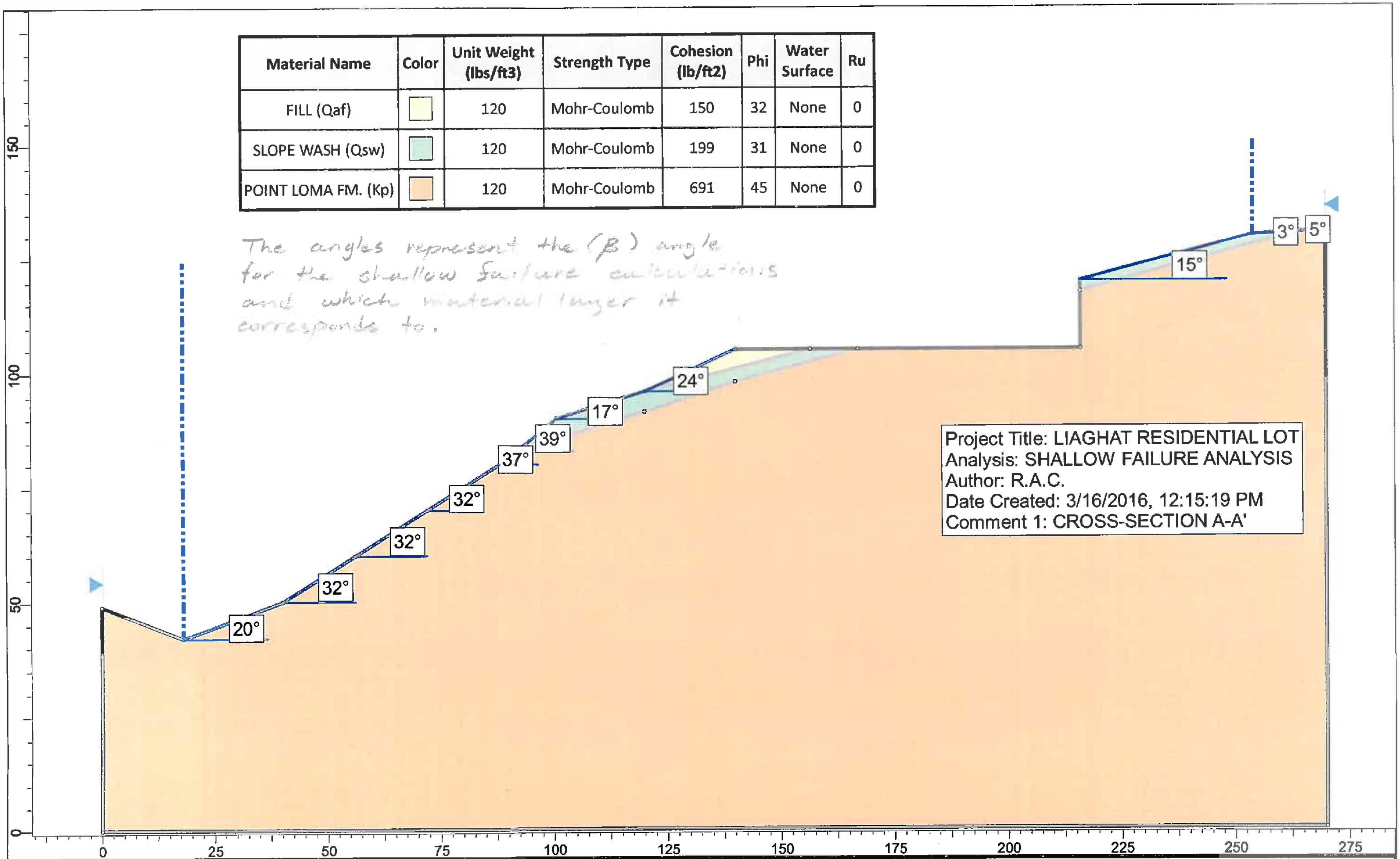
Analysis of the basement wall including the effect of the basement retaining under seismic conditions.

| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:44:13 AM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience
SLIDEINTERPRET 6.005

Project: LIAGHAT RESIDENTIAL LOT
Analysis Description: SLOPE STABILITY ANALYSIS
Drawn By: R.A.C.
Scale: 1:500
Company:
Date: 3/16/2016, 11:44:13 AM
File Name: JOB NO. 16-11019A03w_0.15gSHAKE.slim



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | ☐ | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

The angles represent the (β) angle for the shallow failure calculations and which material layer it corresponds to.

Project Title: LIAGHAT RESIDENTIAL LOT
Analysis: SHALLOW FAILURE ANALYSIS
Author: R.A.C.
Date Created: 3/16/2016, 12:15:19 PM
Comment 1: CROSS-SECTION A-A'

rocscience

SLIDE 6.005

| | | | |
|---|---|---|---|
| Project | LIAGHAT RESIDENTIAL LOT | | |
| Analysis Description | SHALLOW FAILURE ANALYSIS | | |
| Drawn By | R.A.C. | Scale | 1:350 |
| Company | | | |
| Date | 3/16/2016, 12:15:19 PM | File Name | JOB NO. 16-11019A_SHALLOWFAILURE.slim |

## SHALLOW FAILURE

| $\gamma_{sat}$ | $\gamma_{water}$ | $\gamma'$ | H |
|---|---|---|---|
| pcf | pcf | pcf | ft |
| 130 | 62.4 | 67.6 | 3 |

**EQUATION 1**

$$F.S. = \left(\frac{C}{\gamma_{sat} \times H \times \cos^2(\beta)\tan(\beta)}\right) + \left(\frac{\gamma'}{\gamma_{sat}} * \frac{\tan(\varphi)}{\tan(\beta)}\right)$$

SHALLOW SLOPE STABILITY ANALYSIS IS BASED ON EQUATION (1) FOR THE CALCULATED VALUES.

**CROSS-SECTION A-A'**

| SOIL TYPE | C (psf) | ϕ(°) | β(°) | F.S. |
|---|---|---|---|---|
| Kp | 691 | 45 | 5 | 26.350 |
| Qsw | 199 | 31 | 3 | 15.725 |
| Qsw | 199 | 31 | 15 | 3.207 |
| Qaf | 150 | 32 | 24 | 1.765 |
| Qsw | 199 | 31 | 17 | 2.847 |
| Qsw | 199 | 31 | 39 | 1.429 |
| Kp | 691 | 45 | 37 | 4.376 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 20 | 6.942 |

The City of San Diego

# PRIORITY DEVELOPMENT PROJECT (PDP) STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) FOR

Liaghat Hillside Residence
Insert Permit Application Numbers
Drawing Number (If Applicable) & Internal Order Number (If Applicable)

**ENGINEER OF WORK:**

Insert Civil Engineer's Name and PE Nubmer Here
Provide Wet Signature and Stamp Above Line

**PREPARED FOR:**
Hamid Liaghat
1469 Caminito Halago
La Jolla, CA 92037
858-717-5375

**PREPARED BY:**

Insert Company Logo

Meriam Chihwaro
Insert Address
Insert City, State, Zip Code
Insert Telephone Number

**DATE:**
April 8, 2017

Approved by: City of San Diego Date

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## TABLE OF CONTENTS

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## ACRONYMS

| | |
|---|---|
| APN | Assessor's Parcel Number |
| ASBS | Area of Special Biological Significance |
| BMP | Best Management Practice |
| CEQA | California Environmental Quality Act |
| CGP | Construction General Permit |
| DCV | Design Capture Volume |
| DMA | Drainage Management Areas |
| ESA | Environmentally Sensitive Area |
| GLU | Geomorphic Landscape Unit |
| GW | Ground Water |
| HMP | Hydromodification Management Plan |
| HSG | Hydrologic Soil Group |
| HU | Harvest and Use |
| INF | Infiltration |
| LID | Low Impact Development |
| LUP | Linear Underground/Overhead Projects |
| MS4 | Municipal Separate Storm Sewer System |
| N/A | Not Applicable |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| PDP | Priority Development Project |
| PE | Professional Engineer |
| POC | Pollutant of Concern |
| SC | Source Control |
| SD | Site Design |
| SDRWQCB | San Diego Regional Water Quality Control Board |
| SIC | Standard Industrial Classification |
| SWPPP | Stormwater Pollutant Protection Plan |
| SWQMP | Storm Water Quality Management Plan |
| TMDL | Total Maximum Daily Load |
| WMAA | Watershed Management Area Analysis |
| WPCP | Water Pollution Control Program |
| WQIP | Water Quality Improvement Plan |

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## CERTIFICATION PAGE

**Project Name:** Liaghat Hillside Residence
**Permit Application Number:** Insert Permit Application Number

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Standards. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Engineer of Work's Signature, PE Number & Expiration Date

Click or tap here to enter text.
Print Name

Click or tap here to enter text.
Company

Insert Date
Date

Engineer's Stamp

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## SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments.

| Submittal Number | Date | Project Status | Changes |
|---|---|---|---|
| **1** | 4/10/17 | ● Preliminary Design/Planning/CEQA<br>○ Final Design | Initial Submittal |
| **2** | Enter a date. | ○ Preliminary Design/Planning/CEQA<br>● Final Design | Click here to enter text. |
| **3** | Enter a date. | ○ Preliminary Design/Planning/CEQA<br>● Final Design | Click here to enter text. |
| **4** | Enter a date. | ○ Preliminary Design/Planning/CEQA<br>● Final Design | Click here to enter text. |

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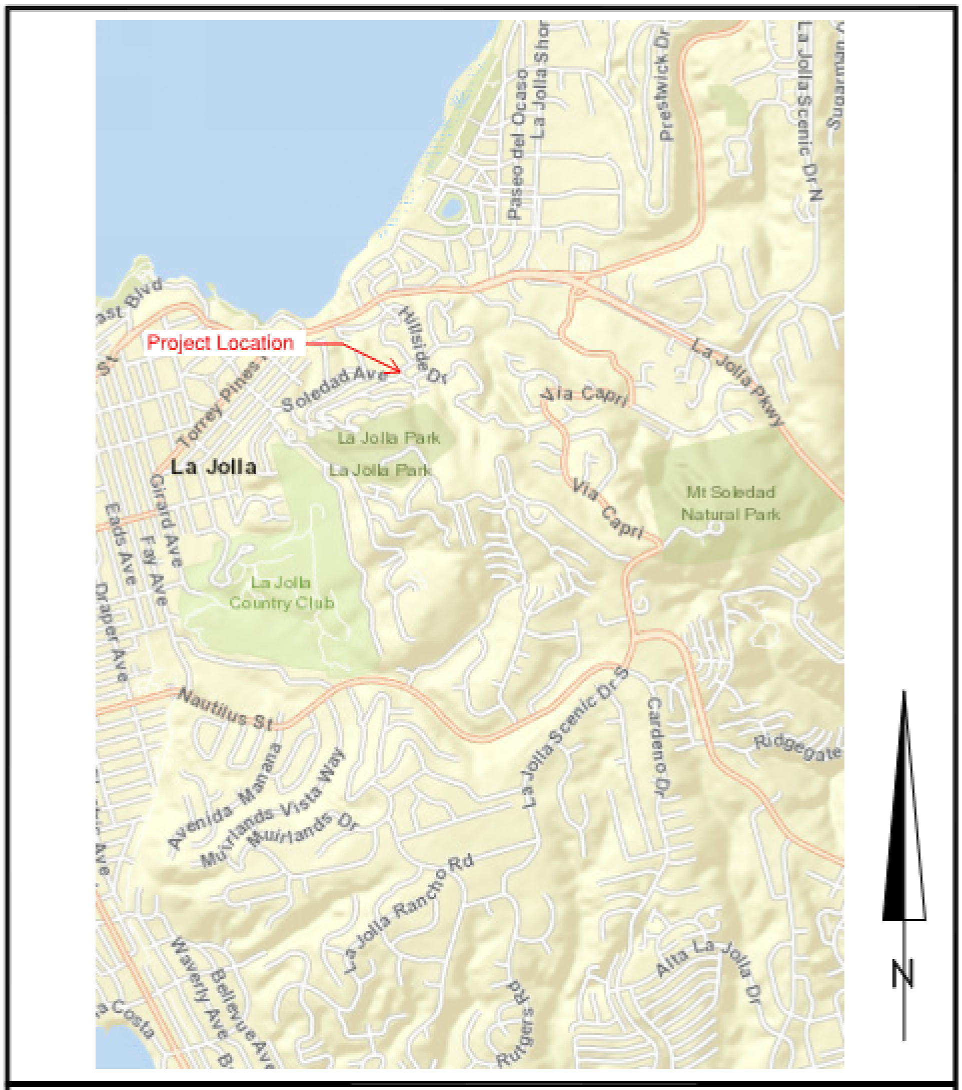
## PROJECT VICINITY MAP

**Project Name:** Liaghat Hillside Residence
**Permit Application Number:** Insert Application Number.



VICINITY MAP

Liaghat Hillside Residence
7500 Block of Hillside Drive
La Jolla, California 92037

MRC

DATE: April 2017

FIG 1

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THE CITY OF SAN DIEGO

City of San Diego
**Development Services**
1222 First Ave., MD-302
San Diego, CA 92101
(619) 446-5000

# Storm Water Requirements Applicability Checklist

FORM
**DS-560**
February 2016

| | |
|---|---|
| Project Address:<br>Click here to enter project address. | Project Number *(for the City Use Only)*:<br>Click here to enter project number |

## SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1], which is administrated by the State Water Resources Control Board.

**For all projects complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.**

### PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with construction activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ● Yes; SWPPP required, skip questions 2-4 ○ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?

   ● Yes; WPCP required, skip questions 3-4 ○ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (projects such as pipeline/utility replacement)

   ● Yes; WPCP required, skip questions 4 ○ No; next question

4. Does the project only include the following Permit types listed below?
   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include one of the following activities and associated curb/ sidewalk repair: water services, sewer lateral, storm drain lateral, or dry utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, curb and gutter replacement, and retaining wall encroachments.

   ☐ Yes; no document required

Check one of the boxes to the right, and continue to PART B:

☐ If you checked "Yes" for question 1,
**a SWPPP is REQUIRED. Continue to PART B**

☐ If you checked "No" for question 1, and checked "Yes" for question 2 or 3,
**a WPCP is REQUIRED.** If the project processes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

☐ If you checked "No" for all question 1-3, and checked "Yes" for question 4
PART B **does not apply and no document is required. Continue to Section 2.**

More information on the City's construction BMP requirements as well as CGP requirements can be found at:
www.sandiego.gov/stormwater/regulations/swguide/constructing.shtml

**PART B: Determine Construction Site Priority.**

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk. Determination approach of the Stat e Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

**Complete PART B and continued to Section 2**

1. ☐ **ASBS**
   a. Projects located in the ASBS watershed. A map of the ASBS watershed can he found here *<placeholder for ASBS map link>*

2. ☐ **High Priority**
   a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.
   b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.

3. ☐ **Medium Priority**
   a. Projects 1 acre or more but not subject to an ASBS or high priority designation.
   b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.

4. ☐ **Low Priority**
   a. Projects not subject to ASBS, high or medium priority designation.

**SECTION 2. Permanent Storm Water BMP Requirements.**

Additional information for determining the requirements is found in the Storm Water Standards Manual.

**PART C: Determine if Not Subject to Permanent Storm Water Requirements.**

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

**If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".**

**If "no" is checked for all of the numbers in Part C continue to Part D.**

| | | |
|---|---|---|
| 1. | Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water? | ○ Yes ● No |
| 2. | Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces? | ● Yes ○ No |
| 3. | Does the project fall under routine maintenance? Examples include, but are not limited to:<br>roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair). | ● Yes ○ No |

**PART D: PDP Exempt Requirements.**

**PDP Exempt projects are required to implement site design and source control BMPs.**

**If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."**
**If "no" was checked for all questions in Part D, continue to Part E.**

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:

   - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   - Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
   - Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?

   ● Yes; PDP exempt requirements apply ○ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ● Yes; PDP exempt requirements apply ○ No; PDP not exempt. PDP requirements apply.

**PART E: Determine if Project is a Priority Development Project (PDP).** Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

**If "yes" is checked for any number in PART E, continue to PART F and check the box labeled "Priority Development Project".**
**If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Project".**

1. **New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ○ Yes ● No

2. **Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ○ Yes ● No

3. **New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface. ○ Yes ● No

4. **New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater. ○ Yes ● No

**Page 4 of 4 City of San Diego • Development Services Department • Storm Water Requirements Applicability Checklist**

5. **New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).** ○ Yes ● No

6. **New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site). ○ Yes ● No

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging- directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ○ Yes ● No

8. **New development or redevelopment projects of a retail gasoline outlet that creates and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic of 100 or more vehicles per day. ○ Yes ● No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ○ Yes ● No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ○ Yes ● No

**PART F: Select the appropriate category based on the outcomes of PART C through PART E.**

1. The project is **NOT SUBJECT TO STORM WATER REQUIREMENTS**. ☐
2. The project is a **STANDARD PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☐
3. The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☐
4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires hydromodification management. ☐

Name of Owner or Agent *(Please Print):* Click here to enter name.

Title: Click here to enter title

Signature:

Date: Insert Date

| Applicability of Permanent, Post-Construction Storm Water BMP Requirements<br>(Storm Water Intake Form for all Development Permit Applications) | | **Form I-1** |
|---|---|---|
| Project Identification | | |
| Project Name: Liaghat Hillside Residence | | |
| Permit Application Number: Insert Application Number. | | Date: 4/8/17 |
| Determination of Requirements | | |
| The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.<br>Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop".<br>Refer to Part 1 of Storm Water Standards sections and/or separate forms referenced in each step below. | | |
| Step | Answer | Progression |
| Step 1: Is the project a "development project"?<br>See Section 1.3 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. | ● Yes | Go to Step 2. |
| | ○ No | Stop.<br>Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below. |
| Discussion / justification if the project is not a "development project" (e.g., the project includes only interior remodels within an existing building):<br>Click or tap here to enter text. | | |
| Step 2: Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions?<br>To answer this item, see Section 1.4 of the BMP Design Manual (Part 1 of Storm Water Standards) in its entirety for guidance, AND complete Storm Water Requirements Applicability Checklist. | ○ Standard Project | Stop.<br>Standard Project requirements apply. |
| | ● PDP | PDP requirements apply, including PDP SWQMP.<br>Go to Step 3. |
| | ○ PDP Exempt | Stop.<br>Standard Project requirements apply. Provide discussion and list any additional requirements below. |
| Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:<br>Click or tap here to enter text. | | |

| Form I-1 Page 2 | | |
|---|---|---|
| Step | Answer | Progression |
| Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval?<br>See Section 1.10 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. | ○ Yes | Consult the City Engineer to determine requirements.<br>Provide discussion and identify requirements below.<br>Go to Step 4. |
| | ● No | BMP Design Manual PDP requirements apply.<br>Go to Step 4. |
| Discussion / justification of prior lawful approval, and identify requirements (<u>not required if prior lawful approval does not apply</u>):<br>Click or tap here to enter text. | | |
| Step 4. Do hydromodification control requirements apply?<br>See Section 1.6 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. | ○ Yes | PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6).<br>Go to Step 5. |
| | ● No | Stop.<br>PDP structural BMPs required for pollutant control (Chapter 5) only.<br>Provide brief discussion of exemption to hydromodification control below. |
| Discussion / justification if hydromodification control requirements do <u>not</u> apply:<br>This project is exempt from hydromodification measures because the ultimate point of discharge for all runoff leaving this site is an exempt waterbody (Pacific Ocean.) | | |
| Step 5. Does protection of critical coarse sediment yield areas apply?<br>See Section 6.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. | ○ Yes | Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2).<br>Stop. |
| | ● No | Management measures not required for protection of critical coarse sediment yield areas.<br>Provide brief discussion below.<br>Stop. |
| Discussion / justification if protection of critical coarse sediment yield areas does <u>not</u> apply:<br>N/A no hydromodification requirements | | |

| Site Information Checklist For PDPs | Form I-3B |
|---|---|
| Project Summary Information | |
| Project Name | Liaghat Hillside Residence |
| Project Address | Block of 7500 Hillside Drive, La Jolla CA 92037 |
| Assessor's Parcel Number(s) (APN(s)) | 352-130-03-00 |
| Permit Application Number | Click here to enter text. |
| Project Watershed | Select One:<br>○ San Dieguito River<br>● Penasquitos<br>○ Mission Bay<br>○ San Diego River<br>○ San Diego Bay<br>○ Tijuana River |
| Hydrologic subarea name with Numeric Identifier up to two decimal paces (9XX.XX) | Scripps HA 906.30 |
| Project Area<br>(total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way) | 0.52 Acres ([SQFT] Square Feet) |
| Area to be disturbed by the project<br>(Project Footprint) | 0.32 Acres ([SQFT] Square Feet) |
| Project Proposed Impervious Area<br>(subset of Project Footprint) | 0.28 Acres ([SQFT] Square Feet) |
| Project Proposed Pervious Area<br>(subset of Project Footprint) | 0.04 Acres ([SQFT] Square Feet) |
| Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area. | |
| The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition. | [Change in impervious area] % |

**Project Name: Liaghat Hillside Residence**

## Form I-3B Page 2 of 11

### Description of Existing Site Condition and Drainage Patterns

Current Status of the Site (select all that apply):
☐ Existing development
☐ Previously graded but not built out
☐ Agricultural or other non-impervious use
☒ Vacant, undeveloped/natural
Description / Additional Information:
The current site is an undeveloped lot located in Lot A of La Jolla Hills Unit 2 of Map 2087. The site currently drains northwest towards the hillside.

Existing Land Cover Includes (select all that apply):
☒ Vegetative Cover
☐ Non-Vegetated Pervious Areas
☐ Impervious Areas
Description / Additional Information:
Weeds, native shrubbery and a few mature trees.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):
☐ NRCS Type A
☐ NRCS Type B
☐ NRCS Type C
☒ NRCS Type D

Approximate Depth to Groundwater (GW):
○ GW Depth < 5 feet
○ 5 feet < GW Depth < 10 feet
● 10 feet < GW Depth < 20 feet
○ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):
☐ Watercourses
☐ Seeps
☐ Springs
☐ Wetlands
☒ None
Description / Additional Information:
Click or tap here to enter text.

## Form I-3B Page 3 of 11

### Description of Existing Site Topography and Drainage:

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

1. Whether existing drainage conveyance is natural or urban;
2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site;
3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels;
4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

### Description / Additional Information:

Elevations across the property range from 302 feet above mean sea level at the northwest corner to 390 feet AMSL at the southeast corner. Existing drainage conveyance is natural with runoff flowing northwest along the site towards the hillside. The runoff is then picked up by an existing off site storm drain inlet and drainage ditch.

**Project Name:** **Liaghat Hillside Residence**

| Form I-3B Page 4 of 11 |
|---|
| Description of Proposed Site Development and Drainage Patterns |
| Project Description / Proposed Land Use and/or Activities:<br>The proposed project consists of the clearing and grubbing of the existing site to grade a new building pad for a two story single family residential home. The proposed work also includes a new driveway approach from Hillside Drive down towards the home and all associated hardscape and pavement around the home. A 2'-10' varying retaining wall is proposed all along the east, north and northwest ends of the property. Drainage and runoff at the undisturbed area from beyond the wall will continue to follow similar drainage patterns. Drainage and runoff from within the wall and new proposed property is yet TBD. |
| List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):<br>Building, roadway/driveway, courtyard, deck/patio, concrete paving, decorative pavers etc... |
| List/describe proposed pervious features of the project (e.g., landscape areas):<br>Backyard/Landscape areas |
| Does the project include grading and changes to site topography?<br>● Yes<br>○ No<br>Description / Additional Information:<br>Grading at the site will result in changes to site topography in order to provide a new pad for the proposed improvements. |

**Project Name:** **Liaghat Hillside Residence**

## Form I-3B Page 5 of 11

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

● Yes

○ No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural and constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Description / Additional Information:
TBD

**Project Name:** **Liaghat Hillside Residence**

## Form I-3B Page 6 of 11

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

☐ On-site storm drain inlets
☐ Interior floor drains and elevator shaft sump pumps
☒ Interior parking garages
☐ Need for future indoor & structural pest control
☒ Landscape/Outdoor Pesticide Use
☒ Pools, spas, ponds, decorative fountains, and other water features
☐ Food service
☒ Refuse areas
☐ Industrial processes
☐ Outdoor storage of equipment or materials
☐ Vehicle and Equipment Cleaning
☐ Vehicle/Equipment Repair and Maintenance
☐ Fuel Dispensing Areas
☐ Loading Docks
☐ Fire Sprinkler Test Water
☒ Miscellaneous Drain or Wash Water
☐ Plazas, sidewalks, and parking lots
☐ Large Trash Generating Facilities
☐ Animal Facilities
☐ Plant Nurseries and Garden Centers
☐ Automotive-related Uses

Description / Additional Information:
Click or tap here to enter text.

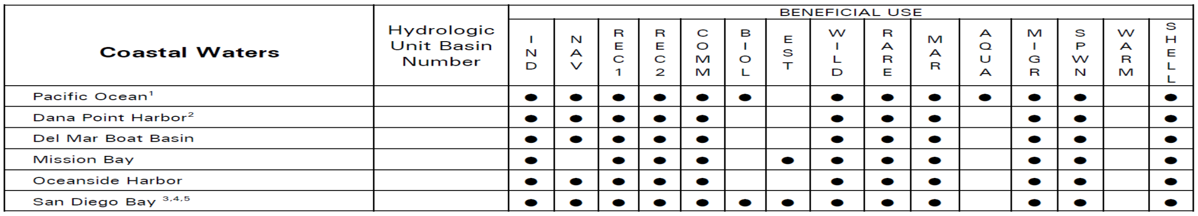
## Form I-3B Page 7 of 11

### Identification and Narrative of Receiving Water

Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable)

Overland conveyance to the ultimate point of discharge at the Pacific Ocean.

Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations.



| Coastal Waters | Hydrologic Unit Basin Number | BENEFICIAL USE | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | IND | NAV | REC1 | REC2 | COMM | BIOL | EST | WILD | RARE | MAR | AQUA | MIGR | SPWN | WARM | SHELL |
| Pacific Ocean[1] | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | ● |
| Dana Point Harbor[2] | | ● | ● | ● | ● | ● | | | ● | ● | ● | | ● | ● | | ● |
| Del Mar Boat Basin | | ● | ● | ● | ● | ● | | | ● | ● | ● | | ● | ● | | ● |
| Mission Bay | | ● | | ● | ● | ● | | ● | ● | ● | ● | | ● | ● | | ● |
| Oceanside Harbor | | ● | ● | ● | ● | ● | | | ● | ● | ● | | ● | ● | | ● |
| San Diego Bay [3,4,5] | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | | ● |

Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations.

The La Jolla Area of Special Biological Significance (ASBS) has approximately 1.7 miles of shoreline adjacent to the city of San Diego. The ASBS contains 453 acres of marine habitat, including a marine protected area, the La Jolla State Marine Conservation Area. It receives extremely heavy beach traffic, especially at Kellogg Park, which sees up to two million visitors a year. This ASBS is adjacent to the San Diego-Scripps ASBS.

Provide distance from project outfall location to impaired or sensitive receiving waters.

0.5 mi

Sumarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands

The proposed post construction BMPs will remain on the site and will not interfere with the city's environmentally sensitive lands.

## Form I-3B Page 8 of 11

### Identification of Receiving Water Pollutants of Concern

List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

| 303(d) Impaired Water Body | Pollutant(s)/Stressor(s) | TMDLs/ WQIP Highest Priority Pollutant |
|---|---|---|
| N/A | Click or tap here to enter text. | Click or tap here to enter text. |
| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |
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| Click or tap here to enter text. | Click or tap here to enter text. | Click or tap here to enter text. |

### Identification of Project Site Pollutants*

*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)

Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see BMP Design Manual (Part 1 of Storm Water Standards) Appendix B.6):

| Pollutant | Not Applicable to the Project Site | Anticipated from the Project Site | Also a Receiving Water Pollutant of Concern |
|---|---|---|---|
| Sediment | ☒ | ☐ | ☐ |
| Nutrients | ☒ | ☐ | ☐ |
| Heavy Metals | ☒ | ☐ | ☐ |
| Organic Compounds | ☒ | ☐ | ☐ |
| Trash & Debris | ☒ | ☐ | ☐ |
| Oxygen Demanding Substances | ☒ | ☐ | ☐ |
| Oil & Grease | ☒ | ☐ | ☐ |
| Bacteria & Viruses | ☒ | ☐ | ☐ |
| Pesticides | ☒ | ☐ | ☐ |

## Form I-3B Page 9 of 11

### Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☐ Yes, hydromodification management flow control structural BMPs required.

● No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Click or tap here to enter text.

### Critical Coarse Sediment Yield Areas*

*This Section only required if hydromodification management requirements apply

Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint?

☐ Yes

● No, No critical coarse sediment yield areas to be protected based on WMAA maps

Discussion / Additional Information:

Click or tap here to enter text.

| Form I-3B Page 10 of 11 |
|---|
| Flow Control for Post-Project Runoff*<br>*This Section only required if hydromodification management requirements apply |
| List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.<br>Click or tap here to enter text. |
| Has a geomorphic assessment been performed for the receiving channel(s)?<br>● No, the low flow threshold is 0.1Q2 (default low flow threshold)<br>○ Yes, the result is the low flow threshold is 0.1Q2<br>○ Yes, the result is the low flow threshold is 0.3Q2<br>○ Yes, the result is the low flow threshold is 0.5Q2<br><br>If a geomorphic assessment has been performed, provide title, date, and preparer:<br>Click or tap here to enter text. |
| Discussion / Additional Information: (optional)<br>Click or tap here to enter text. |

| Form I-3B Page 11 of 11 |
|---|
| Other Site Requirements and Constraints |
| When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.<br>N/A |
| Optional Additional Information or Continuation of Previous Sections As Needed |
| This space provided for additional information or continuation of information from previous sections as needed.<br>Click or tap here to enter text. |

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**Project Name:** **Liaghat Hillside Residence**

## Source Control BMP Checklist for All Development Projects

## Form I-4

### Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

| Source Control Requirement | Applied? | | |
|---|---|---|---|
| SC-1 Prevention of Illicit Discharges into the MS4 | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SC-1 not implemented:<br>Click or tap here to enter text. | | | |
| SC-2 Storm Drain Stenciling or Signage | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SC-2 not implemented:<br>Click or tap here to enter text. | | | |
| SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SC-3 not implemented:<br>Click or tap here to enter text. | | | |
| SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SC-4 not implemented:<br>Click or tap here to enter text. | | | |
| SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SC-5 not implemented:<br>Click or tap here to enter text. | | | |

## Form I-4 Page 2 of 2

| Source Control Requirement | Applied? |
|---|---|
| SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below) | |
| On-site storm drain inlets | ○ Yes ○ No ● N/A |
| Interior floor drains and elevator shaft sump pumps | ○ Yes ○ No ● N/A |
| Interior parking garages | ● Yes ○ No ○ N/A |
| Need for future indoor & structural pest control | ○ Yes ○ No ● N/A |
| Landscape/Outdoor Pesticide Use | ● Yes ○ No ○ N/A |
| Pools, spas, ponds, decorative fountains, and other water features | ● Yes ○ No ○ N/A |
| Food service | ○ Yes ○ No ● N/A |
| Refuse areas | ● Yes ○ No ○ N/A |
| Industrial processes | ○ Yes ○ No ● N/A |
| Outdoor storage of equipment or materials | ○ Yes ○ No ● N/A |
| Vehicle/Equipment Repair and Maintenance | ○ Yes ○ No ● N/A |
| Fuel Dispensing Areas | ○ Yes ○ No ● N/A |
| Loading Docks | ○ Yes ○ No ● N/A |
| Fire Sprinkler Test Water | ○ Yes ○ No ● N/A |
| Miscellaneous Drain or Wash Water | ● Yes ○ No ○ N/A |
| Plazas, sidewalks, and parking lots | ○ Yes ○ No ● N/A |
| SC-6A: Large Trash Generating Facilities | ○ Yes ○ No ● N/A |
| SC-6B: Animal Facilities | ○ Yes ○ No ● N/A |
| SC-6C: Plant Nurseries and Garden Centers | ○ Yes ○ No ● N/A |
| SC-6D: Automotive-related Uses | ○ Yes ○ No ● N/A |
| Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.<br>Click or tap here to enter text. | |

**Project Name:** **Liaghat Hillside Residence**

| Site Design BMP Checklist for All Development Projects | Form I-5 |
|---|---|

## Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

A site map with implemented site design BMPs must be included at the end of this checklist.

| Site Design Requirement | Applied? | | |
|---|---|---|---|
| SD-1 Maintain Natural Draiange Pathways and Hydrologic Features | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-1 not implemented:<br>Click or tap here to enter text. | | | |
| 1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map? | ☒ Yes | ☐ No | ☐ N/A |
| 1-2 Are street trees implemented? If yes, are they shown on the site map? | ☐ Yes | ☐ No | ☒ N/A |
| 1-3 Implemented street trees meet the design criteria in SD-1 Fact Sheet (e.g. soil volume, maximum credit, etc.)? | ☐ Yes | ☐ No | ☒ N/A |
| 1-4 Is street tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E? | ☐ Yes | ☐ No | ☒ N/A |
| SD-2 Have natural areas, soils and vegetation been conserved? | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-2 not implemented:<br>Click or tap here to enter text. | | | |

## Form I-5 Page 2 of 4

| Site Design Requirement | Applied? | | |
|---|---|---|---|
| SD-3 Minimize Impervious Area | ☐ Yes | ☒ No | ☐ N/A |

Discussion / justification if SD-3 not implemented:

Impervious areas have been minimized to the best extent possible but the nature of the proposed development requires large amounts of impervious type paving. Landscaping is proposed in some areas throughout the site to assist with the increase in pervious surfaces. Due to setback constraints, a large portion of the site remains undeveloped therefore also increasing (maintaining) the amount of pervious surface on the site.

| | | | |
|---|---|---|---|
| SD-4 Minimize Soil Compaction | ☐ Yes | ☒ No | ☐ N/A |

Discussion / justification if SD-4 not implemented:

Soil compaction necessary in areas to receive fill, p/geotech report.

| | | | |
|---|---|---|---|
| SD-5 Impervious Area Dispersion | ☒ Yes | ☐ No | ☐ N/A |

Discussion / justification if SD-5 not implemented:

Click or tap here to enter text.

| | | | | |
|---|---|---|---|---|
| 5-1 | Is the pervious area receiving runon from impervious area identified on the site map? | ☒ Yes | ☐ No | |
| 5-2 | Does the pervious area satisfy the design criteria in SD-5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.) | ☒ Yes | ☐ No | |
| 5-3 | Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and SD-5 Fact Sheet in Appendix E? | ☒ Yes | ☐ No | |

**Project Name:** **Liaghat Hillside Residence**

| Form I-5 Page 3 of 4 | | | |
|---|---|---|---|
| Site Design Requirement | Applied? | | |
| SD-6 Runoff Collection | ☑ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-6 not implemented:<br>Click or tap here to enter text. | | | |
| 6a-1 Are green roofs implemented in accordance with design criteria in SD-6A Fact Sheet? If yes, are they shown on the site map? | ☐ Yes | ☐ No | ☑ N/A |
| 6a-2 Is green roof credit volume calculated using Appendix B.2.1.2 and SD-6A Fact Sheet in Appendix E? | ☐ Yes | ☐ No | ☑ N/A |
| 6b-1 Are permeable pavements implemented in accordance with design criteria in SD-6B Fact Sheet? If yes, are they shown on the site map? | ☐ Yes | ☐ No | ☑ N/A |
| 6b-2 Is permeable pavement credit volume calculated using Appendix B.2.1.3 and SD-6B Fact Sheet in Appendix E? | ☐ Yes | ☐ No | ☑ N/A |
| SD-7 Landscaping with Native or Drought Tolerant Species | ☐ Yes | ☐ No | ☑ N/A |
| Discussion / justification if SD-7 not implemented:<br>Landscaping materials yet to be determined | | | |
| SD-8 Harvesting and Using Precipitation | ☐ Yes | ☐ No | ☑ N/A |
| Discussion / justification if SD-8 not implemented:<br>Click or tap here to enter text. | | | |
| 8-1 Are rain barrels implemented in accordance with design criteria in SD-8 Fact Sheet? If yes, are they shown on the site map? | ☐ Yes | ☐ No | ☑ N/A |
| 8-2 Is rain barrel credit volume calculated using Appendix B.2.2.2 and SD-8 Fact Sheet in Appendix E? | ☐ Yes | ☐ No | ☑ N/A |

**Project Name: Liaghat Hillside Residence**

| Form I-5 Page 4 of 4 |
|---|
| Insert Site Map with all site design BMPs identified: |
| Insert Site Map Here. |

| Summary of PDP Structural BMPs | Form I-6 |
|---|---|
| PDP Structural BMPs | |
| All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).<br>PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual).<br>Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP). | |
| Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.<br>Although still in the preliminary stages, the general approach to this project site is to adequately size and design the post-construction BMPs in order to provide the required treatment and control required. To assist with minimizing the design capture volume required, the runoff from the roof of the building will be captured by roof drains and diverted towards the pervious landscaping at the backyard and deck portion of the property. The remaining runoff will be picked up by proposed storm drains and/or via ditches conveying runoff towards a partial retention/biofiltration BMP located at the northwest end of the property. Once runoff has been effectively filtered and retained by the BMP, excess(uninfiltrated) runoff will then be discharged via 6" subdrain/orifice offsite and down the hill in a northwesterly direction in accordance with the existing and current site drainage patterns.<br>Since the grading permit/plans of the project are currently still underway and in the process of still undergoing some changes, this report will currently be submitted without a site plan. However, the approach to utilize the partial retention/biofiltration BMP will remain in place and will be updated to be shown on the BMP plan along with required sections once grading and site plans have been finalized. The addition or removal of certain types of surfaces could potentially have an impact on the required DCV values and could therefore change the required footprints of the BMPs.<br>(Continue on page 2 as necessary.) | |

**Project Name: Liaghat Hillside Residence**

| Form I-6 Page 2 of X |
|---|
| (Page reserved for continuation of description of general strategy for structural BMP implementation at the site) |
| (Continued from page 1)<br>Click or tap here to enter text. |

## Form I-6 Page 3 of X (Copy as many as needed)

### Structural BMP Summary Information

Structural BMP ID No. Click or tap here to enter text.

Construction Plan Sheet No. Click or tap here to enter text.

Type of structural BMP:

○ Retention by harvest and use (HU-1)

○ Retention by infiltration basin (INF-1)

○ Retention by bioretention (INF-2)

○ Retention by permeable pavement (INF-3)

● Partial retention by biofiltration with partial retention (PR-1)

○ Biofiltration (BF-1)

○ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide ( BMP type/description in discussion section below)

○ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)

○ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion

○ Detention pond or vault for hydromodification management

○ Other (describe in discussion section below)

Purpose:

● Pollutant control only

○ Hydromodification control only

○ Combined pollutant control and hydromodification control

○ Pre-treatment/forebay for another structural BMP

○ Other (describe in discussion section below)

| | |
|---|---|
| Who will certify construction of this BMP?<br>Provide name and contact information for the party responsible to sign BMP verification form DS-563 | Hamid Liaghat |
| Who will be the final owner of this BMP? | The owner of the residential property |
| Who will maintain this BMP into perpetuity? | The owner of the residential property |
| What is the funding mechanism for maintenance? | The owner of the residential property |

| |
|---|
| Form I-6 Page 4 of X (Copy as many as needed) |
| Structural BMP ID No. Click or tap here to enter text. |
| Construction Plan Sheet No. Click or tap here to enter text. |
| Discussion (as needed):<br>Click or tap here to enter text. |

| | | | |
|---|---|---|---|
| THE CITY OF SAN DIEGO | City of San Diego<br>**Development Services**<br>1222 First Ave., MD-302<br>San Diego, CA 92101<br>(619) 446-5000 | **Permenant BMP Construction**<br>**Self Certification Form** | FORM<br>DS-563<br>January 2016 |

Date Prepared: 4/8/2017

Project No.: Click here to enter text.

Project Applicant: Hamid Liaghat

Phone: Click here to enter text.

Project Address: 7500 Block of Hillside Dr., La Jolla 92037

Project Engineer: Click here to enter text.

Phone: 858-500-4532

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Quality Management Plan (SWQMP) documents and drawings.

This form must be completed by the engineer and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and NDPES Permit Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of San Diego.

**CERTIFICATION:**

As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and structural BMP's required per the approved SWQMP and Construction Permit No. Click here to enter text.; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

**Signature:** ______________________________

**Date of Signature:** _ Insert Date___

**Printed Name:** _Click here to enter text._

**Title:** _Click here to enter text._

**Phone No.** _Click here to enter text._

Engineer's Stamp

DS-563 (12-15)

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# ATTACHMENT 1
# BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

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**Project Name:** **Liaghat Hillside Residence**

**Indicate which Items are Included:**

| Attachment Sequence | Contents | Checklist |
|---|---|---|
| **Attachment 1a** | DMA Exhibit (Required)<br>See DMA Exhibit Checklist. | ☐ Included |
| **Attachment 1b** | Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)*<br>*Provide table in this Attachment OR on DMA Exhibit in Attachment 1a | ○ Included on DMA Exhibit in Attachment 1a<br>● Included as Attachment 1b, separate from DMA Exhibit |
| **Attachment 1c** | Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs)<br>Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7. | ○ Included<br>● Not included because the entire project will use infiltration BMPs |
| **Attachment 1d** | Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs)<br>Refer to Appendices C and D of the BMP Design Manual to complete Form I-8. | ● Included<br>○ Not included because the entire project will use harvest and use BMPs |
| **Attachment 1e** | Pollutant Control BMP Design Worksheets / Calculations (Required)<br>Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations | ☐ Included |

**Project Name:** **Liaghat Hillside Residence**

**Use this checklist to ensure the required information has been included on the DMA Exhibit:**

The DMA Exhibit must identify:

☐ Underlying hydrologic soil group
☐ Approximate depth to groundwater
☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☐ Critical coarse sediment yield areas to be protected
☐ Existing topography and impervious areas
☐ Existing and proposed site drainage network and connections to drainage offsite
☐ Proposed grading
☐ Proposed impervious features
☐ Proposed design features and surface treatments used to minimize imperviousness
☐ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☐ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
☐ Structural BMPs (identify location, type of BMP, and size/detail)

# ATTACHMENT 2
# BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☑ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

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**Project Name: Liaghat Hillside Residence**

**Indicate which Items are Included:**

| Attachment Sequence | Contents | Checklist |
|---|---|---|
| **Attachment 2a** | Hydromodification Management Exhibit (Required) | ☐ Included<br>See Hydromodification Management Exhibit Checklist. |
| **Attachment 2b** | Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional)<br>See Section 6.2 of the BMP Design Manual. | ☐ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required)<br>Optional analyses for Critical Coarse Sediment Yield Area Determination<br>☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite<br>☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment<br>☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite |
| **Attachment 2c** | Geomorphic Assessment of Receiving Channels (Optional)<br>See Section 6.3.4 of the BMP Design Manual. | ○ Not Performed<br>○ Included<br>● Submitted as separate stand-alone document |
| **Attachment 2d** | Flow Control Facility Design and Structural BMP Drawdown Calculations (Required)<br>Overflow Design Summary for each structural BMP<br>See Chapter 6 and Appendix G of the BMP Design Manual | ○ Included<br>● Submitted as separate stand-alone document |
| **Attachment 2e** | Vector Control Plan (Required when structural BMPs will not drain in 96 hours) | ○ Included<br>● Not required because BMPs will drain in less than 96 hours |

**Project Name: Liaghat Hillside Residence**

**Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:**

The Hydromodification Management Exhibit must identify:

☐ Underlying hydrologic soil group
☐ Approximate depth to groundwater
☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☐ Critical coarse sediment yield areas to be protected
☐ Existing topography
☐ Existing and proposed site drainage network and connections to drainage offsite
☐ Proposed grading
☐ Proposed impervious features
☐ Proposed design features and surface treatments used to minimize imperviousness
☐ Point(s) of Compliance (POC) for Hydromodification Management
☐ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☐ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

# ATTACHMENT 3
# STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

Will be included upon final submittal once grading plans have been finalized.

