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Garcia LLC
4021 North 75th Street
Scottsdale, AZ 85258

September 20, 2017
P/W 1705-04
Report No. 1705-04-B-4

Attention: **Mr. Francisco Gracia**

Subject: **Geotechnical Addendum, Response to Cycle Review Comments, LDR-Geology, Regarding Geotechnical/Geologic Feasibility Report for 8247 Paseo Del Ocaso Project, La Jolla Area, City of San Diego, California**

References: Attached

Gentlemen:

In accordance with your request, Advanced Geotechnical Solutions, Inc. (AGS) has prepared this response to LDR-Geology Cycle Review comments from the City of San Diego regarding the proposed residential development at 8247 Paseo Del Ocaso Project, La Jolla Area, City of San Diego, California. In preparing this response to cycle review comments we have first presented the review comment followed by our response. Specifically, AGS has prepared responses to Items 2 through 8 (dated August 31, 2017) of LDR-Geology comments.

***Item 2* -City of San Diego-** *Submit an addendum geotechnical report or update letter that specifically addresses the proposed development for the purposes of environmental review and the following:*

AGS response – In preparing this addendum letter, AGS has prepared a Preliminary Geotechnical Investigation (AGS 2017b) which specifically addresses the proposed development for the purposes of environmental review. See Report No. 1705-04-B-3, Dated September 19, 2017.

***Item 3*-City of San Diego-** *The geotechnical investigation report must contain a site specific geologic/geotechnical map that shows the distribution of fill and geologic units, location of exploratory excavations, and circumscribes the anticipated limits of recommended remedial grading.*

AGS response – The attached Preliminary Geotechnical Investigation (AGS 2017b) contains a site specific geologic/geotechnical map that shows the distribution of fill, geologic units, and location of exploratory excavations. See Plate 1, Geologic Map and Exploration Location Plan.

***Item 4* -City of San Diego-** *Provide representative geologic/geotechnical cross sections that show the existing and proposed grades, distribution of fill and geologic units, and groundwater conditions.*

AGS response – The attached Preliminary Geotechnical Investigation (AGS 2017b) contains geologic/geotechnical cross sections (AA' & BB') which depict existing and proposed grades, distribution of fill and geologic units, and groundwater conditions. See Plates 2 & 3, Geologic Cross-Sections AA & BB.

***Item 5* -City of San Diego-** *The project's geotechnical consultant should provide a conclusion regarding if the proposed development will destabilize or result in settlement of adjacent property or the Right-of-Way.*

AGS response – The attached Preliminary Geotechnical Investigation (AGS 2017b) contains Section 8.1 – Grading Recommendations and Section 8.2 – Excavation, Dewatering and Shoring.

It is AGS's opinion that construction of the proposed residential structure will not destabilize or result in settlement of adjacent property or Right-of-Way provided, the recommendations presented in our referenced report (AGS 2017b) are incorporated into the design and construction of the project.

Item 6 -City of San Diego- *The project's geotechnical consultant should update Section 2.3.3 of the referenced report and indicate what the risk of landsliding at the subject site is considered to be.*

AGS response – The attached Preliminary Geotechnical Investigation (AGS 2017b) contains Section 6.5.6 – Seismically Induced Landsliding. Within Section 6.5.6, AGS indicates the risk of landsliding at the subject site is "remote".

Item 7 -City of San Diego- *Indicate if the proposed construction will impact groundwater flow or quality.*

AGS response – Groundwater was not encountered during our exploratory excavations and is not anticipated to be encountered during construction of the proposed residential structure.

Item 8 -City of San Diego- *Clarify if the proposed basement will be designed to be water tight or if a basement wall draining system is proposed. The consultant could consider reviewing Chapter 15, section 1510.0403 of the San Diego Municipal Code.*

AGS response – As recommended in our Preliminary Geotechnical Investigation, (AGS 2017b): All basements walls should be water proofed such that they are water tight. Final design of the waterproofing should be determined by the Architect.

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

Respectfully Submitted,
Advanced Geotechnical Solutions, Inc.

Prepared by:

SHANE P. SMITH
Staff Engineer

Reviewed by:

JEFFREY A. CHANEY, President
RCE 46544 / RGE 2314, Reg. Exp. 6-30-19

PAUL J. DERISI, Vice President
CEG 2536, Reg. Exp. 5-31-19

Distribution: (1) Addressee
(5) M Lake Development, Att: Mike Lake

Attachments: References
Appendix A – Preliminary Geotechnical Investigation, Report No. 1705-04-B-3

REFERENCES

Advanced Geotechnical Solutions, Inc., (2017b), Preliminary Geotechnical Investigation for 8247 Paseo Del Ocaso Project, La Jolla Area, City of San Diego, California dated May 12, 2017, Report No. 1705-04-B-3

Advanced Geotechnical Solutions, Inc., (2017a), Geotechnical/Geologic Feasibility Report, 8247 Paseo Del Ocaso, City of San Diego, California, dated May 12, 2017, Report No. 1705-04-B-2

California Building Standards Commission, 2016 *California Building Code*.

City of San Diego, 2008. *Seismic Safety Study*, Grid Tile 30, dated April 3, 2008.

Federal Emergency Management Agency (FEMA), 2012, *Flood Maps*. San Diego County, California. Map Number 06073C1582G. Effective May 16, 2012.

State of California Water Quality Control Board, Geotracker.org, depth to groundwater data, Site T-0607301734, collected 9-26-02, case closed.

Historic Aerial Photography. Www.Historicaerials.com. Photos from 1953, 1964, 1966, 1980, 1990, 1994, 1997, 2002, 2003, 2005, 2009, 2010, and 2012.

Kennedy, M.P. and Tan, S.S. (2008). *Geologic Map of the San Diego 30' x 60' Quadrangle, California,* 1:100,000 Scale.

USGS, 2008, National Seismic Hazards Maps-Source Parameters, accessed 5-10-17.

Victor Rodriquez – Fernadez Civil Engineer & Land Surveyor, 10-Scale Drainage Plan, 8247 Paseo Del Ocaso Street, dated July 2017.

APPENDIX A

PRELIMINARY GEOTECHNICAL INVESTIGATION REPORT

(1705-04-B-3, September 19, 2017)

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September 19, 2017
P/W 1705-04
Report No. 1705-04-B-3

Attention: Mr. Francisco Gracia

Subject: **Preliminary Geotechnical Investigation for Proposed Single-Family Residence, 8247 Paseo Del Ocaso Project, La Jolla Area, City of San Diego, California**

Gentleperson:

In accordance with your request, presented herein are the results of Advanced Geotechnical Solutions, Inc.'s (AGS) preliminary geotechnical investigation and design recommendations for the proposed two story residential structure supported by a subterranean basement located at 8247 Paseo Del Ocaso, La Jolla area, City of San Diego, California.

The recommendations presented in the following report are based on a subsurface investigation performed by AGS and associated laboratory testing. It is AGS's opinion, from a geotechnical standpoint, the subject site is suitable for construction of the proposed two story residential structure supported by a subterranean basement provided the recommendations presented in this report are incorporated into the design, planning and construction phases of site development. Included in this report are: 1) engineering characteristics of the onsite soils; 2) unsuitable soil removal recommendations; 3) grading recommendations; 4) foundation design recommendations; and 5) flatwork recommendations.

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

Respectfully Submitted,
Advanced Geotechnical Solutions, Inc.

Prepared by:

SHANE P. SMITH
Staff Engineer

REGISTERED PROFESSIONAL ENGINEER
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PROFESSIONAL GEOLOGIST
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Reviewed by:

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PAUL J. DERISI, Vice President
CEG 2536, Reg. Exp. 5-31-19

Distribution: (1) Addressee
(5) M Lake Development Att: Mike Lake

ATTACHMENTS:

FIGURE 1- SITE LOCATION MAP
FIGURE 2- REGIONAL GEOLOGIC MAP
FIGURE 3- SEISMIC HAZARDS MAP
FIGURE 4- TSUNAMI INUNDATION MAP

APPENDIX A- REFERENCES
APPENDIX B- SUBSURFACE LOGS
APPENDIX C- LABORATORY TEST RESULTS
APPENDIX D- EARTHWORK SPECIFICATIONS AND GRADING DETAILS
APPENDIX E- HOMEOWNERS MAINTENANCE RECCOMENDATIONS

PLATE 1- GEOLOGIC MAP AND EXPLORATION LOCATION PLAN
PLATES 2&3 - CROSS SECTIONS AA & BB

PELIMINARY GEOTECHNICAL INVESTIGATION FOR PROPOSED SINGLE-FAMILY RESIDENCE, 8247 PASEO DEL OCASO, LA JOLLA AREA, CITY OF SAN DIEGO, CALIFORNIA

1.0 SCOPE OF SERVICES

In preparing this study AGS reviewed the 10-scale Drainage Plans Prepared by Victor Rodriguez-Fernadez Civil Engineering & Land Surveying. This study is aimed at providing geotechnical information as it relates to: 1) existing site soil conditions; 2) discussion of the geologic units onsite; 3) limited seismic hazard analysis; 4) engineering characteristics of the onsite soils; 5) excavation characteristics of earth materials; 6) remedial grading recommendations; 7) seismic design parameters for use in structural design; 8) shoring recommendation for proposed basement excavation; and 9) preliminary foundation design parameters for the proposed two story structure with a subterranean basement.

The scope of our study included the following tasks:

- Review of pertinent published and unpublished geologic and geotechnical literature, maps, and aerial photographs
- Excavate, log and sample two (2) 6-inch diameter solid stem flight auger borings with a limited access tripod drill rig to a maximum depth of 19.5 feet below ground surface (bgs), (Plate 1 and Appendix B).
- Describe general soil conditions and provide boring logs indicating soil variations and lithologic changes (Appendix B).
- Laboratory testing of both ring and bulk samples including: shear strength, consolidation, grain size analysis, moisture and density; expansion, and chemical/resistivity (Appendix C).
- Evaluate suitability of the on-site earth materials for use as compacted fills under building slabs and pavements.
- Prepare a Geologic Map and Exploration Location Plan showing exploration locations and onsite geologic units (Plate 1).
- Prepare Geologic Cross-Sections AA' & BB' showing existing conditions, proposed conditions, exploration locations and geologic units (Plates 2 & 3).
- Determine recommended depths of "unsuitable "soils for support of the proposed improvements.
- Provide compaction criteria and earthwork specifications.
- Identify Site Classification in accordance with the 2016 *California Building Code.*
- Limited seismic hazard evaluation and assessment of liquefaction potential.
- Determine bearing design parameters.
- Provide shoring recommendations.
- Provide foundation design recommendations.
- Estimate differential and total foundation settlements based upon the borings and laboratory data.
- Determine whether native material is expected to be reactive with normal cements and with buried ferrous construction materials.
- Prepare this report, which will be suitable for design, bidding and regulatory review. Three copies of this report along with a digital file will be provided to you for submittal and for your records.

2.0 GEOTECHNICAL STUDY LIMITATIONS

The conclusions and recommendations in this report are professional opinions based on our field investigation, associated lab testing, review of referenced maps, and our experience in the area.

The materials immediately adjacent to or beneath those observed may have different characteristics than those observed. No representations are made as to the quality or extent of materials not observed. Any evaluation regarding the presence or absence of hazardous material is beyond the scope of this firm's services.

3.0 SITE LOCATION AND DESCRIPTION

The rectangular shaped lot is approximately 80 feet wide and 100 feet deep. The lot currently supports a single family residential slab-on-grade, wood frame structure and associated improvements. The site is bounded to the north, east, and south by existing residential structures and to the west by Paseo Del Ocaso (Figure 1, Site Location Map). Approximate grades onsite are estimated to range from 21.5 msl to 25 msl. Review of historic aerial photographs indicate the subject site was originally developed as a single family home between the years of 1953 and 1964. In the 1964 aerial photograph, the site has been developed with a single family residence. No major changes at the subject lot were seen in the following years. It is likely that during the initial development that minor fills may have been placed on the site.

4.0 PROPOSED DEVELOPMENT

As AGS understands, the existing single-story structure will be demolished and a new two-story residential structure with a subterranean basement will be constructed. It is currently planned to support the structure on a basement/conventional foundation system. In addition to the structures, associated parking areas, landscape and other minor lot improvements are proposed.

5.0 FIELD AND LABORATORY INVESTIGATION

5.1. Previous Investigation

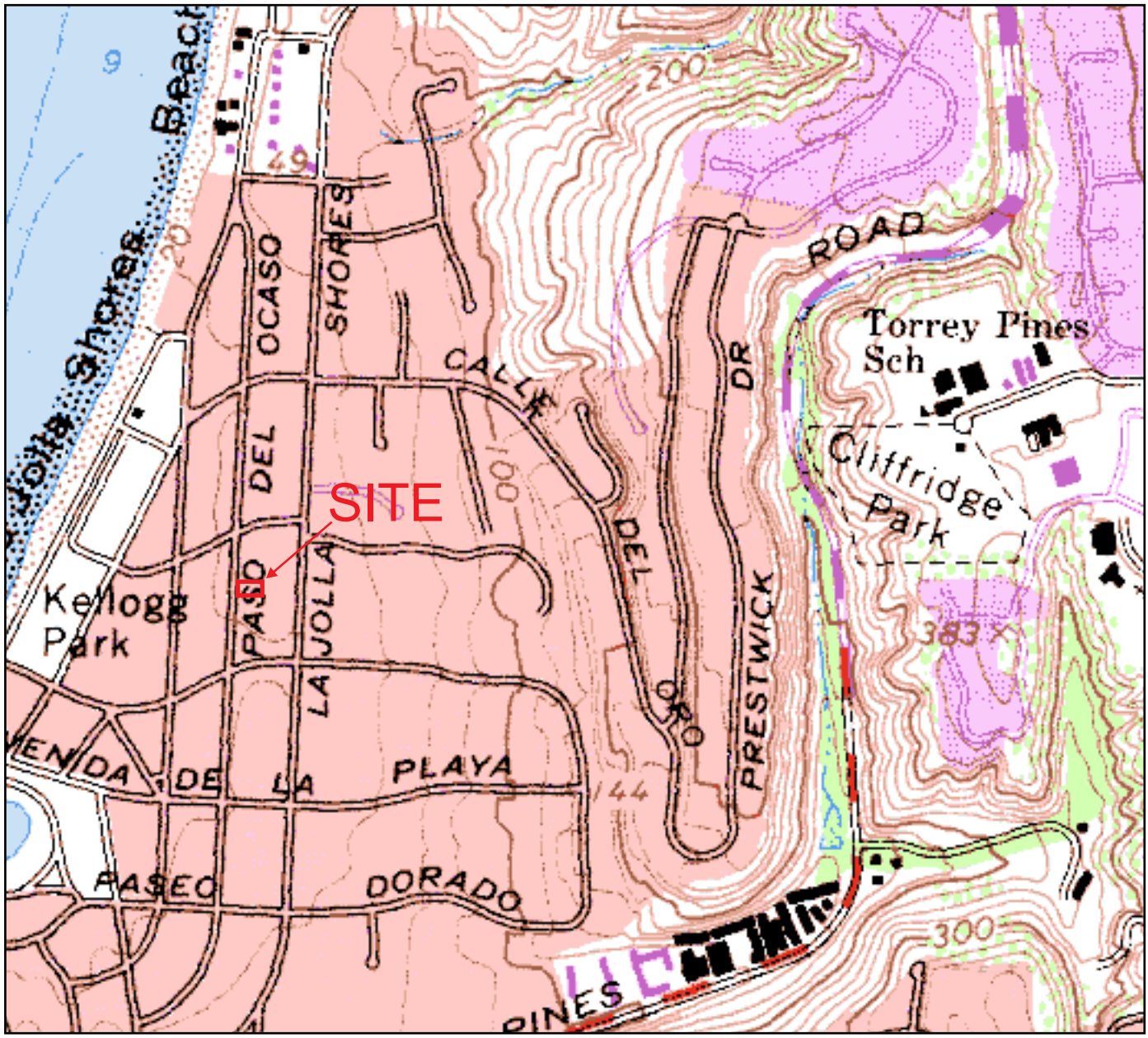
AGS prepared a Geotechnical/Geologic Feasibility Report dated May 12, 2017, Report No. 1705-04-B-2. This study consisted of a visual site reconnaissance and research of readily available records, published reports, and City of San Diego fault and geologic maps.

5.2. Current Investigation

The current scope of services consisted of the following: review of the referenced documents; review of geologic maps; and a subsurface exploration program at the subject site to evaluate the onsite soil conditions. As part of our subsurface investigation two solid stem flight auger borings (B-1 and B-2) were excavated, logged and sampled to a maximum depth of 19.5 feet bgs. These borings were excavated at the approximate locations shown on Plate 1. Boring logs are presented in Appendix B.

5.3. Laboratory Investigation

Bulk, “undisturbed” and SPT samples were obtained during the subsurface investigation for use in our laboratory testing. Selected samples (“undisturbed” and bulk) were utilized to determine: in-situ moisture and density; laboratory maximum density and optimum moisture content; undisturbed



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SITE LOCATION MAP

8247 PASEO DEL OCASO
SAN DIEGO, CALIFORNIA

FIGURE 1

SOURCE MAP(S): LA JOLLA QUADRANGLE
CALIFORNIA - SAN DIEGO CO. 7.5 MINUTE SERIES
(TOPOGRAPHIC)

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P/W 1705-04 **Report No. 1705-04-B-3**

and remolded shear strength; consolidation, particle size analysis and soluble sulfate/chloride content and resistivity. Results of our laboratory testing are presented in Appendix C.

6.0 ENGINEERING GEOLOGY

6.1. Geologic and Geomorphic Setting

The subject site is situated within the Peninsular Ranges Geomorphic Province. The Peninsular Ranges province occupies the southwestern portion of California and extends southward to the southern tip of Baja California. In general the province consists of young, steeply sloped, northwest trending mountain ranges underlain by metamorphosed Late Jurassic to Early Cretaceous-aged extrusive volcanic rock and Cretaceous-aged igneous plutonic rock of the Peninsular Ranges Batholith. The westernmost portion of the province is predominantly underlain by younger marine and non-marine sedimentary rocks. The Peninsular Ranges' dominant structural feature is northwest-southeast trending crustal blocks bounded by active faults of the San Andreas transform system (Figure 2, Regional Geologic Map).

6.2. Subsurface Conditions

A brief description of the earth materials encountered onsite is presented in the following sections. More detailed descriptions of these materials are provided in the boring logs included in Appendix B. Based on our site reconnaissance, recent subsurface excavations, and review of the referenced geologic maps, the site is underlain to the depths explored by Old Alluvial Flood-Plain Deposits, overlain by Young Alluvial Flood-Plain Deposits, which are locally overlain by a thin veneer of topsoil/undocumented fill soils.

