Geotechnical Exploration, Inc.
SOIL AND FOUNDATION ENGINEERING • GROUNDWATER • ENGINEERING GEOLOGY

08 October 2019

Romero Ruoss Group
1299 Prospect Place
La Jolla, CA 92037
Attn: Mr. Klemens Ruoss

Job No. 12-10122

Subject: **Addendum to Geotechnical Report**
Proposed Romero Ruoss Residence
2382 Via Capri Court
La Jolla, California

Dear Mr. Ruoss:

As requested by Ms. Karina Urias, project architect with Arken Design Studio, and as required by the City of San Diego, BDR-Geology reviewer, we herein address comments presented in Cycle 7 BDR-Geology Review with completion date September 25, 2019.

The city reviewer (Issue No. 1) indicates that the following documents have been reviewed: "Update of Foundation Design Recommendations," by Geotechnical Exploration Inc., dated July 12, 2018; Building Plans for Capri Residence, 2382 Via Capri Court, La Jolla, California, prepared by Arkin Design Studio, dated September 12, 2019; Civil Plans by Coffey Engineering, Inc., dated April 19, 2019; and Structural Plans prepared by Delta Engineering, dated August 24, 2019.

Issue No. 2: "Submit an original quality color copy of the Report of Preliminary Geotechnical Investigation, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration Inc., dated April 28, 2012 (their project no. 12-10122) with the next resubmittal." (New Issue)

GEI Response: As requested, we are including an original quality copy of the April 28, 2012, report.

Issue No. 3: "Submit an original color copy of the Cycle Issues Responses to City of San Diego, LDR-Geology Review, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc. dated April 26, 2012, with the next re-submittal." (New Issue)

GEI Response: We are including an original color copy of our responses to the city reviewer dated April 26, 2012.

Issue No. 4: "Submit an original quality copy of the Addendum Geotechnical Report, Lambert Residence, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc. dated July 11, 2019 (their project No. 12-10122, with the next re-submittal." (New Issue)

GEI-Response: We are including an original quality copy of our "Addendum Geotechnical Report, Lambert Residence, 2382 Via Capri Court, La Jolla, California", dated July 11, 2019.

Issue No. 5: "Submit an original quality color copy of the Response to City of San Diego LDR-Geology Cycle Issues, Lambert Residence Remodel and Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc. dated April 13, 2015 (their project No. 12-10122), with their next re-submittal." (New Issue)

GEI-Response: We are including an original quality copy of the Response to City of San Diego LDR-Geology Cycle Issues, Lambert Residence Remodel and Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc., dated April 13, 2015.

Issue No. 6: "Submit a digital copy (on CD or USB data storage device) of all geotechnical documents submitted for reviewer with the next resubmittal."

GEI Response: We are including a digital copy on CD of all geotechnical documents submitted for review referred to in previous paragraphs and in this addendum report.

Issue No. 7: "Submit a conformed copy of the Notice of Geologic and Geotechnical Conditions Recorded June 6, 2013 in the Office of the County Recorder, San Diego County Document Number 2013-03669388 with the next re-submittal." (New Issue)

GEI Response: We are including a conformed copy of the Notice of Geologic and Geotechnical Conditions Recorded June 6, 2013, in the Office of the County Recorder, San Diego County Document Number 2013-03669388.

Issue No. 8: "The design professional should clearly identify and label the discharge points for the basement and/or retaining wall subdrains on the plans. Subdrains may outlet at grade through a headwall or outfall to a storm drain structure but hey must be independent from the surface drainage system." (New Issue)

GEI Response*:* We understand that the design professional involved with drainage issues will address the discharge points of subdrains for basement walls and site retaining walls.

Issue No .9: "If a subdrain discharges at grade, a detail for a subdrain pipe headwall must be shown on the plans." (New Issue)

GEI Response: We understand that the design professional involved with drainage issues will address the subdrain pipe headwall as warranted.

Issue No. 10: "The structural engineer should add the required special inspection and test of cast in place deep foundation elements for the proposed caissons to the plans as per the 2016 CBC, Section 1705.8." (New Issue)

GEI Response: We understand that the structural engineer will add the required special inspection and test of cast in place deep foundation elements for the proposed caissons to the plans as per the 2016 CBC, Section 1705.8.

Issue No. 11: "Additional comments may be necessary pending submittal and review of the requested documents." (New Issue)

GEI Response: We understand.

We recommend that the construction manager for the project provide a copy of the updated geotechnical investigation report and this letter to the general contractor and the pertinent subcontractors involved with the soil and foundations on the project.

The findings and opinions presented herein have been made in accordance with current generally accepted principles and practice in the field of geotechnical engineering in the City of San Diego. No warranty, either expressed or implied, is made.

This opportunity to be of service is sincerely appreciated. Should you have any questions regarding this matter, please contact the undersigned. Reference to our **Job No. 12-10122** will help to 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

Leslie D. Reed, President
C.E.G. 999/P.G. 3391

cc: Karina Urias, Arken Design Studio

ISSUE

Num

2

REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

Lambert Residence Additions
2382 Via Capri Court
La Jolla, California

JOB NO. 12-10122
26 April 2012

Prepared for:

Mr. Bob Lambert

Geotechnical Exploration, Inc.

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

26 April 2012

Mr. Bob Lambert
4135 Porte de Palmas
San Diego, CA 92122

Job No. 12-10122

Subject: **Report of Preliminary Geotechnical Investigation**
Lambert Residence Additions
2382 Via Capri Court
La Jolla, California

Dear Mr. Lambert:

In accordance with your request, and our proposal of January 23, 2012, ***Geotechnical Exploration, Inc.*** has performed a preliminary geotechnical investigation for the proposed addition areas at the subject site. The field work was performed on February 17, 2012.

If the conclusions and recommendations presented in this report are incorporated into the design and construction of the proposed residential additions 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. 12-10122** 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

Leslie D. Reed, President
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REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION
Lambert Residence Additions
2382 Via Capri Court
La Jolla, California

Job No. 12-10122

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

I. PROJECT SUMMARY

It is our understanding that it is proposed to remodel the existing single-story, single-family residence. The remodel will include lateral additions on the northeast and southwest sides of the existing residential structure and a new two-car garage on the south side of the residence. The additions will be of conventional wood framing construction with concrete foundations and raised wood floors. The garage addition will be constructed with a perimeter foundation and slab-on-grade floor.

In addition, it is our understanding that the existing residence previously displayed approximately 5 inches of settlement, prior to releveling, which corresponds to the underlying northerly thickening fill soils. Recommendations have been provided for underpinning the existing north perimeter footings when the new additions are constructed.

With the above in mind, the Scope of Work is briefly outlined as follows:

1. Identify and classify the surface and subsurface soils in the area of the proposed construction, in conformance with the Unified Soil Classification System.

2. Make note of any landslides, faults or significant geologic features that may affect the development of the site.

3. Recommend site soil preparation procedures.

4. Recommend the allowable bearing capacities for the on-site formational and existing fill soils and new properly compacted fills.

5. Evaluate the settlement potential of the bearing soils under the proposed structural loads.

6. Recommend preliminary foundation design information, including active and passive earth pressures to be utilized in design of foundation structures.

Our field investigation revealed that the site is underlain by very stiff silty clay of the Cretaceous-age Point Loma Formation (Kp) overlain with approximately 2 to 18 feet of clayey fill soil. The fill soils are of variable density and thicken in a northerly to northeasterly direction. Although the fill soils below 4 feet in depth have relatively good density, the fill soils in the upper 2 to 4 feet will not provide a stable soil base for the proposed new additions and associated improvements.

As such, it is recommended that new foundations for the proposed additions be founded into the underlying stiff to very stiff fill soils below a depth of 4 feet utilizing a deepened footing foundation system. The existing north perimeter foundations can be underpinned with relatively short piers when the new additions are constructed. Minor re-grading is recommended at the new garage location with new conventional footings placed into shallow formational soils at the proposed garage location.

A preliminary review of the City of San Diego Seismic Safety Maps indicates that the site is located within a moderate-risk geologic hazard zone designated as Category 22 and partially in Zones 11 and 12. As such, the City of San Diego recommends that a geologic investigation be performed in addition to the required soils investigation. Once development plans are finalized, the City may require a large-diameter boring to evaluate the potential landslide conditions (Category 22). In addition, a geologic fault trench may be required in the northern portion of the site to evaluate potential faulting per the City of San Diego Seismic Safety Map requirements (Zones 11 and 12). As part of this report, we have included preliminary foundation and seismic values for the structural designer.

II. SITE DESCRIPTION

The approximately 12,000-square-foot site is more particularly referred to as Assessor's Parcel No. 351-331-13-00, Lot 74, according to Recorded Map 3926, 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 existing single-story, single-family residence and attached, lower-level two-car garage are located on a relatively level building pad and are of wood frame and stucco construction with raised wood floors. The garage is founded on a slab-on-grade with retaining walls and a continuous perimeter footing. Access to the property is provided by a concrete driveway from the Via Capri Court cul-de-sac on the southwest side of the lot. Vegetation includes ornamental landscaping including decorative shrubs, mature trees and lawn grass.

The property is located on the northeast side of the Via Capri Court cul-de-sac and is bounded to the north (northeast) by 1.5:1.0, horizontal to vertical, descending fill slopes ranging from approximately 15 to 20 feet in height. It is located on the south (southwest) by a short ascending slope to the Via Capri Court cul-de-sac; on the east (southeast) by Via Capri; and on the west (northwest) by a similar residential property.

The site consists of a relatively level building pad at an approximate elevation of 430 feet above Mean Sea Level (AMSL). Elevations across the property range from approximately 430 feet AMSL along the southern perimeter of the property adjacent to Via Capri Court, down to 410 feet AMSL along the north property line. Information concerning approximate elevations across the site was obtained from City and County Topographic Maps prepared (dated 1967 and 1978).

III. FIELD INVESTIGATION

Three exploratory borings were placed on the site, specifically in areas where the new residential structure additions and improvements are to be located (for exploratory boring locations, see Figure No. II). The borings were excavated to depths ranging from less than 3 feet to approximately 23.25 feet in order to obtain representative soil samples and to define the soil profile across the lot.

The soils encountered in the exploratory borings were observed and logged by our field representative and samples were taken of the predominant soils. Excavation logs have been prepared on the basis of our observations and laboratory testing. The results have been summarized on Figure Nos. III and IV. The soils encountered in the excavations have been classified in general conformance with the Unified Soil Classification System (refer to Appendix A).

B. Slope Observations

The stability of the existing north- to northeasterly-descending slope should not be affected by the planned residential additions. Evaluation of the slope stability is not part of this geotechnical investigation. The existing fill slope is approximately 1.5:1.0. Concrete block retaining structures on the slope face have been pushed and rotated out-of-slope by the large mature trees they contain.

IV. FIELD AND LABORATORY TESTS AND SOIL INFORMATION

A. Field Tests

Relatively undisturbed samples were obtained by driving a 3-inch outside-diameter (O.D.) by 2-3/8-inch inside-diameter (I.D.) split-tube sampler a distance of 12 inches. Standard Penetration Tests were also performed by using a 140-pound weight falling 30 inches to drive a 2-inch O.D. by 1-3/8-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 sampler. Blow counts are provided on Figure Nos. IIIa-c.

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

Soil	***Density Designation***	***2-inch O.D. Sampler Blows/Foot***	***3-inch O.D. Sampler Blows/Foot***
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

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 residential structure additions and improvements. Test results are presented on Figure Nos. III and IV. The following tests were conducted on representative soil samples:

1. *Standard Practice for Soil Investigation and Sampling by Auger Borings (ASTM D1452-09), Test Method for Penetration Test and Split-barrel Sampling of Soils (ASTM D1586-08) and Standard Practice for Ring-lined Barrel Sampling of Soils (ASTM D3550-07)*
2. *Moisture Content (ASTM D2216-10)*
3. *Density Measurements (ASTM D2937-07)*
4. *Laboratory Compaction Characteristics (ASTM D1557-09)*
5. *Determination of Percentage of Particles Smaller than #200 Sieve (ASTM D1140-06)*
6. *Expansion Test (ASTM D4829-07)*

Moisture content and density measurements were performed to establish the in situ moisture and density of samples retrieved from the exploratory borings. The dry soil weight was compared to the laboratory maximum dry density of the same soil to determine relative compaction.

Laboratory compaction values 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 gives qualitative information regarding soil compaction conditions to be anticipated during any future grading operation. In addition, this relation helps to establish the relative compaction of existing fill soils.

The –200 sieve size analysis and the particle size analysis help 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 fill soils on the site have a medium expansion potential, with a maximum measured expansion index of 62. Based on our experience with similar soils, it is our opinion that the on-site formational soils also possess a medium expansion potential.

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.

V. 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).

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 sideways horizontal motion to the northwest, consistent with slip 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.

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).

VI. 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 update 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 formational materials of the Cretaceous-age Point Loma Formation (Kp). The formational soils are overlain by approximately 2 to 18 feet of fill soil on the building pad (refer to the boring logs, Figure Nos. IIIa-c). Figure No. V presents a plan view geologic map (Kennedy and Tan, 2005) of the general area of the site and Figure No. VI displays the geologic hazards of the area.

Fill Soils (Qaf)/ Slopewash (Qsw): The lot is overlain by fill soils ranging from less than 3 feet to approximately 18 feet in depth. The fill soils were encountered at all boring locations and thicken in a northerly to northeasterly direction. They consist of gray-brown, silty and sandy clay and clayey sand with some gravel, cobble and formational fragments. The fill soils are underlain by 6 inches of dark gray brown silty clay slopewash soils with an organic odor at the location of exploratory boring B-2. The encountered fill soils and slopewash were generally in a moist and firm to stiff condition (the upper 2 to 4 feet of fill were soft to firm) and are considered to have a medium expansion potential. Refer to Figure Nos. III and IV for details.

Point Loma Formation (Kp): The lot is underlain at depth by stiff to very stiff, silty clay of the Point Loma Formation. The formational materials are typically tan- to gray-brown, with some sandy lenses. The formational soils are of medium expansion potential and have good bearing strength characteristics. The formational soils were encountered in all of the exploratory borings. Refer to Figure Nos. III and IV for details.

B. Structure

Based on our investigation and review of available geologic maps no adverse geologic conditions are expected in the building pad area. Mapping by Kennedy and Tan, 2005 (Geologic Map of San Diego 30' x 60' Quadrangle, California), indicates the encountered Point Loma Formation as landslide deposits. However, based on a review of the City of San Diego Seismic Safety Study Maps, the site is located on a possible ancient landslide within a moderate-risk geologic hazard area designated as "Zone 22." The site is also located adjacent to a high-risk hazard area designated as "Zone 21," which indicates a "*confirmed, known or highly suspected*" ancient landslide nearby the subject property.

A 30-inch-diameter boring was placed on a property by our firm approximately 500 feet southeast of the site to investigate possible ancient landslide activity at that property. Within the exploratory boring, we encountered massive sandstone and siltstone materials of the Cabrillo Formation. This material consisted of interbedded silts and sands described as tan-gray, silty fine sand and light-gray and orange-brown, silty sand/sandy silt. A ¼-inch-thick remolded clay seam with slickensides was encountered at a depth of 76 to 78 feet. The strike of the remolded clay seam was N75°E, dipping 40°N. Below 78 feet, the material was dense and appeared

undisturbed. The attitudes of the bedding commonly strike N45°W to N65°W and dip 20°N to 25°N. No significant moisture or seeps were observed. The material at that location consists of very dense, massive silty sandstones with no noted open fracturing within the Cabrillo Formation. The boring was terminated at 86 feet due to practical drilling refusal on dense, well-cemented sandstone.

All observed features within that exploratory boring are considered related to ancient movement that occurred in association with the uplift of Mt. Soledad and nearby faulting, and suggest no recent activity has occurred at the site.

VII. GEOLOGIC HAZARDS

A review of the City of San Diego Seismic Safety Study -- Geologic Hazards Map No. 29 (see Figure No. VI for an excerpted portion of the Geologic Hazards Map and Legend) indicates that the site is located in a moderate-risk geologic hazard zone identified as a "possible or conjectured" landslide area and designated as Category 22. In addition the Seismic Safety Maps indicate that the site is partially located within Zones 11 and 12, designated as "active" or "potentially active" fault zones. As noted previously, the City of San Diego reviewer may require a large-diameter boring to evaluate the potential landslide conditions (Category 22). In addition, a geologic fault trench may be required in the northern portion of the site to evaluate potential faulting per the City of San Diego Seismic Safety Map requirements (Zones 11 and 12).

The following is a discussion of the geologic conditions and hazards common to the northern 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 for the area (Kennedy and Tan, 2005) and the City of San Diego Seismic Safety Study – Geologic Hazards Map Sheet No. 29 indicates that the Mount Soledad Fault is mapped crossing the extreme northeast portion of the site at the toe of the existing slope (see Figure No. VI). The City of San Diego and State of California Fault buffer zones (Zones 11 and 12) cross the entire site and the northeastern portion of the site respectively, but it is our opinion that a known active fault does not exist on the property.

Rose Canyon Fault: The Rose Canyon Fault Zone is mapped less than 1 mile northeast of the subject site. The 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 12.7 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.

Elsinore Fault: The Elsinore Fault is located approximately 37 to 55 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 60 to 81 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, 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. The anticipated ground accelerations from earthquakes on faults within 100 miles of the site are provided in Appendix B. A record of historical earthquakes within a 100-mile radius of the site is provided here as Appendix C. The Modified Mercalli Index is presented as Appendix D.

Landslides: Based upon our geotechnical investigation, review of the geologic map (Kennedy and Tan, 2005), 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), there are no confirmed ancient landslides located on the site. No features observed in our large-diameter boring on the residential property to the southeast suggest landslide activity at the site. The existing structural features are considered related to movement and upward flexure of the bedding that occurred in association with the uplift of Mt. Soledad and nearby faulting.

Since no clear evidence of recent or historic landsliding or deep-seated slope instability was found on the residential site to the southeast, the risk of deep-seated landsliding is considered low. An evaluation of the possible ancient landslide mass adjacent to the site is beyond the scope of this investigation.

Slope Stability: Based on our experience and observation, as well as knowledge of the formational soils in this area, it is our opinion that the existing slope (maximum gradient of 1.5:1.0) has a factor of safety greater than 1.5 against mass or surficial instability. No indication of slope instability was apparent during our slope reconnaissance observations. (Refer to Appendix F for Slope Stability Calculations.)

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: 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). The risk of a tsunami affecting the site is considered very low as the site is situated at an

elevation greater than 400 feet above mean sea level and is not in close proximity to an exposed beach.

Summary: It is our opinion, based upon a review of the available maps and our site investigation, that the site is underlain by relatively stable formational materials, and is suited for the proposed residential structure additions 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. 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. No significant geologic hazards are known to exist on or near the site that would prevent the proposed construction.

VIII. GROUNDWATER

Groundwater was not encountered during the course of our field investigation. We do not anticipate any significant groundwater problems to develop in the future if the property is developed as proposed and proper drainage is implemented and maintained.

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.

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.

X. 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.

Our geotechnical investigation revealed that the proposed addition areas of the site are underlain by very stiff formational materials. Sandy clay/clayey sand fill soils extend from less than 3 feet to approximately 18 feet. In their present condition, the upper 2 to 4 feet of fill soils will not provide a stable base for structure additions and improvements. As such, it is recommended that new foundations utilize deepened footings founded into good-bearing fill or formational soils. The existing north perimeter foundation may also require new deepened footings. The fill soils at the proposed garage addition are shallow therefore, we recommend that these soils be removed and recompacted as part of site preparation prior to the addition of any new fill or structural improvements. The deeper fill soils and formational materials have good bearing strength characteristics and are suitable for support of the proposed structural loads.

Foundation excavations and any areas to receive concrete improvements should be evaluated by our field representative prior to placement of forms, steel placement and concrete placement.

In our opinion, the site is suited for the proposed residential development 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.

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 Data Bases:* An estimation of the peak ground acceleration and the repeatable high ground acceleration (RHGA) likely to occur at the project site based on the known significant local and regional faults within 100 miles of the site is included as Appendix B. In addition, a listing of the known historic seismic events that have occurred within 100 miles of the site at an M5.0 or greater since the year 1800, and the probability of exceeding the experienced ground accelerations in the future based upon the historical record, is provided in Appendix C. Both Appendix B and Appendix C are tables generated from computer programs EQFault and EQSearch by Thomas F. Blake (2000) utilizing a digitized file of late-Quaternary California faults (EQFault) and a file listing of recorded earthquakes (EQSearch). Estimations of site intensity are also provided in these listings as Modified Mercalli Index values. The Modified Mercalli Intensity Index is provided as Appendix D.

2. *Seismic Design Criteria:* The proposed structure 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 32.8456 degrees and longitude of 117.2533 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 E.

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}
1.706	0.68	1.0	1.3	1.706	0.884	1.137	0.589

B. Preparation of Soils for Proposed New Garage Area

3. *Clearing and Stripping:* Vegetation and improvements should be removed prior to the preparation of the building pad for the new garage addition and other areas to receive 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.

4. *Treatment of Existing Fill Soils:* In order to provide suitable foundation support for the proposed garage addition and other associated improvements, we recommend that the existing fill soils be removed and recompacted. The anticipated depth of fill removal is approximately 2 feet.

Existing fill soils should be removed to a depth where stiff fill soils or formational soils are exposed. The recompaction work should consist of (a) removing the fill soils down to stiff fill or formational materials; (b) scarifying, moisture conditioning, and compacting the exposed subgrade soils; and (c) replacing the excavated fill material as compacted structural fill.

The areal extent and depth required to remove the surficial fills should be determined by our representatives during the excavation work based on their examination of the soils being exposed. Recompaction should be at least 5 feet beyond the edge of the perimeter foundations (and not less than the depth to stiff soils) and any areas to receive exterior improvements unless the foundation consists of grade beams spanning between deepened piers. Any unsuitable materials (such as oversize rubble or rocks, and/or organic matter) should be selectively removed as directed by our representative and disposed of off-site.

Any rigid improvements founded on the existing loose or soft surface soils can be expected to undergo movement and possible damage. ***Geotechnical Exploration, Inc.*** takes no responsibility for the performance of any improvements built on loose natural soils or inadequately compacted fills. Subgrade soils in any exterior area receiving concrete improvements should be verified for compaction and moisture within 48 hours prior to concrete placement.

5. *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.

6. *Expansive Soil Conditions:* Should medium or highly expansive clay soils be encountered during grading and used as fill, they should be moisture conditioned to at least 5 percent above Optimum Moisture content, and compacted to 88 to 92 percent based upon ASTM D1557-09. Soils of medium or greater expansion potential should not be used as retaining wall backfill soils. Our expansion index test indicates that tested on-site soils are medium expansive.

7. *Material for Fill:* Existing on-site soils with an organic content of less than 3 percent by volume are, in general, suitable for use as fill. Any required imported fill material should be a low-expansion potential (Expansion Index of 50 or less per ASTM D4829-07). 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.

8. *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 D1557-09. 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 water 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.

9. *Trench and Retaining Wall Backfill:* All backfill soils placed in utility trenches or behind retaining walls should be compacted to at least 90 percent of Maximum Dry Density. 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 walls and/or crawl space retaining walls (not currently planned) should be installed as early as the retaining walls are capable of supporting lateral loads. Backfill material to be placed behind retaining walls should be low-expansive (EI less than 50) and with particles no larger than 3 inches in diameter.