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**Project Name:** **Liaghat Hillside Residence**

**Indicate which Items are Included:**

| Attachment Sequence | Contents | Checklist |
|---|---|---|
| **Attachment 3a** | Structural BMP Maintenance Thresholds and Actions (Required) | ☐ Included<br>See Structural BMP Maintenance Information Checklist. |
| **Attachment 3b** | Maintenance Agreement (Form DS-3247) (when applicable) | ○ Included<br>● Not Applicable |

**Project Name: Liaghat Hillside Residence**

**Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:**

**Preliminary Design / Planning / CEQA level submittal:**

- Attachment 3a must identify:
  - ☐ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual
- Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

**Final Design level submittal:**

**Attachment 3a** must identify:

☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
☐ How to access the structural BMP(s) to inspect and perform maintenance
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐ When applicable, frequency of bioretention soil media replacement
☐ Recommended equipment to perform maintenance
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

**Attachment 3b**: For private entity operation and maintenance, Attachment 3b must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

☐ Vicinity map
☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
☐ BMP and HMP location and dimensions
☐ BMP and HMP specifications/cross section/model
☐ Maintenance recommendations and frequency
☐ LID features such as (permeable paver and LS location, dim, SF).

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMP's, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s):Click or tap here to enter text..
2. Property Owner shall install, maintain and repair or replace all Permanent Storm Water BMP's within their property, according to the OMP guidelines as described in the attached exhibit(s), the project's WQTR and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s)Click or tap here to enter text..
3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibits(s):Click or tap here to enter text.

(Owner Signature)

Click or tap here to enter text.
(Print Name and Title)

Click or tap here to enter text.
(Company/Organization Name)

Click or tap to enter a date.
(Date)

**THE CITY OF SAN DIEGO**

APPROVED:

(City Control engineer Signature

(Print Name)

(Date)

**NOTE: ALL SIGNATURES MUST INCLUDE NOTARY ACKNOWLEDMENTS PER CIVIL CODE SEC. 1180 ET.SEQ**

**Project Name:** **Liaghat Hillside Residence**

# ATTACHMENT 4
# COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS

This is the cover sheet for Attachment 4.

Will be included upon final submittal once grading plans have been finalized.

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**Use this checklist to ensure the required information has been included on the plans:**

The plans must identify:

☐ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☐ Details and specifications for construction of structural BMP(s)
☐ Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
☐ How to access the structural BMP(s) to inspect and perform maintenance
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐ Recommended equipment to perform maintenance
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☐ All BMPs must be fully dimensioned on the plans
☐ When propritery BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Broucher photocopies are not allowed.

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# ATTACHMENT 5
# DRAINAGE REPORT

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

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# ATTACHMENT 6
# GEOTECHNICAL AND GROUNDWATER INVESTIGATION REPORT

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

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# REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, California

**JOB NO. 16-11019**
06 April 2017

Prepared for:

***Mr. Hamid Liaghat***

**Geotechnical Exploration, Inc.**
SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

06 April 2017

Mr. Hamid Liaghat
10525 Vista Sorrento Parkway, Suite 350
San Diego, CA 92121

**Job No. 16-11019**

Subject: **Report of Preliminary Geotechnical Investigation**
Proposed Liaghat Residential Lot Development
West of 7550 Hillside Drive
La Jolla, California

Dear Mr. Liaghat:

In accordance with your request, and our proposal of February 1, 2016, ***Geotechnical Exploration, Inc.*** has performed an investigation of the geotechnical and general geologic conditions at the location of the proposed residential lot. The field work was performed on March 2, 2016.

If the conclusions and recommendations presented in this report are incorporated into the design and construction of the proposed residential development and associated improvements, it is our opinion that the site is suitable for the proposed project.

This opportunity to be of service is sincerely appreciated. Should you have any questions concerning the following report, please do not hesitate to contact us. Reference to our **Job No. 16-11019** will expedite a response to your inquiries.

Respectfully submitted,

**GEOTECHNICAL EXPLORATION, INC.**

Jaime A. Cerros, P.E.
R.C.E. 34422/G.E. 2007
Senior Geotechnical Engineer

Jay K. Heiser
Senior Project Geologist

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# REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, California

## Job No. 16-11019

The following report presents the findings and recommendations of ***Geotechnical Exploration, Inc.*** for the subject project.

## I. PROJECT SUMMARY

It is our understanding, based on communications with you, that the existing undeveloped residential lot will be developed to receive a new two-story, single-family residence and associated improvements. It is assumed that the planned new residential structure will utilize conventional foundations.

Construction and conceptual plans for the proposed residential development have not been provided to us during the preparation of this report. We recommend that they be provided to us for review as they are developed.

## II. SCOPE OF WORK

The scope of work performed for this investigation included a review of available published information pertaining to the site geology, a site reconnaissance and subsurface exploration program, laboratory testing, geotechnical engineering analysis of the research, field and laboratory data, and the preparation of this report. The data obtained and the analyses performed were for the purpose of providing preliminary design and construction criteria for the project earthwork, building foundations, and slab on-grade floors.

## III. SUMMARY OF GEOTECHNICAL & GEOLOGIC FINDINGS

Our subsurface investigation and site reconnaissance revealed that the site is underlain at depth by very stiff to hard, adequate bearing sandy clay of the Point Loma Formation (Kp), overlain with approximately 2¾ to 4½ feet of sandy clay slopewash materials. The slopewash soils are of variable density and will not provide a stable soil base for the proposed residential structure or associated improvements. As such, it is recommended that either new foundations be founded into the underlying formational soils utilizing a deepened footing foundation system or the existing slopewash soils be removed and recompacted.

The on-site soils should provide adequate bearing strength for new slab on-grade exterior improvements, after proper removal and recompaction of the existing shallow surface soils. As such, we recommend that the existing slopewash soils (2 to 3 feet) be removed and recompacted as part of site preparation prior to placement of slab on-grade exterior improvements in these areas.

In our opinion, the site is suited for the proposed residential construction provided the following recommendations are implemented during site development. Conventional construction techniques and materials can be utilized. Detailed construction plans have not been provided to us for the preparation of this report, however, when completed they should be made available for our review for new or modified recommendations. In addition, the proposed work will not, in our opinion, destabilize or result in settlement of adjacent property if the recommendations presented in this report are implemented.

## IV. SITE DESCRIPTION

The approximately 0.5-acre site is more particularly referred to as Assessor's Parcel No. 352-130-03-00, Portion of Lot A of La Jolla Hills Unit No. 2, according to Recorded Map 2087, in the La Jolla area of the City and County of San Diego, State of California. For the location of the site, refer to the Vicinity Map, Figure No. I.

The property is bordered on the north and east by existing residential properties, on the west by partially developed land and on the south by Hillside Drive. Elevations across the property range from approximately 302 feet above Mean Sea Level (AMSL) at the northwest corner, to 390 feet AMSL at the southeast corner. Information concerning approximate elevations across the site was obtained from the City of San Diego Topographic maps and Google Earth Imagery. Refer to the Plot Plan, Figure No. II.

Vegetation at the site consists primarily of weeds, native shrubbery and a few mature trees. The lot is undeveloped with the exception a sewer easement running through the western portion of the lot.

## V. FIELD INVESTIGATION

Three exploratory borings were advanced in the vicinity, and most likely area where the proposed residential structure would be located, and where access and soil conditions allowed (for excavation locations, refer to the Plot Plan and Site-specific Geologic Map, Figure No. II). All three borings were drilled to a maximum depth of 10 feet in order to obtain representative soil samples and to define a soil profile across the project area.

The soil conditions encountered in the borings were logged by our field representative and samples were taken of the predominant soils throughout the field operation. Exploratory boring logs have been prepared on the basis of our observations and laboratory testing, Figure Nos. IIIa-c. The predominant soils have been classified per applicable portions of the Unified Soil Classification System.

## VI. FIELD AND LABORATORY TESTS & SOIL INFORMATION

### A. *Field Tests*

Standard Penetration Tests were performed in the borings by using a 140-pound weight falling 30 inches to drive a 2-inch O.D. by 1⅜-inch I.D. sampler tube a distance of 18 inches. The number of blows required to drive the sampler the last 12 inches was recorded for use in evaluation of the soil consistency. The following chart provides an in-house correlation between the number of blows and the consistency of the soil for the Standard Penetration Test and the 3-inch O.D. ("Cal") sampler.

| ***Soil*** | ***Density Designation*** | ***2-inch O.D. Sampler Blows/Foot*** | ***3-inch O.D. Sampler Blows/Foot*** |
|---|---|---|---|
| Sand and Non-plastic Silt | Very loose | 0-4 | 0-7 |
| | Loose | 5-10 | 8-20 |
| | Medium | 11-30 | 21-53 |
| | Dense | 31-50 | 54-98 |
| | Very Dense | Over 50 | Over 98 |
| Clay and Plastic Silt | Very soft | 0-2 | 0-2 |
| | Soft | 3-4 | 3-4 |
| | Firm | 5-8 | 5-9 |
| | Stiff | 9-15 | 10-18 |
| | Very Stiff | 15-30 | 19-45 |
| | Hard | 31-60 | 46-90 |
| | Very Hard | Over 60 | Over 90 |

Bulk (disturbed) and relatively undisturbed (ring) samples were retrieved, sealed and transported to the laboratory for testing.

In general, the tests performed in the field included the Standard Practice for Soil Investigation and Sampling by Auger Borings (ASTM D1452), Test Method for Penetration Test and Split-barrel Sampling of Soils (ASTM D1586), and Standard Practice for Ring-lined Barrel Sampling of Soils (ASTM D3550).

### *B. Laboratory Tests*

Laboratory tests were performed on retrieved soil samples in order to evaluate their physical and mechanical properties and their ability to support the proposed remodel, additions and improvements. Test results are presented on Figure Nos. III and IV. The following tests were conducted on representative soil samples:

1. *Moisture Content (ASTM D2216-10)*
2. *Density Measurements (ASTM D2937-10)*
3. *Laboratory Compaction Characteristics (ASTM D1557-12)*
4. *Determination of Percentage of Particles Smaller than #200 Sieve (ASTM D1140-14)*
5. *Standard Test Method for Expansion Test (ASTM D4829-11)*
6. *Standard Test Method for Direct Shear Test of Soils under Consolidated Drained Conditions (ASTM D3080-11)*

The moisture content of a soil sample (ASTM D2216) is a measure of the water content, expressed as a percentage of the dry weight of the sample. Moisture content and density measurements (ASTM D2937) were performed to establish the in situ moisture and density of samples retrieved from the exploratory excavations. The dry soil weights were compared to the laboratory maximum dry density of the same soil to determine relative compaction.

Laboratory compaction values (ASTM D1557) establish the optimum moisture content and the laboratory maximum dry density of the tested soils. The relationship between the moisture and density of remolded soil samples helps to establish the relative compaction of the existing fill soils and soil compaction conditions to be anticipated during any future grading operation.

The -200 sieve size analysis helps to more precisely classify the tested soils based on their fine material content, and provide qualitative information related to engineering characteristics such as expansion potential, permeability, and shear strength.

The expansion potential of soils is determined, when necessary, utilizing the Standard Test Method for Expansion Index of Soils. In accordance with the Standard (Table 5.3), potentially expansive soils are classified as follows:

| ***EXPANSION INDEX*** | ***POTENTIAL EXPANSION*** |
|---|---|
| 0 to 20 | Very low |
| 21 to 50 | Low |
| 51 to 90 | Medium |
| 91 to 130 | High |
| Above 130 | Very high |

Based on the test results, the existing sandy clay slopewash and formational soils have a medium to high expansion potential, with a maximum measured expansion index of 91 and 87, respectively.

Two direct shear tests (ASTM D3080) were performed in order to evaluate strength characteristics of the soils comprising the descending slope. The shear tests were performed with a constant strain rate direct shear machine. The specimens tested were saturated and then sheared under various normal loads.

Based on the field and laboratory test data, our observations of the primary soil types on the project, and our previous experience with laboratory testing of similar soils, our Geotechnical Engineer has assigned values for friction angle, coefficient of friction, and cohesion for those soils which will have significant lateral support or load bearing functions on the project. These values have been utilized in determining the recommended bearing value as well as active and passive earth pressure design criteria.

### *C. Slope Observations*

The stability of the existing slopes should not be affected by the planned residential construction if proper drainage conditions are implemented and maintained. Existing slopes range from approximately 1.2:1.0 to 2.8:1.0 (horizontal to vertical) on the western portion of the property, to approximately 1.8:1.0 to 2.4:1.0 (horizontal to vertical) on the eastern portion of the property. The lot generally slopes to the northwest. Overall, the steeper slope on the western portion of the lot was observed to be in generally good condition with no evidence of instability or prior slope failure.

## VII. REGIONAL GEOLOGIC DESCRIPTION

San Diego County has been divided into three major geomorphic provinces: the Coastal Plain, the Peninsular Ranges and the Salton Trough. The Coastal Plain

exists west of the Peninsular Ranges. The Salton Trough is east of the Peninsular Ranges. These divisions are the result of the basic geologic distinctions between the areas. Mesozoic metavolcanic, metasedimentary and plutonic rocks predominate in the Peninsular Ranges with primarily Cenozoic sedimentary rocks to the west and east of this central mountain range (Demere, 1997).

In the Coastal Plain region, where the subject property is located, the "basement" consists of Mesozoic crystalline rocks. Basement rocks are also exposed as high relief areas (e.g., Black Mountain northeast of the subject property and Cowles Mountain near the San Carlos area of San Diego). Younger Cretaceous and Tertiary sediments lap up against these older features. The Cretaceous sediments form the local basement rocks on the Point Loma area. These sediments form a "layer cake" sequence of marine and non-marine sedimentary rock units, with some formations up to 140 million years old. Faulting related to the La Nacion and Rose Canyon Fault zones has broken up this sequence into a number of distinct fault blocks in the southwestern part of the county. Northwestern portions of the county are relatively undeformed by faulting (Demere, 1997).

The Peninsular Ranges form the granitic spine of San Diego County. These rocks are primarily plutonic, forming at depth beneath the earth's crust 140 to 90 million years ago as the result of the subduction of an oceanic crustal plate beneath the North American continent. These rocks formed the much larger Southern California batholith. Metamorphism associated with the intrusion of these great granitic masses affected the much older sediments that existed near the surface over that period of time. These metasedimentary rocks remain as roof pendants of marble, schist, slate, quartzite and gneiss throughout the Peninsular Ranges. Locally, Miocene-age volcanic rocks and flows have also accumulated within these mountains (e.g., Jacumba Valley). Regional tectonic forces and erosion over time

have uplifted and unroofed these granitic rocks to expose them at the surface (Demere, 1997).

The Salton Trough is the northerly extension of the Gulf of California. This zone is undergoing active deformation related to faulting along the Elsinore and San Jacinto Fault Zones, which are part of the major regional tectonic feature in the southwestern portion of California, the San Andreas Fault Zone. Translational movement along these fault zones has resulted in crustal rifting and subsidence. The Salton Trough, also referred to as the Colorado Desert, has been filled with sediments to depth of approximately 5 miles since the movement began in the early Miocene, 24 million years ago. The source of these sediments has been the local mountains as well as the ancestral and modern Colorado River (Demere, 1997).

As indicated previously, the San Diego area is part of a seismically active region of California. It is on the eastern boundary of the Southern California Continental Borderland, part of the Peninsular Ranges Geomorphic Province. This region is part of a broad tectonic boundary between the North American and Pacific Plates. The actual plate boundary is characterized by a complex system of active, major, right-lateral strike-slip faults, trending northwest/southeast. This fault system extends eastward to the San Andreas Fault (approximately 70 miles from San Diego) and westward to the San Clemente Fault (approximately 50 miles off-shore from San Diego) (Berger and Schug, 1991).

In California, major earthquakes can generally be correlated with movement on active faults. As defined by the California Division of Mines and Geology (Hart, E.W., 1980), an "active" fault is one that has had ground surface displacement within Holocene time (about the last 11,000 years). Additionally, faults along which

major historical earthquakes have occurred (about the last 210 years in California) are also considered to be active (Association of Engineering Geologist, 1973). The California Division of Mines and Geology (now the California Geological Survey) defines a *"potentially active"* fault as one that has had ground surface displacement during Quaternary time, that is, between 11,000 and 1.6 million years (Hart, E.W., 1980).

During recent history, prior to April 2010, the San Diego County area has been relatively quiet seismically. No fault ruptures or major earthquakes had been experienced in historic time within the greater San Diego area. Since earthquakes have been recorded by instruments (since the 1930s), the San Diego area has experienced scattered seismic events with Richter magnitudes generally less than M4.0. During June 1985, a series of small earthquakes occurred beneath San Diego Bay, three of which were recorded at M4.0 to M4.2. In addition, the Oceanside earthquake of July 13, 1986, located approximately 26 miles offshore of the City of Oceanside, had a magnitude of M5.3 (Hauksson and Jones, 1988).

On June 15, 2004, a M5.3 earthquake occurred approximately 45 miles southwest of downtown San Diego (26 miles west of Rosarito, Mexico). Although this earthquake was widely felt, no significant damage was reported. Another widely felt earthquake on a distant southern California fault was a M5.4 event that took place on July 29, 2008, west-southwest of the Chino Hills area of Riverside County.

Several earthquakes ranging from M5.0 to M6.0 occurred in northern Baja California, centered in the Gulf of California on August 3, 2009. These were felt in San Diego but no injuries or damage was reported. A M5.8 earthquake followed by a M4.9 aftershock occurred on December 30, 2009, centered about 20 miles south

of the Mexican border city of Mexicali. These were also felt in San Diego, swaying high-rise buildings, but again no significant damage or injuries were reported.

On Easter Sunday April 4, 2010, a large earthquake occurred in Baja California, Mexico. It was widely felt throughout the southwest including Phoenix, Arizona and San Diego in California. This M7.2 event, the Sierra El Mayor earthquake, occurred in northern Baja California, approximately 40 miles south of the Mexico-USA border at shallow depth along the principal plate boundary between the North American and Pacific plates. According to the U. S. Geological Survey this is an area with a high level of historical seismicity, and it has recently also been seismically active, though this is the largest event to strike in this area since 1892. The April 4, 2010, earthquake appears to have been larger than the M6.9 earthquake in 1940 or any of the early 20th century events (e.g., 1915 and 1934) in this region of northern Baja California. The event caused widespread damage to structures, closure of businesses, government offices and schools, power outages, displacement of people from their homes and injuries in the nearby major metropolitan areas of Mexicali in Mexico and Calexico in Southern California. Estimates of the cost of the damage range to $100 million.

This event's aftershock zone extends significantly to the northwest, overlapping with the portion of the fault system that is thought to have ruptured in 1892. Some structures in the San Diego area experienced minor damage and there were some injuries. Ground motions for the April 4, 2010, main event, recorded at stations in San Diego and reported by the California Strong Motion Instrumentation Program (CSMIP), ranged up to 0.058g. Aftershocks from this event continue to the date of this report along the trend northwest and south of the original event, including within San Diego County, closer to the San Diego metropolitan area. There have been hundreds of these earthquakes including events up to M5.7.

On July 7, 2010, a M5.4 earthquake occurred in Southern California at 4:53 pm (Pacific Time) about 30 miles south of Palm Springs, 25 miles southwest of Indio, and 13 miles north-northwest of Borrego Springs. The earthquake occurred near the Coyote Creek segment of the San Jacinto Fault. The earthquake exhibited right lateral slip to the northwest, consistent with the direction of movement on the San Jacinto Fault. The earthquake was felt throughout Southern California, with strong shaking near the epicenter. It was followed by more than 60 aftershocks of M1.3 and greater during the first hour. Seismologists expect continued aftershock activity.

In the last 50 years, there have been four other earthquakes in the magnitude M5.0 range within 20 kilometers of the Coyote Creek segment: M5.8 in 1968, M5.3 on 2/25/1980, M5.0 on 10/31/2001, and M5.2 on 6/12/2005. The biggest earthquake near this location was the M6.0 Buck Ridge earthquake on 3/25/1937.

## VIII. SITE-SPECIFIC SOIL & GEOLOGIC DESCRIPTION

### *A. Stratigraphy*

Our field work, reconnaissance and review of the *"Geologic Map of the La Jolla Quadrangle"* contained within California Division of Mines and Geology (now the California Geological Survey) Bulletin 200 *"Geology of the San Diego Metropolitan Area, California"* (Michael P. Kennedy, 1975) and the updated geologic maps by Kennedy and Tan, 2005 and 2008, *"Geologic Map of San Diego, 30'x60' Quadrangle, CA,"* indicate that the site is underlain by Cretaceous-age Point Loma (Kp) formational materials and landslide deposits. The formational soils are overlain by approximately 2¾ to 4½ feet of slopewash soils where the assumed building pad would be located (refer to the boring logs, Figure Nos. IIIa-c). Figure

No. V presents a plan view geologic map (Kennedy and Tan, 2008) of the general area of the site and Figure No. VI displays the geologic hazards of the area.

*Slopewash (Qsw):* Slopewash materials were encountered in all of our exploratory boring locations. The slopewash soils consist of dark gray to dark brown sandy clay with angular gravel to ¾-inch in diameter. The encountered slopewash soils were generally stiff to very stiff, moist condition and are considered to have a high expansion potential. Refer to Figure Nos. IIIa-c for details.

*Point Loma Formation (Kp):* Formational soils of the Point Loma Formation were encountered in all of our exploratory borings underlying the slopewash soils. The Point Loma Formational soils consist of dark gray sandy clay with some iron oxide staining on fracture surfaces, trace caliche, trace manganese staining and were somewhat disturbed and blocky to approximately 7 feet. The encountered formational soils were generally very stiff to hard, moist condition and are considered to have a high expansion potential. Refer to Figure Nos. IIIa-c for details. These soils have good bearing strength characteristics.

*Landslide (Qls):* According to Kennedy and Tan, 2008 "*Geologic Map of San Diego, 30'x60' Quadrangle, CA,*" the site is underlain by Quaternary-age Landslide debris. Landslide deposits were not encountered in our relatively shallow exploratory borings.

Although the Point Loma Formation observed in our exploratory borings was blocky and somewhat disturbed to approximately 7 feet, it is our opinion, that this is not part of the landslide deposits as mapped by Kennedy and Tan. In addition, according to the City of San Diego Seismic Safety Study, Geologic Hazards Map Sheet No. 29 indicates that the site is located in a low to moderate risk geologic

category. An excerpted portion of the Geologic Hazards Map Sheet 29 and the legend are presented as Figure No. VI.

The following is a discussion of the geologic conditions and hazards common to this area of the City of San Diego, as well as project-specific geologic information relating to development of the subject property.

## *A. Local and Regional Faults*

Reference to the geologic map of the area, Figure No. V (Kennedy and Tan, 2008), and the City of San Diego Seismic Safety Study, Geologic Hazards Map No. 29, Figure No. VI, indicates that no faults are mapped on the site. In our explicit professional opinion, neither an active fault nor a potentially active fault underlies the site.

*Rose Canyon Fault*: The Rose Canyon Fault Zone (Mount Soledad and Rose Canyon Faults) is mapped ¼ mile southwest of the subject site. The Rose Canyon Fault is mapped trending north-south from Oceanside to downtown San Diego, from where it appears to head southward into San Diego Bay, through Coronado and offshore. The Rose Canyon Fault Zone is considered to be a complex zone of onshore and offshore, en echelon strike slip, oblique reverse, and oblique normal faults. The Rose Canyon Fault is considered to be capable of generating an M7.2 earthquake and is considered microseismically active, although no significant recent earthquakes are known to have occurred on the fault.

Investigative work on faults that are part of the Rose Canyon Fault Zone at the Police Administration and Technical Center in downtown San Diego, at the SDG&E facility in Rose Canyon, and within San Diego Bay and elsewhere within downtown

San Diego, has encountered offsets in Holocene (geologically recent) sediments. These findings confirm Holocene displacement on the Rose Canyon Fault, which was designated an "active" fault in November 1991 (California Division of Mines and Geology -- Fault Rupture Hazard Zones in California, 1999).

*Coronado Bank Fault*: The Coronado Bank Fault is located approximately 12 miles southwest of the site. Evidence for this fault is based upon geophysical data (acoustic profiles) and the general alignment of epicenters of recorded seismic activity (Greene, 1979). The Oceanside earthquake of M5.3 recorded July 13, 1986, is known to have been centered on the fault or within the Coronado Bank Fault Zone. Although this fault is considered active, due to the seismicity within the fault zone, it is significantly less active seismically than the Elsinore Fault (Hileman, 1973). It is postulated that the Coronado Bank Fault is capable of generating a M7.6 earthquake and is of great interest due to its close proximity to the greater San Diego metropolitan area.

*Newport-Inglewood Fault:* The Newport-Inglewood Fault Zone is located approximately 22 miles northwest of the site. A significant earthquake (M6.4) occurred along this fault on March 10, 1933. Since then no additional significant events have occurred. The fault is believed to have a slip rate of approximately 0.6 mm/yr with an unknown recurrence interval. This fault is believed capable of producing an earthquake of M6.0 to M7.4 (SCEC, 2004).

*Elsinore Fault*: The Elsinore Fault is located approximately 37 to 54 miles east and northeast of the site. The fault extends approximately 200 km (125 miles) from the Mexican border to the northern end of the Santa Ana Mountains. The Elsinore Fault zone is a 1- to 4-mile-wide, northwest-southeast-trending zone of discontinuous and en echelon faults extending through portions of Orange,

Riverside, San Diego, and Imperial Counties. Individual faults within the Elsinore Fault Zone range from less than 1 mile to 16 miles in length. The trend, length and geomorphic expression of the Elsinore Fault Zone identify it as being a part of the highly active San Andreas Fault system.

Like the other faults in the San Andreas system, the Elsinore Fault is a transverse fault showing predominantly right-lateral movement. According to Hart, et al. (1979), this movement averages less than 1 centimeter per year. Along most of its length, the Elsinore Fault Zone is marked by a bold topographic expression consisting of linearly aligned ridges, swales and hallows. Faulted Holocene alluvial deposits (believed to be less than 11,000 years old) found along several segments of the fault zone suggest that at least part of the zone is currently active.

Although the Elsinore Fault Zone belongs to the San Andreas set of active, northwest-trending, right-slip faults in the southern California area (Crowell, 1962), it has not been the site of a major earthquake in historic time, other than a M6.0 earthquake near the town of Elsinore in 1910 (Richter, 1958; Toppozada and Parke, 1982). However, based on length and evidence of late-Pleistocene or Holocene displacement, Greensfelder (1974) has estimated that the Elsinore Fault Zone is reasonably capable of generating an earthquake ranging from M6.8 to M7.1. Faulting evidence exposed in trenches placed in Glen Ivy Marsh across the Glen Ivy North Fault (a strand of the Elsinore Fault Zone between Corona and Lake Elsinore), suggest a maximum earthquake recurrence interval of 300 years, and when combined with previous estimates of the long-term horizontal slip rate of 0.8 to 7.0 mm/year, suggest typical earthquakes of M6.0 to M7.0 (Rockwell, 1985).

*San Jacinto Fault*: The San Jacinto Fault is located 59 to 80 miles to the northeast of the site. The San Jacinto Fault Zone consists of a series of closely spaced faults,

including the Coyote Creek Fault, that form the western margin of the San Jacinto Mountains. The fault zone extends from its junction with the San Andreas Fault in San Bernardino, southeasterly toward the Brawley area, where it continues south of the international border as the Imperial Transform Fault (Earth Consultants International [ECI], 2009).

The San Jacinto Fault zone has a high level of historical seismic activity, with at least 10 damaging earthquakes (M6.0 to M7.0) having occurred on this fault zone between 1890 and 1986. Earthquakes on the San Jacinto Fault in 1899 and 1918 caused fatalities in the Riverside County area. Offset across this fault is predominantly right-lateral, similar to the San Andreas Fault, although some investigators have suggested that dip-slip motion contributes up to 10% of the net slip (ECI, 2009).

The segments of the San Jacinto Fault that are of most concern to major metropolitan areas are the San Bernardino, San Jacinto Valley and Anza segments. Fault slip rates on the various segments of the San Jacinto are less well constrained than for the San Andreas Fault, but the available data suggest slip rates of 12 ±6 mm/yr for the northern segments of the fault, and slip rates of 4 ±2 mm/yr for the southern segments. For large ground-rupturing earthquakes on the San Jacinto fault, various investigators have suggested a recurrence interval of 150 to 300 years. The Working Group on California Earthquake Probabilities (WGCEP, 2008) has estimated that there is a 31 percent probability that an earthquake of M6.7 or greater will occur within 30 years on this fault. Maximum credible earthquakes of M6.7, M6.9 and M7.2 are expected on the San Bernardino, San Jacinto Valley and Anza segments, respectively, capable of generating peak horizontal ground accelerations of 0.48 to 0.53 g in the County of Riverside, (ECI, 2009). A M5.4 earthquake occurred on the San Jacinto Fault on July 7, 2010.

The United States Geological Survey has issued the following statements with respect to the recent seismic activity on southern California faults:

> The San Jacinto fault, along with the Elsinore, San Andreas, and other faults, is part of the plate boundary that accommodates about 2 inches/year of motion as the Pacific plate moves northwest relative to the North American plate. The largest recent earthquake on the San Jacinto fault, near this location, the M6.5 1968 Borrego Mountain earthquake April 8, 1968, occurred about 25 miles southeast of the July 7, 2010, M5.4 earthquake.
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> This M5.4 earthquake follows the 4th of April 2010, Easter Sunday, Mw7.2 earthquake, located about 125 miles to the south, well south of the US Mexico international border. A M4.9 earthquake occurred in the same area on June 12th at 8:08 pm (Pacific Time). Thus this section of the San Jacinto fault remains active.
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> Seismologists are watching two major earthquake faults in southern California. The San Jacinto fault, the most active earthquake fault in southern California, extends for more than 100 miles from the international border into San Bernardino and Riverside, a major metropolitan area often called the Inland Empire. The Elsinore fault is more than 110 miles long, and extends into the Orange County and Los Angeles area as the Whittier fault. The Elsinore fault is capable of a major earthquake that would significantly affect the large metropolitan areas of southern California. The Elsinore fault has not hosted a major earthquake in more than 100 years. The occurrence of these earthquakes along the San Jacinto fault and continued aftershocks demonstrates that the earthquake activity in the region remains at an elevated level. The San Jacinto fault is known as the most active earthquake fault in southern California. Caltech and USGS seismologist continue to monitor the ongoing earthquake activity using the Caltech/USGS Southern California Seismic Network and a GPS network of more than 100 stations.

## *B. Other Geologic Hazards*

*Ground Rupture*: Ground rupture is characterized by bedrock slippage along an established fault and may result in displacement of the ground surface. For ground rupture to occur along a fault, an earthquake usually exceeds M5.0. If a M5.0 earthquake were to take place on a local fault, an estimated surface-rupture length 1 mile long could be expected (Greensfelder, 1974). Our investigation indicates that the subject site is not directly on a known active fault trace and, therefore, the risk of ground rupture is remote.

*Ground Shaking*: Structural damage caused by seismically induced ground shaking is a detrimental effect directly related to faulting and earthquake activity. Ground shaking is considered to be the greatest seismic hazard in San Diego County. The intensity of ground shaking is dependent on the magnitude of the earthquake, the distance from the earthquake, and the seismic response characteristics of underlying soils and geologic units. Earthquakes of M5.0 or greater are generally associated with significant damage. It is our opinion that the most serious damage to the site would be caused by a large earthquake originating on a nearby strand of the Rose Canyon Fault Zone. Although the chance of such an event is remote, it could occur within the useful life of the structure.

*Landslides*: Based upon our geotechnical investigation, review of the geologic map (Kennedy and Tan, 2008), review of the referenced City of San Diego Seismic Safety Study -- Geologic Hazards Map Sheet 29 and stereo-pair aerial photographs (4-11-53, AXN-8M-1 and 2), we did not identify or encounter the landslide as indicated on (Kennedy and Tan, 2008), geologic map.

*Slope Stability*: We performed slope stability analysis based on the laboratory test results from retrieved soil samples collected during the exploratory excavations, our field review of site conditions, our review of aerial photos, review of pertinent documents and geologic maps, and our experience with similar formational units in the La Jolla area of San Diego. We utilized a computer program titled *SLIDE6* using Bishops Simplified method and conventional equations for gross and shallow stability. Based on our slope stability analysis, a factor of safety (FS) less than 1.5 against gross or shallow slope failure does not exist at any location across the property. In our professional opinion, the site will have a factor of safety of 1.5 or greater following the proposed construction (refer to Appendix C for details).

*Liquefaction*: The liquefaction of saturated sands during earthquakes can be a major cause of damage to buildings. Liquefaction is the process by which soils are transformed into a viscous fluid that will flow as a liquid when unconfined. It occurs primarily in loose, saturated sands and silts when they are sufficiently shaken by an earthquake.

On this site, the risk of liquefaction of foundation materials due to seismic shaking is also considered to be remote due to the dense nature of the natural-ground material, the anticipated high density of the proposed recompacted fill, and the lack of a shallow static groundwater surface under the site. No soil liquefaction or soil strength loss is anticipated to occur due to a seismic event.

*Tsunami*: The risk of a tsunami affecting the site is considered low as the site is situated at an elevation of at least 302 feet above mean sea level and approximately 2,400 feet from an exposed beach.

In general, the orientation of the southern California coastline and the bathymetry of the offshore southern California borderland have, during historical times, combined to protect the shoreline from any large magnitude tsunami height increases, as shown by records of tsunami occurrences that have been observed and/or recorded along the southern California shoreline since 1810 (Lander et al, 1993). For this segment of the California coastline (south of Santa Monica) there is no evidence of any high magnitude tsunamis generated during the last 200 years by large-scale regional sea floor movements (Gayman, 1998).

*Geologic Hazards Summary*: It is our opinion, based upon a review of the available geologic maps and our site investigation, that the site is underlain by relatively stable formational materials, and is suited for the proposed residential structure and associated improvements provided the recommendations herein are implemented.

The most significant geologic hazard at the site is anticipated ground shaking from earthquakes on active Southern California and Baja California faults. The United States Geologic Survey has issued statements indicating that seismic activity in Southern California may continue at elevated levels with increased risk to major metropolitan areas near the Elsinore and San Jacinto faults. These faults are too far from the subject property to present a seismic risk.

To date, the nearest known "active" faults to the subject site are the northwest-trending Rose Canyon Fault, Coronado Bank Fault and the Elsinore Fault. There are no known significant geologic hazards on or near the site that would prevent the proposed construction.

## X. GROUNDWATER

Groundwater and/or perched water conditions were not encountered at the shallow excavation locations and we do not expect significant groundwater problems to develop in the future ***if proper drainage is maintained on the property***. The potential does exist for perched water conditions to occur if rainwater and irrigation waters are allowed to infiltrate through the upper, more permeable fill soils and encounter less permeable natural ground materials.

It should be kept in mind that construction operations may change surface drainage patterns and/or reduce permeabilities due to the densification of compacted soils. Such changes of surface and subsurface hydrologic conditions, plus irrigation of landscaping or significant increases in rainfall, may result in the appearance of surface or near-surface water at locations where none existed previously. The appearance of such water is expected to be localized and cosmetic in nature, if good positive drainage is implemented, as recommended in this report, during and at the completion of construction.

On properties such as the subject site where dense, low permeability soils exist at shallow depths, even normal landscape irrigation practices on the property or neighboring properties, or periods of extended rainfall, can result in shallow "perched" water conditions. The perching (shallow depth) accumulation of water on a low permeability surface can result in areas of persistent wetting and drowning of lawns, plants and trees. Resolution of such conditions, should they occur, may require site-specific design and construction of subdrain and shallow "wick" drain dewatering systems.

Subsurface drainage with a properly designed and constructed subdrain system will be required behind proposed below-ground building retaining walls. Additional recommendations may be required at the time of construction.

It must be understood that unless discovered during initial site exploration or encountered during site construction operations, it is extremely difficult to predict if or where perched or true groundwater conditions may appear in the future. When site fill or formational soils are fine-grained and of low permeability, water problems may not become apparent for extended periods of time.

Water conditions, where suspected or encountered during construction, should be evaluated and remedied by the project civil and geotechnical consultants. The project developer and property owner, however, must realize that post-construction appearances of groundwater may have to be dealt with on a site-specific basis.

## XII. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based upon the practical field investigation conducted by our firm, and resulting laboratory tests, in conjunction with our knowledge and experience with similar soils in the La Jolla area. The opinions, conclusions, and recommendations presented in this report are contingent upon ***Geotechnical Exploration, Inc.*** being retained to review the final plans and specifications as they are developed and to observe the site earthwork and installation of foundations.

## *A. Seismic Design Criteria*

1. *Seismic Design Criteria:* The proposed structure and/or additions should be designed in accordance with Section 1613 of the 2010 CBC, which incorporates by reference the ASCE 7-05 for seismic design. We recommend the following parameters be utilized. We have determined the mapped spectral acceleration values for the site based on a latitude of 32.8452 degrees and longitude of -117.2578 degrees, utilizing a program titled "*Seismic Hazard Curves, Response Parameters and Design Parameters-v5.0.8*," provided by the USGS, which provides a solution for ASCE 7-05 (Section 1613 of the 2010 CBC) utilizing digitized files for the Spectral Acceleration maps. In addition, we have assigned a Site Classification of $S_D$. The response parameters for design are presented in the following table. The design Spectrum Acceleration (SA) vs. Period (T) is shown on Appendix B.

### TABLE I
### *Mapped Spectral Acceleration Values and Design Parameters*

| $S_s$ | $S_1$ | $F_a$ | $F_v$ | $S_{ms}$ | $S_{m1}$ | $S_{ds}$ | $S_{d1}$ |
|---|---|---|---|---|---|---|---|
| 1.292 | 0.500 | 1.0 | 1.50 | 1.292 | 0.750 | 0.862 | 0.500 |

## *B. Preparation of Soils for Site Development*

2. *Clearing and Stripping:* Vegetation and improvements should be removed prior to the preparation of the building pad for areas to receive new structures, additions, or improvements. This includes any roots from existing trees and shrubbery. Holes resulting from the removal of root systems or other buried obstructions that extend below the planned grades should be cleared and backfilled with properly compacted fill.

3. *Treatment of Existing Slopewash Soils or Loose Soils:* In order to provide suitable support for the proposed new residence, basement and associated improvements such as decking, sidewalks and driveways, we recommend that all existing fill, slopewash and colluvium soils be removed and replaced as structural fill compacted to a minimum degree of compaction of 90 percent. The limits of recompaction should extend at least 10 feet beyond the perimeter limits of all new improvements, where feasible. The recompaction work should consist of: (a) removing all existing fill, slopewash and colluvium soils down to the underlying undisturbed formational materials; (b) scarifying, moisture conditioning, and compacting the exposed natural subgrade soils; and (c) replacing the materials as compacted structural fill. The areal extent and depths required to remove the existing fill, slopewash and colluvium should be determined by our representative during the excavation work based on their examination of the soils being exposed and physical constraints.

   In addition, we recommend that, if encountered, any low expansion soil from the required removals be selectively stockpiled for use as capping material and wall backfills as recommended below in Recommendation Nos. 4 and 8.

4. *Subgrade Preparation:* After areas to receive new improvements have been cleared, stripped, and the required excavations made, the exposed subgrade soils in areas to receive fill and/or building improvements should be scarified to a depth of 6 inches, moisture conditioned, and compacted to the requirements for structural fill. The near-surface moisture content of clayey soils should be maintained by periodic sprinkling until within 48 hours prior to concrete placement.

5. *Expansive Soil Conditions:* We do anticipate that significant quantities of highly expansive clay soils will be encountered during grading. Encountered clayey fill soils are of generally high moisture content. Should such soils (of lower moisture content) be encountered and used as fill, however, they should be moisture conditioned or dried to no greater than 5 percent above Optimum Moisture content, compacted to 88 to 92 percent, and preferably placed outside building areas. Soils of medium or greater expansion potential should not be used as retaining wall backfill soils.

6. *Material for Fill:* Any required imported fill material should be a low-expansion potential (Expansion Index of 50 or less per ASTM D4829-11). In addition, both imported and existing on-site materials for use as fill should not contain rocks or lumps more than 6 inches in greatest dimension. All materials for use as fill should be approved by our firm prior to filling.

7. *Fill Compaction:* All structural fill to receive the new foundations and slabs should be compacted to a minimum degree of compaction of 90 percent based upon ASTM D1557-12. Fill material should be spread and compacted in uniform horizontal lifts not exceeding 8 inches in uncompacted thickness. Before compaction begins, the fill should be brought to a moisture content that will permit proper compaction by either: (1) aerating and drying the fill if it is too wet, or (2) moistening the fill with water if it is too dry. Each lift should be thoroughly mixed before compaction to ensure a uniform distribution of moisture. For low expansive soils, the moisture content should be within 2 percent of optimum. As an alternative to fill soil recompaction, deepened foundations and raised wood floors or structural slabs may be considered.

No uncontrolled fill soils should remain on the site after completion of the site work. In the event that temporary ramps or pads are constructed of uncontrolled fill soils, the loose fill soils should be removed and/or recompacted prior to completion of the grading operation.

8. *Trench and Retaining/Basement Wall Backfill:* All backfill soils placed in utility trenches or behind retaining/basement walls should be compacted to a minimum degree of compaction of 90 percent at the Optimum Moisture content. Backfill material should be placed in lift thicknesses appropriate to the type of compaction equipment utilized and compacted to a minimum degree of 90 percent by mechanical means. In pavement areas, that portion of the trench backfill within the pavement section should conform to the material and compaction requirements of the adjacent pavement section. In addition, the low-expansion potential fill layer around the pipe should be maintained in utility trench backfill within the building and adjoining exterior slab areas. Trench backfill on top of the low-expansion fill layer should consist of on-site soils in order to minimize the potential for migration of water below the perimeter footings at the trench locations.

Our experience has shown that even shallow, narrow trenches, such as for irrigation and electrical lines, that are not properly compacted can result in problems, particularly with respect to shallow groundwater accumulation and migration.

Backfill soils placed behind retaining/basement walls should be installed as early as the retaining walls are capable of supporting lateral loads. Backfill soils behind retaining/basement walls should be low expansive, with an Expansion Index equal to or lower than 50.

## *C. Design Parameters for Proposed Foundations*

9. *Deepened Footings:* If the existing surface is not removed and recompacted, deepened footings for proposed residence should be founded at least 3 feet below the lowest adjacent finished grade and penetrate at least 12 inches in dense or stiff formational soils and have a minimum width of 15 inches. The deepened footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. The final dimensions and reinforcing should be specified by the structural engineer. A minimum clearance of 3 inches should be maintained between steel reinforcement and the bottom or sides of the footing.

   Since slab on-grade are most likely planned for both interior and exterior improvements, soil grading and proper moisture conditioning will be required prior to constructing the slabs and shallow footings.

   *NOTE: The project Civil/Structural Engineer should review all reinforcing schedules. The reinforcing minimums recommended herein are not to be construed as structural designs, but merely as minimum reinforcement to reduce the potential for cracking and separations.*

10. Shallow Footings: Shallow footings should bear on undisturbed formational materials or properly compacted fill soils. The footings should be founded at least 24 inches below the lowest adjacent finished grade when founded into properly compacted fill (or 24 inches into formational material). Footings located adjacent to utility trenches should have their bearing surfaces situated below an imaginary 1.5:1.0 plane projected upward from the bottom edge of the adjacent utility trench.

