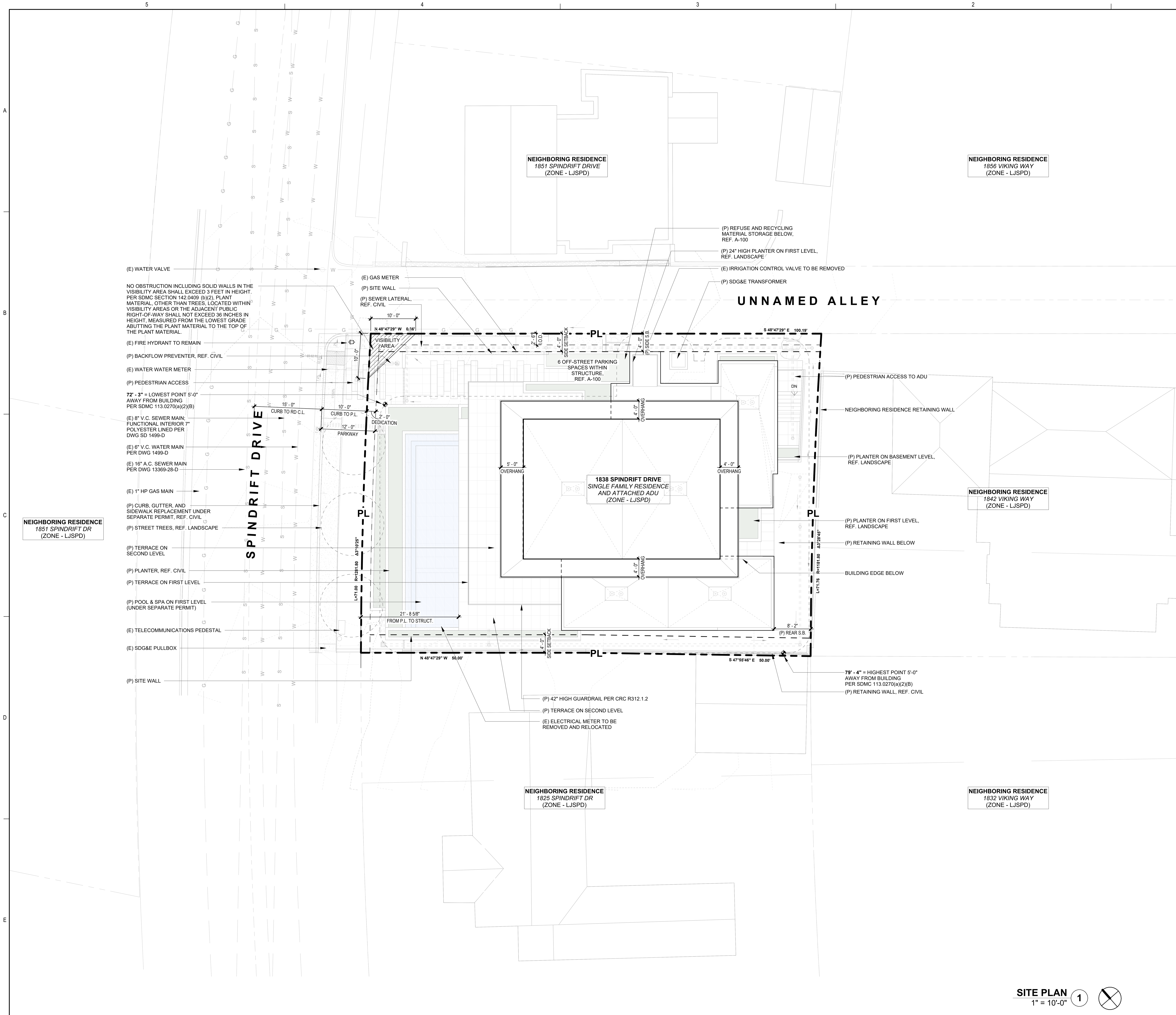

SITE PLAN (1)
1" = 10'-0"

GENERAL NOTES

1. GRIDLINES ARE MEASURED TO THE EXTERIOR FACE OF STUD U.N.O.
2. INTERIOR DIMENSIONS ARE MEASURED TO FACE OF FINISH U.N.O.
3. PLANS CONTENTS:
   A. **1/8" FLOOR PLANS CONTAIN:** GRID DIMENSIONS, OVERALL LAYOUT & OVERALL DIMENSIONS *(REF. A-100 THROUGH A-102).*
   B. **1/4" FLOOR PLANS CONTAIN:** OVERALL ROOM FINISH DIMENSIONS, FLOOR, ROOF, WALL, CEILING, DOOR & WINDOW TAGS *(REF. A-400 THROUGH A-407).*
4. KEY NOTES ON THESE SHEETS ARE AN ACCUMULATION OF ITEMS FOUND ON THE PLANS, ELEVATIONS, AND SECTIONS. NOT ALL ITEMS ARE FOUND ON EACH SHEET.

SITE PLAN NOTES

1. PROVIDE BUILDING ADDRESS NUMBERS VISIBLE AND LEGIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY PER FHPS POLICY P-00-06 (UFC 901.4.4)
2. CONTRACTOR TO ENSURE THAT SPRINKLERS REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION.
3. NO INVASIVE PLANT SPECIES ARE TO BE PLANTED IN LANDSCAPED / PLANTING AREAS.

DEFERRED SUBMITTALS

- NFPA 13-D FIRE SPRINKLER SYSTEM
- PHOTOVOLTAIC SYSTEM (PV)

FIRE SAFETY NOTES

FOR FIRE SAFETY NOTES, SEE SHEET G-101

LEGEND

PL - PROPERTY LINE
SETBACK LINE
MAIN CONTOUR LINE
SECONDARY CONTOUR LINE

MORADI RESIDENCE

1835 SPINDRIFT DRIVE, LA JOLLA, CA 92037

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PROJECT TEAM

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LA JOLLA, CA 92037

CONTRACTOR
TO BE DETERMINED

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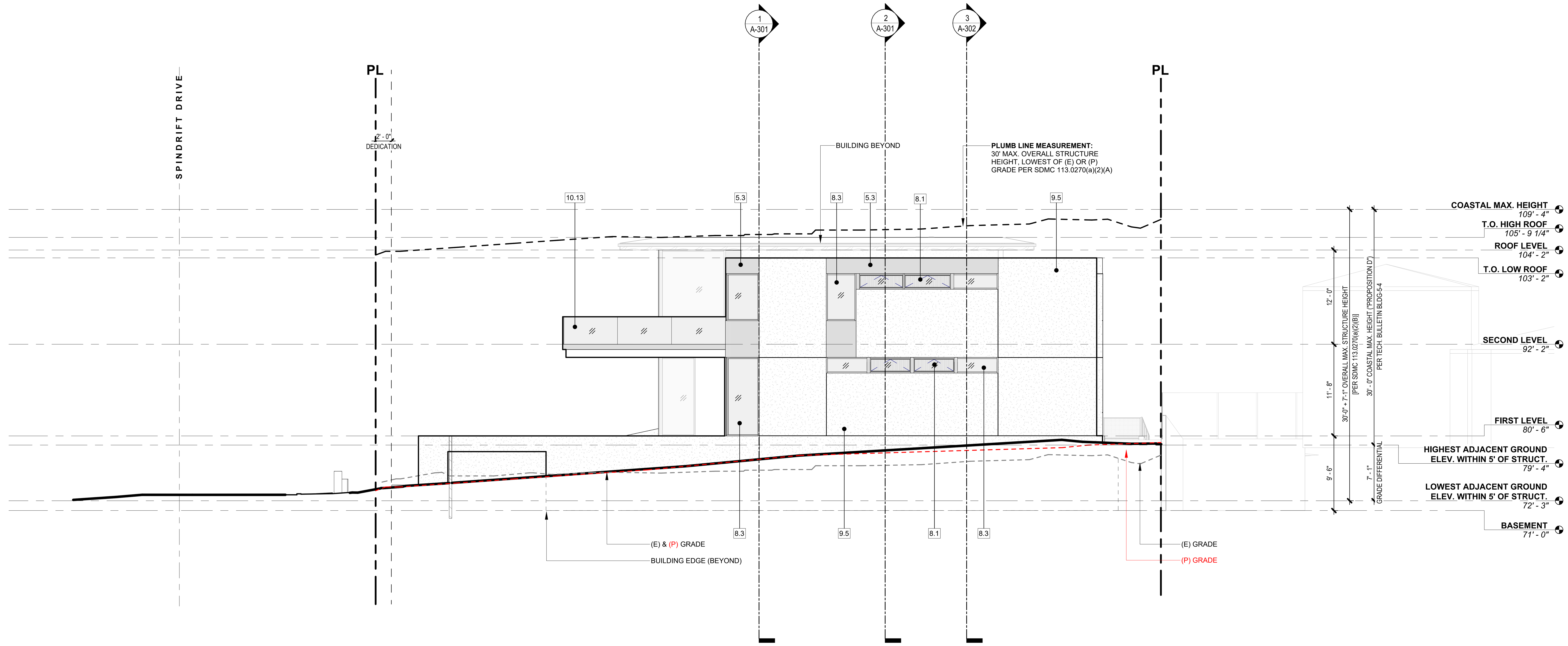
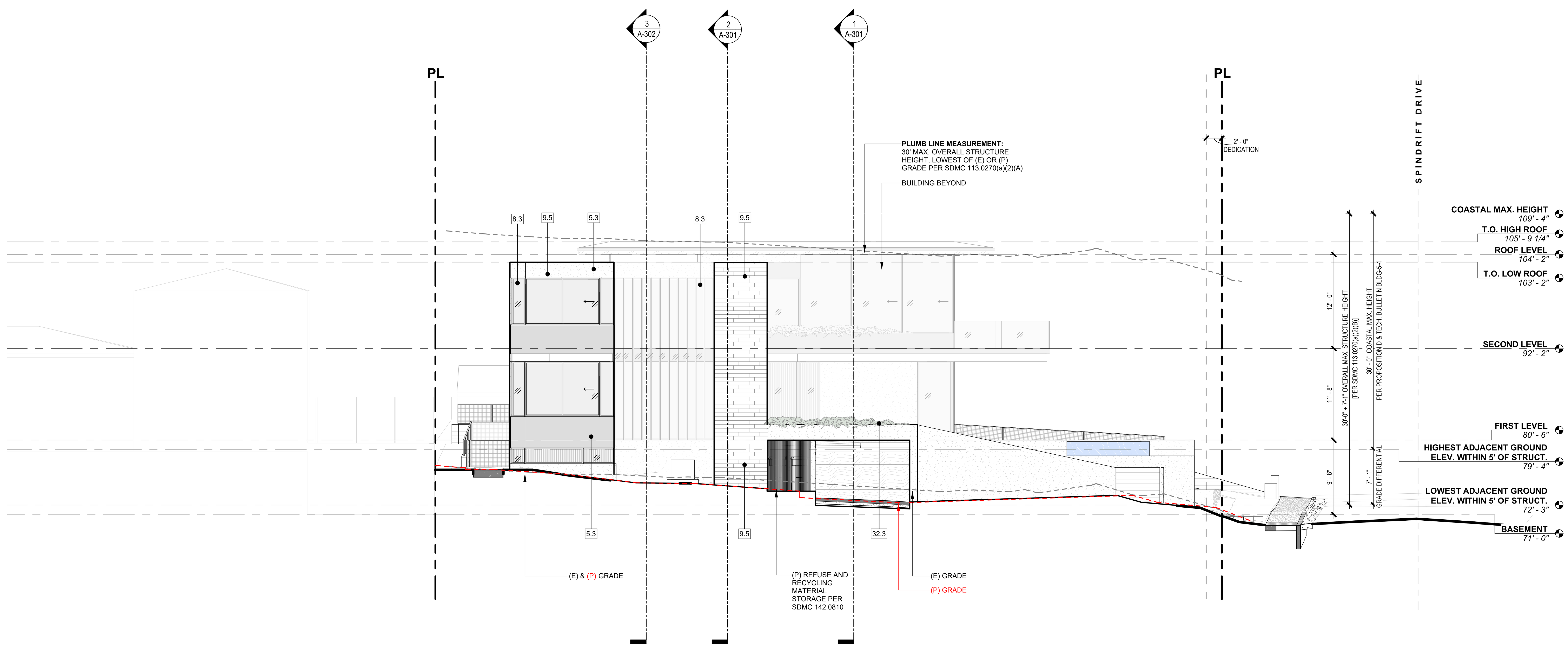
SITE PLAN

A-001



BUILDING ELEVATION - SOUTH 2
1/8" = 1'-0"



BUILDING ELEVATION - NORTH 1
1/8" = 1'-0"

GENERAL NOTES

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5. REFER TO WALL, FLOOR, AND CEILING TYPES FOR R-VALUES.
6. ALL ROOFING TO BE CLASS 'A' FIRE RATED.
7. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
8. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
9. REFER TO ACOUSTICAL REPORT FOR MEP INSTALLATION RECOMMENDATIONS AND ADDITIONAL INFO.
10. THIS PROJECT SHALL COMPLY WITH THE CITY OF SAN DIEGO LIGHTING ORDINANCE.
11. ROOF VENTS, DORMER VENTS, GABLE VENTS, CRAWLSPACE VENTS OR OTHER SIMILAR OPENINGS SHALL BE COVERED WITH 1/4" NON-COMBUSTIBLE CORROSION RESISTANT METAL MESH OR OTHER APPROVED MATERIAL THAT OFFERS EQUIVALENT PROTECTION.
12. ALL ROOF DRAINS, DECK DRAINS AND RAISED PLANTER DRAINS SHALL CONNECT TO DRAIN LINES CONCEALED FROM SIGHT AND DIRECTED TO FLOW @ MIN. 2% SLOPE AWAY FROM THE BUILDING. REFER TO CIVIL DRAWINGS FOR MORE INFORMATION.

ELEVATION / SECTION NOTES

1. THIS PROJECT MUST COMPLY WITH MUNICIPAL CODE REQUIREMENTS FOR MAXIMUM HEIGHT OF THE STRUCTURE NOT TO EXCEED 30-FEET (SDMC 131.0444 AND 132.0505). THE HIGHEST POINT ON ROOF EQUIPMENT, PIPES, VENTS, ANTENNA, OR OTHER PROJECTIONS SHALL NOT EXCEED 30-FEET ABOVE GRADE.
2. PROVIDE BUILDING ADDRESS NUMBER VISIBLE AND LEGIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY PER FHPS POLICY P-00-06 (UFC 901.4.4)
3. ALTERNATIVE COMPLIANCE MEASURES FOR BRUSH MANAGEMENT; OPENINGS IN WALLS ADJACENT TO BRUSH MANAGEMENT ZONES, ALONG WITH A 10 FT. PERPENDICULAR RETURN, SHALL BE UPGRADED TO DUAL-TEMPERED,DUAL-GLAZED PANES.
4. PROVIDED INSULATION SHOULD HAVE THE FOLLOWING VALUES PER T-24 (REF. WALL, FLOOR AND ROOF TYPES FOR MORE INFORMATION):
   A. EXTERIOR WALLS :
   B. FLOOR:
   C. ROOF:

FIRE SAFETY NOTES

REFER TO FIRE SAFETY NOTES ON SHEET G-101

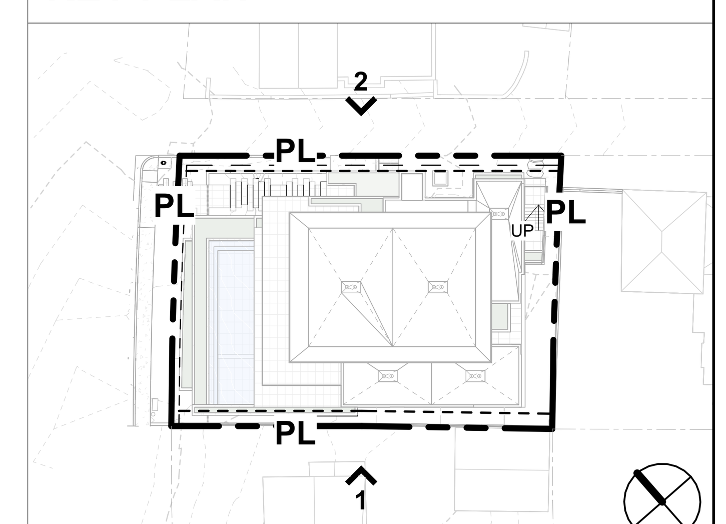
KEYNOTES

5.3	DECORATIVE FORMED METAL
8.1	WINDOW SYSTEM
8.3	CURTAIN PANEL SYSTEM
9.5	CEMENT PLASTER STUCCO
10.13	42" A.F.F., 9/16" (2-PLY AT 1/4" PER PLY) SAFETY GLASS GUARDRAIL SYSTEM
32.3	PLANTING, REF. LANDSCAPE

LEGEND *(REF. TO LEGEND SYMBOLS ON G-101 FOR ADD. INFO)*

SECTION MARK
KEYNOTE
GRID LINE
PL - PROPERTY LINE
SETBACK LINE
(E) GRADE
(P) GRADE
LINE ABOVE / BELOW
MATCHLINE
LEVEL ELEVATION

KEY PLAN



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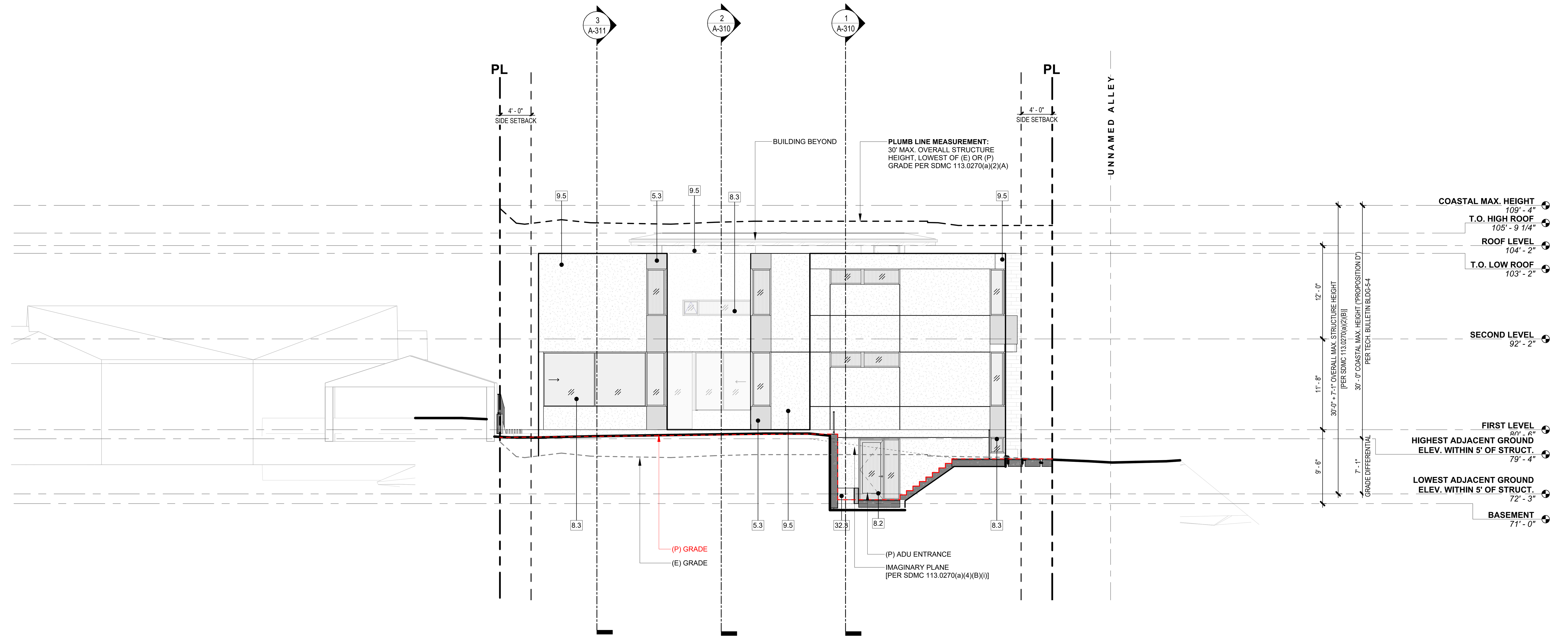
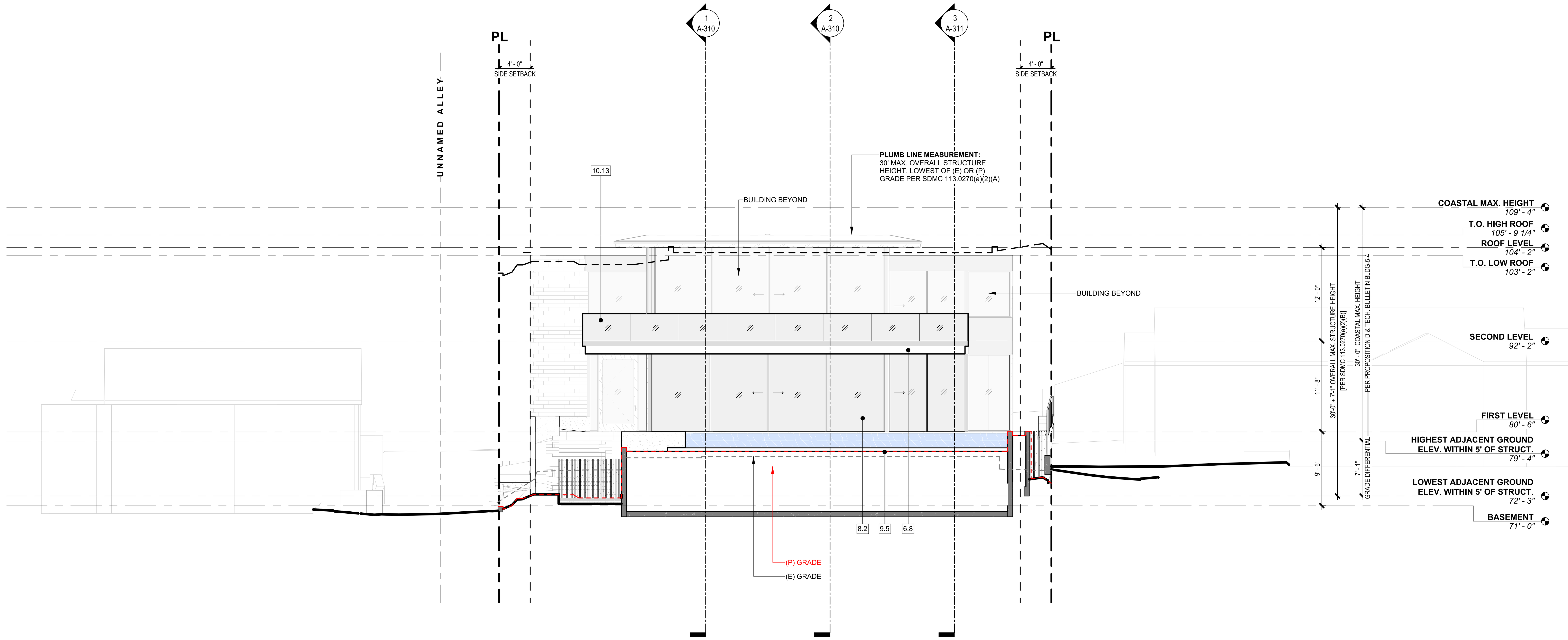
SRA Project Number: 2602

OVERALL ELEVATIONS - NORTH / SOUTH

A-201



BUILDING ELEVATION - EAST (2)
1/8" = 1'-0"



BUILDING ELEVATION - WEST (1)
1/8" = 1'-0"

GENERAL NOTES

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2. INTERIOR DIMENSIONS ARE MEASURED TO FACE OF FINISH U.N.O.
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   B. FLOOR:
   C. ROOF:

FIRE SAFETY NOTES

REFER TO FIRE SAFETY NOTES ON SHEET G-101

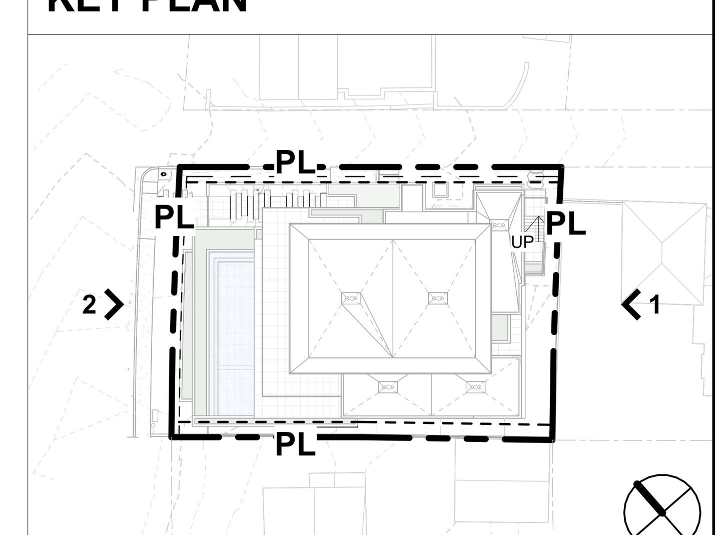
KEYNOTES

5.3	DECORATIVE FORMED METAL
6.8	EXTERIOR WOOD FINISH
8.2	DOOR SYSTEM
8.3	CURTAIN PANEL SYSTEM
9.5	CEMENT PLASTER STUCCO
10.13	42" A.F.F., 9/16" (2-PLY AT 1/4" PER PLY) SAFETY GLASS GUARDRAIL SYSTEM
32.3	PLANTING, REF. LANDSCAPE

LEGEND *(REF. TO LEGEND SYMBOLS ON G-101 FOR ADD. INFO)*

SECTION MARK	(E) GRADE
KEYNOTE	(P) GRADE
GRID LINE	LINE ABOVE / BELOW
PL - PROPERTY LINE	MATCHLINE
SETBACK LINE	LEVEL ELEVATION

KEY PLAN



MORADI RESIDENCE

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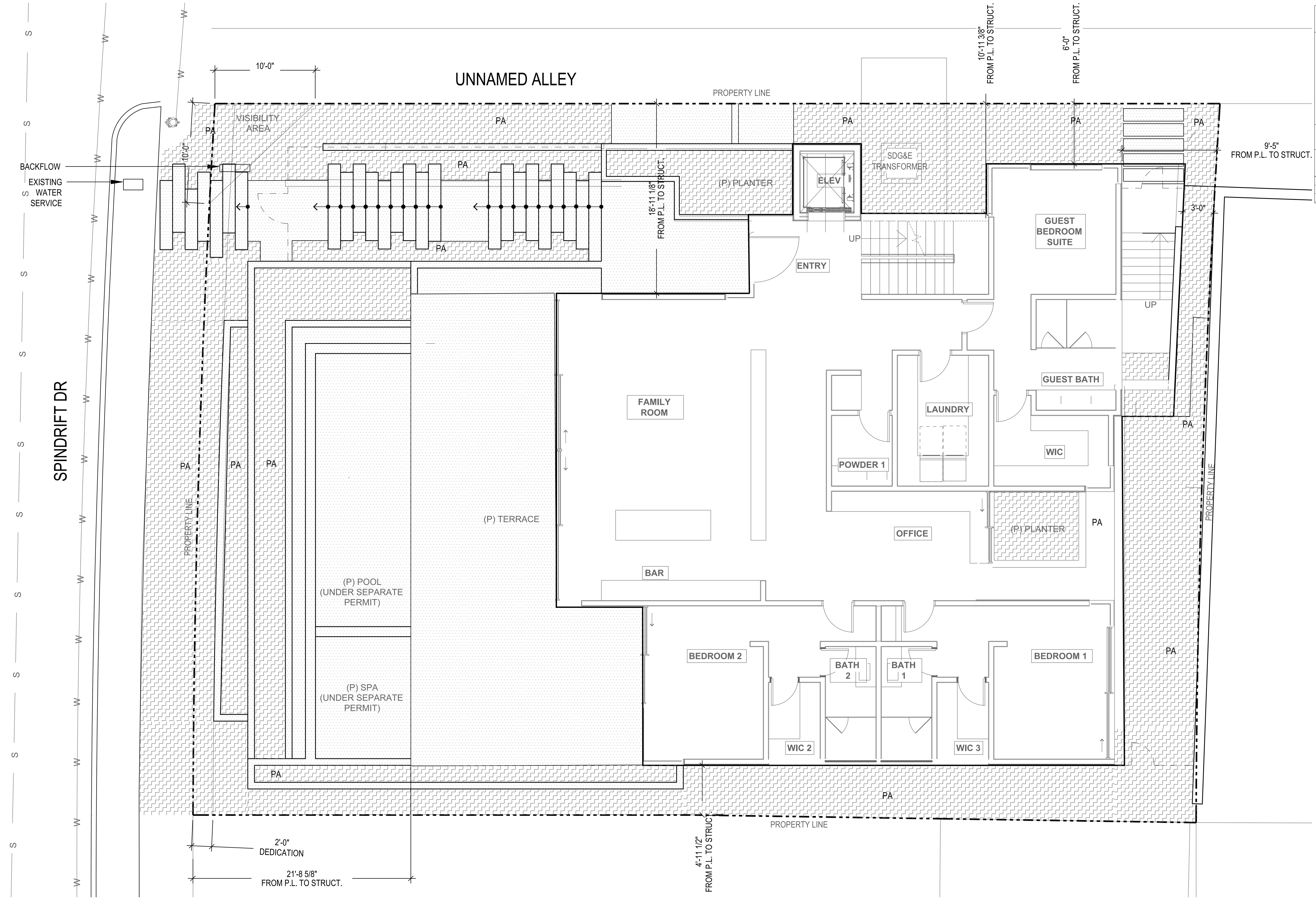
06	CDP & SDP RESUBMITTAL	04/03/26