C. Design Parameters for Proposed Foundations

In order to support the proposed new improvements on conventional continuous concrete foundations the following recommendations should be followed. Deepened footings extending into well compacted fill soils at an approximate depth of 4 feet

will be required for the additions. Deeper footings or piers may be required for the outer pier foundations of the deck. The footings for the new garage addition and other living area additions should extend into formational soils or properly compacted fill soils to a depth of 18 inches.

10. *Deepened Footings:* The deepened footings for the proposed additions should be founded at least 48 inches below the lowest adjacent finished grade and should have a minimum width of 18 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.

    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.

11. *Shallow Footings:* We recommend that the proposed garage addition be supported on conventional, continuous footing foundations bearing on undisturbed formational materials. The garage addition footings should be founded at least 18 inches below the lowest adjacent finished grade.

    If the proposed footings are located closer than 8 feet inside the top or face of slopes, they should be deepened to at least 1½ feet below a line beginning at a point 8 feet horizontally inside the slopes and projected outward and downward, parallel to the face of the slope and at least 1½ feet into firm soils (see Figure No. VII). 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.

12. *Bearing Values*: At the recommended depths, footings on compacted fill or formational soil may be designed for allowable bearing pressures of 2,000 pounds per square foot (psf) for combined dead and live loads and 2,600 psf for all loads, including wind or seismic. The footings should have a minimum width of 18 inches. This allowable soil bearing capacity can be used for deck pier design. The effective depth of embedment of foundations near slope tops is 8 feet from the slope face.

13. *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.

14. *Lateral Loads:* Lateral load resistance for the structure supported on footing 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 275 pounds per cubic foot 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. For areas where soft soils are present in front of foundations (within 3 times the depth of embedment) then the allowable resistance should be reduced to 150 pcf. 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.

15. *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. Underpinning of Existing Footings in Remodel Areas

16. *North Foundation Footings*: The existing north perimeter foundation will require underpinning during construction of the new northern additions. Existing footings are apparently founded 18 to 24 inches below the lowest adjacent finished grade into existing fill. We recommend that existing footings on the northern side of the existing structure be underpinned. Also, in areas where new loads are proposed, the existing footings should be

evaluated to determine if underpinning is required due to the anticipated new loads.

New underpinning footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. The structural engineer should provide the reinforcing schedule. In areas where adequate bearing soils are at a depth shallower than 4 feet, a continuous trench excavation and deepened footings are recommended. Where adequate bearing soils are at depths of more than 4 feet, underpinning may require piers and grade beams. Allowable soil bearing capacity and other parameters presented in previous paragraphs are applicable.

In order for us to offer an opinion as to whether any new footings are founded on soils of the recommended load bearing capacity, it is essential that our representative observe 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.

E. Concrete Slab On-grade Criteria

Slabs on-grade may only be used on new, properly compacted fill or when bearing on dense natural soils. A slab-on-grade is currently planned for the garage addition

only. It is our understanding that raised wood floors are planned for the addition areas.

17. *Minimum Floor Slab Reinforcement:* Based on our experience, we have found that, for various reasons, floor slabs occasionally crack. Therefore, we recommend that the garage addition slab-on-grade contain at least a minimum amount of reinforcing steel to reduce the separation of cracks, should they occur. The garage slab should be a minimum of 5 inches actual thickness and be reinforced with No. 3 bars on 15-inch centers, both ways, placed at midheight in the slab. 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.

18. *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.

    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.

18.1 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.

18.2 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.

18.3 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.

19. *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.

20. Exterior Slab Reinforcement: As a minimum for protection of on-site improvements, we recommend that all new nonstructural concrete slabs (such as patios, sidewalks, etc.), be at least 4 inches in actual thickness, founded on properly compacted and tested fill or dense native formation and

underlain by no more than 3 inches of clean leveling sand, with No. 3 bars at 18-inch centers, both ways, at the center of the slab, and 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 exterior slabs on-grade.

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.

21. *Concrete Pavement:* If a new driveway slab is constructed it should be at least 5½ inches thick and rest on properly prepared and compacted subgrade soils. Subgrade soil for the driveway should be dense/hard or, if fill, be compacted to at least 90 percent of Maximum Dry Density. The concrete should be at least 3,500 psi compressive strength, with control joints no farther than 15 feet apart and also at re-entrant corners. Pavement joints should be properly sealed with permanent joint sealant, as required in sections 201.3.6 through 201.3.8 of the Standard Specifications for Public Work Construction, 2009 Edition. All slab joints shall be placed within 12

hours of concrete placement or as soon as the concrete sets, whichever occurs sooner.

*F. **Slopes***

22. *Permanent Slopes:* It is our understanding that no significant new slopes are to be graded for the proposed project. If any new cut or fill slopes are proposed, they may be up to 10 feet in height and should be constructed at an inclination of 2.0:1.0 (horizontal to vertical). The existing slope is at an approximate slope of 1.5:1.0 (horizontal to vertical).

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. *Temporary Slopes*: 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. Temporary cut slopes can be made at slope ratios of 0.5:1.0 (horizontal to vertical) but they may not be surcharged within 10 feet of the slope top.

25. *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.

26. *Slope Top/Face Performance*: The soils that occur in close proximity to the top or face of even properly compacted fill or dense natural ground cut slopes often possess poor lateral stability. The degree of lateral and vertical deformation depends on the inherent expansion and strength characteristics of the soil types comprising the slope, slope steepness and height, loosening of slope face soils by burrowing rodents, and irrigation and vegetation maintenance practices, as well as the quality of compaction of fill soils. Structures and other improvements could suffer damage due to these soil movement factors if not properly designed to accommodate or withstand such movement. As previously indicated, a minimum 8-foot setback from the top of the foundation should be measured for future new structures built near a slope top. We do not anticipate that new slopes will be required for the planned remodeling project.

27. *Top-of-Slope Improvements:* Rigid improvements such as top-of-slope walls, columns, decorative planters, concrete flatwork, swimming pools and other similar types of improvements can be expected to display varying degrees of separation typical of improvements constructed at the top of a slope. The separations result primarily from slope top lateral and vertical soil deformation processes. These separations often occur regardless of being underlain by cut or fill slope material. Proximity to a slope top is often the primary factor affecting the degree of separations occurring. Concrete slabs adjacent to the house may also separate from adjacent foundations due to the drying and wetting effects of expansive soils.

Typical and to-be-expected separations can range from minimal to up to 1 inch or greater in width. In order to minimize the effect of slope-top lateral soil deformation, we recommend that the top-of-slope improvements be

designed with flexible connections and joints in rigid structures so that the separations do not result in visually apparent cracking damage and/or can be cosmetically dressed as part of the ongoing property maintenance. These flexible connections may include "slip joints" in wrought iron fencing, evenly spaced vertical joints in block walls or fences, control joints with flexible caulking in exterior flatwork improvements, etc.

In addition, use of planters to provide separation between top-of-slope hardscape such as patio slabs and pool decking from top-of-slope walls can aid greatly in reducing cosmetic cracking and separations in exterior improvements. Actual materials and techniques would need to be determined by the project architect or the landscape architect for individual properties. Steel dowels placed in flatwork may prevent noticeable vertical differentials, but if provided with a slip-end they may still allow some lateral displacement.

G. Retaining Wall Design Criteria

New retaining walls are not currently planned for the residential remodeling project. The following recommendations are provided should the planned project be modified to include retaining walls.

28. *Design Parameters – Unrestrained:* The active earth pressure to be utilized in the design of any cantilever retaining walls (***utilizing imported very low- to low-expansive soils*** [EI less than 50] as backfill) should be based on an *Equivalent Fluid Weight* of 38 pounds per cubic foot (for level backfill only). In the event that a retaining wall is surcharged by sloping backfill, the

design active earth pressure should be based on the appropriate Equivalent Fluid Weight presented in the following table.

	Height of Slope/Height of Wall*			
Slope Ratio	**0.25**	**0.50**	**0.75**	**1.00(+)**
2.0:1.0 (existing slope)	42	48	50	52

*To determine design active earth pressures for ratios intermediate to those presented, interpolate between the stated values.

29. *Design Parameters – Restrained:* Retaining walls designed for a restrained condition should utilize a uniform pressure equal to 9xH (nine times the total height of retained soil, considered in pounds per square foot) considered as acting everywhere on the back of the wall ***in addition to the design Equivalent Fluid Weight***. The soil pressure produced by any footings, improvements, or any other surcharge placed within a horizontal distance equal to the height of the retaining portion of the wall should be included in the wall design pressure. The recommended lateral soil pressures are based on the assumption that no loose soils or soil sliding wedges will be retained by the retaining wall. Backfill soils should consist of low-expansive soils with EI less than 50, and should be placed from the heel of the foundation to the ground surface within the wedge formed by a plane at 30° from vertical, and passing by the heel of the foundation and the back face of the retaining wall. Exterior walls should be sealed with an 8-inch-thick layer of properly compacted on-site soils.

30. *Surcharge Loads:* Any loads placed on the active wedge behind a cantilever wall should be included in the design by multiplying the load weight by a factor of 0.31. For a restrained wall, the lateral factor shall be 0.47.

31. *Wall Drainage:* Proper subdrains and free-draining backwall material or board drains (such as J-drain or Miradrain) should be installed behind all retaining walls (in addition to proper waterproofing) on the subject project (see Figure No. VIII for Retaining Wall Backdrain and Waterproofing Schematic). ***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.

32. *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 and/or their retained construction inspection service provider 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.

H. Site Drainage Considerations

33. *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.

34. *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.

35. *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.

I. General Recommendations

36. *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.).

37. *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.

X. 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 and 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.

XI. 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 and/or their retained construction inspection service provider 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 see that our recommendations are adequately incorporated in the plans. 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. 12-10122** will expedite a reply to your inquiries.

Respectfully submitted,

GEOTECHNICAL EXPLORATION, INC.

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REFERENCES
JOB NO. 12-10122
April 2012

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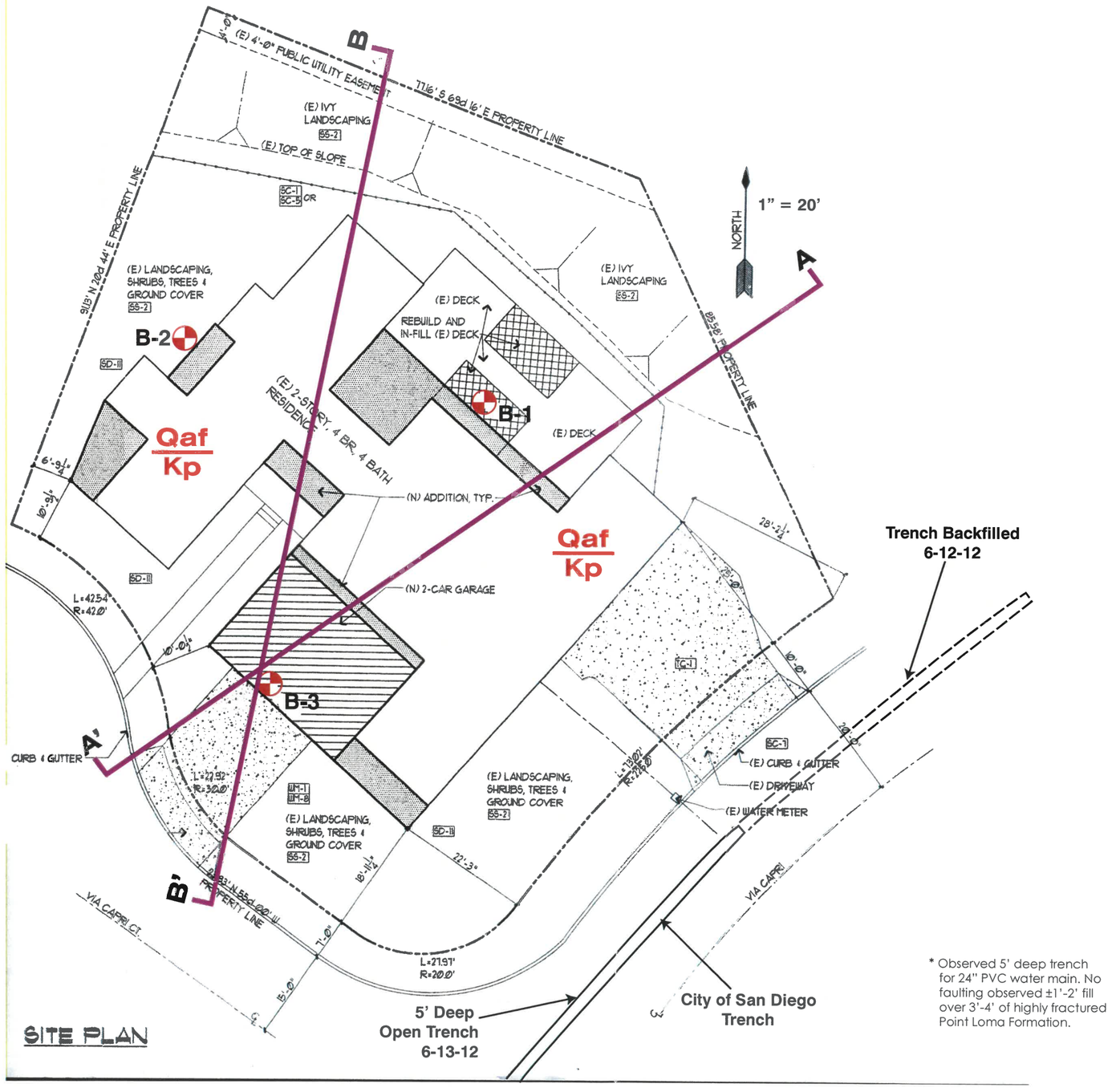
VICINITY MAP

Thomas Bros. Guide San Diego County pg. 1227

Lambert Residence Additions
2382 Via Capri Court
La Jolla, CA.

Figure No. I
Job No. 12-10122



REFERENCE: This Plot Plan was prepared from an existing SITE PLAN by Dakini General Contracting Inc. dated 12/21/2011and from on-site field reconnaissance performed by GEI.

Legend

B-3	Approximate Location of Exploratory Boring
A — A'	Approximate Location of Geologic Cross Section
Qaf	Artificial Fill
Kp	Point Loma Formation

* Observed 5' deep trench for 24" PVC water main. No faulting observed ±1'-2' fill over 3'-4' of highly fractured Point Loma Formation.

PLOT PLAN

Lambert Residence Additions
2382 Via Capri Court
La Jolla, CA.
Figure No. IIa
Job No. 12-10122

Geotechnical Exploration, Inc.

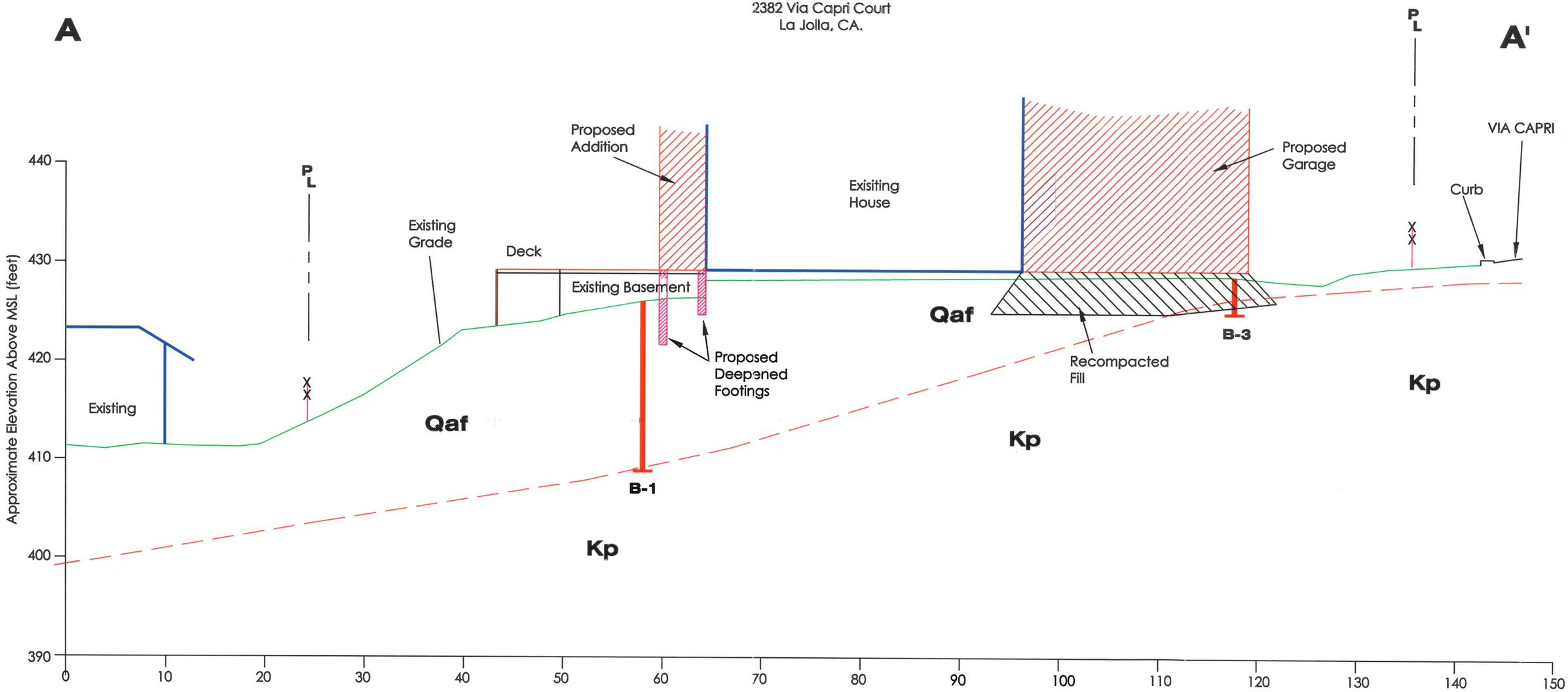
April 2012

(November 2012)

12-10122-p2.AI

CROSS SECTION A-A'

Lambert Residence
2382 Via Capri Court
La Jolla, CA.



Scale: 1" = 10'
(Horizontal and Vertical)

Geologic Legend

Qaf	Artificial Fill
Sw	Slopewash
Kp	Point Loma Formation

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.

12-10122-AA

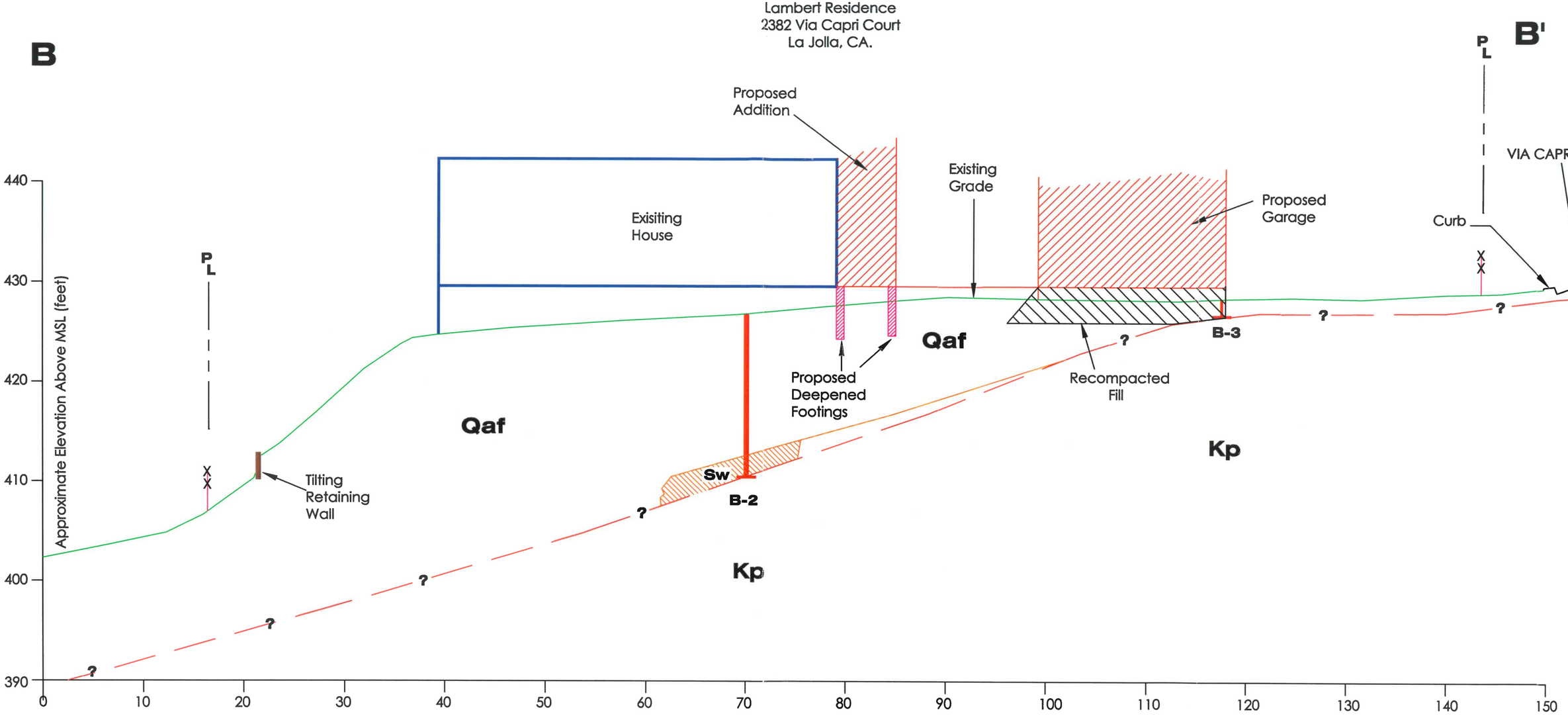
Figure No. IIb
Job No. 12-10122

Geotechnical Exploration, Inc.

November 2012

CROSS SECTION B-B'

Lambert Residence
2382 Via Capri Court
La Jolla, CA.



Scale: 1" = 10'
(Horizontal and Vertical)

Geologic Legend

Qaf	Artificial Fill
Sw	Slopewash
Kp	Point Loma Formation

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.

12-10122-BB

Figure No. IIc
Job No. 12-10122

Geotechnical Exploration, Inc.

April 2012
(revised November 2012)

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Limited Access Auger Drill Rig	**6-inch diameter Boring**	**2-17-12**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 430' Mean Sea Level	**Not Encountered**	**SO**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION 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)
			SILTY CLAY/ SANDY CLAY. Soft to firm. Moist. Gray-brown.	CL									
			FILL (Qaf)										
2			-- abundant tree roots in the upper 2 feet.										
			-- siltstone/ claystone fragments.										
4			**SILTY CLAY/ SANDY CLAY**, with some gravel and cobbles. Very stiff. Moist. Gray-brown.	CL	23.3	98.8			89			32	3"
			FILL (Qaf)										
6			-- abundant formational claystone fragments.									14	2"
			Bulk bag sample from 5'- 8'. -- 91% passing #200 sieve.				17.8	110.7			62		
8													
10			**SILTY CLAY/ SANDY CLAY**, with large formational chunks. Very stiff. Moist. Gray-brown.	CL	25.0	101.3			92			42	3"
			FILL (Qaf)										
12			-- large formational chunks in sampler tip (10-11.5' sample); retrieved 10" in sample.									32	2"
			Bulk bag sample from 10'- 14'.										
14													

EXPLORATION LOG 10122 LAMBERT.GPJ GEO_EXPL.GDT 4/27/12

PERCHED WATER TABLE
LOOSE BAG SAMPLE
1 IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
S FIELD DENSITY TEST
STANDARD PENETRATION TEST

JOB NAME
Lambert Residence

SITE LOCATION
2382 Via Capri Court, La Jolla, CA

JOB NUMBER
12-10122

REVIEWED BY
LDR/JAC

FIGURE NUMBER
IIIa

Geotechnical Exploration, Inc.