11. *Bearing Values*: At the recommended depths, footings on native, medium dense formational soil or properly compacted fill soil may be designed for allowable bearing pressures of 2,500 pounds per square foot (psf) for combined dead and live loads and increased one-third for all loads, including wind or seismic. The footings should have a minimum width of 12 inches.

12. *Footing Reinforcement*: All continuous footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. We recommend that a minimum of two No. 5 top and two No. 5 bottom reinforcing bars be provided in the footings. A minimum clearance of 3 inches should be maintained between steel reinforcement and the bottom or sides of the footing. Isolated square footings should contain, as a minimum, a grid of three No. 4 steel bars on 12-inch centers, both ways. In order for us to offer an opinion as to whether the footings are founded on soils of sufficient load bearing capacity, it is essential that our representative inspect the footing excavations prior to the placement of reinforcing steel or concrete.

    *NOTE: The project Civil/Structural Engineer should review all reinforcing schedules. The reinforcing minimums recommended herein are not to be construed as structural designs, but merely as minimum reinforcement to reduce the potential for cracking and separations.*

13. *Lateral Loads:* Lateral load resistance for structure foundations may be developed in friction between the foundation bottoms and the supporting subgrade. An allowable friction coefficient of 0.35 is considered applicable. An additional allowable passive resistance equal to an equivalent fluid weight of 300 pounds per cubic foot (pcf) acting against the foundations may be

used in design provided the footings are poured neat against the adjacent undisturbed formational materials and/or properly compacted fill materials. Due to the highly expansive soil conditions, the upper 1 foot of soil should not count in providing passive resistance.

In areas where existing fill soils are present in front of foundations (i.e., within 3 times the depth of embedment), the allowable passive resistance should be reduced to 150 pcf and friction coefficient to 0.30. These lateral resistance values assume a level surface in front of the footing for a minimum distance of three times the embedment depth of the footing.

14. *Settlement:* Settlements under building loads are expected to be within tolerable limits for the proposed additions. For footings designed in accordance with the recommendations presented in the preceding paragraphs, we anticipate that total settlements should not exceed 1 inch and that post-construction differential angular rotation should be less than 1/240.

## *D. Concrete Slab On-grade Criteria*

Slabs on-grade may only be used on new, properly compacted fill or when bearing on dense natural soils at a moisture content of 5 percent over optimum and compacted to between 88 and 92 percent of relative compaction. If concrete slabs are planned on existing fills or slopewash, they should be designed as structural slabs spanning between foundations bearing in formational soils.

15. *Minimum Floor Slab Reinforcement:* Based on our experience, we have found that, for various reasons, floor slabs occasionally crack. Therefore, we recommend that all slabs-on-grade contain at least a minimum amount of reinforcing steel to reduce the separation of cracks, should they occur. Slab subgrade soil should be verified by a ***Geotechnical Exploration, Inc***. representative to have the proper moisture content within 48 hours prior to placement of the vapor barrier and pouring of concrete.

    15.1 New interior floor slabs should be a minimum of 5 inches actual thickness and be reinforced with No. 4 bars on 18-inch centers, both ways, placed at midheight in the slab. *The slabs should be underlain by a 4-inch-thick layer of compacted crushed rock gravel overlying or underlying a moisture retardant membrane (15-mil StegoWrap)*. Slab subgrade soil should be verified by a ***Geotechnical Exploration, Inc.*** representative to have the proper moisture content within 48 hours prior to placement of the vapor barrier and pouring of concrete.

16. *Slab Moisture Protection and Vapor Barrier Membrane:* Although it is not the responsibility of geotechnical engineering firms to provide moisture protection recommendations, as a service to our clients we provide the following discussion and suggested minimum protection criteria. Actual recommendations should be provided by the architect and waterproofing consultants or product manufacturer.

    Soil moisture vapor can result in damage to moisture-sensitive floors, some floor sealers, or sensitive equipment in direct contact with the floor, in addition to mold and staining on slabs, walls, and carpets. The common practice in Southern California is to place vapor retarders made of PVC, or of

polyethylene. PVC retarders are made in thickness ranging from 10- to 60-mil. Polyethylene retarders, called visqueen, range from 5- to 10-mil in thickness. These products are no longer considered adequate for moisture protection and can actually deteriorate over time.

Specialty vapor retarding products possess higher tensile strength and are more specifically designed for and intended to retard moisture transmission into and through concrete slabs. The use of such products is highly recommended for reduction of floor slab moisture emission.

The following American Society for Testing and Materials (ASTM) and American Concrete Institute (ACI) sections address the issue of moisture transmission into and through concrete slabs: ASTM E1745-97 (2009) Standard Specification for Plastic Water Vapor Retarders Used in Contact Concrete Slabs; ASTM E154-88 (2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth; ASTM E96-95 Standard Test Methods for Water Vapor Transmission of Materials; ASTM E1643-98 (2009) Standard Practice for Installation of Water Vapor Retarders Used in Contact Under Concrete Slabs; and ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

16.1 Based on the above, we recommend that the vapor barrier consist of a minimum 15-mil extruded polyolefin plastic (no recycled content or woven materials permitted). Permeance as tested before and after mandatory conditioning (ASTM E1745 Section 7.1 and sub-paragraphs 7.1.1-7.1.5) should be less than 0.01 perms (grains/square foot/hour in Hg) and comply with the ASTM E1745 Class A requirements. Installation of vapor barriers should be in accordance with ASTM

E1643. The basis of design is Stego wrap vapor barrier 15-mil. The vapor barrier should be placed in accordance with the manufacturer's specifications.

16.2 Common to all acceptable products, vapor retarder/barrier joints must be lapped and sealed with mastic or the manufacturer's recommended tape or sealing products. In actual practice, stakes are often driven through the retarder material, equipment is dragged or rolled across the retarder, overlapping or jointing is not properly implemented, etc. All these construction deficiencies reduce the retarder's effectiveness. In no case should retarder/barrier products be punctured or gaps be allowed to form prior to or during concrete placement.

16.3 Following placement of concrete floor slabs, sufficient drying time must be allowed prior to placement of any floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials.

17. *Concrete Isolation Joints:* We recommend the project Civil/Structural Engineer incorporate isolation joints and sawcuts to at least one-fourth the thickness of the slab in any floor designs. The joints and cuts, if properly placed, should reduce the potential for and help control floor slab cracking. We recommend that concrete shrinkage joints be spaced no farther than approximately 20 feet apart, and also at re-entrant corners. However, due to a number of reasons (such as base preparation, construction techniques, curing procedures, and normal shrinkage of concrete), some cracking of slabs can be expected.

18. Exterior Slab Reinforcement: Exterior concrete slabs should be at least 4 inches thick. As a minimum for protection of on-site improvements, we recommend that all nonstructural concrete slabs (such as patios, sidewalks, etc.), be founded on properly compacted and tested fill or dense native formation and be underlain by 2 inches and no more than 3 inches of clean leveling sand, with No. 4 bars at 18-inch centers, both ways, at the center of the slab. Exterior slabs should contain adequate isolation and control joints.

The performance of on-site improvements can be greatly affected by soil base preparation and the quality of construction. It is therefore important that all improvements are properly designed and constructed for the existing soil conditions. The improvements should not be built on loose soils or fills placed without our observation and testing. The subgrade of exterior improvements should be verified as properly prepared within 48 hours prior to concrete placement. A minimum thickness of 2 feet of properly recompacted soils should underlie the secondary exterior slabs on-grade or be built on properly moisture conditioned dense formational soils.

For exterior slabs with the minimum shrinkage reinforcement, control joints should be placed at spaces no farther than 15 feet apart or the width of the slab, whichever is less, and also at re-entrant corners. Control and isolation joints in exterior slabs should be sealed with elastomeric joint sealant. The sealant should be inspected every 6 months and be properly maintained.

## *E. Retaining Wall Design Criteria*

19. *Static Design Parameters:* Retaining walls must be designed to resist lateral earth pressures and any additional lateral pressures caused by surcharge

loads on the adjoining retained surface, plus an additional seismic soil increment when applicable. We recommend that restrained retaining walls with level, low-expansive imported backfill be designed for an equivalent fluid pressure of 38 pcf. Wherever restrained walls will be subjected to surcharge loads, they should also be designed for an additional uniform lateral pressure of 0.31 times the anticipated surcharge pressure for unrestrained walls (and 0.58 times for restrained walls) supporting level, low-expansive backfill.

Exterior unrestrained retaining walls supporting a 1.5:1.0 (h:v) backfill may be designed for an equivalent fluid weight of 62 pcf (using low expansive soils) and 85 pcf for on-site expansive soils with a 2.0:1.0 (h:v) sloping backfill. Restrained retaining walls supporting a 2.0:1.0 (h:v) backfill of low expansive soils should be designed with a soil pressure of 55 pcf (100 pcf for on-site expansive soils supporting a 2.0:1.0 sloping backfill).

Backfill placed behind the walls should be compacted to a minimum degree of compaction of 90 percent using light compaction equipment. If heavy equipment is used, the walls should be appropriately temporarily braced.

20. *Retaining Wall Seismic Earth Pressures:* If seismic loading is considered for retaining walls more than 6 feet in height, they should be designed for seismic earth pressures in addition to the normal static pressures. For the retaining wall (restrained) with level backfill, we recommend that the seismic pressure increment be taken as an additional fluid pressure distribution (zero pressure at the ground surface and maximum pressure at the base) utilizing an equivalent fluid weight of 16 pounds per cubic foot (pcf). A Kh value of 0.17 may be used is a computer program such as "*Retaining Wall Pro*" or a

similar program is used for wall design. The soil pressure described above may be used for the design of shoring structures.

21. *Wall Drainage:* The preceding design pressures assume that the walls are backfilled with the on-site soils or imported low-expansive soils, and that there is sufficient drainage behind the walls to prevent the build-up of hydrostatic pressures from surface water infiltration. We recommend that drainage be provided by a composite drainage material such as Miradrain 6000/6200 or equivalent. The drain material should terminate 3 inches below the finish surface where the surface is covered by pavements or slabs or 6 inches below the finish surface in landscape areas (see Figure No. IX for Retaining Wall Drainage schematic). Waterproofing should extend from the bottom to the top of the wall.

    ***Geotechnical Exploration, Inc.*** will assume no liability for damage to structures or improvements that is attributable to poor drainage. The architectural plans should clearly indicate that subdrains for any lower-level walls be placed at an elevation at least 1 foot below the bottom of the lower-level slabs. At least 0.5-percent gradient should be provided to the subdrain. The subdrain should be placed in an envelope of crushed rock gravel up to 1 inch in maximum diameter, and be wrapped with Mirafi 140N filter or equivalent. A sump pump may be needed if the subdrain does not outlet via gravity. The collected water should be taken to an approved drainage facility.

22. *Drainage Quality Control*: It must be understood that it is not within the scope of our services to provide quality control oversight for surface or subsurface drainage construction or retaining wall sealing and base of wall

drain construction. It is the responsibility of the contractor to verify proper wall sealing, geofabric installation, protection board (if needed), drain depth below interior floor or yard surface, pipe percent slope to the outlet, etc.

## *F.* ***Slopes***

It is our understanding that no large permanent slopes are proposed. Temporary slopes may be required during site preparation and construction.

23. *Slope Observations:* A representative of ***Geotechnical Exploration, Inc.*** must observe any steep temporary slopes *during construction.* In the event that soils and formational material comprising a slope are not as anticipated, any required slope design changes would be presented at that time.

24. *Permanent Slopes*: Any new cut or fill slopes up to 10 feet in height should be constructed at an inclination of 2.0:1.0 (horizontal to vertical). Permanent slopes at a 2.0:1.0 slope should possess a factor of safety of 1.5 against deep and shallow failure. Existing on-site slopes have also been found to possess a factor of safety of at least 1.5 against gross and shallow slope failure.

25. *Temporary Slopes*: Based on our subsurface investigation work, laboratory test results, and engineering analysis, temporary slopes should be stable for a maximum slope height of up to 12 feet and may be cut at a slope ratio of 1.0:1.0 in properly compacted fill soils and at 0.75:1.0 in medium dense natural soils. Some localized sloughing or raveling of the soils exposed on the slopes, however, may occur.

Since the stability of temporary construction slopes will depend largely on the contractor's activities and safety precautions (storage and equipment loadings near the tops of cut slopes, surface drainage provisions, etc.), it should be the contractor's responsibility to establish and maintain all temporary construction slopes at a safe inclination appropriate to his methods of operation. No soil stockpiles or surcharge may be placed within a horizontal distance of 10 feet from the excavation.

If these recommendations are not feasible due to space constraints, temporary shoring may be required for safety and to protect adjacent property improvements. Similarly, footings near temporary cuts should be underpinned or protected with shoring.

26. *Cal-OSHA*: Where not superseded by specific recommendations presented in this report, trenches, excavations, and temporary slopes at the subject site should be constructed in accordance with Title 8, Construction Safety Orders, issued by Cal-OSHA.

### G. ***Site Drainage Considerations***

27. *Erosion Control*: Appropriate erosion control measures should be taken at all times during and after construction to prevent surface runoff waters from entering footing excavations or ponding on finished building pad areas.

28. *Surface Drainage:* Adequate measures should be taken to properly finish-grade the lot after the additions and other improvements are in place. Drainage waters from this site and adjacent properties should be directed away from the footings, floor slabs, and slopes, onto the natural drainage

direction for this area or into properly designed and approved drainage facilities provided by the project civil engineer. Roof gutters and downspouts should be installed on the residence, with the runoff directed away from the foundations via closed drainage lines. Proper subsurface and surface drainage will help minimize the potential for waters to seek the level of the bearing soils under the footings and floor slabs.

Failure to observe this recommendation could result in undermining and possible differential settlement of the structure or other improvements on the site or cause other moisture-related problems. Currently, the California Building Code requires a minimum 1-percent surface gradient for proper drainage of building pads unless waived by the building official. Concrete pavement may have a minimum gradient of 0.5-percent.

29. *Planter Drainage:* Planter areas, flower beds and planter boxes should be sloped to drain away from the footings and floor slabs at a gradient of at least 5 percent within 5 feet from the perimeter walls. Any planter areas adjacent to the residence or surrounded by concrete improvements should be provided with sufficient area drains to help with rapid runoff disposal. No water should be allowed to pond adjacent to the residence or other improvements or anywhere on the site.

## *H. General Recommendations*

30. *Project Start Up Notification:* In order to reduce work delays during site development, this firm should be contacted 48 hours prior to any need for observation of footing excavations or field density testing of compacted fill soils. If possible, placement of formwork and steel reinforcement in footing

excavations should not occur prior to observing the excavations; in the event that our observations reveal the need for deepening or redesigning foundation structures at any locations, any formwork or steel reinforcement in the affected footing excavation areas would have to be removed prior to correction of the observed problem (i.e., deepening the footing excavation, recompacting soil in the bottom of the excavation, etc.).

31. *Construction Best Management Practices (BMPs):* Construction BMPs must be implemented in accordance with the requirements of the controlling jurisdiction. Sufficient BMPs must be installed to prevent silt, mud or other construction debris from being tracked into the adjacent street(s) or storm water conveyance systems due to construction vehicles or any other construction activity. The contractor is responsible for cleaning any such debris that may be in the street at the end of each work day or after a storm event that causes breach in the installed construction BMPs.

All stockpiles of uncompacted soil and/or building materials that are intended to be left unprotected for a period greater than 7 days are to be provided with erosion and sediment controls. Such soil must be protected each day when the probability of rain is 40% or greater. A concrete washout should be provided on all projects that propose the construction of any concrete improvements that are to be poured in place. All erosion/sediment control devices should be maintained in working order at all times. All slopes that are created or disturbed by construction activity must be protected against erosion and sediment transport at all times. The storage of all construction materials and equipment must be protected against any potential release of pollutants into the environment.

## XII. GRADING NOTES

***Geotechnical Exploration, Inc.*** recommends that we be retained to verify the actual soil conditions revealed during site grading work and footing excavation to be as anticipated in this "*Report of Preliminary Geotechnical Investigation*" for the project. In addition, the compaction of any fill soils placed during site grading work must be observed and tested by the soil engineer.

It is the responsibility of the grading contractor to comply with the requirements on the grading plans as well as the local grading ordinance. All retaining wall and trench backfill should be properly compacted. ***Geotechnical Exploration, Inc.*** will assume no liability for damage occurring due to improperly or uncompacted backfill placed without our observations and testing.

## XIII. LIMITATIONS

Our conclusions and recommendations have been based on available data obtained from our field investigation and laboratory analysis, as well as our experience with similar soils and formational materials located in this area of San Diego. Of necessity, we must assume a certain degree of continuity between exploratory excavations and/or natural exposures. It is, therefore, necessary that all observations, conclusions, and recommendations be verified at the time grading operations begin or when footing excavations are placed. In the event discrepancies are noted, additional recommendations may be issued, if required.

The work performed and recommendations presented herein are the result of an investigation and analysis that meet the contemporary standard of care in our profession within the County of San Diego. No warranty is provided.

As stated previously, it is not within the scope of our services to provide quality control oversight for surface or subsurface drainage construction or retaining wall sealing and base of wall drain construction. It is the responsibility of the contractor to verify proper wall sealing, geofabric installation, protection board installation (if needed), drain depth below interior floor or yard surfaces; pipe percent slope to the outlet, etc.

This report should be considered valid for a period of two (2) years, and is subject to review by our firm following that time. If significant modifications are made to the building plans, especially with respect to the height and location of any proposed structures, this report must be presented to us for immediate review and possible revision.

It is the responsibility of the owner and/or developer to ensure that the recommendations summarized in this report are carried out in the field operations and that our recommendations for design of this project are incorporated in the structural plans. We should be retained to review the project plans once they are available, to verify that our recommendations are adequately incorporated in the plans. Additional or modified recommendations may be issued if warranted after plan review.

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations, and we cannot be responsible for the safety of personnel other than our own on the site; the safety of others is the responsibility of the contractor. The contractor should notify the owner if he considered any of the recommended actions presented herein to be unsafe.

The firm of ***Geotechnical Exploration, Inc.*** shall not be held responsible for changes to the physical condition of the property, such as addition of fill soils or changing drainage patterns, which occur subsequent to issuance of this report and the changes are made without our observations, testing, and approval.

Once again, should any questions arise concerning this report, please feel free to contact the undersigned. Reference to our **Job No. 16-11019** will expedite a reply to your inquiries.

Respectfully submitted,

**GEOTECHNICAL EXPLORATION, INC.**

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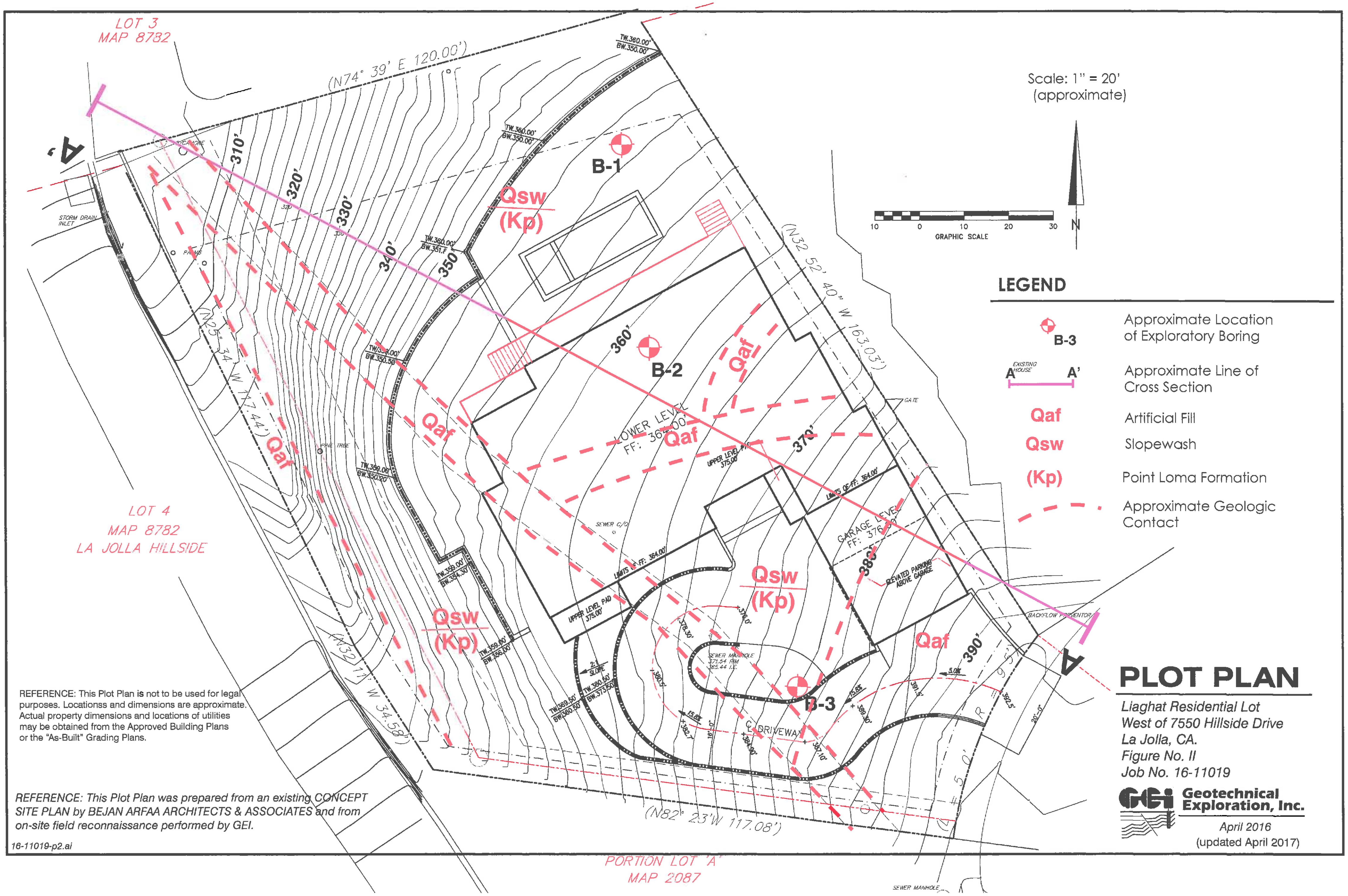
# VICINITY MAP

Thomas Bros Guide San Diego County pg 1227-H6

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

*Figure No. I*
*Job No. 16-11019*



REFERENCE: This Plot Plan is not to be used for legal purposes. Locationss and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

*REFERENCE: This Plot Plan was prepared from an existing CONCEPT SITE PLAN by BEJAN ARFAA ARCHITECTS & ASSOCIATES and from on-site field reconnaissance performed by GEI.*

*16-11019-p2.ai*

# PLOT PLAN

*Liaghat Residential Lot*
*West of 7550 Hillside Drive*
*La Jolla, CA.*
*Figure No. II*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**
April 2016
(updated April 2017)

| EQUIPMENT | DIMENSION & TYPE OF EXCAVATION | DATE LOGGED |
|---|---|---|
| **Limited Access Auger Drill Rig** | **6-inch diameter Boring** | **3-2-16** |
| SURFACE ELEVATION | GROUNDWATER/ SEEPAGE DEPTH | LOGGED BY |
| **± 350' Mean Sea Level** | **Not Encountered** | **JAB** |

| DEPTH (feet) | SYMBOL | SAMPLE | FIELD DESCRIPTION AND CLASSIFICATION<br>DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | EXPANSION INDEX | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **SANDY CLAY**, fine- to medium-grained sand, trace subangular gravel to 3/4" in diameter. Stiff. Moist. Dark gray to dark brown. | CL | | | | | | | | | |
| | | 1 | **SLOPEWASH (Qsw)**<br>-- 75% passing #200 sieve. | | 19.6 | | | | | | 91 | | |
| 2 | | | | | | | | | | | | | |
| | | ■ | | | 18.6 | 97.6 | | | | | | 22 | 3" |
| 4 | | | | | | | | | | | | | |
| | | ▨ | | | | | | | | | | 12 | 2" |
| | | | **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Very stiff. Moist. Dark gray.<br>**POINT LOMA FORMATION (Kp)** | CL | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| | | ■ | | | 19.4 | 103.4 | | | | | 87 | 34 | 3" |
| 8 | | ☒ | Bulk bag sample from 7'- 10'. | | | | | | | | | | |
| | | ▨ | | | | | | | | | | 21 | 2" |
| 10 | | | | | | | | | | | | | |
| | | | Bottom @ 10' | | | | | | | | | | |

| | |
|---|---|
| ▼ | PERCHED WATER TABLE |
| ☒ | BULK BAG SAMPLE |
| 1 | IN-PLACE SAMPLE |
| ■ | MODIFIED CALIFORNIA SAMPLE |
| S | NUCLEAR FIELD DENSITY TEST |
| ▨ | STANDARD PENETRATION TEST |

JOB NAME
**Liaghat Residential Lot**

SITE LOCATION
**West of 7550 Hillside Drive, La Jolla, CA**

JOB NUMBER
**16-11019**

FIGURE NUMBER
**IIIa**

REVIEWED BY **LDR/JAC**

**Geotechnical Exploration, Inc.**

LOG No.
**B-1**

| EQUIPMENT | DIMENSION & TYPE OF EXCAVATION | DATE LOGGED |
|---|---|---|
| **Limited Access Auger Drill Rig** | **6-inch diameter Boring** | **3-2-16** |
| SURFACE ELEVATION | GROUNDWATER/ SEEPAGE DEPTH | LOGGED BY |
| **± 362' Mean Sea Level** | **Not Encountered** | **JAB** |

| DEPTH (feet) | SYMBOL | SAMPLE | FIELD DESCRIPTION AND CLASSIFICATION<br>DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | **SANDY CLAY**, fine- to medium-grained sand. Very stiff. Moist. Dark brown.<br>**SLOPEWASH (Qsw)** | CL | | | | | | | | |
| 2 | | ■ | | | | | | | | | 24 | 3" |
| 3 | | | **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Very stiff. Moist. Dark gray.<br>**POINT LOMA FORMATION (Kp)** | CL | | | | | | | | |
| 4 | | ▨ | | | | | | | | | 18 | 2" |
| 6 | | | | | | | | | | | | |
| 7 | | ■ | -- becomes hard, less disturbed. | | 19.1 | 108.1 | | | | | 75 | 3" |
| 9 | | ▨ | | | | | | | | | 49 | 2" |
| 10 | | | Bottom @ 10' | | | | | | | | | |

- ▼ PERCHED WATER TABLE
- ☒ BULK BAG SAMPLE
- 1 IN-PLACE SAMPLE
- ■ MODIFIED CALIFORNIA SAMPLE
- S NUCLEAR FIELD DENSITY TEST
- ▨ STANDARD PENETRATION TEST

JOB NAME
**Liaghat Residential Lot**

SITE LOCATION
**West of 7550 Hillside Drive, La Jolla, CA**

JOB NUMBER
**16-11019**

FIGURE NUMBER
**IIIb**

REVIEWED BY **LDR/JAC**

Geotechnical Exploration, Inc.

LOG No.
**B-2**

EXPLORATION LOG 11019 LIAGHAT.GPJ GEO_EXPL.GDT 3/14/16

| EQUIPMENT | DIMENSION & TYPE OF EXCAVATION | DATE LOGGED |
|---|---|---|
| **Limited Access Auger Drill Rig** | **6-inch diameter Boring** | **3-2-16** |
| SURFACE ELEVATION | GROUNDWATER/ SEEPAGE DEPTH | LOGGED BY |
| **± 381' Mean Sea Level** | **Not Encountered** | **JAB** |

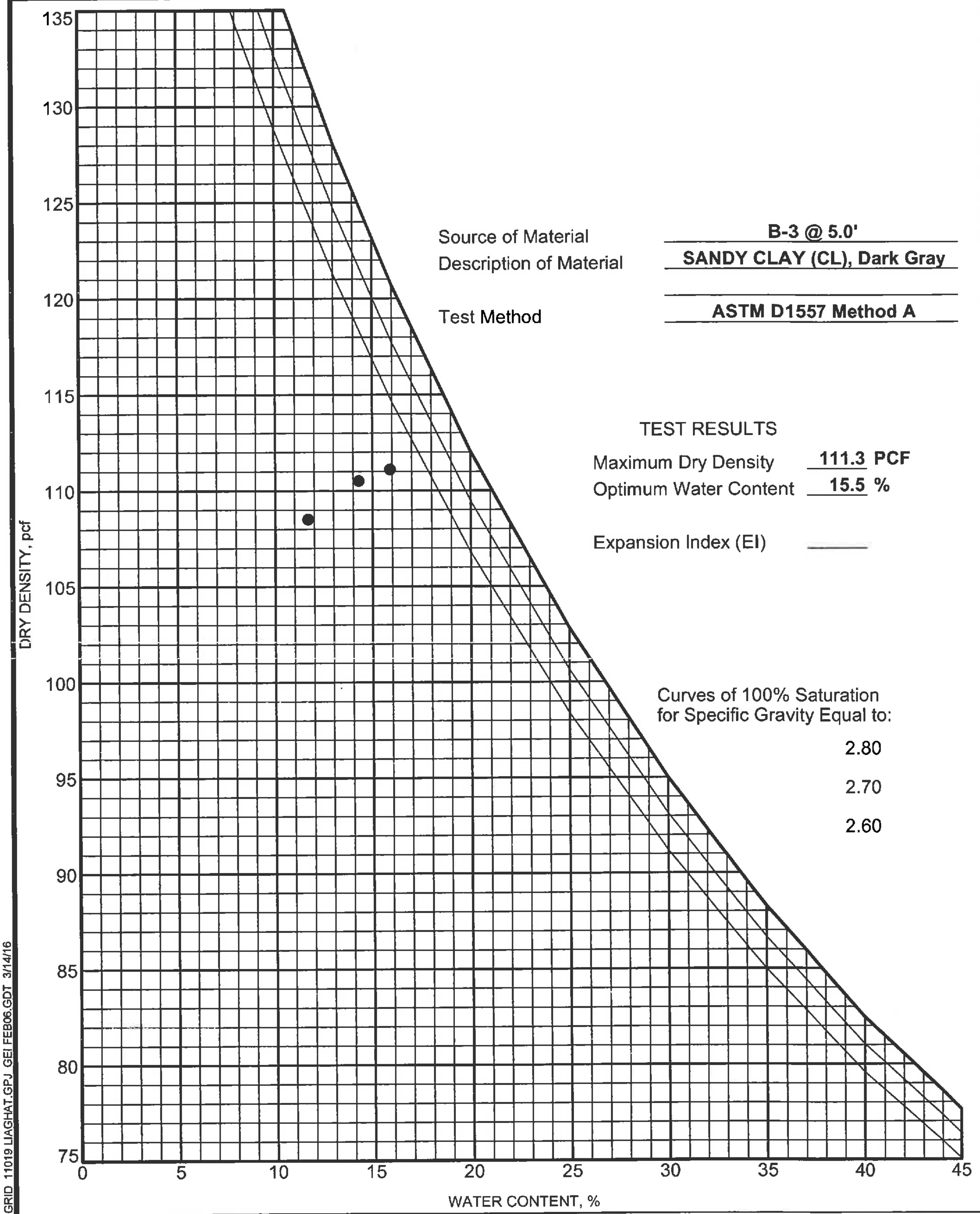
| DEPTH (feet) | SYMBOL | SAMPLE | FIELD DESCRIPTION AND CLASSIFICATION<br>DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| |  | ☒ | **SANDY CLAY**, fine- to medium-grained sand, with abundant roots to 1.5 feet. Stiff. Moist. Dark yellow-brown to dark brown.<br>**SLOPEWASH (Qsw)** | CL | | | | | | | | |
| 2 | | ■ | | | | | | | | | | |
| | | | **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Stiff. Moist. Dark gray.<br>**POINT LOMA FORMATION (Kp)** | CL | 13.7 | 86.9 | | | | | 13 | 3" |
| 4 | | ▨ | | | | | | | | | 15 | 2" |
| | | ☒ | -- Bulk bag sample from 4'- 7'.<br>-- 93% passing #200 sieve. | | | | | | | | | |
| 6 | | | | | | | 15.5 | 111.3 | | | | |
| | | ■ | -- becomes hard, less disturbed. | | | | | | | | | |
| 8 | | | | | | | | | | | 50 | 3" |
| | | ▨ | | | | | | | | | 50 | 2" |
| 10 | | | Bottom @ 10' | | | | | | | | | |

- ▼ PERCHED WATER TABLE
- ☒ BULK BAG SAMPLE
- 1 IN-PLACE SAMPLE
- ■ MODIFIED CALIFORNIA SAMPLE
- S NUCLEAR FIELD DENSITY TEST
- ▨ STANDARD PENETRATION TEST

JOB NAME
**Liaghat Residential Lot**

SITE LOCATION
**West of 7550 Hillside Drive, La Jolla, CA**

| JOB NUMBER | REVIEWED BY | LOG No. |
|---|---|---|
| **16-11019** | **LDR/JAC** | **B-3** |
| FIGURE NUMBER | Geotechnical Exploration, Inc. | |
| **IIIc** | | |



Source of Material: **B-3 @ 5.0'**

Description of Material: **SANDY CLAY (CL), Dark Gray**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density **111.3 PCF**

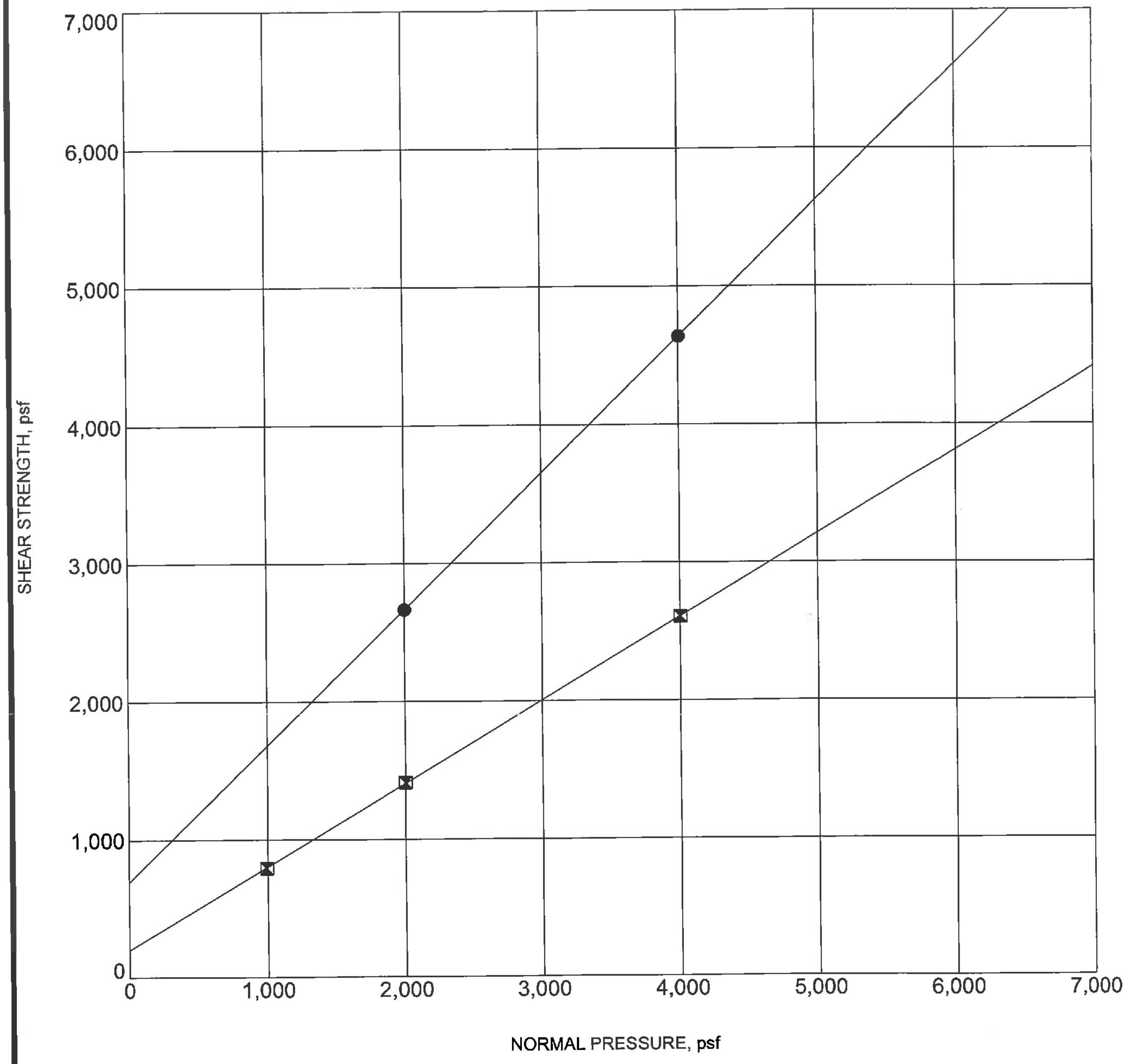
Optimum Water Content **15.5 %**

Expansion Index (EI) ______

**Geotechnical Exploration, Inc.**

## MOISTURE-DENSITY RELATIONSHIP

Figure Number: IVa
Job Name: Liaghat Residential Lot
Site Location: West of 7550 Hillside Drive, La Jolla, CA
Job Number: 16-11019



| Specimen Identification | | Classification | $\gamma_d$ | MC% | c | φ |
|---|---|---|---|---|---|---|
| ● | **B-2 @ 8.0'** | **SANDY CLAY (CL), Dark Gray** | | | **691** | **45** |
| ☒ | **B-3 @ 3.0'** | **SANDY CLAY (CL), Dark Gray** | | | **199** | **31** |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Geotechnical Exploration, Inc.**

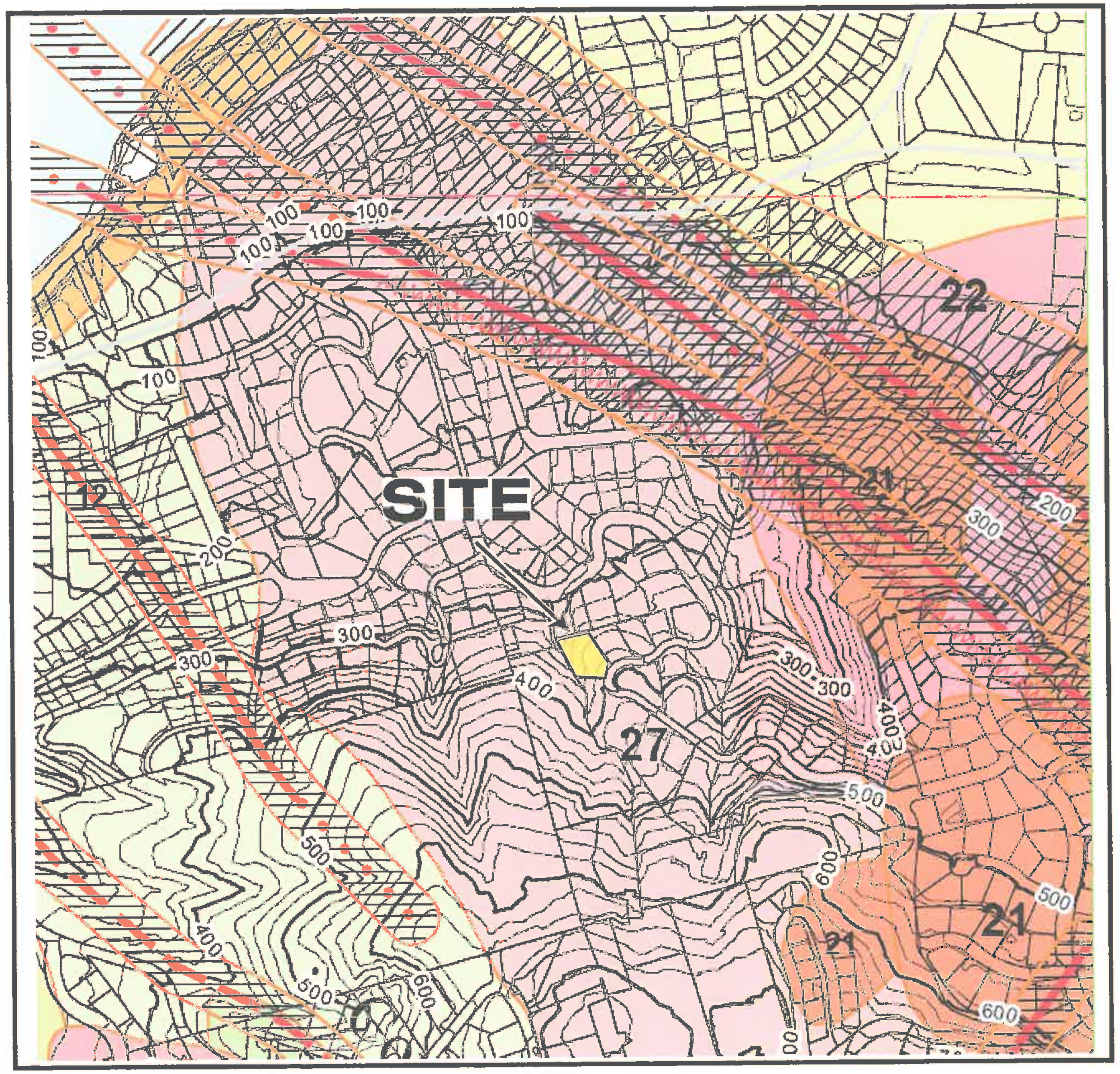
# DIRECT SHEAR TEST

Figure Number: IVb
Job Name: Liaghat Residential Lot
Site Location: West of 7550 Hillside Drive, La Jolla, CA
Job Number: 16-11019

# Geologic Hazards Map Excerpt
# from City of San Diego
# Geologic Hazards and Fault Map
# Sheet 29

Development Services Department

DATE: 4/3/2008



Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

## LEGEND

### Geologic Hazard Categories

**FAULT ZONES**

- ▨ 11 Active, Alquist-Priolo Earthquake Fault Zone
- ▤ 12 Potentially Active, Inactive, Presumed Inactive, or Activity Unknown
- ■ 13 Downtown special fault zone

**LANDSLIDES**

- ■ 21 Confirmed, known, or highly suspected
- ■ 22 Possible or conjectured

**SLIDE-PRONE FORMATIONS**

- ■ 23 Friars: neutral or favorable geologic structure
- ■ 24 Friars: unfavorable geologic structure
- ■ 25 Ardath: neutral or favorable geologic structure
- ■ 26 Ardath: unfavorable geologic structure
- ■ 27 Otay, Sweetwater, and others

**LIQUEFACTION**

- ■ 31 High Potential -- shallow groundwater major drainages, hydraulic fills
- ■ 32 Low Potential -- fluctuating groundwater minor drainages

**COASTAL BLUFFS**

- ■ 41 Generally unstable Numerous landslides, high steep bluffs, severe erosion, unfavorable geologic structure
- ■ 42 Generally unstable Unfavorable bedding plains, high erosion
- ■ 43 Generally unstable Unfavorable jointing, local high erosion
- ■ 44 Moderately stable Mostly stable formations, local high erosion
- ■ 45 Moderately stable Some minor landslides, minor erosion
- ■ 46 Moderately stable Some unfavorable geologic structure, minor or no erosion
- ■ 47 Generally stable Favorable geologic structure, minor or no erosion, no landslides
- ■ 48 Generally stable Broad beach areas, developed harbor

**OTHER TERRAIN**

- ■ 51 Level mesas -- underlain by terrace deposits and bedrock nominal risk
- ■ 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
- ■ 54 Steeply sloping terrain, unfavorable or fault controlled geologic structure, Moderate risk
- ■ 55 Modified terrain (graded sites) Nominal risk

**Water (Bays and Lakes)**

- ■

**FAULTS**

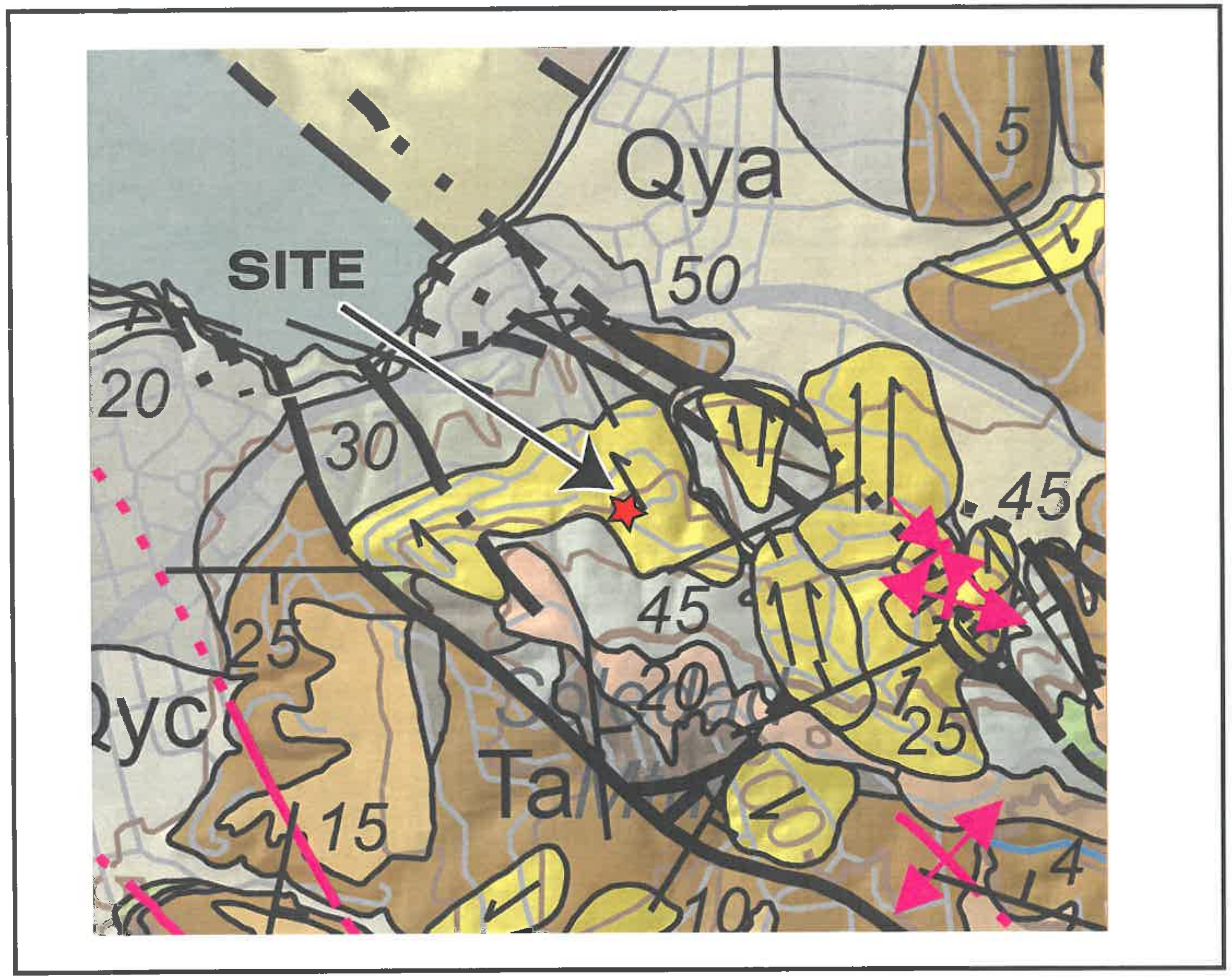
- ∧∨ Fault
- ∧ ∨ Inferred Fault
- Concealed Fault
- Shear Zone

*Figure No. V*
*Job No. 16-11019*

**GEI Geotechnical Exploration, Inc.**

April 2016

Liaghat-seis-combo.ai



Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

## EXCERPT FROM GEOLOGIC MAP OF THE SAN DIEGO 30' x 60' QUADRANGLE, CALIFORNIA

By
Michael P. Kennedy[1] and Siang S. Tan[1]
2008
Digital preparation by
Kelly R. Bovard[2], Anne G. Garcia[2], Diane Burns[2], and Carlos I. Gutierrez[1]
1. Department of Conservation, California Geological Survey
2. U.S. Geological Survey, Department of Earth Sciences, University of California, Riverside

### ONSHORE MAP SYMBOLS

Contact - Contact between geologic units; dotted where concealed.