6.2.1. Topsoil/Artificial Fill (Map symbol afu)

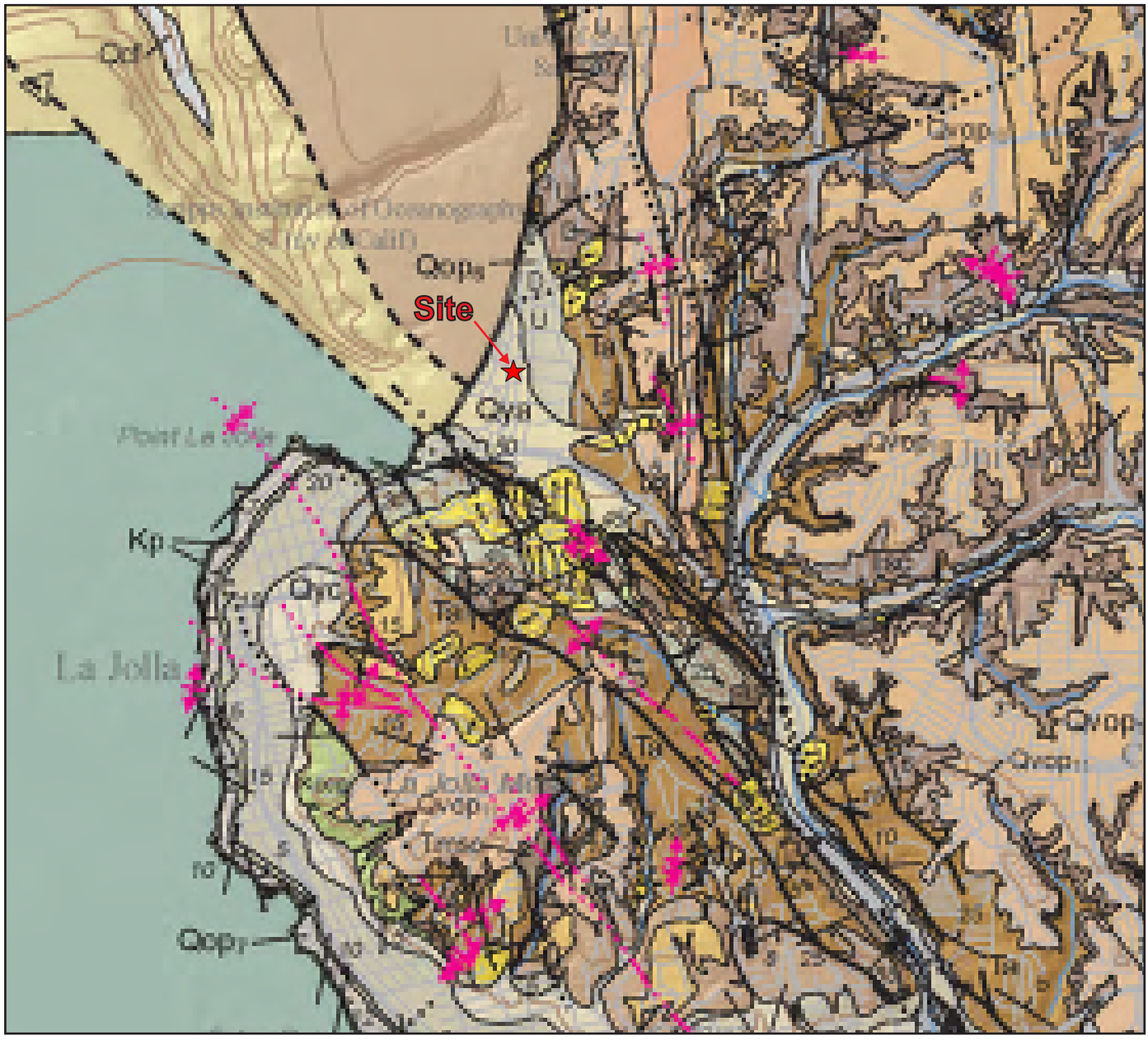
The site is mantled by a thin veneer of undifferentiated topsoil/undocumented fill soils, on the order of 1 to 2 feet thick. These soils can generally be described as light brown, fine- to medium-grained, silty sands, in a dry and loose condition. These soils were found to overlay Young Alluvial Flood-Plain Deposits.

6.2.2. Young Alluvial Flood-Plain Deposits (Map symbol Qya)

Young alluvial flood-plain deposits were encountered within both exploratory borings. As encountered, the young alluvial deposits generally consisted of black to orange, fine to medium grained sand in a dry to moist and loose to medium dense condition. The young alluvial deposits were approximately eight feet in thickness in both borings.

6.2.3. Old Alluvial Flood-Plain Deposits (May symbol Qoa)

The site is underlain to maximum depth explored by old alluvial flood-plain deposits. As encountered, these materials generally consisted of light brown to white with orange iron oxide staining, fine- to medium-grained sand in a slightly moist to wet and dense to very dense condition.



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Scale: 1:100,00

REGIONAL GEOLOGY MAP

8247 PASEO DEL OCASO
SAN DIEGO, CALIFORNIA

LEGEND:

Qya	Young alluvial flood-plain deposits (Holocene and late Pleistocene)

FIGURE 2

SOURCE MAP(S):Geologic Map of the San Diego 30' x 60'Quadrangle, Southern California, Kennedy & Tan 2008

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6.3. Groundwater

Groundwater was not encountered in our exploratory borings, however depth to groundwater at the site is estimated to be slightly above sea level due to the proximity to the coast. Accordingly, ground water is anticipated to be 20 to 23 feet bgs (2 to 0 MSL). Currently, the anticipated depth of the foundation will be approximately 10 MSL.

There is no known groundwater condition on site that would affect the proposed structures nor was groundwater encountered in our exploratory borings. However, it should be noted that the groundwater level may vary, due to fluctuations in precipitation, irrigation practices, tidal movement, or factors not evident at the time of our field explorations. In consideration of the height of the proposed foundation above current sea level it is highly unlikely that the proposed foundation system will be adversely affected by rising ground water level over the design life of the structure.

6.4. Non-seismic Geologic Hazards

6.4.1. Mass Wasting

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

6.4.2. Flooding

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

6.4.3. Subsidence/Ground Fissuring

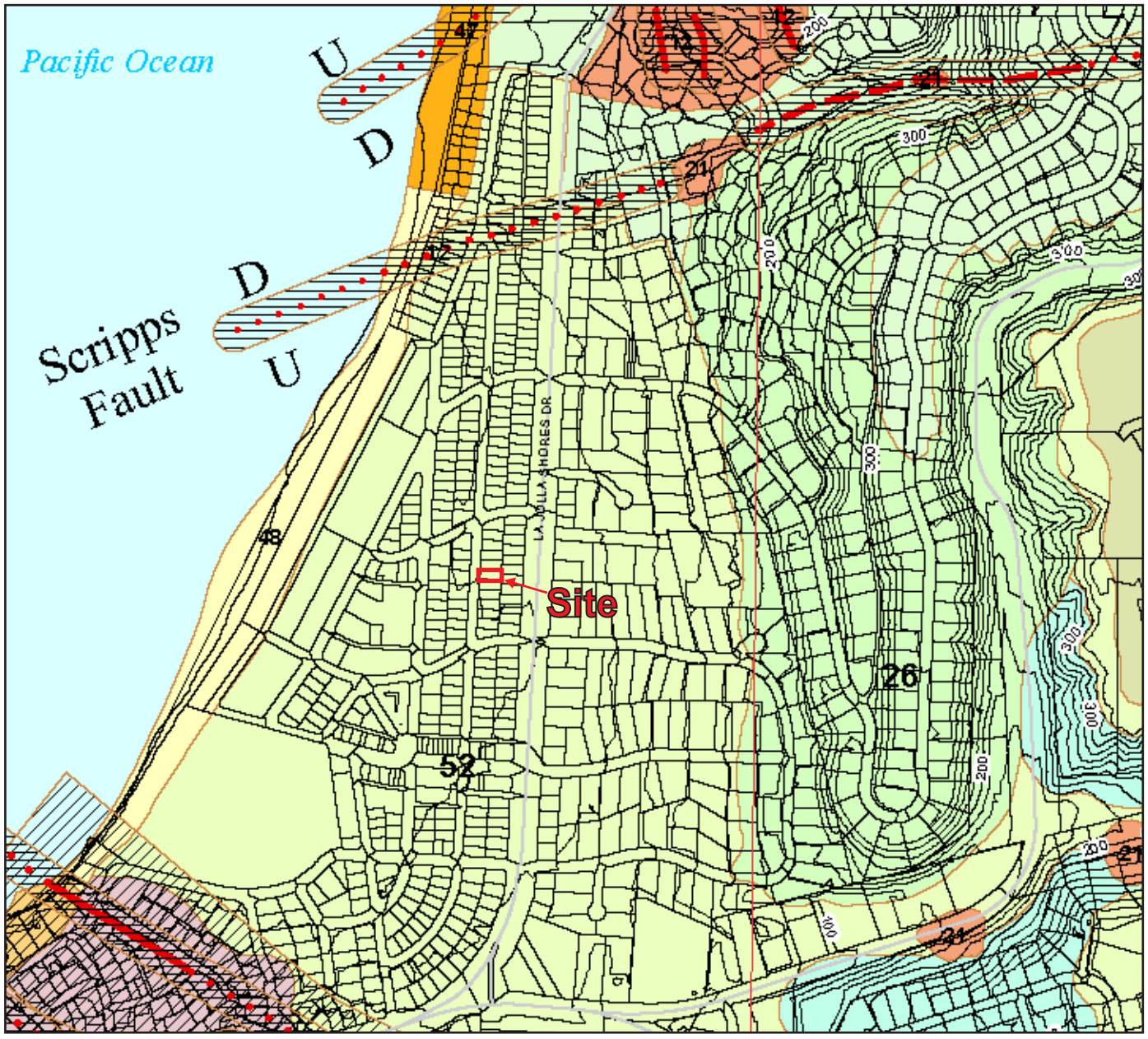
Due to the presence of the dense to very dense underlying materials, the potential for subsidence and ground fissuring due to settlement is considered to be “low” to “very low”.

6.5. Seismic Hazards

The site is located in the tectonically active Southern California area, and will therefore likely experience shaking effects from earthquakes. The type and severity of seismic hazards affecting the site are to a large degree dependent upon the distance to the causative fault, the intensity of the seismic event, and the underlying soil characteristics. The seismic hazard may be primary, such as surface rupture and/or ground shaking, or secondary, such as liquefaction or dynamic settlement. The following is a site-specific discussion of ground motion parameters, earthquake-induced landslide hazards, settlement, and liquefaction. The purpose of this analysis is to identify potential seismic hazards and propose mitigations, if necessary, to reduce the hazard to an acceptable level of risk. The following seismic hazards discussion is guided by the California Building Code (2016), CDMG (2008), and Martin and Lew (1998).

6.5.1. City of San Diego Seismic Safety Study

The City of San Diego Seismic Safety Study (2008) indicates the project site is located within Geologic Hazard Zone 52 (Figure 3, Seismic Hazards Map). Hazard Zone 52 is described as “other level areas, gently sloping to steep terrain, favorable geologic structure, low risk”.



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SCALE: 1 in. = 800 ft.

SEISMIC HAZARDS MAP

8247 PASEO DEL OCASCO, SAN DIEGO, CALIFORNIA

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

FIGURE 3

SOURCE MAP(S): CITY OF SAN DIEGO SEISMIC SAFETY, GEOLOGIC HAZARDS AND FAULTS, GRID TITLE: 30

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6.5.2. Surface Fault Rupture

The project site is not located in an Alquist-Priolo Earthquake Fault Zone. At the time of this investigation, no faults are known to exist at or project into the project site. The nearest known active fault to the site is the Newport-Inglewood-Rose Canyon Fault Zone, San Diego section located approximately 0.5 miles south of the project site. A site specific fault investigation and structural setbacks are not anticipated. However, the potential exists for strong ground motion that may affect future improvements.

6.5.3. Seismicity

As noted, the site is within the tectonically active Southern California area, and is approximately 0.5 miles from an active fault, the San Diego section of the Newport-Inglewood-Rose Canyon fault zone. The potential exists for strong ground motion that may affect future improvements.

At this point in time, non-critical structures (commercial, residential, and industrial) are usually designed according to the California Building Code (2016) and that of the controlling local agency. However, liquefaction/seismic slope stability analyses, critical structures, water tanks and unusual structural designs will likely require site specific ground motion input.

6.5.4. Liquefaction

Due to the density, age and fines content of the old alluvial flood-plain deposits, the potential for seismically induced liquefaction is considered “very low”.

6.5.5. Dynamic Settlement

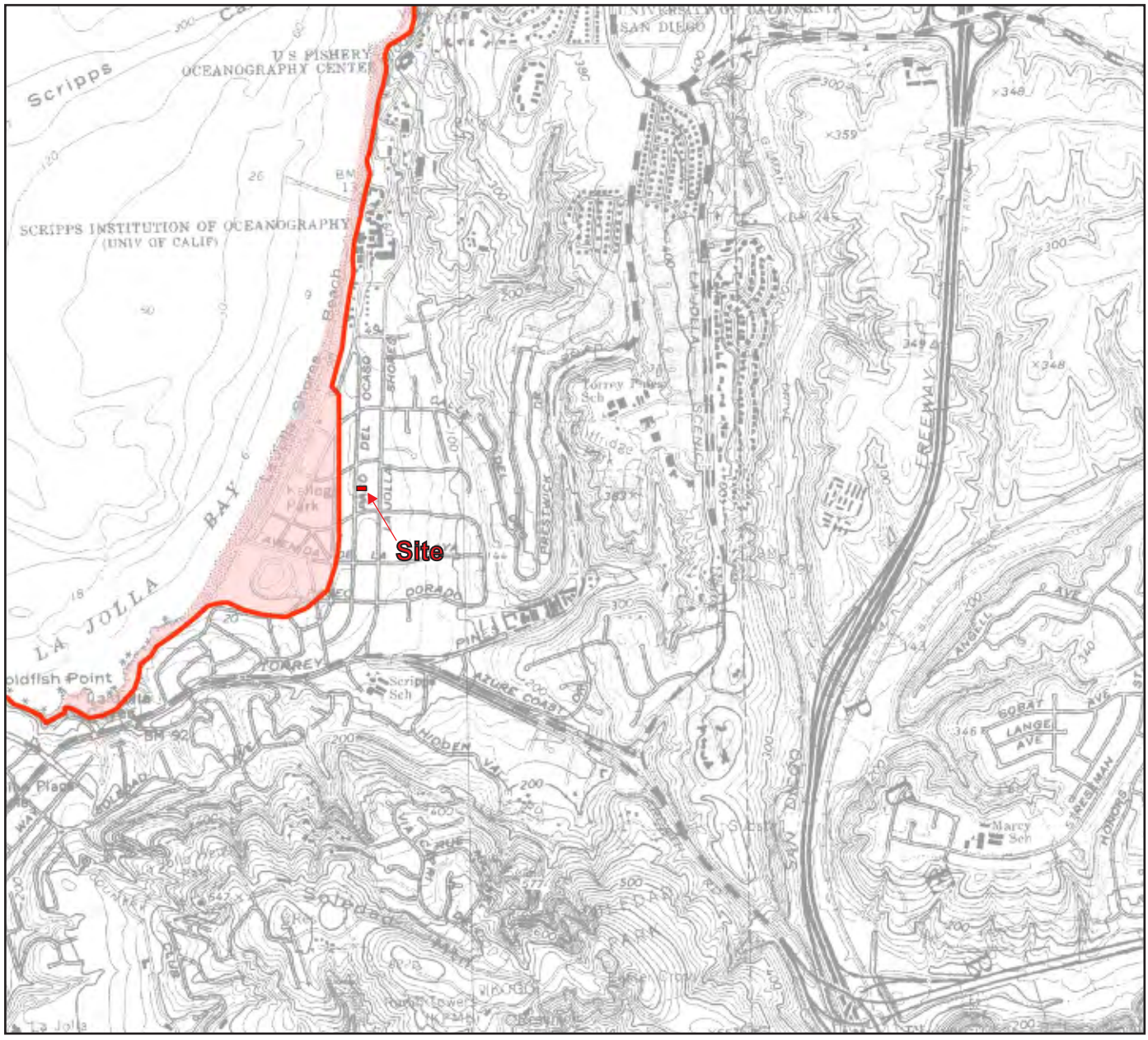
Dynamic settlement occurs in response to a seismic event in loose and saturated sandy earth materials. Given the proposed basement excavation, remedial grading recommendations, lack of loose saturated sandy materials present on site and the relatively dense materials at depth; the potential for seismically induced dynamic settlement is considered to be “remote”.

6.5.6. Seismically Induced Landsliding

Evidence of landsliding at the site was not observed during our field investigation nor was any geomorphic features indicative of landsliding noted during our review of aerial photos and published geologic maps. Given the location of the subject site and the generally flat terrain the risk of seismically induced landsliding is considered “remote”.

6.5.7. Tsunamis

Our review of the 2009 Tsunami Inundation Map for Emergency Planning, La Jolla Quadrangle, prepared by CalEMA, indicates the project site is not within a potential inundation area (Figure 4, Tsunami Inundation Map). It is our opinion that tsunamis are not a significant risk at the project site.



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TSUNAMI INUNDATION MAP

8247 PASEO DEL OCASO
SAN DIEGO, CALIFORNIA

Tsunami Inundation Line

Tsunami Inundation Area

FIGURE 4

SOURCE MAP(S): California Emergency Management Agency California Geological Survey, University of Southern California, Tsunami Inundation Map for Emergency Planning La Jolla Quadrangle

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P/W 1705-04 **Report No. 1705-04-B-3**

7.0 GEOTECHNICAL ENGINEERING

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

7.1. Material Properties

7.1.1. Excavation Characteristics

Based on our previous experience with similar projects near the subject site and the information gathered in preparing this report, it is our opinion that the topsoil/undocumented fill, and young alluvial deposits are readily excavatable with conventional grading equipment. However, it should be anticipated that well cemented zones could be encountered within the old alluvial deposits that may be difficult to excavate. Specialized grading equipment (large excavators and/or bull dozers) may be necessary to efficiently excavate portions of the old alluvial deposits.

7.1.2. Compressibility

The near surface undifferentiated topsoil/undocumented fills and young alluvial deposits are considered to be "moderately" compressible in their present condition. The old alluvial deposits encountered are dense to very dense and are anticipated to have favorable bearing characteristics.

7.1.3. Collapse Potential/Hydro-Consolidation

Given the dense natural of the underlain materials and the removals proposed herein, the potential for hydro-consolidation is considered "remote" at the subject site.

7.1.4. Expansion Potential

Based on our previous experience in the area with similar materials, the onsite soils are anticipated to exhibit a "very low" to "low" expansion potential.

7.1.5. Shear Strength

Based upon our laboratory testing and previous experience in the area with similar soils, the following are assumed shear strengths for compacted fill and young and old alluvial flood-plain deposits.

TABLE 7.1.5
SHEAR STRENGTHS

Material	Cohesion (psf)	Friction Angle (degrees)
Compacted Fill (afc)	150	29
Young Alluvial Flood-Plain Deposits (Qya)	100	30
Old Alluvial Flood-Plain Deposits (Qoa)	125	31

7.1.6. Chemical/Resistivity Test Results

Preliminary soluble sulfate and chloride, and resistivity testing was conducted on representative bulk samples obtained during subsurface exploration (Appendix C). Based upon the test results and our previous experience in the area it is anticipated that the onsite soil will exhibit "negligible" sulfate concentrations when classified in accordance with ACI 318-05 Table 4.3.1 (per 2016 CBC). Resistivity testing indicates that the onsite soils are not corrosive where in direct contact with metal construction materials.

7.1.7. Pavement Support Characteristics

It is anticipated that the onsite soils will have “moderate” support characteristics. Depending upon the final distribution of site soils, pavement support characteristics could vary. If structural pavements are to be constructed (concrete or asphaltic concrete), an "R"-value of 20 can be utilized for the preliminary design of pavements. Final design should be based upon representative sampling of the as-graded soils.

8.0 CONCLUSIONS AND RECOMMENDATIONS

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

8.1. Grading Recommendations

8.1.1. Unsuitable Soil Removals

In areas to receive settlement sensitive improvements, all undocumented fill and young alluvial deposits should be removed. It is anticipated that the upper 8 to 10 feet of the onsite soils will require removal and compaction for the support of settlement sensitive structures. As we understand, development of the proposed basement is anticipated to extend to a depth of 12 feet below existing grade. Removal bottoms should expose competent formational materials in a firm and unyielding condition. The resulting removal bottoms should be observed by a representative of AGS to verify that adequate removal of unsuitable materials have been conducted prior to fill placement. In general, soils removed during remedial grading will be suitable for reuse in compacted fills, provided they are not saturated and do not contain deleterious materials. Grading shall be accomplished under the observation and testing of the project soils engineer and engineering geologist or their authorized representative in accordance with the recommendations contained herein, the current grading ordinance of the City of San Diego.

Groundwater was not encountered within our subsurface investigation and is anticipated to be approximately 20 to 23 feet bgs. It is highly unlikely that groundwater will be encountered during grading. However, although not anticipated, if groundwater is encountered during construction; dewatering and stabilization of the subgrade soils may be required to construct the proposed foundation system.

8.1.2. Earthwork Considerations

8.1.2.1. Compaction Standards

Fill and processed natural ground shall be compacted to a minimum relative compaction of 90 percent, as determined by ASTM Test Method: D 1557. Compaction shall be achieved at or slightly above the optimum moisture content and as generally discussed in the attached Earthwork Specifications (Appendix D).

8.1.2.2. Treatment of Removal Bottoms

At the completion of unsuitable soil removals, the exposed bottom should be scarified to a minimum depth of eight inches, moisture conditioned to above optimum moisture and compacted in-place to the standards set forth in this report.