LOG No.
B-1

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Limited Access Auger Drill Rig	**6-inch diameter Boring**	**2-17-12**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 430' Mean Sea Level	**Not Encountered**	**SO**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION 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)
16			**SILTY CLAY/ SANDY CLAY**, with large formational chunks. Very stiff. Moist. Gray-brown. **FILL (Qaf)**	CL									
18			**SILTY CLAY**, with some sand lenses. Hard. Moist. Tan- and gray-brown.	CL	22.2	104.5			94			58	3"
20			**POINT LOMA FORMATION (Kp)** -- upper 2 feet is weathered with some caliche.									32	2"
22			-- encountered sandy lens within clay.									50/ 3"	2"
24			Bottom @ 23.25'										
26													
28													

EXPLORATION LOG 10122 LAMBERT.GPJ GEO_EXPL.GDT 4/27/12

PERCHED WATER TABLE
LOOSE BAG SAMPLE
1 IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
S FIELD DENSITY TEST
STANDARD PENETRATION TEST

JOB NAME
Lambert Residence

SITE LOCATION
2382 Via Capri Court, La Jolla, CA

JOB NUMBER
12-10122

REVIEWED BY
LDR/JAC

FIGURE NUMBER
IIIb

Geotechnical Exploration, Inc.

LOG No.
B-1

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Limited Access Auger Drill Rig	**6-inch diameter Boring**	**2-17-12**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 430' Mean Sea Level	**Not Encountered**	**SO**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION 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)
			SILTY CLAY/ SANDY CLAY. Soft to firm (upper 2 feet). Moist. Gray-brown.	CL								
			FILL (Qaf)									
2			-- abundant claystone formational fragments. -- becomes very stiff at 2'- 3'. -- large formational chunks in sampler tip (retrieved 10" in sample).		19.3	104.2			94		37	3"
4											21	2"
6												
8			-- becomes very stiff to hard at 7'. -- large formational chunks in sampler tip (retrieved 10" in sample).		20.0	104.9			95		41	3"
10											35	2"
12												
14			**SILTY CLAY**, with organic odor. Hard. Moist. Dark gray-brown.	CL	14.2	115.1					52	3"
			SLOPEWASH (Qsw)	CL							53	2"
16			**SILTY CLAY**, with some sand lenses; weathered, with some caliche in the upper 1 foot. Hard. Moist. Tan- and gray-brown.									
18			**POINT LOMA FORMATION (Kp)** Bottom @ 16'									

EXPLORATION LOG 10122 LAMBERT.GPJ GEO_EXPL.GDT 4/27/12

PERCHED WATER TABLE
LOOSE BAG SAMPLE
1 IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
S FIELD DENSITY TEST
STANDARD PENETRATION TEST

JOB NAME		
Lambert Residence		
SITE LOCATION		
2382 Via Capri Court, La Jolla, CA		
JOB NUMBER	REVIEWED BY	LOG No.
12-10122	**LDR/JAC**	**B-2**
FIGURE NUMBER	Geotechnical Exploration, Inc.	
IIIc		

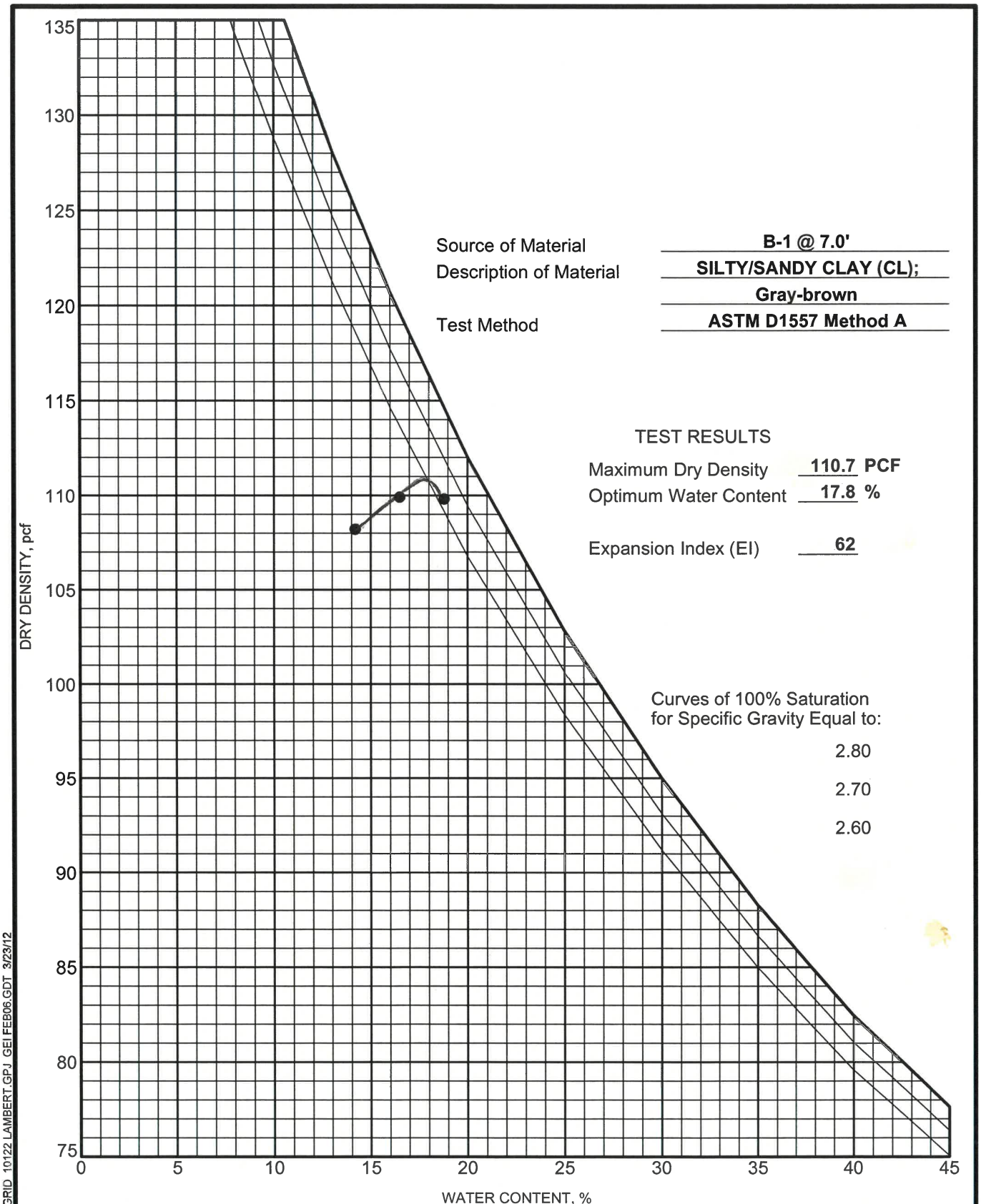
EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Limited Access Auger Drill Rig	**6-inch diameter Boring**	**2-17-12**
SURFACE ELEVATION	**GROUNDWATER/ SEEPAGE DEPTH**	**LOGGED BY**
± 430' Mean Sea Level	**Not Encountered**	**SO**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION 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)
1			**SILTY CLAY**, with claystone formational fragments. Soft. Moist. Gray-brown. **FILL (Qaf)**	CL								
2			**SILTY CLAY**, with some sand lenses. Very stiff. Moist. Tan- and gray-brown. **POINT LOMA FORMATION (Kp)**	CL								
3			Bottom @ 2.75'									
4												

PERCHED WATER TABLE
LOOSE BAG SAMPLE
1 IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
S FIELD DENSITY TEST
STANDARD PENETRATION TEST

JOB NAME		
Lambert Residence		
SITE LOCATION		
2382 Via Capri Court, La Jolla, CA		
JOB NUMBER	REVIEWED BY	LOG No.
12-10122	**LDR/JAC**	**B-3**
FIGURE NUMBER	Geotechnical Exploration, Inc.	
IIId		

EXPLORATION LOG 10122 LAMBERT.GPJ GEO_EXPL.GDT 4/27/12



Source of Material: **B-1 @ 7.0'**

Description of Material: **SILTY/SANDY CLAY (CL); Gray-brown**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **110.7 PCF**

Optimum Water Content: **17.8 %**

Expansion Index (EI): **62**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

Geotechnical Exploration, Inc.

MOISTURE-DENSITY RELATIONSHIP

Figure Number: IV

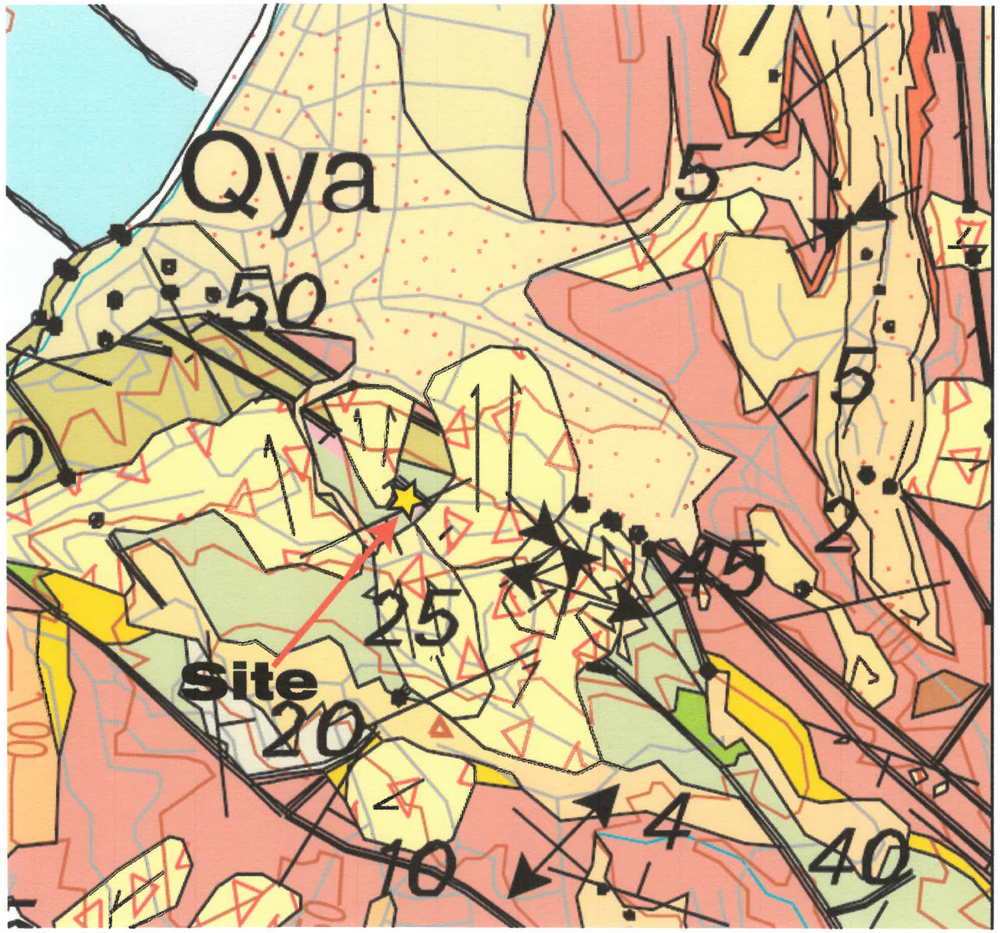
Job Name: Lambert Residence

Site Location: 2382 Via Capri Court, La Jolla, CA

Job Number: 12-10122

COMPACTION + EI DARK GRID 10122 LAMBERT.GPJ GEI FEB06.GDT 3/23/12

GEOLOGIC MAP
2005
compiled by Michael P. Kennedy
and Siang S Tan



Lambert Residence Additions
2382 Via Capri Court
La Jolla, CA.

GEOLOGIC MAP OF THE SAN DIEGO 30' X 60' QUADRANGLE, CALIFORNIA

Compiled by
Michael P. Kennedy and Siang S. Tan
2005
Digital Preparation by
Kelly R. Bovard[1], Anne G. Garcia[1] and Diane Burns[1]
[1] U.S. Geological Survey, Department of Earth Science, University of California, Riverside

ONSHORE MAP SYMBOLS

Contact—Contact between geologic units; dotted where concealed.

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; dotted where concealed.

Syncline—Solid where accurately located; dotted where concealed.

Kgd—granite pegmatite dike

Closed depression—Closed depression in Elsinore fault zone.

Landslide—Arrows indicate principal direction of movement. Queried where existence is questionable.

Strike and dip of beds
- Inclined
- Overturned
- Vertical
- Horizontal

Strike and dip of igneous foliation
- Inclined
- Vertical

Strike and dip of igneous joints
- Inclined
- Vertical

Strike and dip of metamorphic foliation
- Inclined

Strike and dip of sedimentary joints
- Vertical

DESCRIPTION OF MAP UNITS

Artificial fill (late Holocene)—Deposits of fill resulting from human construction, mining, or quarrying activities; includes compacted engineered and non compacted non engineered fill. Some large deposits are mapped, but in some areas no deposits are shown

Point Loma Formation (Upper Cretaceous)—Mostly interbedded, fine-grained, dusky-yellow sandstone and olive-gray siltstone. Named for exposures in the sea cliffs along the west side of the Point Loma Peninsula and assigned to the intermediate part of the Rosario Group (Kennedy and Moore, 1971). Contains calcareous nannoplankton of Upper Cretaceous (Campanian and Maestrichtian) age. The Point Loma Formation is correlative in part to the Williams Formation in the Santa Ana Mountains (Popenoe and others, 1960; Bukry and Kennedy, 1969). Arthur and others (1979) and Nilsen and Abbott (1979) provide a detailed description of these rocks

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The Department of Conservation makes no warranties as to the suitability of this product for any particular purpose.

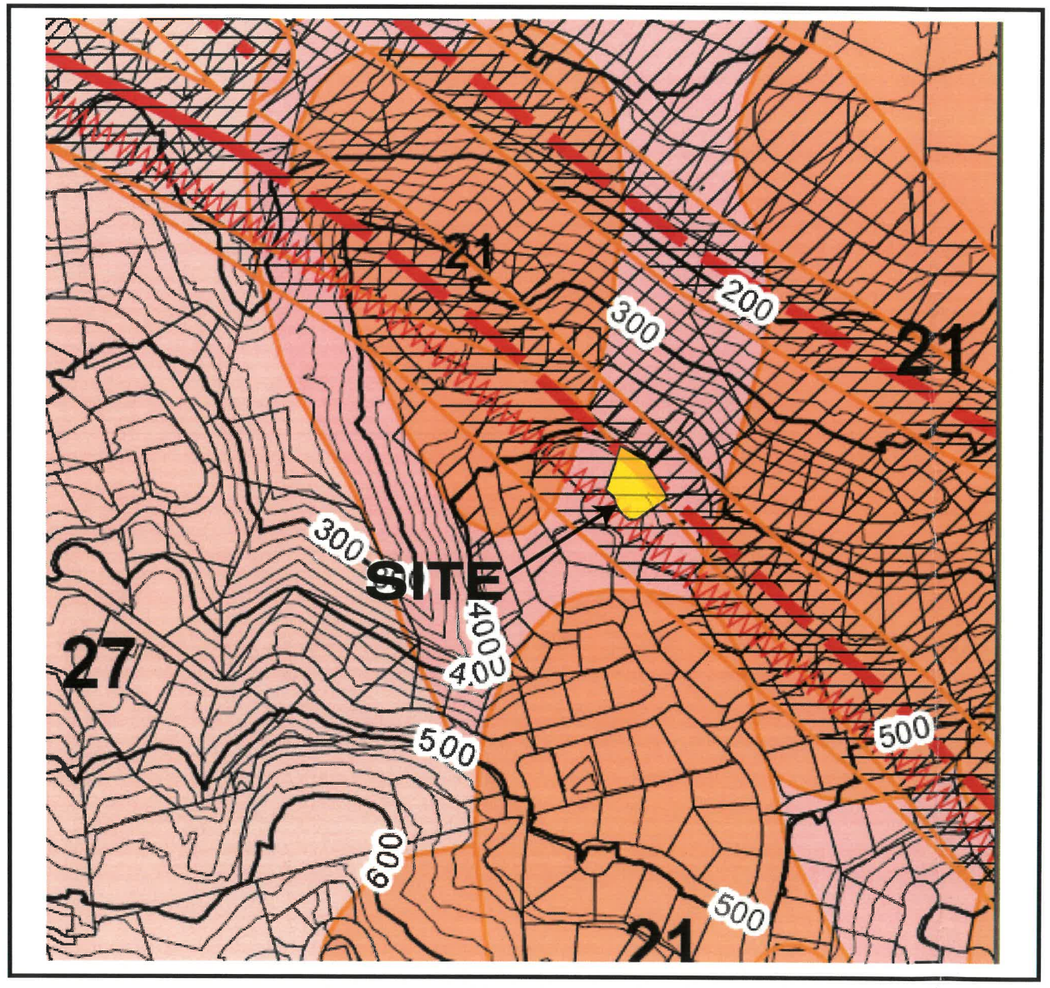
Figure No. V
Job No. 12-10122

Geotechnical Exploration, Inc.

City of San Diego
SEISMIC SAFETY STUDY
Geologic Hazards and Faults

Development Services Department

DATE: 4/3/2008



Lambert Residence Additions
2382 Via Capri Court
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

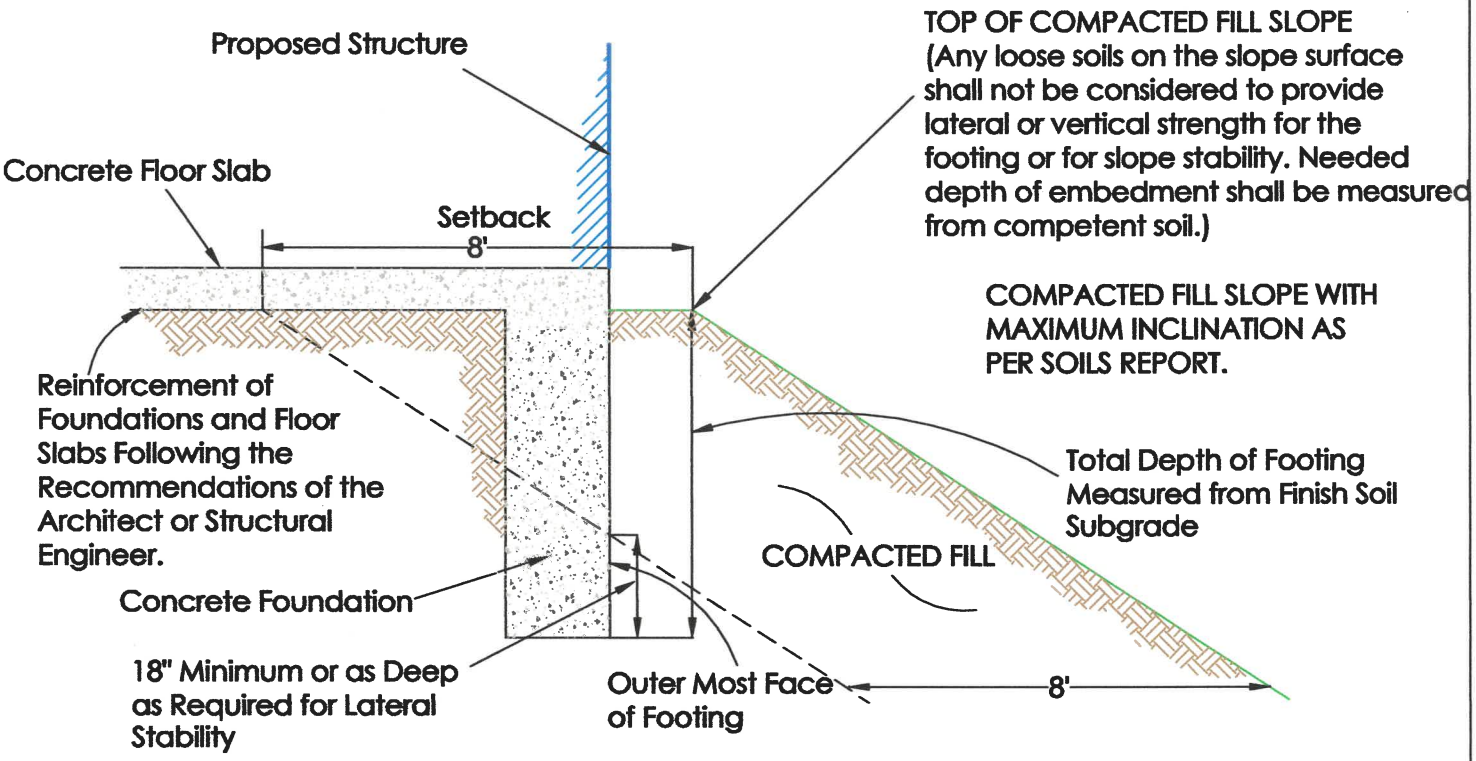
Concealed Fault

Shear Zone

Figure No. VI
Job No. 12-10122

Geotechnical Exploration, Inc.