70 U D Fault - Solid where accurately located; dashed where approximately located; dotted where concealed. U = upthrown block, D = downthrown block. Arrow and number indicate direction and angle of dip of fault plane.

Anticline - Solid where accurately located; dashed where approximately located; dotted where concealed. Arrow indicates direction of axial plunge.

Syncline - Solid where accurately located; dotted where concealed. Arrow indicates direction of axial plunge.

Qls? Landslide - Arrows indicate principal direction of movement. Queried where existence is questionable.

Strike and dip of beds

70 Inclined

Strike and dip of igneous joints

60 Inclined

Vertical

Strike and dip of metamorphic foliation

55 Inclined

## DESCRIPTION OF MAP UNITS

**Qls** **Landslide deposits undivided (Holocene and Pleistocene)**—Highly fragmented to largely coherent landslide deposits. Unconsolidated to moderately well consolidated. Most mapped landslides contain scarp area as well as slide deposit. Many Pleistocene age landslides were reactivated in part or entirely during late Holocene

Base Map

Onshore base (hypsography, hydrography and transportation) from U.S.G.S. digital line graph (DLG) data, San Diego 30' x 60' metric quadrangle. Shaded topographic base from U.S.G.S. digital elevation models (DEM's). Offshore bathymetric contours and shaded bathymetry from N.O.A.A. single and multibeam data. Projection is UTM, zone 11, North American Datum 1927.

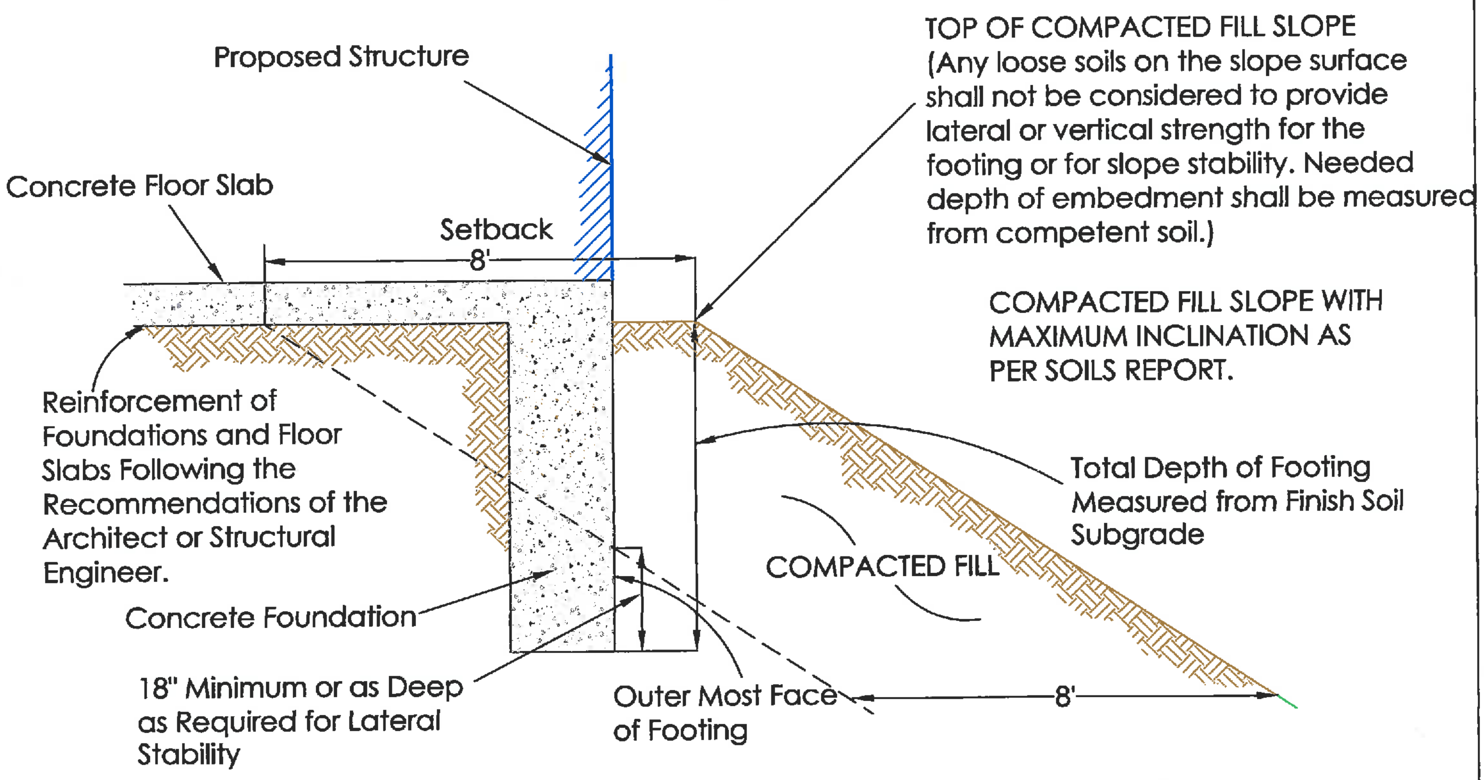
This map was funded in part by the U.S. Geological Survey National Cooperative Geologic Mapping Program, STATEMAP Award no. 08HQAG2049.

Prepared in cooperation with the U.S. Geological Survey, Southern California Areal Mapping Project.

Liaghat-2008-geo.ai

*Figure No. VI*
*Job No. 16-11019*
Geotechnical Exploration, Inc.
April 2016

# FOUNDATION REQUIREMENTS NEAR SLOPES



TOP OF COMPACTED FILL SLOPE
(Any loose soils on the slope surface shall not be considered to provide lateral or vertical strength for the footing or for slope stability. Needed depth of embedment shall be measured from competent soil.)

COMPACTED FILL SLOPE WITH MAXIMUM INCLINATION AS PER SOILS REPORT.

Reinforcement of Foundations and Floor Slabs Following the Recommendations of the Architect or Structural Engineer.

Total Depth of Footing Measured from Finish Soil Subgrade

18" Minimum or as Deep as Required for Lateral Stability

## TYPICAL SECTION

( Showing Proposed Foundation Located Within 8 Feet of Top of Slope )

## 18" FOOTING / 8' SETBACK

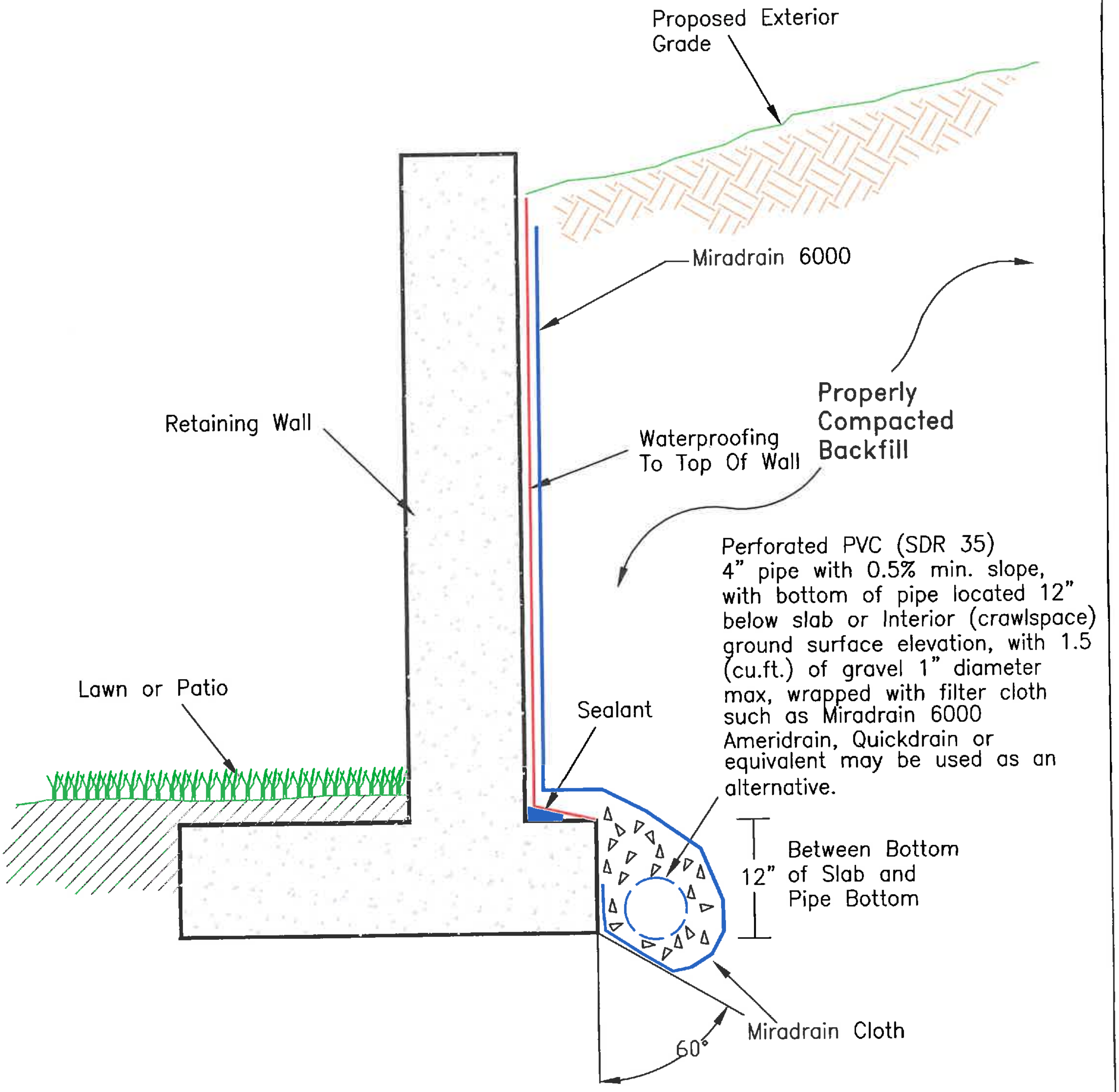
| | Total Depth of Footing | |
|---|---|---|
| Distance From Top of Slope | 1.5:1.0 SLOPE * | 2.0:1.0 SLOPE |
| 0 | 82" | 66" |
| 2' | 66" | 54" |
| 4' | 51" | 42" |
| 6' | 34" | 30" |
| 8' | 18" | 18" |

* when applicable

*Figure No. VIII*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

# SCHEMATIC RETAINING WALL
# SUBDRAIN RECOMMENDATIONS



Perforated PVC (SDR 35) 4" pipe with 0.5% min. slope, with bottom of pipe located 12" below slab or Interior (crawlspace) ground surface elevation, with 1.5 (cu.ft.) of gravel 1" diameter max, wrapped with filter cloth such as Miradrain 6000 Ameridrain, Quickdrain or equivalent may be used as an alternative.

**NOT TO SCALE**

*Figure No. IX*
*Job No. 16–11019*

NOTE: As an option to Miradrain 6000, Gravel or Crushed rock 3/4" maximum diameter may be used with a minimum 12" thickness along the interior face of the wall and 2.0 cu.ft./ft. of pipe gravel envelope.

**Geotechnical Exploration, Inc.**

*April 2016*

# APPENDIX A
# UNIFIED SOIL CLASSIFICATION CHART
# SOIL DESCRIPTION

**Coarse-grained (More than half of material is larger than a No. 200 sieve)**

| | | |
|---|---|---|
| GRAVELS, CLEAN GRAVELS (More than half of coarse fraction is larger than No. 4 sieve size, but smaller than 3") | GW | Well-graded gravels, gravel and sand mixtures, little or no fines. |
| | GP | Poorly graded gravels, gravel and sand mixtures, little or no fines. |
| GRAVELS WITH FINES (Appreciable amount) | GC | Clay gravels, poorly graded gravel-sand-silt mixtures |
| SANDS, CLEAN SANDS (More than half of coarse fraction is smaller than a No. 4 sieve) | SW | Well-graded sand, gravelly sands, little or no fines |
| | SP | Poorly graded sands, gravelly sands, little or no fines. |
| SANDS WITH FINES (Appreciable amount) | SM | Silty sands, poorly graded sand and silty mixtures. |
| | SC | Clayey sands, poorly graded sand and clay mixtures. |

**Fine-grained (More than half of material is smaller than a No. 200 sieve)**

SILTS AND CLAYS

| | | |
|---|---|---|
| *Liquid Limit Less than 50* | ML | Inorganic silts and very fine sands, rock flour, sandy silt and clayey-silt sand mixtures with a slight plasticity |
| | CL | Inorganic clays of low to medium plasticity, gravelly clays, silty clays, clean clays. |
| | OL | Organic silts and organic silty clays of low plasticity. |
| *Liquid Limit Greater than 50* | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. |
| | CH | Inorganic clays of high plasticity, fat clays. |
| | OH | Organic clays of medium to high plasticity. |
| HIGHLY ORGANIC SOILS | PT | Peat and other highly organic soils |

(rev. 6/05)

# USGS Design Maps Summary Report

## User–Specified Input

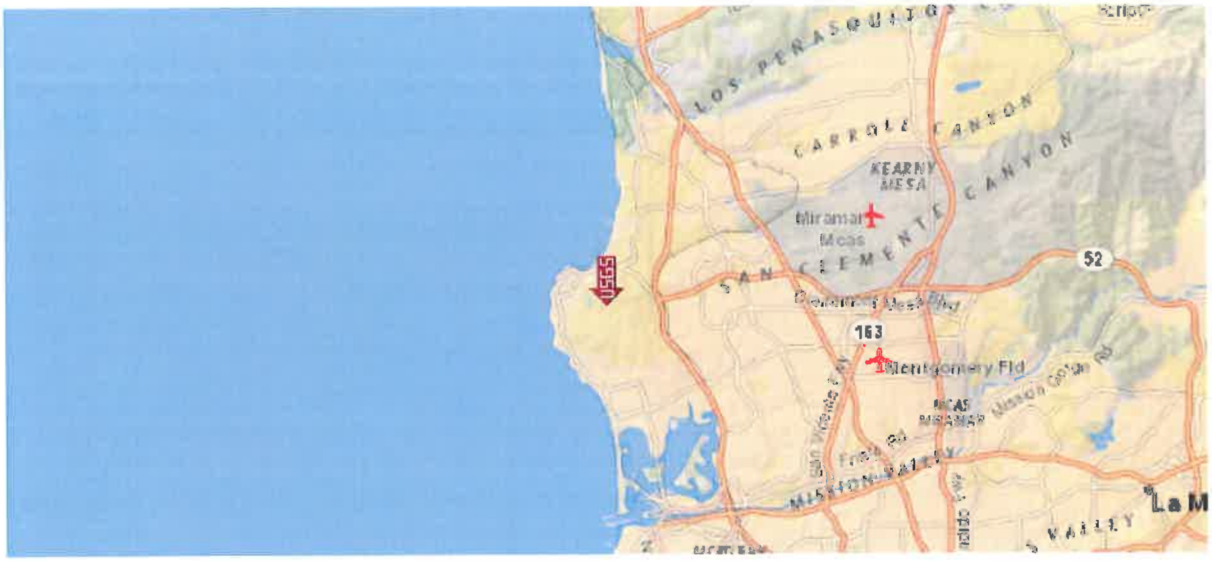
**Report Title** Liaghat Residential Lot
Thu March 17, 2016 22:05:53 UTC

**Building Code Reference Document** ASCE 7-10 Standard
(which utilizes USGS hazard data available in 2008)

**Site Coordinates** 32.8452°N, 117.2578°W

**Site Soil Classification** Site Class D – "Stiff Soil"

**Risk Category** I/II/III

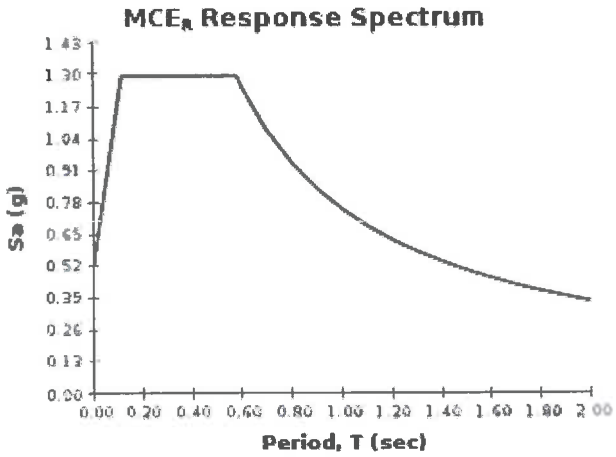


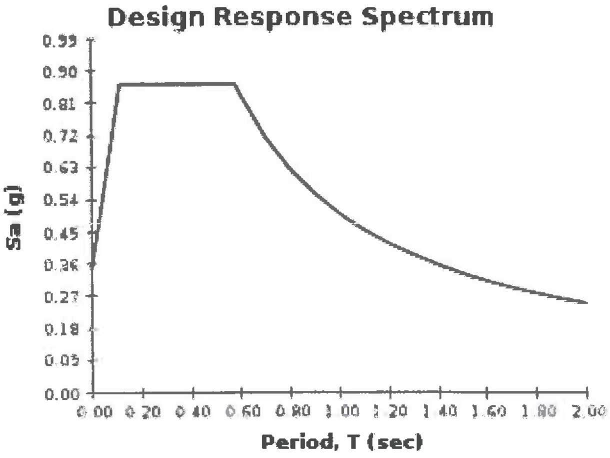
## USGS–Provided Output

$S_S =$ 1.292 g $S_{MS} =$ 1.292 g $S_{DS} =$ 0.862 g

$S_1 =$ 0.500 g $S_{M1} =$ 0.750 g $S_{D1} =$ 0.500 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.

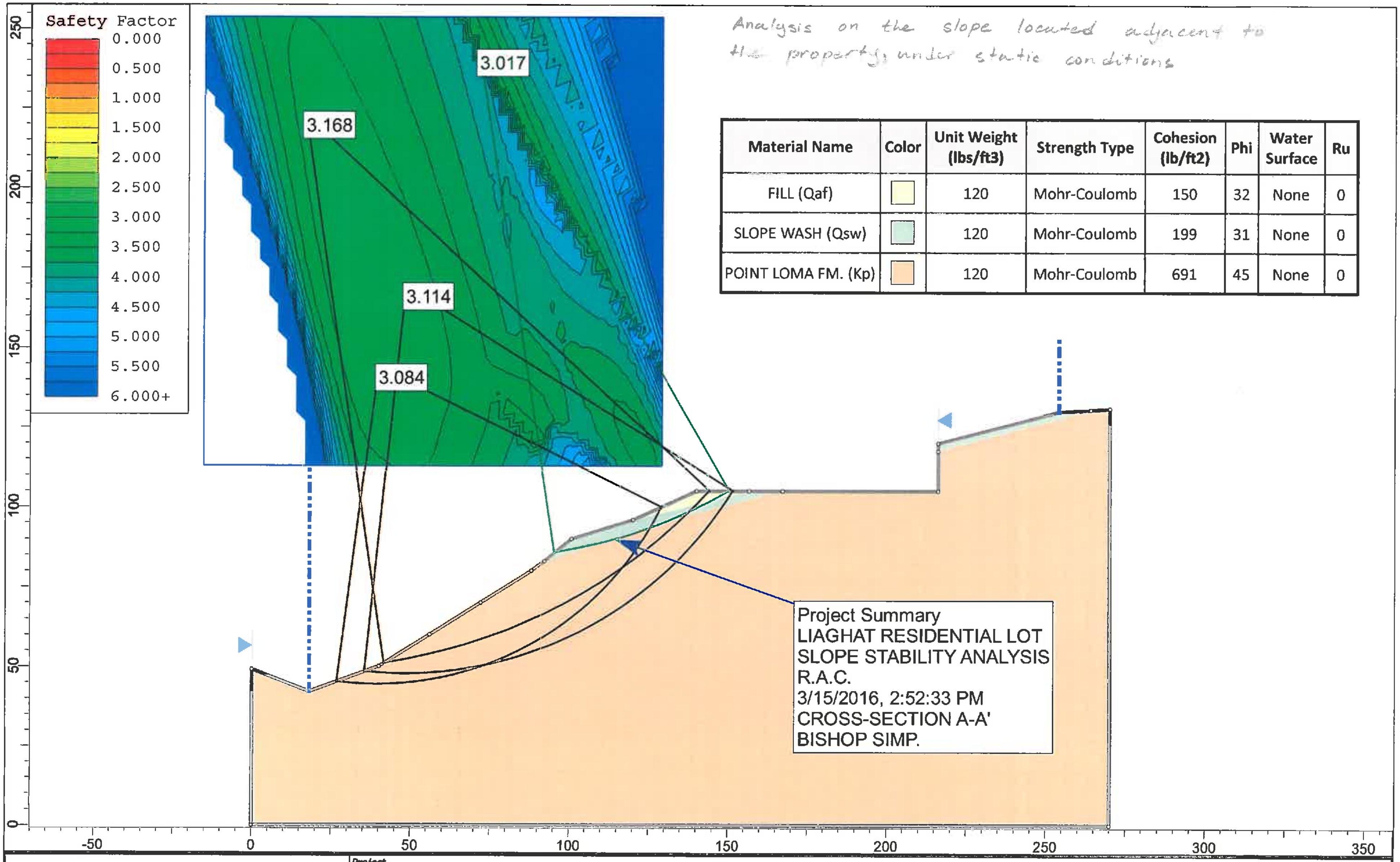




For $PGA_M$, $T_L$, $C_{RS}$, and $C_{R1}$ values, please view the detailed report.

# APPENDIX C

Analysis on the slope located adjacent to the property under static conditions



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | ☐ | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | ☐ | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | ☐ | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/15/2016, 2:52:33 PM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience
SLIDEINTERPRET 6.005

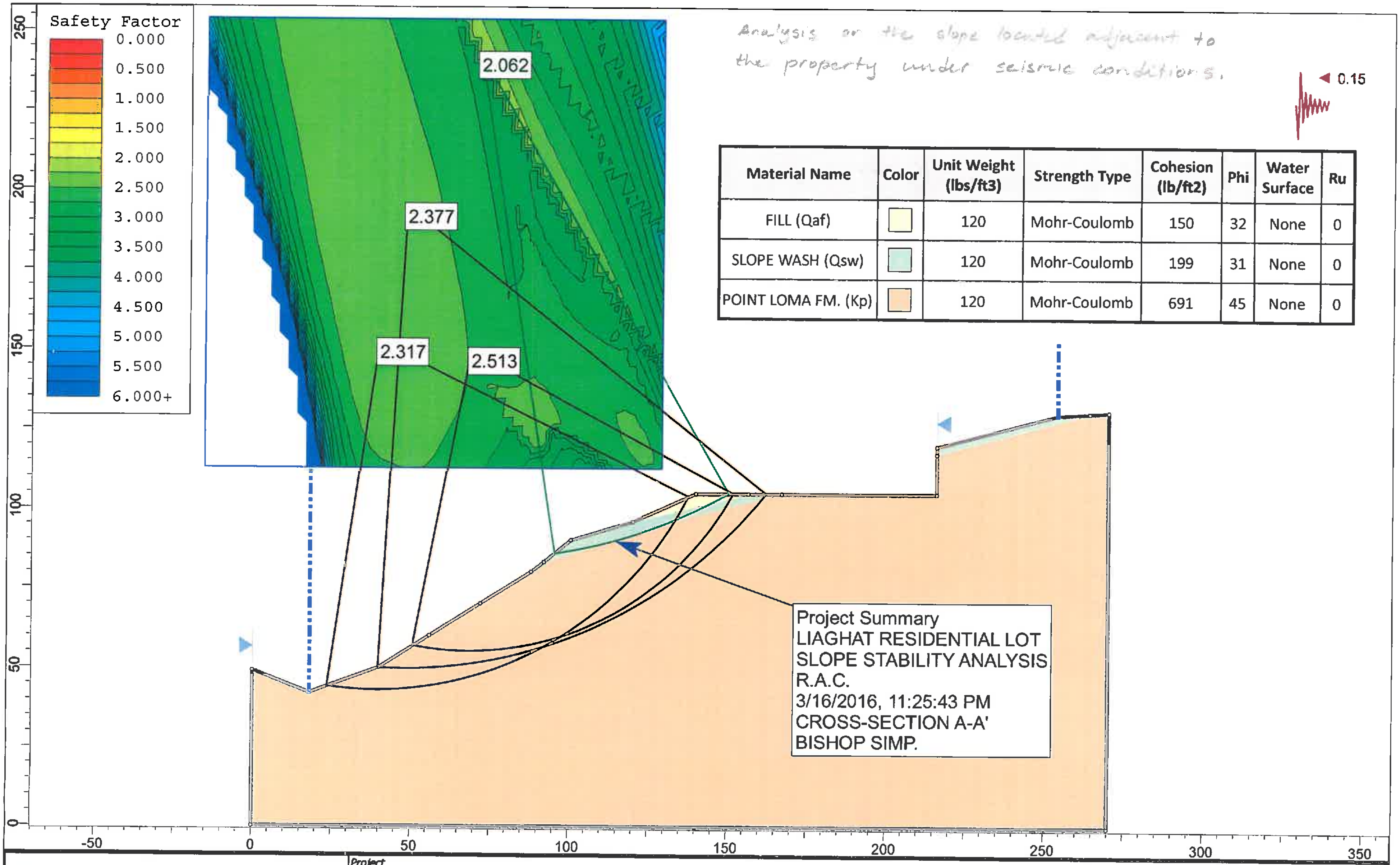
Project
LIAGHAT RESIDENTIAL LOT

Analysis Description
SLOPE STABILITY ANALYSIS

Drawn By R.A.C.
Scale 1:500
Company

Date 3/15/2016, 2:52:33 PM
File Name JOB NO. 16-11019A01.slim

Analysis on the slope located adjacent to the property under seismic conditions.



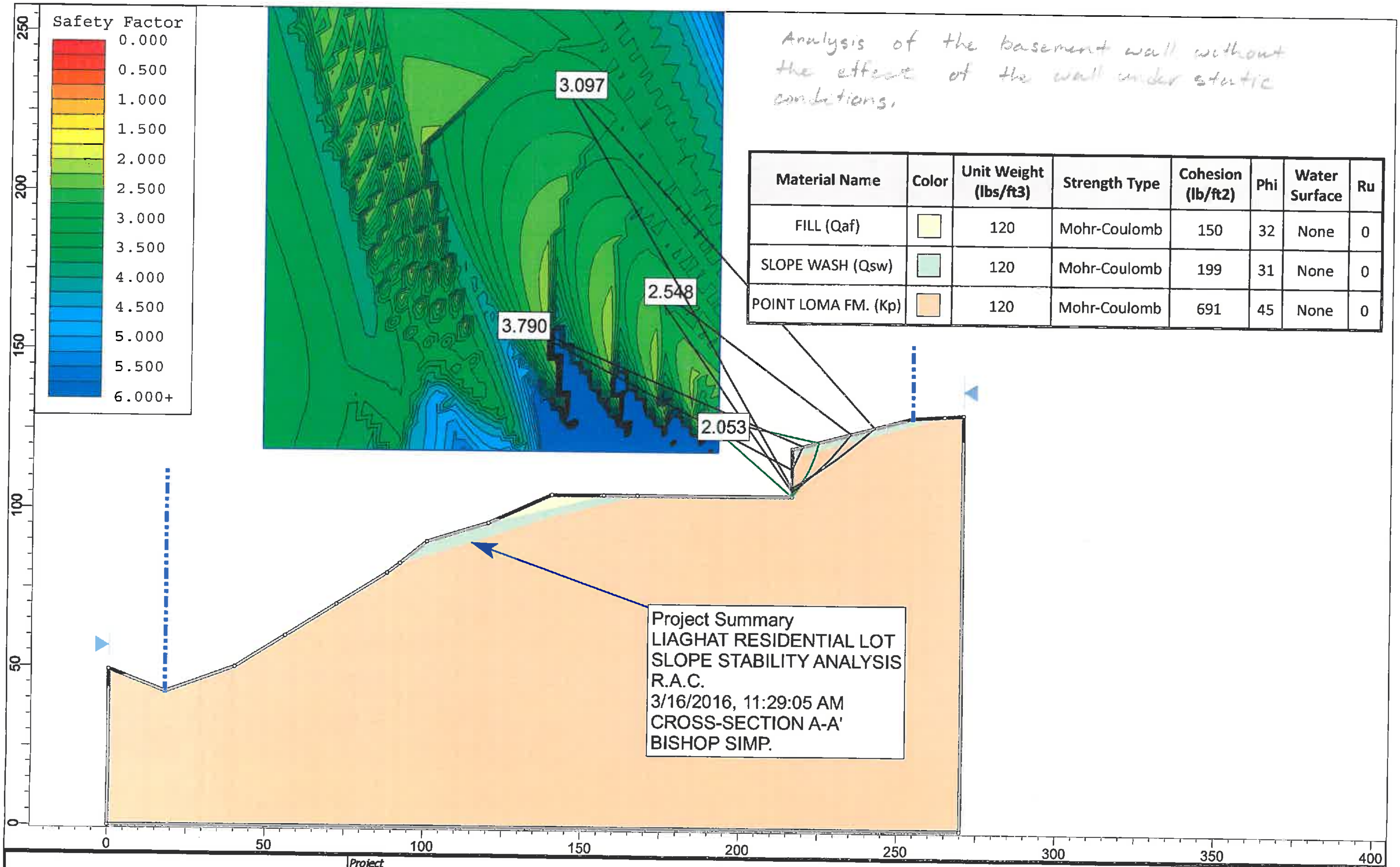
| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:25:43 PM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

SLIDEINTERPRET 6.005

| | |
|---|---|
| Project | LIAGHAT RESIDENTIAL LOT |
| Analysis Description | SLOPE STABILITY ANALYSIS |
| Drawn By | R.A.C. |
| Scale | 1:500 |
| Company | |
| Date | 3/16/2016, 11:25:43 PM |
| File Name | JOB NO. 16-11019A01w_0.15gSHAKE.slim |



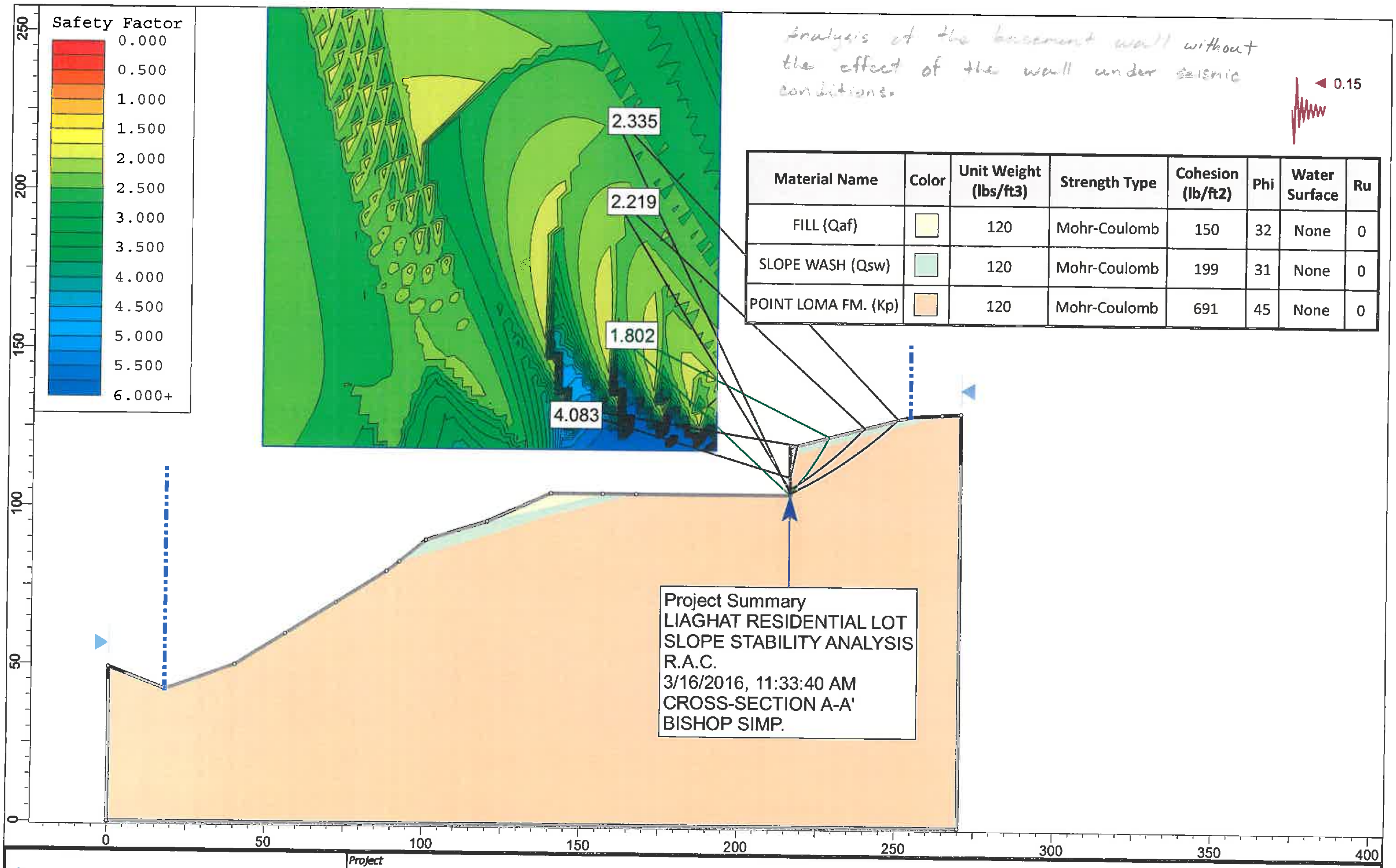
Analysis of the basement wall without the effect of the wall under static conditions.

| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:29:05 AM
CROSS-SECTION A-A'
BISHOP SIMP.

| | |
|---|---|
| Project | LIAGHAT RESIDENTIAL LOT |
| Analysis Description | SLOPE STABILITY ANALYSIS |
| Drawn By | R.A.C. |
| Scale | 1:500 |
| Company | |
| Date | 3/16/2016, 11:29:05 AM |
| File Name | JOB NO. 16-11019A02.slim |

SLIDEINTERPRET 6.005



Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:33:40 AM
CROSS-SECTION A-A'
BISHOP SIMP.

| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | ▨ | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | ▨ | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | ▨ | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Analysis of the basement wall without the effect of the wall under seismic conditions.

| | |
|---|---|
| Project | LIAGHAT RESIDENTIAL LOT |
| Analysis Description | SLOPE STABILITY ANALYSIS |
| Drawn By | R.A.C. |
| Scale | 1:500 |
| Company | |
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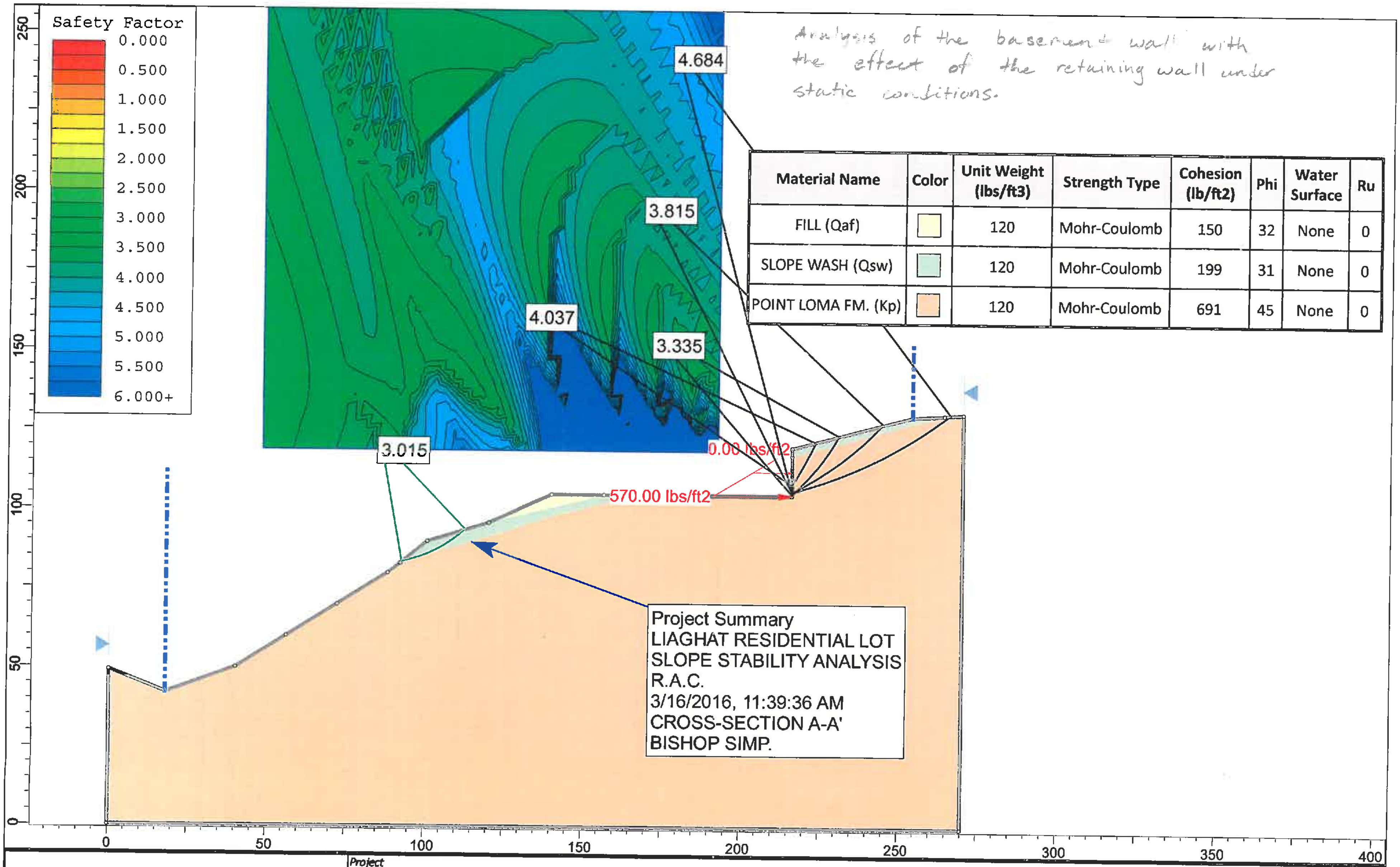
SLIDEINTERPRET 6.005



Analysis of the basement wall with the effect of the retaining wall under static conditions.

| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | ▨ | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | ▨ | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | ▨ | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:39:36 AM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