8.1.2.3. Fill Placement

Fill should be placed in thin lifts (eight-inch bulk), moisture conditioned to at or slightly above the optimum moisture content, uniformly mixed, and compacted by the use of both wheel rolling and kneading type (sheep's foot) compaction equipment until the designed grades are achieved.

8.2. Excavation, Dewatering and Shoring

8.2.1. Temporary Cut Slopes

Temporary cut slopes should be made no steeper that 1½:1 and no higher than 5 feet adjacent to existing improvements. In consideration of the inherent instability created by temporary construction of backcuts, it is imperative that grading schedules be coordinated to minimize the unsupported exposure time of these excavations. Once started these excavations and subsequent fill operations should be maintained to completion without intervening delays imposed by avoidable circumstances. In cases where five-day workweeks comprise a normal schedule, grading should be planned to avoid exposing at-grade or near-grade excavations through a non-work weekend. Where improvements may be affected by temporary instability, either on or offsite, further restrictions such as slot cutting, extending work days, implementing weekend schedules, and/or other requirements considered critical to serving specific circumstances may be imposed. All utility trenches and excavations should be shored or laid back in accordance with applicable Cal-OSHA standards.

8.2.2. Dewatering

If dewatering becomes necessary to construct the proposed subterranean basement and foundation elements. Dewatering can create subsidence outside of the area of work and create distress to adjacent improvements. Adjacent improvements should be inventoried prior to dewatering and observed periodically to determine if the dewatering is creating settlement outside of the work area. It is suggested that key survey points should be established and monitored during construction and dewatering.

Discharge of groundwater generated during the dewatering process will require a discharge permit in accordance with NPDES permits. Accordingly, water testing and possible treatment of the discharge water will be necessary.

8.2.3. Shoring and Tieback Design

Shoring and/or tiebacks will be necessary for the majority of the excavations for the basement. Design of shoring should utilize the active, passive and at-rest pressures presented in Section 9.2. If a dewatering system is not used during construction to lower the groundwater below the excavation bottom, the shoring wall should be designed to resist hydrostatic forces below the observed groundwater level. All components of the shoring system should be designed by a specialist who is a Registered Civil Engineer in the State of California. The design should also consider the requirements of CAL-OSHA. The design of shoring should consider hydrostatic pressures, adjacent structures and transient traffic and construction loads.

In general, soldier piles with wood lagging and sheet piling can be used for support of portions of the temporary excavations. However, if settlement sensitive improvements are located within a distance from the top of shoring equal to the excavation depth, additional measures should be implemented (i.e. internal bracing, rakers, tiebacks, etc.) to limit the amount of shoring deflection to tolerable levels. Caving soils may be encountered between the piles and may be supported by lagging or guniting. All lumber left in the ground should be treated in accordance with Section 204-2 of the "Standard Specifications for Public Works Construction".

Soldier piles may be designed using an ultimate passive resistance corresponding to an equivalent fluid weight of 300 pounds per cubic foot per effective pile width. The effective pile width can be taken as 3 times the pile width. The upper 1.5B of passive resistance should be ignored, where B is equal to the pile width. Since the above passive pressures are considered ultimate, an appropriate factor of safety should be incorporated into the design. These values cannot be used to estimate the amount of deflection experienced at the allowable lateral loads. A more rigorous analysis, utilized in lateral load-pile deflection software, should be conducted for piles that are sensitive to deflection.

Tiebacks, if used, should develop resistance past the active pressure zone behind the wall (30 degree angle projected from the toe of the wall). Anchor capacity is dependent upon the installation techniques used by the contractor and is typically a design-build from the specialty contractor. A tieback testing program should be undertaken during installation to verify the maximum and design capacity of the tiebacks.

8.2.4. Monitoring of Settlement and Lateral Movement

Excavations, shoring and tie-back walls adjacent to existing improvements can cause settlement and disturbance to existing adjacent improvements. It is recommended that survey monuments should be installed within a 1½:1 projection of the bottom of any vertical cut, at the top of the soldier pile/sheet pile, midpoint and bottom of the pile at the base of the excavation. These monitoring points should be monitored on a regular basis during construction to within a tolerance of 0.1 inches. Prior to construction a detailed

inventory of all adjacent surface and subsurface improvements should be made. Regularly scheduled survey should be conducted around all deeper excavations. If movement is noted then corrective actions can be instigated.

9.0 DESIGN RECOMMENDATIONS

It is our understanding that the proposed foundations will consist of a Post-Tensioned or a "Conventional" foundation system to support of the proposed two story residential structure and subterranean basement. Design recommendations for either foundation type are provided herein. From a geotechnical perspective these proposed improvements are feasible provided that the following recommendations are incorporated into the design and construction.

9.1. Foundation Design Criteria

The single-family residential structure can be supported on conventional or post-tensioned slab-on-grade foundations. For preliminary design, the expansion potential of the underlying soils can be considered "Very Low" to "Low". The following values may be used in the foundation design.

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

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

9.1.1. Seismic Design Parameters

The following seismic design parameters are presented to be code compliant to the California Building Code (2016). The subject lot has been identified to be Site Class "D" in accordance with CBC, 2016, Section 1613.3.2 and ASCE 7, Chapter 20. The lot is located at Latitude 32.857°N, and Longitude 117.254°W. Utilizing this information, the United States Geological Survey (USGS) web tool (http://earthquake.usgs.gov/hazards/designmaps/) and ASCE 7 criterion, the mapped seismic acceleration parameters S_S, for 0.2 seconds and S_1, for 1.0 second period (CBC, 2013, 1613.3.1) for Risk-Targeted Maximum Considered Earthquake (MCE_R) can be determined. The mapped acceleration parameters are provided for Site Class "B". Adjustments for other Site Classes are made, as needed, by utilizing Site Coefficients F_a and F_v for determination of MCE_R spectral response acceleration parameters S_{MS} for short periods and S_{M1} for 1.0 second period (CBC, 2016 1613.3.3). Five-percent damped design spectral response acceleration parameters S_{DS} for short periods and S_{D1} for 1.0 second period can be determined from the equations in CBC, 2016, Section 1613.3.4.

TABLE 9.1.1 SEISMIC DESIGN CRITERIA	
Mapped Spectral Acceleration (0.2 sec Period), S_S	1.297g
Mapped Spectral Acceleration (1.0 sec Period), S_1	0.503g
Site Coefficient, F_a	1.000
Site Coefficient, F_v	1.500
MCE Spectral Response Acceleration (0.2 sec Period), SM_S	1.297g
MCE Spectral Response Acceleration (1.0 sec Period), SM_1	0.754g
Design Spectral Response Acceleration (0.2 sec Period), SD_S	0.864g
Design Spectral Response Acceleration (1.0 sec Period), SD_1	0.503g

Using the United States Geological Survey (USGS) web-based ground motion calculator, the site class modified PGA_M (F_{PGA}*PGA) was determined to be 0.588g. This value does not include near-source factors that may be applicable to the design of structures on site.

9.1.2. Conventional Foundations

Based upon the onsite soil conditions and information supplied by the 2016 CBC, conventional foundation systems should be designed in accordance with Section 9.1 and the following recommendations.

- **Three-story** - Interior and exterior footings should be a minimum of 18 inches wide and extend to a depth of at least 24 inches below lowest adjacent grade. Footing reinforcement should minimally consist of four No. 5 reinforcing bars, two top and two bottoms.
- **Slab** - Conventional, slab-on-grade floors or garage slabs, underlain by "very low" to "low" expansive compacted fill, should be six or more inches thick and be reinforced with No. 4 or larger reinforcing bars spaced 15 inches on center each way. The slab reinforcement and expansion joint spacing should be designed by the Structural Engineer.
- **Embedment** - If exterior footings adjacent to drainage swales are to exist within five feet horizontally of the swale, the footing should be embedded sufficiently to assure embedment below the swale bottom is maintained.
- **Garage** - A grade beam reinforced continuously with the garage footings shall be constructed across the garage entrance, tying together the ends of the perimeter footings and between individual spread footings. This grade beam should be embedded at the same depth as the adjacent perimeter footings. A thickened slab, separated by a cold joint from the garage beam, should be provided at the garage

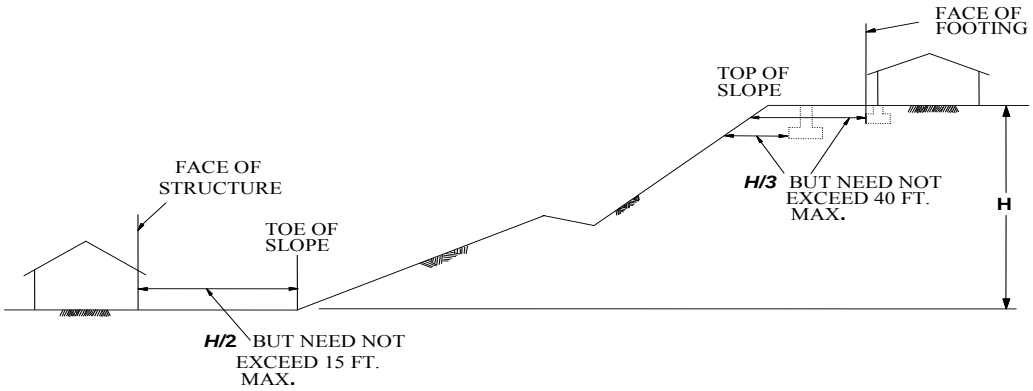
entrance. Minimum dimensions of the thickened edge shall be six (6) inches deep. Footing depth, width and reinforcement should be the same as the structure. Slab thickness, reinforcement and under-slab treatment should be the same as the structure.

- **Isolated Spread Footings** - Isolated spread footings should be embedded a minimum of 24 inches below lowest adjacent finish grade and should at least 24 inches wide. A grade beam should also be constructed for interior and exterior spread footings and should be tied into the structure in two orthogonal directions footing dimensions and reinforcement should be similar to the aforementioned continuous footing recommendations. Final depth, width and reinforcement should be determined by the structural engineer.
- **Basement Walls** - Basement Walls should be designed to resist "at rest" earth pressures as presented Section 9.2. A bearing value of 3000 psf may be used for design of retaining walls. A value of 0.35 may be used to model the friction between the soil and concrete. For sliding passive pressure both passive and friction can be combined to a maximum of 2/3 the total. All basements walls should be water proofed and a drain should be integrated into the design behind the walls. Water collected in this drain should be directed to a sump where this nuisance water can be pumped away from the basements to a suitable offsite discharge point. Final design of the waterproofing should be determined by the Architect.

9.1.3. Deepened Footings and Structural Setbacks

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

Grading plans for the subject site were not available for review at the time of this report, but as AGS understands the project, no slopes greater than 5 feet are planned. If foundations for residential structures are to exist in proximity to slopes, the footings should be embedded to satisfy the requirements presented in Figure 9.1.3.



9.1.4. Under Slab

Prior to concrete placement the subgrade soils should be moisture conditioned to optimum moisture content.

A moisture and vapor retarding system should be placed below the slabs-on-grade in portions of the structure considered to be moisture sensitive. The retarder should be of suitable composition, thickness, strength and low permeance to effectively prevent the migration of water and reduce the transmission of water vapor to acceptable levels. Historically, a 10-mil plastic membrane, such as *Visqueen*, placed between one to four inches of clean sand, has been used for this purpose. More recently Stego® Wrap or similar underlayments have been used to lower permeance to effectively prevent the migration of water and reduce the transmission of water vapor to acceptable levels. The use of this system or other systems, materials or techniques can be considered, at the discretion of the designer, provided the system reduces the vapor transmission rates to acceptable levels.

9.1.5. Concrete Design

Laboratory testing and our previous experience in the general area indicates onsite soils likely exhibit a “negligible” sulfate exposure when classified in accordance with ACI 318-05 Table 4.3.1 (per 2016 CBC). Final determination will be based upon testing of near surface soils obtained at the conclusion of grading. However, some fertilizers have been known to leach sulfates into soils otherwise containing "negligible" sulfate concentrations and increase the sulfate concentrations to potentially detrimental levels. It is incumbent upon the owner to determine whether additional protective measures are warranted to mitigate the potential for increased sulfate concentrations to onsite soils as a result of the future homeowner’s actions.

9.1.6. Corrosion

Resistivity tests performed indicate that the onsite soils are not corrosive to buried metallic construction materials. It is our understanding that typically only the last ten feet of the domestic and fire waterlines will be metallic, with the remainder of these lines being

nonmetallic. Further, the proposed plumbing for the structure will not be located under slab but will be located in the walls and roofs. Provided that all metallic piping is wrapped with a suitable corrosion inhibiting material (foam, plastic sleeve, tape, or similar products) and that non-aggressive backfill (sand) soils are placed around all metallic pipe, no other requirements are deemed necessary to address the potential corrosive soils found onsite.

9.2. Retaining Walls

The following earth pressures are recommended for the design of retaining and basement walls onsite. These pressures should be modeled by the Structural Engineer utilizing a triangular pressure distribution. In addition, the wall designer should also consider adjacent foundation and transitory construction loads that the basement walls could be subject to. For "restrained" basement walls it is recommended that the "at-rest pressure" should be used with a triangular pressure distribution.

Compacted Fill/Young Alluvial Deposits (phi = 29°, unit wt. = 125pcf)

Static Case

Level Backfill	Rankine Coefficients	Equivalent Fluid Pressure (psf/lin.ft.)
Coefficient of Active Pressure:	$K_a = 0.35$	43
Coefficient of Passive Pressure:	$K_p = 2.88$	360
Coefficient of At Rest Pressure:	$K_o = 0.52$	64

Old Alluvial Deposits (phi = 31°, unit wt. = 125pcf)

Static Case

Level Backfill	Rankine Coefficients	Equivalent Fluid Pressure (psf/lin.ft.)
Coefficient of Active Pressure:	$K_a = 0.32$	40
Coefficient of Passive Pressure:	$K_p = 3.12$	391
Coefficient of At Rest Pressure:	$K_o = 0.48$	61

Seismic Case

In addition to the above static pressures, unrestrained retaining walls should be designed to resist seismic loading. In order to be considered unrestrained, retaining walls should be allowed to rotate a minimum of roughly 0.004 times the wall height. The seismic load can be modeled as a thrust load applied at a point 0.6H above the base of the wall, where H is equal to the height of the wall. This seismic load (in pounds per lineal foot of wall) is represented by the following equation:

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

Where:

H = Height of the wall (feet)

γ = soil density = 125 pounds per cubic foot (pcf)

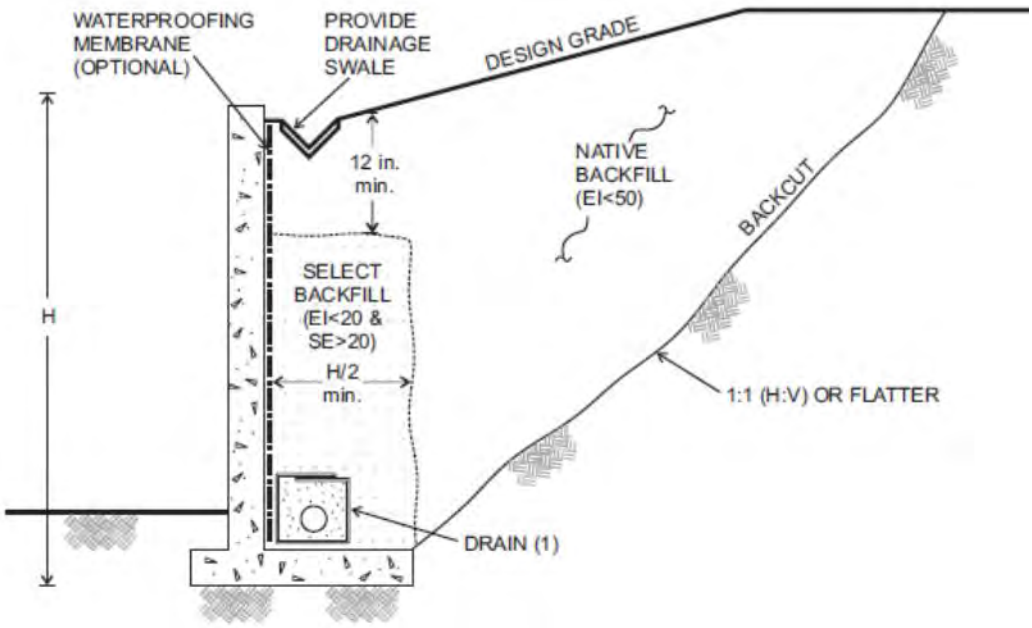
k_h = 0.5* peak horizontal ground acceleration (PGA_M=0.588g)

Walls should be designed to resist the combined effects of static pressures and the above seismic thrust load.

A bearing value of 3000 psf may be used for design of basement retaining walls. A value of 0.35 may be used to model the frictional between the soil and concrete. For sliding passive pressure both passive and friction can be combined to a maximum of 2/3 the total.

Retaining wall footings should be designed to resist the lateral forces by passive soil resistance and/or base friction as recommended for foundation lateral resistance for non-basement walls. To relieve the potential for hydrostatic pressure wall backfill should consist of a free draining backfill (sand equivalent "SE" >20) and a heel drain should be constructed. The heel drain should be place at the heel of the wall and should consist of a 4-inch diameter perforated pipe (SDR35 or SCHD 40) surrounded by 4 cubic feet of crushed rock (3/4-inch) per lineal foot, wrapped in filter fabric (Mirafi® 140N or equivalent).

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



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

The wall should be backfilled with granular soils placed in loose lifts no greater than 8-inches thick, at or near optimum moisture content, and mechanically compacted to a minimum 90 percent

relative compaction as determined by ASTM Test Method D1557. Flooding or jetting of backfill materials generally do not result in the required degree and uniformity of compaction and, therefore, is not recommended. The soils engineer or his representative should observe the retaining wall footings, backdrain installation and be present during placement of the wall backfill to confirm that the walls are properly backfilled and compacted.

9.3. Utility Trench Excavation

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

9.4. Utility Trench Backfill

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

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

9.5. Exterior Slabs and Walkways

9.5.1. Subgrade Compaction

The subgrade below exterior slabs, sidewalks, driveways, patios, etc. should be compacted to a minimum of 90 percent relative compaction as determined by ASTM D1557.

9.5.2. Subgrade Moisture

The subgrade soils exhibiting “low” expansion potential below exterior slabs, sidewalks, driveways, patios, etc. should be moisture conditioned to a minimum of: optimum moisture prior to concrete placement.

9.5.3. Slab Thickness

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

9.5.4. Control Joints

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

9.5.5. Flatwork Reinforcement

Consideration should be given to reinforcing any exterior flatwork.

9.5.6. Thickened Edge

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

9.6. Plan Review

Once grading and foundation design plans become available, they should be reviewed by AGS to verify that the design recommendations presented are consistent with the proposed construction.

9.7. Geotechnical Review

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

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

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

10.0 SLOPE AND LOT MAINTENANCE

Maintenance of improvements is essential to the long-term performance of structures and slopes. Although the design and construction during mass grading is planned to create slopes that are both grossly and surficially stable, certain factors are beyond the control of the soil engineer and geologist. The homeowners must implement certain maintenance procedures.

The following recommendations should be implemented.

10.1. Slope Planting

Slope planting should consist of ground cover, shrubs and trees that possess deep, dense root structures and require a minimum of irrigation. The resident should be advised of their responsibility to maintain such planting.

10.2. Lot Drainage

Roof, pad and lot drainage should be collected and directed away from structures and slopes and toward approved disposal areas. Design fine-grade elevations should be maintained through the life of the structure or if design fine grade elevations are altered, adequate area drains should be installed in order to provide rapid discharge of water, away from structures and slopes. Residents

should be made aware that they are responsible for maintenance and cleaning of all drainage terraces, down drains and other devices that have been installed to promote structure and slope stability.

10.3. Slope Irrigation

The resident, homeowner and Homeowner Association should be advised of their responsibility to maintain irrigation systems. Leaks should be repaired immediately. Sprinklers should be adjusted to provide maximum uniform coverage with a minimum of water usage and overlap.

Overwatering with consequent wasteful run-off and ground saturation should be avoided. If automatic sprinkler systems are installed, their use must be adjusted to account for natural rainfall conditions.

10.4. Burrowing Animals

Residents or homeowners should undertake a program for the elimination of burrowing animals. This should be an ongoing program in order to maintain slope stability.