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

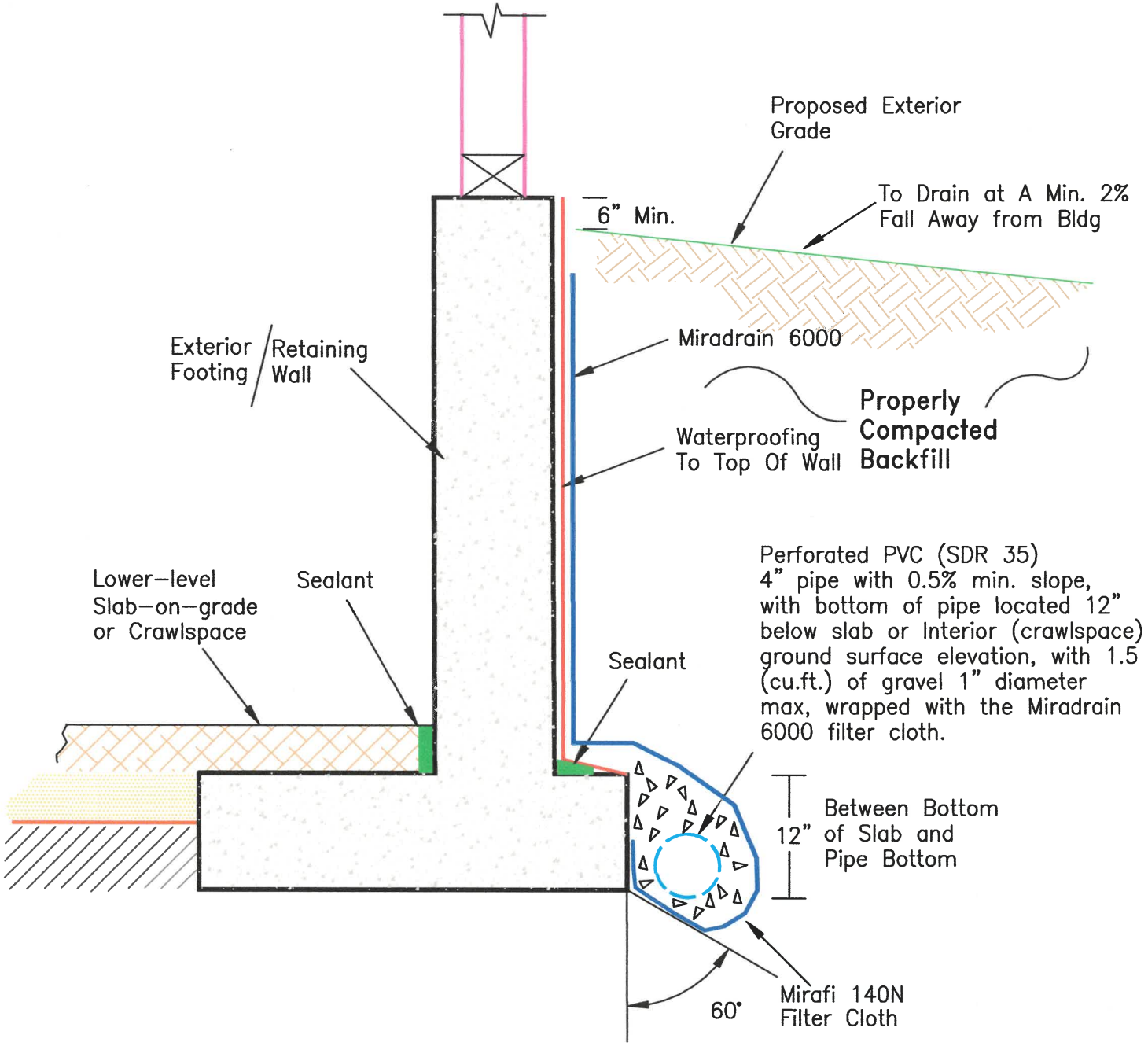
Distance From Top of Slope	1.5:1.0 SLOPE *	2.0:1.0 SLOPE
0	82"	66"
2'	66"	54"
4'	51"	42"
6'	34"	30"
8'	18"	18"

* when applicable

Figure No. VII
Job No. 12-10122

Geotechnical Exploration, Inc.

RECOMMENDED SUBGRADE RETAINING WALL DRAINAGE SCHEMATIC



NOT TO SCALE

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.

Figure No. VIII

Job No. 12-10122

GEI Geotechnical Exploration, Inc.

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

EQ FAULT TABLES

TEST.OUT

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*    Version 3.00    *
*                    *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 12-10122

DATE: 04-10-2012

JOB NAME: Lambert Test Run

CALCULATION NAME: Test Run Analysis

FAULT-DATA-FILE NAME: CDMGFLTE.DAT

SITE COORDINATES:
SITE LATITUDE: 32.8456
SITE LONGITUDE: 117.2533

SEARCH RADIUS: 100 mi

ATTENUATION RELATION: 12) Bozorgnia Campbell Niazi (1999) Hor.-Soft Rock-Cor.
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
DISTANCE MEASURE: cdist
SCOND: 0
Basement Depth: 5.00 km Campbell SSR: 1 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: CDMGFLTE.DAT

MINIMUM DEPTH VALUE (km): 3.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT		
		MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
ROSE CANYON	1.9(3.0)	6.9	0.485	X
CORONADO BANK	12.7(20.4)	7.4	0.234	IX
NEWPORT-INGLEWOOD (Offshore)	23.8(38.3)	6.9	0.094	VII
ELSINORE-JULIAN	37.8(60.8)	7.1	0.067	VI
ELSINORE-TEMECULA	39.3(63.3)	6.8	0.052	VI
EARTHQUAKE VALLEY	45.4(73.1)	6.5	0.037	V
PALOS VERDES	50.0(80.4)	7.1	0.050	VI
ELSINORE-COYOTE MOUNTAIN	52.4(84.4)	6.8	0.039	V
ELSINORE-GLEN IVY	55.4(89.2)	6.8	0.036	V
SAN JACINTO-ANZA	60.1(96.8)	7.2	0.044	VI
SAN JACINTO-COYOTE CREEK	60.5(97.4)	6.8	0.033	V
SAN JACINTO-SAN JACINTO VALLEY	64.8(104.3)	6.9	0.033	V
NEWPORT-INGLEWOOD (L.A.Basin)	65.4(105.3)	6.9	0.033	V
SAN JACINTO - BORREGO	66.2(106.6)	6.6	0.026	V
CHINO-CENTRAL AVE. (Elsinore)	69.5(111.8)	6.7	0.038	V
WHITTIER	73.2(117.8)	6.8	0.027	V
COMPTON THRUST	74.9(120.5)	6.8	0.038	V
SUPERSTITION MTN. (San Jacinto)	78.0(125.5)	6.6	0.022	IV
ELYSIAN PARK THRUST	79.5(127.9)	6.7	0.033	V
LAGUNA SALADA	80.0(128.8)	7.0	0.028	V
SAN JACINTO-SAN BERNARDINO	81.0(130.3)	6.7	0.023	IV
ELMORE RANCH	82.2(132.3)	6.6	0.021	IV
SAN ANDREAS - Southern	83.0(133.6)	7.4	0.036	V
SAN ANDREAS - San Bernardino	83.0(133.6)	7.3	0.034	V
SUPERSTITION HILLS (San Jacinto)	83.0(133.6)	6.6	0.021	IV
SAN ANDREAS - Coachella	87.0(140.0)	7.1	0.028	V
PINTO MOUNTAIN	89.3(143.7)	7.0	0.025	V
SAN JOSE	90.5(145.7)	6.5	0.025	V
BURNT MTN.	91.5(147.2)	6.4	0.016	IV
EUREKA PEAK	94.1(151.4)	6.4	0.016	IV
SIERRA MADRE	94.2(151.6)	7.0	0.034	V
CUCAMONGA	94.5(152.1)	7.0	0.034	V
BRAWLEY SEISMIC ZONE	96.3(154.9)	6.4	0.016	IV
NORTH FRONTAL FAULT ZONE (West)	96.6(155.4)	7.0	0.033	V
IMPERIAL	98.0(157.7)	7.0	0.023	IV
CLEGHORN	98.7(158.9)	6.5	0.016	IV
NORTH FRONTAL FAULT ZONE (East)	98.9(159.2)	6.7	0.026	V

-END OF SEARCH- 37 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE ROSE CANYON FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.9 MILES (3.0 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.4852 g

TEST.OUT

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*    E Q F A U L T   *
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*    Version 3.00    *
*                    *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 12-10122

DATE: 04-10-2012

JOB NAME: Lambert Test Run

CALCULATION NAME: Test Run Analysis

FAULT-DATA-FILE NAME: CDMGFLTE.DAT

SITE COORDINATES:
SITE LATITUDE: 32.8456
SITE LONGITUDE: 117.2533

SEARCH RADIUS: 100 mi

ATTENUATION RELATION: 12) Bozorgnia Campbell Niazi (1999) Hor.-Soft Rock-Cor.
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
DISTANCE MEASURE: cdist
SCOND: 0
Basement Depth: 5.00 km Campbell SSR: 1 Campbell SHR: 0
COMPUTE RHGA HORIZ. ACCEL. (FACTOR: 0.65 DISTANCE: 20 miles)

FAULT-DATA FILE USED: CDMGFLTE.DAT

MINIMUM DEPTH VALUE (km): 3.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

Page 1

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT		
		MAXIMUM EARTHQUAKE MAG.(Mw)	RHGA SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
ROSE CANYON	1.9(3.0)	6.9	0.315	IX
CORONADO BANK	12.7(20.4)	7.4	0.234	IX
NEWPORT-INGLEWOOD (Offshore)	23.8(38.3)	6.9	0.094	VII
ELSINORE-JULIAN	37.8(60.8)	7.1	0.067	VI
ELSINORE-TEMECULA	39.3(63.3)	6.8	0.052	VI
EARTHQUAKE VALLEY	45.4(73.1)	6.5	0.037	V
PALOS VERDES	50.0(80.4)	7.1	0.050	VI
ELSINORE-COYOTE MOUNTAIN	52.4(84.4)	6.8	0.039	V
ELSINORE-GLEN IVY	55.4(89.2)	6.8	0.036	V
SAN JACINTO-ANZA	60.1(96.8)	7.2	0.044	VI
SAN JACINTO-COYOTE CREEK	60.5(97.4)	6.8	0.033	V
SAN JACINTO-SAN JACINTO VALLEY	64.8(104.3)	6.9	0.033	V
NEWPORT-INGLEWOOD (L.A.Basin)	65.4(105.3)	6.9	0.033	V
SAN JACINTO - BORREGO	66.2(106.6)	6.6	0.026	V
CHINO-CENTRAL AVE. (Elsinore)	69.5(111.8)	6.7	0.038	V
WHITTIER	73.2(117.8)	6.8	0.027	V
COMPTON THRUST	74.9(120.5)	6.8	0.038	V
SUPERSTITION MTN. (San Jacinto)	78.0(125.5)	6.6	0.022	IV
ELYSIAN PARK THRUST	79.5(127.9)	6.7	0.033	V
LAGUNA SALADA	80.0(128.8)	7.0	0.028	V
SAN JACINTO-SAN BERNARDINO	81.0(130.3)	6.7	0.023	IV
ELMORE RANCH	82.2(132.3)	6.6	0.021	IV
SAN ANDREAS - Southern	83.0(133.6)	7.4	0.036	V
SAN ANDREAS - San Bernardino	83.0(133.6)	7.3	0.034	V
SUPERSTITION HILLS (San Jacinto)	83.0(133.6)	6.6	0.021	IV
SAN ANDREAS - Coachella	87.0(140.0)	7.1	0.028	V
PINTO MOUNTAIN	89.3(143.7)	7.0	0.025	V
SAN JOSE	90.5(145.7)	6.5	0.025	V
BURNT MTN.	91.5(147.2)	6.4	0.016	IV
EUREKA PEAK	94.1(151.4)	6.4	0.016	IV
SIERRA MADRE	94.2(151.6)	7.0	0.034	V
CUCAMONGA	94.5(152.1)	7.0	0.034	V
BRAWLEY SEISMIC ZONE	96.3(154.9)	6.4	0.016	IV
NORTH FRONTAL FAULT ZONE (West)	96.6(155.4)	7.0	0.033	V
IMPERIAL	98.0(157.7)	7.0	0.023	IV
CLEGHORN	98.7(158.9)	6.5	0.016	IV
NORTH FRONTAL FAULT ZONE (East)	98.9(159.2)	6.7	0.026	V

-END OF SEARCH- 37 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE ROSE CANYON FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.9 MILES (3.0 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.3154 g

APPENDIX C

EQ SEARCH TABLES

TEST.OUT

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*    E Q S E A R C H     *
*                        *
*     Version 3.00       *
*                        *
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ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 12-10122

DATE: 04-26-2012

JOB NAME: Lambert Test Run

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
MINIMUM MAGNITUDE: 5.00
MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
SITE LATITUDE: 32.8456
SITE LONGITUDE: 117.2533

SEARCH DATES:
START DATE: 1800
END DATE: 2012

SEARCH RADIUS:
100.0 mi
160.9 km

ATTENUATION RELATION: 12) Bozorgnia Campbell Niazi (1999) Hor.-Soft Rock-Cor.
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
SCOND: 0 Depth Source: A
Basement Depth: 5.00 km Campbell SSR: 1 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 3.0

TEST.OUT

EARTHQUAKE SEARCH RESULTS

Page 1

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
MGI	32.8000	117.1000	05/25/1803	0 0 0.0	0.0	5.00	0.097	VII	9.4(15.2)
DMG	32.7000	117.2000	05/27/1862	20 0 0.0	0.0	5.90	0.157	VIII	10.5(16.9)
DMG	33.0000	117.3000	11/22/1800	2130 0.0	0.0	6.50	0.218	VIII	11.0(17.7)
T-A	32.6700	117.1700	10/21/1862	0 0 0.0	0.0	5.00	0.072	VII	13.0(21.0)
T-A	32.6700	117.1700	12/00/1856	0 0 0.0	0.0	5.00	0.072	VII	13.0(21.0)
T-A	32.6700	117.1700	05/24/1865	0 0 0.0	0.0	5.00	0.072	VII	13.0(21.0)
MGI	33.0000	117.0000	09/21/1856	730 0.0	0.0	5.00	0.053	VI	18.1(29.2)
DMG	32.8000	116.8000	10/23/1894	23 3 0.0	0.0	5.70	0.054	VI	26.5(42.6)
PAS	32.9710	117.8700	07/13/1986	1347 8.2	6.0	5.30	0.030	V	36.8(59.2)
DMG	33.2000	116.7000	01/01/1920	235 0.0	0.0	5.00	0.023	IV	40.3(64.9)
T-A	32.2500	117.5000	01/13/1877	20 0 0.0	0.0	5.00	0.021	IV	43.6(70.1)
MGI	33.2000	116.6000	10/12/1920	1748 0.0	0.0	5.30	0.025	V	45.0(72.5)
DMG	33.0000	116.4330	06/04/1940	1035 8.3	0.0	5.10	0.020	IV	48.7(78.4)
GSP	32.3290	117.9170	06/15/2004	222848.2	10.0	5.30	0.021	IV	52.6(84.6)
DMG	32.7000	116.3000	02/24/1892	720 0.0	0.0	6.70	0.047	VI	56.2(90.5)
PDG	33.4200	116.4890	07/07/2010	235333.5	14.0	5.50	0.021	IV	59.4(95.5)
DMG	33.7000	117.4000	05/13/1910	620 0.0	0.0	5.00	0.015	IV	59.6(95.9)
DMG	33.7000	117.4000	05/15/1910	1547 0.0	0.0	6.00	0.028	V	59.6(95.9)
DMG	33.7000	117.4000	04/11/1910	757 0.0	0.0	5.00	0.015	IV	59.6(95.9)
DMG	32.0000	117.5000	06/24/1939	1627 0.0	0.0	5.00	0.015	IV	60.1(96.8)
DMG	32.0000	117.5000	05/01/1939	2353 0.0	0.0	5.00	0.015	IV	60.1(96.8)
DMG	32.2000	116.5500	11/05/1949	43524.0	0.0	5.10	0.016	IV	60.5(97.4)
DMG	32.2000	116.5500	11/04/1949	204238.0	0.0	5.70	0.023	IV	60.5(97.4)
DMG	33.6990	117.5110	05/31/1938	83455.4	10.0	5.50	0.020	IV	60.8(97.8)
GSP	33.5290	116.5720	06/12/2005	154146.5	14.0	5.20	0.017	IV	61.4(98.9)
PAS	33.5010	116.5130	02/25/1980	104738.5	13.6	5.50	0.020	IV	62.3(100.2)
GSP	33.5080	116.5140	10/31/2001	075616.6	15.0	5.10	0.015	IV	62.6(100.7)
DMG	33.7100	116.9250	09/23/1963	144152.6	16.5	5.00	0.015	IV	62.6(100.8)
DMG	33.3430	116.3460	04/28/1969	232042.9	20.0	5.80	0.023	IV	62.7(100.9)
DMG	33.5000	116.5000	09/30/1916	211 0.0	0.0	5.00	0.015	IV	62.7(101.0)
DMG	32.0830	116.6670	11/25/1934	818 0.0	0.0	5.00	0.015	IV	62.8(101.0)
DMG	32.8170	118.3500	12/26/1951	04654.0	0.0	5.90	0.025	V	63.7(102.4)
DMG	33.7500	117.0000	04/21/1918	223225.0	0.0	6.80	0.044	VI	64.1(103.2)
DMG	33.7500	117.0000	06/06/1918	2232 0.0	0.0	5.00	0.014	IV	64.1(103.2)
DMG	33.5750	117.9830	03/11/1933	518 4.0	0.0	5.20	0.016	IV	65.7(105.7)
DMG	33.2000	116.2000	05/28/1892	1115 0.0	0.0	6.30	0.031	V	65.7(105.7)
DMG	33.4000	116.3000	02/09/1890	12 6 0.0	0.0	6.30	0.030	V	67.1(108.0)
DMG	33.6170	117.9670	03/11/1933	154 7.8	0.0	6.30	0.030	V	67.3(108.4)
DMG	33.8000	117.0000	12/25/1899	1225 0.0	0.0	6.40	0.032	V	67.5(108.6)
MGI	33.8000	117.6000	04/22/1918	2115 0.0	0.0	5.00	0.013	III	68.9(110.8)
DMG	33.2830	116.1830	03/19/1954	95556.0	0.0	5.00	0.013	III	68.9(110.9)
DMG	33.2830	116.1830	03/23/1954	41450.0	0.0	5.10	0.014	IV	68.9(110.9)
DMG	33.2830	116.1830	03/19/1954	95429.0	0.0	6.20	0.027	V	68.9(110.9)

DMG	33.2830	116.1830	03/19/1954	102117.0	0.0	5.50	0.018	IV	68.9(110.9)
DMG	33.6170	118.0170	03/14/1933	19 150.0	0.0	5.10	0.014	IV	69.1(111.3)
DMG	33.4080	116.2610	03/25/1937	1649 1.8	10.0	6.00	0.024	IV	69.3(111.5)
DMG	33.1900	116.1290	04/09/1968	22859.1	11.1	6.40	0.031	V	69.3(111.5)
DMG	33.2170	116.1330	08/15/1945	175624.0	0.0	5.70	0.020	IV	69.7(112.2)
DMG	31.8110	117.1310	12/22/1964	205433.2	2.3	5.60	0.018	IV	71.8(115.5)
DMG	33.1130	116.0370	04/09/1968	3 353.5	5.0	5.20	0.014	IV	72.8(117.2)
DMG	33.9000	117.2000	12/19/1880	0 0 0.0	0.0	6.00	0.023	IV	72.9(117.3)
DMG	32.9670	116.0000	10/21/1942	162213.0	0.0	6.50	0.031	V	73.1(117.7)
DMG	32.9670	116.0000	10/22/1942	181326.0	0.0	5.00	0.012	III	73.1(117.7)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	32.9670	116.0000	10/21/1942	162654.0	0.0	5.00	0.012	III	73.1(117.7)
DMG	32.9670	116.0000	10/21/1942	162519.0	0.0	5.00	0.012	III	73.1(117.7)
DMG	33.6830	118.0500	03/11/1933	658 3.0	0.0	5.50	0.016	IV	73.9(118.9)
DMG	32.9830	115.9830	05/23/1942	154729.0	0.0	5.00	0.012	III	74.2(119.5)
DMG	33.7000	118.0670	03/11/1933	85457.0	0.0	5.10	0.013	III	75.4(121.3)
DMG	33.7000	118.0670	03/11/1933	51022.0	0.0	5.10	0.013	III	75.4(121.3)
DMG	33.2310	116.0040	05/26/1957	155933.6	15.1	5.00	0.012	III	77.0(124.0)
PDG	32.7000	115.9210	06/15/2010	042658.5	5.0	5.80	0.019	IV	78.0(125.5)
DMG	31.8670	116.5710	02/27/1937	12918.4	10.0	5.00	0.012	III	78.4(126.2)
DMG	33.7500	118.0830	03/11/1933	2 9 0.0	0.0	5.00	0.011	III	78.7(126.6)
DMG	33.7500	118.0830	03/11/1933	323 0.0	0.0	5.00	0.011	III	78.7(126.6)
DMG	33.7500	118.0830	03/11/1933	230 0.0	0.0	5.10	0.012	III	78.7(126.6)
DMG	33.7500	118.0830	03/11/1933	910 0.0	0.0	5.10	0.012	III	78.7(126.6)
DMG	33.7500	118.0830	03/13/1933	131828.0	0.0	5.30	0.014	III	78.7(126.6)
DMG	32.5000	118.5500	02/24/1948	81510.0	0.0	5.30	0.014	III	79.0(127.2)
DMG	34.0000	117.2500	07/23/1923	73026.0	0.0	6.25	0.024	V	79.7(128.3)
DMG	33.9500	116.8500	09/28/1946	719 9.0	0.0	5.00	0.011	III	79.7(128.3)
MGI	34.0000	117.5000	12/16/1858	10 0 0.0	0.0	7.00	0.039	V	81.0(130.3)
GSG	33.9530	117.7610	07/29/2008	184215.7	14.0	5.30	0.013	III	81.9(131.7)
DMG	33.7830	118.1330	10/02/1933	91017.6	0.0	5.40	0.014	IV	82.2(132.4)
PAS	33.0130	115.8390	11/24/1987	131556.5	2.4	6.00	0.020	IV	82.8(133.2)
DMG	33.0000	115.8330	01/08/1946	185418.0	0.0	5.40	0.014	III	83.0(133.6)
PDP	32.6520	115.8350	05/19/2010	003900.0	7.0	5.10	0.011	III	83.4(134.3)
DMG	33.9760	116.7210	06/12/1944	104534.7	10.0	5.10	0.011	III	83.9(134.9)
DMG	33.0330	115.8210	09/30/1971	224611.3	8.0	5.10	0.011	III	84.0(135.2)
DMG	33.1830	115.8500	04/25/1957	222412.0	0.0	5.10	0.011	III	84.5(136.0)
DMG	33.9940	116.7120	06/12/1944	111636.0	10.0	5.30	0.013	III	85.2(137.1)
PDP	32.6400	115.8010	04/05/2010	133305.4	0.0	5.10	0.011	III	85.5(137.6)
DMG	33.7830	118.2500	11/14/1941	84136.3	0.0	5.40	0.013	III	86.6(139.3)
MGI	34.1000	117.3000	07/15/1905	2041 0.0	0.0	5.30	0.012	III	86.6(139.4)
PDP	32.6340	115.7820	04/05/2010	031525.2	3.0	5.00	0.010	III	86.7(139.5)
PAS	33.0820	115.7750	11/24/1987	15414.5	4.9	5.80	0.017	IV	87.2(140.3)
PDG	32.6160	115.7730	05/22/2010	173058.8	3.0	5.00	0.010	III	87.4(140.7)
DMG	33.2160	115.8080	04/25/1957	215738.7	-0.3	5.20	0.012	III	87.5(140.8)
DMG	31.7500	116.5000	04/29/1935	20 8 0.0	0.0	5.00	0.010	III	87.5(140.8)
PAS	33.9980	116.6060	07/08/1986	92044.5	11.7	5.60	0.015	IV	87.9(141.4)
DMG	32.9830	115.7330	01/24/1951	717 2.6	0.0	5.60	0.014	IV	88.6(142.6)
DMG	32.9500	115.7170	06/14/1953	41729.9	0.0	5.50	0.013	III	89.4(143.8)
DMG	32.9000	115.7000	10/02/1928	19 1 0.0	0.0	5.00	0.010	III	90.1(145.1)