Issue Date: 6/11/2026 3:34:03 PM
Scale: As indicated
SRA Project Number: 2602

OVERALL ELEVATIONS - EAST / WEST

A-202

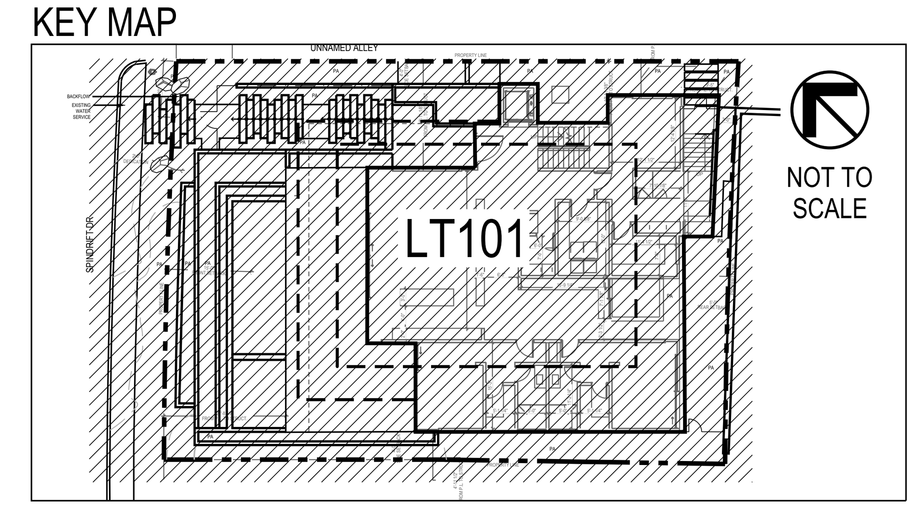


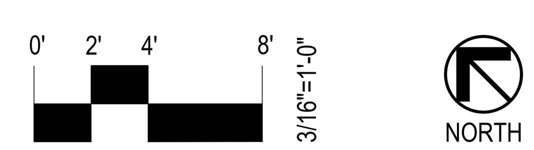
LANDSCAPE CALCULATIONS

SDMC 1510.0304(H):
IN THE SINGLE-FAMILY ZONE, ALL OF THE PROPERTY NOT USED OR OCCUPIED BY STRUCTURES, UNPLANTED RECREATIONAL AREAS, WALKS AND DRIVEWAYS SHALL BE LANDSCAPED AND MAY INCLUDE NATIVE MATERIALS, AND IN NO CASE SHALL THIS LANDSCAPED AREA BE LESS THAN 30 PERCENT OF THE TOTAL PARCEL AREA. ALL LANDSCAPING AND IRRIGATION SHALL BE DEVELOPED IN CONFORMANCE WITH THE LANDSCAPE GUIDELINES OF THE LAND DEVELOPMENT MANUAL.

SYMBOL	DESCRIPTION	AREA	PERCENTAGE OF LOT AREA
	HARDSCAPE AREA PROVIDED (INCLUDES RETAINING WALLS)	2276 SF	$\frac{2276}{7120}=0.32 = 32\%$
	PLANTING AREA PROVIDED	2352 SF	$\frac{2352}{7120}=0.330 = 33\%$

KEY MAP





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Issue Date: **3/18/2026 9:58:45 AM**
Scale: **As indicated**
SRA Project Number: 2602

LANDSCAPE CALCULATIONS

LT101

INITIAL SUBMISSION
SEPTEMBER 9, 2024

GEOTECHNICAL INVESTIGATION

Proposed Residence
1835 Spindrift
La Jolla, California

prepared for:

VM – Paso Real LLC
c/o C.A. Marengo
Marengo Morton Architects
7724 Girard Avenue, Second Floor
La Jolla, California 92037

by:

TerraPacific Consultants, Inc.
4010 Morena Boulevard, Suite 108
San Diego, CA 92117

September 9, 2024
File No. 23-223

VM – Paso Real LLC
c/o C.A. Marengo
Marengo Morton Architects
7724 Girard Avenue, Second Floor
La Jolla, California 92037

September 9, 2024
File No. 23-223

Subject: **Geotechnical Investigation**
Spindrift Residence
1835 Spindrift Drive
La Jolla, California 92037

Dear Mr. Marengo:

In accordance with our proposal dated November 14, 2024, TerraPacific Consultants, Inc. (TCI) has prepared the following report presenting our findings and recommendations from a geotechnical investigation at the subject property. The purpose of the investigation was to evaluate the subsurface conditions at the site and provide recommendations and design parameters for the proposed construction. The following report contains a summary of our findings and recommendations.

We greatly appreciate the opportunity to be of service. If you should have any questions or comments regarding this report or our findings, please do not hesitate to call.

Sincerely,
TerraPacific Consultants, Inc.

Cristopher C. O'Hern, CEG 2397
Senior Engineering Geologist

Octavio Brambila, GE 3259
Project Engineer

CCO/OB:lb

4010 Morena Boulevard, Suite 108 • San Diego, CA 92117 • (858) 521-1190 • (858) 521-1199 fax • terrapac.net

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

The following report presents the findings of a geotechnical investigation performed at 1835 Spindrift in San Diego, California, presented on the Site Location Plan, Figure 1 in Appendix A. The purpose of the investigation was to evaluate the subsurface conditions at the site to provide recommendations and soil design parameters for the proposed construction.

1.2 Scope of Services

The scope of the investigation consisted of field reconnaissance, subsurface exploration, laboratory testing, and engineering and geologic analysis of the obtained data. The following tasks were performed during the investigation and production of this report:

- Site reconnaissance and review of published geologic, seismologic, and geotechnical reports and maps pertinent to the project. A list of references is provided in Appendix B.

- Logging/sampling of six small-diameter borings at the subject property. The subsurface exploration locations are presented in the Geotechnical Plan, Figure 2 in Appendix A, and the excavation logs are in Appendix C.

- Collection of representative soil samples from selected depths within the excavations.

- Laboratory testing of samples collected from the test excavations. The testing included in-situ moisture and density, direct shear, expansion index, maximum dry density and optimum moisture content, hydro response, and soil corrosivity levels. The laboratory data is presented in Appendix D.

- Engineering and geologic analysis of data acquired from the investigation, which provided the basis for our conclusions and recommendations.

- Preparation of this report presenting our findings and recommendations.

2.0 PROJECT BACKGROUND

2.1 <u>Site Description and Development History</u>

The subject property is located on the east side of Spindrift Drive in La Jolla, California. The legal description is APN 346-451-0900, Block 198, Lot 39, Submap 1762, La Jolla Vista. The rectangular-shaped lot is bordered by residential properties to the south and east, an alleyway to the north, and Spindrift Drive to the west. The site is generally flat with a small westerly descending slope at the front of the lot. Lot elevations range from approximately 77 feet mean seal level (msl) at the east property line to 72 feet msl at the west property line. The lot is currently improved with residential structure(s), concrete pavements, and other associated appurtenances.

2.2 <u>Proposed Development</u>

Based on our review of the concept plans, it is our understanding that the existing structure(s) are to be razed, and a new residential structure including a subterranean level is proposed. The new structure is anticipated to consist of light wood-framed structures supported on a conventional concrete slab-on-grade and footing foundation system.

3.0 SITE INVESTIGATION

The site investigation was conducted on July 25th and July 26th, 2024, and consisted of visual reconnaissance and subsurface exploration. The purpose of the investigation was to gain an understanding of the site configuration and subsurface conditions in the vicinity of the proposed construction.

3.1 <u>Site Reconnaissance</u>

Our site reconnaissance consisted of walking the site to determine if any adverse geologic conditions were present. No outward signs of distress indicating adverse geologic conditions were noted.

3.2 <u>Subsurface Exploration</u>

The subsurface exploration consisted of six small-diameter borings excavated with a limited access tripod rig. Borings B-1 through B-6, were excavated to depths of up to 16.5 feet below ground surface (bgs) and were logged and sampled by a geologist or engineer from our office. The borings were continuously logged within distinct bedding identified within paralic deposits for purposes of conducting a fault study. The approximate excavation locations are presented on the Geotechnical Plan, Figure 2 in Appendix A.

In general, the subsurface exploration revealed that the site is mantled by fill soil and slope wash, which is underlain by native marine terrace deposits identified as Old Paralic Deposits, Unit 6. Groundwater was not encountered within the depths of our excavations. Descriptions of each material are detailed in Section 4.2 Site Stratigraphy, and the subsurface excavation logs are provided in Appendix C.

3.3 Laboratory Testing

Soil samples collected during the field exploration were tested to characterize the soil types and evaluate the engineering properties of the soil. The laboratory testing included in-situ moisture and density, direct shear, expansion index, maximum dry density and optimum moisture content, hydro response, and soil corrosivity levels. Each laboratory test was performed per ASTM specifications or other accepted testing procedures. The results of the laboratory tests are presented in Appendix D.

4.0 SITE GEOLOGY

4.1 Geologic Setting

The site is located within the coastal portion of the Peninsular Ranges Geomorphic Province of California. This province, which extends 900 miles from Southern California to the southern tip of Baja California, is characterized by northwest-trending structural blocks. The coastal portion of the province in San Diego County is typically comprised of upper Cretaceous-aged to Tertiary-aged (1.8 million to 65 million years) marine and non-marine sedimentary bedrock units deposited within a northwest-trending basin known as the San Diego Embayment (Norris & Webb, 1976). Recent geologic uplift along the San Diego coastal margin and sea-level changes have created marine terraces and associated deposits of near-shore marine, beach estuarine, and lagoonal facies. These deposits range from early to mid-Quaternary-aged (45,000 to 1.5 million years) and are designated in geologic literature as Paralic Deposits.

According to geologic literature, the site is underlain by Quaternary-aged surficial deposits designated as Old Paralic Deposits, Unit 6. The literature describes the paralic deposits as “poorly sorted, moderately permeable, reddish-brown, inter-fingered strandline, beach, estuarine and colluvial deposits composed of siltstone, sandstone and conglomerate” (Kennedy and Tan, 2008).

Based on the City of San Diego Seismic Safety Study Map, the site is located within a Zone 27 – “slide prone formation, Otay, Sweetwater, and others,” and within a Zone 12 – “fault zone, potentially active, inactive, presumed inactive, or activity unknown.” The site is located on the Geologic Map, Figure 3 in Appendix A and the Seismic Safety Study Map, Figure 4 in Appendix A.

4.2 Site Stratigraphy

The subsurface descriptions presented are interpreted from the conditions exposed during the field investigation and/or inferred from local geologic literature. In addition to the following descriptions, detailed exploration logs are presented in Appendix C and the subsurface profile is depicted on Cross Sections A-A' and B-B', Figures 5 and 6 in Appendix A.

Fill Soil (Af) – Fill soil is earth material that has been placed using mechanical means, such as bulldozers or other large earthmovers. Typically, the fill soil has been removed from topographically high locations and placed in low-lying areas to create level building pads. When properly compacted, fill soil can be used to support structures. However, it is typically more compressible than natural formational soils.

Relatively shallow fill soils were encountered in each of the borings from the ground surface to depths ranging from 1.2 feet to 6.5 feet bgs. The fill soils were relatively consistent and generally described as a dark brown sandy clay to clayey sand that was moist and loose in consistency.

Slopewash Deposits (Qsw) – Native surficial slopewash deposits are sediments deposited through the action of moving water or gravity associated with sloping terrain. Slopewash deposits were encountered with each of the excavations underlying the fill soil with approximate 12-inch to 18-inch thickness. The slopewash was generally described as a moist and stiff, gray brown sandy clay. Faint caliche stringers and orange oxidation staining was noted within the slope wash deposits.

Old Paralic Deposits, Unit 6 (Qop6) – Marine terrace deposits designated Quaternary-aged Old Paralic Deposits, Unit 6, were encountered in each of the borings underlying the slopewash. These deposits are associated with the Nestor marine terrace and are approximately 120,000 years old. The material encountered during our exploration was generally described as a brown sandstone that was moist and medium dense to dense. Zones with slight porosity, carbon deposits were observed. Distinct bedding was identified within the formation and identified within the subsurface exploration across the work area and are indicated on the exploration logs in Appendix C and Cross Section A-A' and B-B' Figures 5 and 6 in Appendix A.

4.3 Groundwater

Groundwater was not encountered within the depths of our excavations which extended to depths of 16.5 feet bgs. It should be noted that additional zones of perched groundwater could develop during periods of heavy or prolonged rainfall, and/or with changes in site improvements on the subject or adjacent lots, and/or changes in irrigation patterns on the subject or adjacent lots.

5.0 SEISMICITY

5.1 Regional Seismicity

Generally, the seismicity within California can be attributed to the regional tectonic movement along the San Andreas Fault Zone, including the San Andreas Fault and most parallel and sub-parallel faulting within the state. A majority of Southern California, which includes the subject site, is considered seismically active. Seismic hazards can be attributed to potential ground shaking from an earthquake along nearby faults or more distant faulting.

According to regional geologic literature, the closest known active faults are located within the Rose Canyon Fault Zone. The Rose Canyon fault zone consists of several en echelon strike-slip, oblique, reverse, and normal faults, extending onshore from San Diego Bay north to La Jolla Bay. Several other potentially active and pre-Quaternary faults also occur within the regional vicinity. Currently, the geologic literature presents varying opinions regarding the seismicity of these faults. As such, the following Seismic Analysis only considers the effects of nearby faults currently considered active.

5.2 Probabilistic Ground Acceleration

A simplified probabilistic seismic hazard analysis was performed for the site. The California Geological Survey has a webpage that allows a user to calculate the ground motion at a site with either a 2 percent or 10 percent probability of exceedance in a 50-year period. The results of the output indicated the site had respective calculated peak ground accelerations of 0.67g and 0.31g.

The values provided compare the potential for seismic shaking due to fault activity most likely to affect the site. Other factors should be considered when completing the seismic design, such as the duration of shaking, structure period, design category, etc. The structural design engineer should consider the information provided herein and evaluate the structure(s) per the California Building Code and guidelines of the City of San Diego. The earthquake design parameters based on the 2022 CBC applicable to the site are provided in Section 7.6.

5.3 Hazard Assessment

Faulting/Fault Rupture Hazard – An “active” fault, defined by the Alquist-Priolo Earthquake Fault Zoning Act, is a fault that has had surface rupture within Holocene time (the past 11,000 years). A “potentially active” fault is defined as any fault that showed evidence of surface displacement during Quaternary time (last approximate 1.6 million years), but not since Holocene time.

According to the City of San Diego Seismic Safety Study 2008 the site is located with a Zone 12 – Potentially active, inactive, presumed inactive or activity unknown. Based on the Quaternary Fault Map from the USGS Earthquake Hazards Program, the subject parcel is located approximately 600 feet southwest of an "active" portion of the Rose Canyon Fault Zone (Rose Canyon Fault). Several other unnamed faults considered to be older than Quaternary-aged are mapped nearby and classified on the City map as "potentially active, inactive, presumed inactive or activity unknown." The site is not located within an Alquist-Priolo fault zone, and according to geologic literature, is not intersected by any faults. The site is depicted on the Seismic Safety Study Map, Figure 4 in Appendix A.

To address the Zone 12 site designation, a fault study including a review of historic aerial images, review of reports by others and a site-specific geotechnical investigation including subsurface exploration was conducted. The site-specific field investigation included surficial mapping of the site and surrounding area, and subsurface exploration consisted of the excavation, logging, and sampling of six borings across the site. The borings conducted in a pattern perpendicular to the fault buffer zone indicated on the maps and were sampled in a manner to allow for continuous logging. Several distinct beds were identified within the paralic deposits and were mapped as continuous with no indications of offset. Indications of faulting within the borings and trench, (i.e., offset marker beds, gouge, breccia, or slickensides) were also not observed. These are described in detail within the excavation logs provided in Appendix C and are graphically depicted on Cross Section A-A' and B-B', Figures 5 and 6 in Appendix A.

The review of historic aerial images, which included a predevelopment, 1953 flight did not reveal distinct geomorphic expressions (i.e., linear offset or depressions) that would indicate the presence of faulting within or near the lot.

Based on our site-specific field investigation, review of geologic literature, and review of aerial images, it is our opinion that the site is not intersected by a geologic fault, as such, a structural setback is not required. Cross Section C-C' in Appendix A, depicts the subsurface profile in a direction generally perpendicular to the fault buffer zone indicated on the maps and the Fault Rupture Hazard Map, Figure 7 provides a summary of pertinent previous studies by others and fault locations from geologic literature.

<u>Seismically Induced Settlement</u> - Within the depths of our exploration, the soils encountered consisted of relatively dense formational soils at shallow depths. Based on the anticipated earthquake effect and the stratigraphy of the site, seismically induced settlement is expected to be minor and within tolerable limits. Structures designed and constructed per applicable building codes are expected to perform well with respect to settlement associated with predictable seismic events.

Liquefaction – Liquefaction involves the substantial loss of shear strength in saturated soil, usually taking place within a saturated medium exhibiting a uniform fine grained characteristic, loose consistency, and low confining pressure when subjected to impact by seismic or dynamic loading. Based on the shallow depth to dense formational soil, the site is considered to have a negligible risk for liquefaction.

Lurching and Shallow Ground Rupture – Rupturing of the ground is not likely due to the absence of known active fault traces within the project limits. Due to the generally active seismicity of Southern California; however, the possibility for ground lurching or rupture cannot be completely ruled out. In this light, a "flexible" design for on-site utility lines and connections should be considered.

Landsliding – Given the shallow topographic relief of the site and surrounding area, the possibility for landsliding is believed to be negligible. Furthermore, the San Diego Seismic Safety Study does not depict any known landslides in the vicinity of the site.

Tsunamis or Seiches – Tsunamis are great sea waves produced by seismic events. Given the site elevation of approximately 70 feet msl, it is not likely that a tsunami could impact the site. Historically, the magnitudes of tsunamis to impact the San Diego coastline have been fairly small, typically less than 1 meter in height. Recent studies into the possibility of offshore seismic events triggering tsunamis via fault movement or undersea landslides have experts of the opinion that Southern California is not free from tsunami risks (Krier, 2005). However, predicting the level of risk is difficult due to the lack of knowledge about the offshore fault system.

In our opinion, there is no practical approach for mitigating the potential impact to the site from a tsunami. This is an inherent risk for those living within the beach area. All residents in coastal areas should have an evacuation plan for a strong seismic event (i.e., typically 20 seconds or more of sturdy ground shaking) or when an official tsunami warning is issued.

6.0 CONCLUSIONS

Based on the results of our geotechnical investigation, it is our opinion that the proposed development is feasible from a geotechnical standpoint, provided the recommendations presented in the following sections are adopted and incorporated into the project plans and specifications.

The following sections provide recommendations for the proposed site development. The civil and/or structural engineer should use this information during the planning and design of the proposed construction. Once the plans and details have been prepared, they should be forwarded to this office for review and comment.

A key aspect of the proposed development, which will need to be considered during the design is the presence of undocumented fill soil and/or weathered paralic deposits within the upper approximate 5 to 6 feet of the site. If a transitional footprint is planned, it is recommended that remedial grading be conducted to provide a uniform fill mat under the bottom of the proposed foundation bottoms. This would help limit potential transitional effects on the structure. Alternatively, the foundations can be supported directly on competent paralic deposits. Due to the presence of paralic deposits at a relatively shallow depth, the basement level will extend well into this material; however, any on-grade portions of the structure will likely require deepened footings to accomplish this. In addition, the proposed grades near the property lines will require shoring walls to limit potential impact to neighboring properties and structures.

7.0 RECOMMENDATIONS

The following sections provide our recommendations for site preparation, design, and construction of the proposed foundation systems. Once the plans and details have been prepared, they should be forwarded to this office for review and comment.

7.1 Site Preparation and Grading

7.1.1 Clearing/Grubbing

It is assumed that all existing improvements will be demolished and removed from the site to prepare the site for the new construction. However, if unsuitable materials (e.g., construction debris, plant material, etc.) are encountered during the grading phase, they should be removed and properly disposed of off-site.

7.1.2 Site Grading

Removals of undocumented fill and weathered paralic deposits are expected to be accomplished with the design subterranean grades; however, as previously mentioned, any residual undocumented fill or paralic deposits exposed at finish grade should be removed and replaced as engineered fill. Ultimately, removal depths will need to be field verified at the time of construction.

In areas where less critical structures such as site walls, driveways, and walkway slabs are proposed, it is also recommended to remove and replace all undocumented fill and slope wash deposits with engineered fill. This will help provide a more uniform bearing support for these types of appurtenant structures.

If remedial grading is conducted to eliminate transitional structural footprint, then the removals should extend to 2 feet below the foundation bottom for all structures to provide a uniform fill mat. Removals on the order of 5 feet below exiting grade are anticipated with deeper removals as needed for the subterranean foundations. Localized areas of deeper removals may be required.

Once the removal bottoms have been established, the bottoms should be scarified a minimum of 6 inches, moisture-conditioned, and compacted 90 percent relative compaction.

7.1.3 Fill Materials and Compaction Requirements

The on-site soil, less organic debris, may be used for fill, provided it is placed in thin lifts (not exceeding 8 inches in loose thickness). All soil should be properly moisture conditioned and mechanically compacted to a minimum of 90 percent of the laboratory maximum dry density, per ASTM D-1557, and at or slightly above optimum moisture condition. The removal bottoms, fill placement, and compaction should be observed and tested by the geotechnical consultant. The grading contractor will be required to utilize proper earthwork equipment for the site grading (i.e., compaction equipment for compaction). Standard guidelines for grading are provided in Appendix F.

7.2 Temporary Excavations

Foundation excavations, utility trenches, or other temporary vertical cuts may be conducted in fill or native soils to a maximum height of 4 feet. Any temporary cuts beyond the above height restraints could experience sloughing or caving and, therefore, should either be shored or laid-back. In no case shall any excavation exceed 4 feet without further input from the geotechnical consultant. In addition, no excavation should undercut a 1:1 projection below the foundation for any existing improvements, i.e., existing building foundations both on and off-site. Regional safety measures should be enforced, and all excavations should be conducted in strict accordance with OSHA guidelines.

If deeper excavations are required or excavations encroach into a 1:1 projection from an existing structure, shoring will likely be required. For temporary excavations that will be shored but not braced with tiebacks or struts, see Section 7.4.

Excavation spoils should not be stockpiled adjacent to excavations as they can surcharge the soils and trigger failure. In addition, proper erosion protection, including runoff diversion, is recommended to reduce the possibility of erosion during grading and building construction. Ultimately, it is the contractor's responsibility to maintain safe working conditions for persons on-site and verify compliance with the project's BMPs.

7.3 Foundation Recommendations

The following sections provide the soil parameters and general guidelines for foundation design and construction. It is anticipated that all new construction will be supported by conventional continuous and spread footings. As mentioned previously, the new foundations should be supported on engineered fill or competent native soil per Section 7.1. Additional parameters can be provided on request.

The foundation design parameters and guidelines provided below are "minimums" in keeping with the current standard of practice. They do not preclude more restrictive criteria that the governing agency or structural engineer may require. The architect or structural engineer should evaluate the foundation configurations and reinforcement requirements for structural loading, concrete shrinkage, and temperature stress.

7.4 Soil Design Criteria

The following separate soil design criteria are provided for designing and constructing the conventional foundations for building structures. The parameters provided assume foundation embedment in competent engineered fill material with an expansion index classification as high.

Conventional Foundations

Allowable bearing capacity for square or continuous footings................................2,000 psf

Minimum embedment in competent engineered fill ....30 inches

Minimum width for continuous footings..18 inches

Minimum width for square footings .... 3.0 feet

Note: The bearing capacity value may be increased by one-third for transient loads such as wind and seismic.

Coefficient of friction against sliding 0.35

Passive resistance ....300 psf/ft up to a maximum of 2,000 psf

Soldier Pile Temporary Shoring (Cantilevered)

Allowable bearing capacity for temporary soldier pile shoring ....7,000 psf

Note: The bearing capacity provided is a net value after down drag and concrete weight are taken into account.

Minimum embedment in competent native soil .... 5 ft

Note: All embedments should be verified in the field by the soil engineer prior to placement of reinforcing steel.

Minimum width or diameter for piles .... 24 inches

Active pressure for level ground surface at top of excavation .... 35 psf/ft

Structural surcharge from adjacent footings... 0.45x (footing load)

Note: Apply surcharge to portion of retaining wall below 1:1 projection from base of overlying footing.

Passive resistance in competent bedrock .... 350 psf/ft

Note: Passive resistance may be applied in a tributary fashion over two pile diameters from the elevated ground surface to the base of the pile.

7.5 Retaining Walls

Lateral Loading and Resistance Parameters

For retaining walls, the bearing capacity and foundation dimensions provided for Section 7.4 may be followed. Additional design parameters for lateral loading and resistance are provided below:

Active earth pressure for level backfill (non-restrained walls) .... 40 psf/ft

At-rest earth pressure for level backfill (restrained walls) .... 60 psf/ft

Note: The active and at-rest pressures are provided, assuming granular soil is used for backfill. Backfill and subdrain recommendations are provided in the following sections.

Passive resistance in competent fill .... 300 psf/ft

Coefficient of friction against sliding 0.35

Note: The passive resistance and coefficient of friction may be used in combination if there is a fixed structure, such as a floor slab at the toe of the retaining wall. If the two values are combined, the passive resistance value should be reduced by one third.

Earthquake Loads

Seismic loading for retaining walls with level backfill should be approximated by applying an 21 psf/ft in an inverse triangle shape, where the lateral force at the bottom of the wall is equal to zero, and the lateral force at the top of the retaining wall is equal to 21 psf times the height of the wall. The resultant seismic load should be applied from the bottom of the wall at a distance of 0.6 times the overall height of the wall.

The seismic loads would be in addition to the normal earth pressure loads applied on the retaining walls provided. The structural engineer should evaluate the overall height of the wall and apply the appropriate retaining wall loading parameters for analysis and design.

7.6 Earthquake Design Parameters

Earthquake-resistant design parameters may be determined from the California Building Code (2022 Edition). Based on our investigation and characterization of the site, the following design parameters may be adopted:

Site coordinates .... Latitude: 32.8504, Longitude: -117.2623

Site classification .... D

Site coefficient Fa 1.000

Site coefficient Fv .... n/a

Spectral response acceleration at short periods Ss 1.403

Spectral response acceleration at 1-second period S1 .... 0.491

Maximum spectral response accelerations at short periods Sms 1.403

Maximum spectral response accelerations at 1-second period Sm1 .... n/a

Design spectral response accelerations at short periods Sds 0.935

Design spectral response accelerations at 1-second period Sd1 .... n/a

7.7 Foundation and Retaining Wall Design Guidelines

The following guidelines are provided for assistance in the design of the various foundation elements and are based on the anticipated high expansion potential of the bearing soils. As is always the case, where more restrictive, the structural and/or architectural design criteria should take precedent.