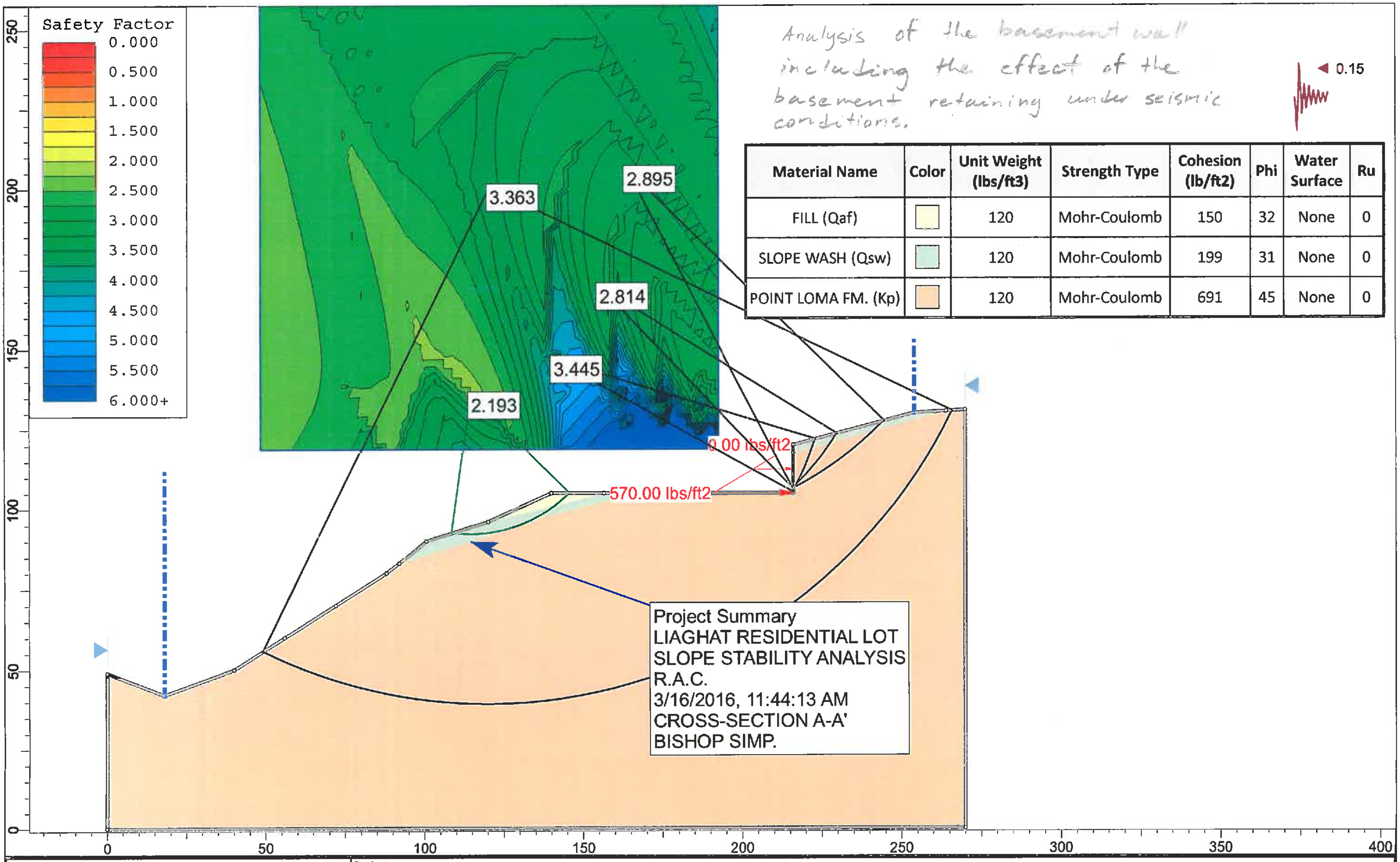
SLIDEINTERPRET 6.005

Project: LIAGHAT RESIDENTIAL LOT

Analysis Description: SLOPE STABILITY ANALYSIS

Drawn By: R.A.C.
Scale: 1:500
Company:

Date: 3/16/2016, 11:39:36 AM
File Name: JOB NO. 16-11019A03.slim



Analysis of the basement wall including the effect of the basement retaining under seismic conditions.

| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:44:13 AM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

SLIDEINTERPRET 6.005

Project: LIAGHAT RESIDENTIAL LOT

Analysis Description: SLOPE STABILITY ANALYSIS

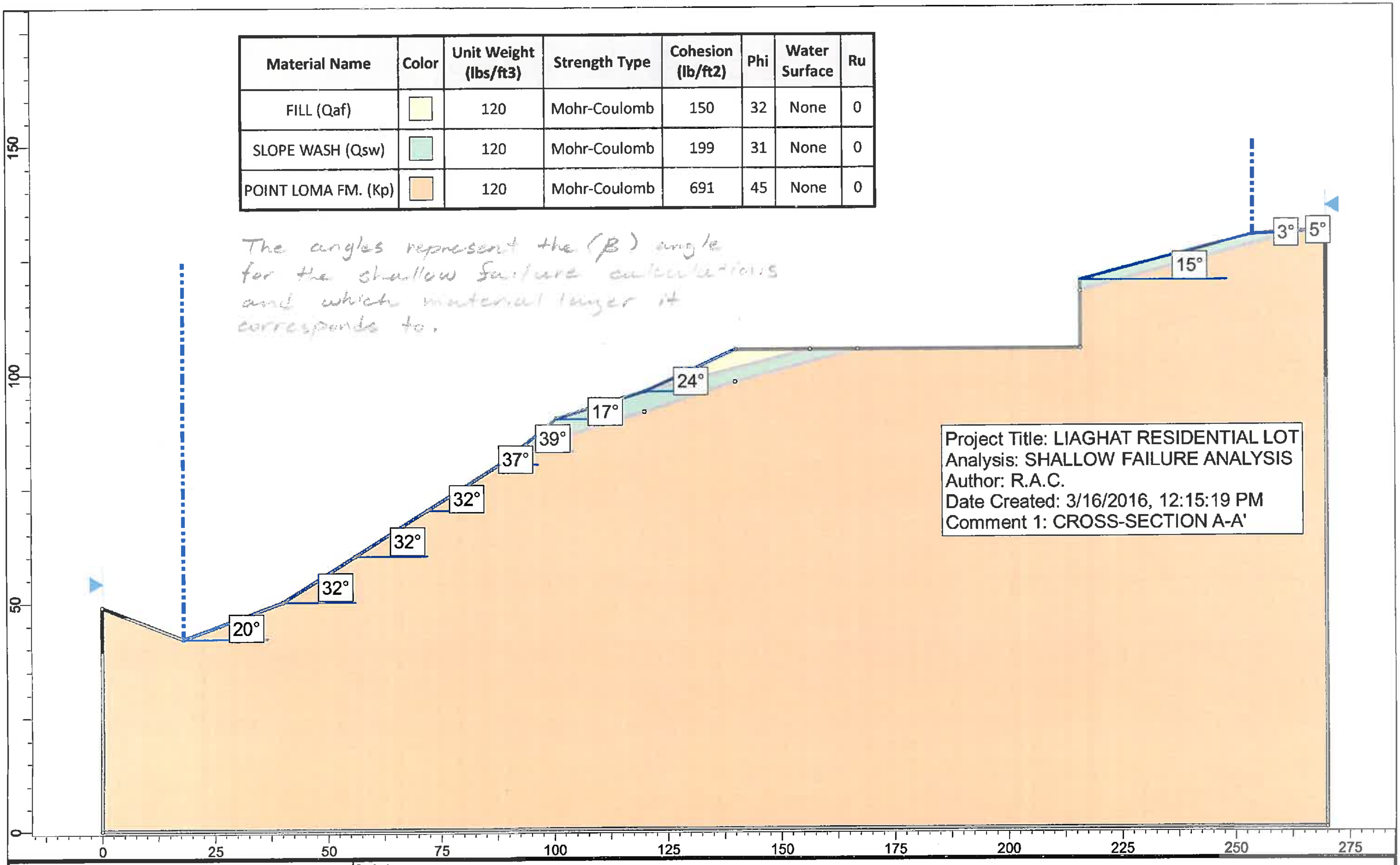
Drawn By: R.A.C.

Scale: 1:500

Company:

Date: 3/16/2016, 11:44:13 AM

File Name: JOB NO. 16-11019A03w_0.15gSHAKE.slim



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | ☐ | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

The angles represent the (β) angle for the shallow failure calculations and which material layer it corresponds to.

Project Title: LIAGHAT RESIDENTIAL LOT
Analysis: SHALLOW FAILURE ANALYSIS
Author: R.A.C.
Date Created: 3/16/2016, 12:15:19 PM
Comment 1: CROSS-SECTION A-A'

| | |
|---|---|
| Project | LIAGHAT RESIDENTIAL LOT |
| Analysis Description | SHALLOW FAILURE ANALYSIS |
| Drawn By | R.A.C. |
| Scale | 1:350 |
| Company | |
| Date | 3/16/2016, 12:15:19 PM |
| File Name | JOB NO. 16-11019A_SHALLOWFAILURE.slim |

SLIDE 6.005

## SHALLOW FAILURE

| $\gamma_{sat}$ | $\gamma_{water}$ | $\gamma'$ | H |
|---|---|---|---|
| pcf | pcf | pcf | ft |
| 130 | 62.4 | 67.6 | 3 |

**EQUATION 1**

$$F.S. = \left(\frac{C}{\gamma_{sat} \times H \times \cos^2(\beta)\tan(\beta)}\right) + \left(\frac{\gamma'}{\gamma_{sat}} * \frac{\tan(\varphi)}{\tan(\beta)}\right)$$

SHALLOW SLOPE STABILITY ANALYSIS IS BASED ON EQUATION (1) FOR THE CALCULATED VALUES.

**CROSS-SECTION A-A'**

| SOIL TYPE | C (psf) | ϕ(°) | β(°) | F.S. |
|---|---|---|---|---|
| Kp | 691 | 45 | 5 | 26.350 |
| Qsw | 199 | 31 | 3 | 15.725 |
| Qsw | 199 | 31 | 15 | 3.207 |
| Qaf | 150 | 32 | 24 | 1.765 |
| Qsw | 199 | 31 | 17 | 2.847 |
| Qsw | 199 | 31 | 39 | 1.429 |
| Kp | 691 | 45 | 37 | 4.376 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 20 | 6.942 |

# REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, California

**JOB NO. 16-11019**
06 April 2017

Prepared for:

***Mr. Hamid Liaghat***

**Geotechnical Exploration, Inc.**

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

06 April 2017

Mr. Hamid Liaghat
10525 Vista Sorrento Parkway, Suite 350
San Diego, CA 92121

**Job No. 16-11019**

Subject: **Report of Preliminary Geotechnical Investigation**
Proposed Liaghat Residential Lot Development
West of 7550 Hillside Drive
La Jolla, California

Dear Mr. Liaghat:

In accordance with your request, and our proposal of February 1, 2016, ***Geotechnical Exploration, Inc.*** has performed an investigation of the geotechnical and general geologic conditions at the location of the proposed residential lot. The field work was performed on March 2, 2016.

If the conclusions and recommendations presented in this report are incorporated into the design and construction of the proposed residential development and associated improvements, it is our opinion that the site is suitable for the proposed project.

This opportunity to be of service is sincerely appreciated. Should you have any questions concerning the following report, please do not hesitate to contact us. Reference to our **Job No. 16-11019** will expedite a response to your inquiries.

Respectfully submitted,

**GEOTECHNICAL EXPLORATION, INC.**

Jaime A. Cerros, P.E.
R.C.E. 34422/G.E. 2007
Senior Geotechnical Engineer

Jay K. Heiser
Senior Project Geologist

# TABLE OF CONTENTS

# REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, California

**Job No. 16-11019**

The following report presents the findings and recommendations of ***Geotechnical Exploration, Inc.*** for the subject project.

## I. PROJECT SUMMARY

It is our understanding, based on communications with you, that the existing undeveloped residential lot will be developed to receive a new two-story, single-family residence and associated improvements. It is assumed that the planned new residential structure will utilize conventional foundations.

Construction and conceptual plans for the proposed residential development have not been provided to us during the preparation of this report. We recommend that they be provided to us for review as they are developed.

## II. SCOPE OF WORK

The scope of work performed for this investigation included a review of available published information pertaining to the site geology, a site reconnaissance and subsurface exploration program, laboratory testing, geotechnical engineering analysis of the research, field and laboratory data, and the preparation of this report. The data obtained and the analyses performed were for the purpose of providing preliminary design and construction criteria for the project earthwork, building foundations, and slab on-grade floors.

## III. SUMMARY OF GEOTECHNICAL & GEOLOGIC FINDINGS

Our subsurface investigation and site reconnaissance revealed that the site is underlain at depth by very stiff to hard, adequate bearing sandy clay of the Point Loma Formation (Kp), overlain with approximately 2¾ to 4½ feet of sandy clay slopewash materials. The slopewash soils are of variable density and will not provide a stable soil base for the proposed residential structure or associated improvements. As such, it is recommended that either new foundations be founded into the underlying formational soils utilizing a deepened footing foundation system or the existing slopewash soils be removed and recompacted.

The on-site soils should provide adequate bearing strength for new slab on-grade exterior improvements, after proper removal and recompaction of the existing shallow surface soils. As such, we recommend that the existing slopewash soils (2 to 3 feet) be removed and recompacted as part of site preparation prior to placement of slab on-grade exterior improvements in these areas.

In our opinion, the site is suited for the proposed residential construction provided the following recommendations are implemented during site development. Conventional construction techniques and materials can be utilized. Detailed construction plans have not been provided to us for the preparation of this report, however, when completed they should be made available for our review for new or modified recommendations. In addition, the proposed work will not, in our opinion, destabilize or result in settlement of adjacent property if the recommendations presented in this report are implemented.

## IV. SITE DESCRIPTION

The approximately 0.5-acre site is more particularly referred to as Assessor's Parcel No. 352-130-03-00, Portion of Lot A of La Jolla Hills Unit No. 2, according to Recorded Map 2087, in the La Jolla area of the City and County of San Diego, State of California. For the location of the site, refer to the Vicinity Map, Figure No. I.

The property is bordered on the north and east by existing residential properties, on the west by partially developed land and on the south by Hillside Drive. Elevations across the property range from approximately 302 feet above Mean Sea Level (AMSL) at the northwest corner, to 390 feet AMSL at the southeast corner. Information concerning approximate elevations across the site was obtained from the City of San Diego Topographic maps and Google Earth Imagery. Refer to the Plot Plan, Figure No. II.

Vegetation at the site consists primarily of weeds, native shrubbery and a few mature trees. The lot is undeveloped with the exception a sewer easement running through the western portion of the lot.

## V. FIELD INVESTIGATION

Three exploratory borings were advanced in the vicinity, and most likely area where the proposed residential structure would be located, and where access and soil conditions allowed (for excavation locations, refer to the Plot Plan and Site-specific Geologic Map, Figure No. II). All three borings were drilled to a maximum depth of 10 feet in order to obtain representative soil samples and to define a soil profile across the project area.

The soil conditions encountered in the borings were logged by our field representative and samples were taken of the predominant soils throughout the field operation. Exploratory boring logs have been prepared on the basis of our observations and laboratory testing, Figure Nos. IIIa-c. The predominant soils have been classified per applicable portions of the Unified Soil Classification System.

## VI. FIELD AND LABORATORY TESTS & SOIL INFORMATION

### *A. Field Tests*

Standard Penetration Tests were performed in the borings by using a 140-pound weight falling 30 inches to drive a 2-inch O.D. by 1⅜-inch I.D. sampler tube a distance of 18 inches. The number of blows required to drive the sampler the last 12 inches was recorded for use in evaluation of the soil consistency. The following chart provides an in-house correlation between the number of blows and the consistency of the soil for the Standard Penetration Test and the 3-inch O.D. ("Cal") sampler.

| ***Soil*** | ***Density Designation*** | ***2-inch O.D. Sampler Blows/Foot*** | ***3-inch O.D. Sampler Blows/Foot*** |
|---|---|---|---|
| Sand and Non-plastic Silt | Very loose | 0-4 | 0-7 |
| | Loose | 5-10 | 8-20 |
| | Medium | 11-30 | 21-53 |
| | Dense | 31-50 | 54-98 |
| | Very Dense | Over 50 | Over 98 |
| Clay and Plastic Silt | Very soft | 0-2 | 0-2 |
| | Soft | 3-4 | 3-4 |
| | Firm | 5-8 | 5-9 |
| | Stiff | 9-15 | 10-18 |
| | Very Stiff | 15-30 | 19-45 |
| | Hard | 31-60 | 46-90 |
| | Very Hard | Over 60 | Over 90 |

Bulk (disturbed) and relatively undisturbed (ring) samples were retrieved, sealed and transported to the laboratory for testing.

In general, the tests performed in the field included the Standard Practice for Soil Investigation and Sampling by Auger Borings (ASTM D1452), Test Method for Penetration Test and Split-barrel Sampling of Soils (ASTM D1586), and Standard Practice for Ring-lined Barrel Sampling of Soils (ASTM D3550).

### *B.* ***Laboratory Tests***

Laboratory tests were performed on retrieved soil samples in order to evaluate their physical and mechanical properties and their ability to support the proposed remodel, additions and improvements. Test results are presented on Figure Nos. III and IV. The following tests were conducted on representative soil samples:

1. *Moisture Content (ASTM D2216-10)*
2. *Density Measurements (ASTM D2937-10)*
3. *Laboratory Compaction Characteristics (ASTM D1557-12)*
4. *Determination of Percentage of Particles Smaller than #200 Sieve (ASTM D1140-14)*
5. *Standard Test Method for Expansion Test (ASTM D4829-11)*
6. *Standard Test Method for Direct Shear Test of Soils under Consolidated Drained Conditions (ASTM D3080-11)*

The moisture content of a soil sample (ASTM D2216) is a measure of the water content, expressed as a percentage of the dry weight of the sample. Moisture content and density measurements (ASTM D2937) were performed to establish the in situ moisture and density of samples retrieved from the exploratory excavations. The dry soil weights were compared to the laboratory maximum dry density of the same soil to determine relative compaction.

Laboratory compaction values (ASTM D1557) establish the optimum moisture content and the laboratory maximum dry density of the tested soils. The relationship between the moisture and density of remolded soil samples helps to establish the relative compaction of the existing fill soils and soil compaction conditions to be anticipated during any future grading operation.

The –200 sieve size analysis helps to more precisely classify the tested soils based on their fine material content, and provide qualitative information related to engineering characteristics such as expansion potential, permeability, and shear strength.

The expansion potential of soils is determined, when necessary, utilizing the Standard Test Method for Expansion Index of Soils. In accordance with the Standard (Table 5.3), potentially expansive soils are classified as follows:

| ***EXPANSION INDEX*** | ***POTENTIAL EXPANSION*** |
|---|---|
| 0 to 20 | Very low |
| 21 to 50 | Low |
| 51 to 90 | Medium |
| 91 to 130 | High |
| Above 130 | Very high |

Based on the test results, the existing sandy clay slopewash and formational soils have a medium to high expansion potential, with a maximum measured expansion index of 91 and 87, respectively.

Two direct shear tests (ASTM D3080) were performed in order to evaluate strength characteristics of the soils comprising the descending slope. The shear tests were performed with a constant strain rate direct shear machine. The specimens tested were saturated and then sheared under various normal loads.

Based on the field and laboratory test data, our observations of the primary soil types on the project, and our previous experience with laboratory testing of similar soils, our Geotechnical Engineer has assigned values for friction angle, coefficient of friction, and cohesion for those soils which will have significant lateral support or load bearing functions on the project. These values have been utilized in determining the recommended bearing value as well as active and passive earth pressure design criteria.

### *C. Slope Observations*

The stability of the existing slopes should not be affected by the planned residential construction if proper drainage conditions are implemented and maintained. Existing slopes range from approximately 1.2:1.0 to 2.8:1.0 (horizontal to vertical) on the western portion of the property, to approximately 1.8:1.0 to 2.4:1.0 (horizontal to vertical) on the eastern portion of the property. The lot generally slopes to the northwest. Overall, the steeper slope on the western portion of the lot was observed to be in generally good condition with no evidence of instability or prior slope failure.

## VII. REGIONAL GEOLOGIC DESCRIPTION

San Diego County has been divided into three major geomorphic provinces: the Coastal Plain, the Peninsular Ranges and the Salton Trough. The Coastal Plain

exists west of the Peninsular Ranges. The Salton Trough is east of the Peninsular Ranges. These divisions are the result of the basic geologic distinctions between the areas. Mesozoic metavolcanic, metasedimentary and plutonic rocks predominate in the Peninsular Ranges with primarily Cenozoic sedimentary rocks to the west and east of this central mountain range (Demere, 1997).

In the Coastal Plain region, where the subject property is located, the "basement" consists of Mesozoic crystalline rocks. Basement rocks are also exposed as high relief areas (e.g., Black Mountain northeast of the subject property and Cowles Mountain near the San Carlos area of San Diego). Younger Cretaceous and Tertiary sediments lap up against these older features. The Cretaceous sediments form the local basement rocks on the Point Loma area. These sediments form a "layer cake" sequence of marine and non-marine sedimentary rock units, with some formations up to 140 million years old. Faulting related to the La Nacion and Rose Canyon Fault zones has broken up this sequence into a number of distinct fault blocks in the southwestern part of the county. Northwestern portions of the county are relatively undeformed by faulting (Demere, 1997).

The Peninsular Ranges form the granitic spine of San Diego County. These rocks are primarily plutonic, forming at depth beneath the earth's crust 140 to 90 million years ago as the result of the subduction of an oceanic crustal plate beneath the North American continent. These rocks formed the much larger Southern California batholith. Metamorphism associated with the intrusion of these great granitic masses affected the much older sediments that existed near the surface over that period of time. These metasedimentary rocks remain as roof pendants of marble, schist, slate, quartzite and gneiss throughout the Peninsular Ranges. Locally, Miocene-age volcanic rocks and flows have also accumulated within these mountains (e.g., Jacumba Valley). Regional tectonic forces and erosion over time

have uplifted and unroofed these granitic rocks to expose them at the surface (Demere, 1997).

The Salton Trough is the northerly extension of the Gulf of California. This zone is undergoing active deformation related to faulting along the Elsinore and San Jacinto Fault Zones, which are part of the major regional tectonic feature in the southwestern portion of California, the San Andreas Fault Zone. Translational movement along these fault zones has resulted in crustal rifting and subsidence. The Salton Trough, also referred to as the Colorado Desert, has been filled with sediments to depth of approximately 5 miles since the movement began in the early Miocene, 24 million years ago. The source of these sediments has been the local mountains as well as the ancestral and modern Colorado River (Demere, 1997).

As indicated previously, the San Diego area is part of a seismically active region of California. It is on the eastern boundary of the Southern California Continental Borderland, part of the Peninsular Ranges Geomorphic Province. This region is part of a broad tectonic boundary between the North American and Pacific Plates. The actual plate boundary is characterized by a complex system of active, major, right-lateral strike-slip faults, trending northwest/southeast. This fault system extends eastward to the San Andreas Fault (approximately 70 miles from San Diego) and westward to the San Clemente Fault (approximately 50 miles off-shore from San Diego) (Berger and Schug, 1991).

In California, major earthquakes can generally be correlated with movement on active faults. As defined by the California Division of Mines and Geology (Hart, E.W., 1980), an "active" fault is one that has had ground surface displacement within Holocene time (about the last 11,000 years). Additionally, faults along which

major historical earthquakes have occurred (about the last 210 years in California) are also considered to be active (Association of Engineering Geologist, 1973). The California Division of Mines and Geology (now the California Geological Survey) defines a *"potentially active"* fault as one that has had ground surface displacement during Quaternary time, that is, between 11,000 and 1.6 million years (Hart, E.W., 1980).

During recent history, prior to April 2010, the San Diego County area has been relatively quiet seismically. No fault ruptures or major earthquakes had been experienced in historic time within the greater San Diego area. Since earthquakes have been recorded by instruments (since the 1930s), the San Diego area has experienced scattered seismic events with Richter magnitudes generally less than M4.0. During June 1985, a series of small earthquakes occurred beneath San Diego Bay, three of which were recorded at M4.0 to M4.2. In addition, the Oceanside earthquake of July 13, 1986, located approximately 26 miles offshore of the City of Oceanside, had a magnitude of M5.3 (Hauksson and Jones, 1988).

On June 15, 2004, a M5.3 earthquake occurred approximately 45 miles southwest of downtown San Diego (26 miles west of Rosarito, Mexico). Although this earthquake was widely felt, no significant damage was reported. Another widely felt earthquake on a distant southern California fault was a M5.4 event that took place on July 29, 2008, west-southwest of the Chino Hills area of Riverside County.

Several earthquakes ranging from M5.0 to M6.0 occurred in northern Baja California, centered in the Gulf of California on August 3, 2009. These were felt in San Diego but no injuries or damage was reported. A M5.8 earthquake followed by a M4.9 aftershock occurred on December 30, 2009, centered about 20 miles south

of the Mexican border city of Mexicali. These were also felt in San Diego, swaying high-rise buildings, but again no significant damage or injuries were reported.

On Easter Sunday April 4, 2010, a large earthquake occurred in Baja California, Mexico. It was widely felt throughout the southwest including Phoenix, Arizona and San Diego in California. This M7.2 event, the Sierra El Mayor earthquake, occurred in northern Baja California, approximately 40 miles south of the Mexico-USA border at shallow depth along the principal plate boundary between the North American and Pacific plates. According to the U. S. Geological Survey this is an area with a high level of historical seismicity, and it has recently also been seismically active, though this is the largest event to strike in this area since 1892. The April 4, 2010, earthquake appears to have been larger than the M6.9 earthquake in 1940 or any of the early 20th century events (e.g., 1915 and 1934) in this region of northern Baja California. The event caused widespread damage to structures, closure of businesses, government offices and schools, power outages, displacement of people from their homes and injuries in the nearby major metropolitan areas of Mexicali in Mexico and Calexico in Southern California. Estimates of the cost of the damage range to $100 million.

This event's aftershock zone extends significantly to the northwest, overlapping with the portion of the fault system that is thought to have ruptured in 1892. Some structures in the San Diego area experienced minor damage and there were some injuries. Ground motions for the April 4, 2010, main event, recorded at stations in San Diego and reported by the California Strong Motion Instrumentation Program (CSMIP), ranged up to 0.058g. Aftershocks from this event continue to the date of this report along the trend northwest and south of the original event, including within San Diego County, closer to the San Diego metropolitan area. There have been hundreds of these earthquakes including events up to M5.7.

On July 7, 2010, a M5.4 earthquake occurred in Southern California at 4:53 pm (Pacific Time) about 30 miles south of Palm Springs, 25 miles southwest of Indio, and 13 miles north-northwest of Borrego Springs. The earthquake occurred near the Coyote Creek segment of the San Jacinto Fault. The earthquake exhibited right lateral slip to the northwest, consistent with the direction of movement on the San Jacinto Fault. The earthquake was felt throughout Southern California, with strong shaking near the epicenter. It was followed by more than 60 aftershocks of M1.3 and greater during the first hour. Seismologists expect continued aftershock activity.

In the last 50 years, there have been four other earthquakes in the magnitude M5.0 range within 20 kilometers of the Coyote Creek segment: M5.8 in 1968, M5.3 on 2/25/1980, M5.0 on 10/31/2001, and M5.2 on 6/12/2005. The biggest earthquake near this location was the M6.0 Buck Ridge earthquake on 3/25/1937.

## VIII. SITE-SPECIFIC SOIL & GEOLOGIC DESCRIPTION

### *A. Stratigraphy*

Our field work, reconnaissance and review of the *"Geologic Map of the La Jolla Quadrangle"* contained within California Division of Mines and Geology (now the California Geological Survey) Bulletin 200 *"Geology of the San Diego Metropolitan Area, California"* (Michael P. Kennedy, 1975) and the updated geologic maps by Kennedy and Tan, 2005 and 2008, *"Geologic Map of San Diego, 30'x60' Quadrangle, CA,"* indicate that the site is underlain by Cretaceous-age Point Loma (Kp) formational materials and landslide deposits. The formational soils are overlain by approximately 2¾ to 4½ feet of slopewash soils where the assumed building pad would be located (refer to the boring logs, Figure Nos. IIIa-c). Figure

No. V presents a plan view geologic map (Kennedy and Tan, 2008) of the general area of the site and Figure No. VI displays the geologic hazards of the area.

*Slopewash (Qsw):* Slopewash materials were encountered in all of our exploratory boring locations. The slopewash soils consist of dark gray to dark brown sandy clay with angular gravel to ¾-inch in diameter. The encountered slopewash soils were generally stiff to very stiff, moist condition and are considered to have a high expansion potential. Refer to Figure Nos. IIIa-c for details.

*Point Loma Formation (Kp):* Formational soils of the Point Loma Formation were encountered in all of our exploratory borings underlying the slopewash soils. The Point Loma Formational soils consist of dark gray sandy clay with some iron oxide staining on fracture surfaces, trace caliche, trace manganese staining and were somewhat disturbed and blocky to approximately 7 feet. The encountered formational soils were generally very stiff to hard, moist condition and are considered to have a high expansion potential. Refer to Figure Nos. IIIa-c for details. These soils have good bearing strength characteristics.

*Landslide (Qls):* According to Kennedy and Tan, 2008 "*Geologic Map of San Diego, 30'x60' Quadrangle, CA,*" the site is underlain by Quaternary-age Landslide debris. Landslide deposits were not encountered in our relatively shallow exploratory borings.

Although the Point Loma Formation observed in our exploratory borings was blocky and somewhat disturbed to approximately 7 feet, it is our opinion, that this is not part of the landslide deposits as mapped by Kennedy and Tan. In addition, according to the City of San Diego Seismic Safety Study, Geologic Hazards Map Sheet No. 29 indicates that the site is located in a low to moderate risk geologic

hazard area designated as Category 27, not in a landslide type of hazard like Category 21 or 22.

### *B.* *Structure*

Based on our research and site observations, the site is underlain by relatively stable formational materials and no adverse geologic conditions are expected. Bedding attitudes within the Point Loma Formation were observed on the southerly descending hillside along the southern portion of the property and generally strike N30°E, dipping 25 degrees southeast. In addition, the *Geologic Map of the San Diego 30'x60' Quadrangle, California,* by Michael P. Kennedy and Siang S. Tan (2008) indicates bedding attitudes within the Point Loma Formation in the vicinity of the subject site strike approximately 65 degrees to the northeast and dip 45 degrees to the southeast. The dips observed on the property are into the hillside and, therefore, are considered to be a relatively stable geologic condition.

A review of the City of San Diego Geologic Hazards Map indicates that no faults are mapped on the site. The active Rose Canyon Fault Zone (RCFZ) is mapped approximately ¼-mile northeast of the property.

## IX. GEOLOGIC HAZARDS

A review of the City of San Diego Seismic Safety Study, Geologic Hazards Map Sheet No. 29, indicates that the site is located in a low to moderate risk geologic hazard area designated as Category 27. Category 27 is identified as being underlain by *"slide-prone formations"* specifically the Otay, Sweetwater and others with Potential Slope Instability. The Otay and Sweetwater Formations are not applicable to the project site, and the Point Loma Formation would apply to the "others"

category. An excerpted portion of the Geologic Hazards Map Sheet 29 and the legend are presented as Figure No. VI.

The following is a discussion of the geologic conditions and hazards common to this area of the City of San Diego, as well as project-specific geologic information relating to development of the subject property.

## *A. <u>Local and Regional Faults</u>*

Reference to the geologic map of the area, Figure No. V (Kennedy and Tan, 2008), and the City of San Diego Seismic Safety Study, Geologic Hazards Map No. 29, Figure No. VI, indicates that no faults are mapped on the site. In our explicit professional opinion, neither an active fault nor a potentially active fault underlies the site.

*<u>Rose Canyon Fault</u>*: The Rose Canyon Fault Zone (Mount Soledad and Rose Canyon Faults) is mapped ¼ mile southwest of the subject site. The Rose Canyon Fault is mapped trending north-south from Oceanside to downtown San Diego, from where it appears to head southward into San Diego Bay, through Coronado and offshore. The Rose Canyon Fault Zone is considered to be a complex zone of onshore and offshore, en echelon strike slip, oblique reverse, and oblique normal faults. The Rose Canyon Fault is considered to be capable of generating an M7.2 earthquake and is considered microseismically active, although no significant recent earthquakes are known to have occurred on the fault.

Investigative work on faults that are part of the Rose Canyon Fault Zone at the Police Administration and Technical Center in downtown San Diego, at the SDG&E facility in Rose Canyon, and within San Diego Bay and elsewhere within downtown

San Diego, has encountered offsets in Holocene (geologically recent) sediments. These findings confirm Holocene displacement on the Rose Canyon Fault, which was designated an "active" fault in November 1991 (California Division of Mines and Geology -- Fault Rupture Hazard Zones in California, 1999).

*Coronado Bank Fault*: The Coronado Bank Fault is located approximately 12 miles southwest of the site. Evidence for this fault is based upon geophysical data (acoustic profiles) and the general alignment of epicenters of recorded seismic activity (Greene, 1979). The Oceanside earthquake of M5.3 recorded July 13, 1986, is known to have been centered on the fault or within the Coronado Bank Fault Zone. Although this fault is considered active, due to the seismicity within the fault zone, it is significantly less active seismically than the Elsinore Fault (Hileman, 1973). It is postulated that the Coronado Bank Fault is capable of generating a M7.6 earthquake and is of great interest due to its close proximity to the greater San Diego metropolitan area.

*Newport-Inglewood Fault:* The Newport-Inglewood Fault Zone is located approximately 22 miles northwest of the site. A significant earthquake (M6.4) occurred along this fault on March 10, 1933. Since then no additional significant events have occurred. The fault is believed to have a slip rate of approximately 0.6 mm/yr with an unknown recurrence interval. This fault is believed capable of producing an earthquake of M6.0 to M7.4 (SCEC, 2004).

*Elsinore Fault*: The Elsinore Fault is located approximately 37 to 54 miles east and northeast of the site. The fault extends approximately 200 km (125 miles) from the Mexican border to the northern end of the Santa Ana Mountains. The Elsinore Fault zone is a 1- to 4-mile-wide, northwest-southeast-trending zone of discontinuous and en echelon faults extending through portions of Orange,

Riverside, San Diego, and Imperial Counties. Individual faults within the Elsinore Fault Zone range from less than 1 mile to 16 miles in length. The trend, length and geomorphic expression of the Elsinore Fault Zone identify it as being a part of the highly active San Andreas Fault system.

Like the other faults in the San Andreas system, the Elsinore Fault is a transverse fault showing predominantly right-lateral movement. According to Hart, et al. (1979), this movement averages less than 1 centimeter per year. Along most of its length, the Elsinore Fault Zone is marked by a bold topographic expression consisting of linearly aligned ridges, swales and hallows. Faulted Holocene alluvial deposits (believed to be less than 11,000 years old) found along several segments of the fault zone suggest that at least part of the zone is currently active.

Although the Elsinore Fault Zone belongs to the San Andreas set of active, northwest-trending, right-slip faults in the southern California area (Crowell, 1962), it has not been the site of a major earthquake in historic time, other than a M6.0 earthquake near the town of Elsinore in 1910 (Richter, 1958; Toppozada and Parke, 1982). However, based on length and evidence of late-Pleistocene or Holocene displacement, Greensfelder (1974) has estimated that the Elsinore Fault Zone is reasonably capable of generating an earthquake ranging from M6.8 to M7.1. Faulting evidence exposed in trenches placed in Glen Ivy Marsh across the Glen Ivy North Fault (a strand of the Elsinore Fault Zone between Corona and Lake Elsinore), suggest a maximum earthquake recurrence interval of 300 years, and when combined with previous estimates of the long-term horizontal slip rate of 0.8 to 7.0 mm/year, suggest typical earthquakes of M6.0 to M7.0 (Rockwell, 1985).

*San Jacinto Fault*: The San Jacinto Fault is located 59 to 80 miles to the northeast of the site. The San Jacinto Fault Zone consists of a series of closely spaced faults,

including the Coyote Creek Fault, that form the western margin of the San Jacinto Mountains. The fault zone extends from its junction with the San Andreas Fault in San Bernardino, southeasterly toward the Brawley area, where it continues south of the international border as the Imperial Transform Fault (Earth Consultants International [ECI], 2009).

The San Jacinto Fault zone has a high level of historical seismic activity, with at least 10 damaging earthquakes (M6.0 to M7.0) having occurred on this fault zone between 1890 and 1986. Earthquakes on the San Jacinto Fault in 1899 and 1918 caused fatalities in the Riverside County area. Offset across this fault is predominantly right-lateral, similar to the San Andreas Fault, although some investigators have suggested that dip-slip motion contributes up to 10% of the net slip (ECI, 2009).

The segments of the San Jacinto Fault that are of most concern to major metropolitan areas are the San Bernardino, San Jacinto Valley and Anza segments. Fault slip rates on the various segments of the San Jacinto are less well constrained than for the San Andreas Fault, but the available data suggest slip rates of 12 ±6 mm/yr for the northern segments of the fault, and slip rates of 4 ±2 mm/yr for the southern segments. For large ground-rupturing earthquakes on the San Jacinto fault, various investigators have suggested a recurrence interval of 150 to 300 years. The Working Group on California Earthquake Probabilities (WGCEP, 2008) has estimated that there is a 31 percent probability that an earthquake of M6.7 or greater will occur within 30 years on this fault. Maximum credible earthquakes of M6.7, M6.9 and M7.2 are expected on the San Bernardino, San Jacinto Valley and Anza segments, respectively, capable of generating peak horizontal ground accelerations of 0.48 to 0.53 g in the County of Riverside, (ECI, 2009). A M5.4 earthquake occurred on the San Jacinto Fault on July 7, 2010.

The United States Geological Survey has issued the following statements with respect to the recent seismic activity on southern California faults:

> The San Jacinto fault, along with the Elsinore, San Andreas, and other faults, is part of the plate boundary that accommodates about 2 inches/year of motion as the Pacific plate moves northwest relative to the North American plate. The largest recent earthquake on the San Jacinto fault, near this location, the M6.5 1968 Borrego Mountain earthquake April 8, 1968, occurred about 25 miles southeast of the July 7, 2010, M5.4 earthquake.
>
> This M5.4 earthquake follows the 4th of April 2010, Easter Sunday, Mw7.2 earthquake, located about 125 miles to the south, well south of the US Mexico international border. A M4.9 earthquake occurred in the same area on June 12th at 8:08 pm (Pacific Time). Thus this section of the San Jacinto fault remains active.
>
> Seismologists are watching two major earthquake faults in southern California. The San Jacinto fault, the most active earthquake fault in southern California, extends for more than 100 miles from the international border into San Bernardino and Riverside, a major metropolitan area often called the Inland Empire. The Elsinore fault is more than 110 miles long, and extends into the Orange County and Los Angeles area as the Whittier fault. The Elsinore fault is capable of a major earthquake that would significantly affect the large metropolitan areas of southern California. The Elsinore fault has not hosted a major earthquake in more than 100 years. The occurrence of these earthquakes along the San Jacinto fault and continued aftershocks demonstrates that the earthquake activity in the region remains at an elevated level. The San Jacinto fault is known as the most active earthquake fault in southern California. Caltech and USGS seismologist continue to monitor the ongoing earthquake activity using the Caltech/USGS Southern California Seismic Network and a GPS network of more than 100 stations.

## ***B. Other Geologic Hazards***

*Ground Rupture*: Ground rupture is characterized by bedrock slippage along an established fault and may result in displacement of the ground surface. For ground rupture to occur along a fault, an earthquake usually exceeds M5.0. If a M5.0 earthquake were to take place on a local fault, an estimated surface-rupture length 1 mile long could be expected (Greensfelder, 1974). Our investigation indicates that the subject site is not directly on a known active fault trace and, therefore, the risk of ground rupture is remote.

*Ground Shaking*: Structural damage caused by seismically induced ground shaking is a detrimental effect directly related to faulting and earthquake activity. Ground shaking is considered to be the greatest seismic hazard in San Diego County. The intensity of ground shaking is dependent on the magnitude of the earthquake, the distance from the earthquake, and the seismic response characteristics of underlying soils and geologic units. Earthquakes of M5.0 or greater are generally associated with significant damage. It is our opinion that the most serious damage to the site would be caused by a large earthquake originating on a nearby strand of the Rose Canyon Fault Zone. Although the chance of such an event is remote, it could occur within the useful life of the structure.

*Landslides*: Based upon our geotechnical investigation, review of the geologic map (Kennedy and Tan, 2008), review of the referenced City of San Diego Seismic Safety Study -- Geologic Hazards Map Sheet 29 and stereo-pair aerial photographs (4-11-53, AXN-8M-1 and 2), we did not identify or encounter the landslide as indicated on (Kennedy and Tan, 2008), geologic map.

*Slope Stability*: We performed slope stability analysis based on the laboratory test results from retrieved soil samples collected during the exploratory excavations, our field review of site conditions, our review of aerial photos, review of pertinent documents and geologic maps, and our experience with similar formational units in the La Jolla area of San Diego. We utilized a computer program titled *SLIDE6* using Bishops Simplified method and conventional equations for gross and shallow stability. Based on our slope stability analysis, a factor of safety (FS) less than 1.5 against gross or shallow slope failure does not exist at any location across the property. In our professional opinion, the site will have a factor of safety of 1.5 or greater following the proposed construction (refer to Appendix C for details).

*Liquefaction*: The liquefaction of saturated sands during earthquakes can be a major cause of damage to buildings. Liquefaction is the process by which soils are transformed into a viscous fluid that will flow as a liquid when unconfined. It occurs primarily in loose, saturated sands and silts when they are sufficiently shaken by an earthquake.

On this site, the risk of liquefaction of foundation materials due to seismic shaking is also considered to be remote due to the dense nature of the natural-ground material, the anticipated high density of the proposed recompacted fill, and the lack of a shallow static groundwater surface under the site. No soil liquefaction or soil strength loss is anticipated to occur due to a seismic event.

*Tsunami*: The risk of a tsunami affecting the site is considered low as the site is situated at an elevation of at least 302 feet above mean sea level and approximately 2,400 feet from an exposed beach.

In general, the orientation of the southern California coastline and the bathymetry of the offshore southern California borderland have, during historical times, combined to protect the shoreline from any large magnitude tsunami height increases, as shown by records of tsunami occurrences that have been observed and/or recorded along the southern California shoreline since 1810 (Lander et al, 1993). For this segment of the California coastline (south of Santa Monica) there is no evidence of any high magnitude tsunamis generated during the last 200 years by large-scale regional sea floor movements (Gayman, 1998).

*Geologic Hazards Summary*: It is our opinion, based upon a review of the available geologic maps and our site investigation, that the site is underlain by relatively stable formational materials, and is suited for the proposed residential structure and associated improvements provided the recommendations herein are implemented.

The most significant geologic hazard at the site is anticipated ground shaking from earthquakes on active Southern California and Baja California faults. The United States Geologic Survey has issued statements indicating that seismic activity in Southern California may continue at elevated levels with increased risk to major metropolitan areas near the Elsinore and San Jacinto faults. These faults are too far from the subject property to present a seismic risk.

To date, the nearest known "active" faults to the subject site are the northwest-trending Rose Canyon Fault, Coronado Bank Fault and the Elsinore Fault. There are no known significant geologic hazards on or near the site that would prevent the proposed construction.

## X. GROUNDWATER

Groundwater and/or perched water conditions were not encountered at the shallow excavation locations and we do not expect significant groundwater problems to develop in the future ***if proper drainage is maintained on the property***. The potential does exist for perched water conditions to occur if rainwater and irrigation waters are allowed to infiltrate through the upper, more permeable fill soils and encounter less permeable natural ground materials.