DMG	33.9330	116.3830	12/04/1948	234317.0	0.0	6.50	0.025	V	90.3(145.3)
DMG	34.1000	116.8000	10/24/1935	1448 7.6	0.0	5.10	0.010	III	90.5(145.6)
MGI	34.0000	118.0000	12/25/1903	1745 0.0	0.0	5.00	0.010	III	90.6(145.8)
DMG	33.8500	118.2670	03/11/1933	1425 0.0	0.0	5.00	0.010	III	90.7(146.0)
GSP	33.8760	116.2670	06/29/1992	160142.8	1.0	5.20	0.011	III	91.1(146.6)
DMG	34.0170	116.5000	07/26/1947	24941.0	0.0	5.10	0.010	III	91.8(147.7)
DMG	34.0170	116.5000	07/25/1947	04631.0	0.0	5.00	0.010	III	91.8(147.7)
DMG	34.0170	116.5000	07/25/1947	61949.0	0.0	5.20	0.011	III	91.8(147.7)
DMG	34.0170	116.5000	07/24/1947	221046.0	0.0	5.50	0.013	III	91.8(147.7)
GSP	33.9020	116.2840	07/24/1992	181436.2	9.0	5.00	0.010	III	91.9(147.9)
DMG	34.1000	116.7000	02/07/1889	520 0.0	0.0	5.30	0.012	III	92.3(148.5)
DMG	31.7960	116.2690	06/11/1963	152338.3	-2.0	5.80	0.016	IV	92.5(148.8)
DMG	33.2330	115.7170	10/22/1942	15038.0	0.0	5.50	0.013	III	92.9(149.4)
GSP	34.1400	117.7000	02/28/1990	234336.6	5.0	5.20	0.011	III	93.0(149.7)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	34.1630	116.8550	06/28/1992	144321.0	6.0	5.30	0.011	III	93.8(151.0)
DMG	34.2000	117.4000	07/22/1899	046 0.0	0.0	5.50	0.013	III	93.9(151.1)
DMG	34.2000	117.1000	09/20/1907	154 0.0	0.0	6.00	0.017	IV	93.9(151.2)
GSP	33.9610	116.3180	04/23/1992	045023.0	12.0	6.10	0.018	IV	94.0(151.3)
DMG	34.1800	116.9200	01/16/1930	02433.9	0.0	5.20	0.011	III	94.1(151.4)
DMG	34.1800	116.9200	01/16/1930	034 3.6	0.0	5.10	0.010	III	94.1(151.4)
T-A	33.5000	115.8200	05/00/1868	0 0 0.0	0.0	6.30	0.021	IV	94.4(151.8)
PAS	33.0980	115.6320	04/26/1981	12 928.4	3.8	5.70	0.014	IV	95.5(153.7)
GSP	34.1950	116.8620	08/17/1992	204152.1	11.0	5.30	0.011	III	95.9(154.2)
GSP	33.1600	115.6370	09/02/2005	012719.8	9.0	5.10	0.010	III	96.1(154.6)
PAS	34.0610	118.0790	10/01/1987	144220.0	9.5	5.90	0.016	IV	96.5(155.2)
DMG	32.2500	115.7500	12/01/1958	32118.0	0.0	5.80	0.015	IV	96.7(155.6)
DMG	32.2500	115.7500	12/01/1958	350 0.0	0.0	5.00	0.009	III	96.7(155.6)
DMG	32.2500	115.7500	12/01/1958	6 2 0.0	0.0	5.50	0.012	III	96.7(155.6)
GSN	34.2030	116.8270	06/28/1992	150530.7	5.0	6.70	0.027	V	96.9(155.9)
GSG	31.8060	116.1280	03/23/1994	025916.2	22.0	5.00	0.009	III	97.3(156.5)
PAS	34.0730	118.0980	10/04/1987	105938.2	8.2	5.30	0.011	III	97.7(157.3)
GSP	34.0290	116.3210	08/21/1993	014638.4	9.0	5.00	0.009	III	97.8(157.4)
T-A	34.0000	118.2500	03/26/1860	0 0 0.0	0.0	5.00	0.009	III	98.2(158.1)
T-A	34.0000	118.2500	09/23/1827	0 0 0.0	0.0	5.00	0.009	III	98.2(158.1)
T-A	34.0000	118.2500	01/10/1856	0 0 0.0	0.0	5.00	0.009	III	98.2(158.1)
GSP	34.0640	116.3610	09/15/1992	084711.3	9.0	5.20	0.010	III	98.6(158.6)
DMG	31.8000	116.1000	10/10/1953	1849 6.0	0.0	5.00	0.009	III	98.7(158.8)
PAS	33.0140	115.5550	10/16/1979	65842.8	9.1	5.50	0.012	III	99.1(159.5)
GSP	34.2390	116.8370	07/09/1992	014357.6	0.0	5.30	0.011	III	99.1(159.5)
MGI	34.1000	118.1000	07/11/1855	415 0.0	0.0	6.30	0.020	IV	99.4(159.9)
DMG	33.1170	115.5670	07/28/1950	175048.0	0.0	5.40	0.011	III	99.4(160.0)
DMG	33.1170	115.5670	07/29/1950	143632.0	0.0	5.50	0.012	III	99.4(160.0)
PAS	32.9270	115.5400	10/16/1979	54910.2	10.4	5.10	0.009	III	99.5(160.1)
DMG	34.2670	116.9670	08/29/1943	34513.0	0.0	5.50	0.012	III	99.5(160.1)
PAS	32.9280	115.5390	10/16/1979	61948.7	9.2	5.10	0.009	III	99.6(160.2)
DMG	34.0670	116.3330	05/18/1940	72132.7	0.0	5.00	0.009	III	99.6(160.3)
DMG	34.0670	116.3330	05/18/1940	55120.2	0.0	5.20	0.010	III	99.6(160.3)
DMG	34.2700	117.5400	09/12/1970	143053.0	8.0	5.40	0.011	III	99.7(160.5)
GSP	34.1080	116.4040	06/29/1992	141338.8	9.0	5.40	0.011	III	99.9(160.8)

MGI |34.0000|118.3000|09/03/1905| 540 0.0| 0.0| 5.30| 0.011 | III|100.0(160.8)

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-END OF SEARCH- 142 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2012

LENGTH OF SEARCH TIME: 213 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 9.4 MILES (15.2 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.0

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.218 g

COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
a-value= 1.644
b-value= 0.415
beta-value= 0.955

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	142	0.66667
4.5	142	0.66667
5.0	142	0.66667
5.5	50	0.23474
6.0	22	0.10329
6.5	7	0.03286
7.0	1	0.00469

APPENDIX D
MODIFIED MERCALLI INTENSITY SCALE OF 1931
(Excerpted from the California Division of Conservation Division of Mines and Geology DMG Note 32)

The first scale to reflect earthquake intensities was developed by deRossi of Italy, and Forel of Switzerland, in the 1880s, and is known as the Rossi-Forel Scale. This scale, with values from I to X, was used for about two decades. A need for a more refined scale increased with the advancement of the science of seismology, and in 1902, the Italian seismologist Mercalli devised a new scale on a I to XII range. The Mercalli Scale was modified in 1931 by American seismologists Harry O. Wood and Frank Neumann to take into account modern structural features.

The Modified Mercalli Intensity Scale measures the intensity of an earthquake's effects in a given locality, and is perhaps much more meaningful to the layman because it is based on actual observations of earthquake effects at specific places. It should be noted that because the damage used for assigning intensities can be obtained only from direct firsthand reports, considerable time -- weeks or months -- is sometimes needed before an intensity map can be assembled for a particular earthquake.

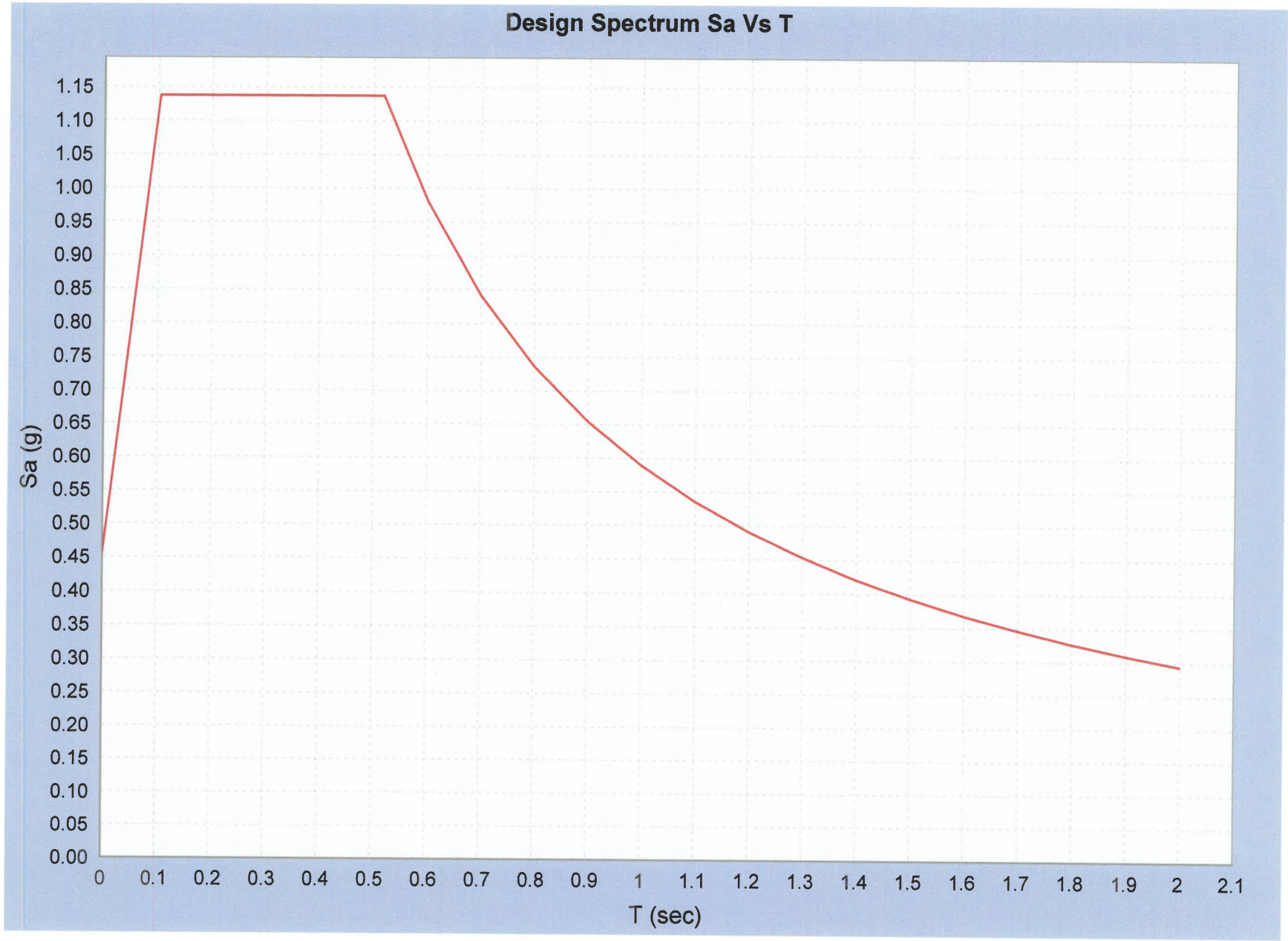
On the Modified Mercalli Intensity Scale, values range from I to XII. The most commonly used adaptation covers the range of intensity from the conditions of *"I -- not felt except by very few, favorably situated,"* to *"XII -- damage total, lines of sight disturbed, objects thrown into the air."* While an earthquake has only one magnitude, it can have many intensities, which decrease with distance from the epicenter.

It is difficult to compare magnitude and intensity because intensity is linked with the particular ground and structural conditions of a given area, as well as distance from the earthquake epicenter, while magnitude depends on the energy released at the focus of the earthquake.

I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII	Everybody runs outdoors. Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI	Few, if any, masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects thrown upward into the air.

APPENDIX E

SPECTRAL ACCELERATION (SA) VS. PERIOD (T)



Lambert Property

GEI Job No 12-10122

APPENDIX F

SLOPE STABILITY ANALYSES

Shallow Failure Analysis
Slope Stability Calculations
Lambert Property
La Jolla, California
Job No.12-10122

Soil Design Parameters:

Soil Unit Weight:120 pcf., Saturated Unit Weight=130 pcf.
Friction Angle: 20 degrees
Cohesion: 400 psf.
Slope Angle, β,: 35.53 degrees (Existing steepest slope)
Soil Friction Angle for Existing Soil, ϕ= 20 degrees,

Shallow Failure Stability Analysis

$Fs = C/(\gamma \text{ sat. } H. \cos\wedge 2\ (\beta). \text{ Tan } \beta) + (\gamma'/\gamma \text{ sat})(\tan \phi/\tan\beta)$

$= 400/(130. 3.0. 0.662 . 0.714) + (67.6/130). (0.364/0.714)$

$= 2.17 + 0.265$

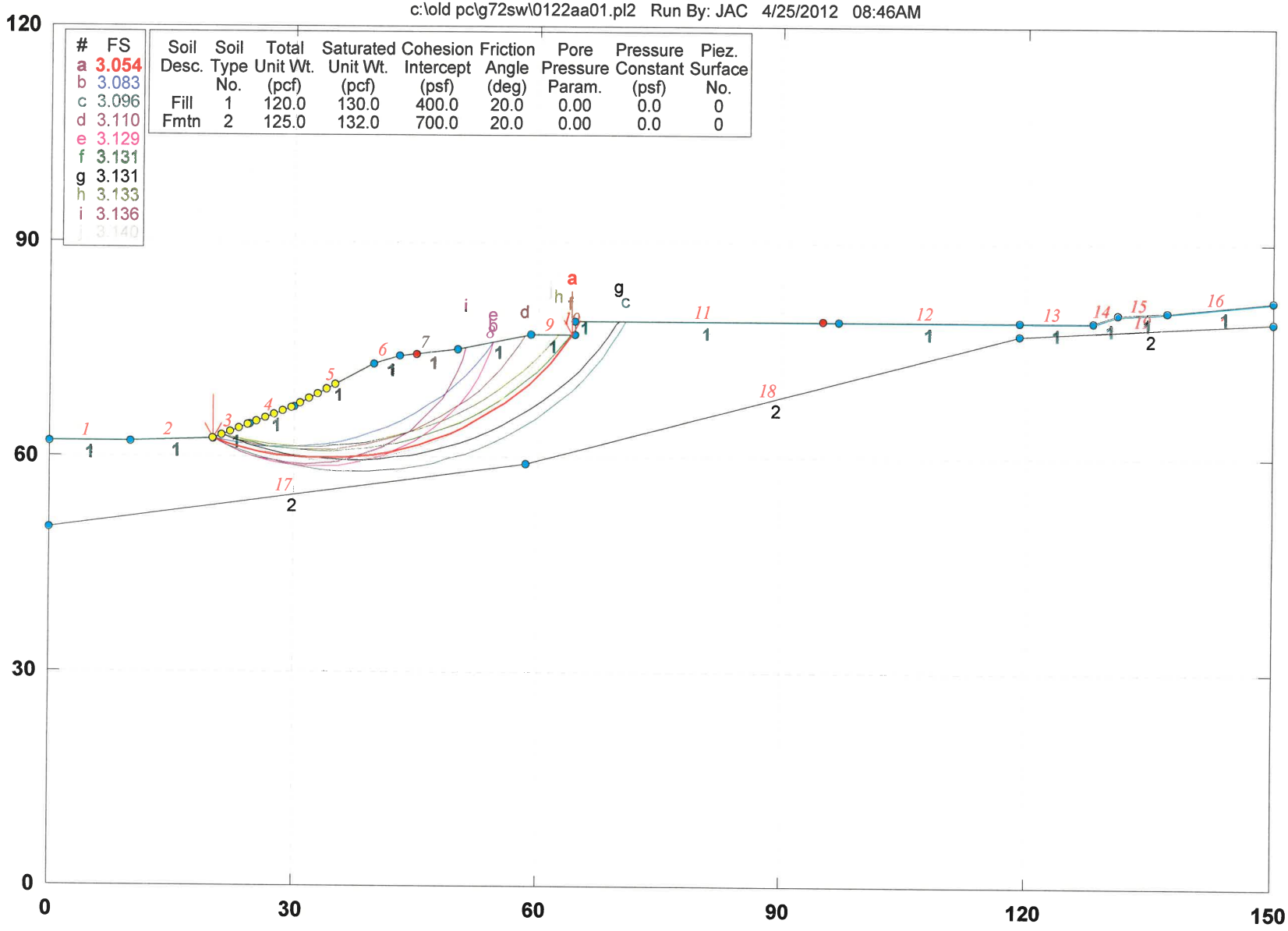
$= 2.435$ O.K.

Lambert Prop, Job No.12-10122 Sectn A-A', 2382 Via Capri, La Jolla

c:\old pc\g72sw\0122aa01.pl2 Run By: JAC 4/25/2012 08:46AM

#	FS
a	3.054
b	3.083
c	3.096
d	3.110
e	3.129
f	3.131
g	3.131
h	3.133
i	3.136
j	3.140

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Fill	1	120.0	130.0	400.0	20.0	0.00	0.0	0
Fmtn	2	125.0	132.0	700.0	20.0	0.00	0.0	0



GSTABL7 v.2 FSmin=3.054

Safety Factors Are Calculated By The Modified Bishop Method

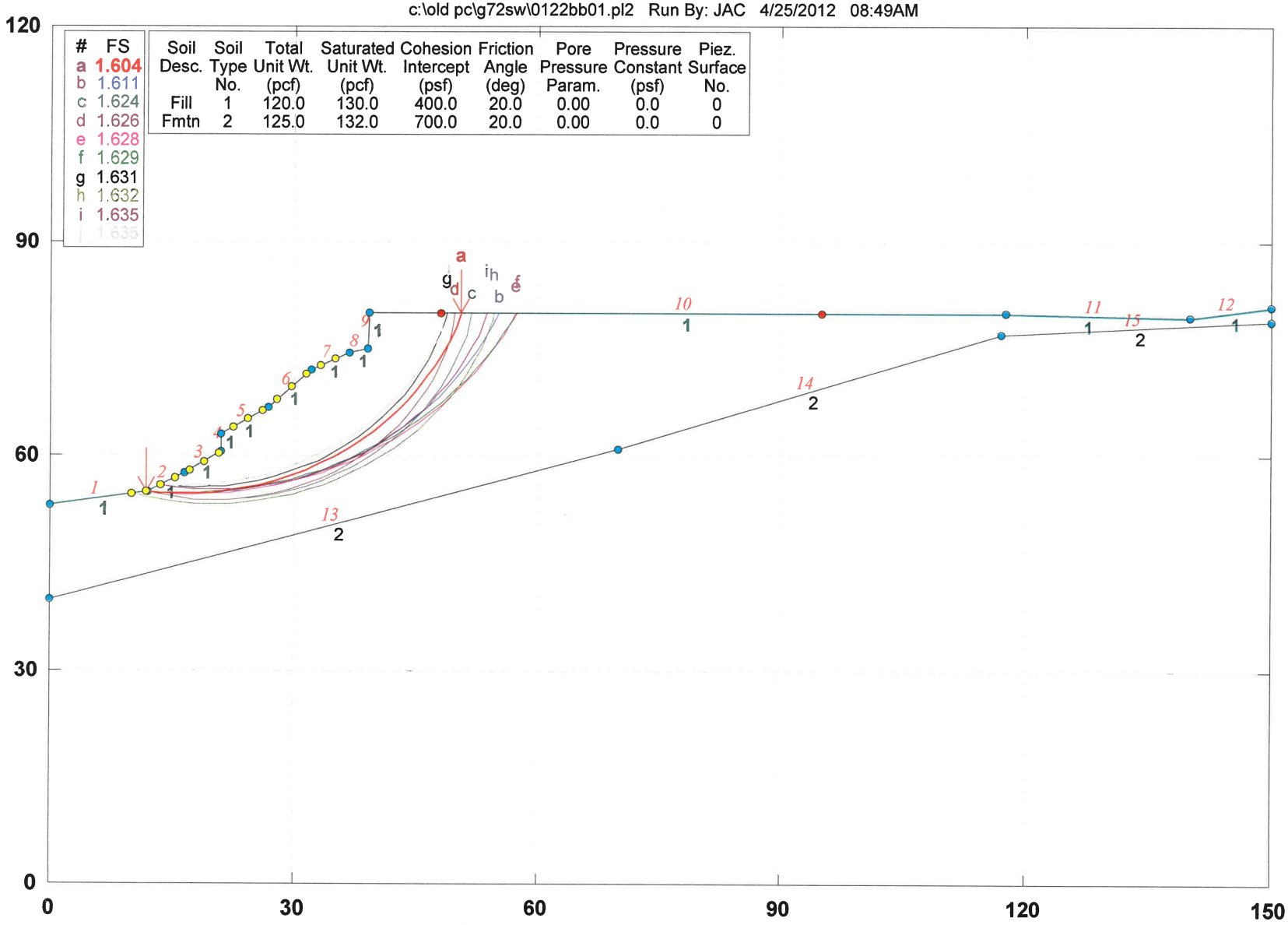
GSTABL7

Lambert Prop, Job No.12-10122 Sectn B-B', 2382 Via Capri, La Jolla

c:\old pc\g72sw\0122bb01.pl2 Run By: JAC 4/25/2012 08:49AM

#	FS
a	1.604
b	1.611
c	1.624
d	1.626
e	1.628
f	1.629
g	1.631
h	1.632
i	1.635
j	1.635

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Fill	1	120.0	130.0	400.0	20.0	0.00	0.0	0
Fmtn	2	125.0	132.0	700.0	20.0	0.00	0.0	0