11.0 LIMITATIONS

This report is based on the project as described and the information obtained from the excavations at the approximate locations indicated on Plate 1. The findings are based on the results of the field, laboratory, and office investigations combined with an interpolation and extrapolation of conditions between and beyond the excavation locations. The results reflect an interpretation of the direct evidence obtained. Services performed by AGS have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, either expressed or implied, and no warranty or guarantee is included or intended.

The recommendations presented in this report are based on the assumption that an appropriate level of field review will be provided by geotechnical engineers and engineering geologists who are familiar with the design and site geologic conditions. That field review shall be sufficient to confirm that geotechnical and geologic conditions exposed during grading are consistent with the geologic representations and corresponding recommendations presented in this report. AGS should be notified of any pertinent changes in the project plans or if subsurface conditions are found to vary from those described herein. Such changes or variations may require a re-evaluation of the recommendations contained in this report.

The data, opinions, and recommendations of this report are applicable to the specific design of this project as discussed in this report. They have no applicability to any other project or to any other location, and any and all subsequent users accept any and all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of AGS.

AGS has no responsibility for construction means, methods, techniques, sequences, or procedures, or for safety precautions or programs in connection with the construction, for the acts or omissions of the CONTRACTOR, or any other person performing any of the construction, or for the failure of any of them to carry out the construction in accordance with the final design drawings and specifications.

APPENDIX A
REFERENCES

Advanced Geotechnical Solutions, Inc., (2017), Geotechnical/Geologic Feasibility Report, 8247 Paseo Del Ocaso, City of San Diego, California, dated May 12, 2017, Report No. 1705-04-B-2

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California Emergency Management Agency, 2009, Tsunami Inundation Map for Emergency Planning, La Jolla Quadrangle, County of San Diego, California, Scale 1:24,000.

City of San Diego, 2008. *Seismic Safety Study*, Grid Tile 30, dated April 3, 2008.

Federal Emergency Management Agency (FEMA), 2012, *Flood Maps*. San Diego County, California. Map Number 06073C1582G. Effective May 16, 2012.

State of California Water Quality Control Board, Geotracker.org, depth to groundwater data, Site T-0607301734, collected 9-26-02, case closed.

Historic Aerial Photography. Www.Historicaerials.com. Photos from 1953, 1964, 1966, 1980, 1990, 1994, 1997, 2002, 2003, 2005, 2009, 2010, and 2012.

Kennedy, M.P. and Tan, S.S. (2008). *Geologic Map of the San Diego 30' x 60' Quadrangle, California,* 1:100,000 Scale.

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

USGS, 2008, National Seismic Hazards Maps-Source Parameters, accessed 5-10-17.

Victor Rodriquez – Fernadez Civil Engineer & Land Surveyor, 10-Scale Drainage Plan, 8247 Paseo Del Ocaso Street, dated July 2017.

APPENDIX B

SUBSURFACE LOGS

ADVANCED GEOTECHNICAL SOLUTIONS, INC., 2017

BORING NUMBER B-1

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

CLIENT M Lake Development
PROJECT NAME 8247 Paseo Del Ocaso
PROJECT NUMBER 1705-04
PROJECT LOCATION City of San Diego, California
DATE STARTED 8/21/17 **COMPLETED** 8/21/17
GROUND ELEVATION 22 ft **HOLE SIZE** 6
DRILLING CONTRACTOR Native Drilling
GROUND WATER LEVELS:
DRILLING METHOD Tripod
AT TIME OF DRILLING ---
LOGGED BY DL **CHECKED BY** JC
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	SATURATION (%)	FINES CONTENT (%)	OTHER TESTS
	0		SM	**Artificial Fill - Undocumented, (afu):** SILTY SAND, fine grained, light brown,							
20			SM	**Young Alluvial Flood-Plain Deposits, (Qya):** SILTY SAND, fine to medium grained, orange to black, dry, medium dense							
			SP	@ 3.0 ft., SAND, fine to medium grained, orange to black, moist, medium dense	BU						Remold, Max, Hydro
	5				SPT	9-10-11 (21)					
15					BU						Chem
	10		SP	**Old Alluvial Flood-Plain deposits, (Qoa):** SAND, fine to medium grained, yellow brown to orange, very dense; with iron oxide staining	MC	15-21-39 (60)	108	6.0	29		Shear
10				@ 10.0 ft., SAND, fine to medium grained, yellow brown to orange, very dense; with iron oxide staining							
	15			@ 15.0 ft., SAND, fine to medium grained, yellow brown to light brown, moist, dense; with iron oxide staining	SPT	15-11-22 (33)					
5					MC	20-31-28/3"					
				@ 19.0 ft., SAND, medium grained, white to yellow brown, very moist, very dense; with iron oxide staining							

Total depth = 19.5 feet
No Groundwater encountered
Backfilled with cement grout and bentonite

BORING NUMBER B-2

AGS
ADVANCED GEOTECHNICAL SOLUTIONS, INC.

CLIENT M Lake Development
PROJECT NAME 8247 Paseo Del Ocaso
PROJECT NUMBER 1705-04
PROJECT LOCATION City of San Diego, California
DATE STARTED 8/21/17 **COMPLETED** 8/21/17
GROUND ELEVATION 22 ft **HOLE SIZE** 6
DRILLING CONTRACTOR Native Drilling
GROUND WATER LEVELS:
DRILLING METHOD Tripod
AT TIME OF DRILLING ---
LOGGED BY DL **CHECKED BY** JC
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	SATURATION (%)	FINES CONTENT (%)	OTHER TESTS
	0		SM	**Artificial Fill - Undocumented, (afu):** SILTY SAND, fine grained, light brown, dry, loose; with roots							
20			SM	**Young Alluvial Flood-Plain Deposits, (Qya):** SILTY SAND, fine to medium grained, dark brown to orange, dry to slightly moist, loose to medium dense	BU						Hydro
	5		SP	@ 5.0 ft., SAND, fine to medium grained, brown to yellow brown, dry to slightly moist, medium dense	SPT	7-7-10 (17)					
15											
	10		SP	**Old Alluvial Flood-Plain Deposits, (Qoa):** SAND, medium grained, white to yellow brown, slightly moist, dense	SPT	9-13-20 (33)					
10					MC	23-24-30 (54)	109	3.7	18		Consol
	15			@ 15.0 ft, SAND, medium grained, white to yellow brown, slightly moist, very dense	SPT	18-24-27 (51)					
5				@ 17.5 ft, SAND, medium grained, white to yellow brown, moist, very dense	MC	14-50	106	4.6	21		
				@ 19.0 ft, SAND, medium grained, white to yellow brown, moist to wet, dense	SPT	17-22-20 (42)					

APPENDIX C

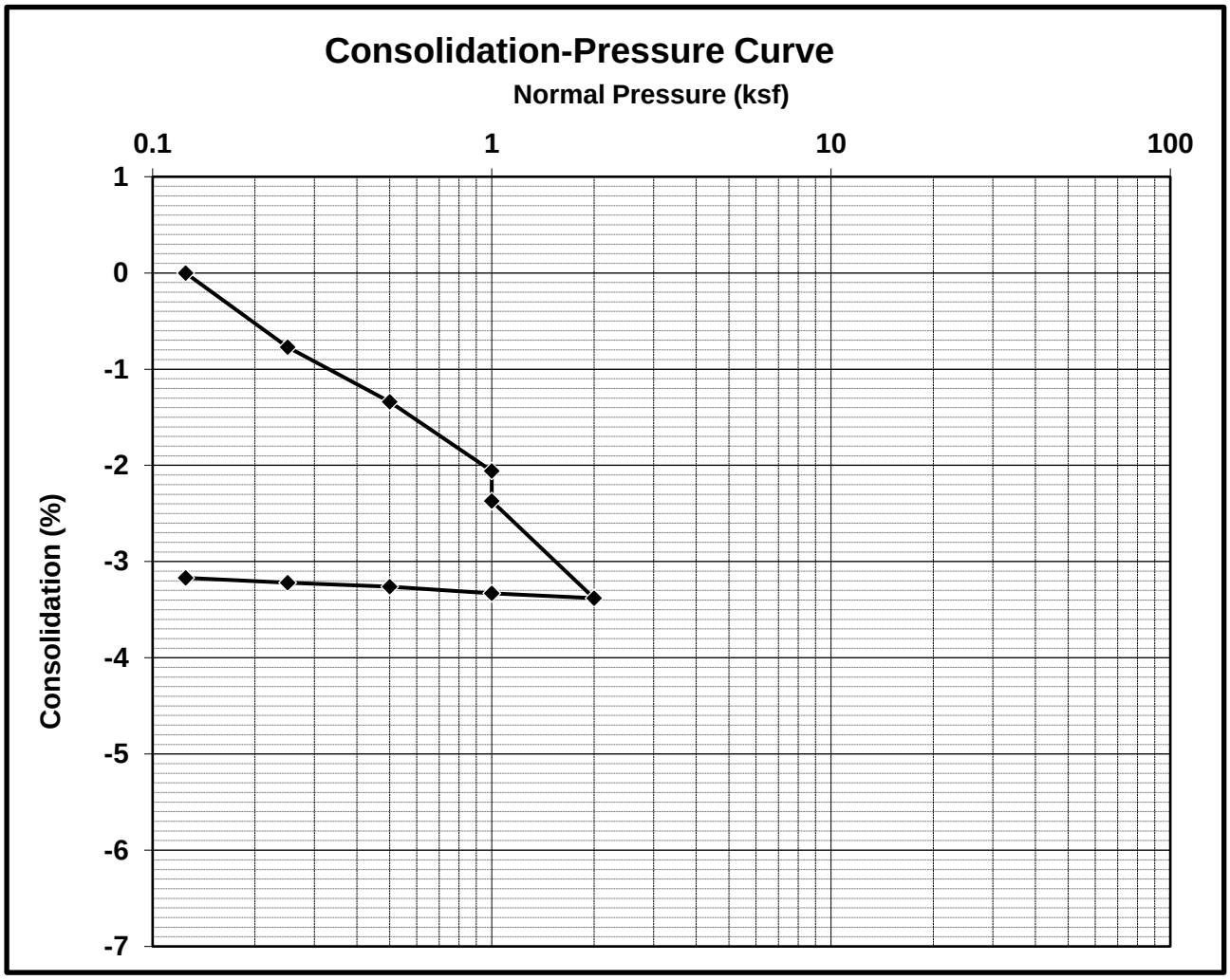
LABORATORY DATA

ADVANCED GEOTECHNICAL SOLUTIONS, INC., 2017

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

CONSOLIDATION - ASTM D2435

Project Name:	8247 Paseo Del Ocaso	Excavation:	B-2
Location:		Depth:	12.5 ft
Project No:	1705-04	Description:	Yellow SP-SM
Date:	8/24/2017	By:	FV



Test Description:

	Before Test	After Test
Water Content, w	3.7%	17.7%
Void Ratio, e	0.60	0.54
Saturation, S	17%	89%
Dry Density (pcf)	105.2	109.7
Wet Density (pcf)	109.1	129.2

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

DIRECT SHEAR - ASTM D3080

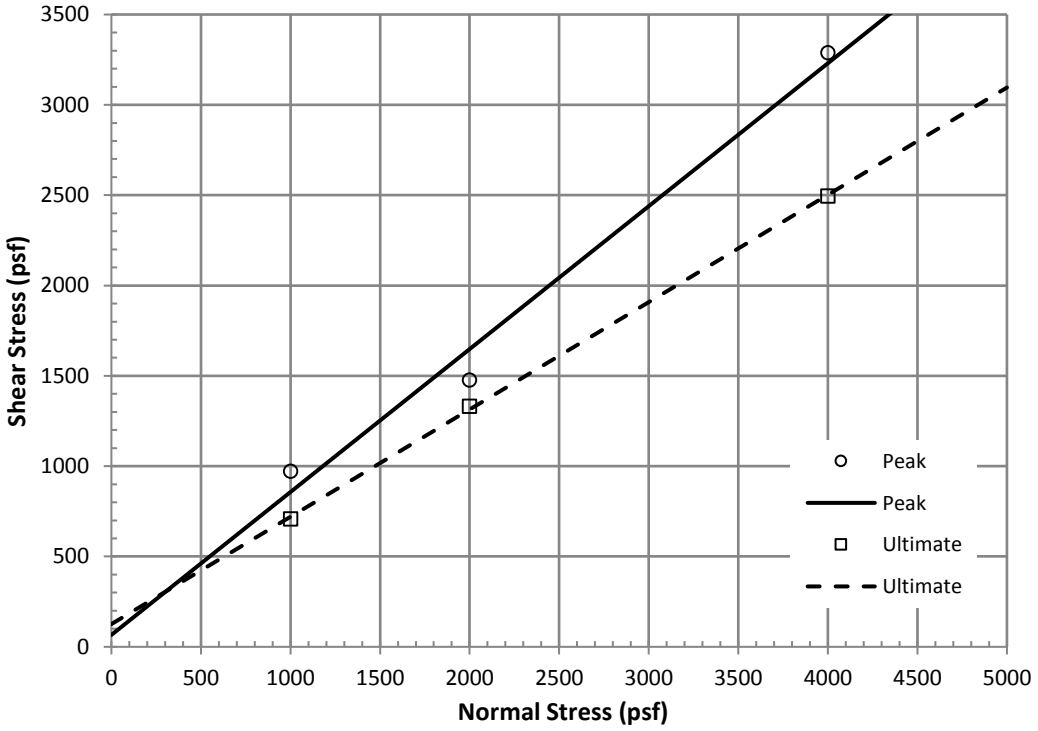
Project Name: 8247 Paseo Del Ocaso
Location:
Project No.: 1705-04
Date: 9/6/17

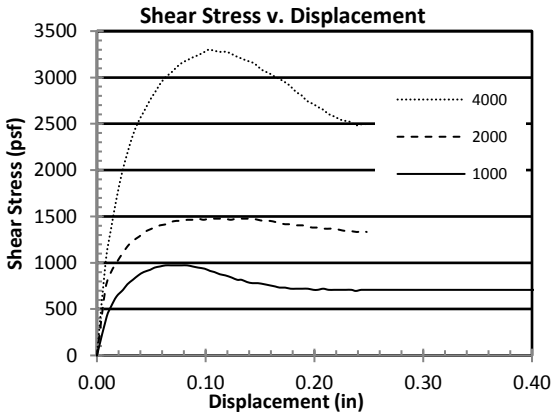
Excavation: B-1
Depth: 10 ft
Sample Type: Undisturbed
By: FV

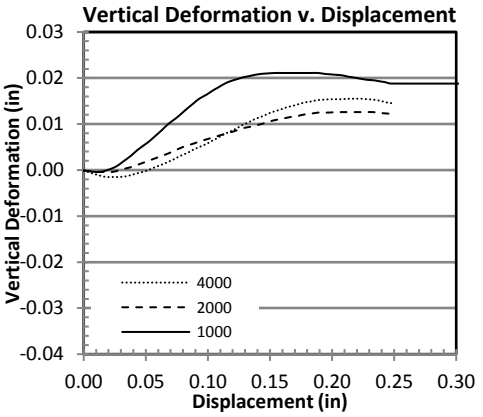
Samples Tested	1	2	3
Normal Stress (psf)	1000	2000	4000
Maximum Shear Stress (psf)	972	1476	3288
Ultimate Shear Stress (psf)	708	1332	2496
Initial Moisture Content (%)	3.7	3.7	3.7
Initial Dry Density (pcf)	109.1	109.1	109.1

Method: Drained
Consolidation: Yes
Saturation: Yes
Shearing Rate (in/min): 0.05

	Peak	Ultimate
Friction Angle, phi (deg)	38	31
Cohesion (psf)	66	126







ADVANCED GEOTECHNICAL SOLUTIONS, INC.

DRY DENSITY AND MOISTURE CONTENT - ASTM D2166

Project Name: 8247 Paseo del Ocaso
Location: La Jolla
Project No: 1705-04

Sample Date:	8/21/17	By: DL
Submittal Date:	8/21/17	By: DL
Test Date:	8/24/17	By: HM

Boring No.	B-1	B-2	B-2
Depth (ft)	10 ft	12.5 ft	17.5 ft
Moisture Content (%)	6.0	3.7	4.6
Dry Density (pcf)	107.9	109.1	105.5

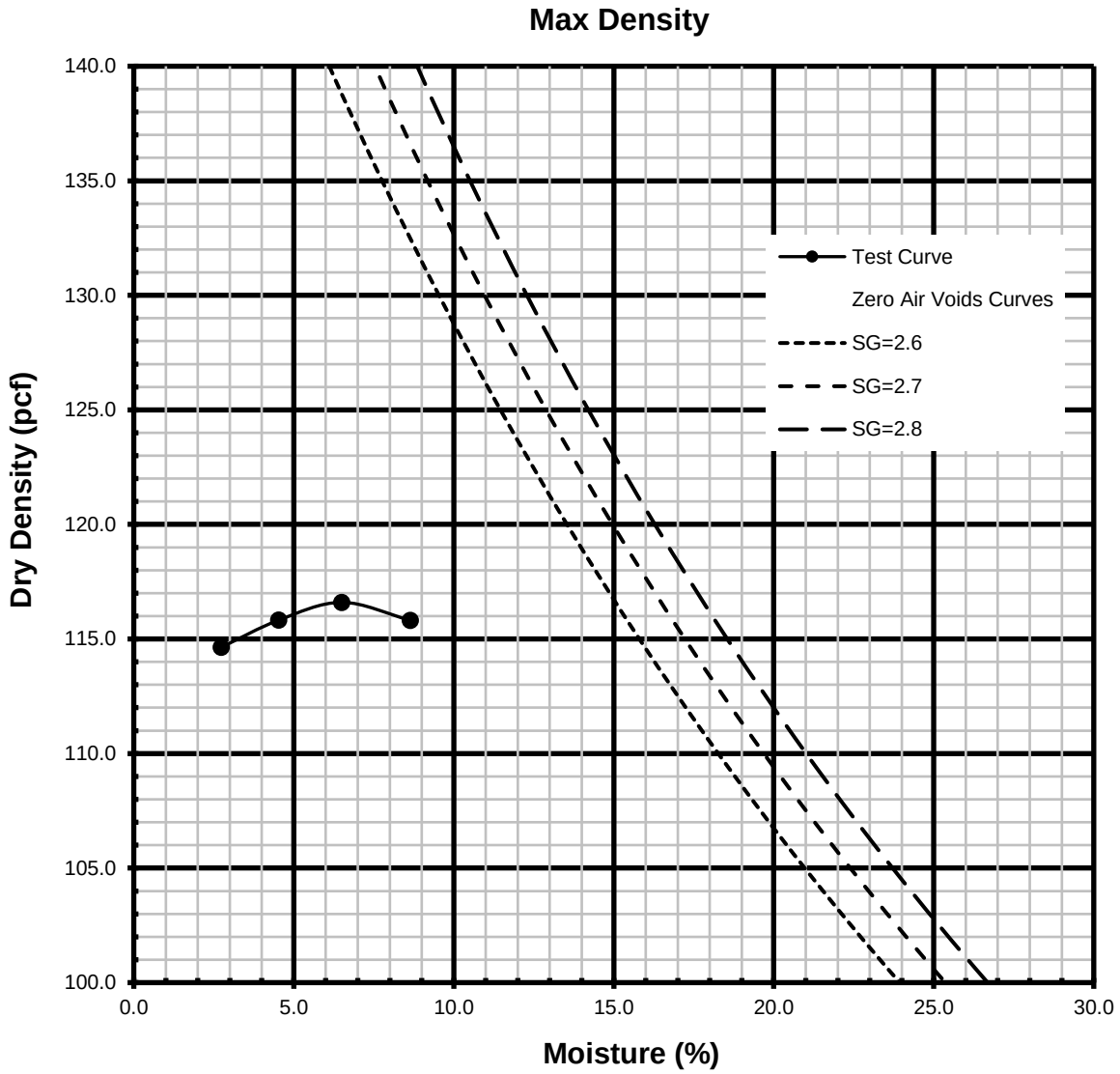
ADVANCED GEOTECHNICAL SOLUTIONS, INC.