It should be kept in mind that construction operations may change surface drainage patterns and/or reduce permeabilities due to the densification of compacted soils. Such changes of surface and subsurface hydrologic conditions, plus irrigation of landscaping or significant increases in rainfall, may result in the appearance of surface or near-surface water at locations where none existed previously. The appearance of such water is expected to be localized and cosmetic in nature, if good positive drainage is implemented, as recommended in this report, during and at the completion of construction.

On properties such as the subject site where dense, low permeability soils exist at shallow depths, even normal landscape irrigation practices on the property or neighboring properties, or periods of extended rainfall, can result in shallow "perched" water conditions. The perching (shallow depth) accumulation of water on a low permeability surface can result in areas of persistent wetting and drowning of lawns, plants and trees. Resolution of such conditions, should they occur, may require site-specific design and construction of subdrain and shallow "wick" drain dewatering systems.

Subsurface drainage with a properly designed and constructed subdrain system will be required behind proposed below-ground building retaining walls. Additional recommendations may be required at the time of construction.

It must be understood that unless discovered during initial site exploration or encountered during site construction operations, it is extremely difficult to predict if or where perched or true groundwater conditions may appear in the future. When site fill or formational soils are fine-grained and of low permeability, water problems may not become apparent for extended periods of time.

Water conditions, where suspected or encountered during construction, should be evaluated and remedied by the project civil and geotechnical consultants. The project developer and property owner, however, must realize that post-construction appearances of groundwater may have to be dealt with on a site-specific basis.

## XII. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based upon the practical field investigation conducted by our firm, and resulting laboratory tests, in conjunction with our knowledge and experience with similar soils in the La Jolla area. The opinions, conclusions, and recommendations presented in this report are contingent upon ***Geotechnical Exploration, Inc.*** being retained to review the final plans and specifications as they are developed and to observe the site earthwork and installation of foundations.

## A. ***Seismic Design Criteria***

1. *Seismic Design Criteria:* The proposed structure and/or additions should be designed in accordance with Section 1613 of the 2010 CBC, which incorporates by reference the ASCE 7-05 for seismic design. We recommend the following parameters be utilized. We have determined the mapped spectral acceleration values for the site based on a latitude of 32.8452 degrees and longitude of -117.2578 degrees, utilizing a program titled "*Seismic Hazard Curves, Response Parameters and Design Parameters-v5.0.8*," provided by the USGS, which provides a solution for ASCE 7-05 (Section 1613 of the 2010 CBC) utilizing digitized files for the Spectral Acceleration maps. In addition, we have assigned a Site Classification of $S_D$. The response parameters for design are presented in the following table. The design Spectrum Acceleration (SA) vs. Period (T) is shown on Appendix B.

### TABLE I
### ***Mapped Spectral Acceleration Values and Design Parameters***

| $S_s$ | $S_1$ | $F_a$ | $F_v$ | $S_{ms}$ | $S_{m1}$ | $S_{ds}$ | $S_{d1}$ |
|---|---|---|---|---|---|---|---|
| 1.292 | 0.500 | 1.0 | 1.50 | 1.292 | 0.750 | 0.862 | 0.500 |

## B. ***Preparation of Soils for Site Development***

2. *Clearing and Stripping:* Vegetation and improvements should be removed prior to the preparation of the building pad for areas to receive new structures, additions, or improvements. This includes any roots from existing trees and shrubbery. Holes resulting from the removal of root systems or other buried obstructions that extend below the planned grades should be cleared and backfilled with properly compacted fill.

3. *Treatment of Existing Slopewash Soils or Loose Soils:* In order to provide suitable support for the proposed new residence, basement and associated improvements such as decking, sidewalks and driveways, we recommend that all existing fill, slopewash and colluvium soils be removed and replaced as structural fill compacted to a minimum degree of compaction of 90 percent. The limits of recompaction should extend at least 10 feet beyond the perimeter limits of all new improvements, where feasible. The recompaction work should consist of: (a) removing all existing fill, slopewash and colluvium soils down to the underlying undisturbed formational materials; (b) scarifying, moisture conditioning, and compacting the exposed natural subgrade soils; and (c) replacing the materials as compacted structural fill. The areal extent and depths required to remove the existing fill, slopewash and colluvium should be determined by our representative during the excavation work based on their examination of the soils being exposed and physical constraints.

   In addition, we recommend that, if encountered, any low expansion soil from the required removals be selectively stockpiled for use as capping material and wall backfills as recommended below in Recommendation Nos. 4 and 8.

4. *Subgrade Preparation:* After areas to receive new improvements have been cleared, stripped, and the required excavations made, the exposed subgrade soils in areas to receive fill and/or building improvements should be scarified to a depth of 6 inches, moisture conditioned, and compacted to the requirements for structural fill. The near-surface moisture content of clayey soils should be maintained by periodic sprinkling until within 48 hours prior to concrete placement.

5. *Expansive Soil Conditions:* We do anticipate that significant quantities of highly expansive clay soils will be encountered during grading. Encountered clayey fill soils are of generally high moisture content. Should such soils (of lower moisture content) be encountered and used as fill, however, they should be moisture conditioned or dried to no greater than 5 percent above Optimum Moisture content, compacted to 88 to 92 percent, and preferably placed outside building areas. Soils of medium or greater expansion potential should not be used as retaining wall backfill soils.

6. *Material for Fill:* Any required imported fill material should be a low-expansion potential (Expansion Index of 50 or less per ASTM D4829-11). In addition, both imported and existing on-site materials for use as fill should not contain rocks or lumps more than 6 inches in greatest dimension. All materials for use as fill should be approved by our firm prior to filling.

7. *Fill Compaction:* All structural fill to receive the new foundations and slabs should be compacted to a minimum degree of compaction of 90 percent based upon ASTM D1557-12. Fill material should be spread and compacted in uniform horizontal lifts not exceeding 8 inches in uncompacted thickness. Before compaction begins, the fill should be brought to a moisture content that will permit proper compaction by either: (1) aerating and drying the fill if it is too wet, or (2) moistening the fill with water if it is too dry. Each lift should be thoroughly mixed before compaction to ensure a uniform distribution of moisture. For low expansive soils, the moisture content should be within 2 percent of optimum. As an alternative to fill soil recompaction, deepened foundations and raised wood floors or structural slabs may be considered.

No uncontrolled fill soils should remain on the site after completion of the site work. In the event that temporary ramps or pads are constructed of uncontrolled fill soils, the loose fill soils should be removed and/or recompacted prior to completion of the grading operation.

8. *Trench and Retaining/Basement Wall Backfill:* All backfill soils placed in utility trenches or behind retaining/basement walls should be compacted to a minimum degree of compaction of 90 percent at the Optimum Moisture content. Backfill material should be placed in lift thicknesses appropriate to the type of compaction equipment utilized and compacted to a minimum degree of 90 percent by mechanical means. In pavement areas, that portion of the trench backfill within the pavement section should conform to the material and compaction requirements of the adjacent pavement section. In addition, the low-expansion potential fill layer around the pipe should be maintained in utility trench backfill within the building and adjoining exterior slab areas. Trench backfill on top of the low-expansion fill layer should consist of on-site soils in order to minimize the potential for migration of water below the perimeter footings at the trench locations.

   Our experience has shown that even shallow, narrow trenches, such as for irrigation and electrical lines, that are not properly compacted can result in problems, particularly with respect to shallow groundwater accumulation and migration.

   Backfill soils placed behind retaining/basement walls should be installed as early as the retaining walls are capable of supporting lateral loads. Backfill soils behind retaining/basement walls should be low expansive, with an Expansion Index equal to or lower than 50.

## *C. Design Parameters for Proposed Foundations*

9. *Deepened Footings:* If the existing surface is not removed and recompacted, deepened footings for proposed residence should be founded at least 3 feet below the lowest adjacent finished grade and penetrate at least 12 inches in dense or stiff formational soils and have a minimum width of 15 inches. The deepened footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. The final dimensions and reinforcing should be specified by the structural engineer. A minimum clearance of 3 inches should be maintained between steel reinforcement and the bottom or sides of the footing.

   Since slab on-grade are most likely planned for both interior and exterior improvements, soil grading and proper moisture conditioning will be required prior to constructing the slabs and shallow footings.

   *NOTE: The project Civil/Structural Engineer should review all reinforcing schedules. The reinforcing minimums recommended herein are not to be construed as structural designs, but merely as minimum reinforcement to reduce the potential for cracking and separations.*

10. Shallow Footings: Shallow footings should bear on undisturbed formational materials or properly compacted fill soils. The footings should be founded at least 24 inches below the lowest adjacent finished grade when founded into properly compacted fill (or 24 inches into formational material). Footings located adjacent to utility trenches should have their bearing surfaces situated below an imaginary 1.5:1.0 plane projected upward from the bottom edge of the adjacent utility trench.

11. *Bearing Values*: At the recommended depths, footings on native, medium dense formational soil or properly compacted fill soil may be designed for allowable bearing pressures of 2,500 pounds per square foot (psf) for combined dead and live loads and increased one-third for all loads, including wind or seismic. The footings should have a minimum width of 12 inches.

12. *Footing Reinforcement*: All continuous footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. We recommend that a minimum of two No. 5 top and two No. 5 bottom reinforcing bars be provided in the footings. A minimum clearance of 3 inches should be maintained between steel reinforcement and the bottom or sides of the footing. Isolated square footings should contain, as a minimum, a grid of three No. 4 steel bars on 12-inch centers, both ways. In order for us to offer an opinion as to whether the footings are founded on soils of sufficient load bearing capacity, it is essential that our representative inspect the footing excavations prior to the placement of reinforcing steel or concrete.

    *NOTE: The project Civil/Structural Engineer should review all reinforcing schedules. The reinforcing minimums recommended herein are not to be construed as structural designs, but merely as minimum reinforcement to reduce the potential for cracking and separations.*

13. *Lateral Loads:* Lateral load resistance for structure foundations may be developed in friction between the foundation bottoms and the supporting subgrade. An allowable friction coefficient of 0.35 is considered applicable. An additional allowable passive resistance equal to an equivalent fluid weight of 300 pounds per cubic foot (pcf) acting against the foundations may be

used in design provided the footings are poured neat against the adjacent undisturbed formational materials and/or properly compacted fill materials. Due to the highly expansive soil conditions, the upper 1 foot of soil should not count in providing passive resistance.

In areas where existing fill soils are present in front of foundations (i.e., within 3 times the depth of embedment), the allowable passive resistance should be reduced to 150 pcf and friction coefficient to 0.30. These lateral resistance values assume a level surface in front of the footing for a minimum distance of three times the embedment depth of the footing.

14. *Settlement:* Settlements under building loads are expected to be within tolerable limits for the proposed additions. For footings designed in accordance with the recommendations presented in the preceding paragraphs, we anticipate that total settlements should not exceed 1 inch and that post-construction differential angular rotation should be less than 1/240.

## *D. Concrete Slab On-grade Criteria*

Slabs on-grade may only be used on new, properly compacted fill or when bearing on dense natural soils at a moisture content of 5 percent over optimum and compacted to between 88 and 92 percent of relative compaction. If concrete slabs are planned on existing fills or slopewash, they should be designed as structural slabs spanning between foundations bearing in formational soils.

15. *Minimum Floor Slab Reinforcement:* Based on our experience, we have found that, for various reasons, floor slabs occasionally crack. Therefore, we recommend that all slabs-on-grade contain at least a minimum amount of reinforcing steel to reduce the separation of cracks, should they occur. Slab subgrade soil should be verified by a ***Geotechnical Exploration, Inc***. representative to have the proper moisture content within 48 hours prior to placement of the vapor barrier and pouring of concrete.

    15.1 New interior floor slabs should be a minimum of 5 inches actual thickness and be reinforced with No. 4 bars on 18-inch centers, both ways, placed at midheight in the slab. *The slabs should be underlain by a 4-inch-thick layer of compacted crushed rock gravel overlying or underlying a moisture retardant membrane (15-mil StegoWrap)*. Slab subgrade soil should be verified by a ***Geotechnical Exploration, Inc.*** representative to have the proper moisture content within 48 hours prior to placement of the vapor barrier and pouring of concrete.

16. *Slab Moisture Protection and Vapor Barrier Membrane:* Although it is not the responsibility of geotechnical engineering firms to provide moisture protection recommendations, as a service to our clients we provide the following discussion and suggested minimum protection criteria. Actual recommendations should be provided by the architect and waterproofing consultants or product manufacturer.

    Soil moisture vapor can result in damage to moisture-sensitive floors, some floor sealers, or sensitive equipment in direct contact with the floor, in addition to mold and staining on slabs, walls, and carpets. The common practice in Southern California is to place vapor retarders made of PVC, or of

polyethylene. PVC retarders are made in thickness ranging from 10- to 60-mil. Polyethylene retarders, called visqueen, range from 5- to 10-mil in thickness. These products are no longer considered adequate for moisture protection and can actually deteriorate over time.

Specialty vapor retarding products possess higher tensile strength and are more specifically designed for and intended to retard moisture transmission into and through concrete slabs. The use of such products is highly recommended for reduction of floor slab moisture emission.

The following American Society for Testing and Materials (ASTM) and American Concrete Institute (ACI) sections address the issue of moisture transmission into and through concrete slabs: ASTM E1745-97 (2009) Standard Specification for Plastic Water Vapor Retarders Used in Contact Concrete Slabs; ASTM E154-88 (2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth; ASTM E96-95 Standard Test Methods for Water Vapor Transmission of Materials; ASTM E1643-98 (2009) Standard Practice for Installation of Water Vapor Retarders Used in Contact Under Concrete Slabs; and ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

16.1 Based on the above, we recommend that the vapor barrier consist of a minimum 15-mil extruded polyolefin plastic (no recycled content or woven materials permitted). Permeance as tested before and after mandatory conditioning (ASTM E1745 Section 7.1 and sub-paragraphs 7.1.1-7.1.5) should be less than 0.01 perms (grains/square foot/hour in Hg) and comply with the ASTM E1745 Class A requirements. Installation of vapor barriers should be in accordance with ASTM

E1643. The basis of design is Stego wrap vapor barrier 15-mil. The vapor barrier should be placed in accordance with the manufacturer's specifications.

16.2 Common to all acceptable products, vapor retarder/barrier joints must be lapped and sealed with mastic or the manufacturer's recommended tape or sealing products. In actual practice, stakes are often driven through the retarder material, equipment is dragged or rolled across the retarder, overlapping or jointing is not properly implemented, etc. All these construction deficiencies reduce the retarder's effectiveness. In no case should retarder/barrier products be punctured or gaps be allowed to form prior to or during concrete placement.

16.3 Following placement of concrete floor slabs, sufficient drying time must be allowed prior to placement of any floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials.

17. *Concrete Isolation Joints:* We recommend the project Civil/Structural Engineer incorporate isolation joints and sawcuts to at least one-fourth the thickness of the slab in any floor designs. The joints and cuts, if properly placed, should reduce the potential for and help control floor slab cracking. We recommend that concrete shrinkage joints be spaced no farther than approximately 20 feet apart, and also at re-entrant corners. However, due to a number of reasons (such as base preparation, construction techniques, curing procedures, and normal shrinkage of concrete), some cracking of slabs can be expected.

18. Exterior Slab Reinforcement: Exterior concrete slabs should be at least 4 inches thick. As a minimum for protection of on-site improvements, we recommend that all nonstructural concrete slabs (such as patios, sidewalks, etc.), be founded on properly compacted and tested fill or dense native formation and be underlain by 2 inches and no more than 3 inches of clean leveling sand, with No. 4 bars at 18-inch centers, both ways, at the center of the slab. Exterior slabs should contain adequate isolation and control joints.

The performance of on-site improvements can be greatly affected by soil base preparation and the quality of construction. It is therefore important that all improvements are properly designed and constructed for the existing soil conditions. The improvements should not be built on loose soils or fills placed without our observation and testing. The subgrade of exterior improvements should be verified as properly prepared within 48 hours prior to concrete placement. A minimum thickness of 2 feet of properly recompacted soils should underlie the secondary exterior slabs on-grade or be built on properly moisture conditioned dense formational soils.

For exterior slabs with the minimum shrinkage reinforcement, control joints should be placed at spaces no farther than 15 feet apart or the width of the slab, whichever is less, and also at re-entrant corners. Control and isolation joints in exterior slabs should be sealed with elastomeric joint sealant. The sealant should be inspected every 6 months and be properly maintained.

## E. *Retaining Wall Design Criteria*

19. *Static Design Parameters:* Retaining walls must be designed to resist lateral earth pressures and any additional lateral pressures caused by surcharge

loads on the adjoining retained surface, plus an additional seismic soil increment when applicable. We recommend that restrained retaining walls with level, low-expansive imported backfill be designed for an equivalent fluid pressure of 38 pcf. Wherever restrained walls will be subjected to surcharge loads, they should also be designed for an additional uniform lateral pressure of 0.31 times the anticipated surcharge pressure for unrestrained walls (and 0.58 times for restrained walls) supporting level, low-expansive backfill.

Exterior unrestrained retaining walls supporting a 1.5:1.0 (h:v) backfill may be designed for an equivalent fluid weight of 62 pcf (using low expansive soils) and 85 pcf for on-site expansive soils with a 2.0:1.0 (h:v) sloping backfill. Restrained retaining walls supporting a 2.0:1.0 (h:v) backfill of low expansive soils should be designed with a soil pressure of 55 pcf (100 pcf for on-site expansive soils supporting a 2.0:1.0 sloping backfill).

Backfill placed behind the walls should be compacted to a minimum degree of compaction of 90 percent using light compaction equipment. If heavy equipment is used, the walls should be appropriately temporarily braced.

20. <u>*Retaining Wall Seismic Earth Pressures*</u>: If seismic loading is considered for retaining walls more than 6 feet in height, they should be designed for seismic earth pressures in addition to the normal static pressures. For the retaining wall (restrained) with level backfill, we recommend that the seismic pressure increment be taken as an additional fluid pressure distribution (zero pressure at the ground surface and maximum pressure at the base) utilizing an equivalent fluid weight of 16 pounds per cubic foot (pcf). A Kh value of 0.17 may be used is a computer program such as "*Retaining Wall Pro*" or a

similar program is used for wall design. The soil pressure described above may be used for the design of shoring structures.

21. *Wall Drainage:* The preceding design pressures assume that the walls are backfilled with the on-site soils or imported low-expansive soils, and that there is sufficient drainage behind the walls to prevent the build-up of hydrostatic pressures from surface water infiltration. We recommend that drainage be provided by a composite drainage material such as Miradrain 6000/6200 or equivalent. The drain material should terminate 3 inches below the finish surface where the surface is covered by pavements or slabs or 6 inches below the finish surface in landscape areas (see Figure No. IX for Retaining Wall Drainage schematic). Waterproofing should extend from the bottom to the top of the wall.

    ***Geotechnical Exploration, Inc.*** will assume no liability for damage to structures or improvements that is attributable to poor drainage. The architectural plans should clearly indicate that subdrains for any lower-level walls be placed at an elevation at least 1 foot below the bottom of the lower-level slabs. At least 0.5-percent gradient should be provided to the subdrain. The subdrain should be placed in an envelope of crushed rock gravel up to 1 inch in maximum diameter, and be wrapped with Mirafi 140N filter or equivalent. A sump pump may be needed if the subdrain does not outlet via gravity. The collected water should be taken to an approved drainage facility.

22. *Drainage Quality Control*: It must be understood that it is not within the scope of our services to provide quality control oversight for surface or subsurface drainage construction or retaining wall sealing and base of wall

drain construction. It is the responsibility of the contractor to verify proper wall sealing, geofabric installation, protection board (if needed), drain depth below interior floor or yard surface, pipe percent slope to the outlet, etc.

## *F.* ***Slopes***

It is our understanding that no large permanent slopes are proposed. Temporary slopes may be required during site preparation and construction.

23. *Slope Observations:* A representative of ***Geotechnical Exploration, Inc.*** must observe any steep temporary slopes *during construction*. In the event that soils and formational material comprising a slope are not as anticipated, any required slope design changes would be presented at that time.

24. *Permanent Slopes*: Any new cut or fill slopes up to 10 feet in height should be constructed at an inclination of 2.0:1.0 (horizontal to vertical). Permanent slopes at a 2.0:1.0 slope should possess a factor of safety of 1.5 against deep and shallow failure. Existing on-site slopes have also been found to possess a factor of safety of at least 1.5 against gross and shallow slope failure.

25. *Temporary Slopes*: Based on our subsurface investigation work, laboratory test results, and engineering analysis, temporary slopes should be stable for a maximum slope height of up to 12 feet and may be cut at a slope ratio of 1.0:1.0 in properly compacted fill soils and at 0.75:1.0 in medium dense natural soils. Some localized sloughing or raveling of the soils exposed on the slopes, however, may occur.

Since the stability of temporary construction slopes will depend largely on the contractor's activities and safety precautions (storage and equipment loadings near the tops of cut slopes, surface drainage provisions, etc.), it should be the contractor's responsibility to establish and maintain all temporary construction slopes at a safe inclination appropriate to his methods of operation. No soil stockpiles or surcharge may be placed within a horizontal distance of 10 feet from the excavation.

If these recommendations are not feasible due to space constraints, temporary shoring may be required for safety and to protect adjacent property improvements. Similarly, footings near temporary cuts should be underpinned or protected with shoring.

26. *Cal-OSHA*: Where not superseded by specific recommendations presented in this report, trenches, excavations, and temporary slopes at the subject site should be constructed in accordance with Title 8, Construction Safety Orders, issued by Cal-OSHA.

## *G. Site Drainage Considerations*

27. *Erosion Control*: Appropriate erosion control measures should be taken at all times during and after construction to prevent surface runoff waters from entering footing excavations or ponding on finished building pad areas.

28. *Surface Drainage:* Adequate measures should be taken to properly finish-grade the lot after the additions and other improvements are in place. Drainage waters from this site and adjacent properties should be directed away from the footings, floor slabs, and slopes, onto the natural drainage

direction for this area or into properly designed and approved drainage facilities provided by the project civil engineer. Roof gutters and downspouts should be installed on the residence, with the runoff directed away from the foundations via closed drainage lines. Proper subsurface and surface drainage will help minimize the potential for waters to seek the level of the bearing soils under the footings and floor slabs.

Failure to observe this recommendation could result in undermining and possible differential settlement of the structure or other improvements on the site or cause other moisture-related problems. Currently, the California Building Code requires a minimum 1-percent surface gradient for proper drainage of building pads unless waived by the building official. Concrete pavement may have a minimum gradient of 0.5-percent.

29. *Planter Drainage:* Planter areas, flower beds and planter boxes should be sloped to drain away from the footings and floor slabs at a gradient of at least 5 percent within 5 feet from the perimeter walls. Any planter areas adjacent to the residence or surrounded by concrete improvements should be provided with sufficient area drains to help with rapid runoff disposal. No water should be allowed to pond adjacent to the residence or other improvements or anywhere on the site.

## *H. General Recommendations*

30. *Project Start Up Notification:* In order to reduce work delays during site development, this firm should be contacted 48 hours prior to any need for observation of footing excavations or field density testing of compacted fill soils. If possible, placement of formwork and steel reinforcement in footing

excavations should not occur prior to observing the excavations; in the event that our observations reveal the need for deepening or redesigning foundation structures at any locations, any formwork or steel reinforcement in the affected footing excavation areas would have to be removed prior to correction of the observed problem (i.e., deepening the footing excavation, recompacting soil in the bottom of the excavation, etc.).

31. *Construction Best Management Practices (BMPs):* Construction BMPs must be implemented in accordance with the requirements of the controlling jurisdiction. Sufficient BMPs must be installed to prevent silt, mud or other construction debris from being tracked into the adjacent street(s) or storm water conveyance systems due to construction vehicles or any other construction activity. The contractor is responsible for cleaning any such debris that may be in the street at the end of each work day or after a storm event that causes breach in the installed construction BMPs.

All stockpiles of uncompacted soil and/or building materials that are intended to be left unprotected for a period greater than 7 days are to be provided with erosion and sediment controls. Such soil must be protected each day when the probability of rain is 40% or greater. A concrete washout should be provided on all projects that propose the construction of any concrete improvements that are to be poured in place. All erosion/sediment control devices should be maintained in working order at all times. All slopes that are created or disturbed by construction activity must be protected against erosion and sediment transport at all times. The storage of all construction materials and equipment must be protected against any potential release of pollutants into the environment.

## XII. GRADING NOTES

***Geotechnical Exploration, Inc.*** recommends that we be retained to verify the actual soil conditions revealed during site grading work and footing excavation to be as anticipated in this "*Report of Preliminary Geotechnical Investigation*" for the project. In addition, the compaction of any fill soils placed during site grading work must be observed and tested by the soil engineer.

It is the responsibility of the grading contractor to comply with the requirements on the grading plans as well as the local grading ordinance. All retaining wall and trench backfill should be properly compacted. ***Geotechnical Exploration, Inc.*** will assume no liability for damage occurring due to improperly or uncompacted backfill placed without our observations and testing.

## XIII. LIMITATIONS

Our conclusions and recommendations have been based on available data obtained from our field investigation and laboratory analysis, as well as our experience with similar soils and formational materials located in this area of San Diego. Of necessity, we must assume a certain degree of continuity between exploratory excavations and/or natural exposures. It is, therefore, necessary that all observations, conclusions, and recommendations be verified at the time grading operations begin or when footing excavations are placed. In the event discrepancies are noted, additional recommendations may be issued, if required.

The work performed and recommendations presented herein are the result of an investigation and analysis that meet the contemporary standard of care in our profession within the County of San Diego. No warranty is provided.

As stated previously, it is not within the scope of our services to provide quality control oversight for surface or subsurface drainage construction or retaining wall sealing and base of wall drain construction. It is the responsibility of the contractor to verify proper wall sealing, geofabric installation, protection board installation (if needed), drain depth below interior floor or yard surfaces; pipe percent slope to the outlet, etc.

This report should be considered valid for a period of two (2) years, and is subject to review by our firm following that time. If significant modifications are made to the building plans, especially with respect to the height and location of any proposed structures, this report must be presented to us for immediate review and possible revision.

It is the responsibility of the owner and/or developer to ensure that the recommendations summarized in this report are carried out in the field operations and that our recommendations for design of this project are incorporated in the structural plans. We should be retained to review the project plans once they are available, to verify that our recommendations are adequately incorporated in the plans. Additional or modified recommendations may be issued if warranted after plan review.

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations, and we cannot be responsible for the safety of personnel other than our own on the site; the safety of others is the responsibility of the contractor. The contractor should notify the owner if he considered any of the recommended actions presented herein to be unsafe.

The firm of ***Geotechnical Exploration, Inc.*** shall not be held responsible for changes to the physical condition of the property, such as addition of fill soils or changing drainage patterns, which occur subsequent to issuance of this report and the changes are made without our observations, testing, and approval.

Once again, should any questions arise concerning this report, please feel free to contact the undersigned. Reference to our **Job No. 16-11019** will expedite a reply to your inquiries.

Respectfully submitted,

**GEOTECHNICAL EXPLORATION, INC.**

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JAIME A CERROS
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Exp 9/30/17

JONATHAN A. BROWNING
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CERTIFIED ENGINEERING GEOLOGIST

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JOB NO. 16-11019

March 2016

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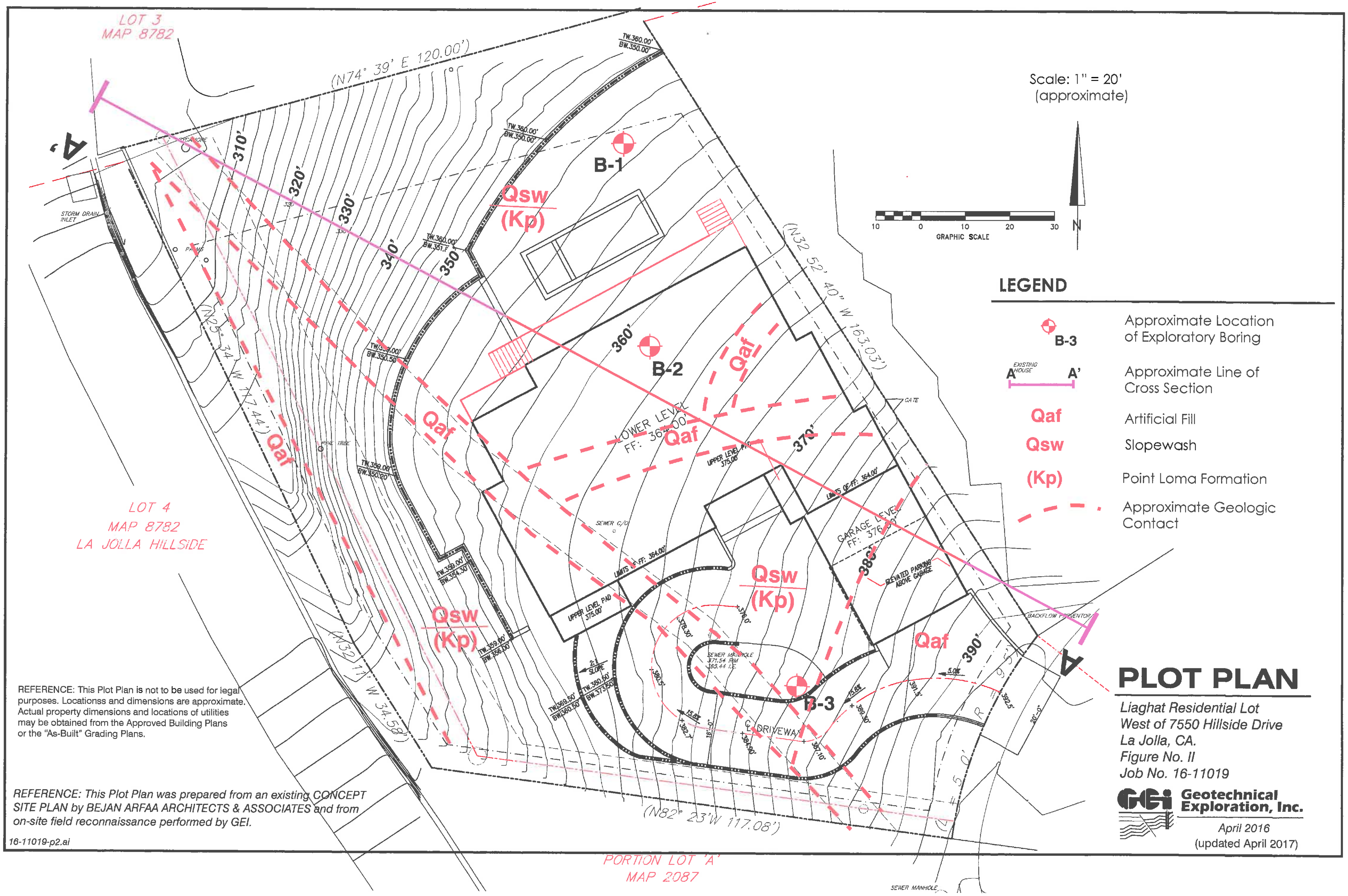
# VICINITY MAP

Thomas Bros Guide San Diego County pg 1227-H6

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

*Figure No. I*
*Job No. 16-11019*



Scale: 1" = 20'
(approximate)

## LEGEND

| | |
|---|---|
| B-3 | Approximate Location of Exploratory Boring |
| A — A' | Approximate Line of Cross Section |
| Qaf | Artificial Fill |
| Qsw | Slopewash |
| (Kp) | Point Loma Formation |
| ‒ ‒ ‒ | Approximate Geologic Contact |

REFERENCE: This Plot Plan is not to be used for legal purposes. Locationss and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

*REFERENCE: This Plot Plan was prepared from an existing CONCEPT SITE PLAN by BEJAN ARFAA ARCHITECTS & ASSOCIATES and from on-site field reconnaissance performed by GEI.*

16-11019-p2.ai

# PLOT PLAN

*Liaghat Residential Lot*
*West of 7550 Hillside Drive*
*La Jolla, CA.*
*Figure No. II*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

April 2016
(updated April 2017)

| EQUIPMENT | DIMENSION & TYPE OF EXCAVATION | DATE LOGGED |
|---|---|---|
| **Limited Access Auger Drill Rig** | **6-inch diameter Boring** | **3-2-16** |
| SURFACE ELEVATION | GROUNDWATER/ SEEPAGE DEPTH | LOGGED BY |
| **± 350' Mean Sea Level** | **Not Encountered** | **JAB** |

| DEPTH (feet) | SYMBOL | SAMPLE | FIELD DESCRIPTION AND CLASSIFICATION | | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | EXPANSION INDEX | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | | | | | | | | | |
| | | | **SANDY CLAY**, fine- to medium-grained sand, trace subangular gravel to 3/4" in diameter. Stiff. Moist. Dark gray to dark brown. | CL | | | | | | | | | |
| | | 1 | **SLOPEWASH (Qsw)**<br>-- 75% passing #200 sieve. | | 19.6 | | | | | | 91 | | |
| 2 | | ■ | | | 18.6 | 97.6 | | | | | | 22 | 3" |
| 4 | | ▨ | | | | | | | | | | 12 | 2" |
| | | | **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Very stiff. Moist. Dark gray. | CL | | | | | | | | | |
| 6 | | | **POINT LOMA FORMATION (Kp)** | | | | | | | | | | |
| 8 | | ■ | Bulk bag sample from 7'- 10'. | | 19.4 | 103.4 | | | | | 87 | 34 | 3" |
| | | ▨ | | | | | | | | | | 21 | 2" |
| 10 | | | Bottom @ 10' | | | | | | | | | | |

▼ PERCHED WATER TABLE
☒ BULK BAG SAMPLE
1 IN-PLACE SAMPLE
■ MODIFIED CALIFORNIA SAMPLE
S NUCLEAR FIELD DENSITY TEST
▨ STANDARD PENETRATION TEST

JOB NAME
**Liaghat Residential Lot**

SITE LOCATION
**West of 7550 Hillside Drive, La Jolla, CA**

JOB NUMBER
**16-11019**

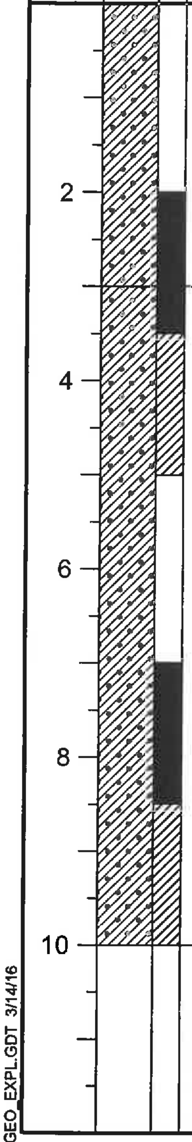
FIGURE NUMBER
**IIIa**

REVIEWED BY **LDR/JAC**

**Geotechnical Exploration, Inc.**

LOG No.
**B-1**

| EQUIPMENT | DIMENSION & TYPE OF EXCAVATION | DATE LOGGED |
|---|---|---|
| **Limited Access Auger Drill Rig** | **6-inch diameter Boring** | **3-2-16** |
| SURFACE ELEVATION | GROUNDWATER/ SEEPAGE DEPTH | LOGGED BY |
| **± 362' Mean Sea Level** | **Not Encountered** | **JAB** |



| FIELD DESCRIPTION AND CLASSIFICATION<br>DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|
| **SANDY CLAY**, fine- to medium-grained sand. Very stiff. Moist. Dark brown.<br>**SLOPEWASH (Qsw)** | CL | | | | | | | | |
| | | | | | | | | 24 | 3" |
| **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Very stiff. Moist. Dark gray.<br>**POINT LOMA FORMATION (Kp)** | CL | | | | | | | | |
| | | | | | | | | 18 | 2" |
| -- becomes hard, less disturbed. | | | | | | | | | |
| | | 19.1 | 108.1 | | | | | 75 | 3" |
| | | | | | | | | 49 | 2" |
| Bottom @ 10' | | | | | | | | | |

- ▼ PERCHED WATER TABLE
- ☒ BULK BAG SAMPLE
- 1 IN-PLACE SAMPLE
- ■ MODIFIED CALIFORNIA SAMPLE
- S NUCLEAR FIELD DENSITY TEST
- ▨ STANDARD PENETRATION TEST

| JOB NAME | | |
|---|---|---|
| **Liaghat Residential Lot** | | |
| SITE LOCATION | | |
| **West of 7550 Hillside Drive, La Jolla, CA** | | |
| JOB NUMBER<br>**16-11019** | REVIEWED BY **LDR/JAC**<br>**Geotechnical Exploration, Inc.** | LOG No.<br>**B-2** |
| FIGURE NUMBER<br>**IIIb** | | |

EQUIPMENT
**Limited Access Auger Drill Rig**

DIMENSION & TYPE OF EXCAVATION
**6-inch diameter Boring**

DATE LOGGED
**3-2-16**

SURFACE ELEVATION
**± 381' Mean Sea Level**

GROUNDWATER/ SEEPAGE DEPTH
**Not Encountered**

LOGGED BY
**JAB**

| DEPTH (feet) | SYMBOL | SAMPLE | FIELD DESCRIPTION AND CLASSIFICATION<br>DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color) | U.S.C.S. | IN-PLACE MOISTURE (%) | IN-PLACE DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) | MAXIMUM DRY DENSITY (pcf) | DENSITY (% of M.D.D.) | EXPAN. + CONSOL. - (%) | BLOW COUNTS/FT. | SAMPLE O.D. (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | ☒ | **SANDY CLAY**, fine- to medium-grained sand, with abundant roots to 1.5 feet. Stiff. Moist. Dark yellow-brown to dark brown.<br>**SLOPEWASH (Qsw)** | CL | | | | | | | | |
| 2 | | ■ | | | | | | | | | | |
| | | ■ | **SANDY CLAY**, fine-grained sand, some iron oxide staining on fractures, trace caliche, trace manganese staining; blocky and disturbed. Stiff. Moist. Dark gray.<br>**POINT LOMA FORMATION (Kp)** | CL | 13.7 | 86.9 | | | | | 13 | 3" |
| 4 | | ▨ | | | | | | | | | 15 | 2" |
| 6 | | ☒ | -- Bulk bag sample from 4'- 7'.<br>-- 93% passing #200 sieve. | | | | 15.5 | 111.3 | | | | |
| | | ■ | -- becomes hard, less disturbed. | | | | | | | | | |
| 8 | | ■ | | | | | | | | | 50 | 3" |
| | | ▨ | | | | | | | | | 50 | 2" |
| 10 | | | Bottom @ 10' | | | | | | | | | |

- ▼ PERCHED WATER TABLE
- ☒ BULK BAG SAMPLE
- 1 IN-PLACE SAMPLE
- ■ MODIFIED CALIFORNIA SAMPLE
- S NUCLEAR FIELD DENSITY TEST
- ▨ STANDARD PENETRATION TEST

JOB NAME
**Liaghat Residential Lot**

SITE LOCATION
**West of 7550 Hillside Drive, La Jolla, CA**

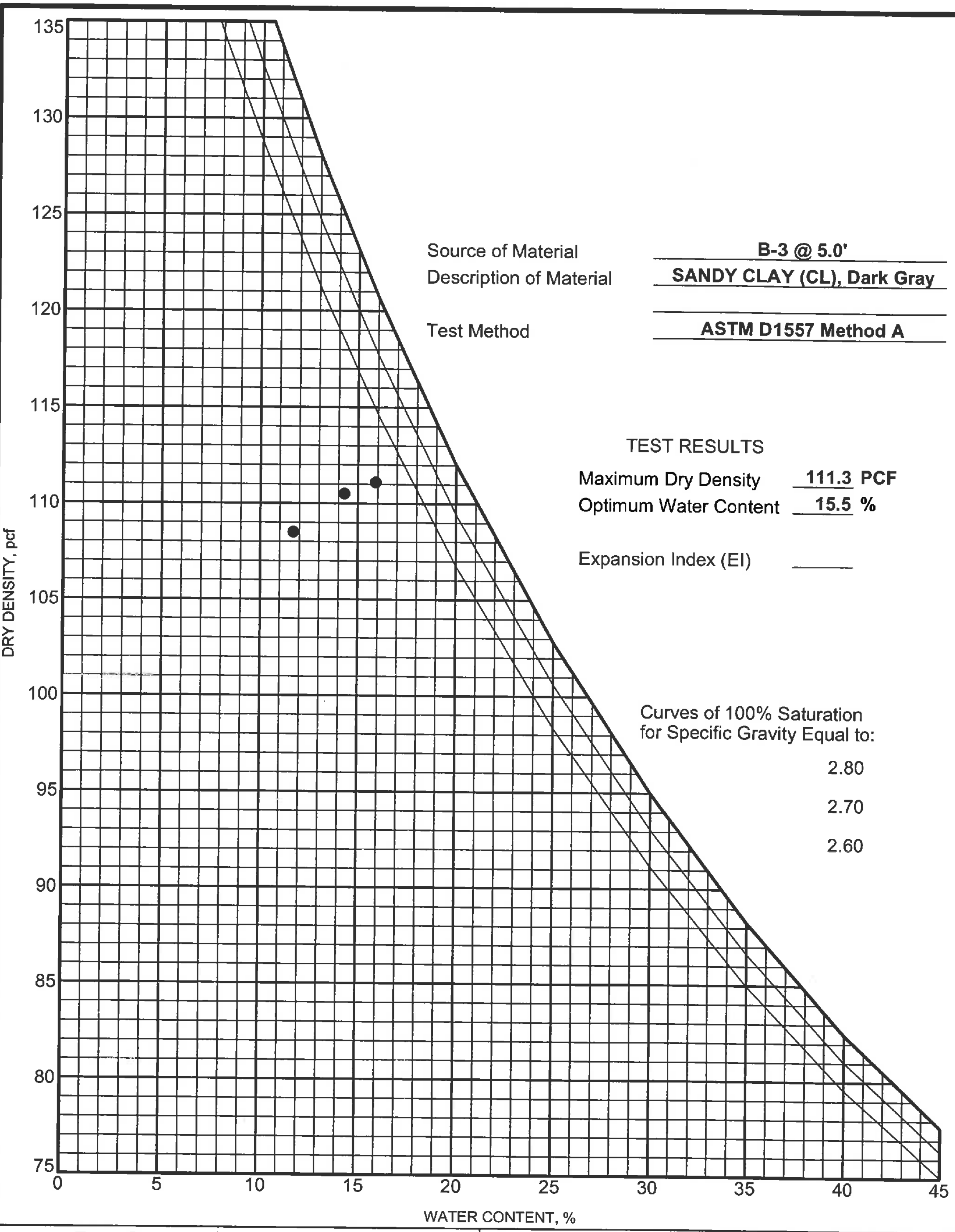
JOB NUMBER
**16-11019**

FIGURE NUMBER
**IIIc**

REVIEWED BY
**LDR/JAC**

Geotechnical Exploration, Inc.