Foundations – Continuous exterior and interior footings for the buildings should be a minimum of 24 inches deep. Reinforcement should consist of a minimum or four No. 5 rebar, two placed at the top and two at the bottom of the footing. All footing embedments should be verified by the soil engineer.

Slabs-on-Grade – Interior and exterior slabs-on-grade should be a minimum of 5 inches thick (net) and reinforced with No. 4 rebar placed at a maximum spacing of 16 inches on center, both ways. The steel reinforcement should be placed at the midpoint or slightly above the mid-point in the slab section. Control joints should be installed for exterior slabs at a maximum spacing of 10 feet in each direction. Before constructing slabs, the subgrade should be moistened to approximately 12 inches in depth at least 24 hours before placing the concrete.

All interior floor slabs should be underlain by 2 inches of clean sand, followed by a minimum 15-mil PVC vapor retarder (Stego Wrap or similar). The vapor retarder should be further underlain by a 4-inch-thick layer of gravel or crushed rock. Also, the vapor retarder should be properly lapped and sealed around all plumbing penetrations.

Retaining Walls – Retaining walls should be provided with a gravel subdrain system. The drain system should start with a minimum 4-inch diameter perforated PVC Schedule 40 or ABS pipe, placed at the heel of the wall footing and below the adjacent slab level. The pipe should be sloped at least 1 percent to a suitable outlet, such as an approved site drainage system or off-site storm drain. The pipe should be surrounded by a gravel backfill consisting of tamped $^3/_4$-inch sized gravel. This gravel backfill zone should be a minimum of 12 inches wide and should extend from slightly below the drainpipe up to approximately two-thirds of the wall height. The entire gravel section should be wrapped in a filter cloth such as Mirafi 140 NS or similar to prevent contamination with fines. Alternatively, walls can be drained using geo-composite panel drains connected to a gravel sub-drain at the heel of the wall. In addition, the wall should be properly moisture-proofed per the project architect. See the Retaining Wall Drain Details, Figure 8 in Appendix A.

Foundation and Slab Concrete – The results of the corrosion tests indicate negligible sulfate and chloride levels. However, due to the coastal location, it is recommended that the concrete used for foundation elements contain Type V cement. The concrete should be mixed and placed per ACI specifications. Water should not be added to the concrete at the site, as this can reduce the mix and lead to increased porosity and shrinkage cracking.

Proper curing techniques and a reduction in mixing water can help reduce cracking and concrete permeability. Consideration should be given to using a concrete mix that possesses a maximum water-cement ratio of 0.5 to further reduce shrinkage cracking and slab permeability. The potential for shrinkage cracking within concrete flatwork elements cannot be completely ruled out and should be expected.

It should be noted that TCI does not consult in the field of corrosion engineering. Thus, the client project architect and project engineer should evaluate the level of corrosion protection required for the project and seek consultation from a qualified professional, as warranted.

Appurtenances – Other site appurtenances, such as planter walls, site walls, etc., can be constructed on continuous footings. Footings for such appurtenances should be a minimum of 18 inches deep, 12 inches wide, and minimally reinforced with four No. 4 bars, two top, and two bottom. The bearing capacity for such appurtenances is 1,500 psf.

7.8 Trench Backfill

Trench excavations for utility lines should be properly backfilled and compacted. Utilities should be properly bedded and backfilled with clean sand or approved granular soil to a depth of at least 6 inches over the pipe. This backfill should be uniformly watered and compacted to a firm condition for vertical and lateral pipe support. The remainder of the backfill may be typical on-site soil or low-expansive import placed near optimum moisture content in lifts not exceeding 8 inches in thickness and mechanically compacted to at least 90 percent relative compaction.

7.9 Pavement

The following pavement sections are provided for the new pavements associated with the proposed improvements. Subgrade preparation should be conducted immediately before placing the pavement section. As a minimum, the upper 12 inches of subgrade in the proposed pavement should be removed and properly re-compacted to 95 percent relative compaction and moisture-conditioned to at least 2 percent over the optimum moisture content (per ASTM D-1557).

It is assumed that the proposed driveway will receive light vehicle traffic, etc. The following pavement sections are recommended based on an assumed R-value of 10 and in accordance with the Caltrans Highway Design Manual and the Flexible Pavement Structural Section Design Guide for California Cities and Counties (3rd edition). Concrete pavement sections were determined utilizing the Design of Concrete Pavement for City Streets by Portland Cement Association.

Assumed Traffic Index	Assumed R-Value	Asphalt Concrete	Aggregate Base (Class II)
Asphalt Pavement Section – Driveway			
5.0	10	3.0 inches	9.0 inches
Concrete Pavement Section – Driveway			
5.0	10	6.0 inches	4.0 inches

Final pavement designs should be determined based on testing of the soils exposed at the completion of the finished grading.

Concrete should be reinforced at a minimum with No. 4 rebar at 18 inches on center, each way, placed at the midpoint of the section. Additionally, control joints should be saw-cut 2.5 inches deep longitudinally at 10-foot maximum spacing and transversely at 10-foot maximum spacing. The concrete should be placed in conformance with ACI standards and have a minimum modulus of rupture of 500 psi.

Aggregate base should conform to the specifications for crushed aggregate base, crushed miscellaneous base, or processed miscellaneous base as defined in Section 200-2 of the "Greenbook." Aggregate base should be compacted to at least 95 percent of maximum dry density based on ASTM D-1557 guidelines. Asphalt concrete should conform to "Greenbook" specifications. Asphalt concrete should be compacted to at least 95 percent based on the Hveem unit weight.

7.10 Site Drainage

Drainage should be designed to direct surface water away from structures and onto an approved disposal area. A minimum gradient of 2 percent should be maintained for earth areas, with drainage directed towards approved collection facilities. Positive drainage should be maintained within an away gradient of at least 5 percent for a minimum distance of 10 feet from foundations to reduce saturation of the building foundation soils. Where property line constraints prohibit this distance, a 5 percent gradient to an approved drainage diversion (i.e., area drains or swales) should be provided. Impervious surfaces within 10 feet of the building foundation should be sloped a minimum of 2 percent away from the building. Drainage patterns approved after grading should be maintained throughout the life of the development. In addition, it is recommended that roof gutters be installed with downspouts tied into the tightlined area drain system.

7.11 Plan Review and Geotechnical Observation

When the grading and foundation plans are completed, they should be reviewed by TCI for compliance with the recommendations herein. Observation by TCI or another company's geotechnical representative is essential during grading and/or construction to confirm conditions anticipated by the preliminary investigation, adjust designs to actual field conditions, and determine that grading is conducted in general accordance with our recommendations. In addition, all foundation excavations should be reviewed for conformance with the plans prior to placement forms, reinforcement, or concrete. Observation, testing, and engineering consulting services are provided by our firm and should be budgeted within the cost of development.

8.0 CLOSURE

8.1 Limits of Investigation

Our investigation was performed using the skill and degree of care ordinarily exercised, under similar circumstances, by reputable soils engineers and engineering geologists practicing in this or similar localities. No warranty, expressed or implied, is made as to the conclusions and professional advice in this report. This report is prepared for the sole use of our client and may not be assigned to others without the written consent of the client and TCI.

The samples taken and used for testing, and the observations made, are believed representative of the site conditions; however, soil and geologic conditions can vary significantly between test excavations and surface exposures. As in most projects, conditions revealed by construction excavations may vary with the preliminary findings. If this occurs, the geotechnical engineer should evaluate the changed conditions and adjust recommendations and designs as necessary.

It is the responsibility of the owner, or of their representative, to ensure that the information and recommendations contained herein are brought to the attention of the project architect and engineer. Appropriate recommendations should be incorporated into the structural plans and the necessary steps taken to see that the contractor and subcontractors carry out such recommendations in the field.

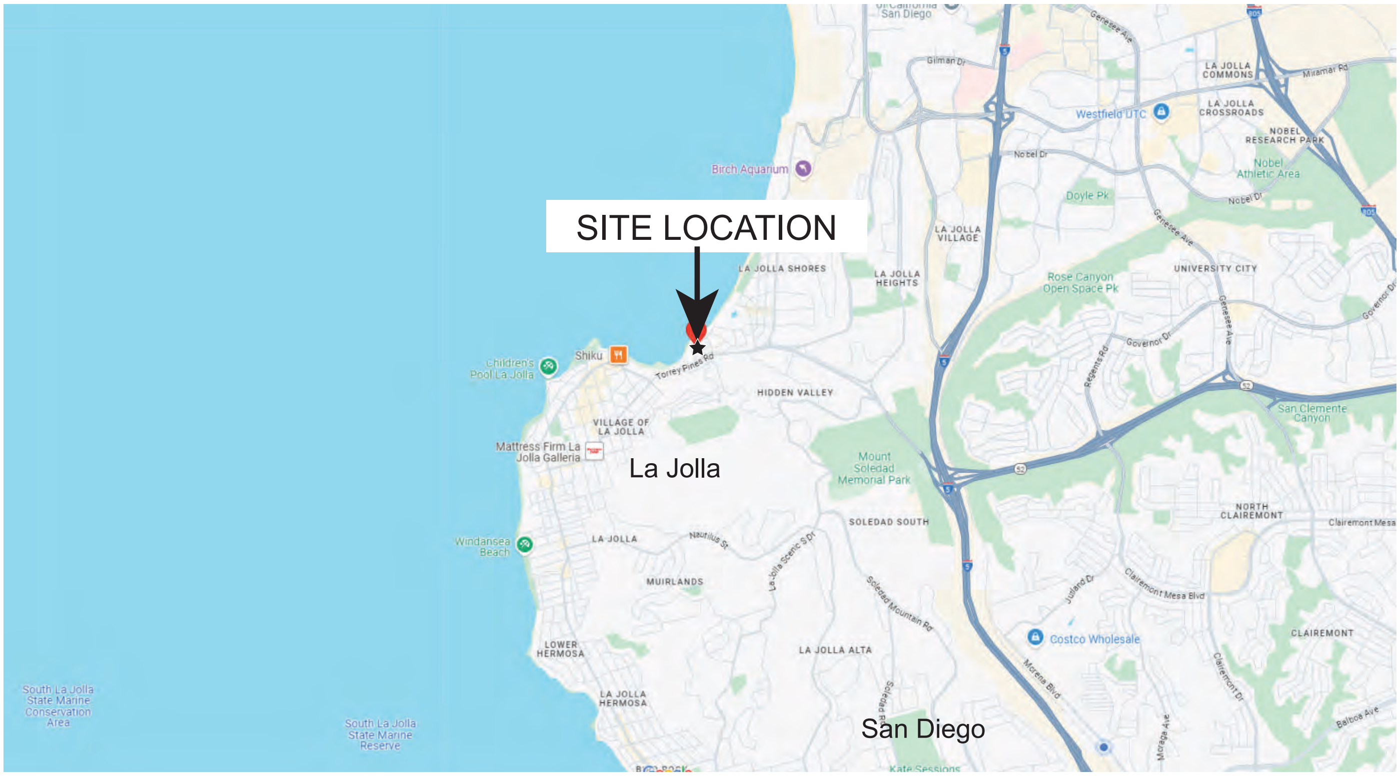
The findings of this report are valid as of the present date. However, the conditions can change over time, whether they are due to natural processes or the works of man. In addition, changes in applicable or appropriate standards may occur from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside of our control. This report is subject to review and should be updated after a period of 3 years.

*** * * TerraPacific Consultants, Inc. * * ***

APPENDIX A

Figures

LOCATION:
1835 Spindrift Drive,
La Jolla, CA



REFERENCE: Google Maps

N

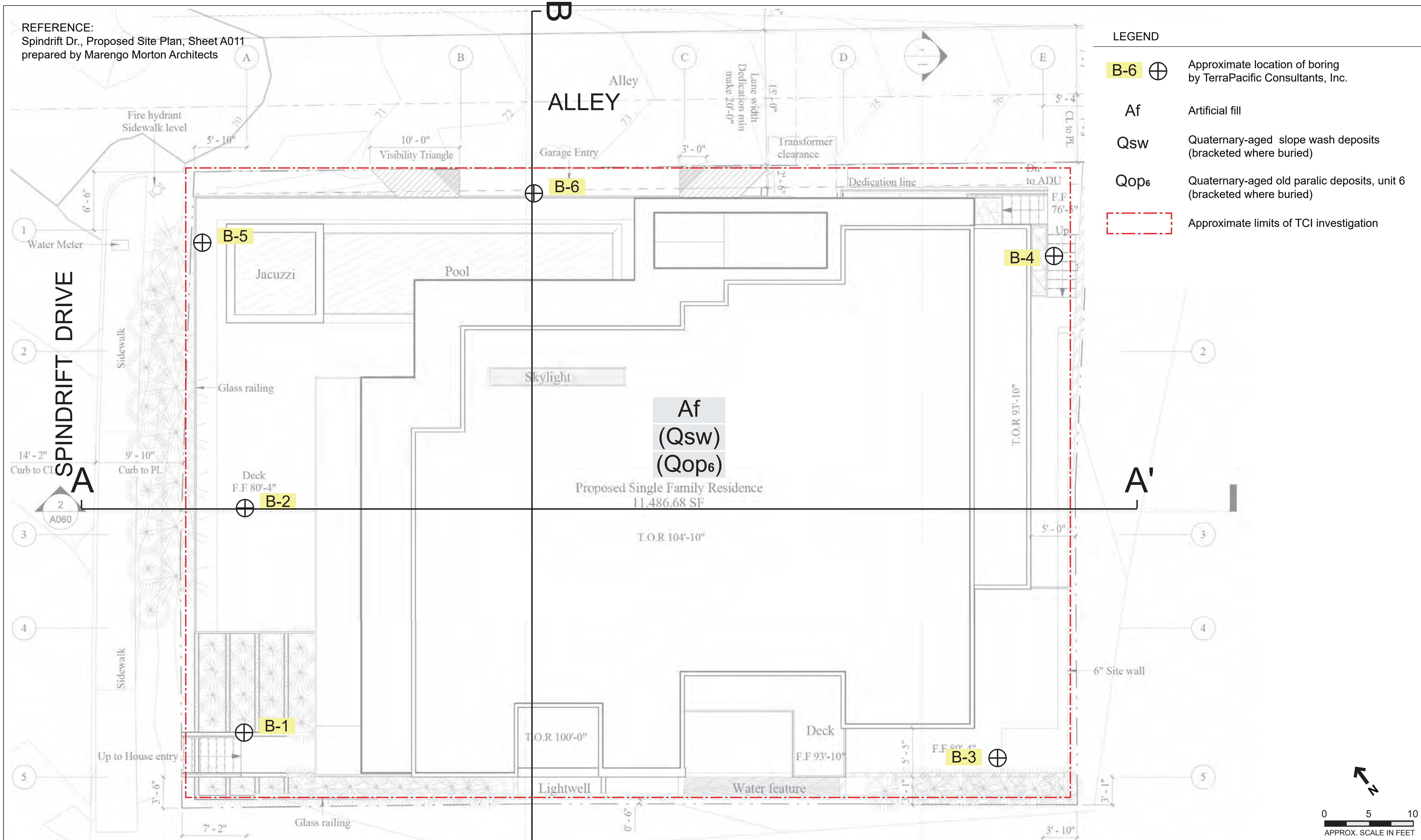
TerraPacific CONSULTANTS INC
4010 Morena Boulevard
Suite 108
San Diego CA 92117
858-521-1190

Site Location Plan

Spindrift

File No. 23-223
September 2024

Figure 1



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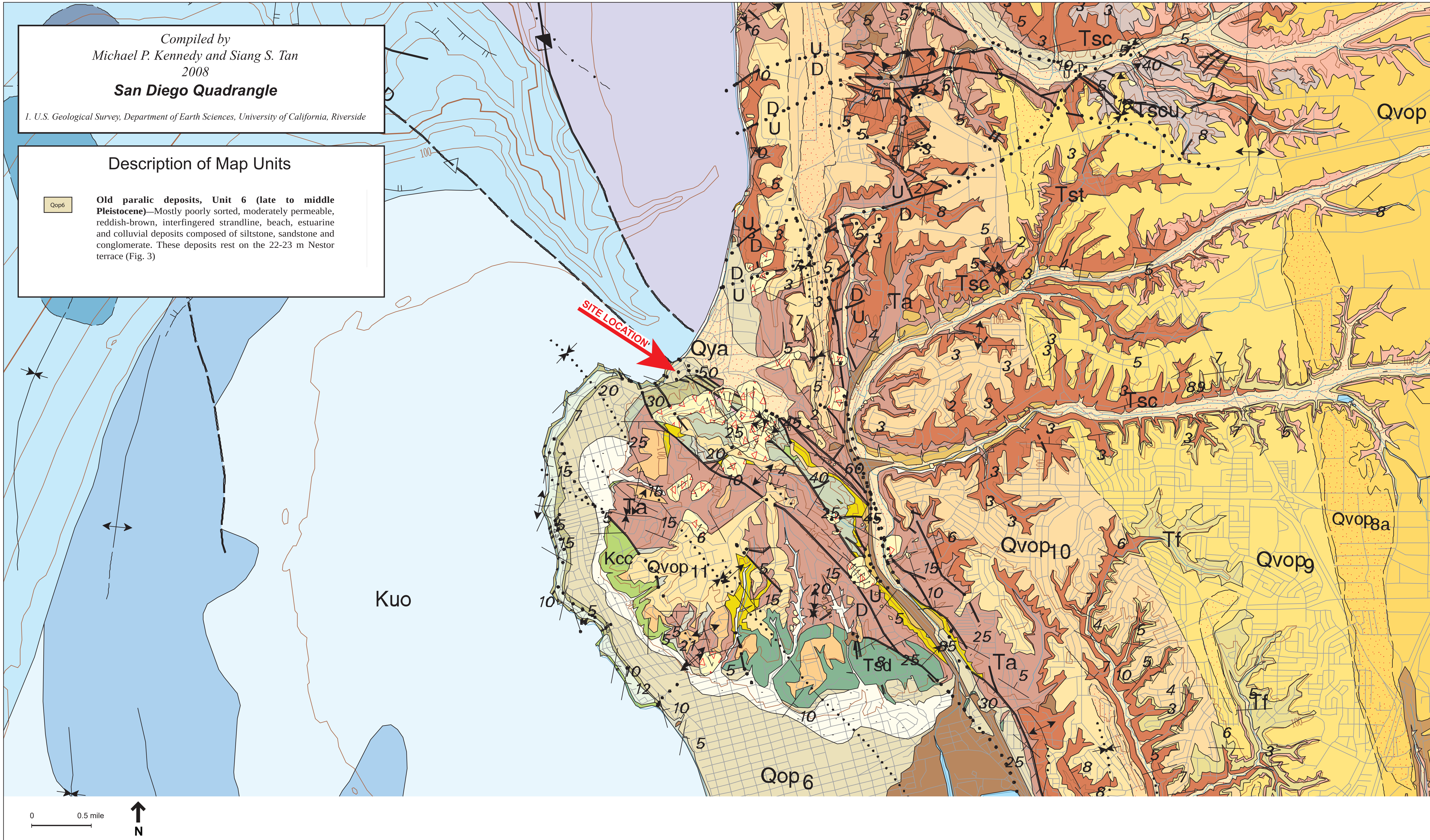
Geotechnical Plan

Spindrift
File No. 23-223
September 2024

Figure 2



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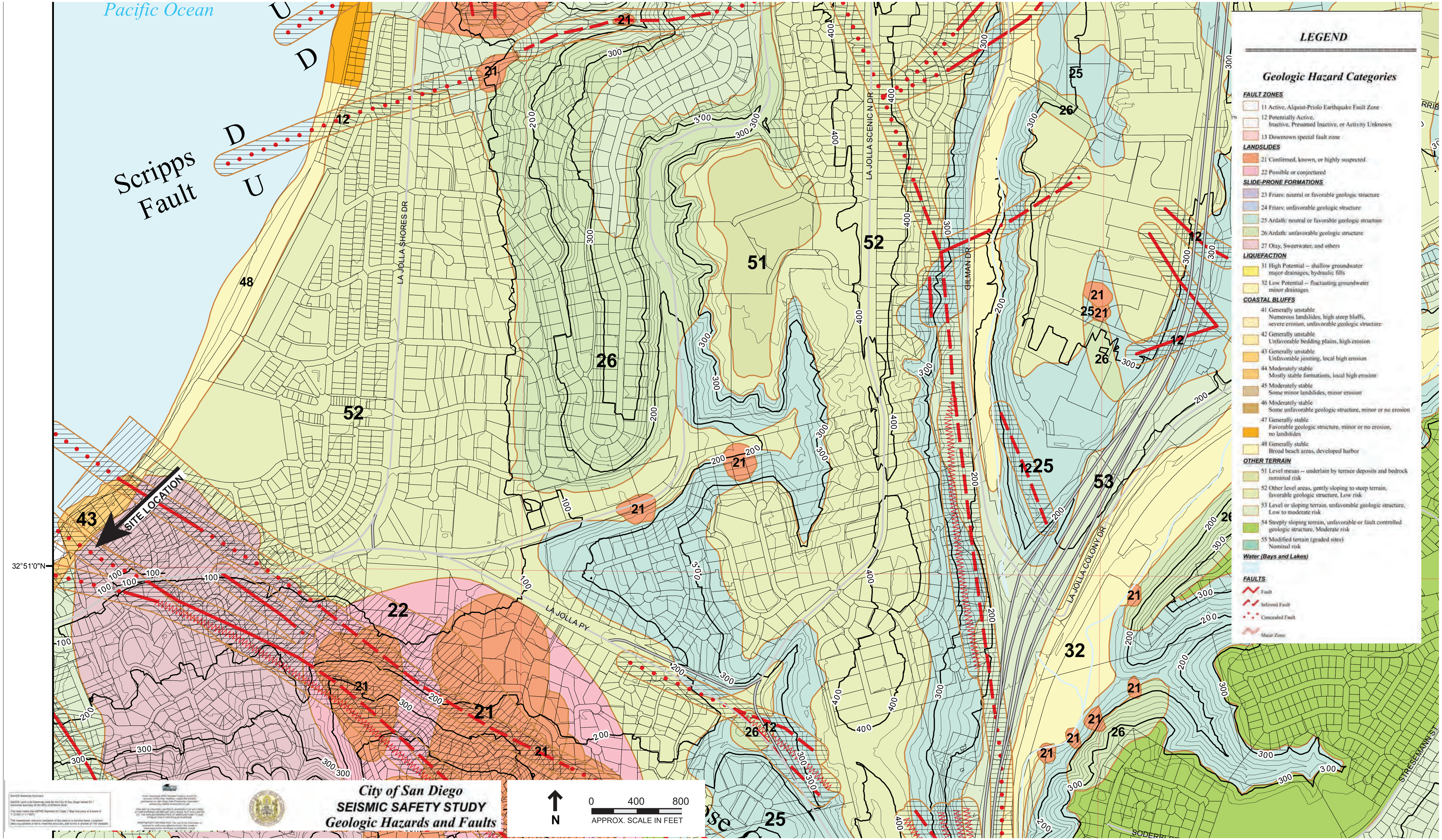
Geologic Map

Spindrift

File No. 23-223
September 2024

Figure 3



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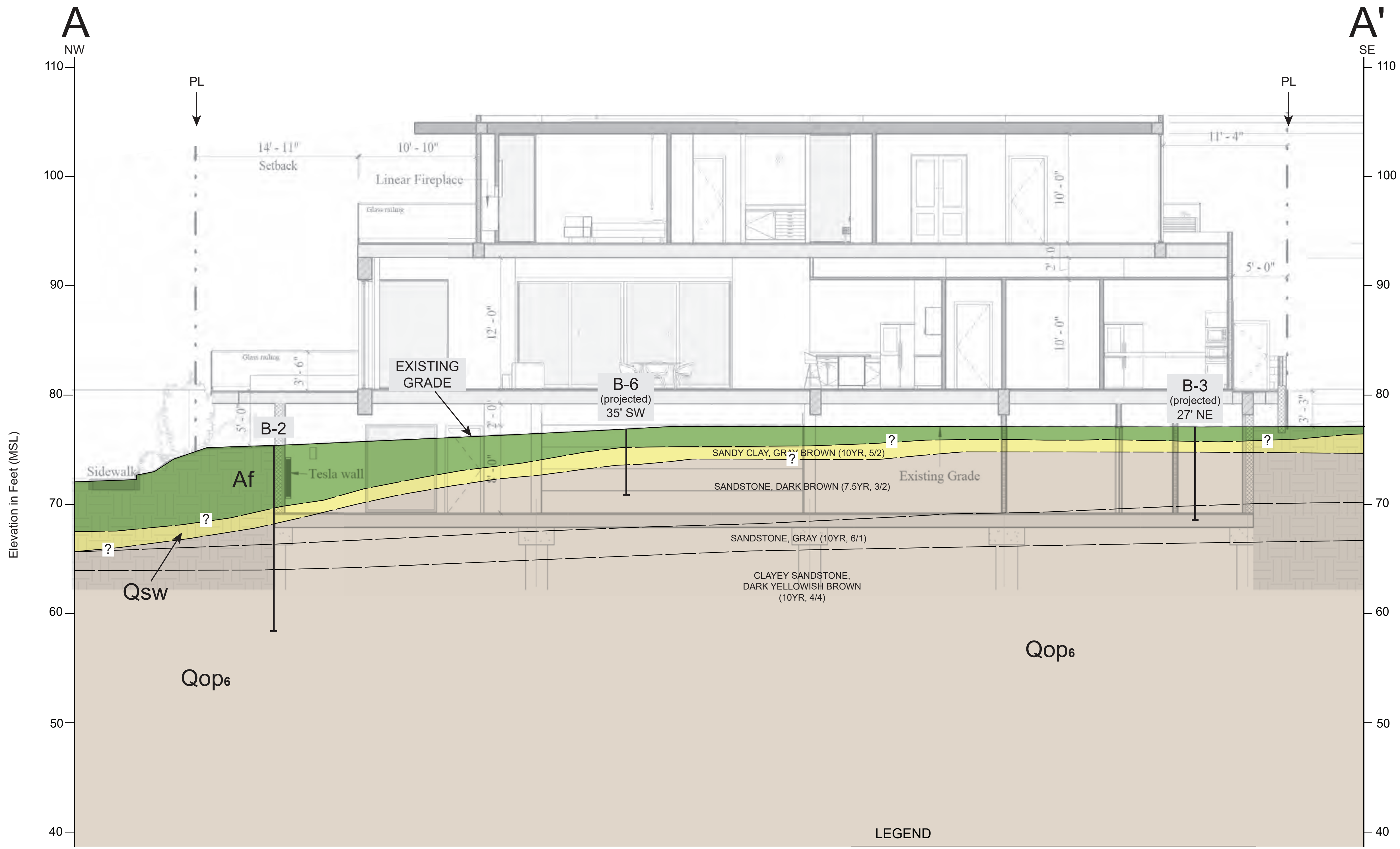
Seismic Safety Study Map

Spindrift

File No. 23-223

September 2024

Figure 4



LEGEND

Af	Artificial fill
Qsw	Quaternary-aged slope wash deposits
Qop_6	Quaternary-aged old paralic deposits, unit 6
—— ——	Geologic contact

0 5 10
APPROX. SCALE IN FEET

REFERENCE:
Spindrift Dr., Sections, Sheet A060
prepared by Marengo Morton Architects