MAXIMUM DENSITY - ASTM D1557

Project Name:	8247 Paseo del Ocaso	Excavation:	B-1
Location:		Depth:	3 ft
Project No.:	1705-04	Description:	Yellow SP-SM
Date:	9/6/2017	Project Manager	JS
		By:	FV

Method: A Rock Coreection 0

Test Number	1	2	3	4
Dry Density (pcf)	114.6	115.8	116.6	115.8
Moisture Content (%)	2.7	4.5	6.5	8.6



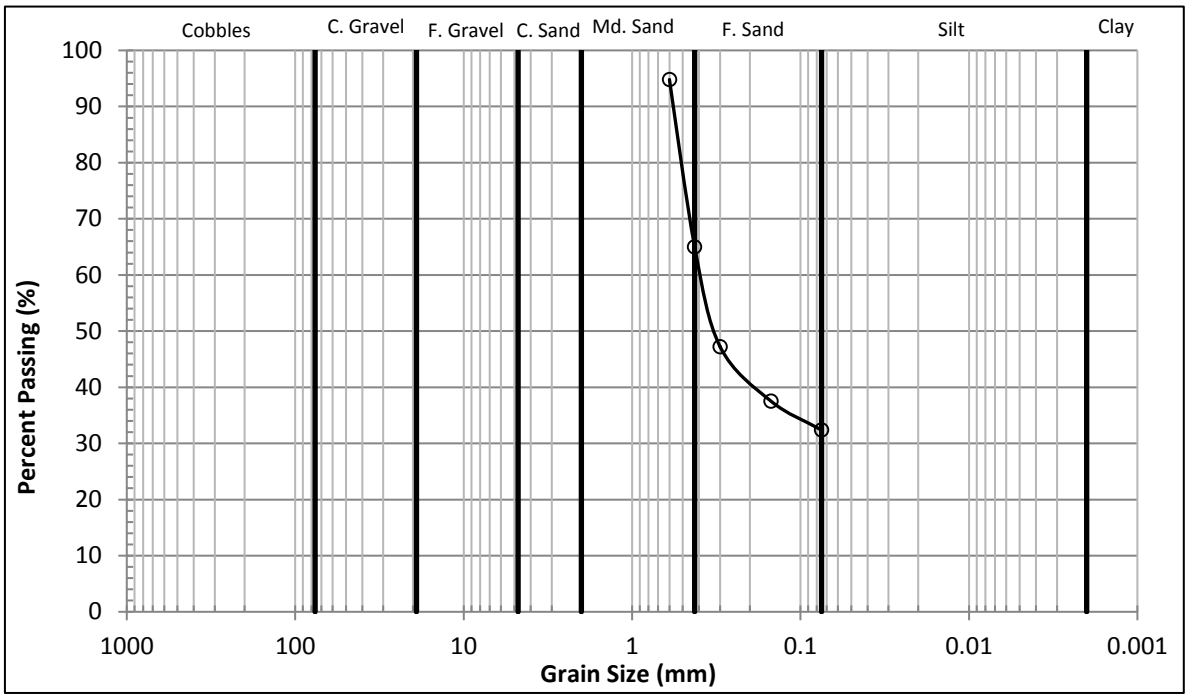
Maximum Density **116.5** pcf Optimum Moisture **6.5** %

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

PARTICLE SIZE ANALYSIS - ASTM D422

Project Name: 8247 Paseo del Ocaso
Location: La Jolla
Project No.: 1705-04
Date: 9/8/17

Excavation: B-2
Depth: 3 ft
By: FV



Grain Size (in/#)	Grain Size (mm)	Amount Passing (%)
3 "	76.20	100.00
2 1/2 "	63.50	100.00
2 "	50.80	100.00
1 1/2 "	38.10	100.00
1 "	25.40	100.00
3/4 "	19.05	100.00
1/2 "	12.70	100.00
3/8 "	9.53	100.00
# 4	4.75	100.00
# 10	2.00	100.00
# 20	0.85	#N/A
# 30	0.60	94.80
# 40	0.425	64.98
# 50	0.30	47.21
# 60	0.212	#N/A
# 100	0.15	37.54
# 200	0.075	32.37
Hydro	0.0328	18.55
Hydro	0.0207	18.55
Hydro	0.0120	18.55
Hydro	0.0086	18.55
Hydro	0.0062	16.23
Hydro	0.0044	16.23
Hydro	0.0031	15.07

Summary	
% Gravel =	0.0
% Sand =	67.6
% Fines =	32.4
Sum =	100.0

LL=
PL=
PI=

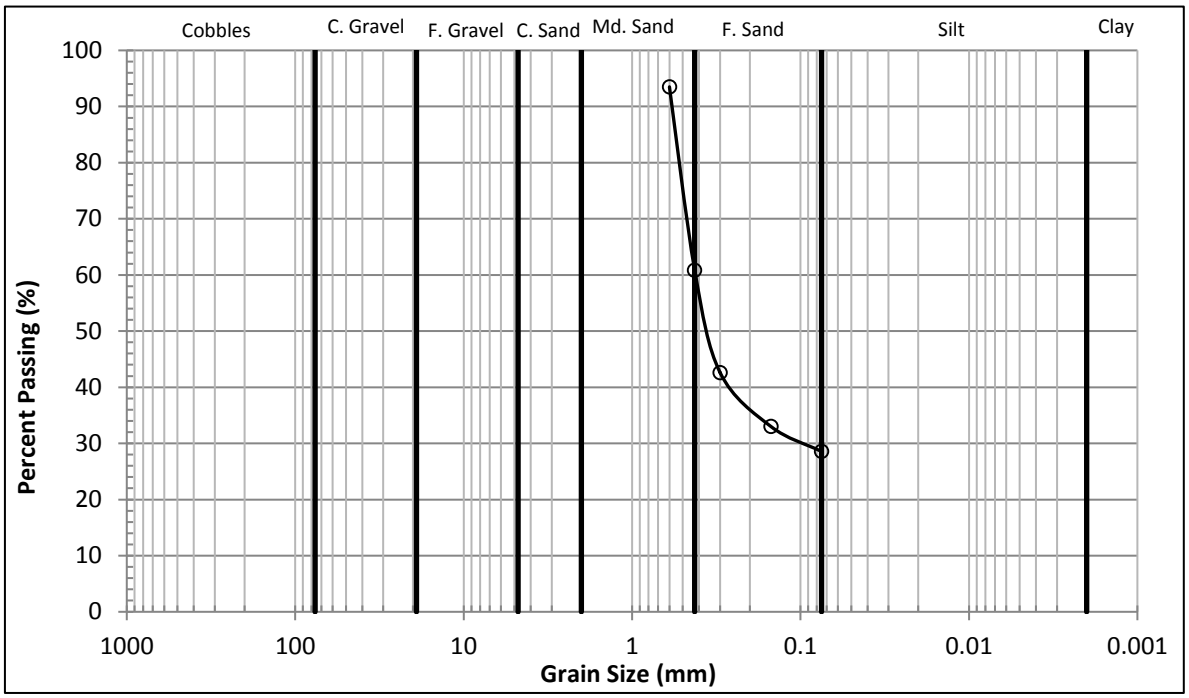
Soil Type: SP-SM

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

PARTICLE SIZE ANALYSIS - ASTM D422

Project Name: 8247 Paseo del Ocaso
Location: La Jolla
Project No.: 1705-04
Date: 9/8/17

Excavation: B-1
Depth: 3 ft
By: FV



Grain Size (in/#)	Grain Size (mm)	Amount Passing (%)
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2 1/2 "	63.50	100.00
2 "	50.80	100.00
1 1/2 "	38.10	100.00
1 "	25.40	100.00
3/4 "	19.05	100.00
1/2 "	12.70	100.00
3/8 "	9.53	100.00
# 4	4.75	100.00
# 10	2.00	100.00
# 20	0.85	#N/A
# 30	0.60	93.50
# 40	0.425	60.86
# 50	0.30	42.59
# 60	0.212	#N/A
# 100	0.15	33.02
# 200	0.075	28.56
Hydro	0.0334	14.39
Hydro	0.0212	13.28
Hydro	0.0122	13.28
Hydro	0.0087	13.28
Hydro	0.0062	13.28
Hydro	0.0045	11.07
Hydro	0.0031	11.07

Summary	
% Gravel =	0.0
% Sand =	71.4
% Fines =	28.6
Sum =	100.0

LL=
PL=
PI=

Soil Type: SP-SM

ANAHEIM TEST LAB, INC

3008 ORANGE AVENUE
SANTA ANA, CALIFORNIA 92707
PHONE (714) 549-7267

Advanced Geotechnical Solutions, Inc
485 Corporate Ave., Suite B
Escondido, CA 92029

DATE: 08/30/17

P.O. NO.: Chain of Custody

LAB NO.: C-0930

SPECIFICATION: CA-417/422/643

MATERIAL: Soil

J.N.: 1705-04
Project: 847 Paseo De Ocaso
Date sampled: 08/24/17
Location: Lab
B-2 @ 8'

ANALYTICAL REPORT

CORROSION SERIES
SUMMARY OF DATA

pH	SOLUBLE SULFATES per CA. 417 ppm	SOLUBLE CHLORIDES per CA. 422 ppm	MIN. RESISTIVITY per CA. 643 ohm-cm
6.8	177	114	7,600

RESPECTFULLY SUBMITTED

WES BRIDGER CHEMIST

APPENDIX D

GENERAL EARTHWORK SPECIFICATIONS

AND GRADING GUIDELINES

GENERAL EARTHWORK SPECIFICATIONS

I. General

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

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

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

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

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

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

II. Site Preparation

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

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

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

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

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

III. Placement of Fill

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

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

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

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

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

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

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

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

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

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

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

IV. Cut Slopes

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

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

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

V. Drainage

A. Back drains and Subdrains: Back drains and subdrains shall be provided in fill as recommended by the Geotechnical Consultant and shall be constructed in accordance with the governing agency and/or recommendations of the Geotechnical Consultant. The location of subdrains, especially outlets, shall be surveyed and recorded by the Civil Engineer.

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

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

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

VI. Erosion Control

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

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

VII. Trench Excavation and Backfill

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

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

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

VIII. Geotechnical Observation and Testing During Grading

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

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

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

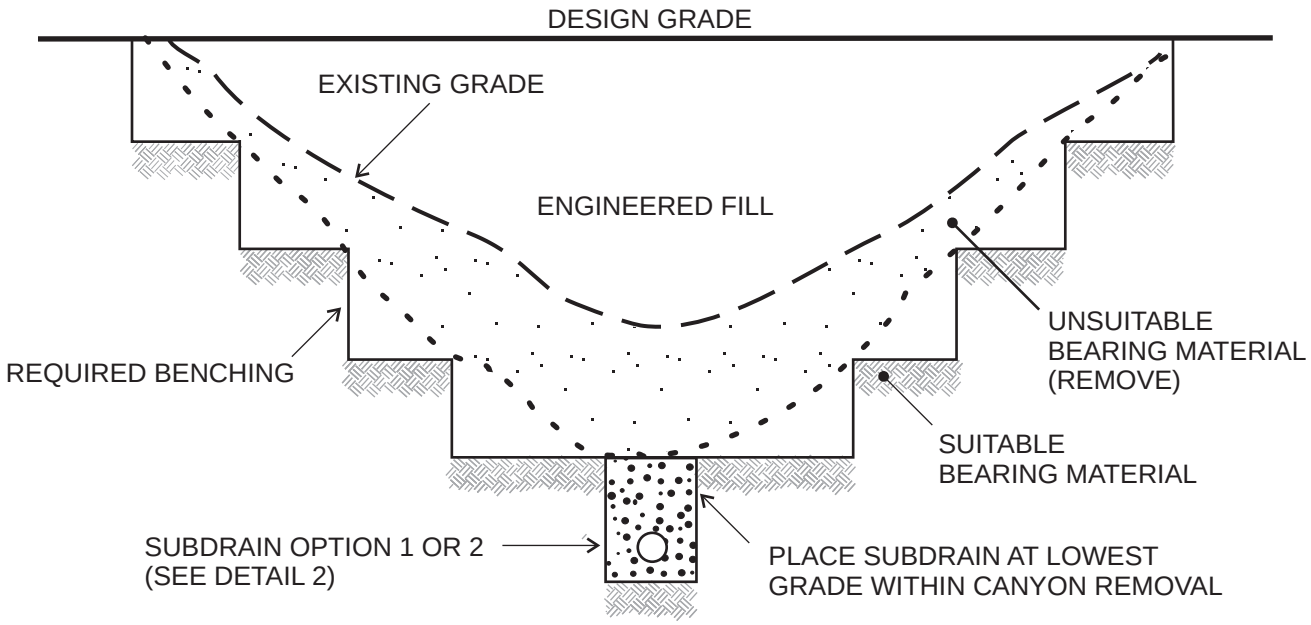
D. Frequency of Compaction Testing: The location and frequency of tests shall be at the Geotechnical Consultant's discretion. Generally, compaction tests shall be taken at intervals not exceeding two feet in fill height and 1,000 cubic yards of fill materials placed.

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

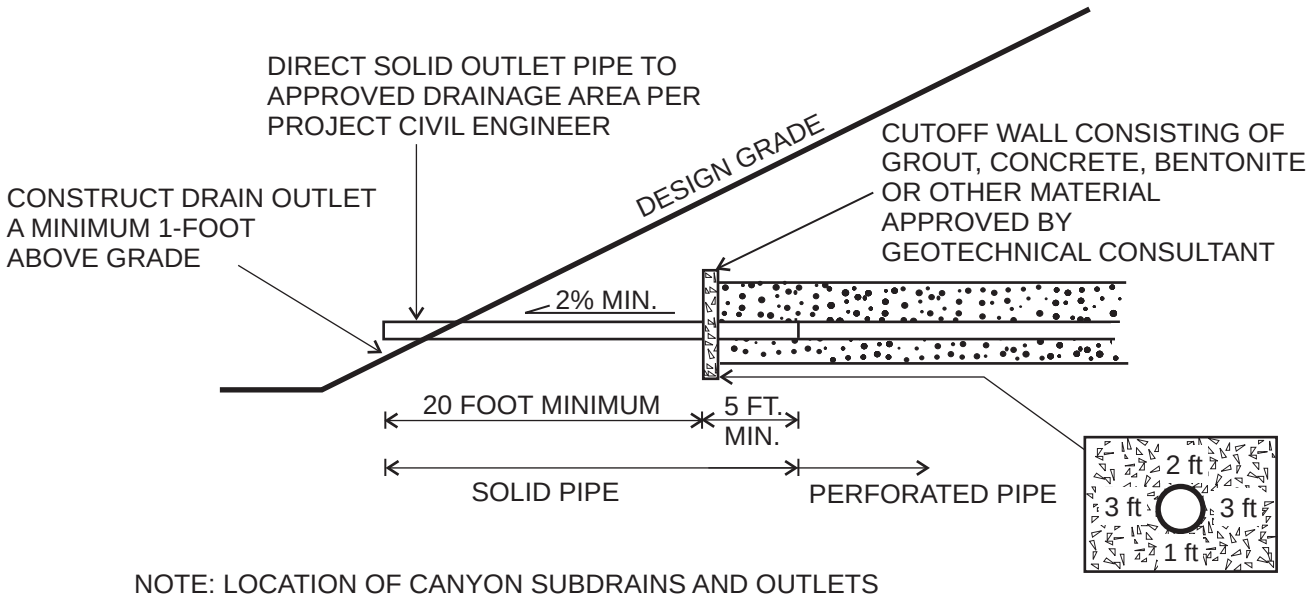
F. Areas of fill that have not been observed or tested by the Geotechnical Consultant may have to be removed and recompacted at the contractor's expense. The depth and extent of removals will be determined by the Geotechnical Consultant.

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

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



CANYON SUBDRAIN PROFILE



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

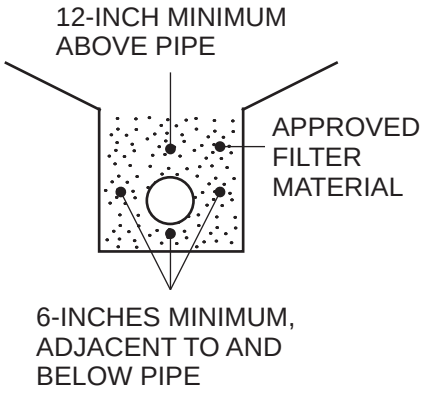
CUTOFF WALL DIMENSIONS

CANYON SUBDRAIN TERMINUS

VER 1.0

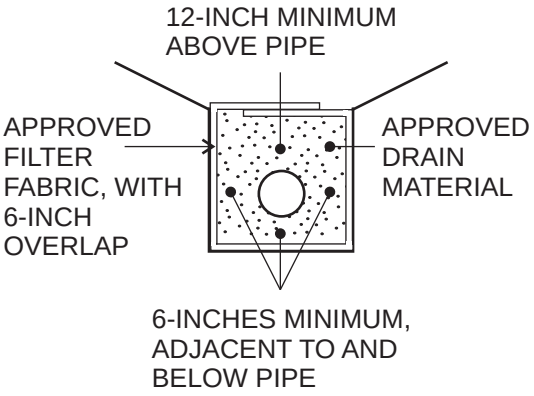
NTS

AGS ADVANCED GEOTECHNICAL SOLUTIONS	CANYON SUBDRAIN	DETAIL 1



OPTION 1

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



OPTION 2

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

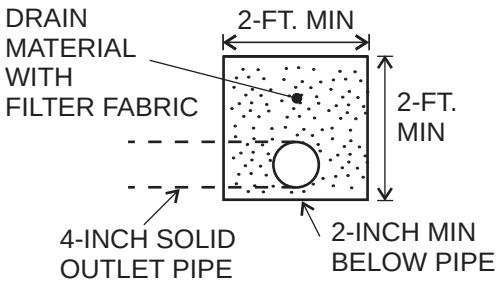
FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT SUBSTITUTE

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

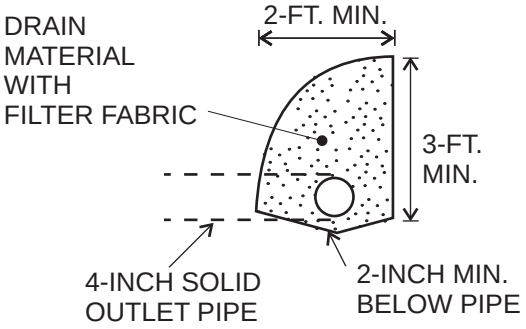
(ASTM D2751, SDR-35 OR ASTM D3034, SDR-35
ASTM D1527, SCHD. 40 OR ASTM D1785, SCHD. 40)

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

CANYON SUBDRAIN



OPTION 1



OPTION 2

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

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

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

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

BUTTRESS/STABILIZATION DRAIN

VER 1.0

NTS

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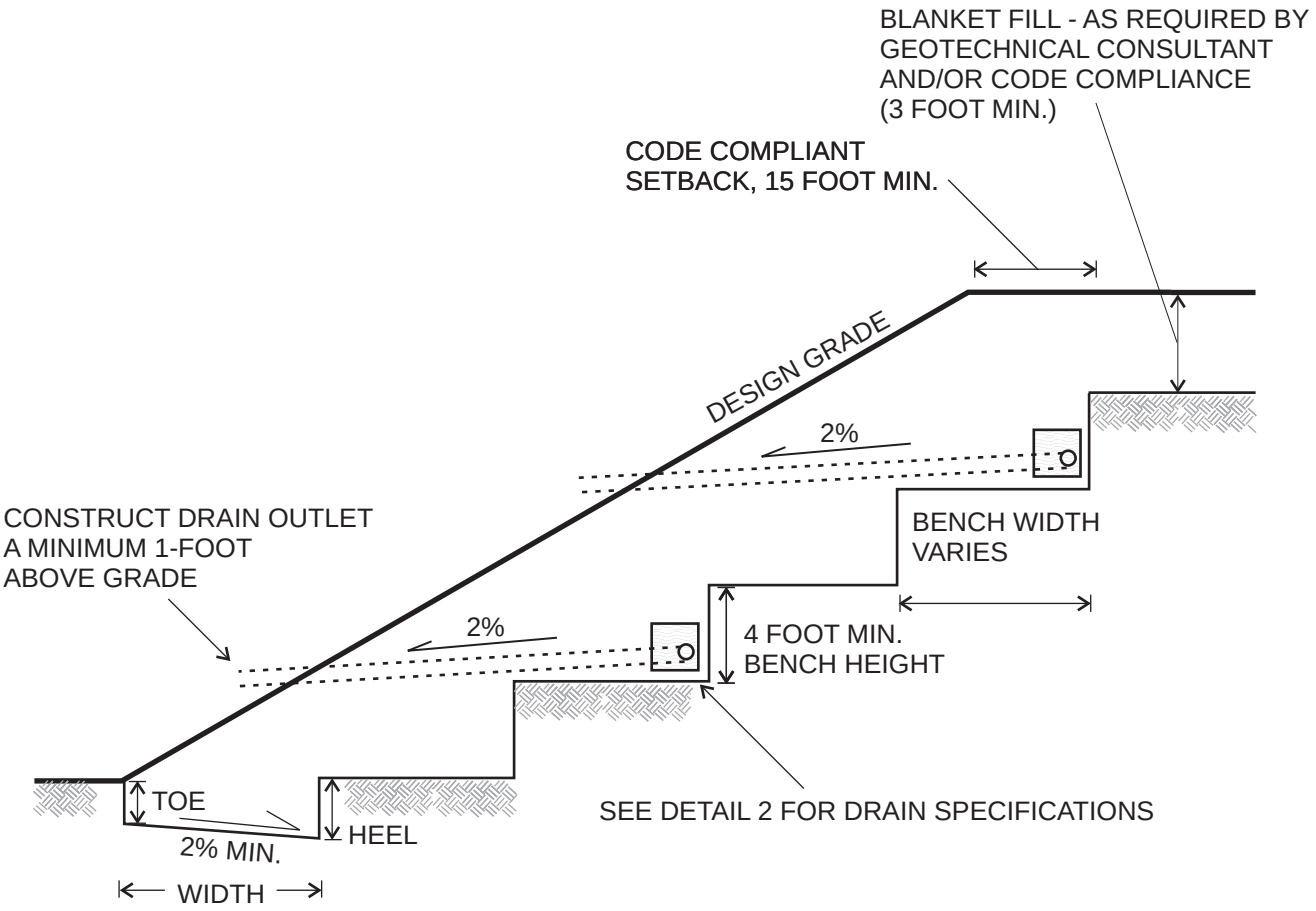
ADVANCED GEOTECHNICAL SOLUTIONS