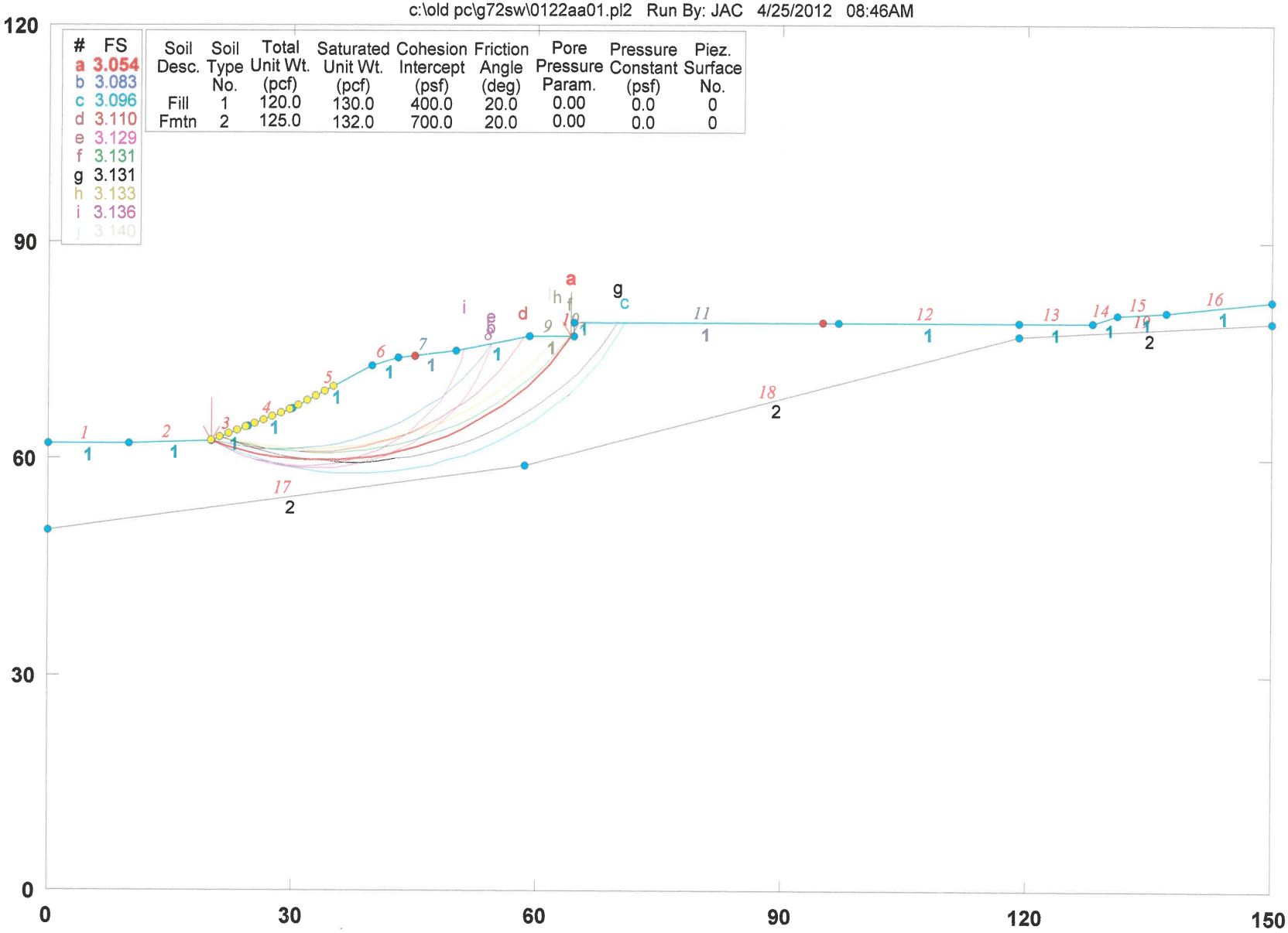
GSTABL7 v.2 FSmin=1.604

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

Lambert Prop, Job No.12-10122 Sectn A-A', 2382 Via Capri, La Jolla

c:\old pc\g72sw\0122aa01.pl2 Run By: JAC 4/25/2012 08:46AM



GSTABL7 v.2 FSmin=3.054

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

Lambert Prop, Job No.12-10122 Sectn B-B', 2382 Via Capri, La Jolla

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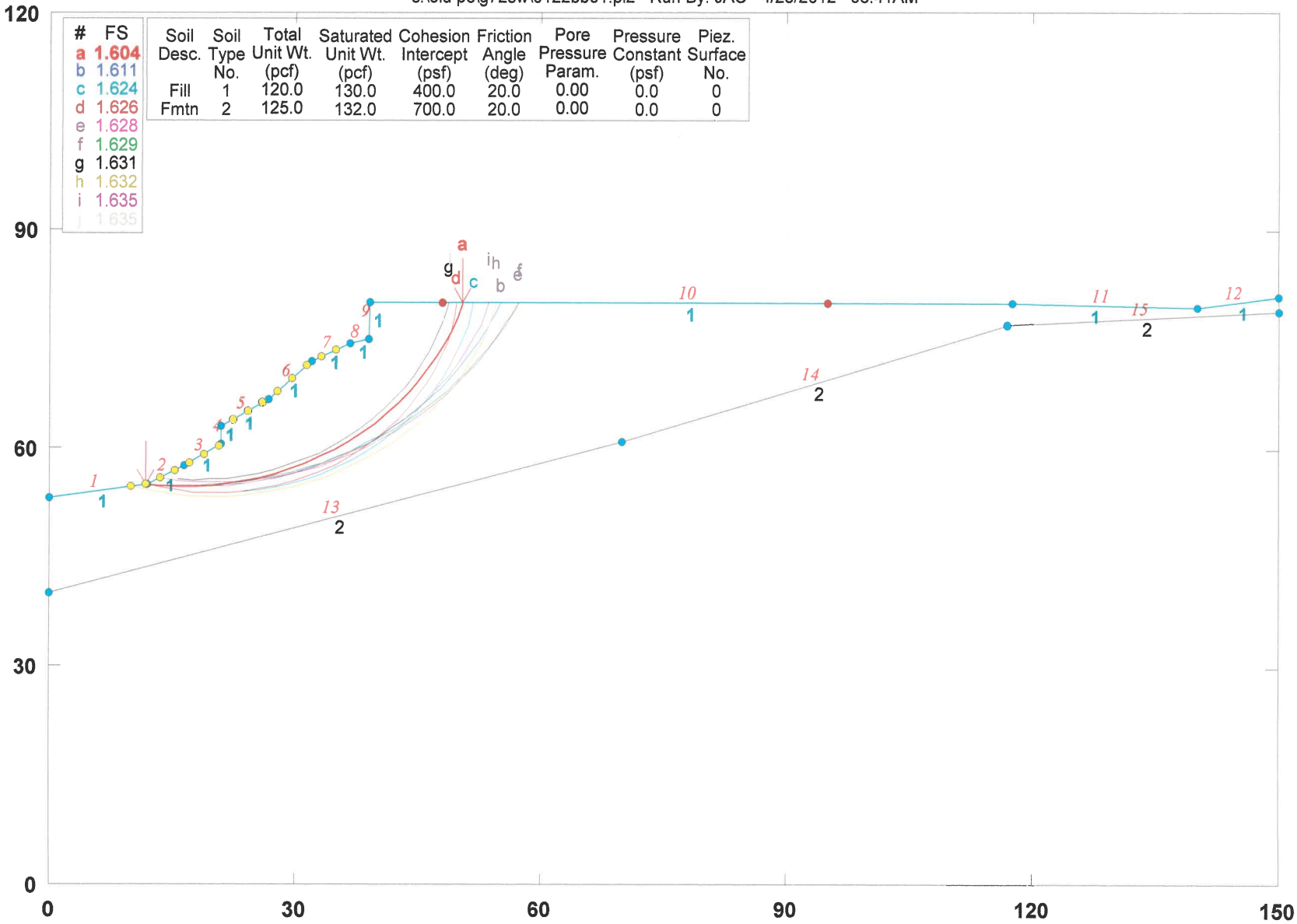


GSTABL7 v.2 FSmin=1.604

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

ISSUE

Num

3

Geotechnical Exploration, Inc.

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

13 November 2012

Mr. Bob Lambert
4135 Porte de Palmas
San Diego, CA 92122

Job No. 12-10122

Subject: **Cycle Issues Response to City of San Diego LDR-Geology Review**
Lambert Residence Additions
2382 Via Capri Court
La Jolla, California

Dear Mr. Lambert:

Geotechnical Exploration, Inc. herein responds to the geotechnical issues raised in the Cycle Issues review by the geologic staff of the City of San Diego's Development Services Department, completion dated October 19, 2012. Our "Report of Geotechnical Preliminary Investigation, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California," for the property is dated April 26, 2012. This was an evaluation of the site's geologic and geotechnical conditions for the existing home and proposed additions. City of San Diego geologic staff has prepared the following comments pursuant to submittal of all documents for a building permit. We have prepared this addendum geotechnical investigation update letter and attached figures from the plans under review by Scott A. Spencer and Associates, dated July 10, 2012.

We have reiterated the appropriate geologic review items here from the City of San Diego LDR-Geology review.

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

Issue No. 2: Submit an addendum geotechnical report or update letter that provides or addresses the following: (New Issue)

GEI Response: We have prepared this addendum geotechnical report that addresses the comments from the City geologic staff in the Cycle Issues memorandum.

Issue No. 3: The submitted referenced report is missing cross section A-A' (Figure No. IIb). Please submit the missing illustration. (New Issue)

GEI Response: We are including cross section A-A' (Figure No. IIb) with this addendum report.

Issue No. 4: Show the recommended deep foundations on the cross sections. (New Issue)

GEI Response: The recommended deep foundations are shown for the new addition areas on cross sections A-A' and B-B'. We have also shown the recompacted fill area under the proposed garage.

Issue No. 5: Cross section B-B' shows two borings B-3. Revise the cross section to indicate the location of boring B-2. (New Issue)

GEI Response: We have revised cross section B-B' to show the location of boring B-2.

Issue No. 6: The referenced geotechnical report indicates, "the Rose Canyon Fault Zone is mapped less than 1 mile northeast of the subject site." Regional geologic mapping indicates that the site is located within the Rose Canyon Fault Zone. The project's geotechnical consultant should clarify their statement regarding the site location in relationship to the Rose Canyon Fault Zone. (New Issue)

GEI Response: As written in our geotechnical report, "*the Rose Canyon **Fault Zone** is mapped less than 1 mile northeast of the subject site*" is an incorrect statement. The Rose Canyon ***Fault*** is mapped less than 1 mile northeast of the site, however, the site is located within the Rose Canyon Fault Zone, which includes the Rose Canyon, Mount Soledad and Country Club Faults.

Issue No. 7: The site is partially located within Geologic Hazard Category (GHC) 11, the Alquist-Priolo fault-rupture hazard zone; and within a fault buffer zone GHC 12. The inferred location of the Mount Soledad fault is mapped crossing the northeastern part of the site and a shear zone is located adjacent to the southwestern part of the site (see Figure No. VI in the referenced report). The project's geotechnical consultant should clarify if the site is threatened by future surface fault rupture. (New Issue)

GEI Response: As indicated in our geotechnical report, the Mount Soledad Fault is mapped crossing the extreme northeast portion of the site at the toe of the existing slope. This area of the site is underlain by at least 10 feet of artificial fill and located at least 30 feet from any proposed new construction. In addition, a shear zone is mapped adjacent to the southwest part of the site. This area is located in the street and at least 30 feet from any new construction. We consider this to be an adequate setback and it is our opinion that the site will not be threatened by future surface fault rupture.

It should be noted that a representative of our firm observed a construction trench in Via Capri, on the southeast side of the site, for the installation of a new water line on June 13, 2012. The trench was excavated to a depth of 5 feet, exposing materials of the Point Loma Formation. Although we were not able to enter the trench for geologic logging, we did not observe any obvious offsets or significant geologic features that would indicate the presence of faulting crossing the open trench location. The construction crew reported that very broken material existed

and that side wall failures occurred at the intersection of Via Capri and Via Avola, 150 feet northeast of the subject property. This suggests the possible existence of a fault trace at that location.

Issue No. 8: The site is located within Geologic Hazard Category 22, characterized as possible or conjectured landslide. The project's geotechnical consultant should clarify if, in their professional opinion, the site is or is not located on a landslide. (New Issue)

GEI Response: The site is located in Geologic Hazard Category 22, characterized as possible or conjectured landslide and, in our opinion, is part of a large primarily ancient landslide complex. However, based on the available information (such as topography, our geotechnical investigations with large-diameter borings on many nearby properties, and review of aerial photographs), it is our professional opinion that the site is not located on a portion of the landslide complex with a potential for re-activation.

Issue No. 9: The project's geotechnical consultant must assess "deep-seated" gross slope stability of the site and provide a professional opinion regarding the factor of safety of the site with respect to "deep-seated" gross slope stability. The consultant must consider the deepest potential failure path with the lowest factor of safety. (New Issue)

GEI Response: We provided a gross slope stability analysis in our preliminary geotechnical report. It is our opinion that evaluation of the "deep-seated" gross slope stability of the large-scale landslide complex is beyond the scope of meaningful evaluation. It is our opinion that the site is not underlain by a portion of the landslide complex with potential for re-activation. We have determined that the site has a factor of safety greater than 1.5 against mass and surficial instability. Evaluation of the "deep-seated" gross slope stability would require extensive

geologic information of the site and surrounding properties that does not exist and may never be known to a degree allowing meaningful slope stability evaluation of the deepest potential slide planes in the large landslide complex.

Issue No. 10: Boring B-2 indicates fill soil was placed on native soil within the site. Cross section B-B' suggests the contact is inclined downslope to the north. Indicate if the contact between the fill soil and native soil represents a potential zone of weakness that should be modeled in the slope stability calculations presented in Appendix F. (New Issue)

GEI Response: It is our opinion that the assumed inclined contact between the fill soil and native soil does not represent a continuous potential zone of weakness. The contact is inclined downslope to the north and was modeled in both cross sections A-A' and B-B' in the slope stability calculations included in the geotechnical report. Also, it is our opinion that at the time of the original mass grading, benching into formation was routinely used to provide proper placement of the fill on formation.

LIMITATIONS

Our findings and conclusions have been based upon all available data obtained from the field reconnaissance and research, as well as our experience with the soils and native materials located in the La Jolla area of the City of San Diego. 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 City of San Diego.

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. 12-10122** will expedite a response 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

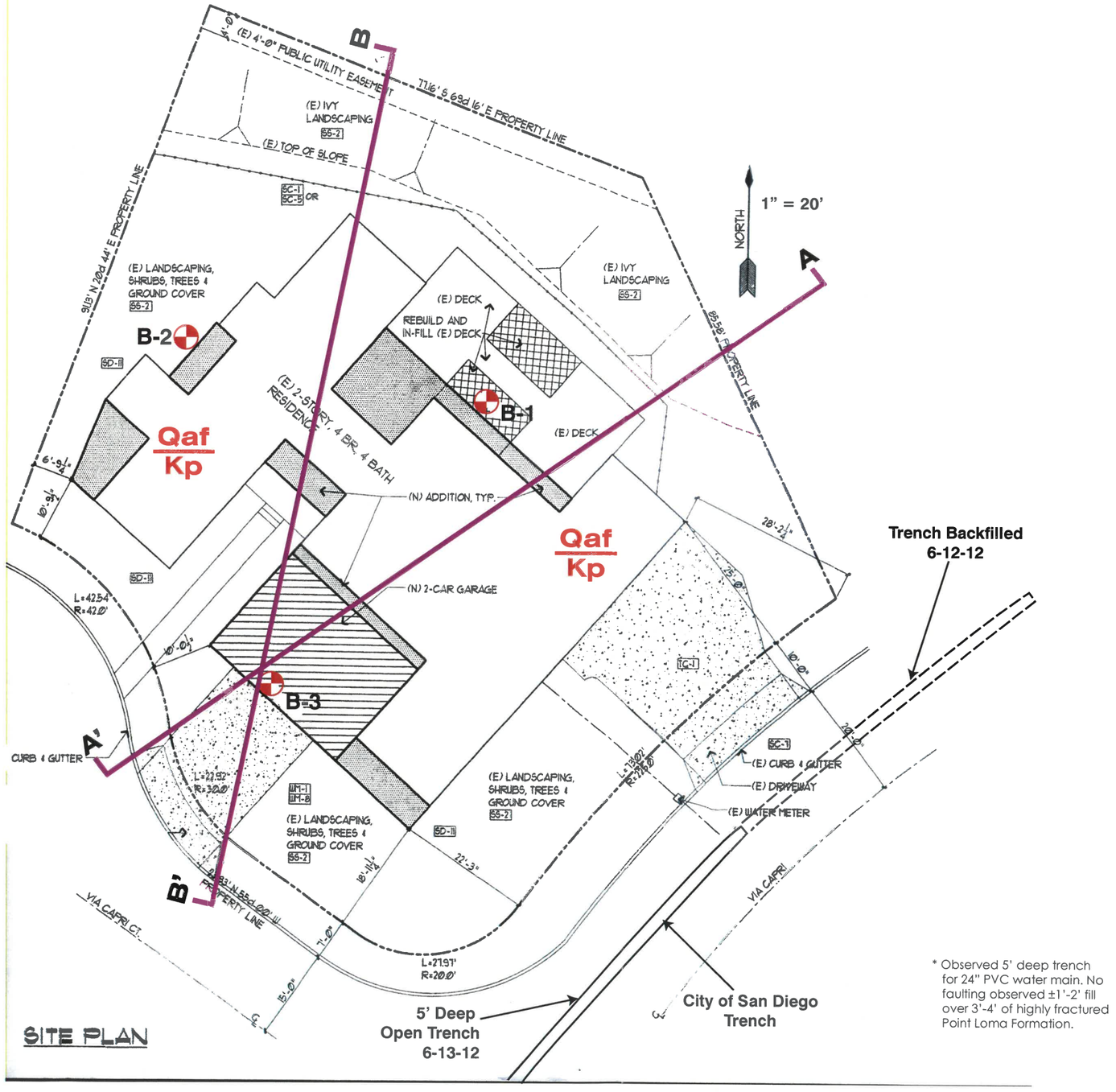
Leslie D. Reed, President
C.E.G. 999 [exp. 3-31-13]/P.G. 3391

VICINITY MAP

Thomas Bros. Guide San Diego County pg. 1227

Lambert Residence Additions
2382 Via Capri Court
La Jolla, CA.

Figure No. I
Job No. 12-10122



REFERENCE: This Plot Plan was prepared from an existing SITE PLAN by Dakini General Contracting Inc. dated 12/21/2011and from on-site field reconnaissance performed by GEI.

Legend

B-3	Approximate Location of Exploratory Boring
A — A'	Approximate Location of Geologic Cross Section
Qaf	Artificial Fill
Kp	Point Loma Formation

* Observed 5' deep trench for 24" PVC water main. No faulting observed ±1'-2' fill over 3'-4' of highly fractured Point Loma Formation.

PLOT PLAN

Lambert Residence Additions
2382 Via Capri Court
La Jolla, CA.
Figure No. IIa
Job No. 12-10122

Geotechnical Exploration, Inc.

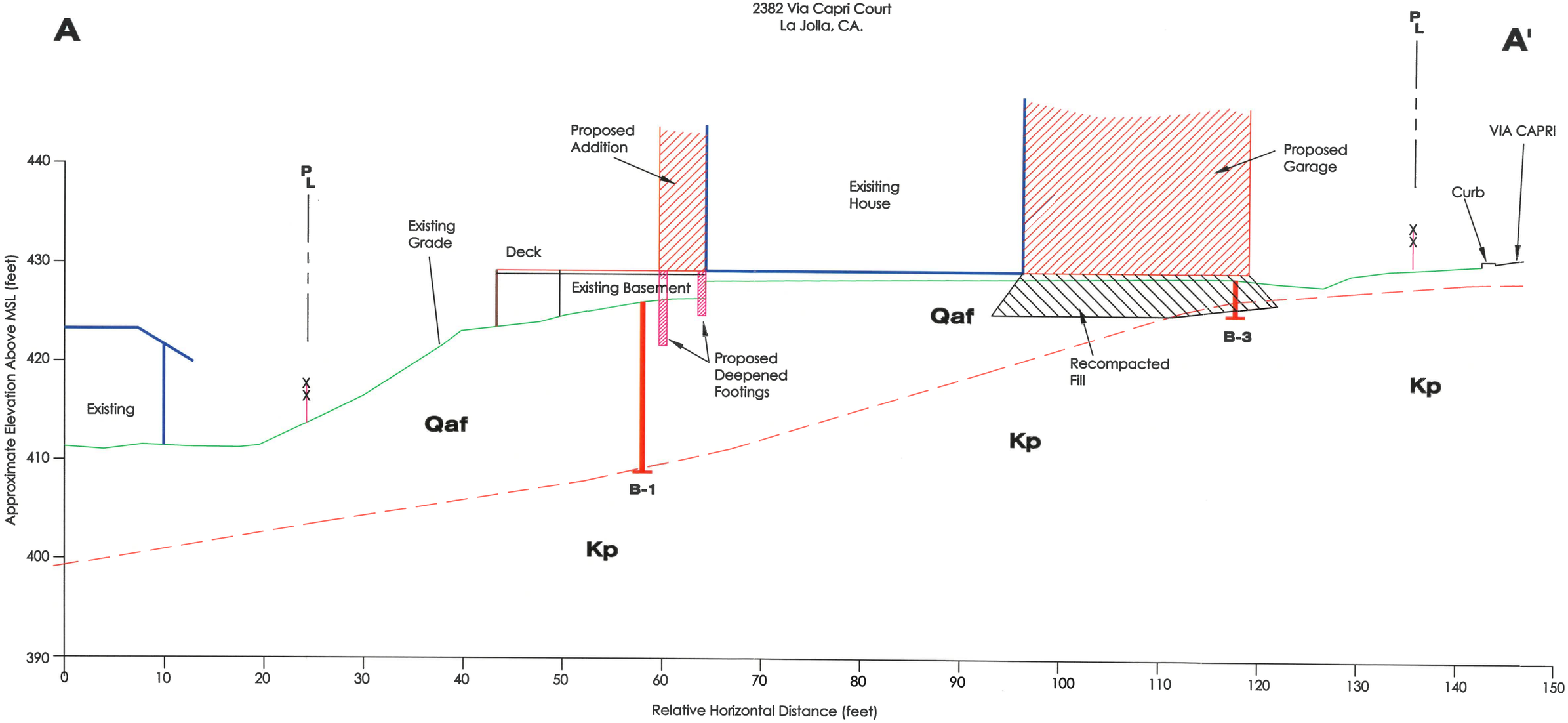
April 2012

(November 2012)

12-10122-p2.AI

CROSS SECTION A-A'

Lambert Residence
2382 Via Capri Court
La Jolla, CA.



Scale: 1" = 10'
(Horizontal and Vertical)

Geologic Legend

Qaf	Artificial Fill
Sw	Slopewash
Kp	Point Loma Formation

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.

12-10122-AA

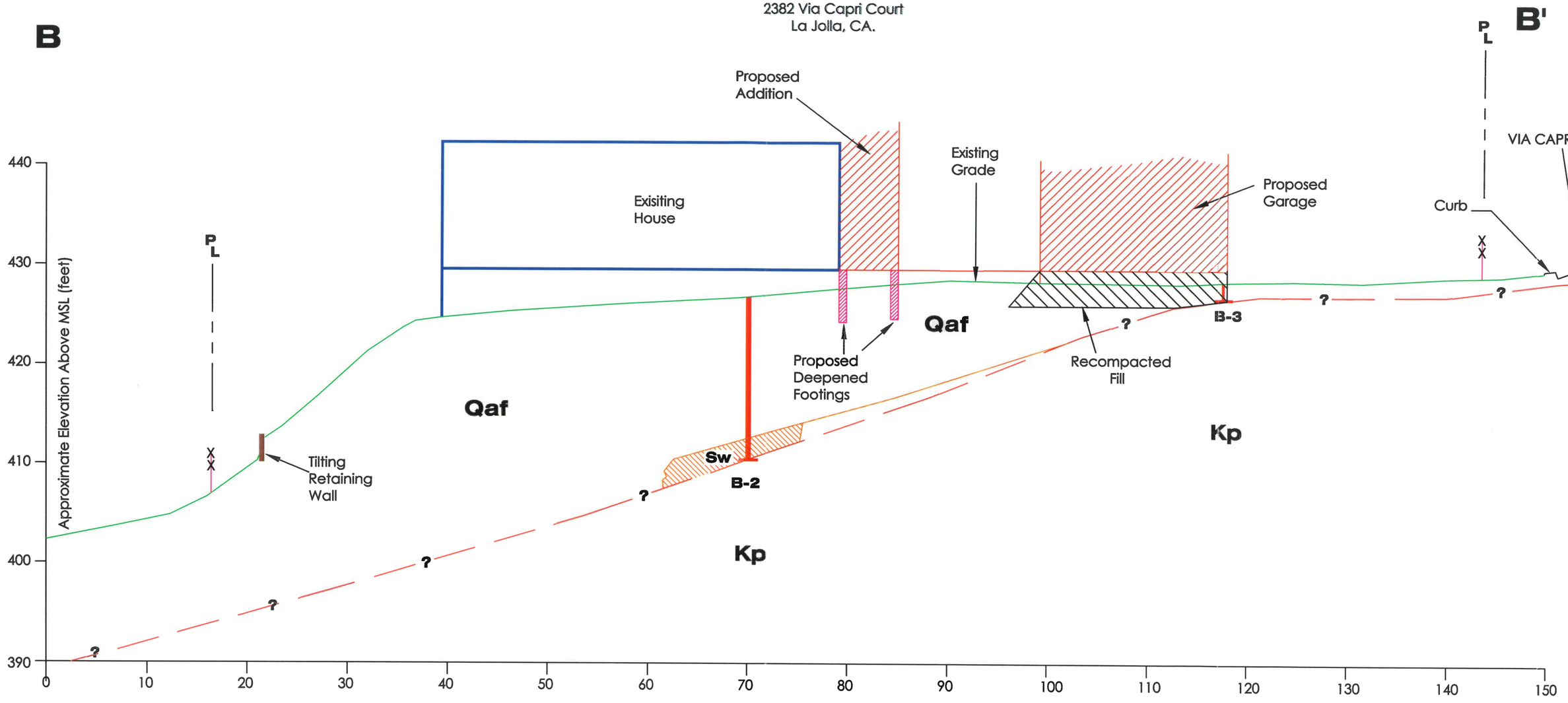
Figure No. IIb
Job No. 12-10122

Geotechnical Exploration, Inc.