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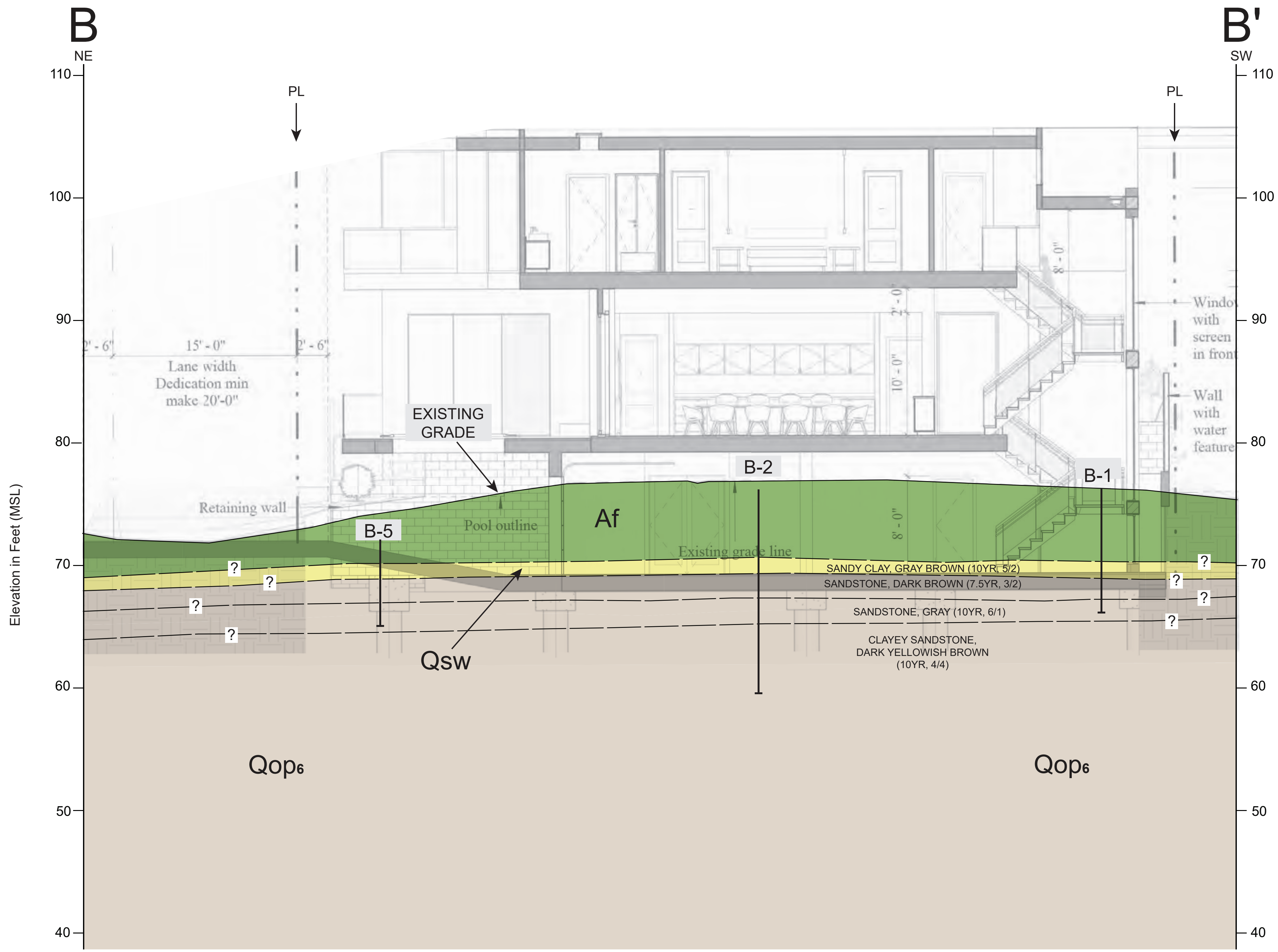
San Diego CA 92117
858-521-1190

Cross Section A-A'

Spindrift
File No. 23-223
September 2024

Figure 5



LEGEND

Af	Artificial fill
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Qop_6	Quaternary-aged old paralic deposits, unit 6
—— ——	Geologic contact

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prepared by Marengo Morton Architects

0 5 10
APPROX. SCALE IN FEET

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Cross Section B-B'

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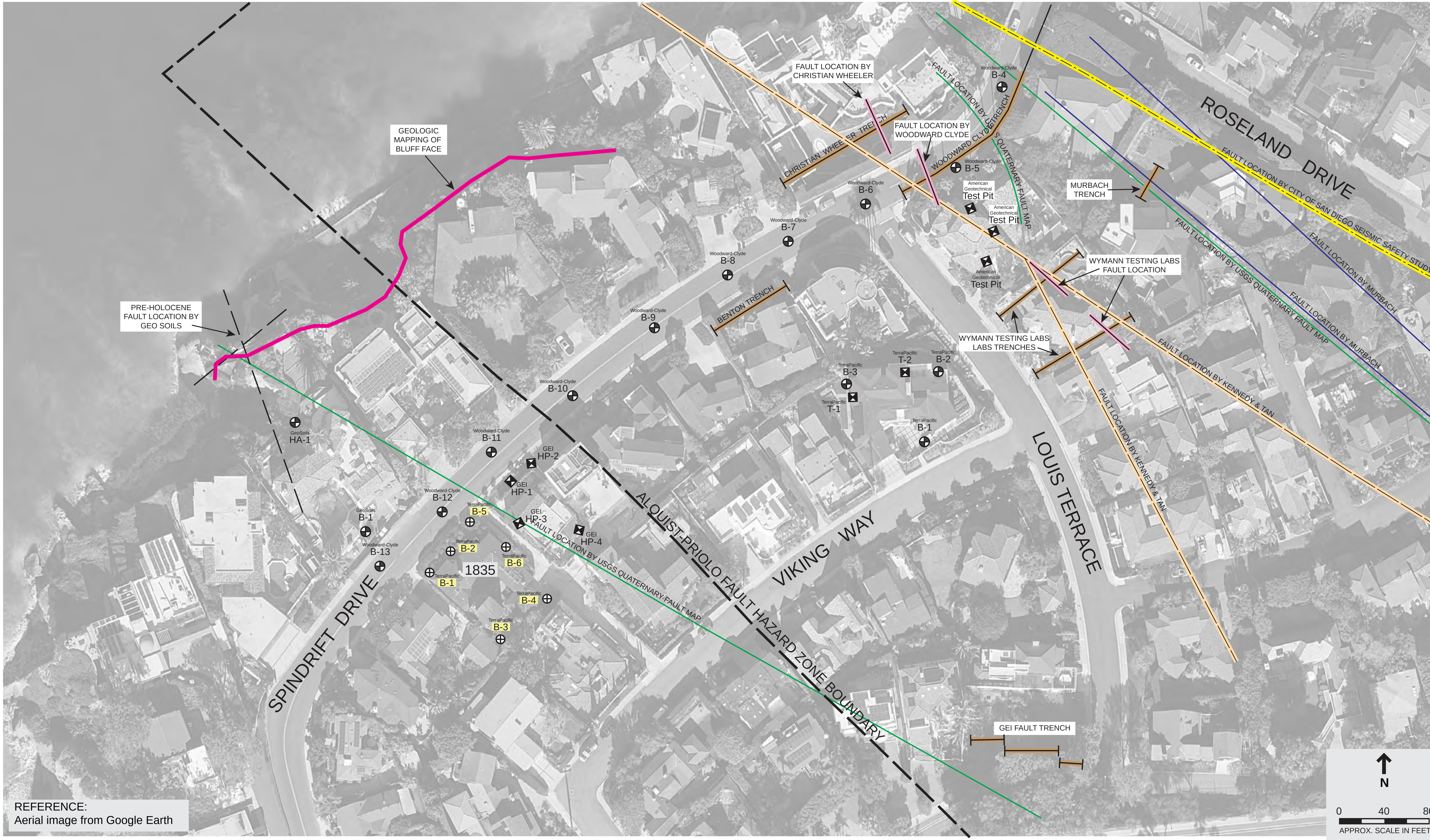
Figure 6



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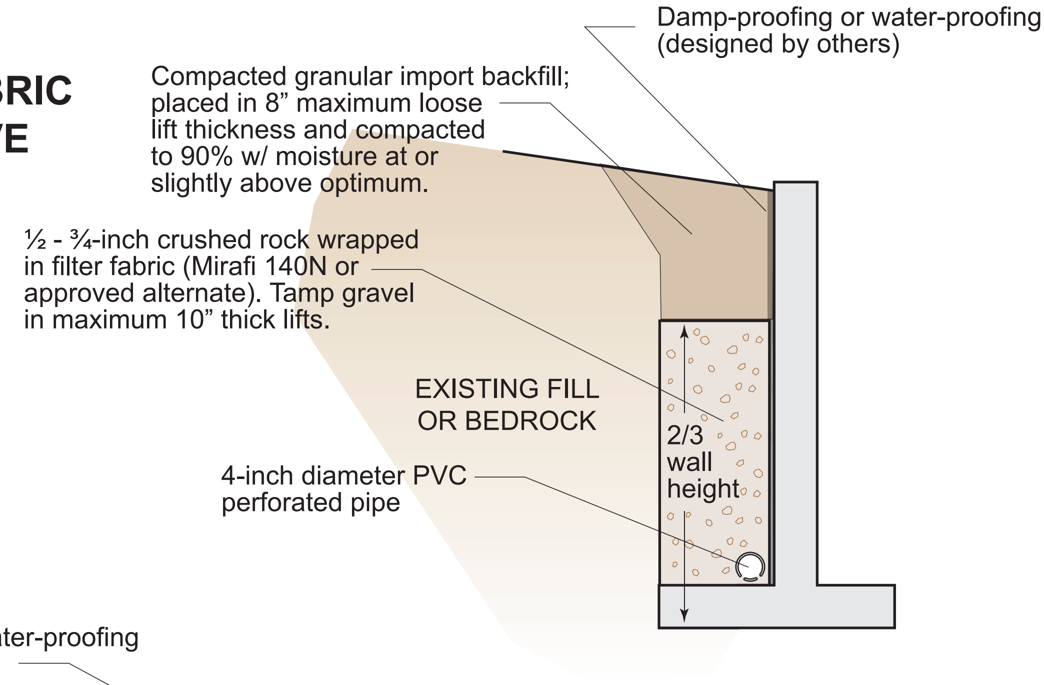
Fault Rupture Hazard Map

Spindrift

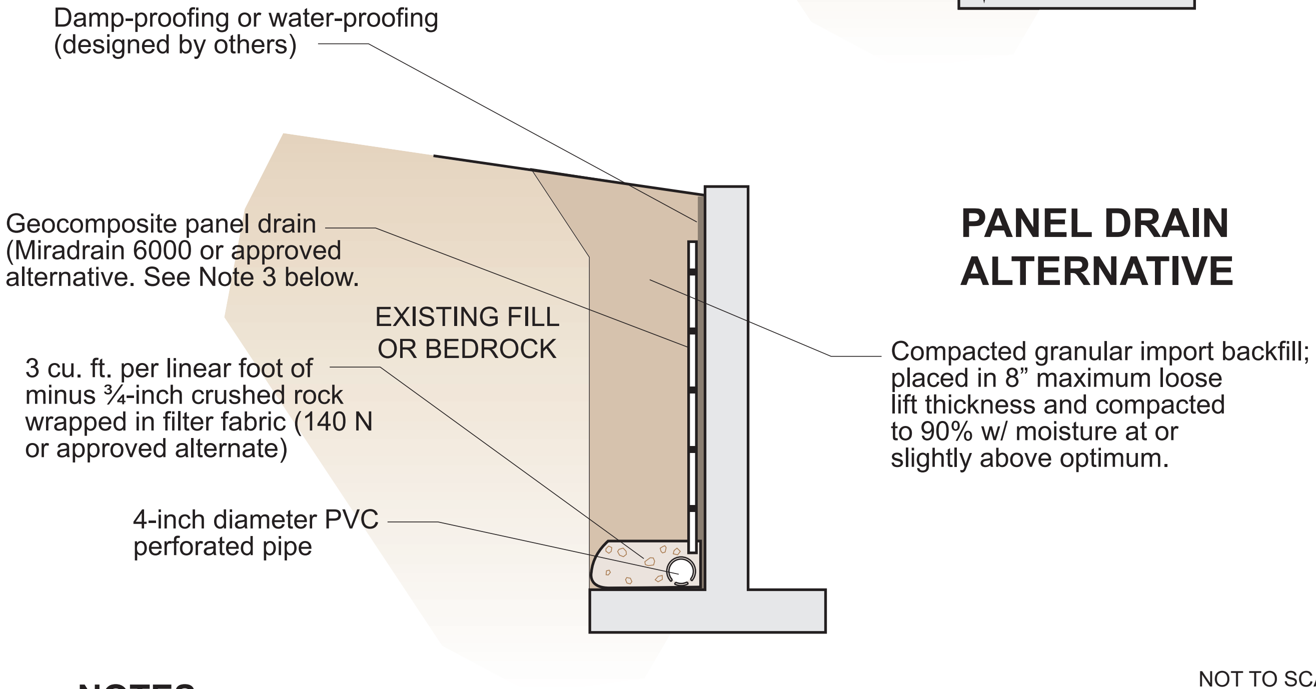
File No. 23-223
September 2024

Figure 7

ROCK & FABRIC ALTERNATIVE



PANEL DRAIN ALTERNATIVE



NOT TO SCALE

NOTES:

1) The wall drain is intended to reduce water buildup by collecting water from a top-down source to help relieve hydrostatic pressure on the wall. If interior living space abuts the retaining wall or water infiltration is otherwise a concern, then the owner or builder should assign a qualified professional to evaluate the wall design. Modifications to the design may include re-location of the subdrain to the heel of the wall.

2) Perforated pipe should outlet through to a solid pipe at maximum 25 foot centers to a free gravity outfall. Perforated pipe and outlet pipe should have a fall of at least 1%.

3) Filter fabric should consist of Mirafi 140N or similar approved fabric. Filter fabric should be overlapped at least 6-inches.

4) Geocomposite panel drain should consist of Miradrain 6000, Mirafi G100N, J-Drain 400, or approved similar product.

5) Drain installation should be observed by the geotechnical consultant prior to backfilling.

TerraPacific CONSULTANTS INC
4010 Morena Boulevard
Suite 108
San Diego CA 92117
858-521-1190

Retaining Wall Drain Details

Spindrift

File No. 23-223
September 2024

Figure 8

APPENDIX B

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APPENDIX C

Subsurface Excavation Logs

Subsurface Boring Log

Boring No: B-1

Project No: 23-223
Project Name: Spindrift Residence
Location: 1835 Spindrift Drive
Sample Method: Modified California Sampler / SPT
Instrumentation: None Installed
Elevation: ~75.2'

Date: 7/25/24
Logged By: E. Perez
Drilling Company: Native Drilling
Driller: Gabe
Drill Rig Type: Tripod
Hammer Wt. & Drop: 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Sandy clay, very dark brown (7.5YR, 2.5/2), moist, loose					
		@ 2.5', Color change to dark brown (7.5 YR, 3/4)					
5		From 4.0', Clayey sand, dark brown (7.5YR, 3/4), moist, medium dense, fine to medium grained, some rootlets		SPT / Bulk	8/10/10	--	--
		SLOPEWASH: From 6.5', Silty sand, very dark brown (7.5 YR/7.5/2), moist, loose, trace of shell fragments, fine to medium grained		Ring	5/12/20	--	--
		NATIVE (Old Paralic Deposits, Unit 6): From 7.5', Sandstone, dark brown (7.5 YR, 3/2), slightly moist, medium dense, poorly cemented, fine grained, massive, trace of fines		SPT	10/10/11	--	--
10		@ 9.3', Color change to gray (10 YR, 6/1), with abundant black grains					
15							
20							

Total Depth: 10.0'
Water: No
Caving: No
Hole Diameter: 5"

Boring
B-1

Subsurface Boring Log

Boring No: B-2

Project No: 23-223
Project Name: Spindrift Residence
Location: 1835 Spindrift Drive
Sample Method: Modified California Sampler / SPT
Instrumentation: None Installed
Elevation: ~75.7'

Date: 7/25/24
Logged By: E. Perez
Drilling Company: Native Drilling
Driller: Gabe
Drill Rig Type: Tripod
Hammer Wt. & Drop: 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Sandy clay, very dark brown (7.5YR, 4/6), moist, soft, some concrete fragments		Bulk	9/9/10	--	--
5				Ring / Bulk	4/4/4	--	--
5.5		SLOPEWASH: From 5.5', Silty sand, dark brown (7.5 YR, 3/3), moist, medium dense, some carbon deposits					
6.5		NATIVE (Old Paralic Deposits, Unit 6): From 6.5', Sandstone, dark brown (7.5 YR, 3/2), slightly moist, loose to medium dense, poorly cemented, fine grained, massive, with abundant black grains					
10		@ 9.0', Sporatic layers of gray (10YR, 6/1), abundant black grains		SPT	12/12/17	--	--
10.9		From 10.9', Clayey/silty sandstone, dark yellowish brown (10 YR, 4/4), moist, medium dense, some black oxidation staining, some lenese of gray sand					
15		@ 15.0', With olive gray mottling, dense in consistency		Ring	22/35/50 for 6"	--	--
20							

Total Depth: 16.5'
Water: No
Caving: No
Hole Diameter: 5"

Boring
B-2

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Subsurface Boring Log

Boring No: B-3

Project No: 23-223	**Date:** 7/25/24
Project Name: Spindrift Residence	**Logged By:** E. Perez
Location: 1835 Spindrift Drive	**Drilling Company:** Native Drilling
Sample Method: Modified California Sampler / SPT	**Driller:** Gabe
Instrumentation: None Installed	**Drill Rig Type:** Tripod
Elevation: ~77.0'	**Hammer Wt. & Drop:** 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Sandy clay, very dark brown (7.5YR, 2.5/2), moist to very moist, loose, with roots					
		SLOPEWASH: From 1.2', Sandy clay, gray brown, mosit, stiff, some oxidation staining, faint caliche stringers					
		NATIVE (Old Paralic Deposits, Unit 6): From 2.0', Clayey sandstone, dark reddish brown (5 YR, 3/4), moist, medium dense, fine grained, trace of carbon deposits		Ring / Bulk	8/17/18	--	--
				SPT	6/8/8	--	--
		From 3.8', Sandstone, dark brown (7.5 YR, 3/2), moist, medium dense, with abundant black grains, fine grained, poorly cemented, trace of fines					
5							
		From 6.9', Sandstone, gray (10 YR, 6/1), moist, medium dense, friable, abundant black grains		SPT	10/14/18	--	--
10							
15							
20							

Total Depth: 8.0'
Water: No
Caving: No
Hole Diameter: 5"

Boring

B-3

TerraPacific CONSULTANTS INC

Subsurface Boring Log

Boring No: B-4

Project No: 23-223
Project Name: Spindrift Residence
Location: 1835 Spindrift Drive
Sample Method: Modified California Sampler / SPT
Instrumentation: None Installed
Elevation: ~77.0'

Date: 7/25/24
Logged By: E. Perez
Drilling Company: Native Drilling
Driller: Gabe
Drill Rig Type: Tripod
Hammer Wt. & Drop: 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Sandy clay, dark grayish brown (10 YR, 4/2), moist to very moist, with roots		Bulk	--	--	--
		SLOPEWASH: From 1.4', Sandy clay, grayish brown (10 YR, 5/2), moist, stiff, trace of caliche stringers, some iron oxide staining		SPT / Bulk	20/22	--	--
		NATIVE (Old Paralic Deposits, Unit 6): From 3.0', Clayey sandstone, reddish brown (5 YR, 3/4), moist, very stiff, with iron oxide and black staining, fine to medium grained		SPT	14/28	--	--
5							
10							
15							
20							

Total Depth: 4.9'
Water: No
Caving: No
Hole Diameter: 5"

Boring
B-4

Subsurface Boring Log

Boring No: B-5

Project No: 23-223
Project Name: Spindrift Residence
Location: 1835 Spindrift Drive
Sample Method: Modified California Sampler / SPT
Instrumentation: None Installed
Elevation: ~72.0'

Date: 7/25/24
Logged By: E. Perez
Drilling Company: Native Drilling
Driller: Gabe
Drill Rig Type: Tripod
Hammer Wt. & Drop: 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Silty sand, very dark brown (7.5 YR, 5/2), moist, loose, some roots					
		SLOPEWASH: From 2.2', Silty sand, very dark brown (7.5 YR, 2.5/2), moist, loose, trace of shell fragments					
		NATIVE (Old Paralic Deposits, Unit 6): From 3.5', Sandstone, dark brown (7.5 YR, 3/2) slightly moist, medium dense, poorly cemented, fine grained		SPT	5/6/9	--	--
5		From 5.2', Sandstone, gray (10 Yr, 6/1), slightly moist, loose to medium dense, friable, abundant black grains					
10							
15							
20							

Total Depth: 7.3'
Water: No
Caving: No
Hole Diameter: 5"

Boring

B-5

TerraPacific CONSULTANTS INC

Subsurface Boring Log

Boring No: B-6

Project No: 23-223	**Date:** 7/25/24
Project Name: Spindrift Residence	**Logged By:** E. Perez
Location: 1835 Spindrift Drive	**Drilling Company:** Native Drilling
Sample Method: Modified California Sampler / SPT	**Driller:** Gabe
Instrumentation: None Installed	**Drill Rig Type:** Tripod
Elevation: ~74.0'	**Hammer Wt. & Drop:** 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Silty sand, dark brown (7.5 YR, 3/4), slightly moist, loose, with roots					
		SLOPEWASH: From 1.6', Sandy clay, medium brown (7.5 YR, 4/3), moist, stiff, with caliche, some roots					
		NATIVE (Old Paralic Deposits, Unit 6): From 2.7', Sandstone, dark brown (7.5 YR, 3/2) slightly moist, medium dense to dense, with abundant black graines, poorly cemented @ 3.9', Increase in clay content		SPT	10/15/19	--	--
5							
10							
15							
20							

Total Depth: 5.5'
Water: No
Caving: No
Hole Diameter: 5"

Boring **B-6**

APPENDIX D

Laboratory Test Results

Spindrift
Summary of Laboratory Test Results

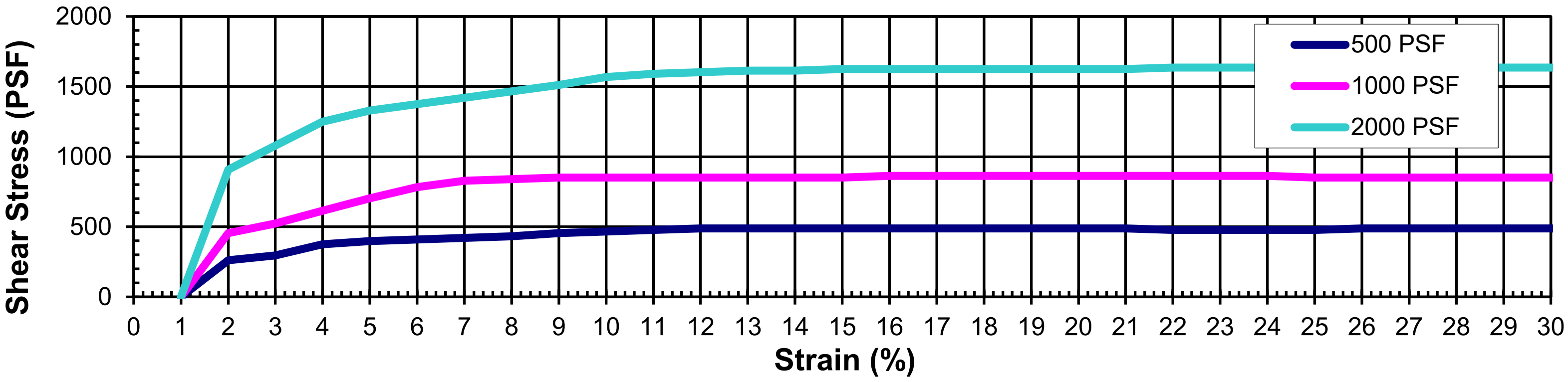
F.N. 23-223

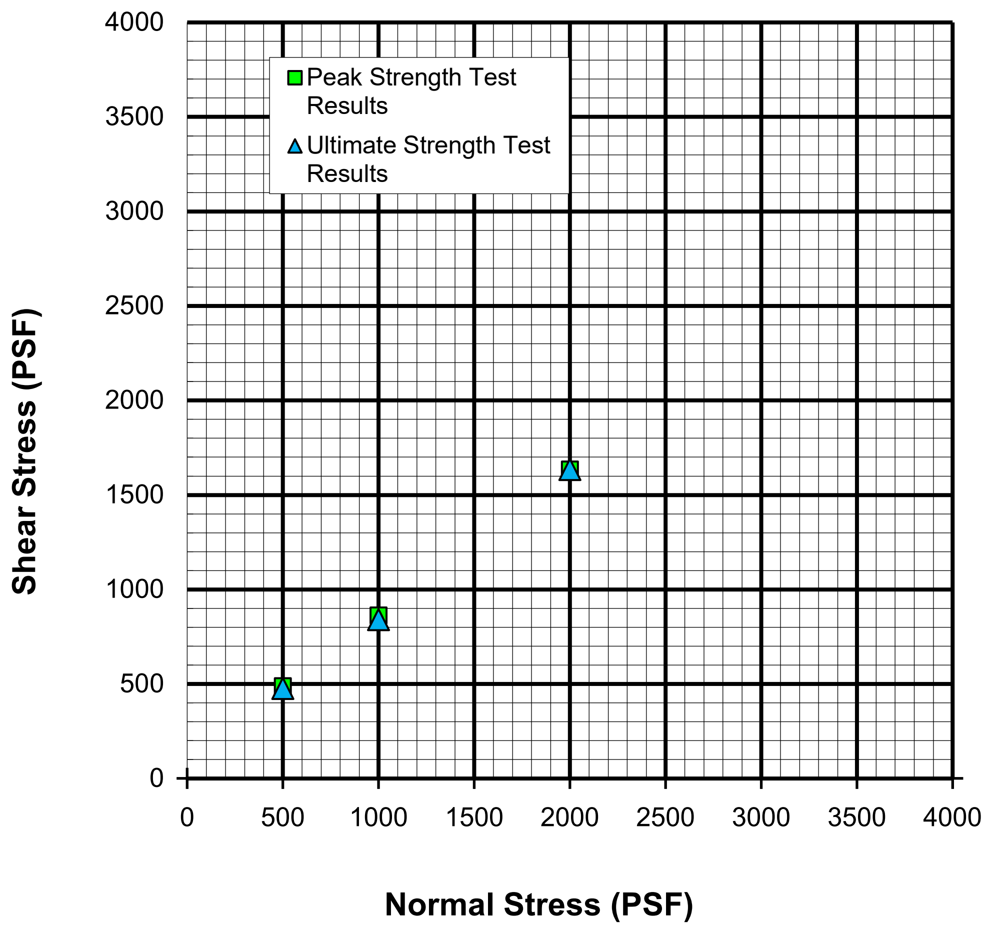
Sample Location			Corrosivity Series		ASTM D 1557		ASTM D 2937		ASTM D 3080		ASTM D 4829		ASTM D 4546	
			CTM422	CTM 417										
Location	Sample Depth	Sample Type	Chloride Content	Sulfate Content	Maximum Dry Density	Opt. Moist Content	Dry Density	Moisture Content	Peak ϕ	Peak c	Expansion Index	Expansion Potential	Hydro Response	Normal Stress
B-1	4.0'-5.5'	SB	0.002	0.004	--	--	--	--	--	--	--	--	--	--
B-1	7.0'	Ring	--	--	--	--	112.6	10.7	--	--	--	--	-0.21	4000.0
B-2	0-10.0'	LB	--	--	128.1	9	--	--	37.0	110.0	--	--	--	--
B-4	1.0'-3.0'	SB	--	--	--	--	--	--	--	--	93	high	--	--

DIRECT SHEAR TEST

Laboratory Report

File Name:	Spindrift
File No.:	23-223
Date:	8/22/2024
Technician:	JMS





Sample No.& Location:	B-2 @ 0-10.0'
Soil Description:	Dark Brown Sand
Sample Type:	Remolded
Specimen Preparation:	Inundated