LOG No.
**B-3**



Source of Material **B-3 @ 5.0'**

Description of Material **SANDY CLAY (CL), Dark Gray**

Test Method **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density **111.3** **PCF**

Optimum Water Content **15.5** **%**

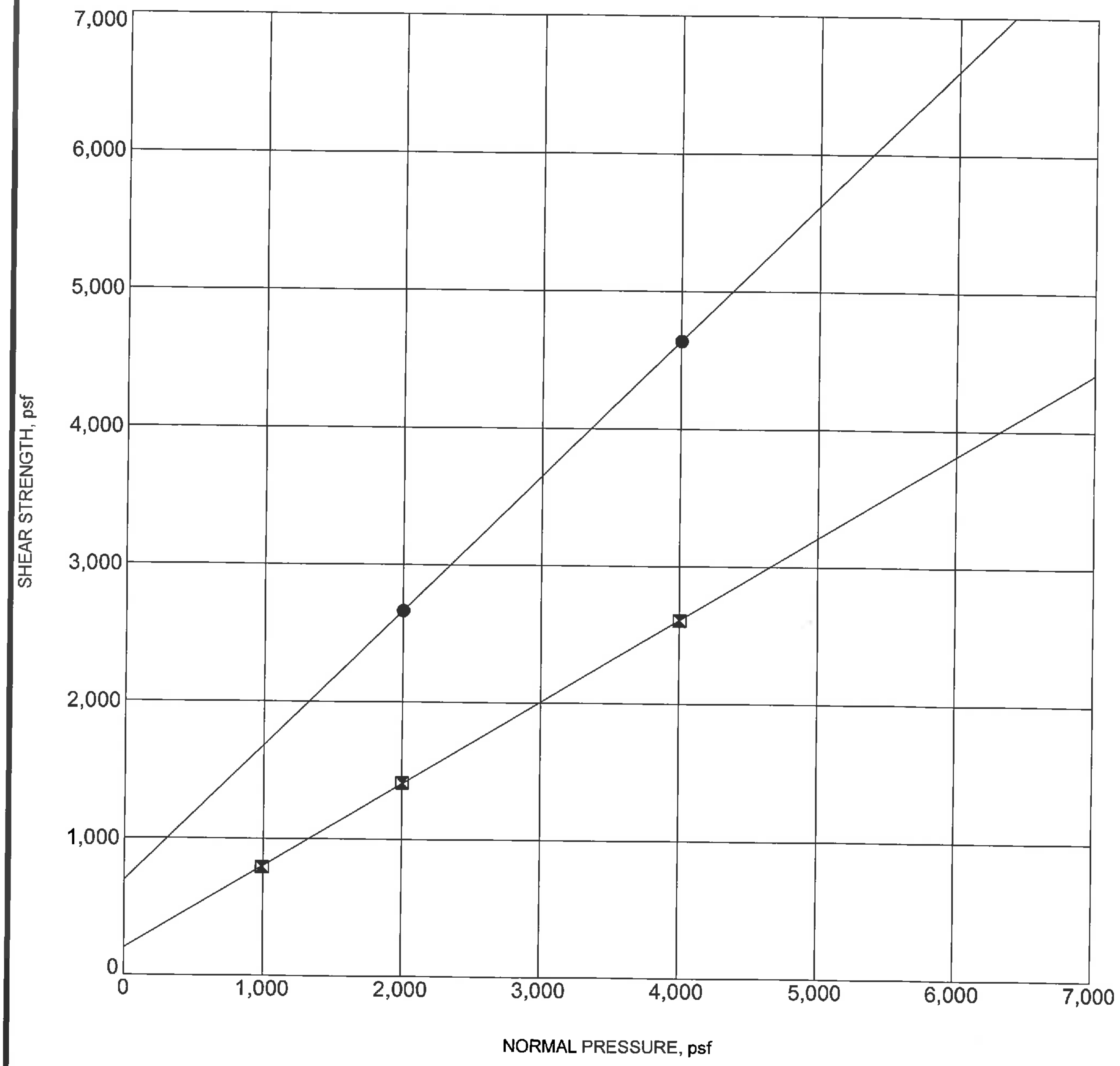
Expansion Index (EI) ______

**Geotechnical Exploration, Inc.**

## MOISTURE-DENSITY RELATIONSHIP

Figure Number: IVa
Job Name: Liaghat Residential Lot
Site Location: West of 7550 Hillside Drive, La Jolla, CA
Job Number: 16-11019

COMPACTION + EI DARK GRID 11019 LIAGHAT.GPJ GEI FEB06.GDT 3/14/16



| | Specimen Identification | Classification | $\gamma_d$ | MC% | c | $\phi$ |
|---|---|---|---|---|---|---|
| ● | **B-2 @ 8.0'** | **SANDY CLAY (CL), Dark Gray** | | | **691** | **45** |
| ☒ | **B-3 @ 3.0'** | **SANDY CLAY (CL), Dark Gray** | | | **199** | **31** |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Geotechnical Exploration, Inc.**

## DIRECT SHEAR TEST

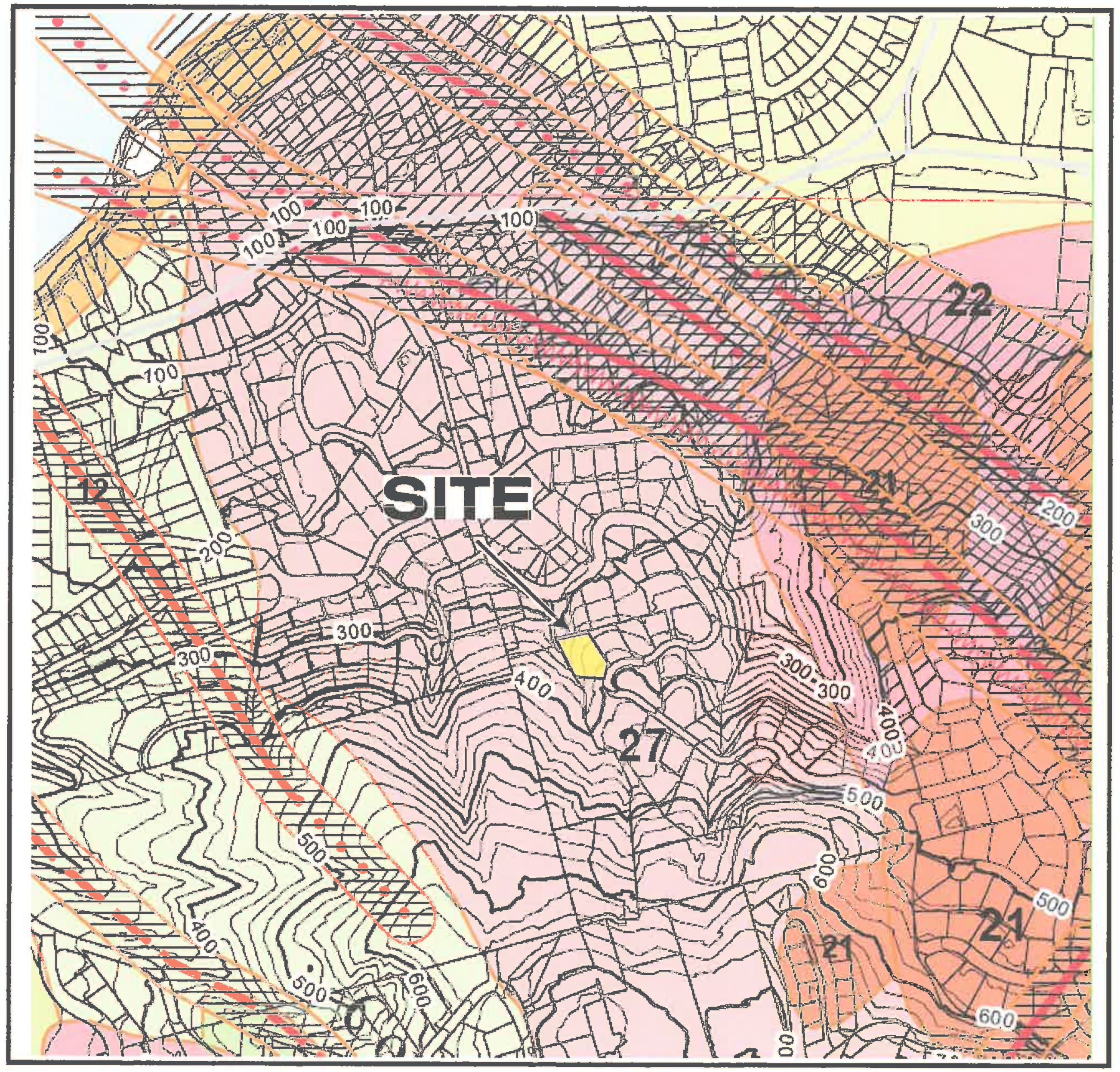
Figure Number: IVb
Job Name: Liaghat Residential Lot
Site Location: West of 7550 Hillside Drive, La Jolla, CA
Job Number: 16-11019

# Geologic Hazards Map Excerpt from City of San Diego Geologic Hazards and Fault Map

## Sheet 29

Development Services Department

DATE: 4/3/2008



Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

### LEGEND

### Geologic Hazard Categories

**FAULT ZONES**

- ▨ 11 Active, Alquist-Priolo Earthquake Fault Zone
- ▤ 12 Potentially Active, Inactive, Presumed Inactive, or Activity Unknown
- ■ 13 Downtown special fault zone

**LANDSLIDES**

- ■ 21 Confirmed, known, or highly suspected
- ■ 22 Possible or conjectured

**SLIDE-PRONE FORMATIONS**

- ■ 23 Friars: neutral or favorable geologic structure
- ■ 24 Friars: unfavorable geologic structure
- ■ 25 Ardath: neutral or favorable geologic structure
- ■ 26 Ardath: unfavorable geologic structure
- ■ 27 Otay, Sweetwater, and others

**LIQUEFACTION**

- ■ 31 High Potential -- shallow groundwater major drainages, hydraulic fills
- ■ 32 Low Potential -- fluctuating groundwater minor drainages

**COASTAL BLUFFS**

- ■ 41 Generally unstable Numerous landslides, high steep bluffs, severe erosion, unfavorable geologic structure
- ■ 42 Generally unstable Unfavorable bedding plains, high erosion
- ■ 43 Generally unstable Unfavorable jointing, local high erosion
- ■ 44 Moderately stable Mostly stable formations, local high erosion
- ■ 45 Moderately stable Some minor landslides, minor erosion
- ■ 46 Moderately stable Some unfavorable geologic structure, minor or no erosion
- ■ 47 Generally stable Favorable geologic structure, minor or no erosion, no landslides
- ■ 48 Generally stable Broad beach areas, developed harbor

**OTHER TERRAIN**

- ■ 51 Level mesas -- underlain by terrace deposits and bedrock nominal risk
- ■ 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
- ■ 54 Steeply sloping terrain, unfavorable or fault controlled geologic structure, Moderate risk
- ■ 55 Modified terrain (graded sites) Nominal risk

**Water (Bays and Lakes)**

- ■

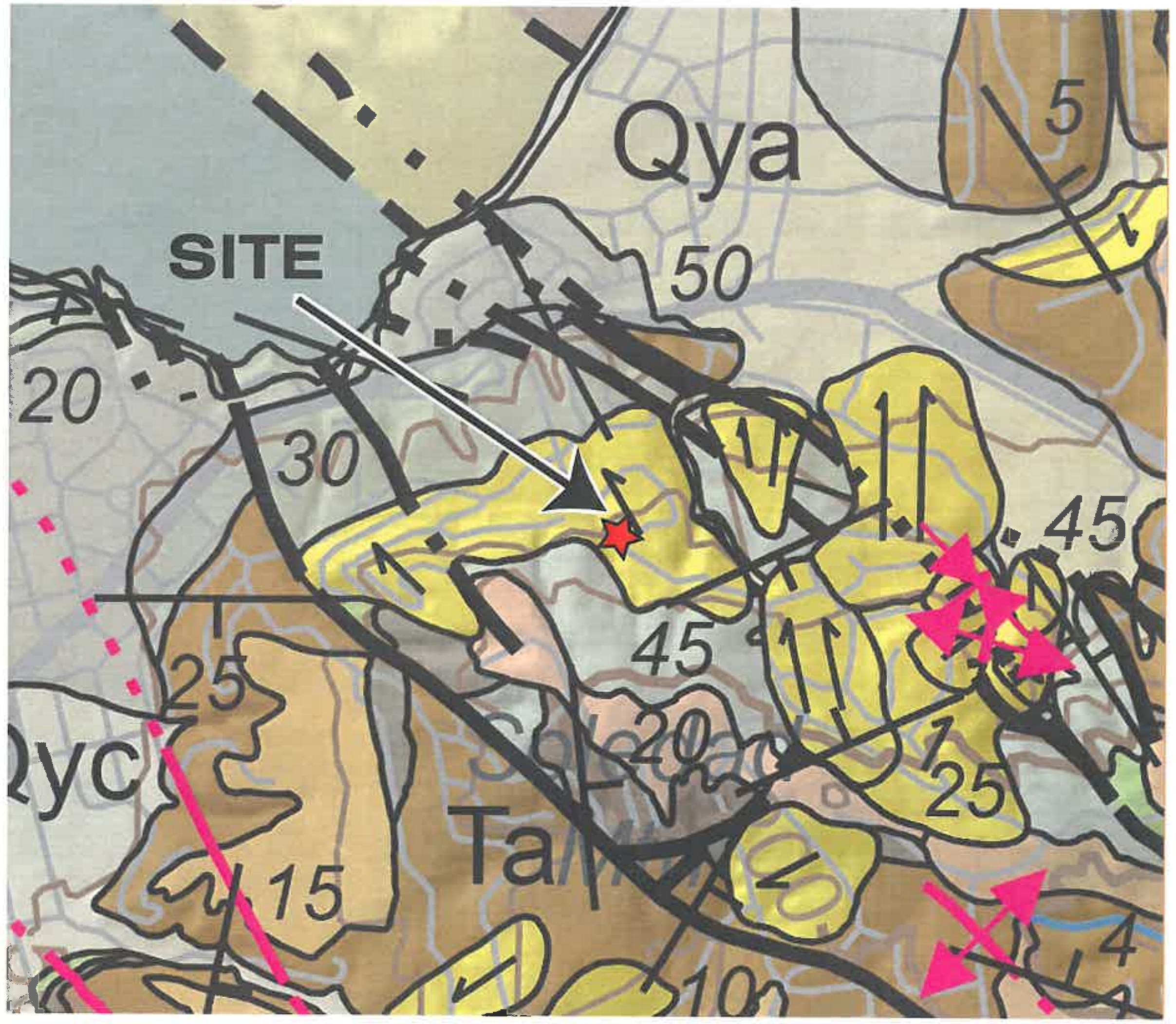
**FAULTS**

- ⁄⁄ Fault
- ⁄⁄ Inferred Fault
- ⁄⁄ Concealed Fault
- ▨ Shear Zone

*Figure No. V*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

April 2016



Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.

# EXCERPT FROM GEOLOGIC MAP OF THE SAN DIEGO 30' x 60' QUADRANGLE, CALIFORNIA

By

Michael P. Kennedy[1] and Siang S. Tan[1]
2008
Digital preparation by
Kelly R. Bovard[2], Anne G. Garcia[2], Diane Burns[2], and Carlos I. Gutierrez[1]

1. Department of Conservation, California Geological Survey
2. U.S. Geological Survey, Department of Earth Sciences, University of California, Riverside

## ONSHORE MAP SYMBOLS

Contact - Contact between geologic units; dotted where concealed.

70 U D Fault - Solid where accurately located; dashed where approximately located; dotted where concealed. U = upthrown block, D = downthrown block. Arrow and number indicate direction and angle of dip of fault plane.

Anticline - Solid where accurately located; dashed where approximately located; dotted where concealed. Arrow indicates direction of axial plunge.

Syncline - Solid where accurately located; dotted where concealed. Arrow indicates direction of axial plunge.

Qls? Landslide - Arrows indicate principal direction of movement. Queried where existence is questionable.

Strike and dip of beds

70 Inclined

Strike and dip of igneous joints

60 Inclined

Vertical

Strike and dip of metamorphic foliation

55 Inclined

## DESCRIPTION OF MAP UNITS

| | |
|---|---|
| Qls | **Landslide deposits undivided (Holocene and Pleistocene)**—Highly fragmented to largely coherent landslide deposits. Unconsolidated to moderately well consolidated. Most mapped landslides contain scarp area as well as slide deposit. Many Pleistocene age landslides were reactivated in part or entirely during late Holocene |

Base Map

Onshore base (hypsography, hydrography and transportation) from U.S.G.S. digital line graph (DLG) data, San Diego 30' x 60' metric quadrangle. Shaded topographic base from U.S.G.S. digital elevation models (DEM's). Offshore bathymetric contours and shaded bathymetry from N.O.A.A. single and multibeam data. Projection is UTM, zone 11, North American Datum 1927.

This map was funded in part by the U.S. Geological Survey National Cooperative Geologic Mapping Program, STATEMAP Award no. 98HQAG2049.

Prepared in cooperation with the U.S. Geological Survey, Southern California Areal Mapping Project.

Liaghat-2008-geo.ai

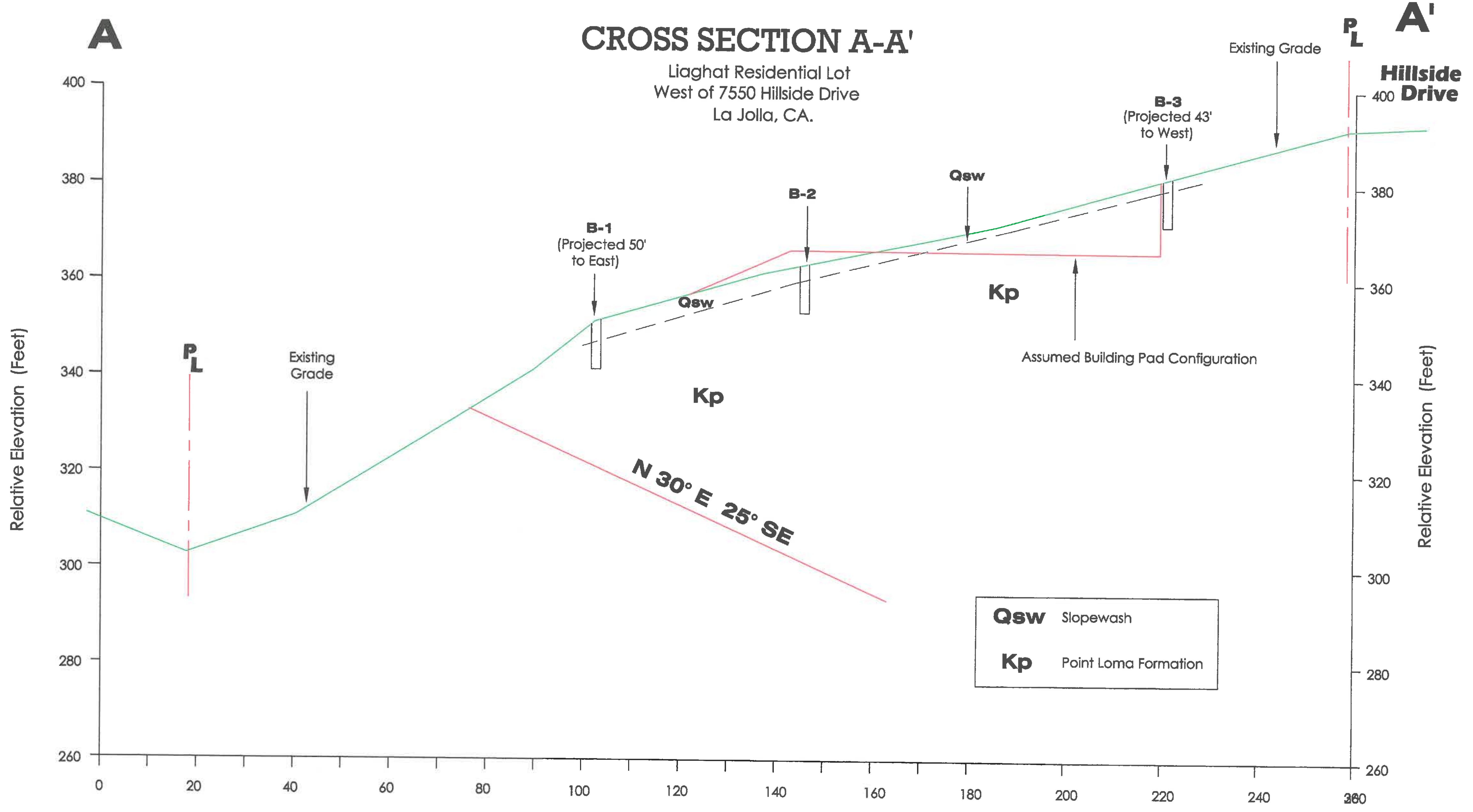
*Figure No. VI*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

April 2016

# CROSS SECTION A-A'

Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, CA.



Relative Horizontal Distance
(Horizontal and Vertical)
SCALE: 1" = 20'

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

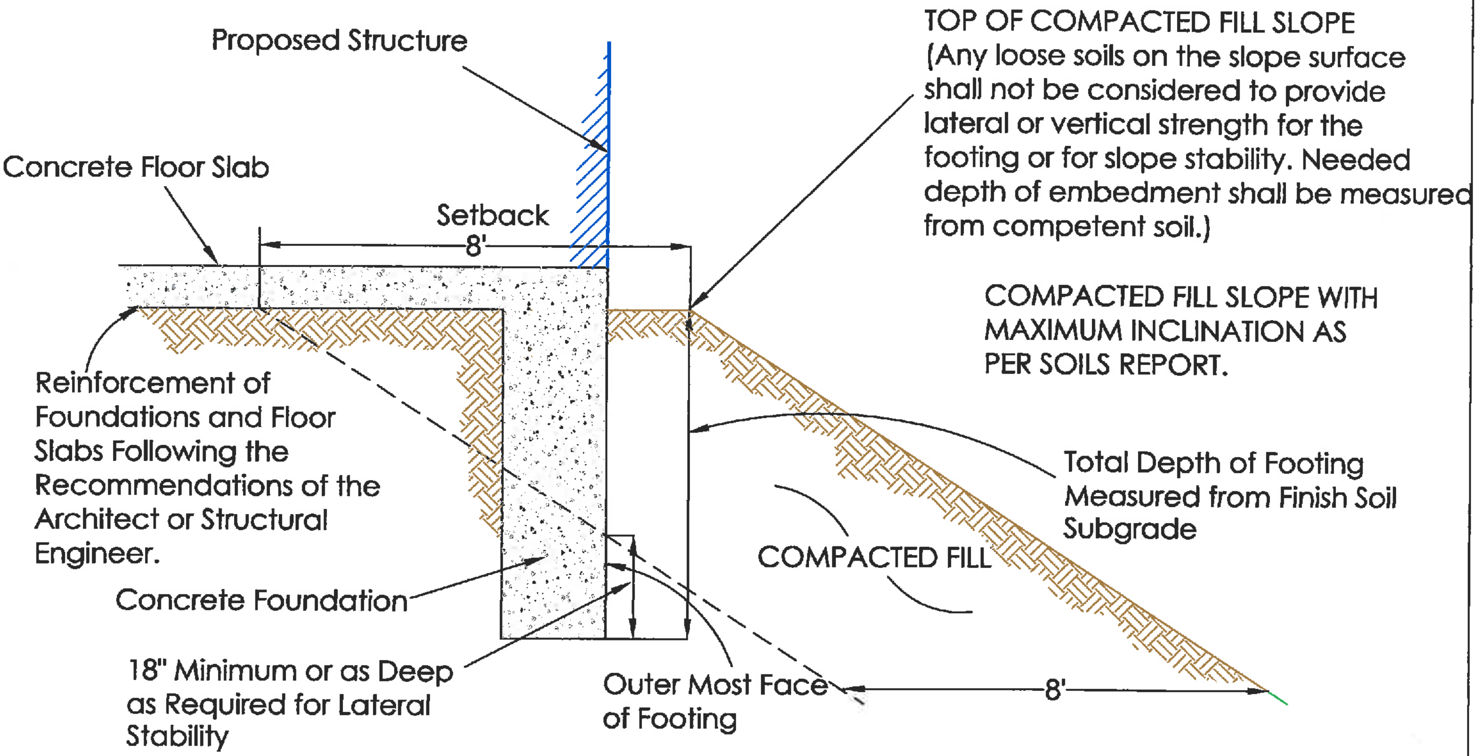
16-11019-AA

*Figure No. VII*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

*April 2016*

# FOUNDATION REQUIREMENTS NEAR SLOPES



## TYPICAL SECTION

( Showing Proposed Foundation Located Within 8 Feet of Top of Slope )

## 18" FOOTING / 8' SETBACK

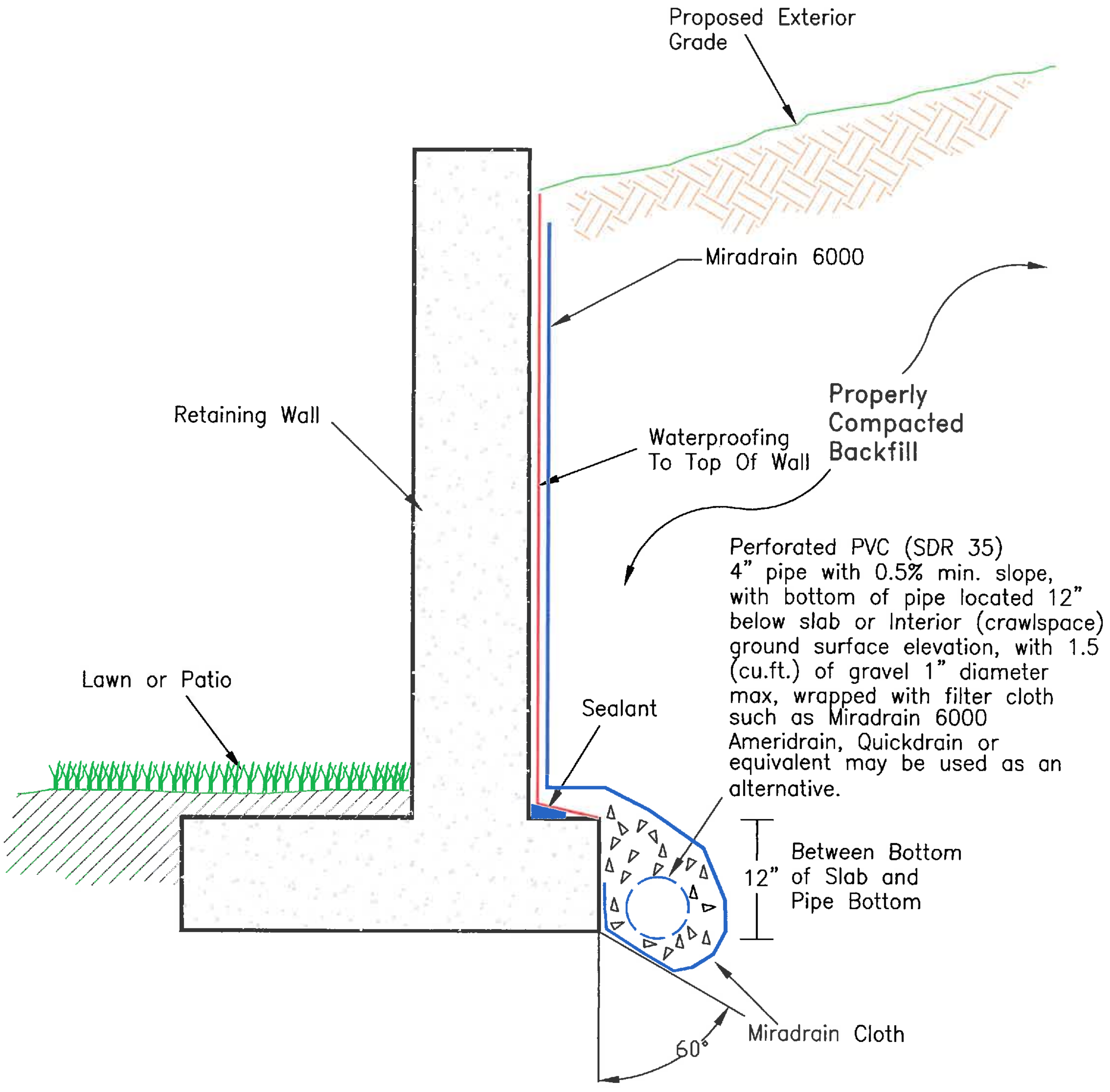
| Distance From Top of Slope | Total Depth of Footing | |
|---|---|---|
| | 1.5:1.0 SLOPE * | 2.0:1.0 SLOPE |
| 0 | 82" | 66" |
| 2' | 66" | 54" |
| 4' | 51" | 42" |
| 6' | 34" | 30" |
| 8' | 18" | 18" |

* when applicable

*Figure No. VIII*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

# SCHEMATIC RETAINING WALL
# SUBDRAIN RECOMMENDATIONS



Perforated PVC (SDR 35) 4" pipe with 0.5% min. slope, with bottom of pipe located 12" below slab or Interior (crawlspace) ground surface elevation, with 1.5 (cu.ft.) of gravel 1" diameter max, wrapped with filter cloth such as Miradrain 6000 Ameridrain, Quickdrain or equivalent may be used as an alternative.

**NOT TO SCALE**

*Figure No. IX*
*Job No. 16–11019*

NOTE: As an option to Miradrain 6000, Gravel or Crushed rock 3/4" maximum diameter may be used with a minimum 12" thickness along the interior face of the wall and 2.0 cu.ft./ft. of pipe gravel envelope.

**Geotechnical Exploration, Inc.**

*16–110–19–IX*

*April 2016*

# APPENDIX A
# UNIFIED SOIL CLASSIFICATION CHART
# SOIL DESCRIPTION

**Coarse-grained (More than half of material is larger than a No. 200 sieve)**

| | | |
|---|---|---|
| GRAVELS, CLEAN GRAVELS (More than half of coarse fraction is larger than No. 4 sieve size, but smaller than 3") | GW | Well-graded gravels, gravel and sand mixtures, little or no fines. |
| | GP | Poorly graded gravels, gravel and sand mixtures, little or no fines. |
| GRAVELS WITH FINES (Appreciable amount) | GC | Clay gravels, poorly graded gravel-sand-silt mixtures |
| SANDS, CLEAN SANDS (More than half of coarse fraction is smaller than a No. 4 sieve) | SW | Well-graded sand, gravelly sands, little or no fines |
| | SP | Poorly graded sands, gravelly sands, little or no fines. |
| SANDS WITH FINES (Appreciable amount) | SM | Silty sands, poorly graded sand and silty mixtures. |
| | SC | Clayey sands, poorly graded sand and clay mixtures. |

**Fine-grained (More than half of material is smaller than a No. 200 sieve)**

SILTS AND CLAYS

| | | |
|---|---|---|
| *Liquid Limit Less than 50* | ML | Inorganic silts and very fine sands, rock flour, sandy silt and clayey-silt sand mixtures with a slight plasticity |
| | CL | Inorganic clays of low to medium plasticity, gravelly clays, silty clays, clean clays. |
| | OL | Organic silts and organic silty clays of low plasticity. |
| *Liquid Limit Greater than 50* | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. |
| | CH | Inorganic clays of high plasticity, fat clays. |
| | OH | Organic clays of medium to high plasticity. |
| HIGHLY ORGANIC SOILS | PT | Peat and other highly organic soils |

(rev. 6/05)

# APPENDIX B

# USGS Design Maps Summary Report

## User–Specified Input

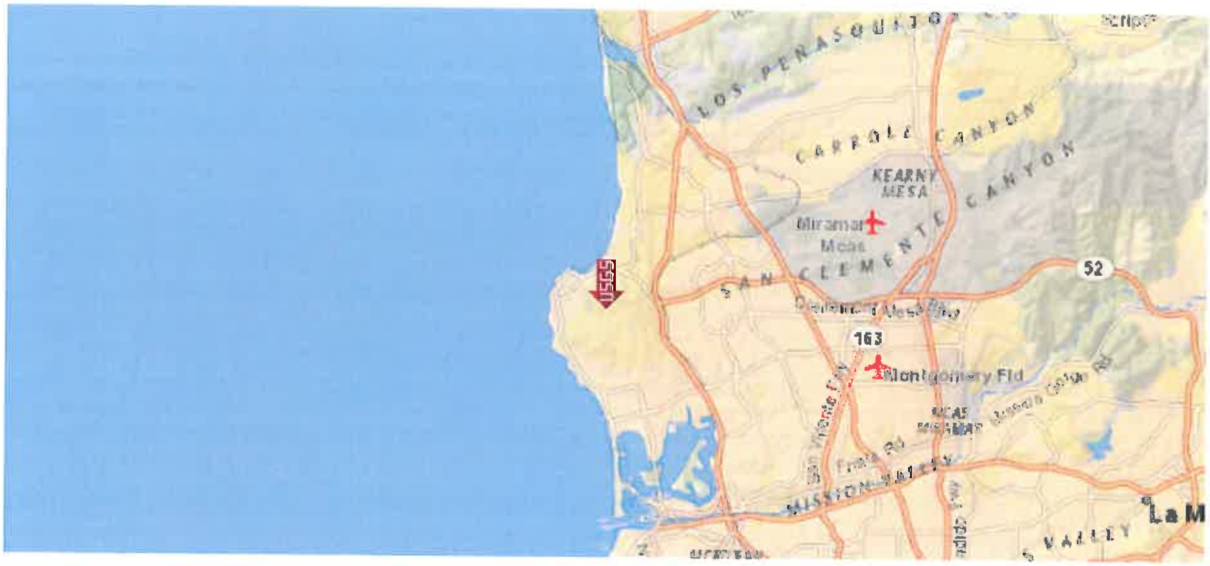
**Report Title** Liaghat Residential Lot
Thu March 17, 2016 22:05:53 UTC

**Building Code Reference Document** ASCE 7-10 Standard
(which utilizes USGS hazard data available in 2008)

**Site Coordinates** 32.8452°N, 117.2578°W

**Site Soil Classification** Site Class D – "Stiff Soil"

**Risk Category** I/II/III

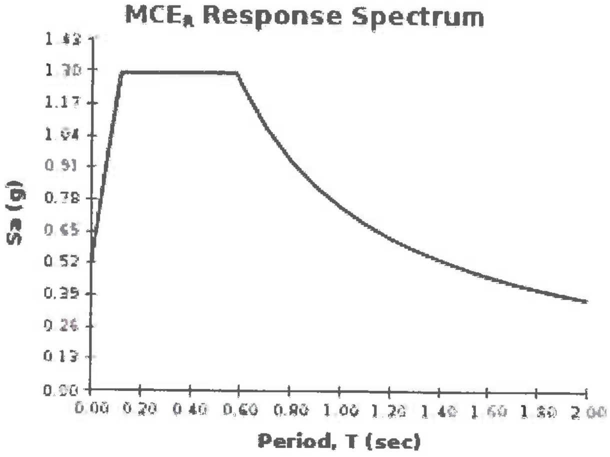


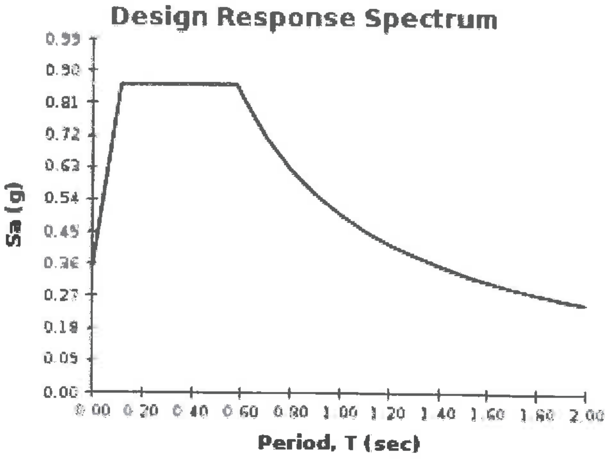
## USGS–Provided Output

$S_S =$ 1.292 g $S_{MS} =$ 1.292 g $S_{DS} =$ 0.862 g

$S_1 =$ 0.500 g $S_{M1} =$ 0.750 g $S_{D1} =$ 0.500 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.

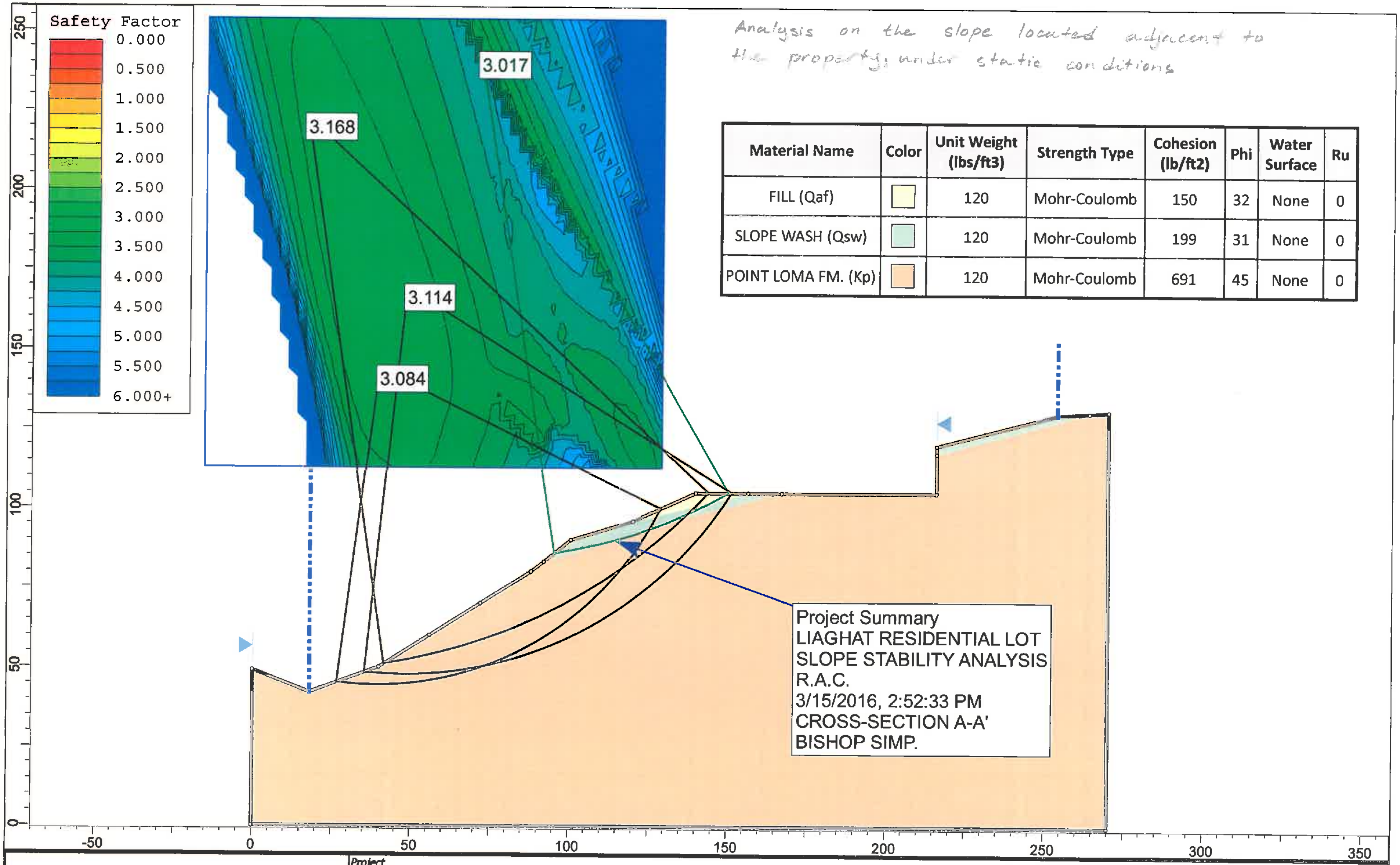




For $PGA_M$, $T_L$, $C_{RS}$, and $C_{R1}$ values, please view the detailed report.

# APPENDIX C

Analysis on the slope located adjacent to the property, under static conditions



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

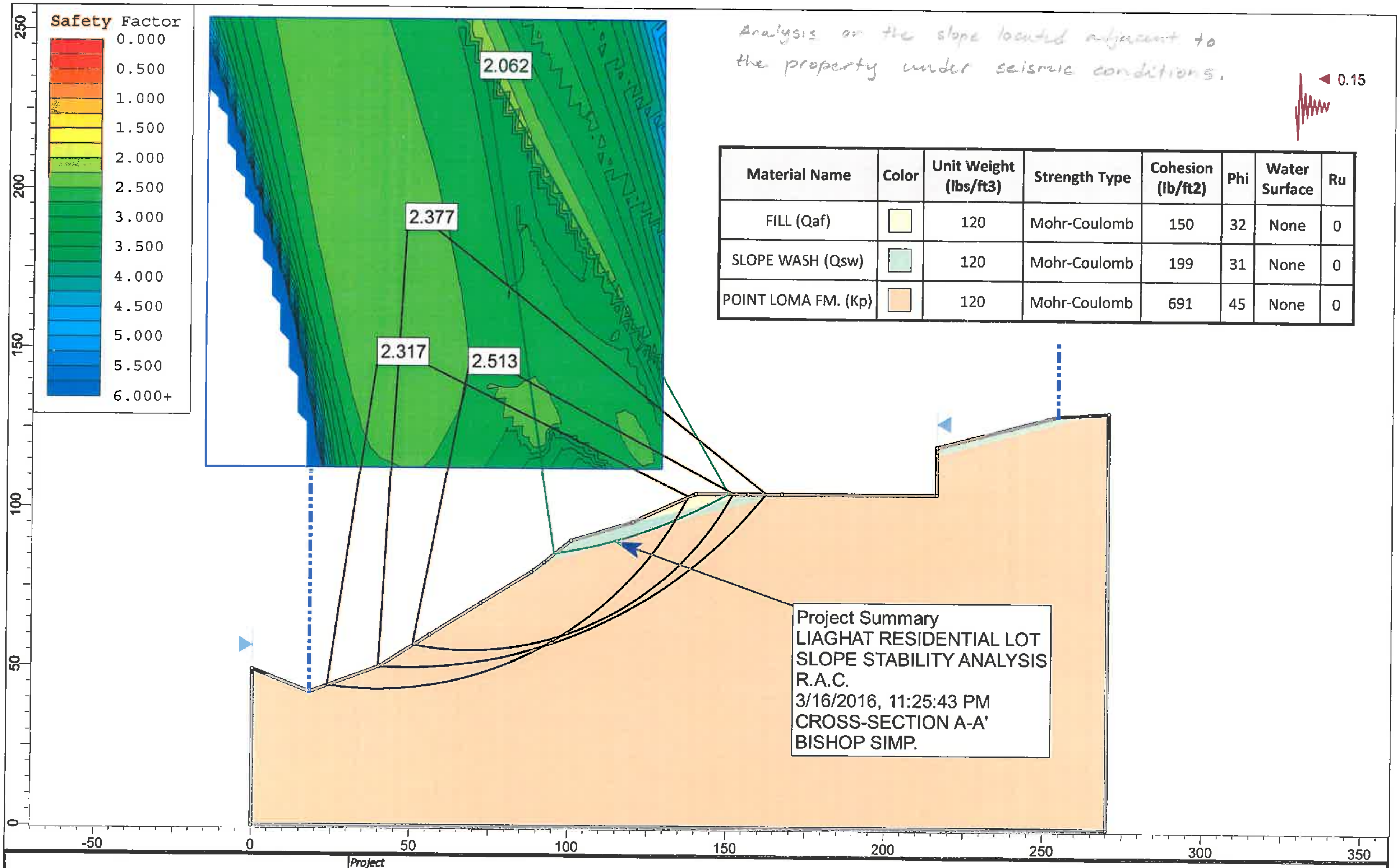
Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/15/2016, 2:52:33 PM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

SLIDEINTERPRET 6.005

| | | | |
|---|---|---|---|
| *Project* | LIAGHAT RESIDENTIAL LOT | | |
| *Analysis Description* | SLOPE STABILITY ANALYSIS | | |
| *Drawn By* R.A.C. | *Scale* 1:500 | *Company* | |
| *Date* 3/15/2016, 2:52:33 PM | | *File Name* | JOB NO. 16-11019A01.slim |

Analysis on the slope located adjacent to the property under seismic conditions.