November 2012

CROSS SECTION B-B'

Lambert Residence
2382 Via Capri Court
La Jolla, CA.



Scale: 1" = 10'
(Horizontal and Vertical)

Geologic Legend

Qaf	Artificial Fill
Sw	Slopewash
Kp	Point Loma Formation

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.

12-10122-BB

Figure No. IIc
Job No. 12-10122

Geotechnical Exploration, Inc.

April 2012
(revised November 2012)

ISSUE

Num

4

Geotechnical Exploration, Inc.
SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

11 July 2014

Mr. Bob Lambert
4135 Porte de Palmas, #217
San Diego, CA 92122

Job No. 12-10122

Subject: **Addendum Geotechnical Report**
Lambert Residence
2382 Via Capri Court
La Jolla, California

Dear Mr. Lambert:

As requested by the project architect, Mr. Scott Spencer and as required by the City of San Diego LDR-Geology reviewer, we herein address the geology/geotechnical review comments made by the reviewer in his Remaining Cycle Issues Memo, completion dated June 27, 2014. The reviewer indicates there are five outstanding issues as follows:

Issue No. 16: *"Site Plan-Project information, Lambert-Felice Residence, prepared by Scott A. Spencer & Associates, dated May 30, 2014 (New Issue)."*

Issue No. 17: *"Submit the following documents:*
Cycle Issues, Responses to City of San Diego, LDR-Geology Review, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc., dated November 13, 2012 (their project no. 12-10122).

Report of Preliminary Geotechnical Investigation, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc., dated April 26, 2012 (their project no.12-10122).

GEI-Response: We understand that the project architect is submitting copies of the requested documents indicated above.

Issue No. 18: *"Submit an addendum geotechnical investigation report or update letter that specifically addresses the revised development plans for the purposes of environmental review."*

Issue No. 19: *"Provide a revised geologic/geotechnical map and cross sections to show the currently proposed development."*

Issue No. 20: *"The project's geotechnical consultant must indicate if the site is suitable for the proposed development. (New Issue)."*

GEI Response: We include here the updated seismic soil parameters applicable to the 2013 CBC Edition. These values are in general lower than the ASCE 7-05 presented in our geotechnical investigation report dated April 26, 2012. The updated seismic soil parameters should be reviewed by the structural designer to evaluate if they unfavorably impact the structural design of the presently proposed remodel and additions. In addition, as required by BDR-Geology reviewer, we are including herewith an update of the geologic/geotechnical map and cross sections showing the currently proposed development. All geologic and geotechnical findings, and soil-related recommendations for foundations, slabs on grade, retaining walls, and improvement design presented in our April 26, 2012, report remain applicable. All new foundations, including underpinning where applicable, should penetrate into firm or stiff soils that are typically encountered at approximately 4 feet below the ground surface (unless dense formational soils are encountered at a shallower depth). Topsoils or fill soils in slab on-grade areas will need to be removed and properly recompacted under our observations and testing, as described in the April 26, 2012 report. In our opinion, the site is suitable for the proposed development, as illustrated in the attached updated plans.

The findings, opinions, and conclusions presented have been made in accordance with current geotechnical and geological engineering principles and practice in the City of San Diego. No warranty, either expressed or implied, is made.

If you have any questions regarding this letter, please contact our office. Reference to our **Job No. 12-10122** will help expedite a response to your inquiry.

Respectfully submitted,

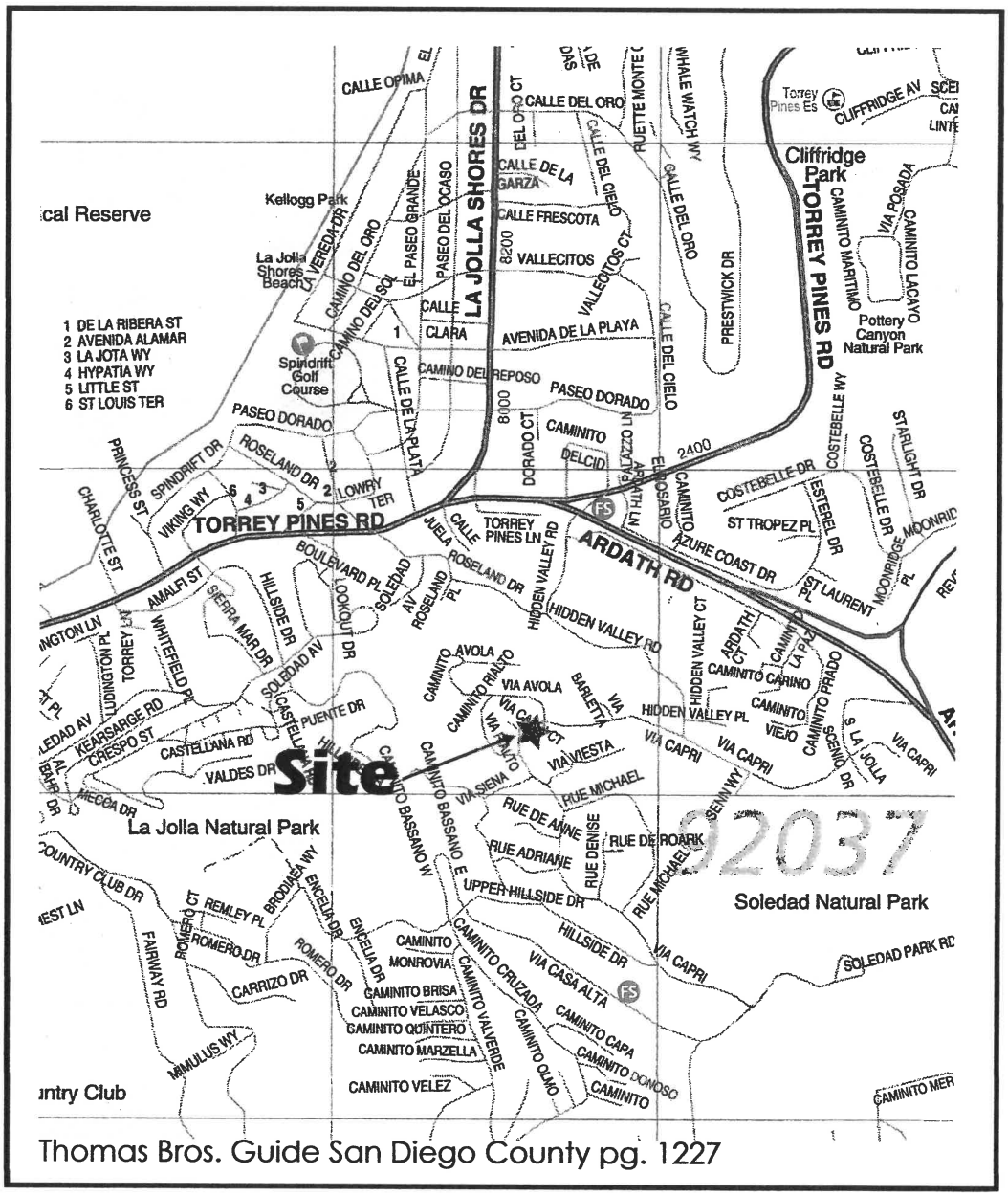
GEOTECHNICAL EXPLORATION, INC.

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

Leslie D. Reed, President
C.E.G 999/P.G. 3391

cc: Scott Spencer Architect

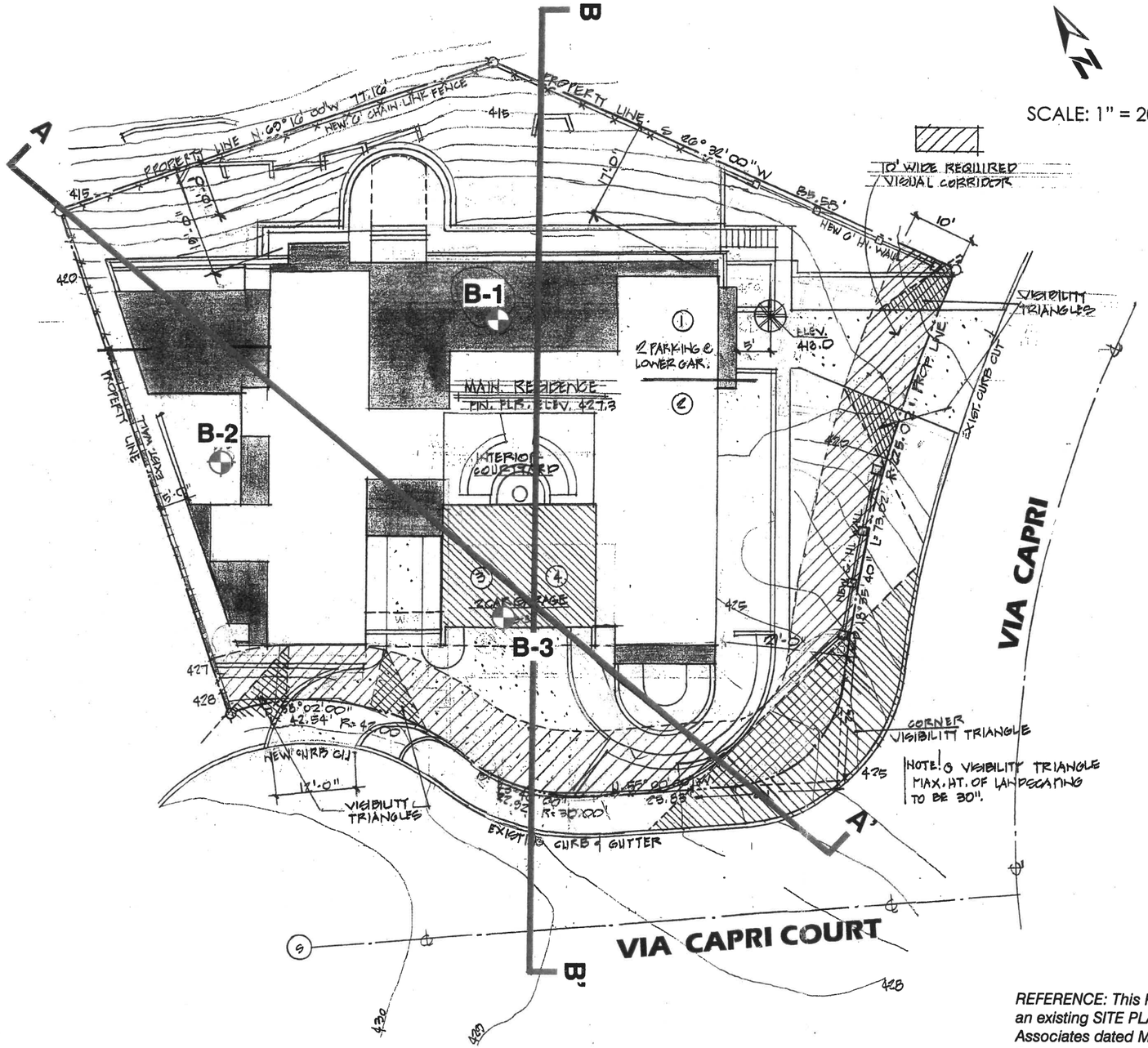
VICINITY MAP



Thomas Bros. Guide San Diego County pg. 1227

Lambert Residence
2382 Via Capri Court
La Jolla, CA.

Figure No. I
Job No. 12-10122



SCALE: 1" = 20'

Lambert - Felice Residence

Scott A. Spencer & Associates
1110 TORREY PINES ROAD, STE-D LA JOLLA, CA 92037
(858) 459-8888 (Fax) 459-8801

SHEET A-1 OF

PROJECT INFORMATION:

OWNERS: BOB LAMBERT - ROBIN FELICE
4135 PORTE de PALMAS # 217
SAN DIEGO, CA 92122
(B). 208.585.4789 (R) 858.337.1189
(e) BOB.LAMBERT@MORGANLEEGAN.COM

SITE PLAN

NORTH

EXISTING BUILDING AREA

AREA OF ADDITION @ MAIN LEVEL

AREA OF NEW GARAGE ADDITION @ MAIN LEVEL

NOTE! THE BUILDING IS LOCATED WEST OF INTERSTATE HIGHWAY I-5. THE HIGHEST POINT OF THE ROOF, EQUIPMENT OR ANY VENT, PIPE, ANTENNA, OR OTHER PROJECTION SHALL NOT EXCEED 30' ABOVE GRADE.

LEGEND

B-3 — Approximate Location of Exploratory Boring

A — A' — Approximate Line of Cross Section

PLOT PLAN

Lambert Residence
2382 Via Capri Court
La Jolla, CA.
Figure No. II
Job No. 12-10222

REFERENCE: This Plot Plan was prepared from an existing SITE PLAN by Scott A. Spencer and Associates dated May 30, 2014 and from on-site field reconnaissance performed by GEI.

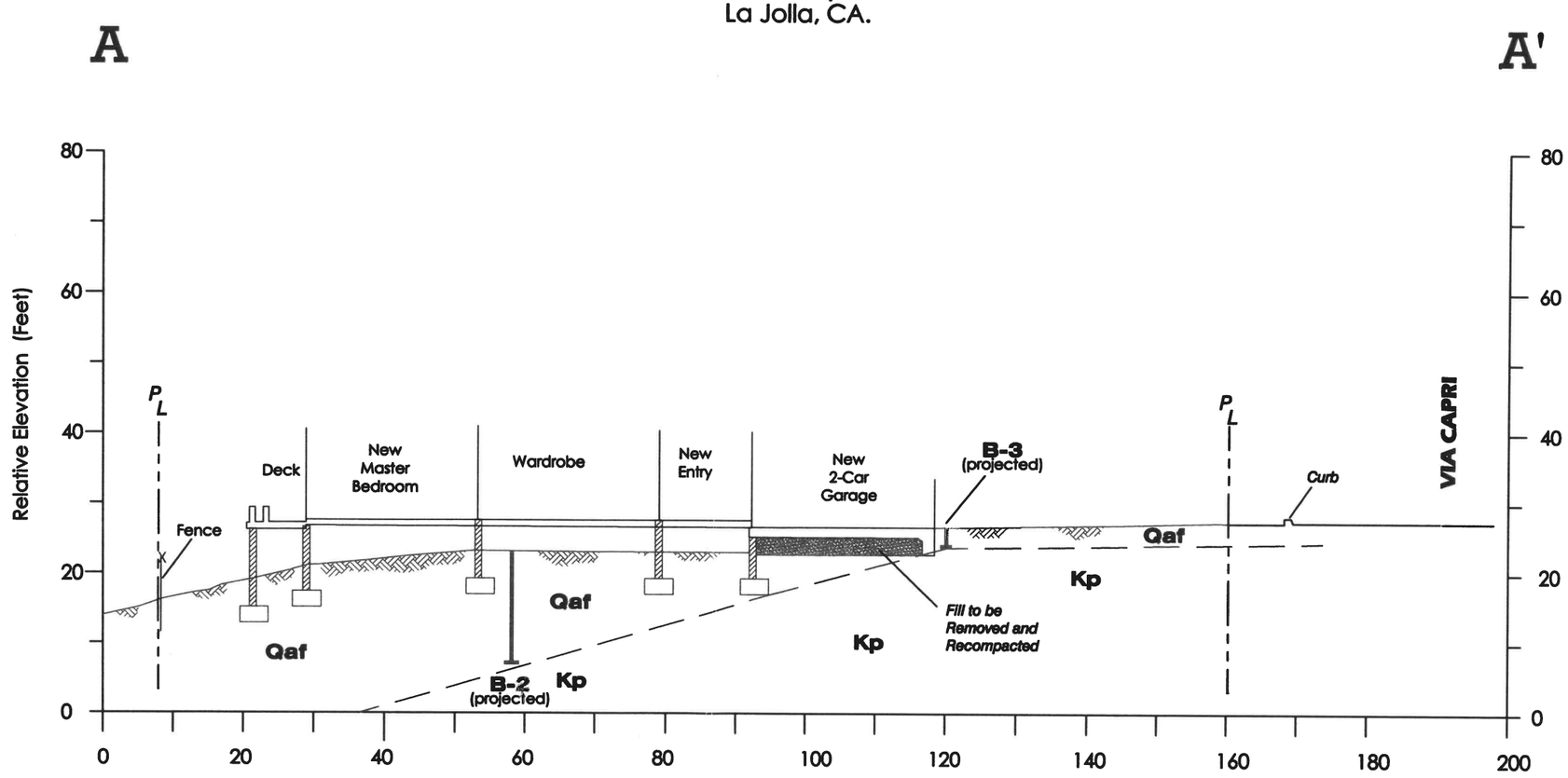
GEI Geotechnical Exploration, Inc.
July 2014

12-10122-p.ai

SCHEMATIC CROSS SECTION A-A'

Lambert Residence

2382 Via Carpri Court
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.

Job No. 12-10122

Geotechnical Exploration, Inc.

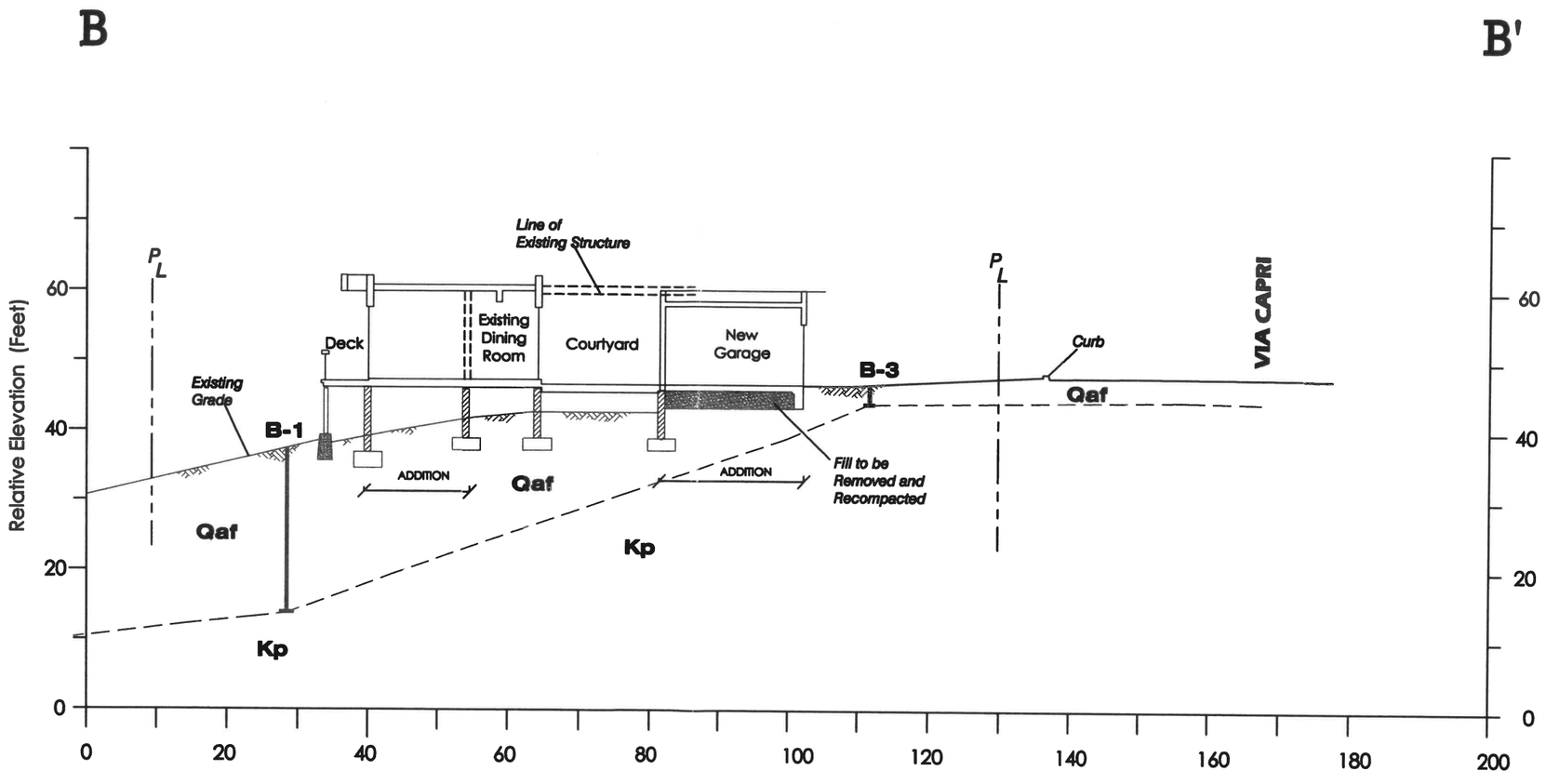
July 2014

12-10122-sa

SCHEMATIC CROSS SECTION B-B'

Lambert Residence

2382 Via Carpri Court
La Jolla, CA.



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.

Job No. 12-10122

Geotechnical Exploration, Inc.