	Peak	Ultimate
Friction Angle Φ' (deg)	37	37
Cohesion C' (psf)	110	100

COMPACTION TEST

ASTM D 1557
Modified Proctor

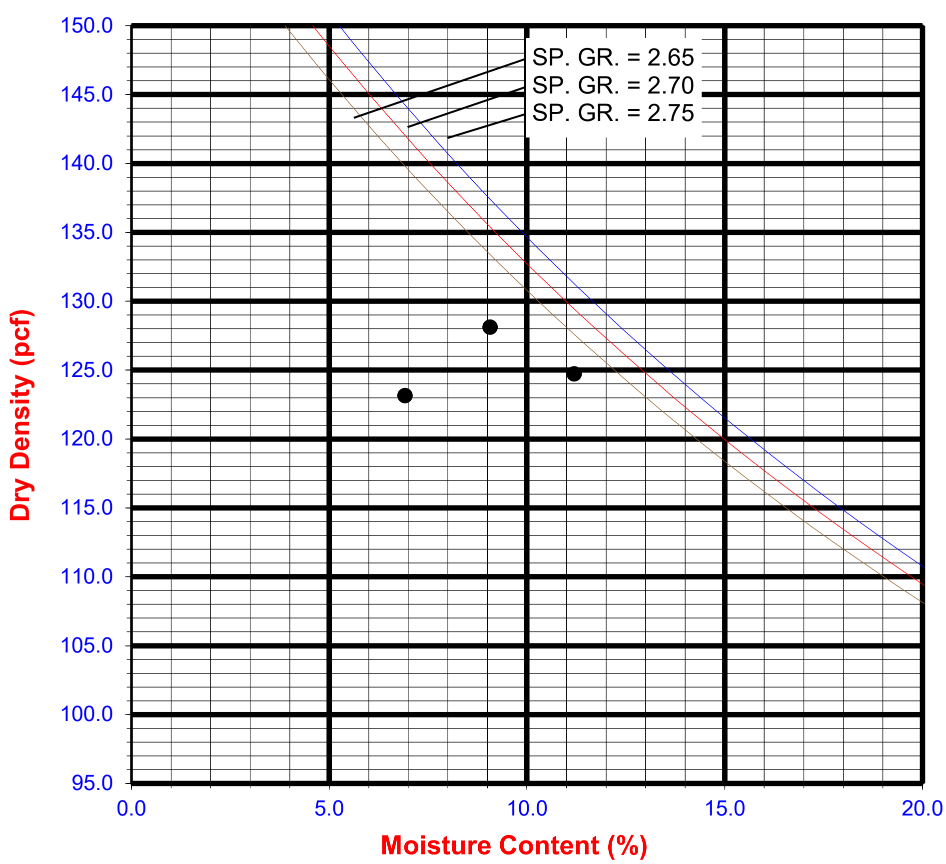
Project Name: Spindrift
Project No. : 23-223
Boring No.: B-2 @ 0'-10'
Technician: JMS
Date: 8/20/2024
Visual Sample Description: Dark Brown Sand w/ Clay

X	**Manual Ram**

Ram Weight 10 LBS Drop 18 inches

		TEST NO.	1	2	3	4	5	6
A	Wt. Comp. Soil + Mold (gm.)		3792.00	3915.00	3899.00			
B	Wt. of Mold (gm.)		1785.00	1785.00	1785.00			
C	Net Wt. of Soil (gm.)	A - B	2007.00	2130.00	2114.00			
D	Wet Wt. of Soil + Cont. (gm.)		1585.8	1125.6	1533.5			
E	Dry Wt. of Soil + Cont. (gm.)		1498.6	1052.0	1409.5			
F	Wt. of Container (gm.)		237.0	240.5	301.4			
G	Moisture Content (%)	[(D-F)-(E-F)]/(E-F)	6.9	9.1	11.2			
H	Wet Density (pcf)	C*29.76 /453.6	131.7	139.7	138.7			
I	Dry Density (pcf)	H/(1+G/100)	123.2	128.1	124.7			

Maximum Dry Density (pcf) **128.1** **Optimum Moisture Content (%)** **9.0**



PROCEDURE USED

Procedure A

Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if No.4 retained < 20%

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A N A L Y T I C A L   A N D   C O N S U L T I N G   C H E M I S T S

Date: August 19, 2024
Purchase Order Number: 23-223
Sales Order Number: 64623
Account Number: TERP

To:

TerraPacific Consultants Inc
4010 Morena Boulevard Ste 108
San Diego, CA 92117
Attention: Sarah McMillin

Laboratory Number: SO1359   Customers Phone: 858-521-1190

Sample Designation:

One soil sample received on 08/05/24 at 1:02pm,
taken from Spindriff #23-223 marked as follows:

ANALYSIS: Water Soluble Sulfate (SO_4) California Test 417
(Turbidity Method)
Water Soluble Chloride (Cl) California Test 422
(Titration Method)

Sample	SO_4%	Cl%
#1 B-1@4-5.5'	0.004	0.002

Rosa Bernal
RMB/js

APPENDIX E

Standard Grading Guidelines

STANDARD GUIDELINES FOR GRADING PROJECTS

TABLE OF CONTENTS

GENERAL

The guidelines contained herein and the standard details attached hereto represent this firm's standard recommendations for grading and other associated operations on construction projects. These guidelines should be considered a portion of the project specifications.

All plates attached hereto shall be considered as part of these guidelines.

The Contractor should not vary from these guidelines without prior recommendation by the Geotechnical Consultant and the approval of the Client or his authorized representative. Recommendation by the Geotechnical Consultant and/or Client should not be considered to preclude requirements for approval by the controlling agency prior to the execution of any changes.

These Standard Grading Guidelines and Standard Details may be modified and/or superseded by recommendations contained in the text of the preliminary geotechnical report and/or subsequent reports.

If disputes arise out of the interpretation of these grading guidelines or standard details, the Geotechnical Consultant shall provide the governing interpretation.

DEFINITIONS OF TERMS

ALLUVIUM - Unconsolidated soil deposits resulting from flow of water, including sediments deposited in river beds, canyons, flood plains, lakes, fans and estuaries.

AS-GRADED (AS-BUILT) - The surface and subsurface conditions at completion of grading.

BACKCUT - A temporary construction slope at the rear of earth retaining structures such as buttresses, shear keys, stabilization fills or retaining walls.

BACKDRAIN - Generally a pipe and gravel or similar drainage system placed behind earth retaining structures such buttresses, stabilization fills, and retaining walls.

BEDROCK - Relatively undisturbed formational rock, more or less solid, either at the surface or beneath superficial deposits of soil.

BENCH - A relatively level step and near vertical rise excavated into sloping ground on which fill is to be placed.

BORROW (Import) - Any fill material hauled to the project site from off-site areas.

BUTTRESS FILL - A fill mass, the configuration of which is designed by engineering calculations to retain slope conditions containing adverse geologic features. A buttress is generally specified by minimum key width and depth and by maximum backcut angle. A buttress normally contains a back-drainage system.

CIVIL ENGINEER - The Registered Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topographic conditions.

CLIENT - The Developer or his authorized representative who is chiefly in charge of the project. He shall have the responsibility of reviewing the findings and recommendations made by the Geotechnical Consultant and shall authorize the Contractor and/or other consultants to perform work and/or provide services.

COLLUVIUM - Generally loose deposits usually found near the base of slopes and brought there chiefly by gravity through slow continuous downhill creep (also see Slope Wash).

COMPACTION - Densification of man-placed fill by mechanical means.

CONTRACTOR - A person or company under contract or otherwise retained by the Client to perform demolition, grading and other site improvements.

DEBRIS - All products of clearing, grubbing, demolition, contaminated soil materials unsuitable for reuse as compacted fill and/or any other material so designated by the Geotechnical Consultant.

ENGINEERING GEOLOGIST - A licensed Engineering Geologist who applies scientific methods, engineering and geologic principles and professional experience to the acquisition, interpretation and use of knowledge of materials of the earth's crust for the evaluation of engineering problems. Geotechnical Engineering encompasses many of the engineering aspects of soil mechanics, rock mechanics, geology, geophysics, hydrology and related sciences.

ENGINEERED FILL - A fill of which the Geotechnical Consultant or his representative, during grading, has made sufficient tests to enable him to conclude that the fill has been placed in substantial compliance with the recommendations of the Geotechnical Consultant and the governing agency requirements.

EROSION - The wearing away of the ground surface as a result of the movement of wind and/or water.

EXCAVATION - The mechanical removal of earth materials.

EXISTING GRADE - The ground surface configuration prior to grading.

FILL - Any deposits of soil, rock, soil-rock blends or other similar materials placed by man.

FINISH GRADE - The ground surface configuration at which time the surface elevations conform to the approved plan.

GEOFABRIC - Any engineering textile utilized in geotechnical applications including subgrade stabilization and filtering.

GEOLOGIST - A representative of the Geotechnical Consultant educated and trained in the field of geology.

GEOTECHNICAL CONSULTANT - The Geotechnical Engineering and Engineering Geology consulting firm retained to provide technical services for the project. For the purpose of these specifications, observations by the Geotechnical Consultant include observations by the Soil Engineer, Geotechnical Engineer, Engineering Geologist and those performed by persons employed by and responsible to the Geotechnical Consultants.

GEOTECHNICAL ENGINEER - A licensed Geotechnical Engineer or Civil Engineer who applies scientific methods, engineering principles and professional experience to the acquisition, interpretation and use of knowledge of materials of the earth's crust for the evaluation of engineering problems. Geotechnical Engineering encompasses many of the engineering aspects of soil mechanics, rock mechanics, geology, geophysics, hydrology and related sciences.

GRADING - Any operation consisting of excavation, filling or combinations thereof and associated operations.

LANDSLIDE DEBRIS - Material, generally porous and of low density, produced from instability of natural or man-made slopes.

MAXIMUM DENSITY - Standard laboratory test for maximum dry unit weight. Unless otherwise specified, the maximum dry unit weight shall be determined in accordance with ASTM Method of Test D 1557-09.

OPTIMUM MOISTURE - Soil moisture content at the test maximum density.

RELATIVE COMPACTION - The degree of compaction (expressed as a percentage) of dry unit weight of a material as compared to the maximum dry unit weight of the material.

ROUGH GRADE - The ground surface configuration at which time the surface elevations approximately conform to the approved plan.

SITE - The particular parcel of land where grading is being performed.

SHEAR KEY - Similar to buttress, however, it is generally constructed by excavating a slot within a natural slope in order to stabilize the upper portion of the slope without grading encroaching into the lower portion of the slope.

SLOPE - An inclined ground surface the steepness of which is generally specified as a ratio of horizontal:vertical (e.g., 2:1).

SLOPE WASH - Soil and/or rock material that has been transported down a slope by action of gravity assisted by runoff water not confined by channels (also see Colluvium).

SOIL - Naturally occurring deposits of sand, silt, clay, etc., or combinations thereof.

SOIL ENGINEER - Licensed Geotechnical Engineer or Civil Engineer experienced in soil mechanics (also see Geotechnical Engineer).

STABILIZATION FILL - A fill mass, the configuration of which is typically related to slope height and is specified by the standards of practice for enhancing the stability of locally adverse conditions. A stabilization fill is normally specified by minimum key width and depth and by maximum backcut angle. A stabilization fill may or may not have a back drainage system specified.

SUBDRAIN - Generally a pipe and gravel or similar drainage system placed beneath a fill in the alignment of canyons or former drainage channels.

SLOUGH - Loose, non-compacted fill material generated during grading operations.

TAILINGS – Non-engineered fill which accumulates on or adjacent to equipment haul-roads.

TERRACE - Relatively level step constructed in the face of graded slope surface for drainage control and maintenance purposes.

TOPSOIL - The presumable fertile upper zone of soil which is usually darker in color and loose.

WINDROW - A string of large rocks buried within engineered fill in accordance with guidelines set forth by the Geotechnical Consultant.

OBLIGATIONS OF PARTIES

The Geotechnical Consultant should provide observation and testing services and should make evaluations in order to advise the Client on geotechnical matters. The Geotechnical Consultant should report his findings and recommendations to the Client or his authorized representative.

The client should be chiefly responsible for all aspects of the project. He or his authorized representative has the responsibility of reviewing the findings and recommendations of the Geotechnical Consultant. He shall authorize or cause to have authorized the Contractor and/or other consultants to perform work and/or provide services. During grading the Client or his authorized representative should remain on-site or should remain reasonably accessible to all concerned parties in order to make decisions necessary to maintain the flow of the project.

The Contractor should be responsible for the safety of the project and satisfactory completion of all grading and other associated operations on construction projects, including but not limited to, earthwork in accordance with the project plans, specifications and controlling agency requirements. During grading, the Contractor or his authorized representative should remain on-site. Overnight and on days off, the Contractor should remain accessible.

SITE PREPARATION

The Client, prior to any site preparation or grading, should arrange and attend a meeting among the Grading Contractor, the Design Engineer, the Geotechnical Consultant, representatives of the appropriate governing authorities as well an any other concerned parties. All parties should be given at least 48 hours notice.

Clearing and grubbing should consist of the removal of vegetation such as brush, grass, woods, stumps, trees, roots of trees and otherwise deleterious natural materials from the areas to be graded. Clearing and grubbing should extend to the outside of all proposed excavation and fill areas.

Demolition should include removal of buildings, structures, foundations, reservoirs, utilities (including underground pipelines, septic tanks, leach fields, seepage pits, cisterns, mining shafts, tunnels, etc.) and other man-made surface and subsurface improvements from the areas to be graded. Demolition of utilities should include proper capping and/or re-routing pipelines at the project perimeter and cutoff and capping of wells in accordance with the requirements of the governing authorities and the recommendations of the Geotechnical Consultant at the time of demolition.

Trees, plants or man-made improvements not planned to be removed or demolished should be protected by the Contractor from damage or injury.

Debris generated during clearing, grubbing and/or demolition operations should be wasted from areas to be graded and disposed off-site. Clearing, grubbing and demolition operations should be performed under the observation of the Geotechnical Consultant.

The Client or Contractor should obtain the required approvals from the controlling authorities for the project prior, during and/or after demolition, site preparation and removals, etc. The appropriate approvals should be obtained prior to proceeding with grading operations.

SITE PROTECTION

Protection of the site during the period of grading should be the responsibility of the Contractor. Unless other provisions are made in writing and agreed upon among the concerned parties, completion of a portion of the project should not be considered to preclude that portion or adjacent areas from the requirements for site protection until such time as the entire project is complete as identified by the Geotechnical Consultant, the Client and the regulating agencies.

The Contractor should be responsible for the stability of all temporary excavations. Recommendations by the Geotechnical Consultant pertaining to temporary excavations (e.g., backcuts) are made in consideration of stability of the completed project and, therefore, should not be considered to preclude the responsibilities of the Contractor. Recommendations by the Geotechnical Consultant should not be considered to preclude more restrictive requirements by the regulating agencies.

Precautions should be taken during the performance of site clearing, excavations and grading to protect the work site from flooding, ponding, or inundation by poor or improper surface drainage. Temporary provisions should be made during the rainy season to adequately direct surface drainage away from and off the work site. Where low areas can not be avoided, pumps should be kept on hand to continually remove water during periods of rainfall.

During periods of rainfall, plastic sheeting should be kept reasonably accessible to prevent unprotected slopes from becoming saturated. Where necessary during periods of rainfall, the Contractor should install check dams, desilting basins, riprap, sand bags or other devices or methods necessary to control erosion and provide safe conditions.

During periods of rainfall, the Geotechnical Consultant should be kept informed by the Contractor as to the nature of remedial or preventative work being performed (e.g., pumping, placement of sandbags or plastic sheeting, other labor, dozing, etc.).

Following periods of rainfall, the Contractor should contact the Geotechnical Consultant and arrange a walk-over of the site in order to visually assess rain related damage. The Geotechnical Consultant may also recommend excavations and testing in order to aid in his assessments. At the request of the Geotechnical Consultant, the Contractor shall make excavations in order to evaluate the extent of rain related damage.

Rain related damage should be considered to include, but may not be limited to, erosion, silting, saturation, swelling, structural distress and other adverse conditions identified by the Geotechnical Consultant. Soil adversely affected should be classified as Unsuitable Materials and should be subject to over-excavation and replacement with compacted fill or other remedial grading as recommended by the Geotechnical Consultant.

Relatively level areas, where saturated soils and/or erosion gullies exist to depths of greater than 1-foot, should be over-excavated to unaffected, competent material. Where less than 1-foot in depth, unsuitable materials may be processed in-place to achieve near optimum moisture conditions, then thoroughly recompacted in accordance with the applicable specifications. If the desired results are not achieved, the affected materials should be over-excavated, then replaced in accordance with the applicable specifications.

In slope areas, where saturated soil and/or erosion gullies exist to depths of greater than 1 foot, they should be over-excavated and replaced as compacted fill in accordance with the applicable specifications. Where affected materials exist to depths of 1 foot or less below proposed finished grade, remedial grading by moisture conditioning in-place, followed by thorough recompaction in accordance with the applicable grading guidelines herein may be attempted. If the desired results are not achieved, all affected materials should be over-excavated and replaced as compacted fill in accordance with the slope repair recommendations herein. As field conditions dictate, other slope repair procedures may be recommended by the Geotechnical Consultant.

EXCAVATIONS

Unsuitable Materials

Materials which are unsuitable should be excavated under observation and recommendations of the Geotechnical Consultant. Unsuitable materials include, but may not be limited to, dry, loose, soft, wet, organic compressible natural soils and fractured, weathered, soft bedrock and non-engineered or otherwise deleterious fill materials.

Material identified by the Geotechnical Consultant as unsatisfactory due to its moisture conditions should be over-excavated, watered or dried, as needed, and thoroughly blended to a uniform near optimum moisture condition (per Moisture guidelines presented herein) prior to placement as compacted fill.

Cut Slopes

Unless otherwise recommended by the Geotechnical Consultant and approved by the regulating agencies, permanent cut slopes should not be steeper than 2:1 (horizontal:vertical).

If excavations for cut slopes expose loose, cohesionless, significantly fractured or otherwise unsuitable material, over-excavation and replacement of the unsuitable materials with a compacted stabilization fill should be accomplished as recommended by the Geotechnical Consultant. Unless otherwise specified by the Geotechnical Consultant, stabilization fill construction should conform to the requirements of the Standard Details.

The Geotechnical Consultant should review cut slopes during excavation. The Geotechnical Consultant should be notified by the contractor prior to beginning slope excavations.

If, during the course of grading, adverse or potentially adverse geotechnical conditions are encountered which were not anticipated in the preliminary report, the Geotechnical Consultant should explore, analyze and make recommendations to treat these problems.

When cut slopes are made in the direction of the prevailing drainage, a non-erodible diversion swale (brow ditch) should be provided at the top-of-cut.

Pad Areas

All lot pad areas, including side yard terraces, above stabilization fills or buttresses should be over-excavated to provide for a minimum of 3-feet (refer to Standard Details) of compacted fill over the entire pad area. Pad areas with both fill and cut materials exposed and pad areas containing both very shallow (less than 3-feet) and deeper fill should be over-excavated to provide for a uniform compacted fill blanket with a minimum of 3-feet in thickness (refer to Standard Details).

Cut areas exposing significantly varying material types should also be over-excavated to provide for at least a 3-foot thick compacted fill blanket. Geotechnical conditions may require greater depth of over-excavation. The actual depth should be delineated by the Geotechnical Consultant during grading.

For pad areas created above cut or natural slopes, positive drainage should be established away from the top-of-slope. This may be accomplished utilizing a berm and/or an appropriate pad gradient. A gradient in soil areas away from the top-of-slopes of 2 percent or greater is recommended.

COMPACTED FILL

All fill materials should be compacted as specified below or by other methods specifically recommended by the Geotechnical Consultant. Unless otherwise specified, the minimum degree of compaction (relative compaction) should be 90 percent of the laboratory maximum density.

Placement

Prior to placement of compacted fill, the Contractor should request a review by the Geotechnical Consultant of the exposed ground surface. Unless otherwise recommended, the exposed ground surface should then be scarified (6-inches minimum), watered or dried as needed, thoroughly blended to achieve near optimum moisture conditions, then thoroughly compacted to a minimum of 90 percent of the maximum density. The review by the Geotechnical Consultant should not be considered to preclude requirements of inspection and approval by the governing agency.

Compacted fill should be placed in thin horizontal lifts not exceeding 8-inches in loose thickness prior to compaction. Each lift should be watered or dried as needed, thoroughly blended to achieve near optimum moisture conditions then thoroughly compacted by mechanical methods to a minimum of 90 percent of laboratory maximum dry density. Each lift should be treated in a like manner until the desired finished grades are achieved.

The Contractor should have suitable and sufficient mechanical compaction equipment and watering apparatus on the job site to handle the amount of fill being placed in consideration of moisture retention properties of the materials. If necessary, excavation equipment should be "shut down" temporarily in order to permit proper compaction of fills. Earth moving equipment should only be considered a supplement and not substituted for conventional compaction equipment.

When placing fill in horizontal lifts adjacent to areas sloping steeper than 5:1 (horizontal:vertical), horizontal keys and vertical benches should be excavated into the adjacent slope area. Keying and benching should be sufficient to provide at least 6-foot wide benches and minimum of 4-feet of vertical bench height within the firm natural ground, firm bedrock or engineered compacted fill. No compacted fill should be placed in an area subsequent to keying and benching until the area has been reviewed by the Geotechnical Consultant.

Material generated by the benching operation should be moved sufficiently away from the bench area to allow for the recommended review of the horizontal bench prior to placement of fill. Typical keying and benching details have been included within the accompanying Standard Details.

Within a single fill area where grading procedures dictate two or more separate fills, temporary slopes (false slopes) may be created. When placing fill adjacent to a false slope, benching should be conducted in the same manner as above described. At least a 3-foot vertical bench should be established within the firm core of adjacent approved compacted fill prior to placement of additional fill. Benching should proceed in at least 3-foot vertical increments until the desired finished grades are achieved.

Fill should be tested for compliance with the recommended relative compaction and moisture conditions. Field density testing should conform to ASTM Method of Test D 1556-07, and/or D 6938-10. Tests should be provided for about every 2 vertical feet or 1,000 cubic yards of fill placed. Actual test intervals may vary as field conditions dictate. Fill found not to be in conformance with the grading recommendations should be removed or otherwise handled as recommended by the Geotechnical Consultant.

The Contractor should assist the Geotechnical Consultant and/or his representative by digging test pits for removal determinations and/or for testing compacted fill.

As recommended by the Geotechnical Consultant, the Contractor should "shut down" or remove grading equipment from an area being tested.

The Geotechnical Consultant should maintain a plan with estimated locations of field tests. Unless the client provides for actual surveying of test locations, the estimated locations by the Geotechnical Consultant should only be considered rough estimates and should not be utilized for the purpose of preparing cross sections showing test locations or in any case for the purpose of after-the-fact evaluating of the sequence of fill placement.

Moisture

For field testing purposes, "near optimum" moisture will vary with material type and other factors including compaction procedures. "Near optimum" may be specifically recommended in Preliminary Investigation Reports and/or may be evaluated during grading.

Prior to placement of additional compacted fill following an overnight or other grading delay, the exposed surface or previously compacted fill should be processed by scarification, watered or dried as needed, thoroughly blended to near-optimum moisture conditions, then recompacted to a minimum of 90 percent of laboratory maximum dry density. Where wet or other dry or other unsuitable materials exist to depths of greater than 1 foot, the unsuitable materials should be over-excavated.

Following a period of flooding, rainfall or overwatering by other means, no additional fill should be placed until damage assessments have been made and remedial grading performed as described herein.

Fill Material

Excavated on-site materials which are acceptable to the Geotechnical Consultant may be utilized as compacted fill, provided trash, vegetation and other deleterious materials are removed prior to placement.

Where import materials are required for use on-site, the Geotechnical Consultant should be notified at least 72 hours in advance of importing, in order to sample and test materials from proposed borrow sites. No import materials should be delivered for use on-site without prior sampling and testing by Geotechnical Consultant.

Where oversized rock or similar irreducible material is generated during grading, it is recommended, where practical, to waste such material off-site or on-site in areas designated as "nonstructural rock disposal areas". Rock placed in disposal areas should be placed with sufficient fines to fill voids. The rock should be compacted in lifts to an unyielding condition. The disposal area should be covered with at least 3 feet of compacted fill which is free of oversized material. The upper 3 feet should be placed in accordance with the guidelines for compacted fill herein.

Rocks 8 inches in maximum dimension and smaller may be utilized within the compacted fill, provided they are placed in such a manner that nesting of the rock is avoided. Fill should be placed and thoroughly compacted over and around all rock. The amount of rock should not exceed 40 percent by dry weight passing the $^{3}/_{4}$-inch sieve size. The 12-inch and 40 percent recommendations herein may vary as field conditions dictate.

During the course of grading operations, rocks or similar irreducible materials greater than 8-inches maximum dimension (oversized material) may be generated. These rocks should not be placed within the compacted fill unless placed as recommended by the Geotechnical Consultant.

Where rocks or similar irreducible materials of greater than 8 inches but less than 4 feet of maximum dimension are generated during grading, or otherwise desired to be placed within an engineered fill, special handling in accordance with the accompanying Standard Details is recommended. Rocks greater than 4 feet should be broken down or disposed off-site. Rocks up to 4 feet maximum dimension should be placed below the upper 10 feet of any fill and should not be closer than 20-feet to any slope face. These recommendations could vary as locations of improvements dictate. Where practical, oversized material should not be placed below areas where structures or deep utilities are proposed.

Oversized material should be placed in windrows on a clean, over-excavated or unyielding compacted fill or firm natural ground surface. Select native or imported granular soil (S.E. 30 or higher) should be placed and thoroughly flooded over and around all windrowed rock, such that voids are filled. Windrows of oversized material should be staggered so that successive strata of oversized material are not in the same vertical plane.

It may be possible to dispose of individual larger rock as field conditions dictate and as recommended by the Geotechnical Consultant at the time of placement. Material that is considered unsuitable by the Geotechnical Consultant should not be utilized in the compacted fill.

During grading operations, placing and mixing the materials from the cut and/or borrow areas may result in soil mixtures which possess unique physical properties. Testing may be required of samples obtained directly from the fill areas in order to verify conformance with the specifications. Processing of these additional samples may take two or more working days. The Contractor may elect to move the operation to other areas within the project, or may continue placing compacted fill pending laboratory and field test results. Should he elect the second alternative, fill placed is done so at the Contractor's risk.

Any fill placed in areas not previously reviewed and evaluated by the Geotechnical Consultant, and/or in other areas, without prior notification to the Geotechnical Consultant may require removal and recompaction at the Contractor's expense. Determination of over-excavations should be made upon review of field conditions by the Geotechnical Consultant.

Fill Slopes

Unless otherwise recommended by the Geotechnical Consultant and approved by the regulating agencies, permanent fill slopes should not be steeper than 2:1 (horizontal to vertical).

Except as specifically recommended otherwise or as otherwise provided for in these grading guidelines (Reference Fill Materials), compacted fill slopes should be overbuilt and cut back to grade, exposing the firm, compacted fill inner core. The actual amount of overbuilding may vary as field conditions dictate. If the desired results are not achieved, the existing slopes should be over-excavated and reconstructed under the guidelines of the Geotechnical Consultant. The degree of overbuilding shall be increased until the desired compacted slope surface condition is achieved. Care should be taken by the Contractor to provide thorough mechanical compaction to the outer edge of the overbuilt slope surface.

Although no construction procedure produces a slope free from risk of future movement, overfilling and cutting back of slope to a compacted inner core is, given no other constraints, the most desirable procedure. Other constraints, however, must often be considered. These constraints may include property line situations, access, the critical nature of the development and cost. Where such constraints are identified, slope face compaction may be attempted by conventional construction procedures including back rolling techniques upon specific recommendation by the Geotechnical Consultant.

As a second-best alternative for slopes of 2:1 (horizontal to vertical) or flatter, slope construction may be attempted as outlined herein. Fill placement should proceed in thin lifts, (i.e., 6 to 8-inch loose thickness). Each lift should be moisture conditioned and thoroughly compacted. The desired moisture condition should be maintained and/or reestablished, where necessary, during the period between successive lifts. Selected lifts should be tested to ascertain that desired compaction is being achieved. Care should be taken to extend compactive effort to the outer edge of the slope. Each lift should extend horizontally to the desired finished slope surface or more as needed to ultimately establish desired grades. Grade during construction should not be allowed to roll off at the edge of the slope. It may be helpful to elevate slightly the outer edge of the slope.

Slough resulting from the placement of individual lifts should not be allowed to drift down over previous lifts. At intervals not exceeding 4 feet in vertical slope height or the capability of available equipment, whichever is less, fill slopes should be thoroughly backrolled utilizing a conventional sheeps foot-type roller. Care should be taken to maintain the desired moisture conditions and/or reestablishing same as needed prior to backrolling. Upon achieving final grade, the slopes should again be moisture conditioned and thoroughly backrolled. The use of a side-boom roller will probably be necessary and vibratory methods are strongly recommended. Without delay, so as to avoid (if possible) further moisture conditioning, the slopes should then be grid-rolled to achieve a relatively smooth surface and uniformly compact condition.