DRAIN SPECIFICATIONS

DETAIL 2



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

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

NOTES:

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

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

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

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

VER 1.0

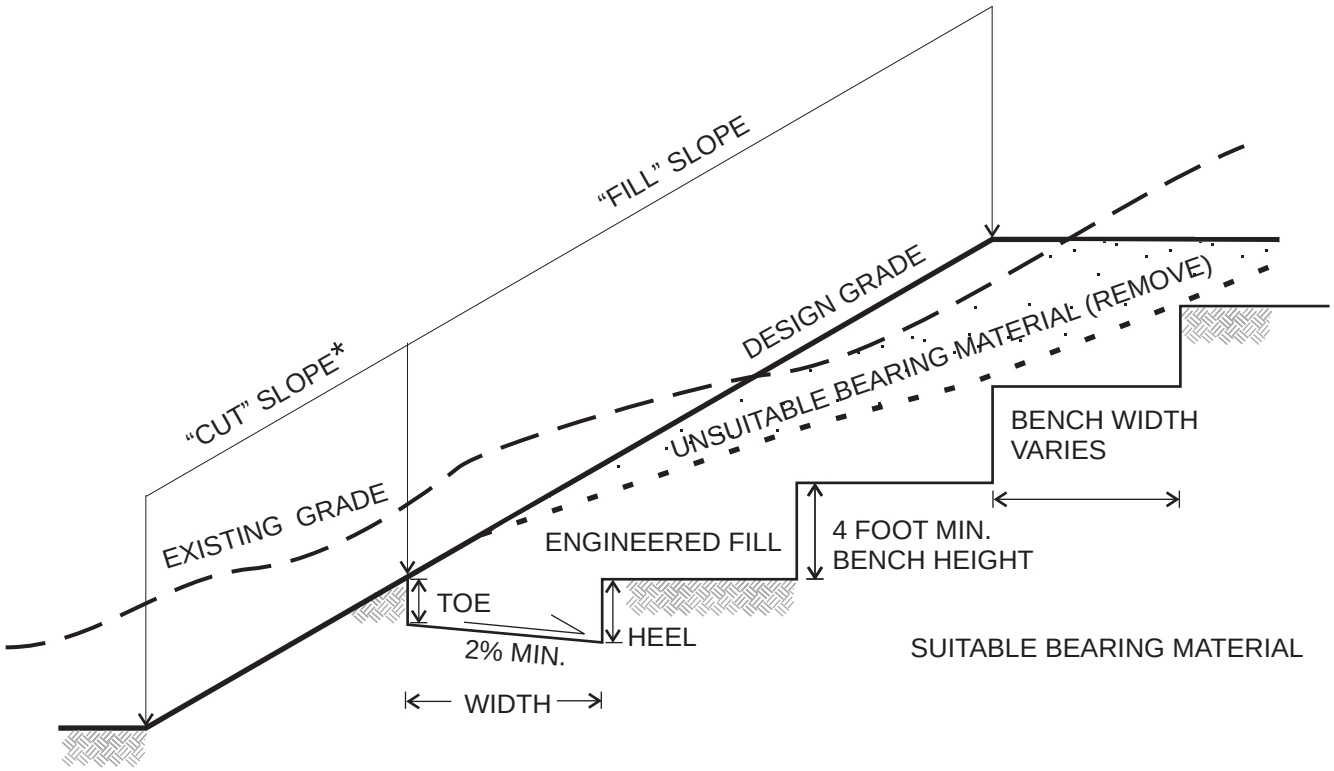
NTS

AGS
ADVANCED GEOTECHNICAL SOLUTIONS

STABILIZATION/BUTTRESS FILL

DETAIL 3

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



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

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

NOTES:

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

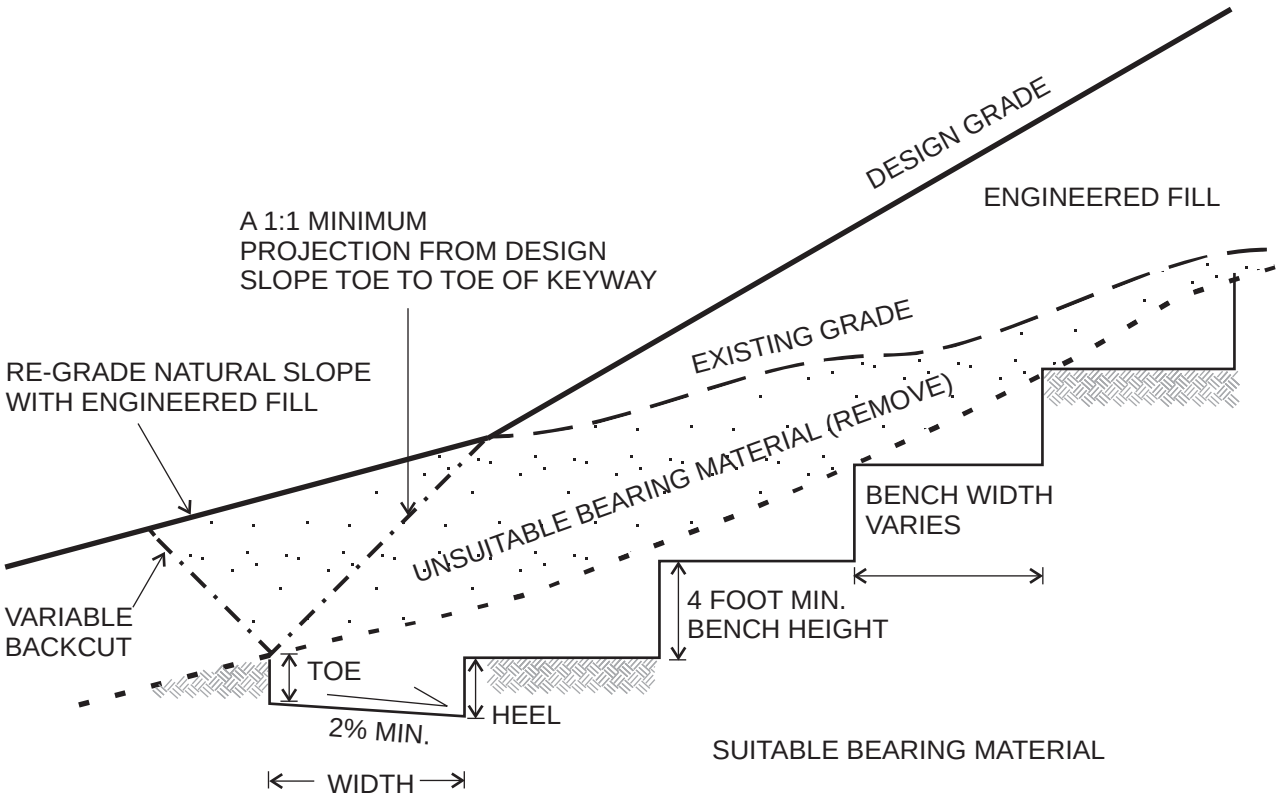
2. SEE DETAIL 2 FOR DRAIN SPECIFICATIONS

VER 1.0 NTS

AGS
ADVANCED GEOTECHNICAL SOLUTIONS

FILL OVER CUT SLOPE

DETAIL 4



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

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

NOTES:

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

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

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

VER 1.0 NTS

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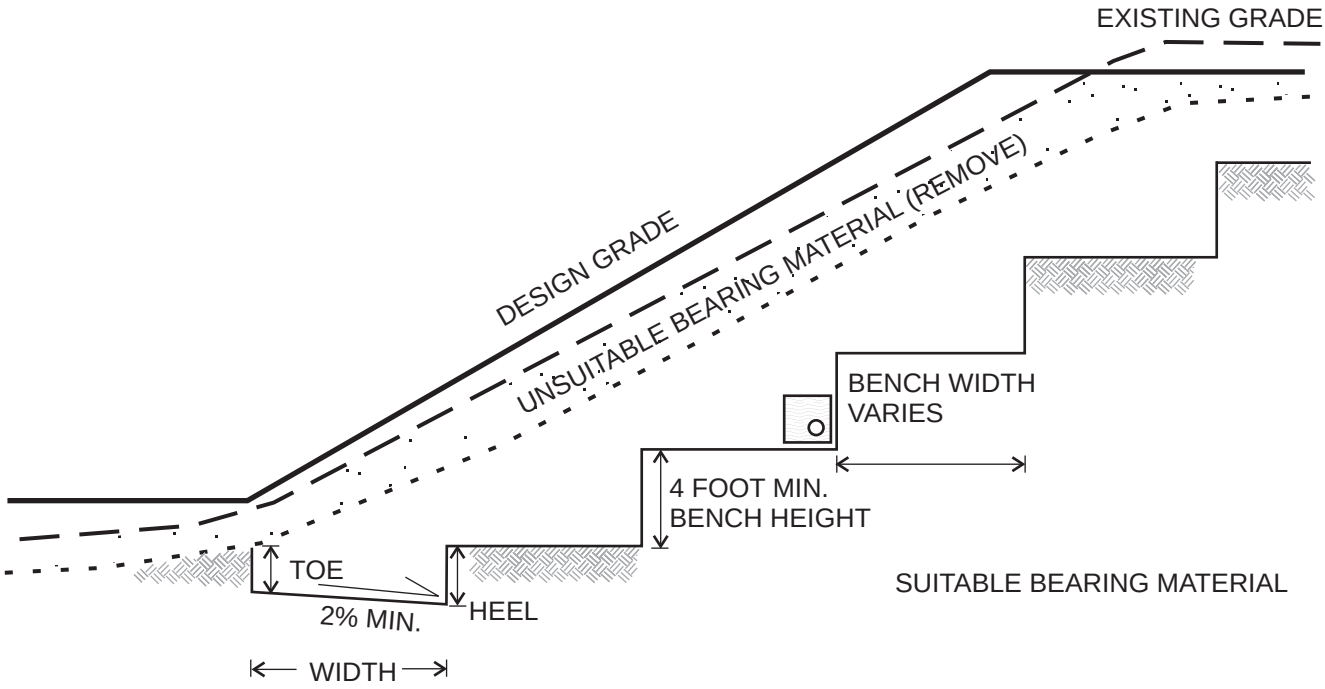
FILL OVER NATURAL SLOPE

DETAIL 5



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

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

NOTES:

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

2. SEE DETAIL 2 FOR DRAIN SPECIFICATIONS

VER 1.0

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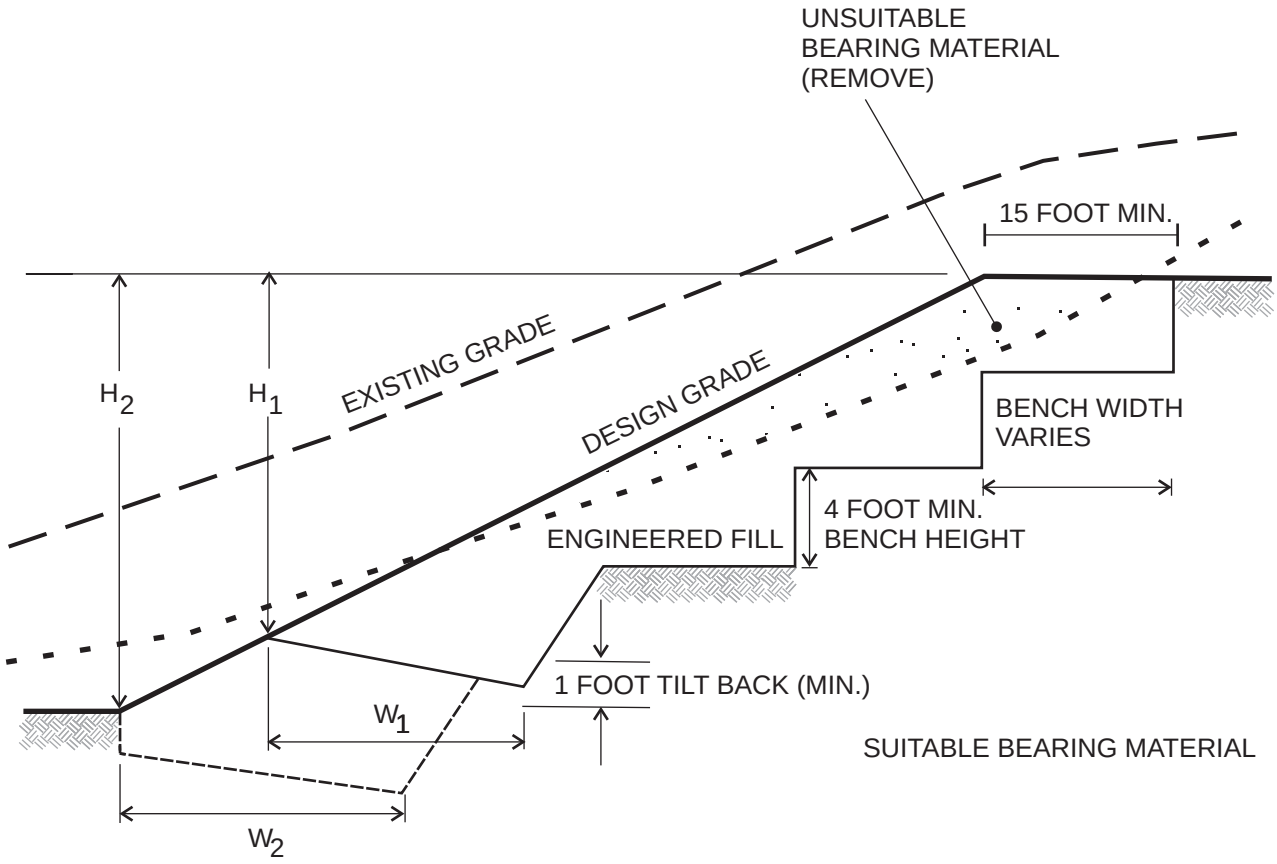
SKIN FILL CONDITION

DETAIL 6



NOTES:

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

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

3. DRAINS WILL BE REQUIRED (SEE DETAIL 2)

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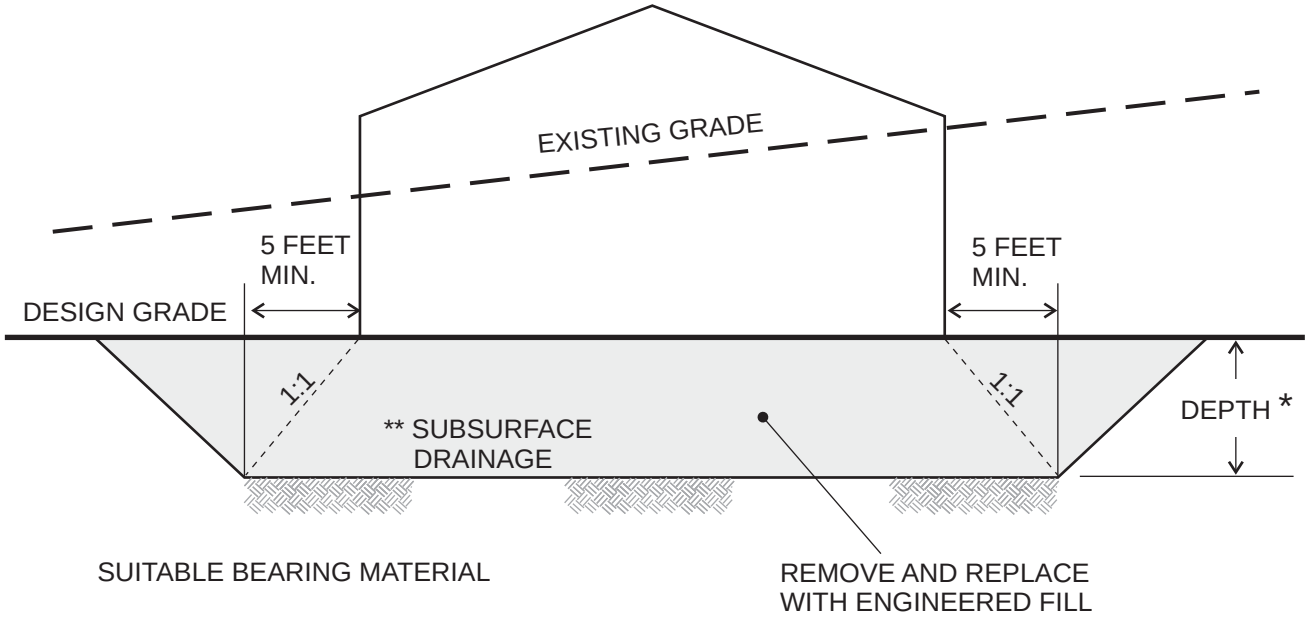
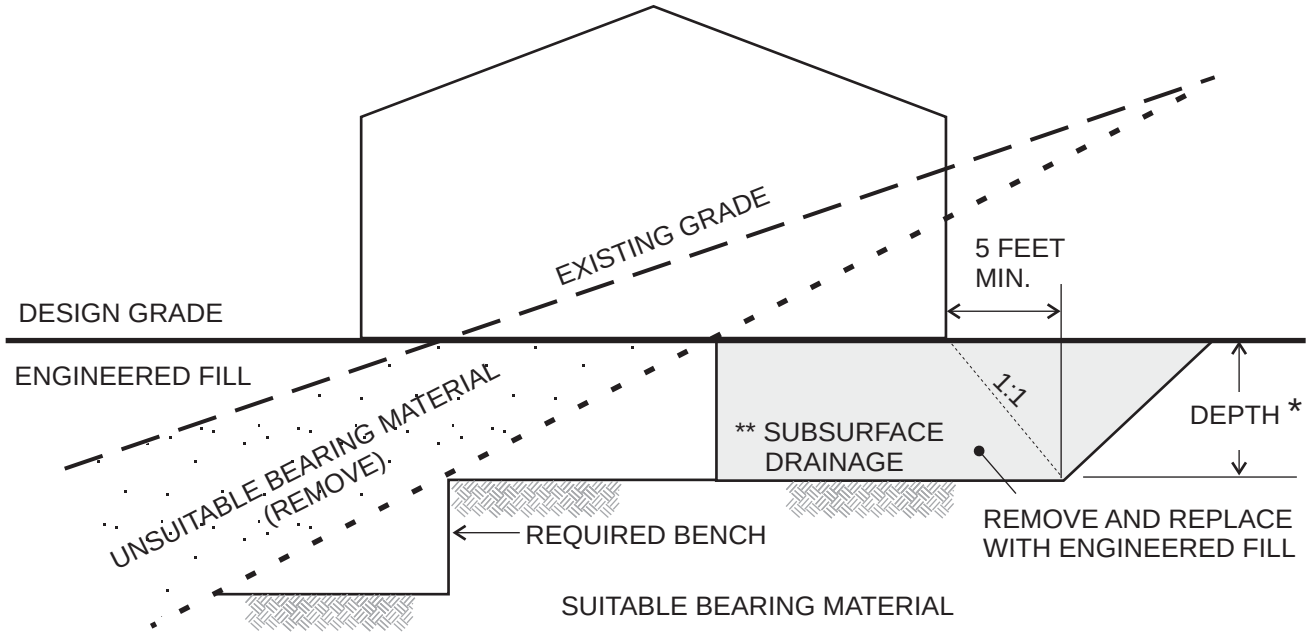
PARTIAL CUT SLOPE STABILIZATION