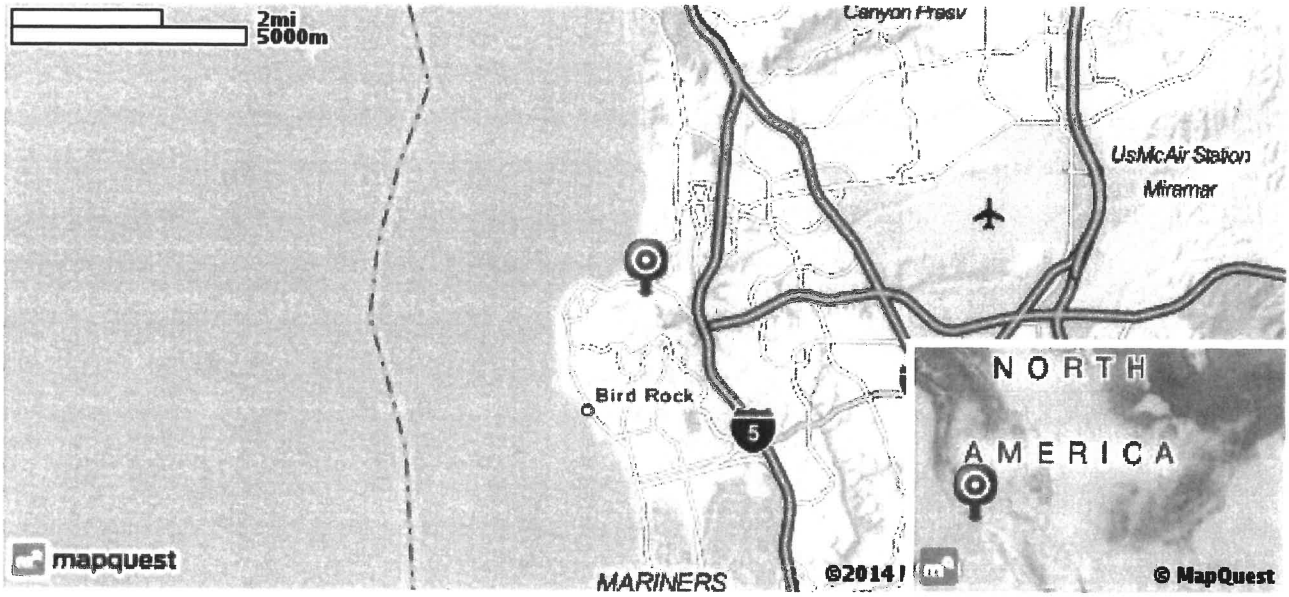
July 2014

12-10122-bb

USGS Design Maps Summary Report

User–Specified Input

Report Title	Lambert Property Thu July 10, 2014 15:52:01 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	32.8456°N, 117.2533°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

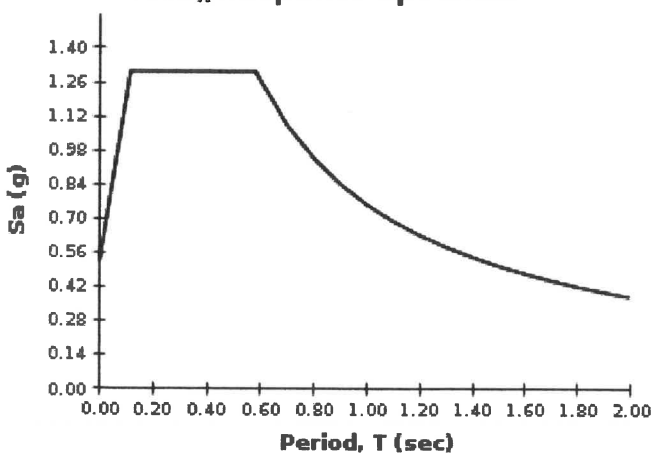


USGS–Provided Output

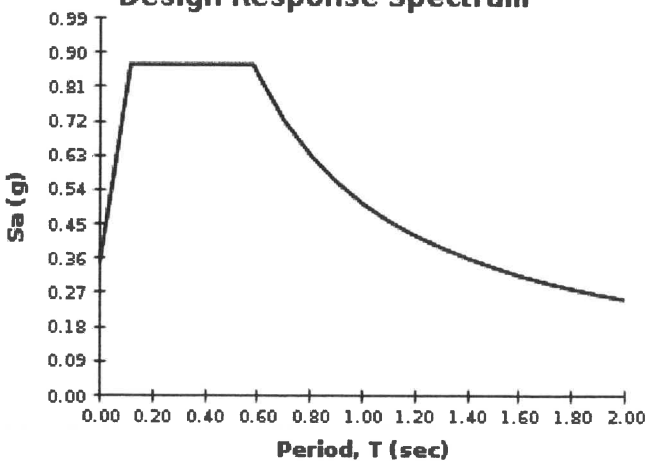
S_S =	1.304 g	S_{MS} =	1.304 g	S_{DS} =	0.869 g
S_1 =	0.505 g	S_{M1} =	0.758 g	S_{D1} =	0.505 g

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.

MCE_R Response Spectrum



Design Response Spectrum



For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

USGS Design Maps Detailed Report

ASCE 7-10 Standard (32.8456°N, 117.2533°W)

Site Class D – "Stiff Soil", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1] $S_S = 1.304$ g

From Figure 22-2 [2] $S_1 = 0.505$ g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index PI > 20, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_S

For Site Class = D and S_s = 1.304 g, F_a = 1.000

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.505 g, F_v = 1.500

Equation (11.4–1): $S_{MS} = F_a S_S = 1.000 \times 1.304 = 1.304$ g

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.500 \times 0.505 = 0.758$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

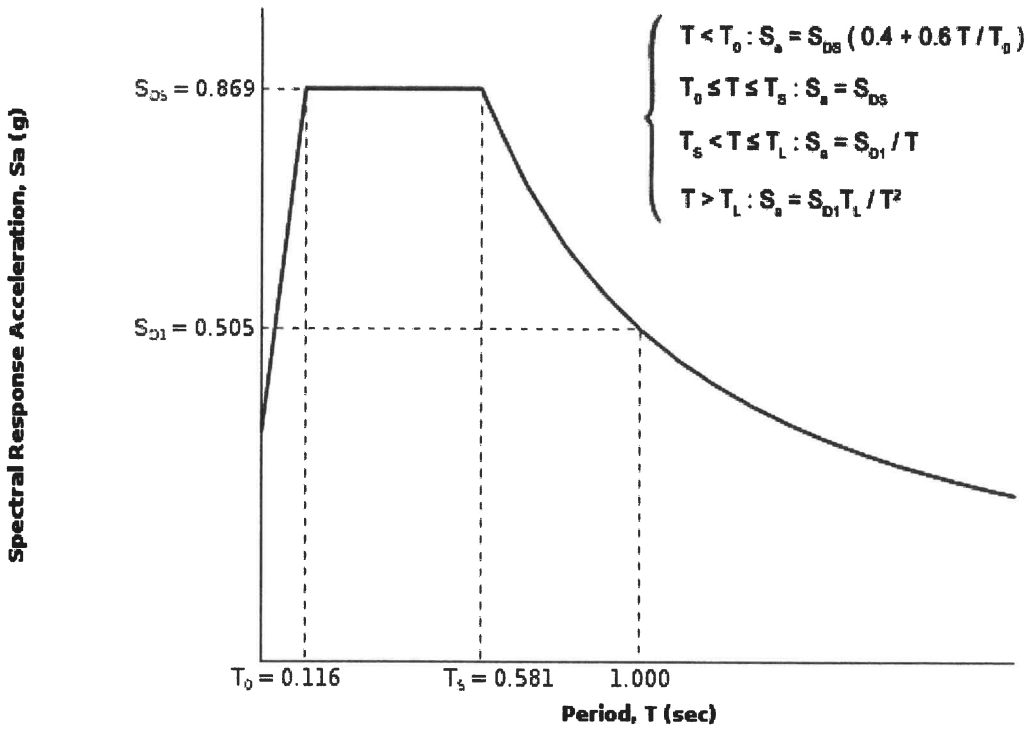
Equation (11.4–3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.304 = 0.869$ g

Equation (11.4–4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.758 = 0.505$ g

Section 11.4.5 — Design Response Spectrum

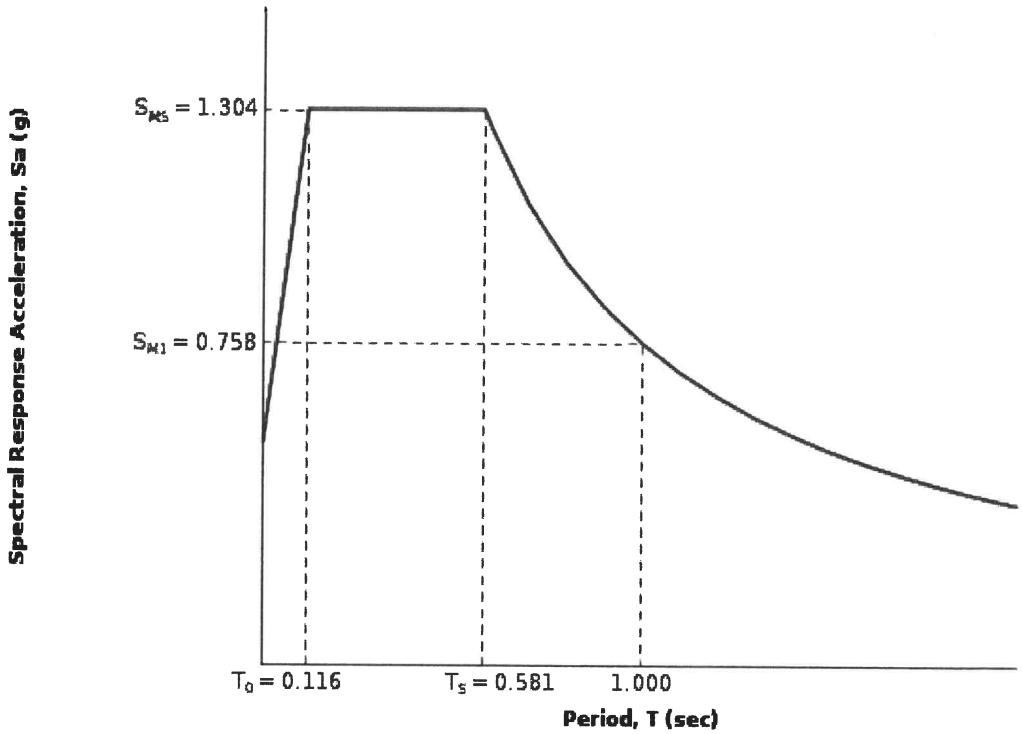
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.593

Equation (11.8–1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.593 = 0.593$ g

Table 11.8–1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.593 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 0.833

From Figure 22-18 [6] C_{R1} = 0.865

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 0.869 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.505 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

Review Information

Cycle Type:	18 Submitted (Multi-Discipline)	**Submitted:**	06/02/2014	Deemed Complete on 06/02/2014
Reviewing Discipline:	LDR-Geology	**Cycle Distributed:**	06/02/2014	
Reviewer:	Quinn, Jim	**Assigned:**	06/02/2014	
	(619) 446-5334	**Started:**	06/02/2014	
	jpquinn@sandiego.gov	**Review Due:**	06/23/2014	
Hours of Review:	0.50	**Completed:**	06/27/2014	COMPLETED LATE
Next Review Method:	Submitted (Multi-Discipline)	**Closed:**	06/27/2014	

. The review due date was changed to 07/02/2014 from 06/26/2014 per agreement with customer.
. The reviewer has indicated they want to review this project again. Reason chosen by the reviewer: Change In Project Scope.
. We request a 5th complete submittal for LDR-Geology on this project as: Submitted (Multi-Discipline).
. The reviewer has requested more documents be submitted.
. Your project still has 5 outstanding review issues with LDR-Geology (all of which are new).
. The reviewer has not signed off 1 job.
. Last month LDR-Geology performed 58 reviews, 48.3% were on-time, and 77.8% were on projects at less than < 3 complete submittals.

288444-18 (6/27/2014)

Reference

Cleared?	Issue Num	Issue Text
☐	16	Site Plan - Project Information, Lambert-Felice Residence, prepared by Scott A. Spencer & Associates, dated May 30, 2014 (New Issue)

Comment

Cleared?	Issue Num	Issue Text
☐	17	Submit the following documents: Cycle Issues Responses to City of San Diego, LDR-Geology Review, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc., dated November 13, 2012 (their project no. 12-10122) Report of Preliminary Geotechnical Investigation, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc., dated April 26, 2012 (their project no. 12-10122) (New Issue)
☐	18	Submit an addendum geotechnical investigation report or update letter that specifically addresses the revised development plans for the purposes of environmental review. (New Issue)
☐	19	Provide a revised geologic/ geotechnical map and cross sections to show the currently proposed development. (New Issue)
☐	20	The project's geotechnical consultant must indicate if the site is suitable for the proposed development. (New Issue)

Jaime

ISSUE

Num

5

Geotechnical Exploration, Inc.
SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

13 April 2015

Mr. Bob Lambert
4135 Porte de Palmas
San Diego, CA 92122

Job No. 12-10122

Subject: **Response to City of San Diego LDR-Geology Cycle Issues**
Lambert Residence Remodel and Additions
2382 Via Capri Court
La Jolla, California

Dear Mr. Lambert:

Geotechnical Exploration, Inc. herein responds to the geotechnical issues raised in the Cycle Issues (Cycle Type 7 BDR- Geology) review by the geologic staff of the City of San Diego's Development Services Department dated March 26, 2015. The BDR-Geology reviewer has reviewed the following GEI documents for your property:

1. "Caissons Soil Design Parameters and Recommendations" dated February 26, 2015.

2. "Addendum Geotechnical Report" dated July 11, 2014.

3. "Cycle Issues Responses to City of San Diego, LDR-Geology Review" dated November 13, 2012.

4. "Report of Preliminary Geotechnical Investigation" dated April 26, 2012.

The BDR-Geology reviewer has also reviewed the following documents:

a. "Notice of Geologic and Geotechnical Conditions, Recorded June 6, 2013, in the Office of the County Recorder San Diego County Document Number 2013-0369388."

b. "Building Plans, Lambert-Felice Residence, Robert Lambert & Robin Felice, 2382 Via Capri Court, Architectural Plans prepared by Scott A. Spencer & Associates, dated March 9, 2015; Structural Plans prepared by Delta Engineering, dated October 29, 2014 (their project No.2014-23)."

The BDR-Geology reviewer has the following comments:

BDR-Geology Issue No. 4: *"Submit and addendum geotechnical report or update letter that specifically addresses and provides recommendations as deemed necessary for the referenced building plans. The addendum geotechnical report or update letter should be signed by a soils engineer and engineering geologist".*

GEI Response: We have reviewed the referenced project plans and, in general, we found them to be in compliance with the recommendations presented in our documents referred to herein. The only part of the project presented on the architectural plans and not addressed in the structural plans is the new deck to be built on the north side of the residential structure. The shallow footings for the deck need to be deepened to penetrate at least 4 feet below the ground surface and at least 18 inches into existing firm fill soils.

Shallow continuous footings for the house are to penetrate into existing fill soils at least 6 feet below the ground surface or be replaced with a caisson and grade-beam system, with the caissons penetrating at least 10 feet into formational soils, similar to the new caisson foundations for the house. Other recommendations presented in

our previous reports for the project are applicable and have been adequately addressed in the reviewed project plans.

BDR-Geology Issue No. 5: *(New Issue) "Revise the geologic map and cross sections if deemed necessary to show the proposed construction."*

GEI Response: It is our opinion that the geologic map and cross sections presented in our July 11, 2014, addendum report adequately show the proposed new construction and geology and do not need to be revised.

BDR-Geology Issue No. 6: *(New Issue) "The project's geotechnical consultant indicates that the site is situated on a large primarily ancient landslide complex (11/13/2012, p.4). The consultant provides recommendations for foundation embedment in formational soils (2/26/2015). The consultant should clarify what formational soils means in context with the geologic conditions of the site and anticipated geotechnical properties."*

GEI Response: The caisson recommendations presented in our February 26, 2015, report indicate that the project caisson foundations shall penetrate at least 10 feet into the Point Loma formational soils encountered at relatively shallow depth below the ground surface and underneath the site existing fill soils. Although thought to be part of the ancient landslide complex, the formational soils encountered during exploration possess adequate formational bearing characteristics. In our previous report, we assigned an end bearing value of 1,800 psf and the recommended caissons will, in our opinion, be adequate to support the structure design vertical and horizontal loads. The caissons are not intended to address the landslide complex.

BDR Geology Issue No. 7: *"The building plans call for embedment in dense formation. The project's geotechnical consultant should clarify the geotechnical embedment requirement based on site geology for the deep foundations shown on the plans."*

GEI Response: As stated in our Issue No. 6 response, although part of the northern flank landslide complex, the formational materials encountered during exploration were not disturbed enough to significantly reduce their geotechnical strength characteristics. We consider the recommended embedment depths to be adequate.

BDR Geology Issue No. 8: *(New Issue) "Clarify if detailed geologic logging of the caisson drilling or pier excavation operations is recommended."*

GEI Response: Geologic (downhole) logging of the formational materials is not considered warranted. Placement and logging of large-diameter borings in the vicinity of the project, including two recent borings to the northeast on Via Capri, revealed good bearing, competent formational materials within the landslide complex at shallow depths. Furthermore, landslide basal and interior slip planes have been shown by past drilling in the area to exist at depths too deep to be encountered in the proposed shallow caisson excavations.

BDR Geology Issue No. 9: *(New Issue) "The project's geotechnical consultant should review the referenced building plans and indicate if those plans are in accordance with their findings and recommendations."*

GEI Response: We have reviewed the building plans dated March 9, 2015, and find them in substantial conformance with our recommendations. As discussed in our

Issue No. 4 response, the plans do not show the proposed northern deck for which we have provided recommendations.

Recommendations presented here and in previous reports for the project remain applicable unless superseded in writing by our firm. Our findings and conclusions are based upon all available data obtained from the field reconnaissance and research, as well as our experience with the soils and native materials located in the La Jolla area of the City of San Diego. 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 City of San Diego.

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. 12-10122** 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

Leslie D. Reed, President
C.E.G. 999/P.G. 3391

ISSUE

Num

6

DVD

ISSUE

Num

7

DOC # 2013-0369388

JUN 12, 2013 10:08 AM

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
Ernest J. Dronenburg, Jr., COUNTY RECORDER
FEES: 28.00

8480

PAGES: 5

FS
5P
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INDEXING INSTRUCTION:
Index as Agreement Affecting Real Property

RECORDING REQUESTED BY
and when recorded mail to:

Robert Lambert and Robin Felice
4135 Porte de Palmas #217
San Diego, CA 92122
288444 / 1078321

Space above this line for Recorder's use

CITY OF SAN DIEGO
NOTICE OF GEOLOGIC AND GEOTECHNICAL CONDITIONS

ASSESSORS PARCEL NUMBER
352-161-07

PROPERTY ADDRESS
2382 Via Capri Court
San Diego, CA 92037

The subject property is more specifically described as:
Lot 9 Hidden Valley Hills, Unit 1, Map 3921in the City of San Diego, County of San Diego, State of California, on File in the Office of the County Recorder.

GENERAL

To: Robert Lambert and Robin Felice, referred to as Owner(s): You and your geotechnical consultant, Geotechnical Exploration, Inc. (GEI), have reviewed the geologic and geotechnical reports referenced on page 4 regarding the subject property. As indicated in the referenced documents, GEI has identified that the subject property is located within the Rose Canyon fault zone and on an ancient landslide. GEI has investigated the site and opined that the site is suitable for the proposed project.

At the present time, the available information is not sufficient to allow a reliable assessment of the level of risk and extent of hazard to which this property and the improvements constructed thereon may be subject because of geologic hazards and other conditions. The presently known facts suggest that these conditions may present a hazard, therefore, the City has the following conditions and requirements.

CONDITIONS, HOLD HARMLESS AND ASSUMPTION OF RISK AND COSTS

A Site Development Permit and Coastal Development Permit Application for construction on this property has been filed with the City of San Diego Development Services Department for (PTS 288444). Pursuant to San Diego Municipal Code §145.1803a(3), the City of San Diego requires the following conditions: (1) The Owner(s) acknowledges by their signature(s) hereon that they have been informed by their consultant of geological conditions, which may constitute a defect or hazard, and they accept the risk and sole responsibility due to these conditions in connection with the development on their property; (2) the Owner(s) certify by its (their) signature(s) hereon that they are fully aware of the information set forth in the documents referenced on page 4 of this Notice; (3) the Owner(s), during the term of its (their) ownership, and its (their) successors, heirs, assignees, transferees and grantees, during their respective terms of ownership, hereby agree to indemnify, defend and hold harmless the City of San Diego, its employees and agents from any and all costs, losses, liabilities or damages resulting from bodily injury, property damage or death to the Owner(s), its (their) family, guests, invitees, visitors, employees, agents or contractors, which occur on the subject property, which are sustained, caused or result from failure of the permitted structure(s), underlying soils, slopes, or utilities which are beneath or adjacent to the referenced property due to ground movement or the presence of faulting on the subject property. The Owner(s), its (their) successors, heirs, assignees, transferees, and grantees, during their respective terms of ownership, also agree to voluntarily assume all risks and costs, known or unknown, associated with ownership, use, development, occupancy, or maintenance of the subject property.

The Owner(s) hereby declare(s) that all property described above is held and shall be held, conveyed, hypothecated or encumbered, leased, rented, used, occupied and improved or maintained subject to the covenants contained herein, which shall run with the land and shall be binding on all parties having or acquiring a right, title or interest in the described lands or any part thereof.

The Owner(s) agree and acknowledge that the City of San Diego may agree to remove this covenant from the subject properties and release the owner and subsequent owners of the property from the hold harmless portion of this agreement by a writing setting forth the release and removal signed by the Chief Executive Officer or designee and thereafter recorded with the County Recorder's Office in the County of San Diego, California. The City of San Diego shall possess the sole authority for determining when and if such removal and release of that portion of the agreement is reasonable and appropriate based on geologic, geotechnical, and other appropriate conditions.

8482

ACKNOWLEDGMENT

~~I~~ (We), the recorded owner of this property, have read and understand this NOTICE, have received a copy, and agree to the above conditions on behalf of all of our heirs, successors in interest, assignees, transferees, and grantees. ~~I~~ (We) accept the indemnity, hold harmless, assumption of the risk and related responsibilities in connection with the construction authorized. ~~I am~~ (We are) aware that this document will be recorded with the County Recorder, and that these obligations shall run with the land.

For the City of San Diego:

Jeffrey D. Strohminger, PE
Program Manager
Development Services

Dated: 1-30-13

For the Owner(s): Robert Lambert and Robin Felice

By: _____
Notarized Signature

Name: ROBERT LAMBERT

Title: OWNER

Date: 1/2/2013

By: _____
Notarized Signature

Name: Robin Felice

Title: OWNER

Date: 1/2/13

C. M. IGUAL DE MONTIJO
COMM. #1846462
NOTARY PUBLIC • CALIFORNIA
SAN DIEGO COUNTY
Commission Expires Apr 26, 2013

1/2/13

C. M. IGUAL DE MONTIJO
COMM. #1846462
NOTARY PUBLIC • CALIFORNIA
SAN DIEGO COUNTY
Commission Expires Apr 26, 2013

1/2/13

REFERENCES

1. Cycle Issues Responses to City of San Diego, LDR-Geology Review, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc., dated November 13, 2012 (their project no. 12-10122)

2. Report of Preliminary Geotechnical Investigation, Lambert Residence Additions, 2382 Via Capri Court, La Jolla, California, prepared by Geotechnical Exploration, Inc., dated April 26, 2012 (their project no. 12-10122)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

CIVIL CODE § 1189

State of California
County of San Diego

8484

On 01-02-13 (Date) before me, C.M. Igual De Montijo, Notary Public (Here Insert Name and Title of the Officer)

personally appeared Robert Lambert + Robin Felice (Name(s) of Signer(s))

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) ~~is~~/are subscribed to the within instrument and acknowledged to me that ~~he/she~~/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

C. M. Igual De Montijo
COMM. #2016549
NOTARY PUBLIC • CALIFORNIA
SAN DIEGO COUNTY
Commission Expires Apr 26, 2017

Signature: C M Igual De Montijo (Signature of Notary Public)

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: Notice of Geologic & Geotechnical Conditions

Document Date: _____ Number of Pages: 4

Signer(s) Other Than Named Above: —

Capacity(ies) Claimed by Signer(s)

Signer's Name: Robert Lambert	Signer's Name: Robin Felice
☐ Corporate Officer — Title(s): _____	☐ Corporate Officer — Title(s): _____
☑ Individual	☑ Individual
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact	☐ Attorney in Fact
☐ Trustee	☐ Trustee
☐ Guardian or Conservator	☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer Is Representing: Self	Signer Is Representing: Self

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Item #5907