In order to monitor slope construction procedures, moisture and density tests will be taken at regular intervals. Failure to achieve the desired results will likely result in a recommendation by the Geotechnical Consultant to over-excavate the slope surfaces followed by reconstruction of the slopes utilizing overfilling and cutting back procedures and/or further attempt at the conventional backrolling approach. Other recommendations may also be provided which would be commensurate with field conditions.

Where placement of fill above a natural slope or above a cut slope is proposed, the fill slope configuration as presented in the accompanying Standard Details should be adopted.

For pad areas above fill slopes, positive drainage should be established away from the top-of-slope. This may be accomplished utilizing a berm and pad gradients of at least 2 percent in soil areas.

<u>Off-Site Fill</u>

Off-site fill should be treated in the same manner as recommended in these specifications for site preparation, excavation, drains, compaction, etc.

Off-site canyon fill should be placed in preparation for future additional fill, as shown in the accompanying Standard Details.

Off-site fill subdrains temporarily terminated (up canyon) should be surveyed for future relocation and connection.

DRAINAGE

Canyon subdrain systems specified by the Geotechnical Consultant should be installed in accordance with the Standard Details.

Typical subdrains for compacted fill buttresses, slope stabilization or sidehill masses, should be installed in accordance with the specifications of the accompanying Standard Details.

Roof, pad and slope drainage should be directed away from slopes and areas of structures to suitable disposal areas via non-erodible devices (i.e., gutters, downspouts, concrete swales).

For drainage over soil areas immediately away from structures (i.e., within 4 feet), a minimum of 4 percent gradient should be maintained. Pad drainage of at least 2 percent should be maintained over soil areas. Pad drainage may be reduced to at least 1 percent for projects where no slopes exist, either natural or man-made, or greater than 10-feet in height and where no slopes are planned, either natural or man-made, steeper than 2:1 (horizontal to vertical slope ratio).

Drainage patterns established at the time of fine grading should be maintained throughout the life of the project. Property owners should be made aware that altering drainage patterns can be detrimental to slope stability and foundation performance.

STAKING

In all fill areas, the fill should be compacted prior to the placement of the stakes. This particularly is important on fill slopes. Slope stakes should not be placed until the slope is thoroughly compacted (backrolled). If stakes must be placed prior to the completion of compaction procedures, it must be recognized that they will be removed and/or demolished at such time as compaction procedures resume.

In order to allow for remedial grading operations, which could include over-excavations or slope stabilization, appropriate staking offsets should be provided. For finished slope and stabilization backcut areas, we recommend at least a 10-feet setback from proposed toes and tops-of-cut.

SLOPE MAINTENANCE

Landscape Plants

In order to enhance surficial slope stability, slope planting should be accomplished at the completion of grading. Slope planting should consist of deep-rooting vegetation requiring little watering. Plants native to the southern California area and plants relative to native plants are generally desirable. Plants native to other semi-arid and arid areas may also be appropriate. A Landscape Architect would be the best party to consult regarding actual types of plants and planting configuration.

Irrigation

Irrigation pipes should be anchored to slope faces, not placed in trenches excavated into slope faces.

Slope irrigation should be minimized. If automatic timing devices are utilized on irrigation systems, provisions should be made for interrupting normal irrigation during periods of rainfall.

Though not a requirement, consideration should be given to the installation of near-surface moisture monitoring control devices. Such devices can aid in the maintenance of relatively uniform and reasonably constant moisture conditions.

Property owners should be made aware that overwatering of slopes is detrimental to slope stability.

Maintenance

Periodic inspections of landscaped slope areas should be planned and appropriate measures should be taken to control weeds and enhance growth of the landscape plants. Some areas may require occasional replanting and/or reseeding.

Terrace drains and down drains should be periodically inspected and maintained free of debris. Damage to drainage improvements should be repaired immediately.

Property owners should be made aware that burrowing animals can be detrimental to slope stability. A preventative program should be established to control burrowing animals.

As a precautionary measure, plastic sheeting should be readily available, or kept on hand, to protect all slope areas from saturation by periods of heavy or prolonged rainfall. This measure is strongly recommended, beginning with the period of time prior to landscape planting.

Repairs

If slope failures occur, the Geotechnical Consultant should be contacted for a field review of site conditions and development of recommendations for evaluation and repair.

If slope failures occur as a result of exposure to periods of heavy rainfall, the failure area and currently unaffected areas should be covered with plastic sheeting to protect against additional saturation.

In the accompanying Standard Details, appropriate repair procedures are illustrated for superficial slope failures (i.e., occurring typically within the outer 1 foot to 3 feet of a slope face).

TRENCH BACKFILL

Utility trench backfill should, unless otherwise recommended, be compacted by mechanical means. Unless otherwise recommended, the degree of compaction should be a minimum of 90 percent of the laboratory maximum density.

Backfill of exterior and interior trenches extending below a 1:1 projection from the outer edge of foundations should be mechanically compacted to a minimum of 90 percent of the laboratory maximum density.

In cases where clean granular materials are proposed for use in lieu of native materials or where flooding or jetting is proposed, the procedures should be considered subject to review by the Geotechnical Consultant.

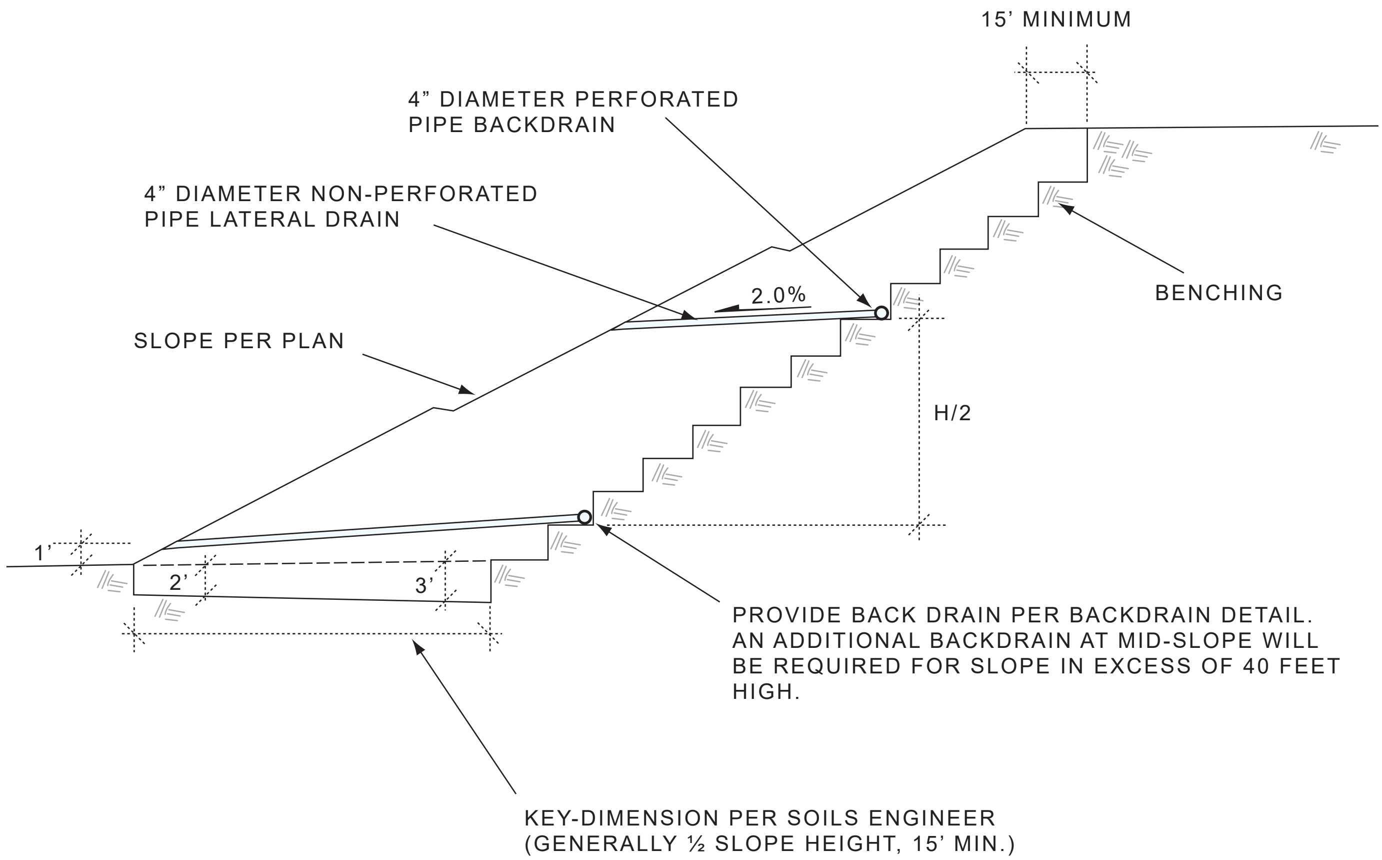
Clean Granular backfill and/or bedding are not recommended in slope areas unless provisions are made for a drainage system to mitigate the potential build-up of seepage forces.

STATUS OF GRADING

Prior of proceeding with any grading operation, the Geotechnical Consultant should be notified at least two working days in advance in order to schedule the necessary observation and testing services.

Prior to any significant expansion or cut back in the grading operation, the Geotechnical Consultant should be provided with adequate notice (i.e., two days) in order to make appropriate adjustments in observation and testing services.

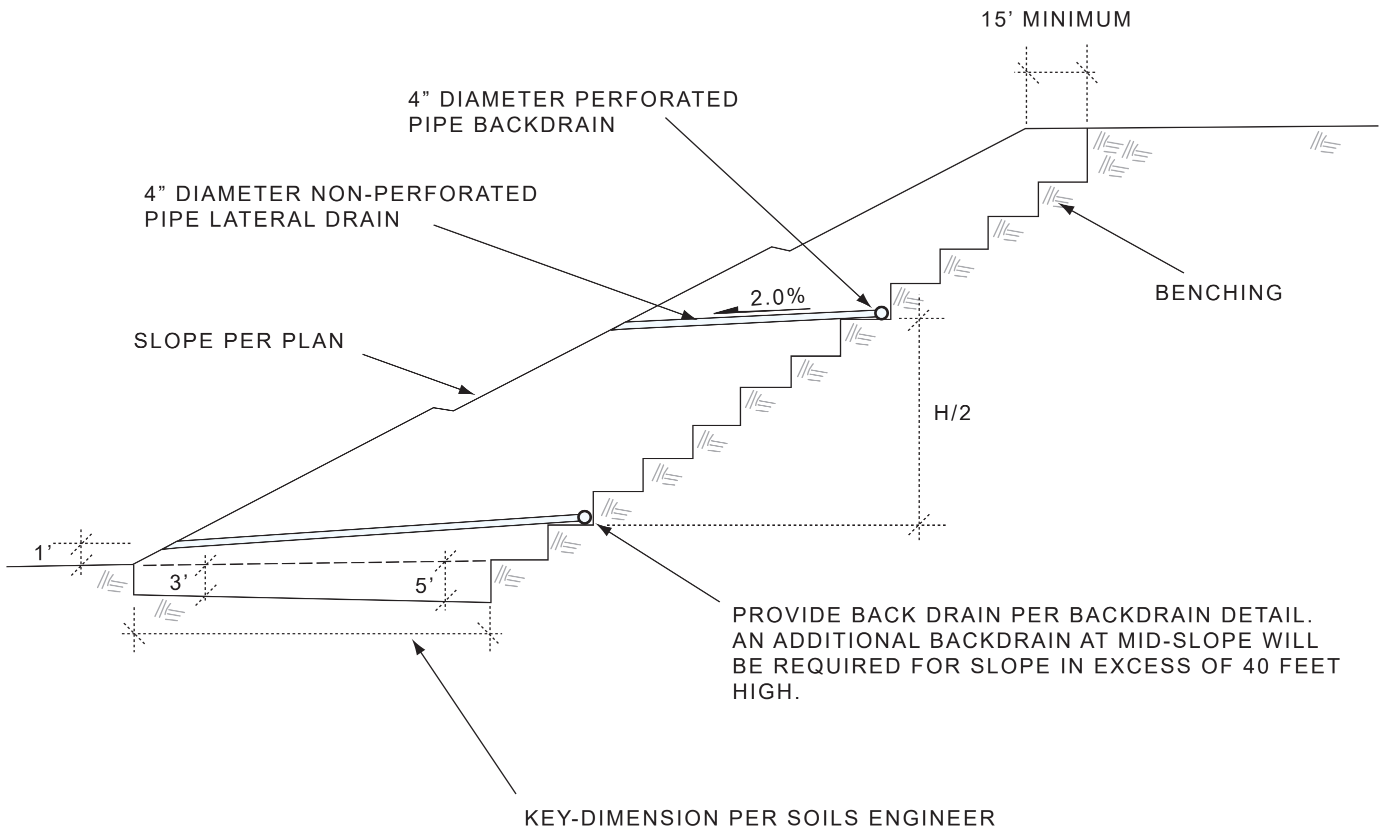
Following completion of grading operations and/or between phases of a grading operation, the Geotechnical Consultant should be provided with at least two working days notice in advance of commencement of additional grading operations.



TYPICAL STABILIZATION FILL DETAIL

NOT TO SCALE

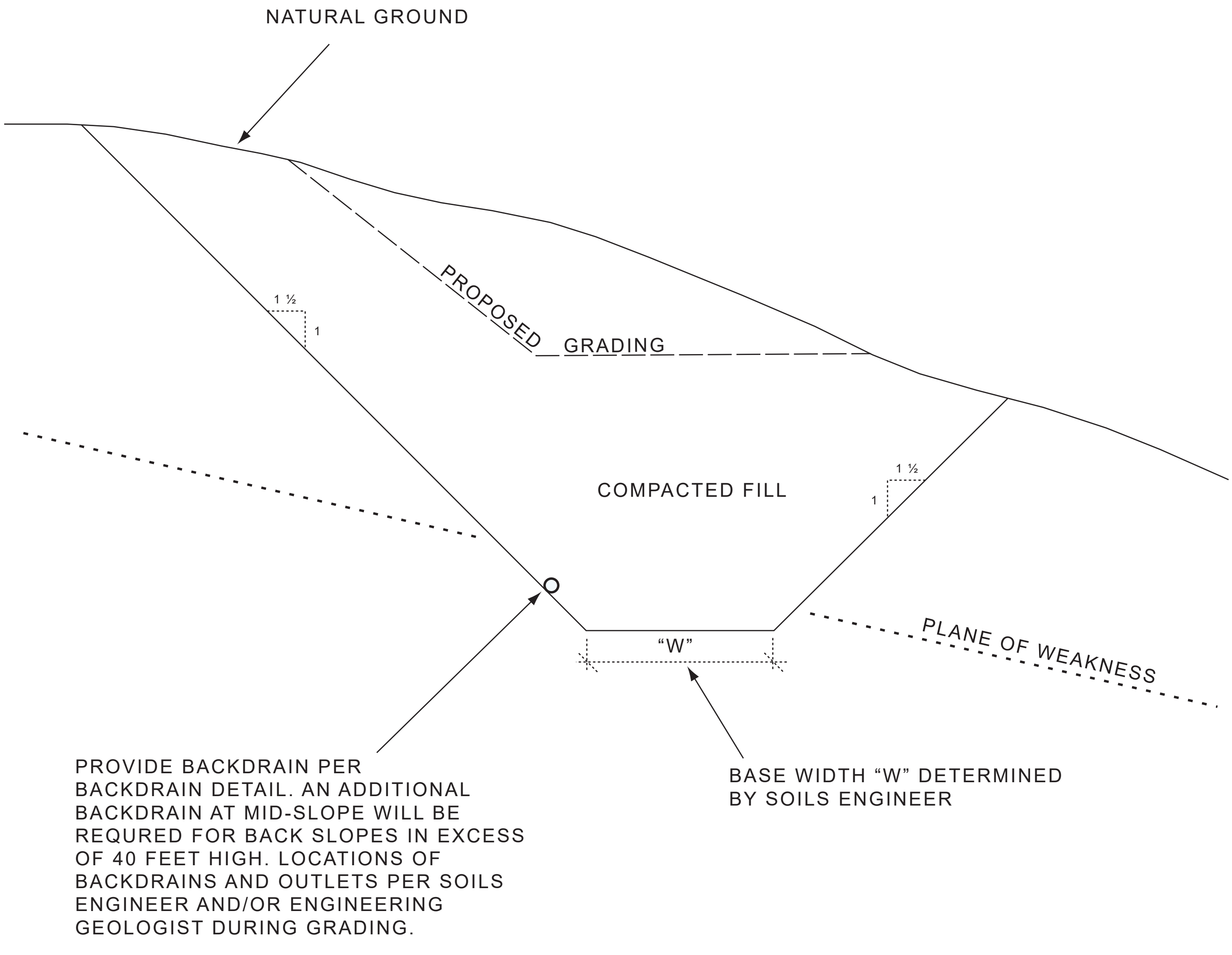
FIGURE 1



TYPICAL BUTTRESS FILL DETAIL

NOT TO SCALE

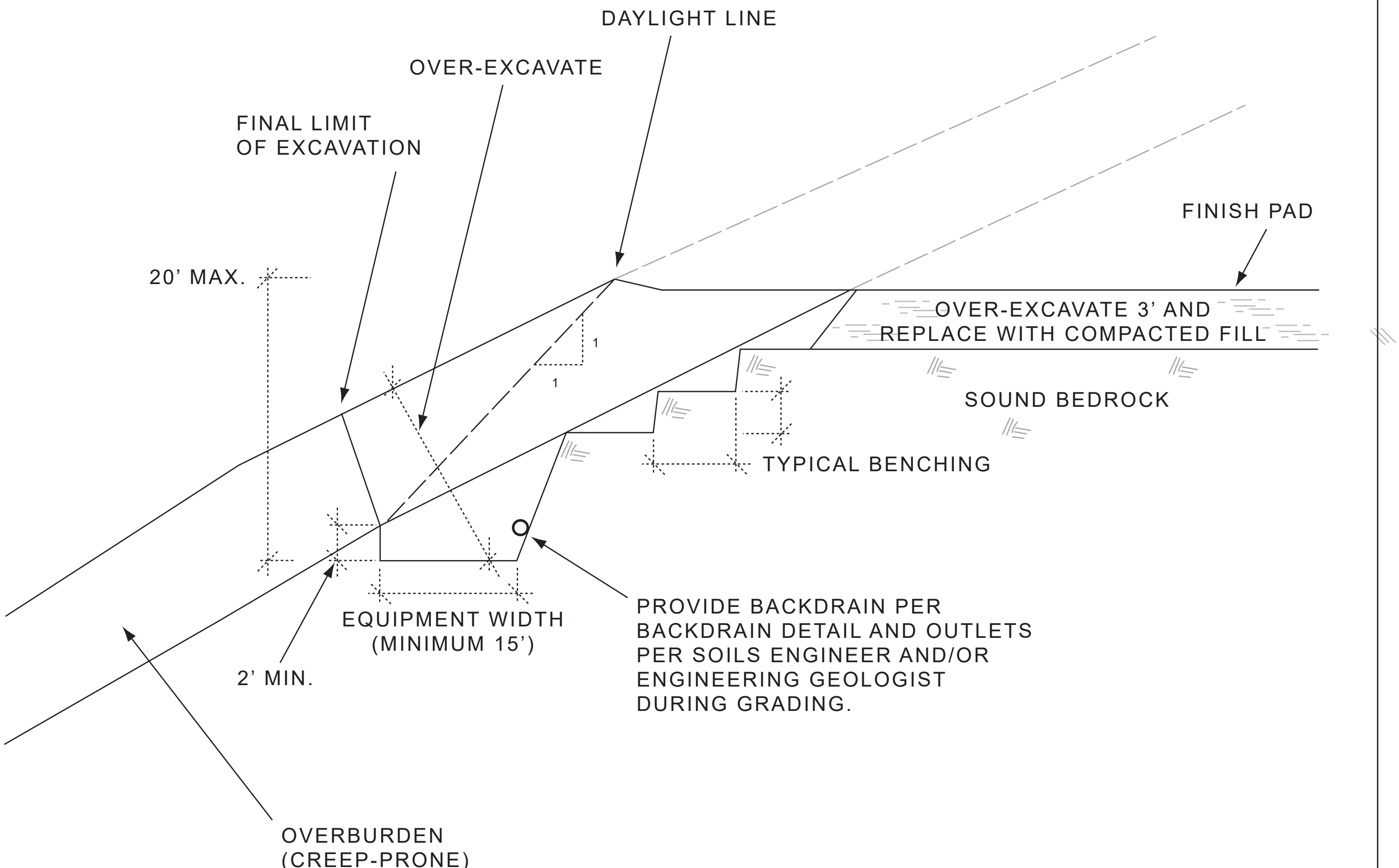
FIGURE 2



TYPICAL SHEAR KEY DETAIL

NOT TO SCALE

FIGURE 3

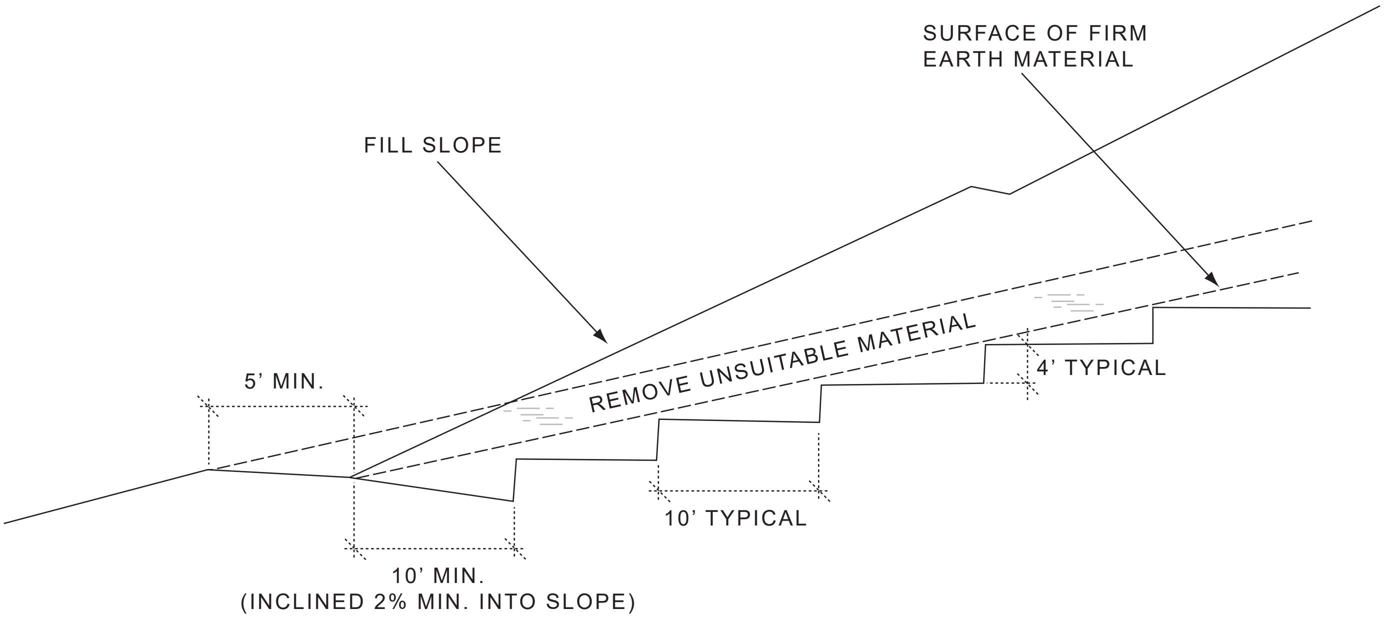


DAYLIGHT SHEAR KEY DETAIL

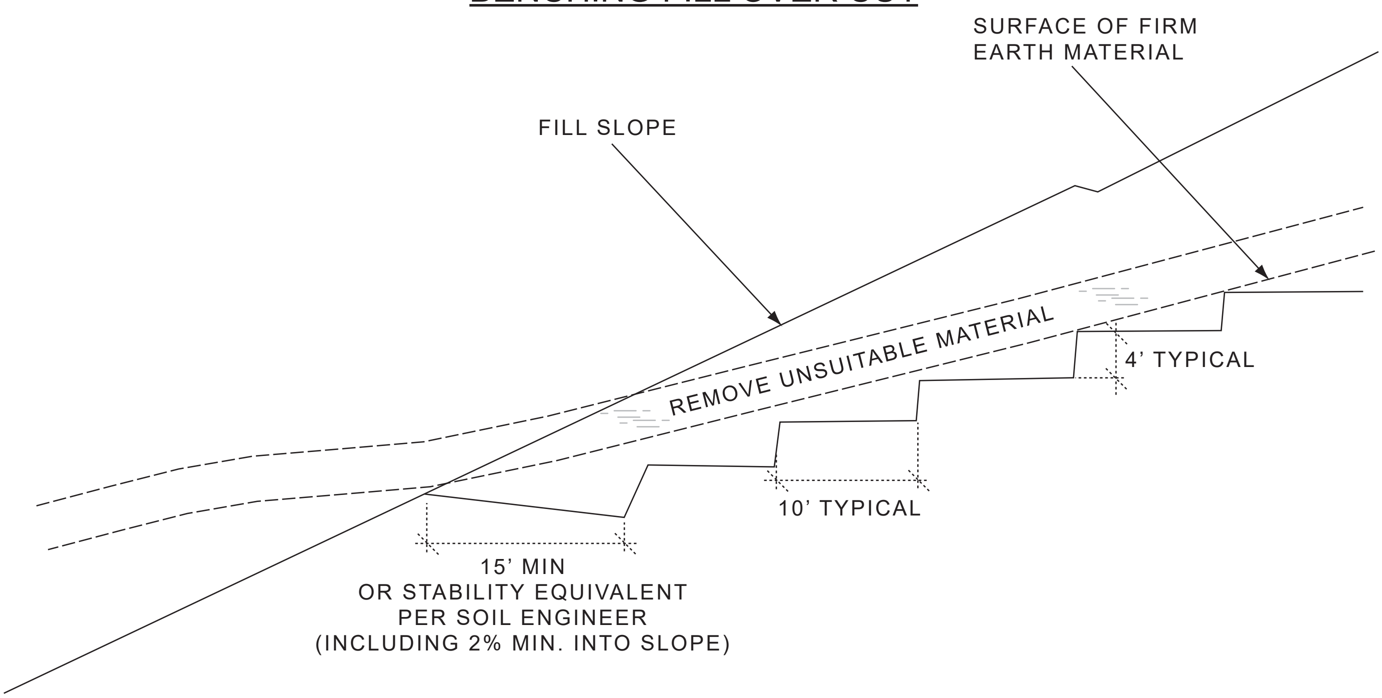
NOT TO SCALE

FIGURE 4

BENCHING FILL OVER NATURAL



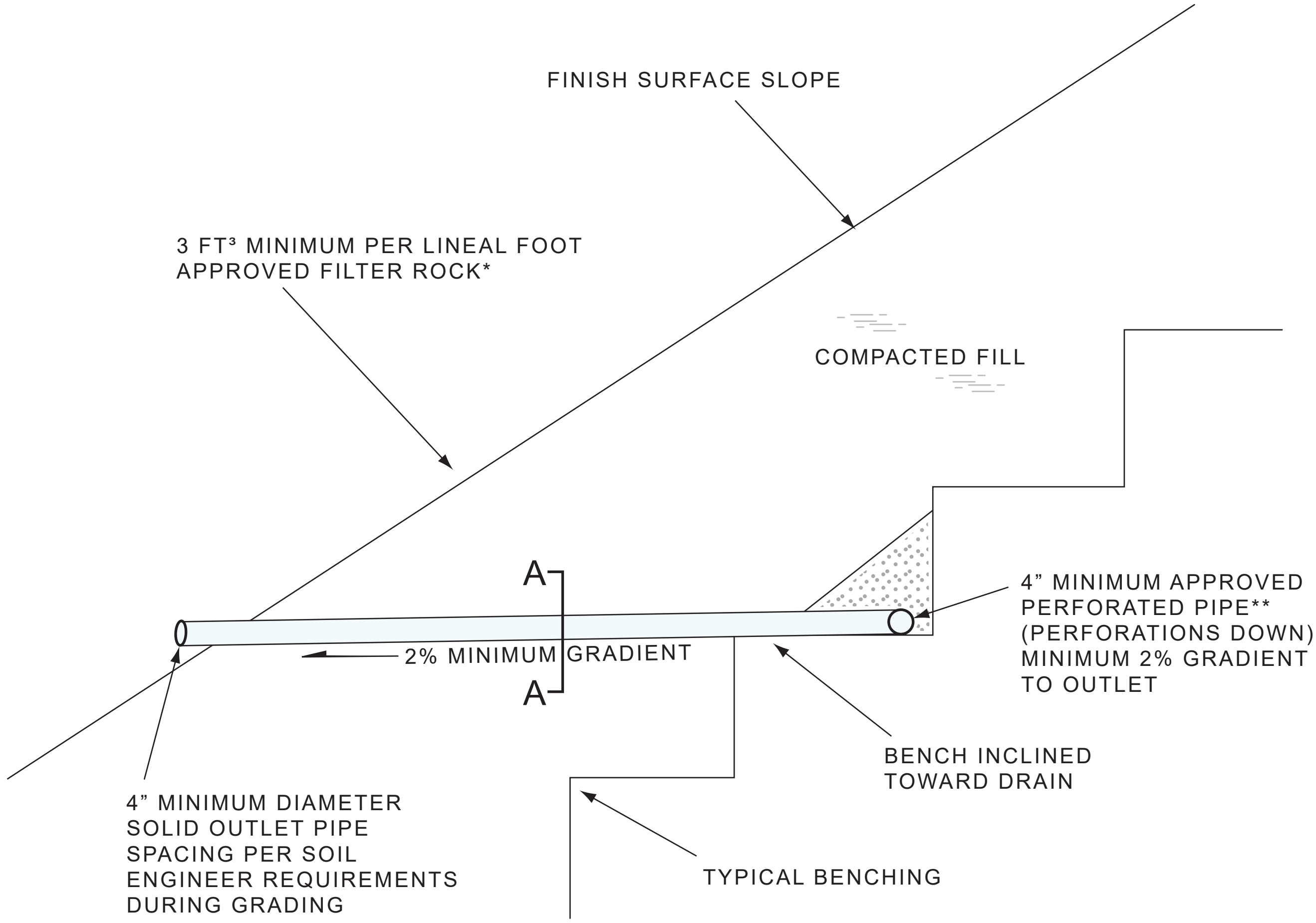
BENCHING FILL OVER CUT



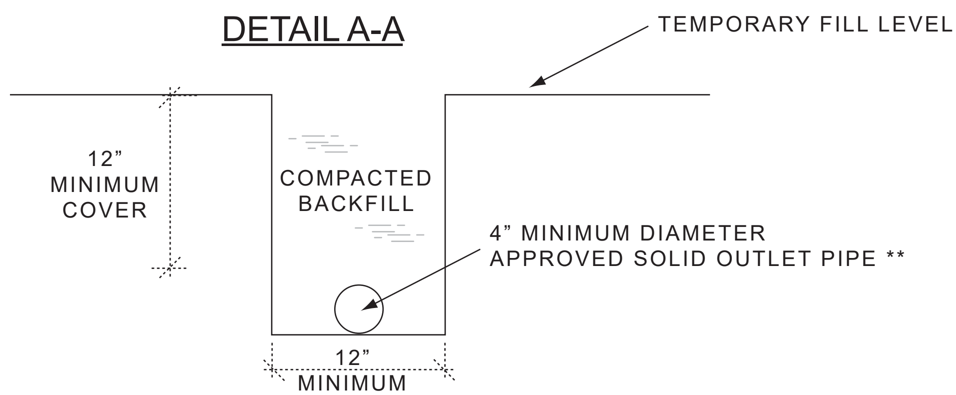
BENCHING FOR COMPACTED FILL DETAIL

NOT TO SCALE

FIGURE 5



DETAIL A-A



* Filter rock to meet following specifications or approved equal.