DETAIL 7



CUT LOT OVEREXCAVATION



CUT-FILL LOT OVEREXCAVATION

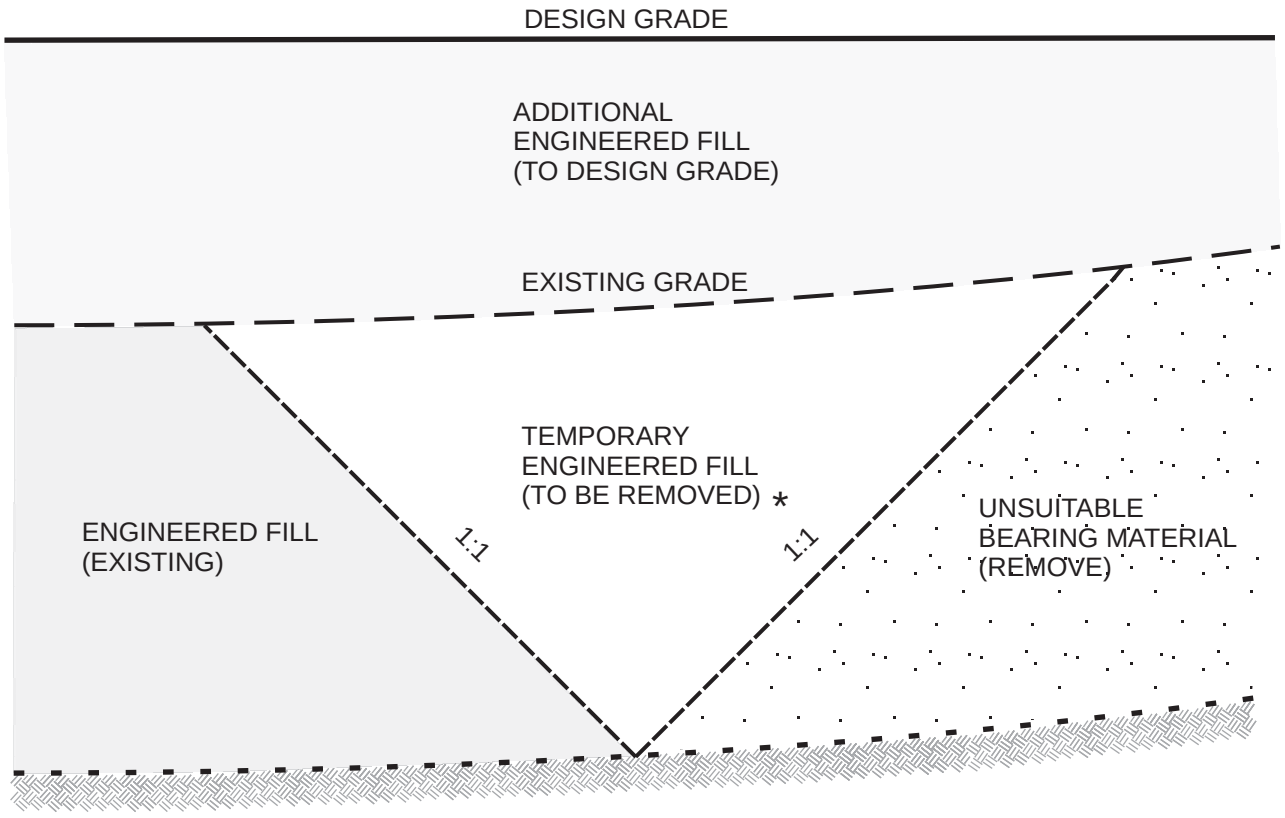
NOTES:

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

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

VER 1.0 NTS

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



* REMOVE BEFORE PLACING ADDITIONAL ENGINEERED FILL

TYPICAL UP-CANYON PROFILE

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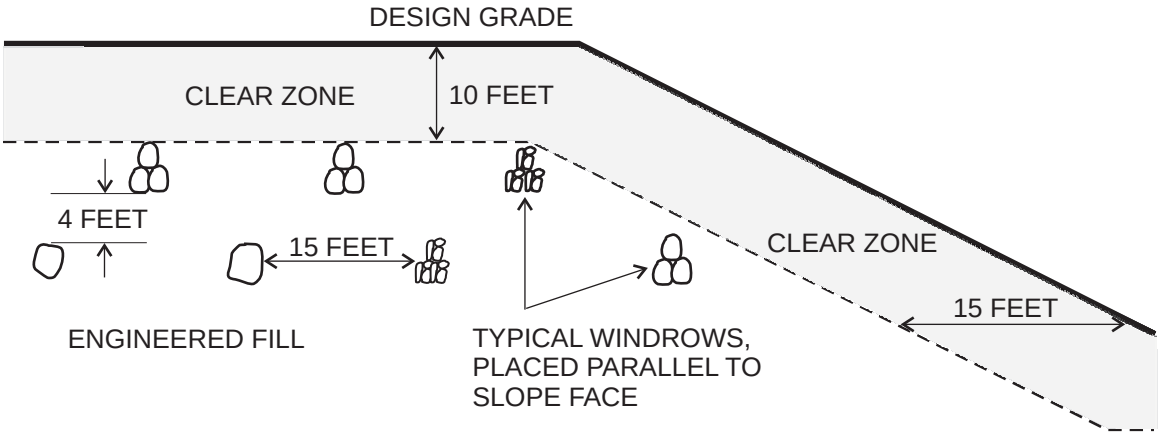
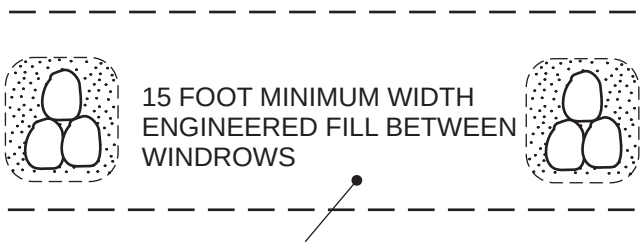
REMOVAL ADJACENT TO EXISTING FILL

DETAIL 9



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

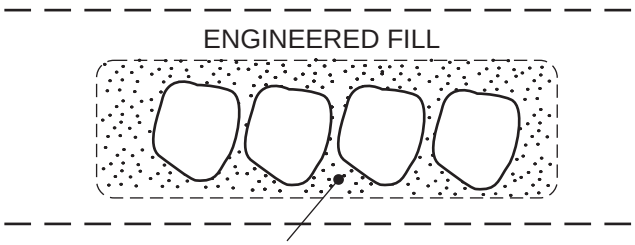
OVERSIZED MATERIAL DISPOSAL PROFILE



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

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

WINDROW CROSS-SECTION



GRANULAR MATERIAL APPROVED BY THE GEOTECHNICAL CONSULTANT AND CONSOLIDATED IN-PLACE BY FLOODING

WINDROW PROFILE

VER 1.0

NTS

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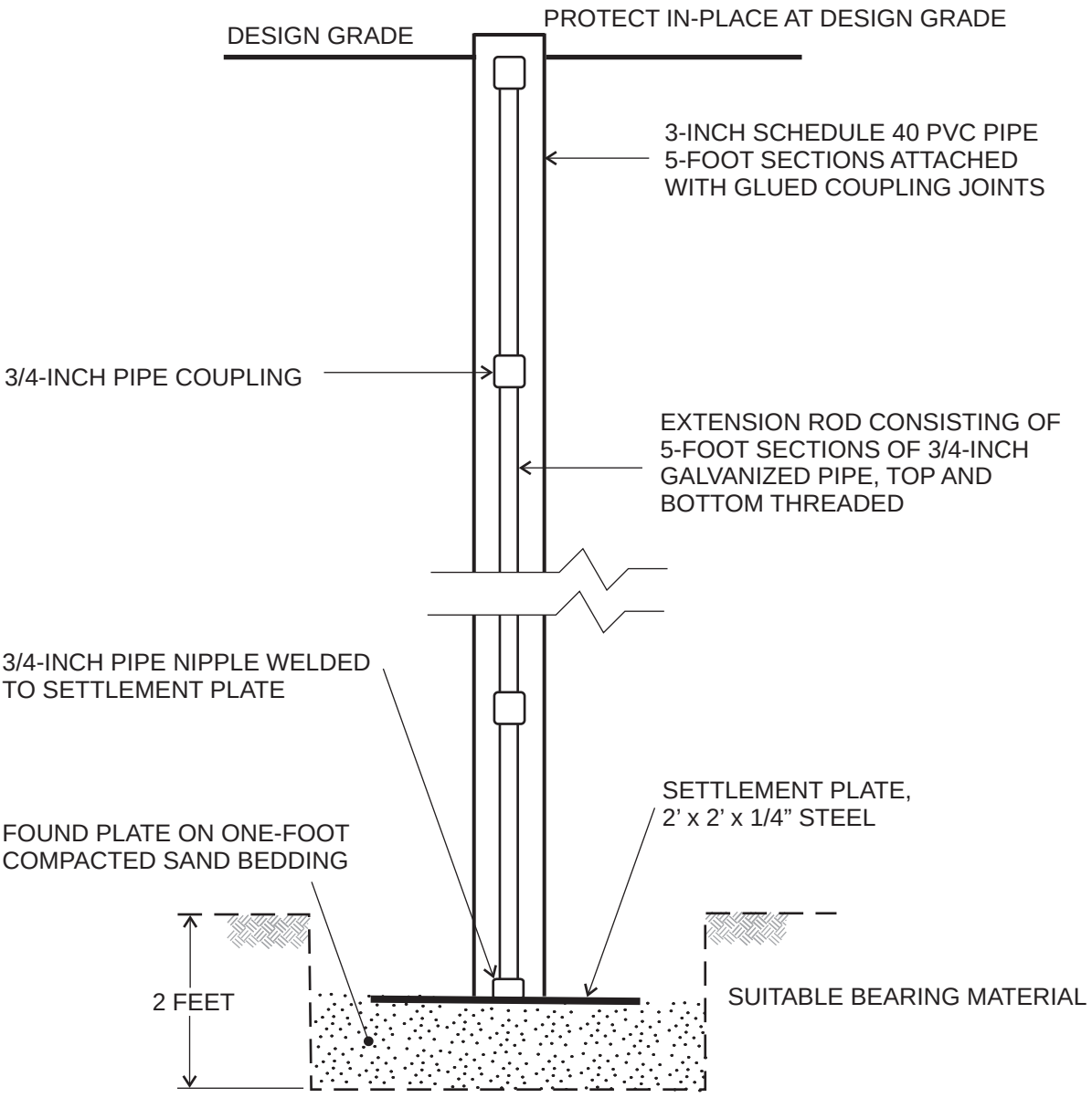
ADVANCED GEOTECHNICAL SOLUTIONS

OVERSIZED MATERIAL DISPOSAL CRITERIA

DETAIL 10



NOTES:

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

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

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

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

VER 1.0

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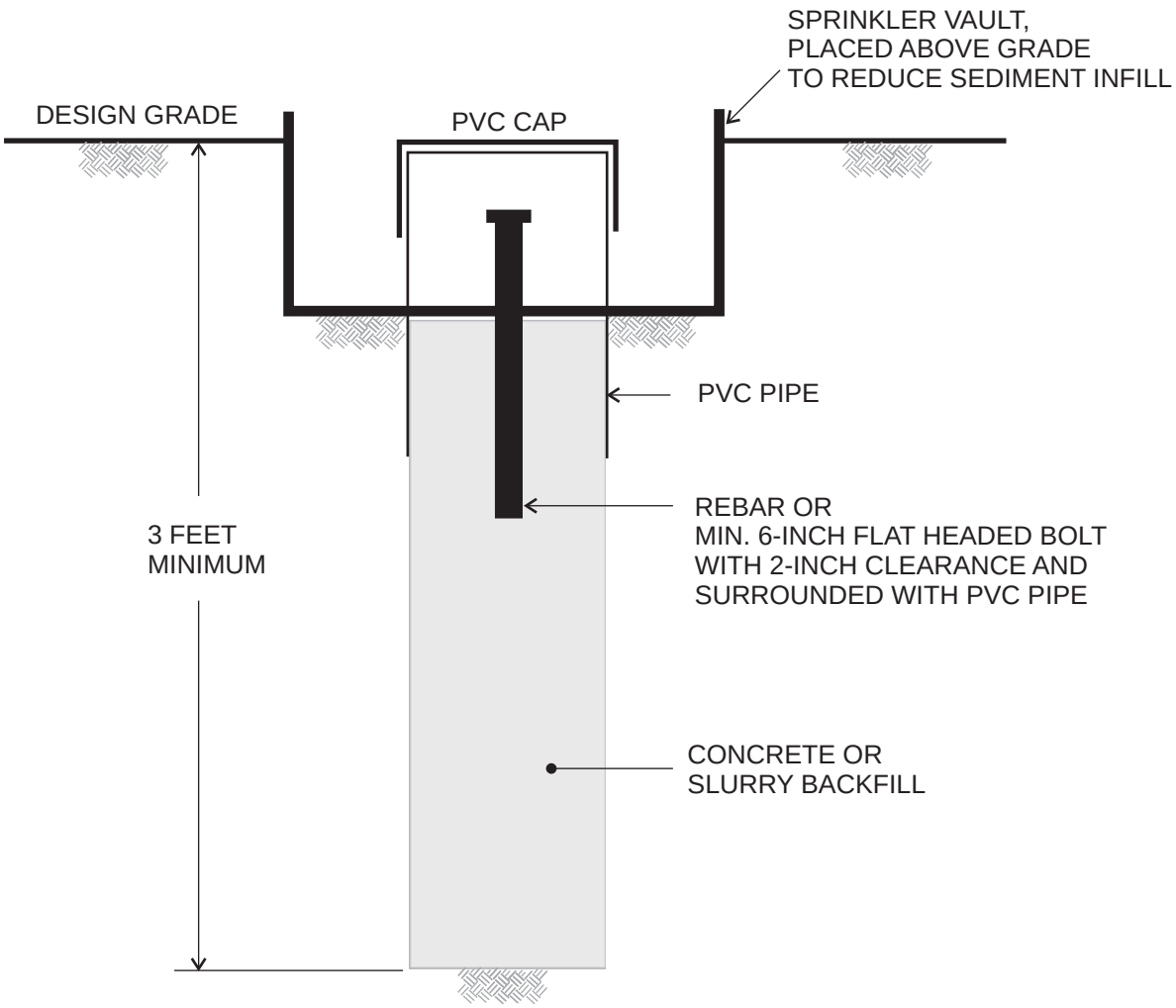
ADVANCED GEOTECHNICAL SOLUTIONS

SETTLEMENT PLATE

DETAIL 11



NOTES:

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

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

VER 1.0

NTS

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ADVANCED GEOTECHNICAL SOLUTIONS

SETTLEMENT MONUMENT

DETAIL 12

APPENDIX E

HOMEOWNER MAINTENANCE RECOMMENDATIONS

HOMEOWNER MAINTENANCE AND IMPROVEMENT CONSIDERATIONS

Homeowners are accustomed to maintaining their homes. They expect to paint their houses periodically, replace wiring, clean out clogged plumbing, and repair roofs. Maintenance of the home site, particularly on hillsides, should be considered on the same basis or even on a more serious basis because neglect can result in serious consequences. In most cases, lot and site maintenance can be taken care of along with landscaping, and can be carried out more economically than repair after neglect.

Most slope and hillside lot problems are associated with water. Uncontrolled water from a broken pipe, cesspool, or wet weather causes most damage. Wet weather is the largest cause of slope problems, particularly in California where rain is intermittent, but may be torrential. Therefore, drainage and erosion control are the most important aspects of home site stability; these provisions must not be altered without competent professional advice. Further, maintenance must be carried out to assure their continued operation.

As geotechnical engineers concerned with the problems of building sites in hillside developments, we offer the following list of recommended home protection measures as a guide to homeowners.

Expansive Soils

Some of the earth materials on site have been identified as being expansive in nature. As such, these materials are susceptible to volume changes with variations in their moisture content. These soils will swell upon the introduction of water and shrink upon drying. The forces associated with these volume changes can have significant negative impacts (in the form of differential movement) on foundations, walkways, patios, and other lot improvements. In recognition of this, the project developer has constructed homes on these lots on post-tensioned or mat slabs with pier and grade beam foundation systems, intended to help reduce the potential adverse effects of these expansive materials on the residential structures within the project. Such foundation systems are not intended to offset the forces (and associated movement) related to expansive soil, but are intended to help soften their effects on the structures constructed thereon.

Homeowners purchasing property and living in an area containing expansive soils must assume a certain degree of responsibility for homeowner improvements as well as for maintaining conditions around their home. Provisions should be incorporated into the design and construction of homeowner improvements to account for the expansive nature of the onsite soils material. Lot maintenance and landscaping should also be conducted in consideration of the expansive soil characteristics. Of primary importance is minimizing the moisture variation below all lot improvements. Such design, construction and homeowner maintenance provisions should include:

- Employing contractors for homeowner improvements who design and build in recognition of local building code and site specific soils conditions.
- Establishing and maintaining positive drainage away from all foundations, walkways, driveways, patios, and other hardscape improvements.
- Avoiding the construction of planters adjacent to structural improvements. Alternatively, planter sides/bottoms can be sealed with an impermeable membrane and drained away from the improvements via subdrains into approved disposal areas.
- Sealing and maintaining construction/control joints within concrete slabs and walkways to reduce the potential for moisture infiltration into the subgrade soils.

- Utilizing landscaping schemes with vegetation that requires minimal watering. Alternatively, watering should be done in a uniform manner as equally as possible on all sides of the foundation, keeping the soil "moist" but not allowing the soil to become saturated.
- Maintaining positive drainage away from structures and providing roof gutters on all structures with downspouts installed to carry roof runoff directly into area drains or discharged well away from the structures.
- Avoiding the placement of trees closer to the proposed structures than a distance of one-half the mature height of the tree.
- Observation of the soil conditions around the perimeter of the structure during extremely hot/dry or unusually wet weather conditions so that modifications can be made in irrigation programs to maintain relatively constant moisture conditions.

Sulfates

Homeowners should be cautioned against the import and use of certain fertilizers, soil amendments, and/or other soils from offsite sources in the absence of specific information relating to their chemical composition. Some fertilizers have been known to leach sulfate compounds into soils otherwise containing "negligible" sulfate concentrations and increase the sulfate concentrations in near-surface soils to "moderate" or "severe" levels. In some cases, concrete improvements constructed in soils containing high levels of soluble sulfates may be affected by deterioration and loss of strength.

Water - Natural and Man Induced

Water in concert with the reaction of various natural and man-made elements, can cause detrimental effects to your structure and surrounding property. Rain water and flowing water erodes and saturates the ground and changes the engineering characteristics of the underlying earth materials upon saturation. Excessive irrigation in concert with a rainy period is commonly associated with shallow slope failures and deep seated landslides, saturation of near structure soils, local ponding of water, and transportation of water soluble substances that are deleterious to building materials including concrete, steel, wood, and stucco.

Water interacting with the near surface and subsurface soils can initiate several other potentially detrimental phenomena other then slope stability issues. These may include expansion/contraction cycles, liquefaction potential increase, hydro-collapse of soils, ground surface settlement, earth material consolidation, and introduction of deleterious substances.

The homeowners should be made aware of the potential problems which may develop when drainage is altered through construction of retaining walls, swimming pools, paved walkways and patios. Ponded water, drainage over the slope face, leaking irrigation systems, over-watering or other conditions which could lead to ground saturation must be avoided.