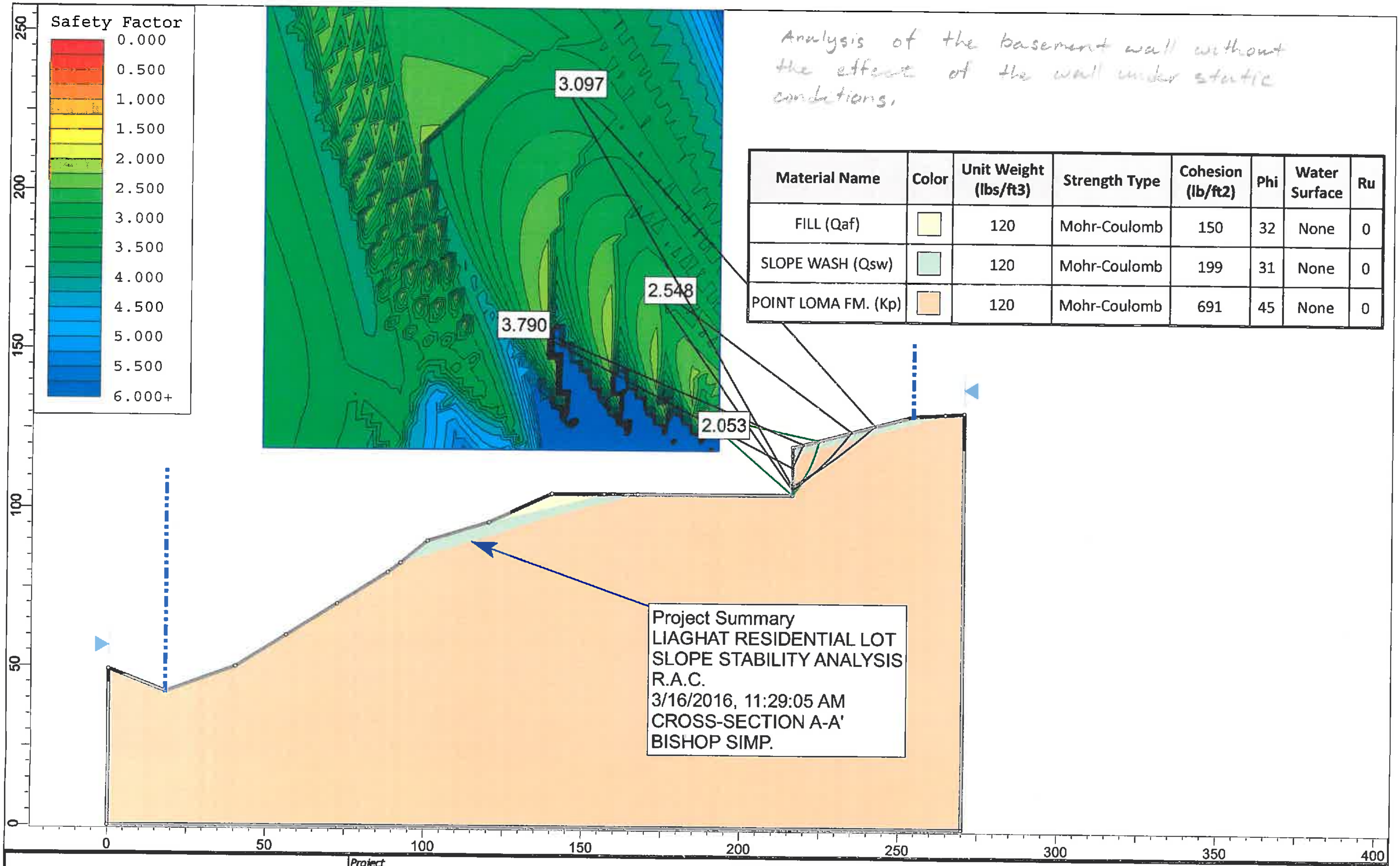


| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:25:43 PM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience
SLIDEINTERPRET 6.005

| | | | |
|---|---|---|---|
| Project | LIAGHAT RESIDENTIAL LOT | | |
| Analysis Description | SLOPE STABILITY ANALYSIS | | |
| Drawn By | R.A.C. | Scale | 1:500 |
| Company | | | |
| Date | 3/16/2016, 11:25:43 PM | File Name | JOB NO. 16-11019A01w_0.15gSHAKE.slim |



Analysis of the basement wall without the effect of the wall under static conditions.

| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

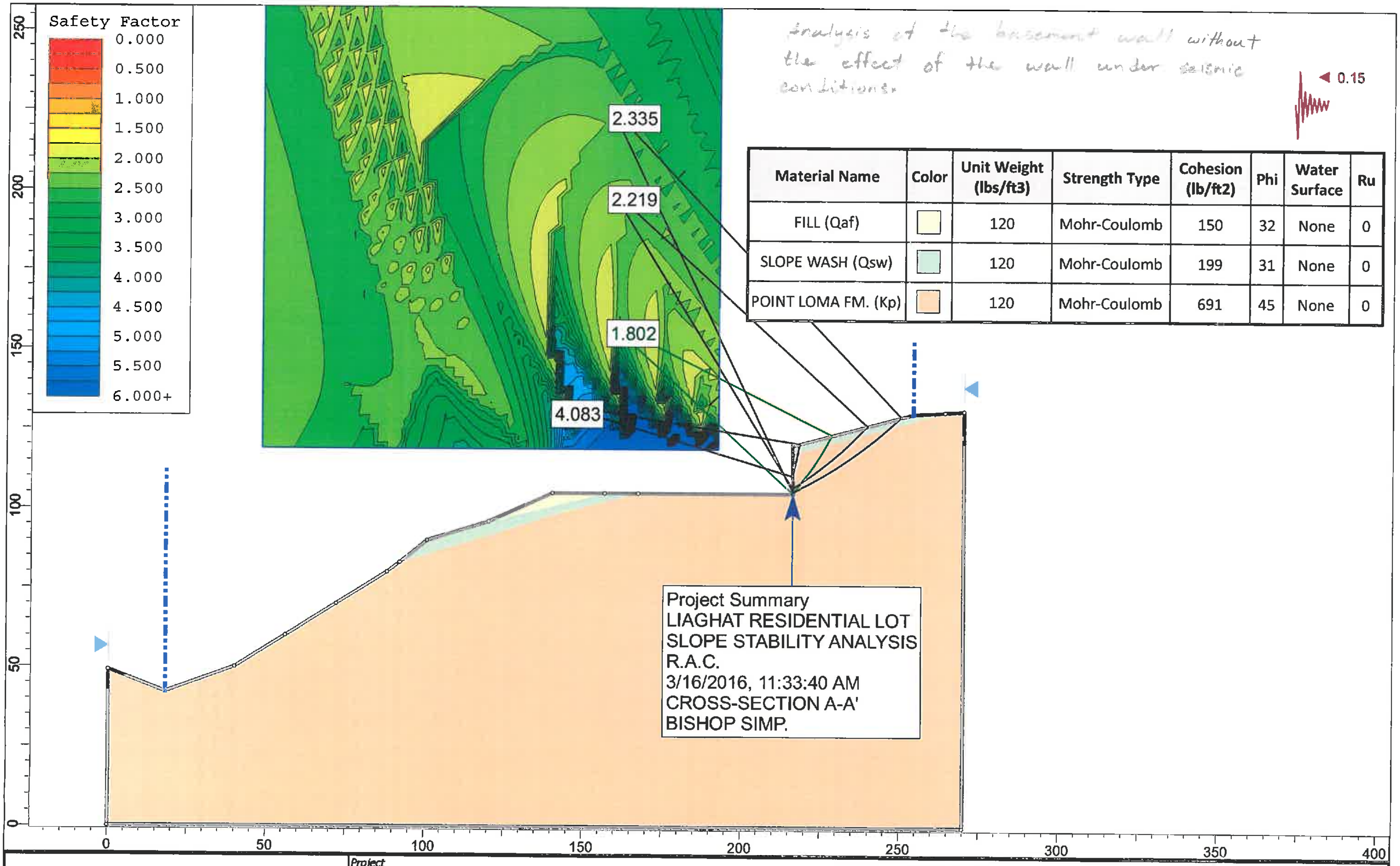
Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:29:05 AM
CROSS-SECTION A-A'
BISHOP SIMP.

| | | | |
|---|---|---|---|
| Project | LIAGHAT RESIDENTIAL LOT | | |
| Analysis Description | SLOPE STABILITY ANALYSIS | | |
| Drawn By | R.A.C. | Scale | 1:500 |
| Company | | | |
| Date | 3/16/2016, 11:29:05 AM | File Name | JOB NO. 16-11019A02.slim |

rocscience

SLIDEINTERPRET 6.005

Analysis of the basement wall without the effect of the wall under seismic conditions.



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

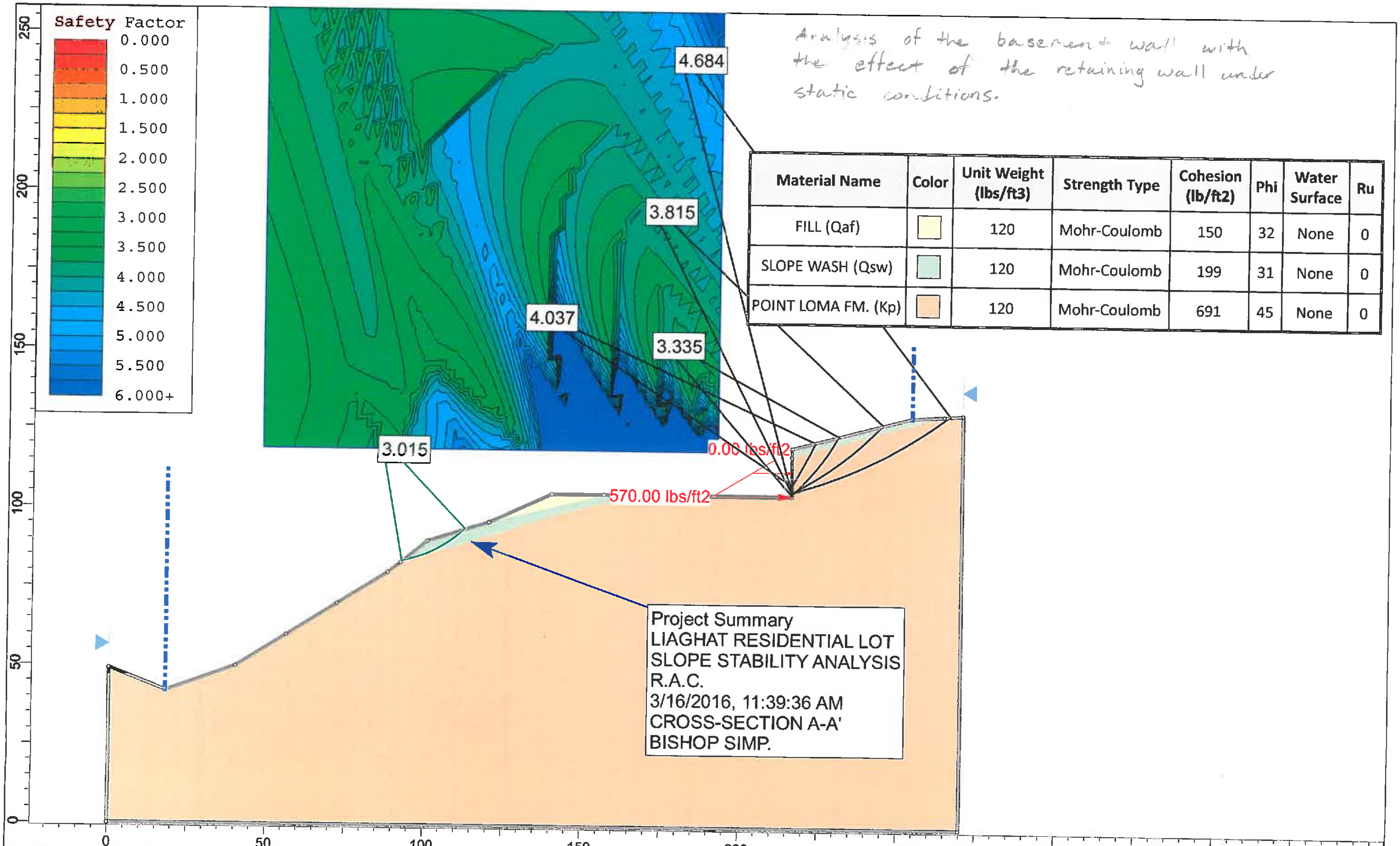
Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:33:40 AM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

SLIDEINTERPRET 6.005

| | | | |
|---|---|---|---|
| Project | LIAGHAT RESIDENTIAL LOT | | |
| Analysis Description | SLOPE STABILITY ANALYSIS | | |
| Drawn By | R.A.C. | Scale | 1:500 |
| Company | | | |
| Date | 3/16/2016, 11:33:40 AM | File Name | JOB NO. 16-11019A02w_0.15gSHAKE.slim |

Analysis of the basement wall with the effect of the retaining wall under static conditions.



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:39:36 AM
CROSS-SECTION A-A'
BISHOP SIMP.

rocscience

SLIDEINTERPRET 6.005

| | |
|---|---|
| Project | LIAGHAT RESIDENTIAL LOT |
| Analysis Description | SLOPE STABILITY ANALYSIS |
| Drawn By | R.A.C. |
| Scale | 1:500 |
| Company | |
| Date | 3/16/2016, 11:39:36 AM |
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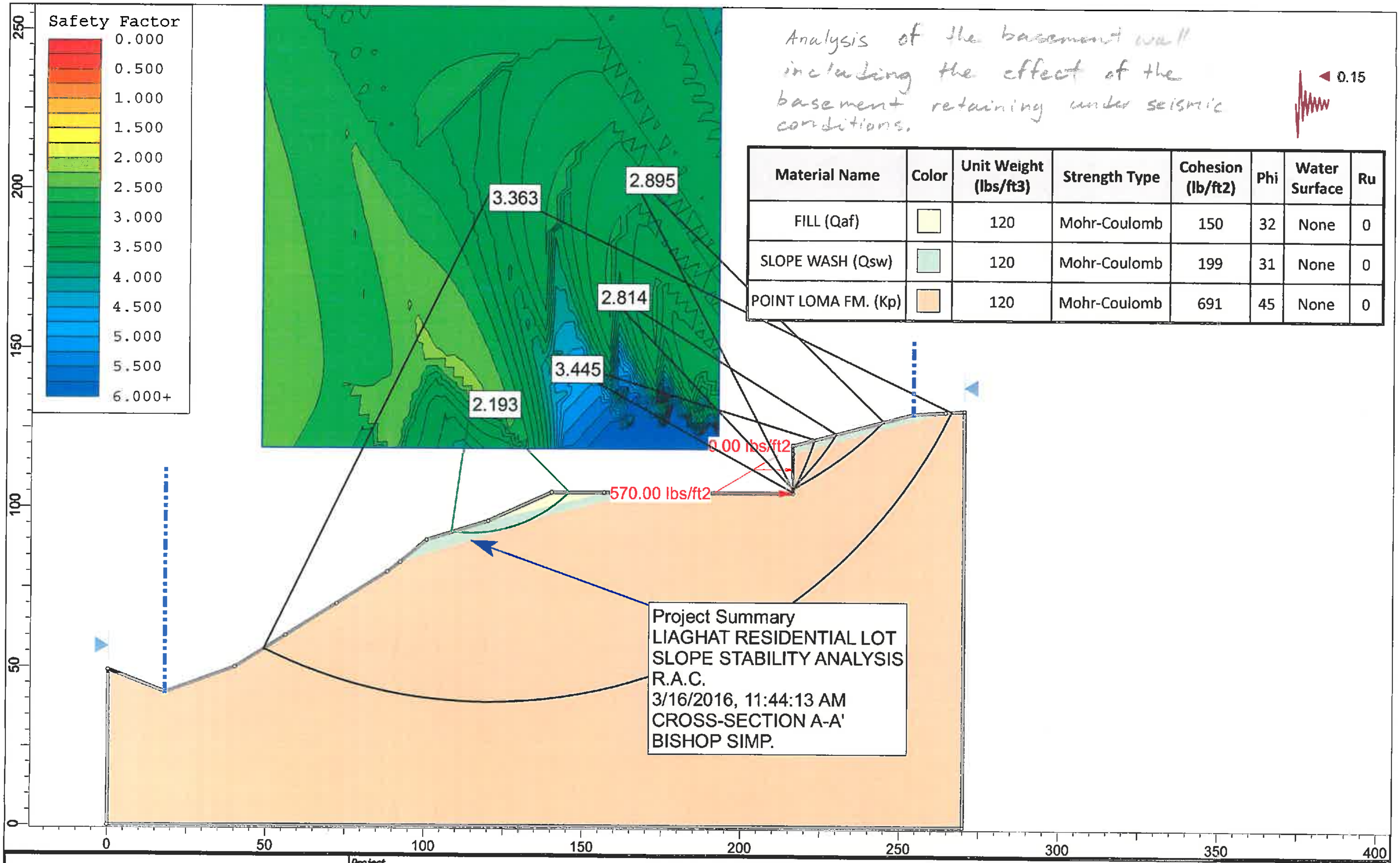


Analysis of the basement wall including the effect of the basement retaining under seismic conditions.

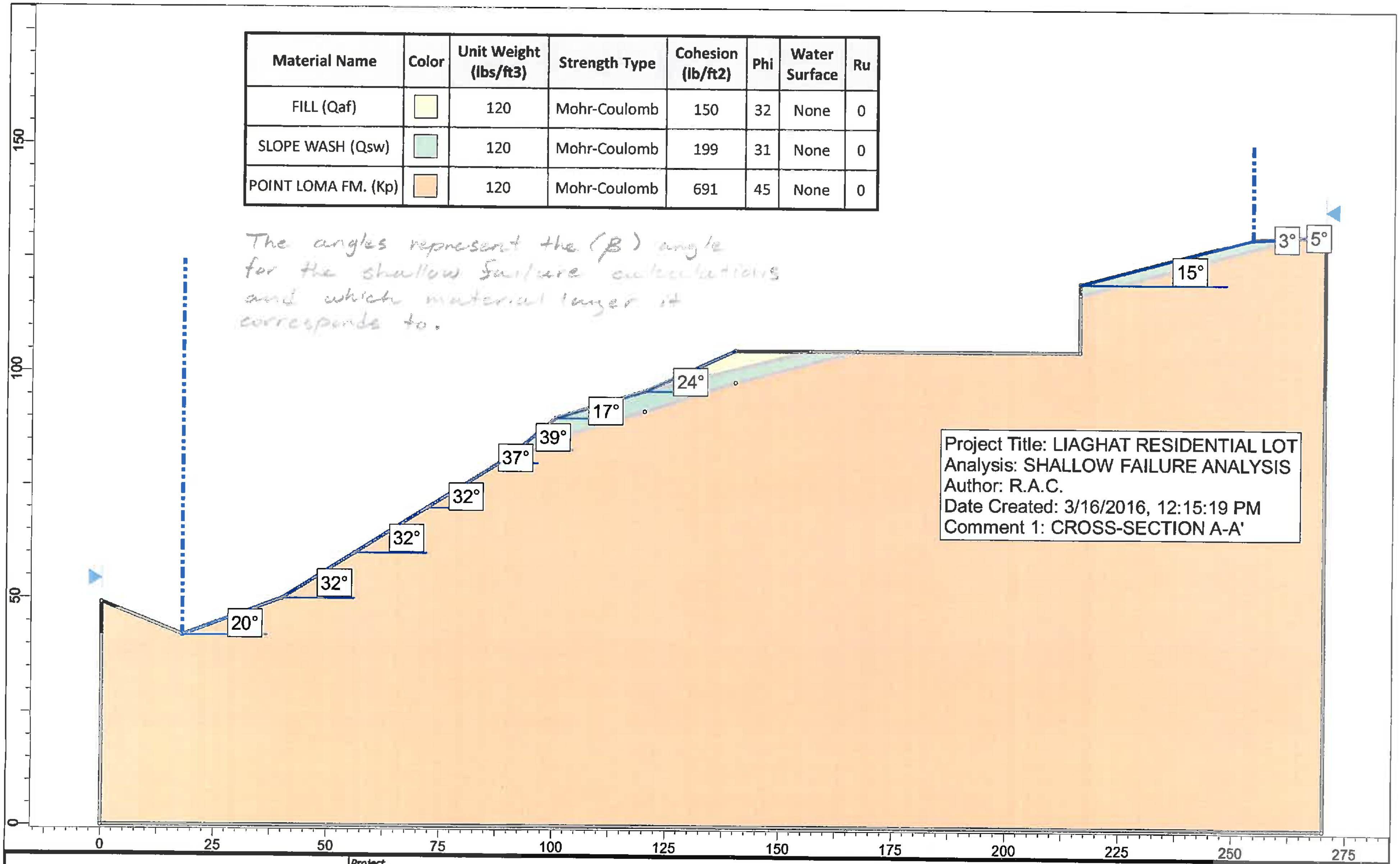
| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | 🟨 | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

Project Summary
LIAGHAT RESIDENTIAL LOT
SLOPE STABILITY ANALYSIS
R.A.C.
3/16/2016, 11:44:13 AM
CROSS-SECTION A-A'
BISHOP SIMP.

| | |
|---|---|
| Project | LIAGHAT RESIDENTIAL LOT |
| Analysis Description | SLOPE STABILITY ANALYSIS |
| Drawn By | R.A.C. |
| Scale | 1:500 |
| Company | |
| Date | 3/16/2016, 11:44:13 AM |
| File Name | JOB NO. 16-11019A03w_0.15gSHAKE.slim |

rocscience

SLIDEINTERPRET 6.005



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (lb/ft2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| FILL (Qaf) | ▢ | 120 | Mohr-Coulomb | 150 | 32 | None | 0 |
| SLOPE WASH (Qsw) | 🟩 | 120 | Mohr-Coulomb | 199 | 31 | None | 0 |
| POINT LOMA FM. (Kp) | 🟧 | 120 | Mohr-Coulomb | 691 | 45 | None | 0 |

The angles represent the (β) angle for the shallow failure calculations and which material layer it corresponds to.

Project Title: LIAGHAT RESIDENTIAL LOT
Analysis: SHALLOW FAILURE ANALYSIS
Author: R.A.C.
Date Created: 3/16/2016, 12:15:19 PM
Comment 1: CROSS-SECTION A-A'

rocscience

SLIDE 6.005

| | | | |
|---|---|---|---|
| Project | LIAGHAT RESIDENTIAL LOT | | |
| Analysis Description | SHALLOW FAILURE ANALYSIS | | |
| Drawn By | R.A.C. | Scale | 1:350 |
| Company | | | |
| Date | 3/16/2016, 12:15:19 PM | File Name | JOB NO. 16-11019A_SHALLOWFAILURE.slim |

## SHALLOW FAILURE

| $\gamma_{sat}$ | $\gamma_{water}$ | $\gamma'$ | H |
|---|---|---|---|
| pcf | pcf | pcf | ft |
| 130 | 62.4 | 67.6 | 3 |

**EQUATION 1**

$$F.S. = \left(\frac{C}{\gamma_{sat} \times H \times \cos^2(\beta)\tan(\beta)}\right) + \left(\frac{\gamma'}{\gamma_{sat}} * \frac{\tan(\varphi)}{\tan(\beta)}\right)$$

SHALLOW SLOPE STABILITY ANALYSIS IS BASED ON EQUATION (1) FOR THE CALCULATED VALUES.

**CROSS-SECTION A-A'**

| SOIL TYPE | C (psf) | ϕ(°) | β(°) | F.S. |
|---|---|---|---|---|
| Kp | 691 | 45 | 5 | 26.350 |
| Qsw | 199 | 31 | 3 | 15.725 |
| Qsw | 199 | 31 | 15 | 3.207 |
| Qaf | 150 | 32 | 24 | 1.765 |
| Qsw | 199 | 31 | 17 | 2.847 |
| Qsw | 199 | 31 | 39 | 1.429 |
| Kp | 691 | 45 | 37 | 4.376 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 32 | 4.775 |
| Kp | 691 | 45 | 20 | 6.942 |

**Geotechnical Exploration, Inc.**

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

14 June 2017

**Job No. 16-11019**

Mr. Hamid Liaghat
10525 Vista Sorrento Parkway, Suite 350
San Diego, CA 92121

Subject: **Addendum Geotechnical Report Response to City Reviewer**
Liaghat Residential Lot
West of 7550 Hillside Drive
La Jolla, California

Dear Mr. Liaghat:

In accordance with your request and as required by LDR-Geology Reviewer, we are replying to comments in a memo with a completion date of May 15, 2017 (Cycle 7). The LDR reviewer has reviewed our Preliminary Geotechnical Investigation report dated April 6, 2017, as well as a Conceptual Grading/Site Plan by Bejan Arfaa Architects dated April 14, 2017.

*Issue No. 4: Laboratory test data sheets for maximum density and shear strength are included in the referenced geotechnical report. Please provide the test data for all other laboratory tests performed for the project including ASTM D2216; ASTM D2937; sieve analysis and expansion potential (New Issue).*

**GEI Response**: The results of all other laboratory tests performed for the project are shown on the boring logs (refer to figure nos. IIIa-c).

*Issue No. 5: Revise the Plot Plan to include the bedding attitudes measured within the Point Loma Formation on the southerly descending hillside along the southern portion of the property (New Issue).*

**GEI Response**: We have revised the Plot Plan to include the bedding attitudes measured within the Point Loma Formation on the southerly descending hillside along the southern portion of the property.

*Issue No. 6: Indicate if the dip of the bedding attitude illustrated on Cross Section A-A' is the true dip or apparent dip. (New Issue).*

**GEI Response**: Bedding attitudes within the Point Loma Formation were observed on the southerly descending slope along the southern portion of the property and generally strike N30E and dip 25 degrees southeast. The bedding dips into the hillside and is considered to be favorable (refer to Appendix C, Slope Stability Analysis in our geotechnical report). The reported dip is the true apparent dip.

Issue No. 7: *One of the surficial stability analysis indicates a factor of safety of 1.429. Clarify if the site will have a factory of safety of 1.5 or greater with respect to surficial slope stability at the completion of the project (New Issue).*

**GEI Response**: It is our professional opinion that the site will have a factor of safety of 1.5 or greater with respect to surficial slope stability following completion of the project.

Issue No. 8: *The geotechnical report must also be signed by a State of California Licensed Professional Geologist or Certified Engineering Geologist (P.G. or C.E.G.) (New Issue).*

**GEI Response**: The geotechnical report was signed and stamped by our Professional Geologist/Certified Engineering Geologist on page 44.

Issue No. 9: *Submit original prints and digital copies (on CD/DVD/or USB data storage device) of the referenced and requested geotechnical reports for our records. (New Issue).*

**GEI Response**: We are providing a copy of our original report and this report as well as copies on CD.

If you have further questions regarding this letter, please contact our office. Reference to our **Job No. 16-11019** will help expedite a response to your inquiry.

Respectfully submitted,

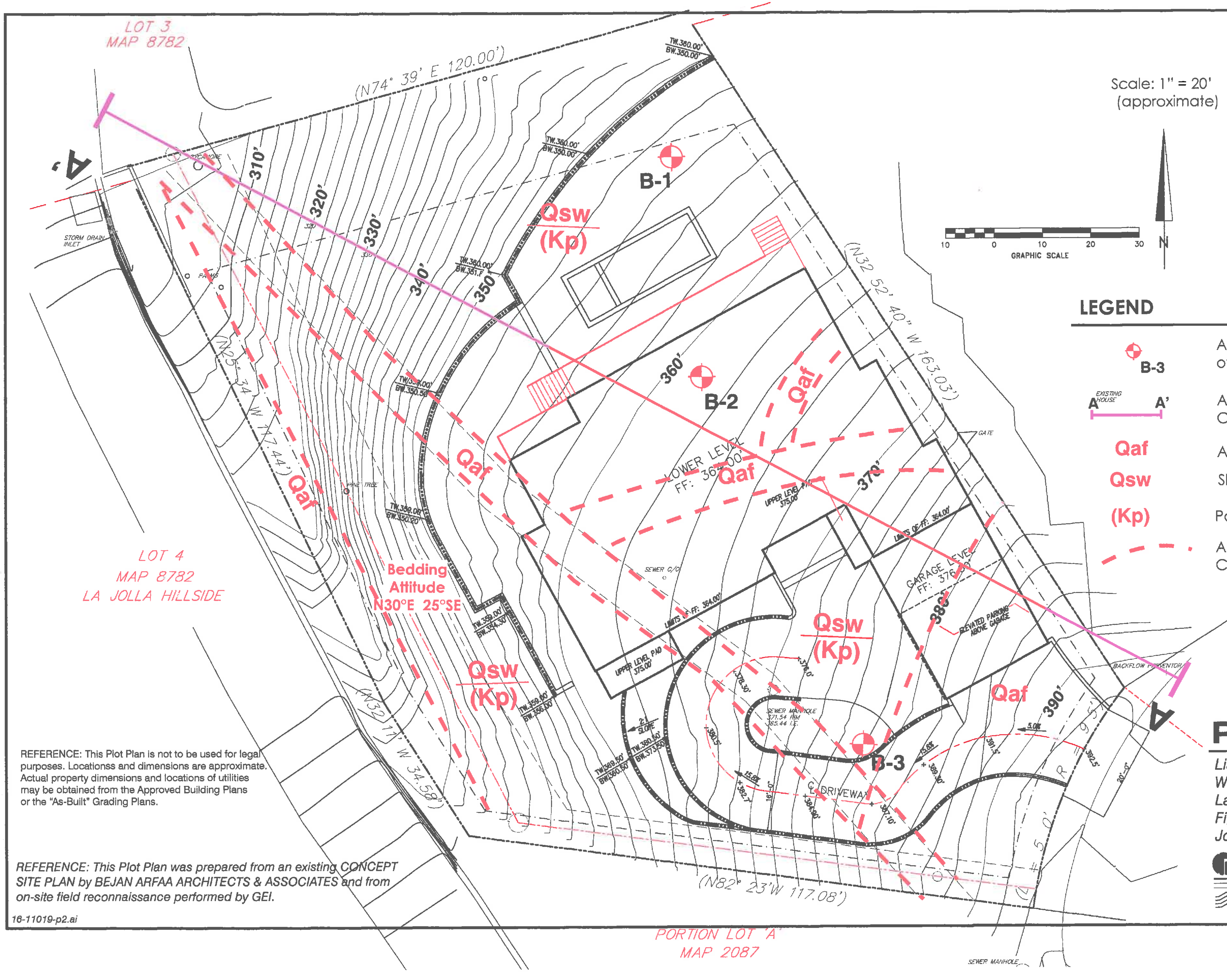
***GEOTECHNICAL EXPLORATION, INC.***

Jaime A. Cerros, P.E.
R.C.E. 34422/G.E. 2007
Senior Geotechnical Engineer

Jonathan A. Browning
C.E.G. 2615/P.G. 9012
Senior Project Geologist

REGISTERED PROFESSIONAL ENGINEER
JAIME A. CERROS
No. 002007
Exp 9/30/17
GEOTECHNICAL
STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST
JONATHAN A. BROWNING
No. 2615
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA



Scale: 1" = 20'
(approximate)

## LEGEND

| | |
|---|---|
| B-3 | Approximate Location of Exploratory Boring |
| A — A' (EXISTING HOUSE) | Approximate Line of Cross Section |
| Qaf | Artificial Fill |
| Qsw | Slopewash |
| (Kp) | Point Loma Formation |
| - - - | Approximate Geologic Contact |

# PLOT PLAN

*Liaghat Residential Lot*
*West of 7550 Hillside Drive*
*La Jolla, CA.*
*Figure No. II*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**
April 2016
(updated April 2017)

REFERENCE: This Plot Plan is not to be used for legal purposes. Locationss and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

*REFERENCE: This Plot Plan was prepared from an existing CONCEPT SITE PLAN by BEJAN ARFAA ARCHITECTS & ASSOCIATES and from on-site field reconnaissance performed by GEI.*

16-11019-p2.ai

**Geotechnical Exploration, Inc.**

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

06 April 2017
**Revised 11 December 2017**

Mr. Hamid Liaghat
10525 Vista Sorrento Parkway, Suite 350
San Diego, CA 92121

**Job No. 16-11019**

Subject: **Updated Opinion of Hillside Disturbance**
Proposed Liaghat Residential Development
West 7550 Hillside Drive
La Jolla, California

Dear Mr. Liaghat:

In accordance with your request, we herein provide an opinion regarding disturbance of the hillside property in the La Jolla area of the City of San Diego, California. As requested, representatives of ***Geotechnical Exploration, Inc.*** visited your property on January 6, 2017, to provide an evaluation of the north and west-facing slopes on the property. We previously prepared a "*Report of Preliminary Geotechnical Investigation*," dated March 24, 2016. At this time, we have been asked to comment on the level of pre-existing disturbance to the hillside property. We excavated approximately 34 pot holes between December 2 and 6, 2017 to confirm the amount of disturbed soil on the site.

## SOURCES OF INFORMATION

At the time of our recent site visits we observed potholes exposing disturbed soil in four specific areas, including, 1) at least a 40-feet-wide area over the existing sewer main that crosses the property from Hillside Drive to the northwest and 2) at least a 30-feet-wide area over the sewer lateral that crosses the middle of the property from east to west. 3) We also observed the physical conditions of disturbance along the majority of the southern slope consisting of old concrete and broken brick walls and fill soils that were placed at the time Hillside Drive was constructed. The disturbed soil was observed from the edge of Hillside Drive to the north side of the sewer lateral at approximately contour elevation 360 feet MSL and 4) the lower slope adjacent to the west property line where rip rap has been placed for drainage runoff on the adjacent properties. In addition, we reviewed USDA stereo-pair aerial photographs, dated April 1953 and City of San Diego topographic and orthophotographic maps dated January 1963 and April 1979.

## OBSERVATIONS AND FINDINGS

Site surface observations indicated that the upper portion of the site has been modified by the grading of Hillside Drive. The northwest descending slope is an approximately 10 to 15-feet-high, 1.5:1.0 (horizontal to vertical) fill slope which transitions into disturbed soil from the installation of the sewer lateral in the lower portion of the lot. We observed evidence of soil disturbance on the upper and lower portions of the slope consisting of 2 to 4 feet of fill soil and broken concrete/brick retaining walls down to approximately elevation 360 feet MSL. In addition, significant excavation and soil disturbance was observed in the area of the sewer main, sewer lateral and lower slope adjacent to the new driveway providing access to the adjacent residential lot. In our opinion, the western portion of the site was observed to be disturbed from the east site of the sewer main to the west property line. Also, the entire lower slope in the northwest corner of the site was observed to consist of fill soil and previously disturbed.

It appears that a major portion of the hillside lot was disturbed by excavation of significant temporary slopes that were placed during the trenching for installation of the sewer main and lateral. It is estimated that 71 percent of the lot has been disturbed by excavation or placement of fill soils to achieve the current grades.

Also, the existing sewer main was installed approximately 60 to 70 years ago. This indicates that this portion of the lot was disturbed at least that long ago. In addition, the debris from the broken concrete/brick walls extends down the hillside, well into the area of proposed new construction.

## OPINION

In our opinion, the Liaghat property in the area of the proposed new development displays evidence of significant disturbance by human activities dating back to at least 1950's.

## LIMITATIONS

The opinions contained in this report are solely professional opinions derived in accordance with current standards of professional practice in the community where the observations have been made.

The professional staff of ***Geotechnical Exploration, Inc.*** strive to perform their services in a proper and professional manner with care and competence, but are not infallible. We understand that there are risks of earth movement and property damage inherent in land development.

The standard of care is time-dependent. This report has been prepared in accordance with the duty of care of geotechnical consultants as of the date on this report. The work was performed for the sole use of our client. Others who seek to rely on the findings contained in this report have a duty to contact ***Geotechnical Exploration, Inc.*** for determination of the adequacy of this report for their time, location and intended use. Furthermore, the opinions of other consultants based on the same available information may vary from ours.

Thank you for this opportunity to be of service. Should you have any questions regarding this transmittal, you may contact the undersigned. Reference to our **Job No. 16-11019** will help to expedite a reply to your inquiries.

Respectfully submitted,

**GEOTECHNICAL EXPLORATION, INC.**

Jaime A. Cerros, P.E.
R.C.E. 34422/G.E. 2007
Senior Geotechnical Engineer

Jay K. Heiser
Senior Project Geologist

JAIME A CERROS
No. 002007
Exp 9/30/17

WHEN MEASURED OVER 15'–0", IT IS LESS THAN 25% SLOPE

THIS AREA IS ALSO DISTURBED HOWEVER, IT IS NOT CLEAR IF IT WAS DISTURBED BY MAIN SEWER PLACEMENT OR BY RIP RAP.

REFERENCE: This Plot Plan is not to be used for legal purposes. Locationss and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

## DEVELOPMENT & SITE SLOPE DIAGRAM

### LEGEND

| | |
|---|---|
| ━ | SEWER CENTERLINE |
| ▨ | AREAS WITH LESS THAN 25% SLOPE |
| 🟨<br>AREA: 11,786 SQ/FT | AREA IDENTIFIED TO BE DISTURBED BY SEWER MAIN AND SEWER LATERAL |
| 🟦<br>AREA: 2,674 SQ/FT | AREA IDENTIFIED TO BE DISTURBED BY CONSTRUCTION OF HILLSIDE DRIVE |
| 🟩<br>AREA: 1,568 SQ/FT | AREA IDENTIFIED TO BE DISTURBED BY PLACING OF RIP–RAP FOR NEIGHBORHOOD RUN–OFF DRAINAGE |

| | |
|---|---|
| TOTAL AREA OF PARCEL: | 22,396 SQ/FT |
| TOTAL DISTURBED AREA: | 16,028 SQ/FT |
| PERCENTAGE OF LOT DISTURBANCE: | 0.715% |

BASIS OF THIS DRAWING GEOTECHNICAL REPORT:
GEOTECHNICAL EXPLORATION INC
REPORT NO. 16-11019 DATED APRIL 6, 2017
JAMIE A CERROS R.C.E. 34422

# PLOT PLAN

*Liaghat Residential Lot*
*West of 7550 Hillside Drive*
*La Jolla, CA.*
*Figure No. I*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

DEVELOPMENT &
SLOPE DIAGRAM

11

BEJAN
ARFAA
ARCHITECTS
&
ASSOCIATES

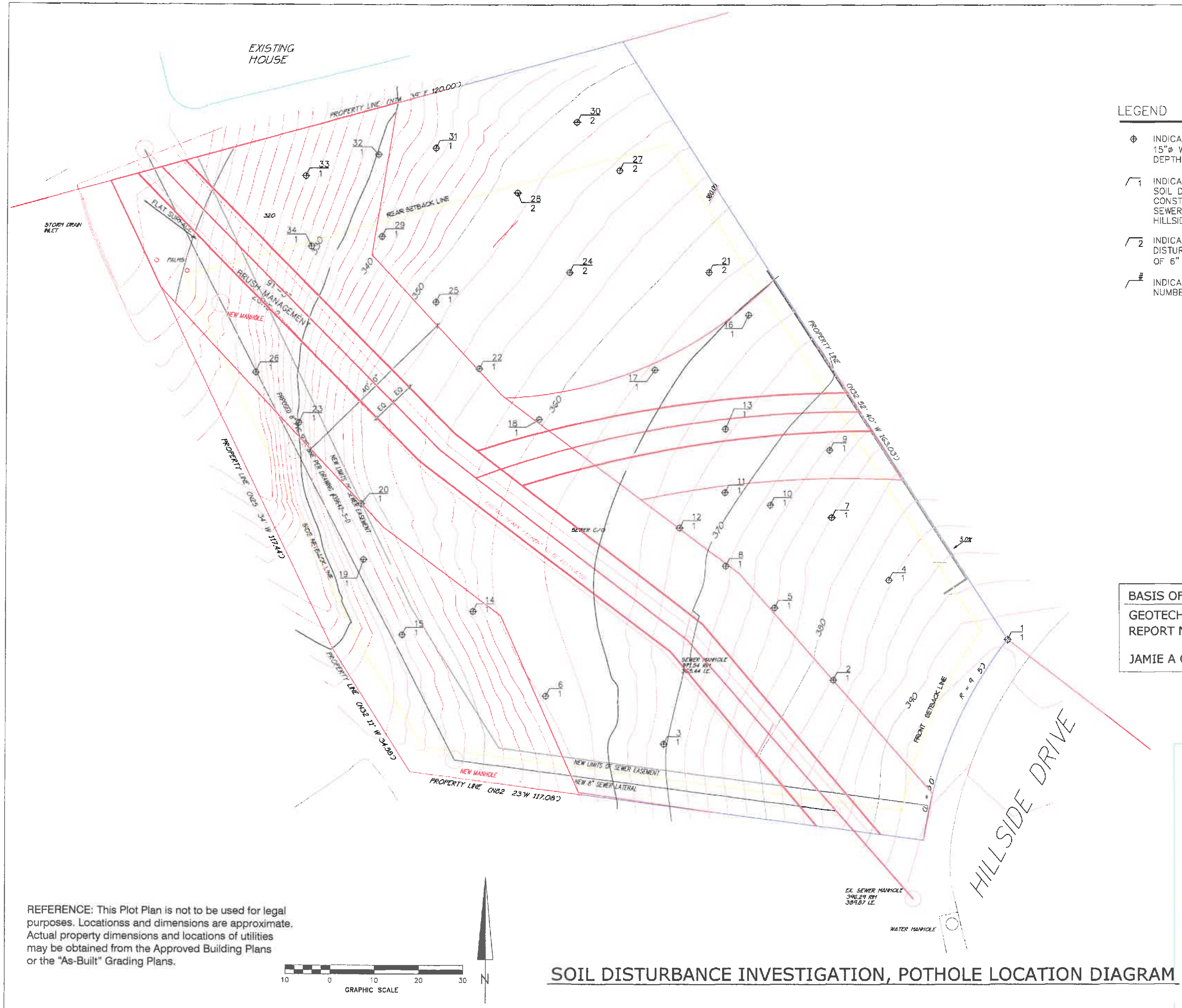
2900 Fourth Ave.
Suite 110
San Diego, CA
92103
PH.619 293-3118
FX.619 293-3419

LIAGHAT RESIDENCE
LA JOLLA, CA.
HILLSIDE DRIVE

No. 09996
REN. 12/17

REVISIONS

DATE
SCALE
FILE
DRAWING NO.
SL-1A



REFERENCE: This Plot Plan is not to be used for legal purposes. Locationss and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

SOIL DISTURBANCE INVESTIGATION, POTHOLE LOCATION DIAGRAM

16-11019-p4.ai

LEGEND

| | |
|---|---|
| ⊕ | INDICATES POTHOLE WITH 15"ø WITH MINIMUM 15" DEPTH |
| ╱‾1 | INDICATES MINIMUM OF 12" SOIL DISTURBANCE DUE TO CONSTRUCTION OF MAIN SEWER, LATERAL SEWER, HILLSIDE DRIVE OR RIP RAP |
| ╱‾2 | INDICATES QUESTIONABLE DISTURBANCE WITH MINIMUM OF 6" FILL |
| ╱‾# | INDICATES POTHOLE NUMBER |

BASIS OF THIS DRAWING GEOTECHNICAL REPORT:
GEOTECHNICAL EXPLORATION INC
REPORT NO. 16-11019 REVISED DATED DECEMBER 7, 2017
JAMIE A CERROS R.C.E. 34422

# PLOT PLAN

*Liaghat Residential Lot*
*West of 7550 Hillside Drive*
*La Jolla, CA.*
*Figure No. II*
*Job No. 16-11019*

**Geotechnical Exploration, Inc.**

DEVELOPMENT &
SLOPE DIAGRAM

11

BEJAN
ARFAA
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&
ASSOCIATES

2900 Fourth Ave.
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FX.619 293-3419

LIAGHAT RESIDENCE
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