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

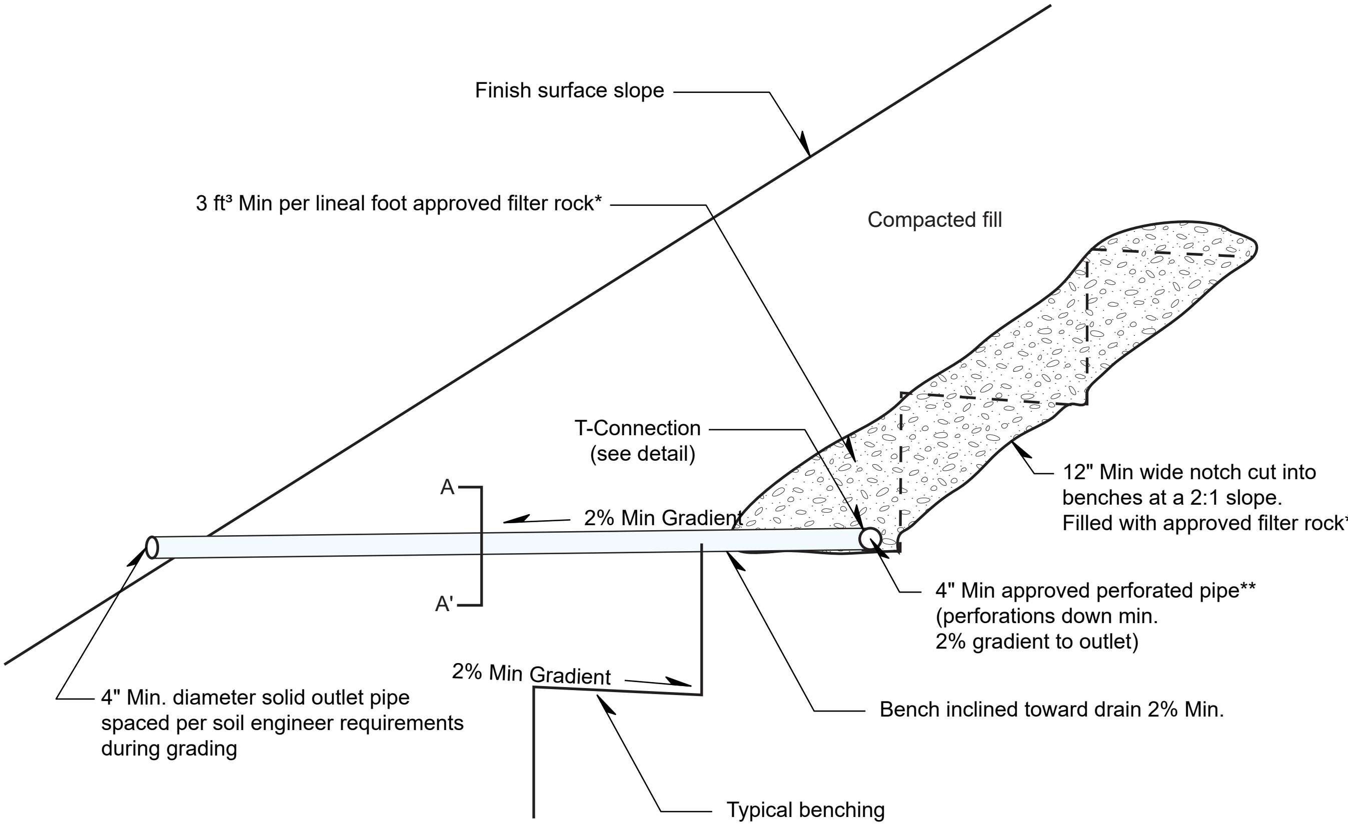
** APPROVED PIPE TYPE

Schedule 40 polyvinyl chloride (P.V.C.) or approved equal.
Min. crush strength 1000 PSI.

TYPICAL BACKDRAIN DETAIL

NOT TO SCALE

FIGURE 6



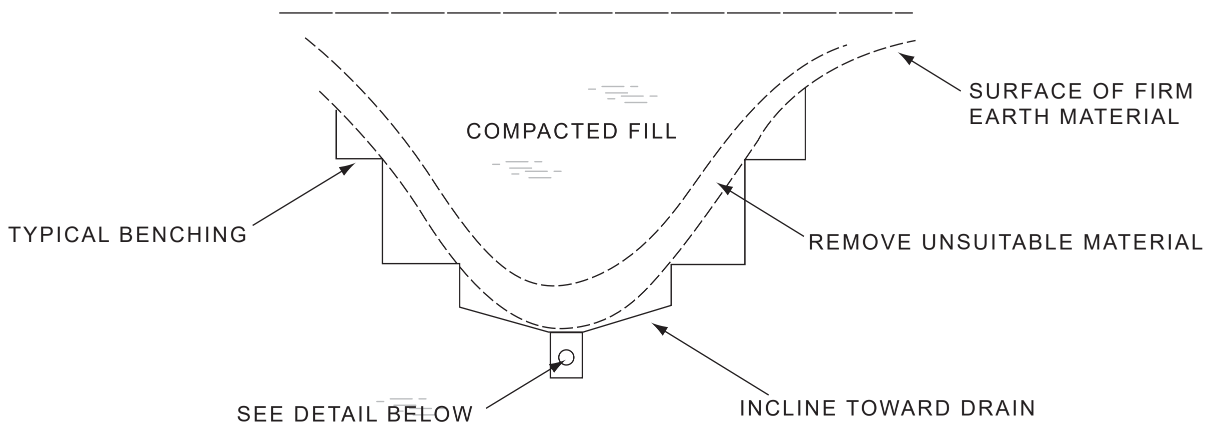
* Filter rock to meet following specifications or approved equal.

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

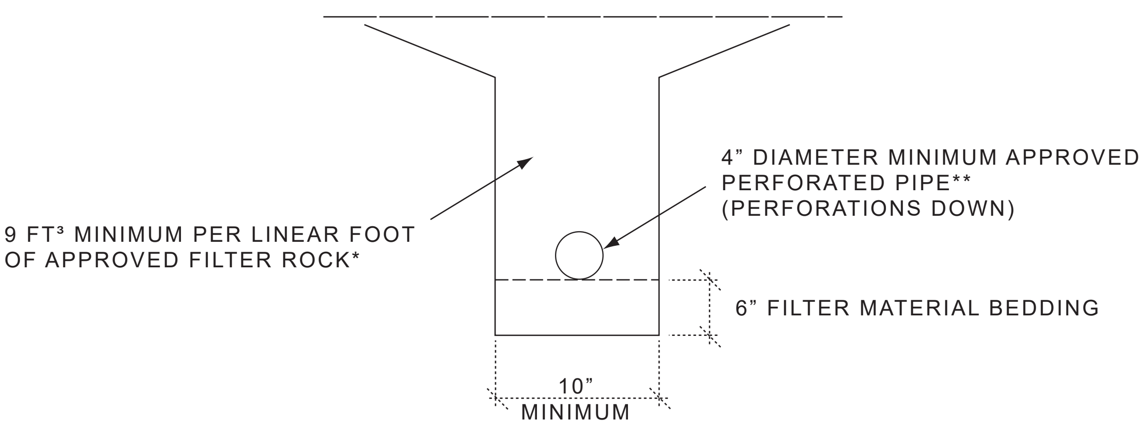
** Approved pipe type:
Schedule 40 polyvinyl chloride (P.V.C.) or approved equal.
Min. crush strength 1000 PSI.

BACKDRAIN DETAIL (GEOFABRIC)

FIGURE 7



DETAIL



* Filter rock to meet following specifications or approved equal.

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

** APPROVED PIPE TYPE

Schedule 40 polyvinyl chloride (P.V.C.) or approved equal.
Min. crush strength 1000 PSI.

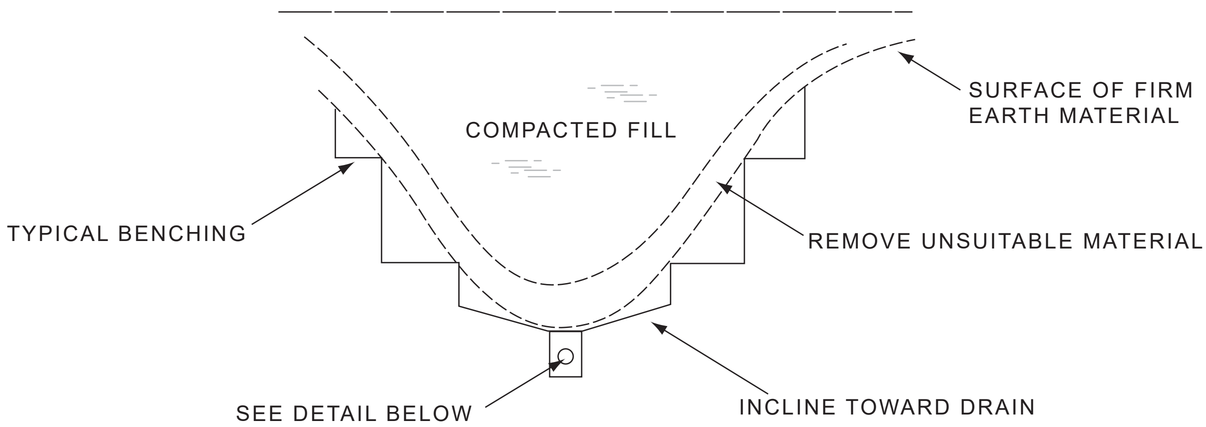
Pipe diameter to meet hte following criteria. Subject to field review based on actual geotechnical conditions encountered during grading.

Length of Run	Pipe Diameter
Upper 500’	4”
Next 1000’	6”
>1500’	8”

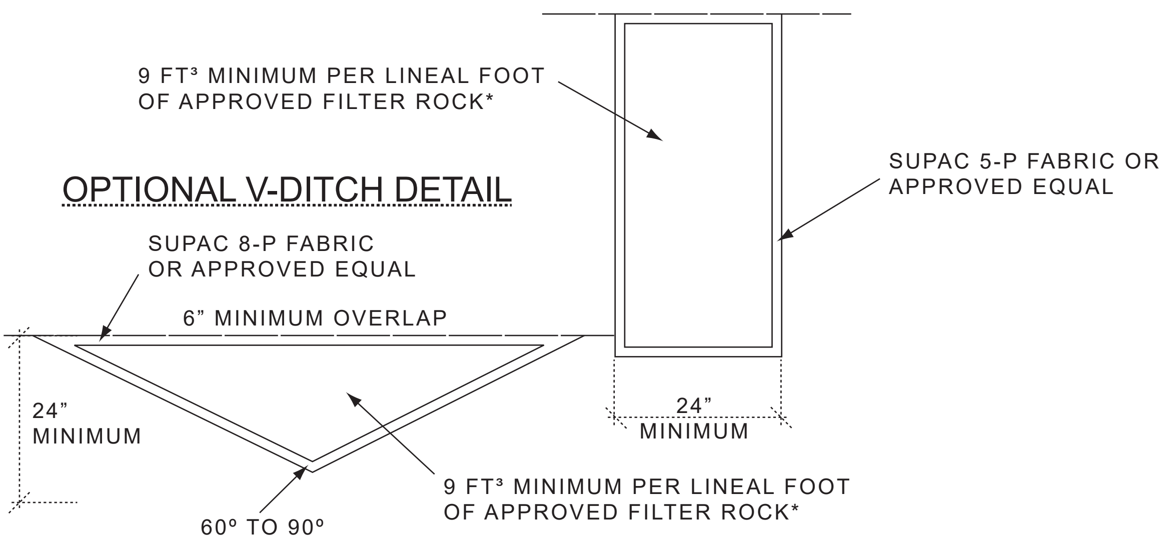
TYPICAL CANYON SUBDRAIN DETAIL

NOT TO SCALE

FIGURE 8



TRENCH DETAIL



* Drainage material to meet following specifications or approved equal.

Sieve	% Passing
1 ½"	88-100
1"	5-40
3/4"	0-17
3/8”	0-7
No.200	0-3

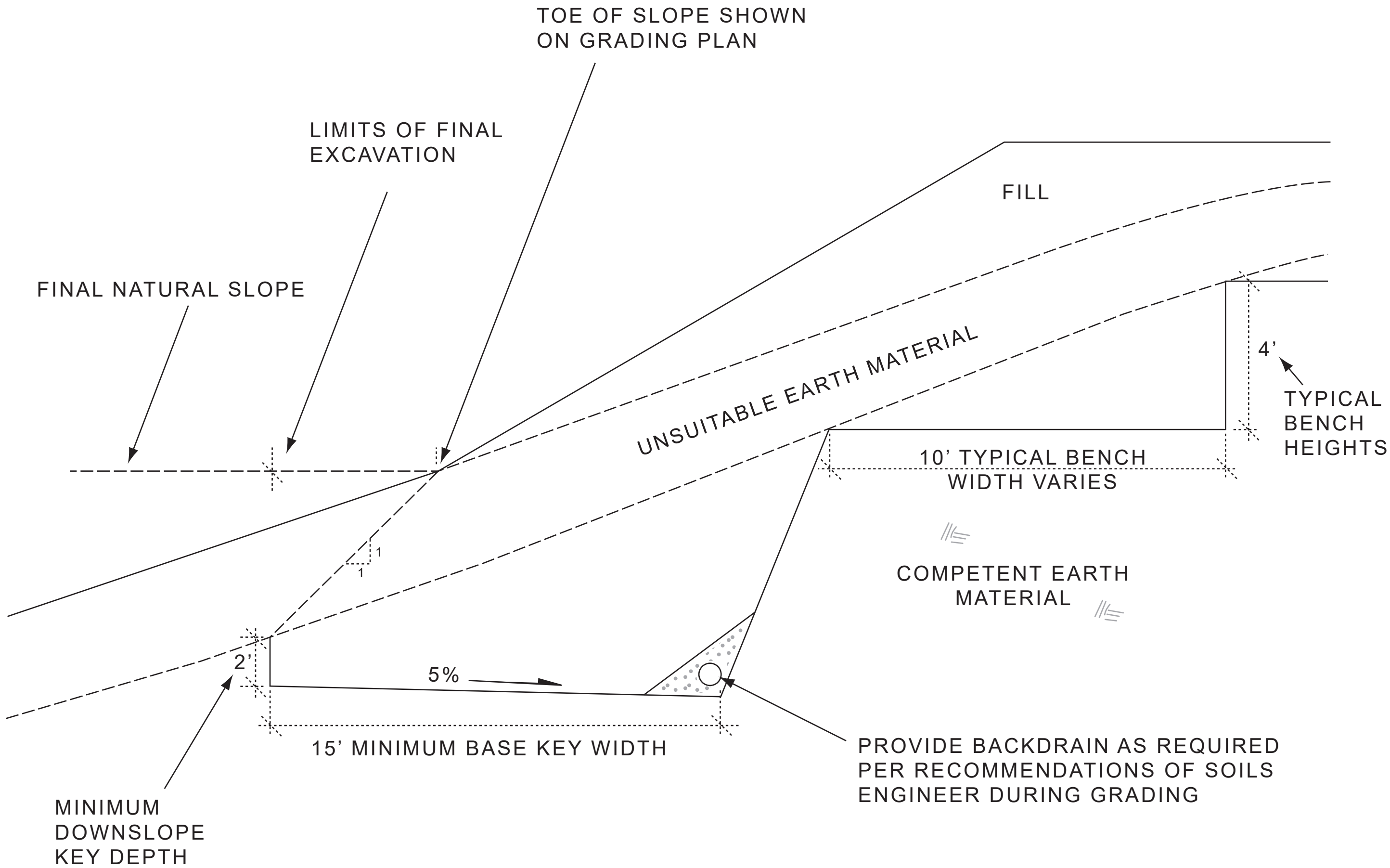
ADD MINIMUM 4” DIAMETER APPROVED PERFORATED PIPE WHEN GRADIENT IS LESS THAN 2%

APPROVED PIPE TO BE SCHEDULE 40 POLY-VINYL-CHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 psi.

GEOFABRIC SUBDRAIN

NOT TO SCALE

FIGURE 9

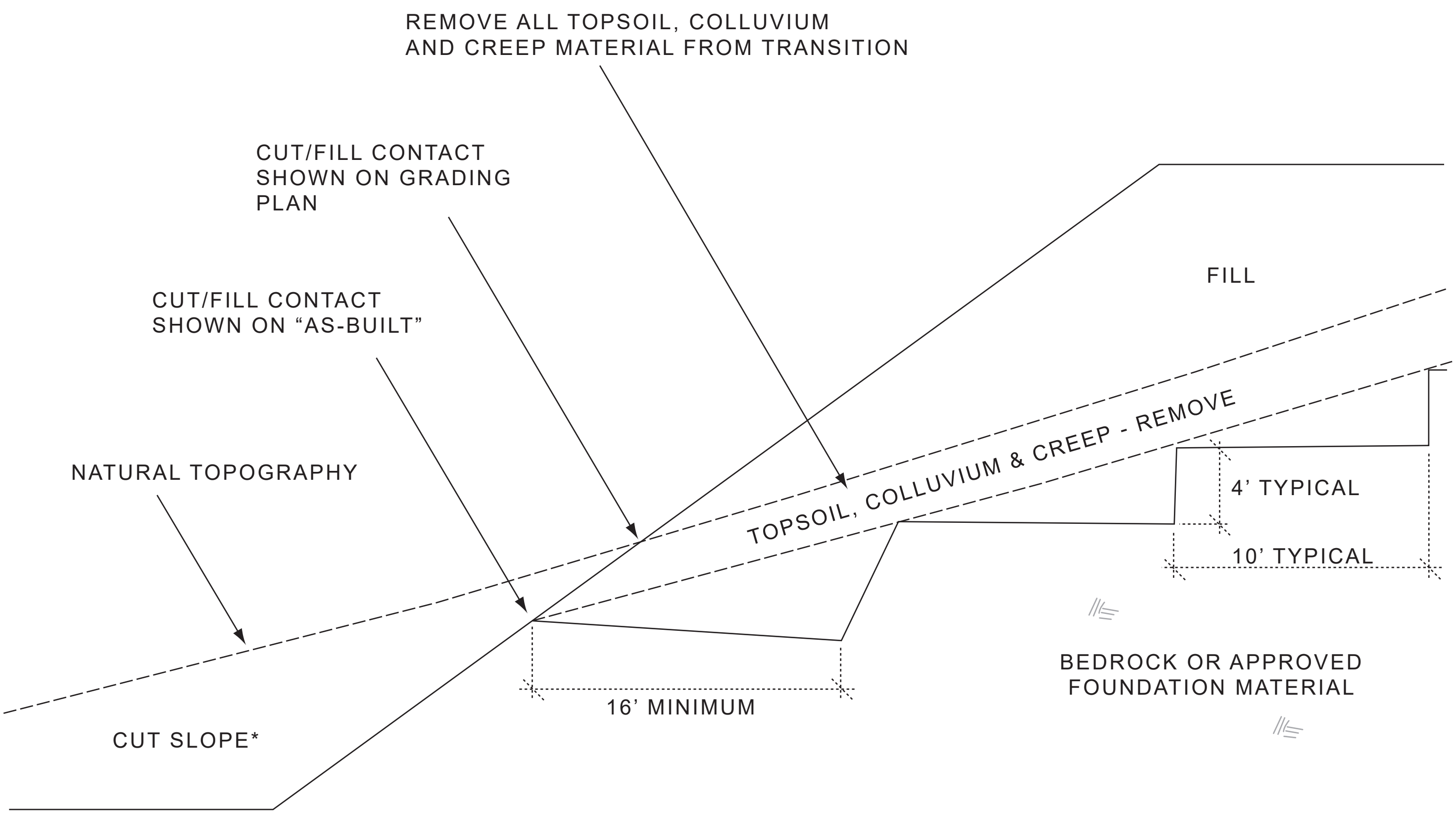


WHERE NATURAL SLOPE GRADIENT IS 5:1 OR LESS, BENCHING IS NOT NECESSARY. HOWEVER, FILL IS NOT TO BE PLACED ON COMPRESSIBLE OR UNSUITABLE MATERIAL.