- Before the rainy season arrives, check and clear roof drains, gutters and down spouts of all accumulated debris. Roof gutters are an important element in your arsenal against rain damage. If you do not have roof gutters and down spouts, you may elect to install them. Roofs, with their, wide, flat area can shed tremendous quantities of water. Without gutters or other adequate drainage, water falling from the eaves collects against foundation and basement walls.
- Make sure to clear surface and terrace drainage ditches, and check them frequently during the rainy season. This task is a community responsibility.
- Test all drainage ditches for functioning outlet drains. This should be tested with a hose and done before the rainy season. All blockages should be removed.
- Check all drains at top of slopes to be sure they are clear and that water will not overflow the slope itself, causing erosion.

- Keep subsurface drain openings (weep-holes) clear of debris and other material which could block them in a storm.
- Check for loose fill above and below your property if you live on a slope or terrace.
- Monitor hoses and sprinklers. During the rainy season, little, if any, irrigation is required. Oversaturation of the ground is unnecessary, increases watering costs, and can cause subsurface drainage.
- Watch for water backup of drains inside the house and toilets during the rainy season, as this may indicate drain or sewer blockage.
- Never block terrace drains and brow ditches on slopes or at the tops of cut or fill slopes. These are designed to carry away runoff to a place where it can be safely distributed.
- Maintain the ground surface upslope of lined ditches to ensure that surface water is collected in the ditch and is not permitted to be trapped behind or under the lining.
- Do not permit water to collect or pond on your home site. Water gathering here will tend to either seep into the ground (loosening or expanding fill or natural ground), or will overflow into the slope and begin erosion. Once erosion is started, it is difficult to control and severe damage may result rather quickly.
- Never connect roof drains, gutters, or down spouts to subsurface drains. Rather, arrange them so that water either flows off your property in a specially designed pipe or flows out into a paved driveway or street. The water then may be dissipated over a wide surface or, preferably, may be carried away in a paved gutter or storm drain. Subdrains are constructed to take care of ordinary subsurface water and cannot handle the overload from roofs during a heavy rain.
- Never permit water to spill over slopes, even where this may seem to be a good way to prevent ponding. This tends to cause erosion and, in the case of fill slopes, can eat away carefully designed and constructed sites.
- Do not cast loose soil or debris over slopes. Loose soil soaks up water more readily than compacted fill. It is not compacted to the same strength as the slope itself and will tend to slide when laden with water; this may even affect the soil beneath the loose soil. The sliding may clog terrace drains below or may cause additional damage in weakening the slope. If you live below a slope, try to be sure that loose fill is not dumped above your property.
- Never discharge water into subsurface blanket drains close to slopes. Trench drains are sometimes used to get rid of excess water when other means of disposing of water are not readily available. Overloading these drains saturates the ground and, if located close to slopes, may cause slope failure in their vicinity.
- Do not discharge surface water into septic tanks or leaching fields. Not only are septic tanks constructed for a different purpose, but they will tend, because of their construction, to naturally accumulate additional water from the ground during a heavy rain. Overloading them artificially during the rainy season is bad for the same reason as subsurface subdrains, and is doubly dangerous since their overflow can pose a serious health hazard. In many areas, the use of septic tanks should be discontinued as soon as sewers are made available.
- Practice responsible irrigation practices and do not over-irrigate slopes. Naturally, ground cover of ice plant and other vegetation will require some moisture during the hot summer months, but during the wet season, irrigation can cause ice plant and other heavy ground cover to pull loose. This not only destroys the cover, but also starts serious erosion. In some areas, ice plant and other heavy cover can cause surface sloughing when saturated due to the increase in weight and weakening of the near-surface soil. Planted slopes should be planned where possible to acquire sufficient moisture when it rains.
- Do not let water gather against foundations, retaining walls, and basement walls. These walls are built to withstand the ordinary moisture in the ground and are, where necessary, accompanied by subdrains to carry off the excess. If water is permitted to pond against them, it may seep through the wall, causing dampness and leakage inside the basement. Further, it may cause the foundation to swell up, or the water pressure could cause structural damage to walls.

- Do not try to compact soil behind walls or in trenches by flooding with water. Not only is flooding the least efficient way of compacting fine-grained soil, but it could damage the wall foundation or saturate the subsoil.
- Never leave a hose and sprinkler running on or near a slope, particularly during the rainy season. This will enhance ground saturation which may cause damage.
- Never block ditches which have been graded around your house or the lot pad. These shallow ditches have been put there for the purpose of quickly removing water toward the driveway, street or other positive outlet. By all means, do not let water become ponded above slopes by blocked ditches.
- Seeding and planting of the slopes should be planned to achieve, as rapidly as possible, a well-established and deep-rooted vegetal cover requiring minimal watering.
- It should be the responsibility of the landscape architect to provide such plants initially and of the residents to maintain such planting. Alteration of such a planting scheme is at the resident's risk.
- The resident is responsible for proper irrigation and for maintenance and repair of properly installed irrigation systems. Leaks should be fixed immediately. Residents must undertake a program to eliminate burrowing animals. This must be an ongoing program in order to promote slope stability. The burrowing animal control program should be conducted by a licensed exterminator and/or landscape professional with expertise in hill side maintenance.

Geotechnical Review

Due to the fact that soil types may vary with depth, it is recommended that plans for the construction of rear yard improvements (swimming pools, spas, barbecue pits, patios, etc.), be reviewed by a geotechnical engineer who is familiar with local conditions and the current standard of practice in the vicinity of your home.

In conclusion, your neighbor's slope, above or below your property, is as important to you as the slope that is within your property lines. For this reason, it is desirable to develop a cooperative attitude regarding hillside maintenance, and we recommend developing a "good neighbor" policy. Should conditions develop off your property, which are undesirable from indications given above, necessary action should be taken by you to insure that prompt remedial measures are taken. Landscaping of your property is important to enhance slope and foundation stability and to prevent erosion of the near surface soils. In addition, landscape improvements should provide for efficient drainage to a controlled discharge location downhill of residential improvements and soil slopes.

Additionally, recommendations contained in the Geotechnical Engineering Study report apply to all future residential site improvements, and we advise that you include consultation with a qualified professional in planning, design, and construction of any improvements. Such improvements include patios, swimming pools, decks, etc., as well as building structures and all changes in the site configuration requiring earth cut or fill construction.

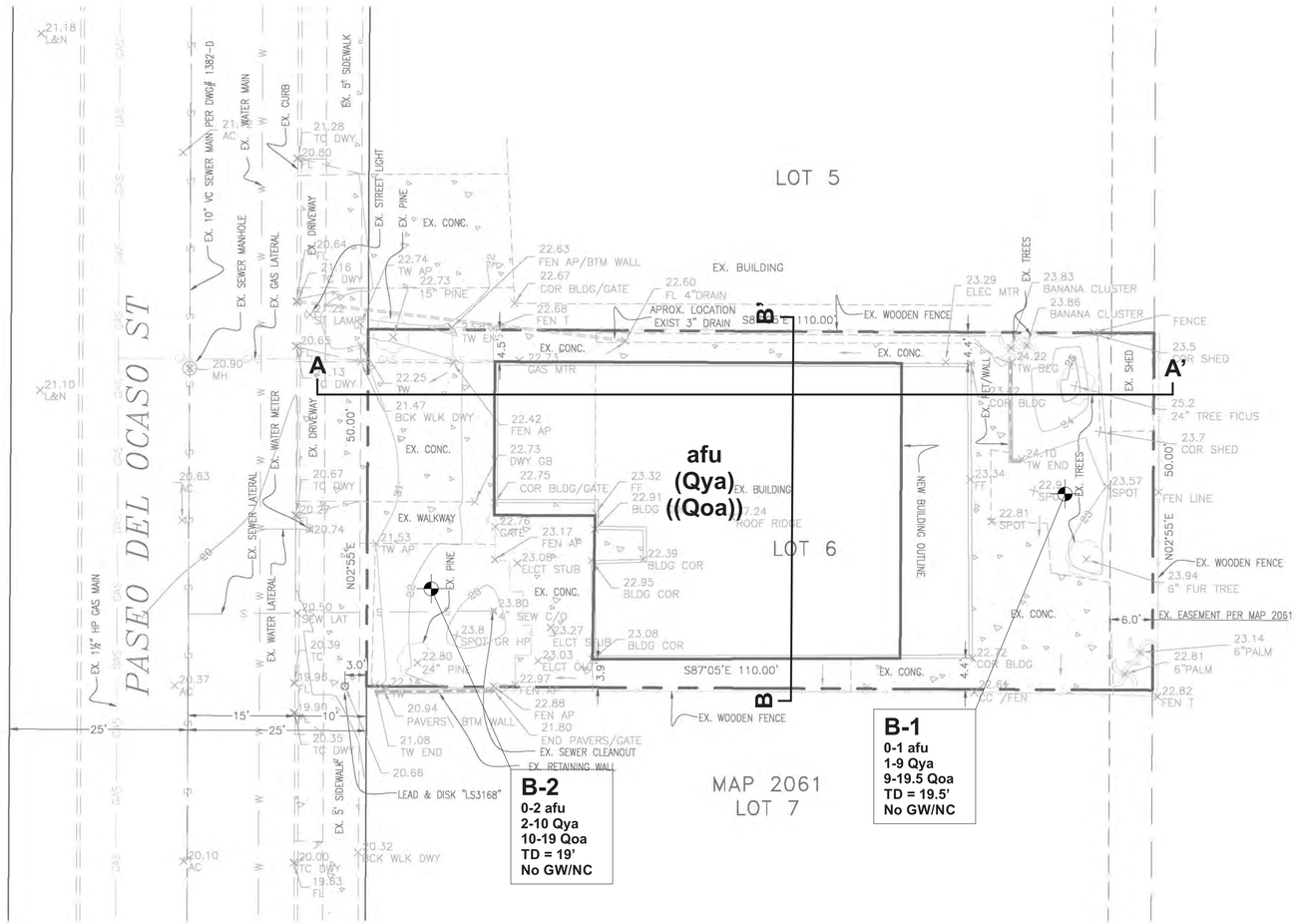
DRAINAGE PLAN
47 PASEO DEL OCASO ST.

LEGEND:

- B-2 — Approximate location of exploratory borings (AGS, 2017)
- afu — Artificial Fill - Undocumented
- Qya — Young Alluvial Flood-Plain Deposits (Bracketed where buried)
- Qoa — Old Alluvial Flood-Plain Deopsits (Bracketed where buried)
- A — A' — Approximate location of geologic cross sections
- Anticipated groundwater elevation
- Existing Grade/Structures
- Proposed Structures
- Approximate Location of Geologic Contacts

*Note: Gray area indicates excavation area for proposed basement level

VICINITY MAP
NO SCALE



LEGEND

ITEM	SYMBOL
PROPERTY LINE	
RIGHT OF WAY LINE	
CENTER LINE	
EXISTING SPOT ELEVATION	
EXISTING CONTOUR ELEVATION	
EXISTING CURB	
EXISTING BUILDING	
EXISTING WOOD FENCE	
EXISTING IRON FENCE	
EXISTING LOT LINE	
EXISTING WATER MAIN LINE	W
EXISTING SEWER MAIN LINE	S
EXISTING ELECTRICAL OVERHEAD	EOH
EXISTING PALM TREE	
EXISTING TREE	
EXISTING DRAINAGE DIRECTION	
EXISTING DRAINAGE SYSTEM	
EXISTING CONCRETE AS NOTED	

SITE ADDRESS:

8247 PASEO DEL OCASO ST.
LA JOLLA, CA 92037

A.P.N.: 346-232-0600

TOPOGRAPHY SOURCE:

VICTOR RODRIGUEZ-FERNANDEZ
LS 5335
DATED: JULY, 2017

LEGAL DESCRIPTION

LOT 6 IN BLOCK 23 PER MAP No. 2061
CITY OF SAN DIEGO,
STATE OF CALIFORNIA

LOT DATA:

LOT AREA = 5,500 SF
EXISTING IMPERVIUOS AREA = 4,068 SF
PROPOSED IMPERVIOUS AREA = 0 SF
IMPERVIOUS AREA INCREASE = 0 SF

EARTHWORK QUANTITIES:

CUT	00	CY	EARTHWORK QUANTITIES ARE
FILL	00	CY	FOR PERMIT PURPOSES ONLY.
EXPORT	00	CY	ACTUAL QUANTITIES MAY VARY DUE TO SHRINKAGE & SWELL FACTORS.

OWNER:

FRANCISCO GARCIA
156 W. MARIPOSA ROAD
NOGALES, Az. 84621

GRAPHIC SCALE: 1"= 10'

0 0 10 20 30

N

PLATE 1
Geologic Map & Exploration Location Plan

AGS
ADVANCED GEOTECHNICAL SOLUTIONS, INC.

Project:	Report:	Date:
P/W 1705-04	1705-04-B-3	Sept. 2017

BENCHMARK:

DESCRIPTION: NW BP
LOCATION: VALLECITOS & LA JOLLA SHORES DR
ELEVATION: 18.984 MSL

ENGINEER OF WORK:

VICTOR RODRIGUEZ-FERNANDEZ
1283 E. MAIN ST., SUITE 109
EL CAJON, CA. 92021
PHONE: (760) 357-2434

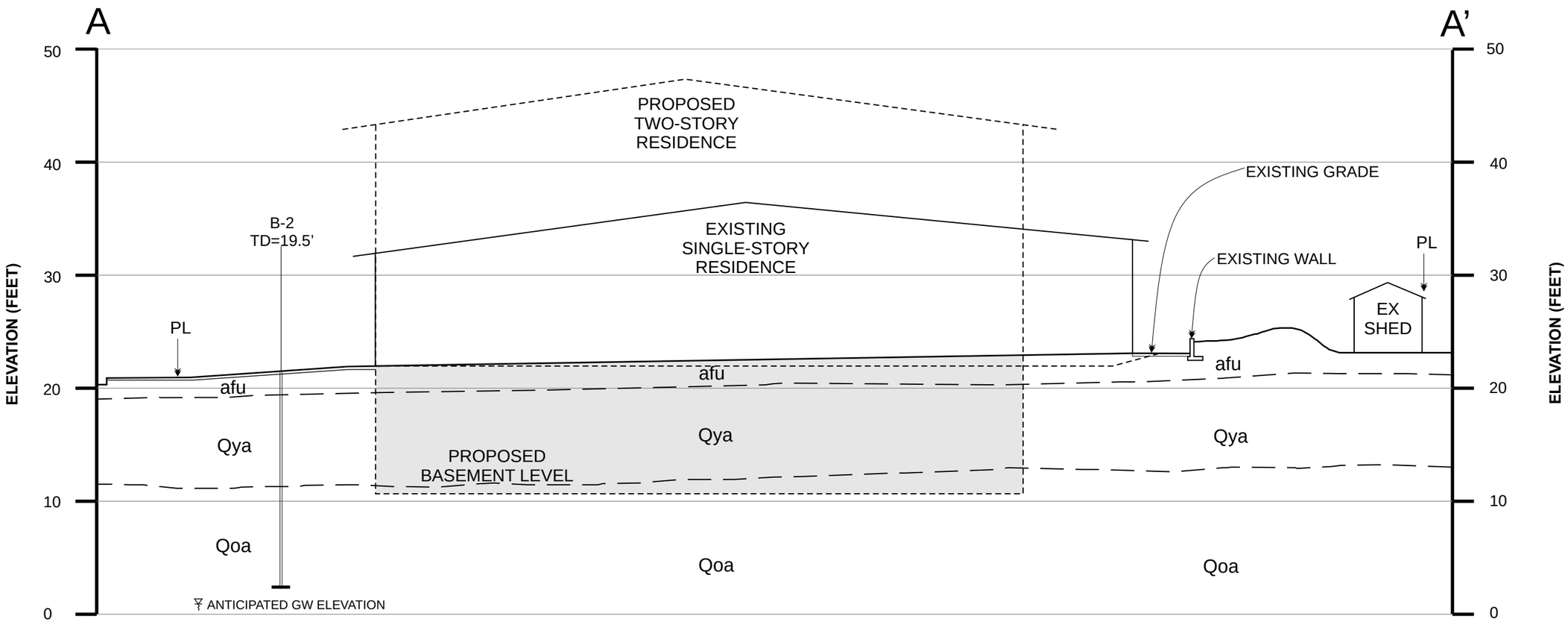
DATE: 07-11-17
VICTOR RODRIGUEZ-FERNANDEZ
R.C.E. 35373

REGISTERED PROFESSIONAL ENGINEER
VICTOR RODRIGUEZ-FERNANDEZ
No. C-35373
CIVIL
STATE OF CALIFORNIA

SHEET 1 OF 1

VICTOR RODRIGUEZ-FERNANDEZ
CIVIL ENGINEER & LAND SURVEYOR
1283 E MAIN STREET, SUITE 109 EL CAJON, CA 92021 (760) 357-2434 Fax (760) 660-4848

***SEE PLATE 1 FOR LEGEND**



CROSS-SECTION A-A'

SCALE 1"=10.0' H&V

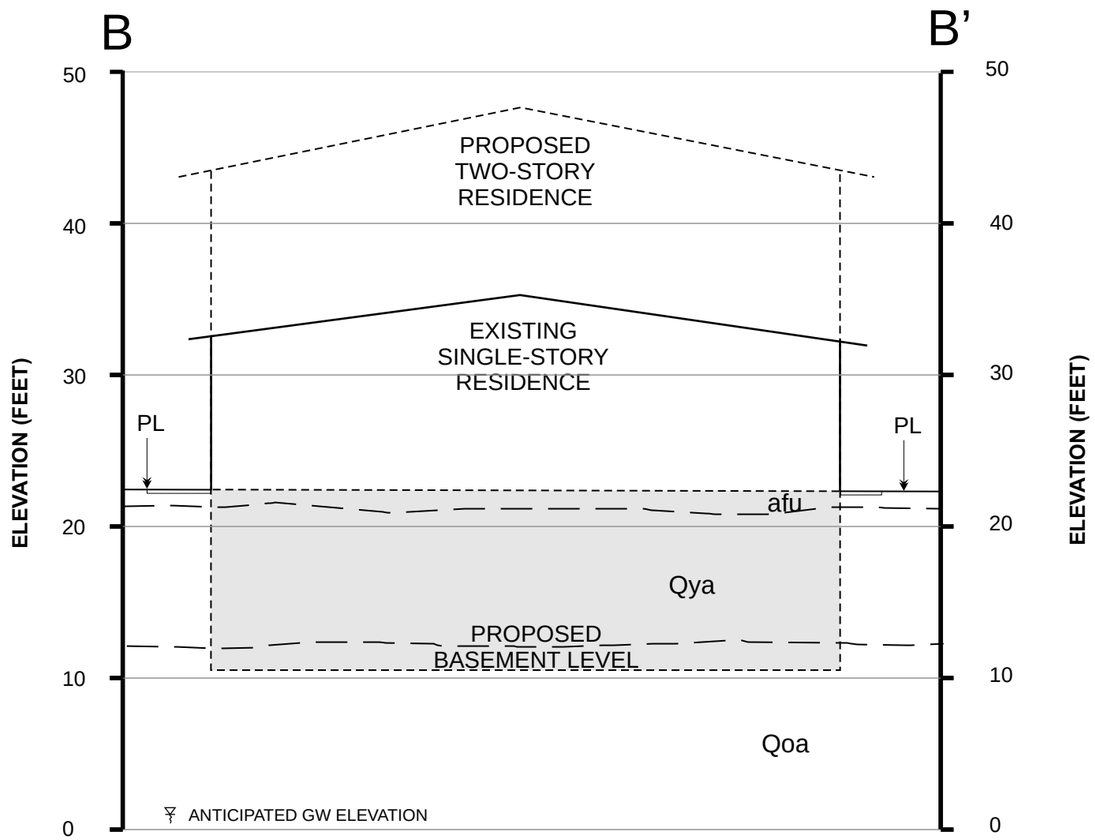
PLATE 2

Geologic Cross-Section A-A'

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

Project:	Report:	Date:
P/W 1705-04	1705-04-B-3	Sept. 2017

***SEE PLATE 1 FOR LEGEND**



CROSS-SECTION B-B'

SCALE 1"=10.0' H&V

PLATE 3

Geologic Cross-Section B-B'

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

Project:	Report:	Date:
P/W 1705-04	1705-04-B-3	Sept. 2017