FILL SLOPE ABOVE NATURAL GROUND DETAIL

NOT TO SCALE

FIGURE 10



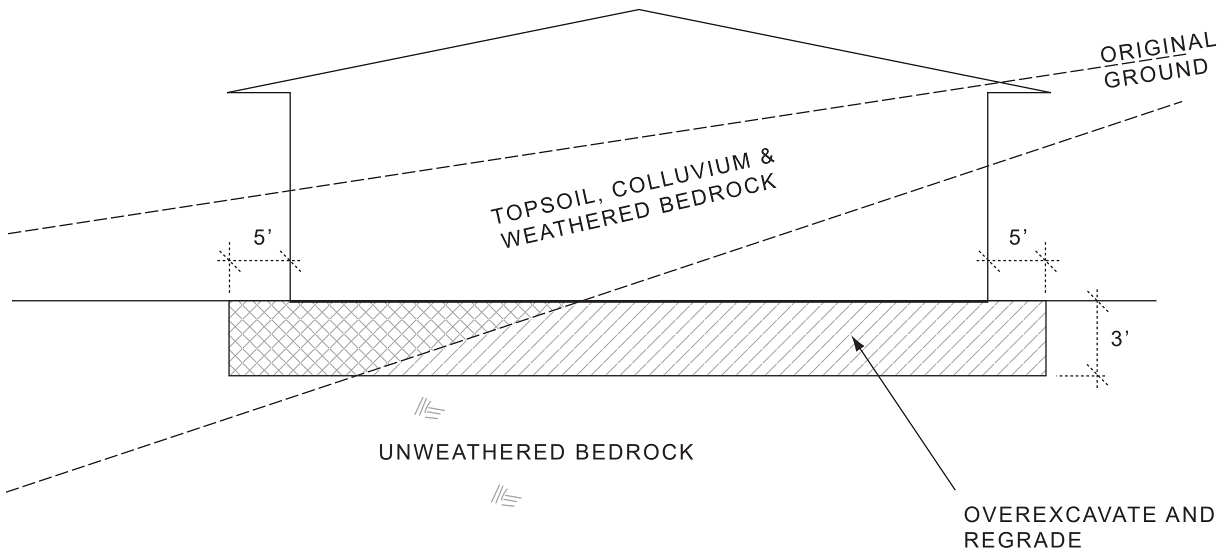
NOTE:
CUT SLOPE PORTION SHALL BE MADE
PRIOR TO PLACEMENT OF FILL

FILL SLOPE ABOVE CUT SLOPE DETAIL

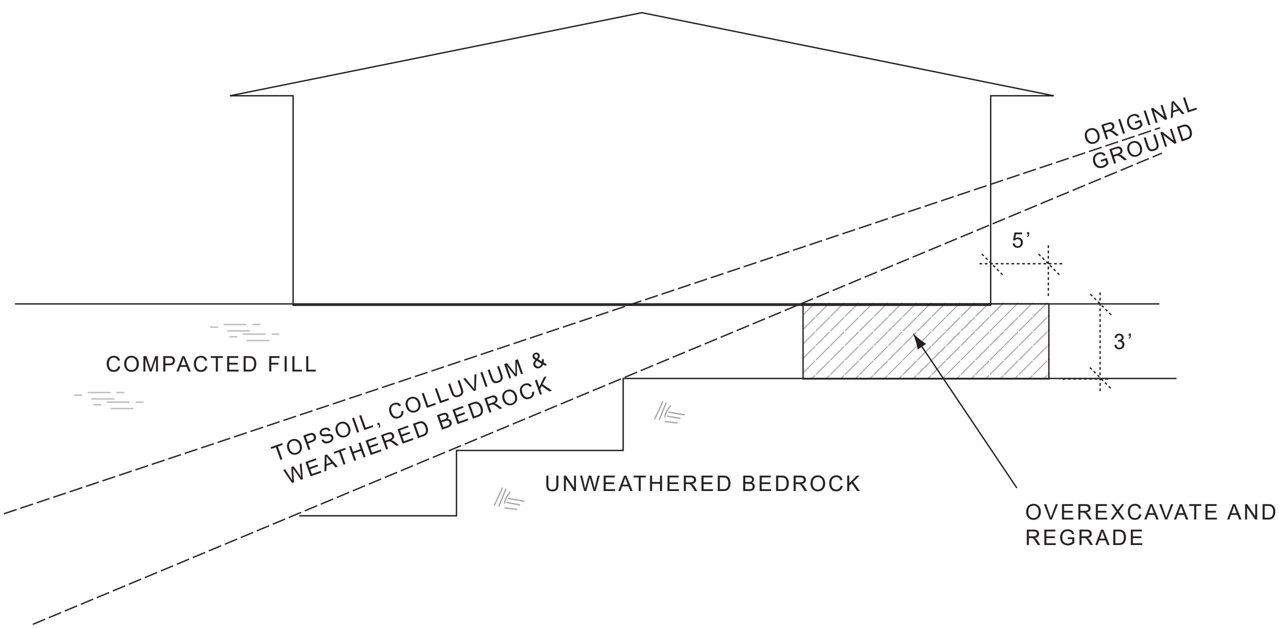
NOT TO SCALE

FIGURE 11

CUT LOT



CUT/FILL LOT (TRANSITION)

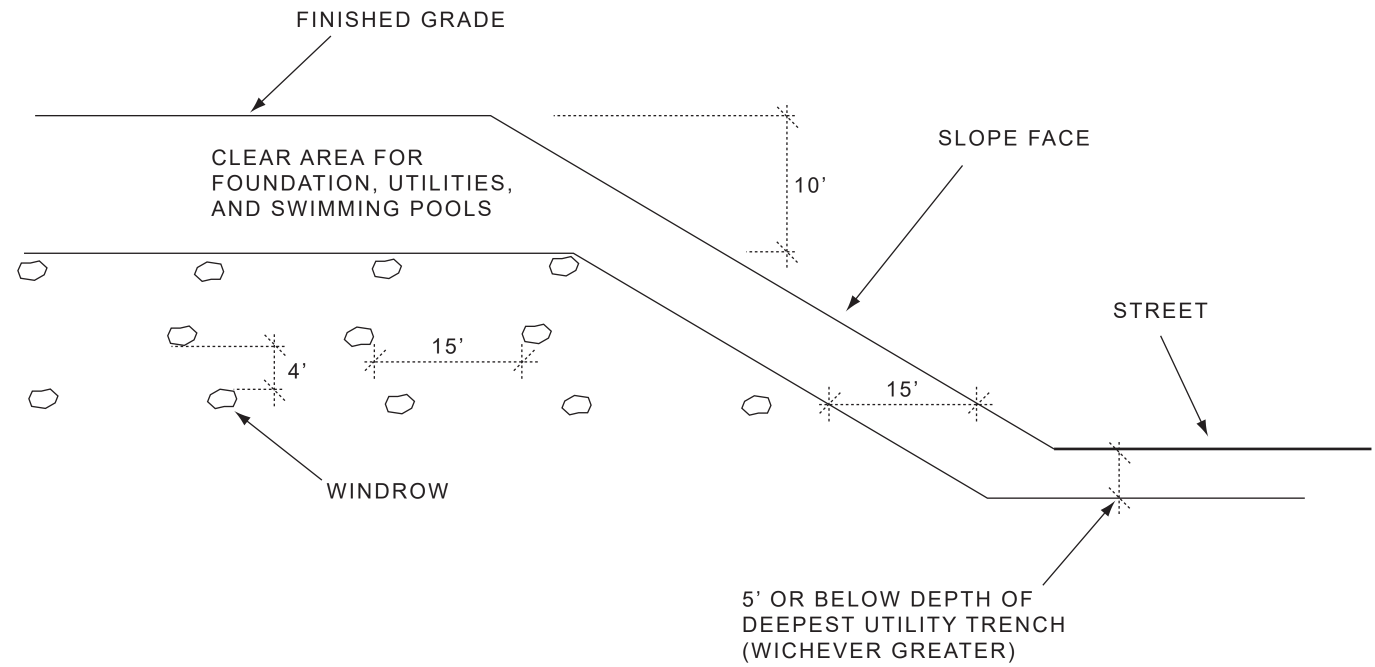


TRANSITION LOT DETAIL

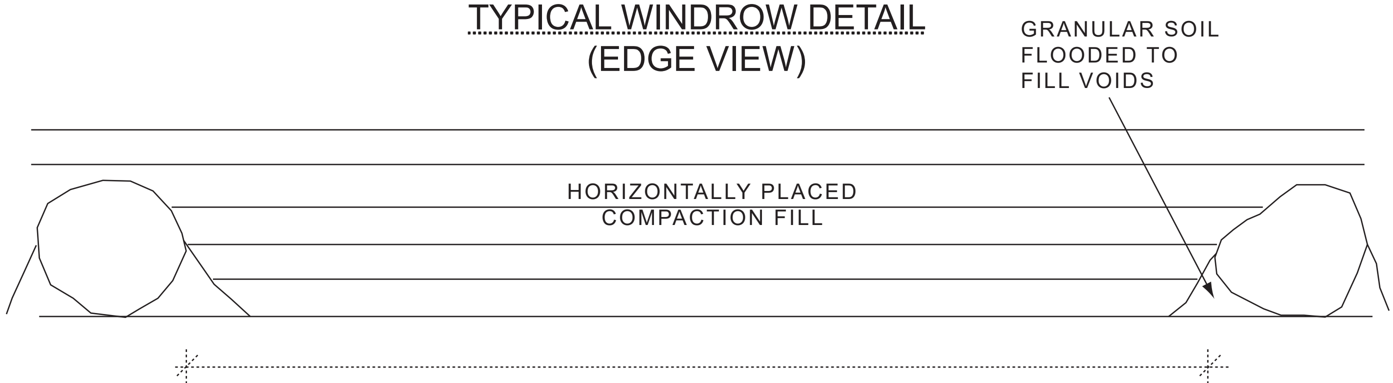
NOT TO SCALE

FIGURE 12

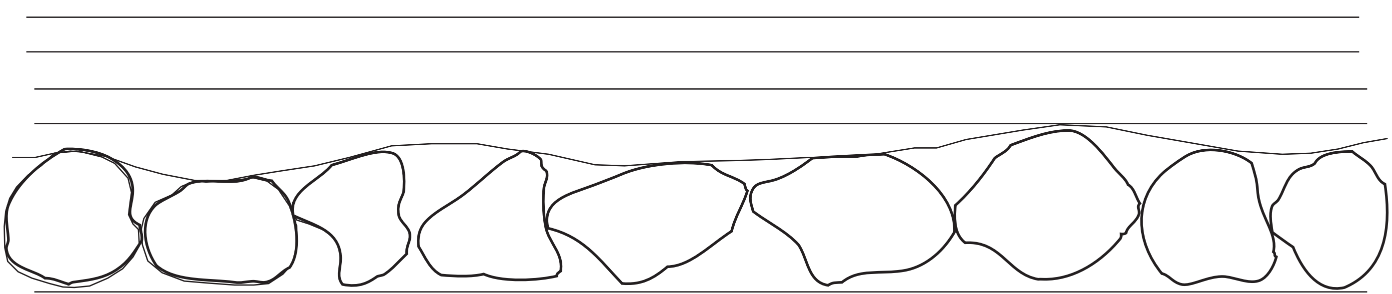
BUILDING



TYPICAL WINDROW DETAIL
(EDGE VIEW)



(PROFILE VIEW)



ROCK DISPOSAL DETAIL

NOT TO SCALE

FIGURE 13

RESPONSE TO PROJECT ISSUES
JUNE 23, 2025

VM – Paso Real LLC
c/o C.A. Marengo
Marengo Morton Architects
7724 Girard Avenue, Second Floor
La Jolla, California 92037

June 23, 2025
File No. 25-0521.1

Subject: **DSD – Geology Project Issues Report**
Spindrift Residence
1835 Spindrift Drive
La Jolla, California 92037

References: 1) Site Development Plans, 1835 Spindrift Drive, La Jolla, San Diego, CA 92037, dated May 8, 2023, by Marengo Morton.

2) Geotechnical Investigation, 1835 Spindrift Drive, La Jolla, California, 92037, September 9, 2024, DSD Response February 4, 2024, by TerraPacific.

Dear Mr. Marengo:

In accordance with your request, Geowest Consultants, Inc. (GCI) has prepared the following responses to the review comments generated by DSD-Geology. It is our opinion that the responses provided herein adequately address the issues raised.

GCI has reviewed the referenced reports and agrees with the data, recommendations and conclusions. GCI will serve as the Geotechnical Consultant of Record for the project moving forward. Based on our review of the referenced reports, the data, recommendations and conclusions are valid for the proposed construction.

Comment 76:

The project's geotechnical consultant has stated the site is not transected by a geologic fault. However, the opinion does not appear to be supported by adequate data. Clarify how the data demonstrates the absence of faults.

GCI Response: The fault investigation included continuous logging through paralic deposits within 6 boring across the site, and review of previous studies conducted by others including a 1981 fault investigation by Woodward Clyde (WC) with coverage along Spindrift Drive immediately in front (west) of the subject lot; a 2021 investigation by Geotechnical Exploration Inc (GEI) for 1851 Spindrift located immediately north of the subject property; and a 2017 investigation by Geosoils (GSI) for 1834 Spindrift located immediately across the street (west) from the subject lot. Based on the site-specific investigation, unbroken and distinct marker beds with stratigraphic continuity and no offset were identified across the site. The previous studies by GEI, GSI and WC, which cover the areas west and north of the subject lot, also did not identify the presence of Quaternary-aged faulting.

The updated Geotechnical Plan and Cross-section C-C' which are included in this response package as Figures 1 and 2 includes data from the row of borings located at the west end of the lot which were oriented perpendicular to the general trend of faulting in the area, in addition, boring data from the 1981 Woodward Clyde investigation was included in the section. This coverage includes 4 unbroken marker beds with stratigraphic continuity. A copy of the 1981 investigation by Woodward Clyde and pertinent logs with rough notes are attached within this response document.

Comment 77:

Provide an updated detailed geologic cross section(s) that better demonstrates stratigraphic/structural continuity between the borings on the subject site. Note that where trenching is not feasible borings must be spaced 10 to 15 feet center. Borings shall be of sufficient depth, adequately spaced, and size to adequately characterize sub-surface conditions and expose geologic features used to support conclusions. Note that additional depth and tighter spacing may be necessary to accurately locate faults.

GCI Response: The updated Cross Section C-C' which is oriented closer to the row of borings at the front of lot depicts the stratigraphic continuity and distinct unbroken marker beds including additional boring data from the 1981 Woodward Clyde investigation. These beds are labeled 1 through 4. Cross Section C-C' and the pertinent logs with rough notes are attached within this response document.

In addition to the site specific investigation, review of previous studies conducted by others including a 1981 fault investigation by Woodward Clyde (WC) with coverage along Spindrift Drive immediately in front (west) of the subject lot; a 2021 investigation by Geotechnical Exploration Inc (GEI) for 1851 Spindrift located immediately north of the subject property; and a 2017 investigation by Geosoils (GSI) for 1834 Spindrift located immediately across the street (west) from the subject lot. Quaternary-aged faulting was not identified within these studies. The 2021 investigation by GEI including bluff mapping along 4-lots, 1834 through 1874 Spindrift, which are also located across the street (west) from the subject lot also identified no offset between the paralic deposits and Cretaceous-aged bedrock.

If additional confirmation of stratigraphic continuity is required it is recommended that during construction, at the time of the basement excavation, additional geologic mapping be conducted for further confirmation of lack of faulting.

Comment 78:

The project's geotechnical consultant should provide professional opinion that the site is not transected by active or potentially active faults.

GCI Response: It is our professional opinion that the site is not transected by active or potentially active faults.

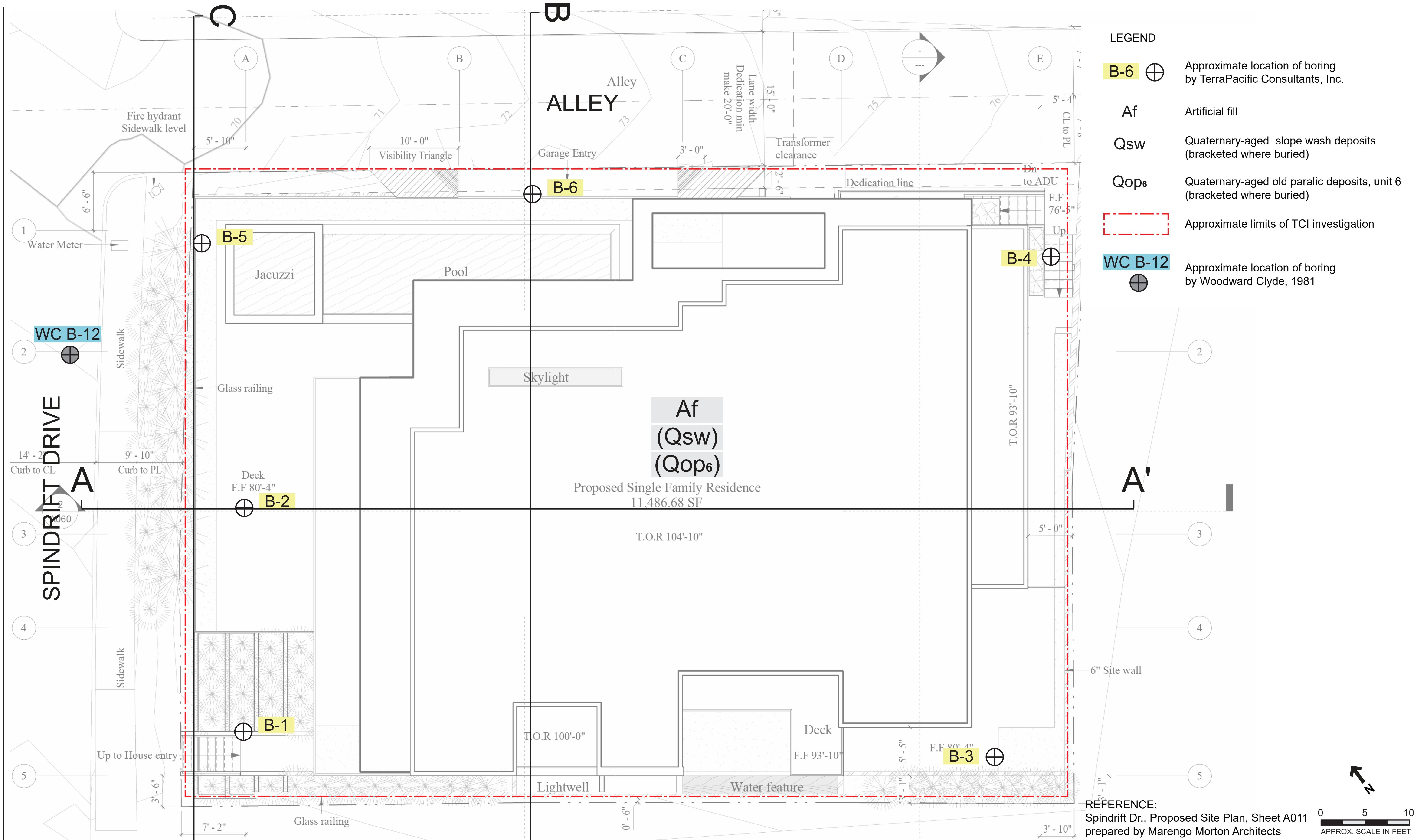
We appreciate the opportunity to be of service. If you should have any questions or comments regarding this report or our findings, please do not hesitate to call.

Sincerely,
Geowest Consultants, Inc.

Cristopher C. O'Hern, CEG 2397
Engineering Geologist

Octavio Brambila, GE 3259
Geotechnical Engineer

ATTACHMENTS



geowest

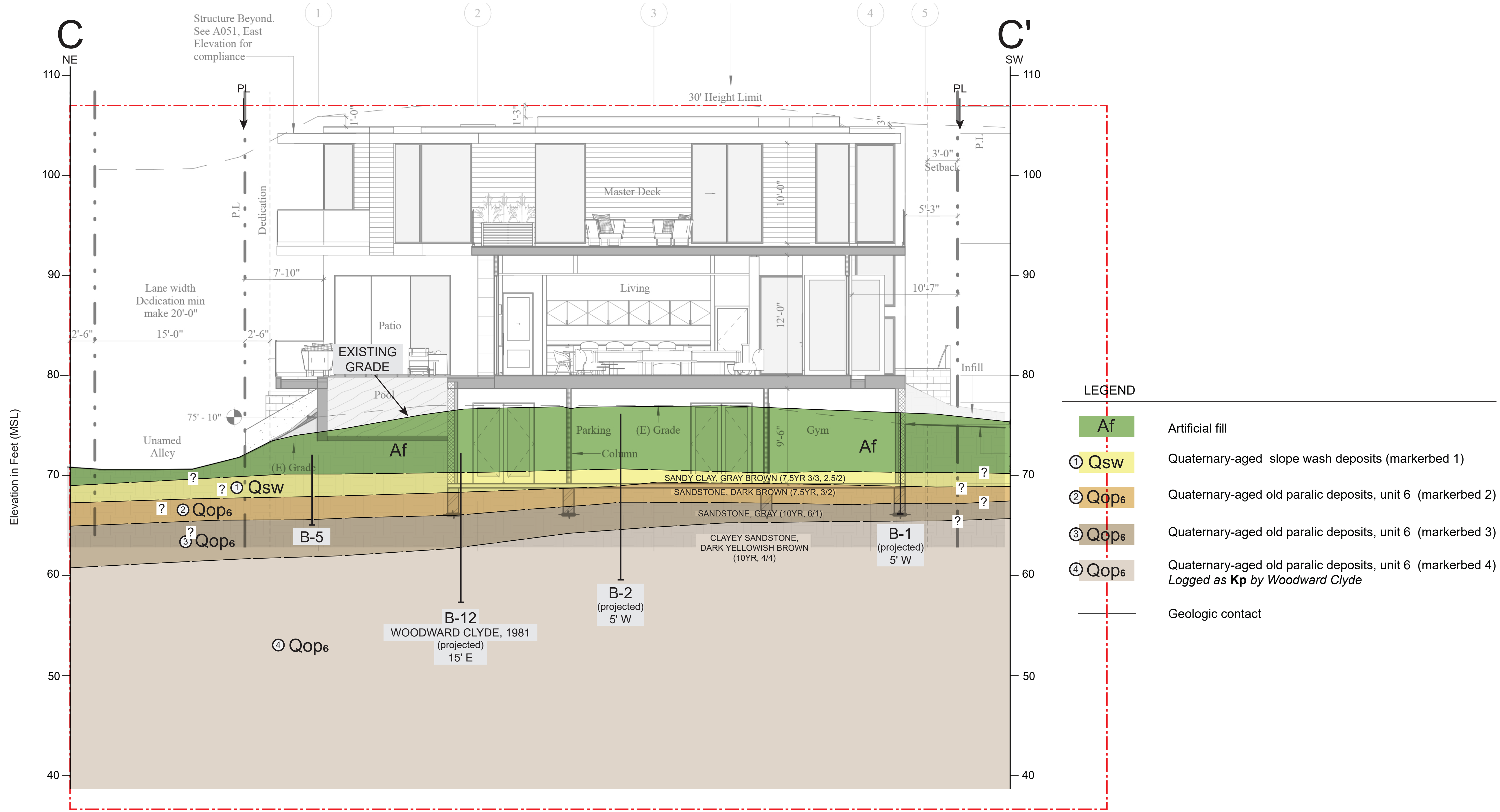
Geowest Consultants Inc
1804 Garnet Ave #400
San Diego, CA 92109
619 275-5002

Geotechnical Plan

Spindrift

File No. 25-0501.1
June 2025

Figure 1



REFERENCE:
Spindrift Dr., Sections, Sheet A061
prepared by Marengo Morton Architects

0 5 10
APPROX. SCALE IN FEET

geowest
Geowest Consultants Inc.
1804 Garnet Ave #400
San Diego, CA 92109
619 275-5002

Cross Section C-C'

Spindrift
File No. 25-0501.1
June 2025

Figure 2

TerraPacific CONSULTANTS INC

Subsurface Boring Log

Boring No: B-1

Project No: 23-223
Project Name: Spindrift Residence
Location: 1835 Spindrift Drive
Sample Method: Modified California Sampler / SPT
Instrumentation: None Installed
Elevation: ~75.2'

Date: 7/25/24
Logged By: E. Perez
Drilling Company: Native Drilling
Driller: Gabe
Drill Rig Type: Tripod
Hammer Wt. & Drop: 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Sandy clay, very dark brown (7.5YR, 2.5/2), moist, loose					
2.5		@ 2.5', Color change to dark brown (7.5 YR, 3/4)					
4.0		From 4.0', Clayey sand, dark brown (7.5YR, 3/4), moist, medium dense, fine to medium grained, some rootlets		SPT / Bulk	8/10/10	--	--
6.5		SLOPEWASH: From 6.5', Silty sand, very dark brown (7.5 YR/7.5/2), moist, loose, trace of shell fragments, fine to medium grained (1)		Ring	5/12/20	--	--
7.5		NATIVE (Old Paralic Deposits, Unit 6): From 7.5', Sandstone, dark brown (7.5 YR, 3/2), slightly moist, medium dense, poorly cemented, fine grained, massive, trace of fines (2)		SPT	10/10/11	--	--
9.3		@ 9.3', Color change to gray (10 YR, 6/1), with abundant black grains (3)					
10							
15							
20							

Total Depth: 10.0'
Water: No
Caving: No
Hole Diameter: 5"

Boring **B-1**

TerraPacific CONSULTANTS INC

Subsurface Boring Log

Boring No: B-2

Project No: 23-223
Project Name: Spindrift Residence
Location: 1835 Spindrift Drive
Sample Method: Modified California Sampler / SPT
Instrumentation: None Installed
Elevation: ~75.7'

Date: 7/25/24
Logged By: E. Perez
Drilling Company: Native Drilling
Driller: Gabe
Drill Rig Type: Tripod
Hammer Wt. & Drop: 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Sandy clay, very dark brown (7.5YR, 4/6), moist, soft, some concrete fragments		Bulk	9/9/10	--	--
5				Ring / Bulk	4/4/4	--	--
5.5		SLOPEWASH: From 5.5', Silty sand, dark brown (7.5 YR, 3/3), moist, medium dense, some carbon deposits (1)					
6.5		NATIVE (Old Paralic Deposits, Unit 6): From 6.5', Sandstone, dark brown (7.5 YR, 3/2), slightly moist, loose to medium dense, poorly cemented, fine grained, massive, with abundant black grains (2)					
9		@ 9.0', Sporatic layers of gray (10YR, 6/1), abundant black grains (3)					
10				SPT	12/12/17	--	--
10.9		From 10.9', Clayey/silty sandstone, dark yellowish brown (10 YR, 4/4), moist, medium dense, some black oxidation staining, some lenese of gray sand (4)					
15		@ 15.0', With olive gray mottling, dense in consistency		Ring	22/35/50 for 6"	--	--
20							

Total Depth: 16.5'
Water: No
Caving: No
Hole Diameter: 5"

Boring **B-2**

TerraPacific CONSULTANTS INC

Subsurface Boring Log

Boring No: B-5

Project No: 23-223	**Date:** 7/25/24
Project Name: Spindrift Residence	**Logged By:** E. Perez
Location: 1835 Spindrift Drive	**Drilling Company:** Native Drilling
Sample Method: Modified California Sampler / SPT	**Driller:** Gabe
Instrumentation: None Installed	**Drill Rig Type:** Tripod
Elevation: ~72.0'	**Hammer Wt. & Drop:** 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Silty sand, very dark brown (7.5 YR, 5/2), moist, loose, some roots					
		SLOPEWASH: From 2.2', Silty sand, very dark brown (7.5 YR, 2.5/2), moist, loose, trace of shell fragments (1)					
		NATIVE (Old Paralic Deposits, Unit 6): From 3.5', Sandstone, dark brown (7.5 YR, 3/2) slightly moist, medium dense, poorly cemented, fine grained (2)		SPT	5/6/9	--	--
5							
		From 5.2', Sandstone, gray (10 Yr, 6/1), slightly moist, loose to medium dense, friable, abundant black grains (3)					
10							
15							
20							

Total Depth: 7.3'
Water: No
Caving: No
Hole Diameter: 5"

Boring

B-5

Boring 12

Approximate El. 71'

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						6" Asphalt Concrete
						Dense, moist, brown silty clayey medium sand (SM) OLDER PLEISTOCENE TERRACE DEPOSIT (Qt)
5						
			42		12-1	Dense, moist, brown silty fine to coarse sand (SM) OLDER PLEISTOCENE TERRACE DEPOSITS (Qt)
						Traces of white carbonate material ($CaCO_2$)
						Clean coarse sand
10						
			88		12-2	Very dense, moist, light yellowish brown micaceous silty fine to medium sand (SM) POINT LOMA FORMATION
15			60/6"		12-3	
						Bottom of Hole
20						
25						
30						
35						
40						

*For description of symbols, see Figure A-2

LOG OF TEST BORING 12

DRAWN BY: mrk	CHECKED BY: JS	PROJECT NO: 501351-GE03	DATE: 10-2-81	FIGURE NO: A-14

NEHRP-234

FINAL TECHNICAL REPORT

TRENCHING THE ROSE CANYON FAULT ZONE SAN DIEGO, CALIFORNIA

By: [illegible], Woodward-Clyde Consultants, San Diego, California

Sponsored by U.S. Geological Survey Contract No. [illegible]

Technical Officer: [illegible], U.S. Geological Survey

Principal Investigators: [illegible], Woodward-Clyde Consultants

Effective Date of Contract: [illegible]

Expiration Date of Contract: September [illegible]

Amount of Contract: [illegible]

Date Submitted: September [illegible]

FINAL TECHNICAL REPORT

TRENCHING THE ROSE CANYON FAULT ZONE SAN DIEGO, CALIFORNIA

By: E.R. Artim and D. Streiff, Woodward-Clyde Consultants,
San Diego, California

Sponsored by U.S. Geological Survey Contract No. 14-08-0001-19824

Technical Officer: Steve Wegener, U.S. Geological Survey

Pricipal Investigators: Daryl Streiff and Ernest R. Artim,
Woodward-Clyde Consultants

Effective Date of Contract: February 8, 1981

Expiration Date of Contract: September 27, 1981

Amount of Contract: $33,302

Date Submitted: September 30, 1981

LIST OF ILLUSTRATIONS

ABSTRACT

A trench was excavated, logged, and the geology interpreted across the mapped projection of the Rose Canyon Fault zone in the La Jolla area of the City of San Diego, California. The trench was extended for approximately 70 meters across the mapped projection of the Rose Canyon Fault. Inspection and analysis of the trench exposures indicated that the fault is located within a zone 3 meters wide that separates the Cretaceous Point Loma and Eocene Ardath Shale.

The main shear of the fault is approximately 23 cm wide, strikes N 18° W and dips 70° southwest. A second shear, about 5 to 12 cm in width and striking about N 20° W and dipping 60 to 80° northeast, is located 1.8 meters north of the main shear. The rake of striations along the 3-meter-wide fault zone dips at angles greater than 80°, suggesting a mainly vertical component of displacement.

The main shear is overlain by an unfaulted Middle to Late Pleistocene deposit estimated to be approximately 75,000 to 128,000 years old. The secondary shear has an apparent vertical stratigraphic separation of 2.5 to 3 meters in the Middle to Late Pleistocene deposits; a residual soil and colluvial deposit dated as approximately 1,140±75 years old showed geologic evidence for no displacement. Careful logging of the geologic features indicates that the strike and dip of the secondary shear in the Middle to Late Pleistocene deposits

coincide with the strike and dip of the bedding of the Ardath Shale which underlies the Middle to Late Pleistocene deposits. Such an association does not discount tectonic faulting but suggests alternate hypotheses for their development such as displacement due to adjustment along bedding planes within the Ardath Shale, consolidation of the younger sediments, or a combination of the two.

Based upon our examinations and those of others of fault exposures along the Rose Canyon Fault, we concluded that the Rose Canyon Fault along the northern side of Mount Soledad is mainly an en-echelon series of oblique reverse faults.

INTRODUCTION

This Final Technical Report of a study carried out under U.S. Geological Survey Contract No. 14-09-0001-1924 documents and describes the results of logging a trench in an area mapped as the location of the Rose Canyon Fault zone. The trench was located in the La Jolla area of San Diego, California (Figure 1).

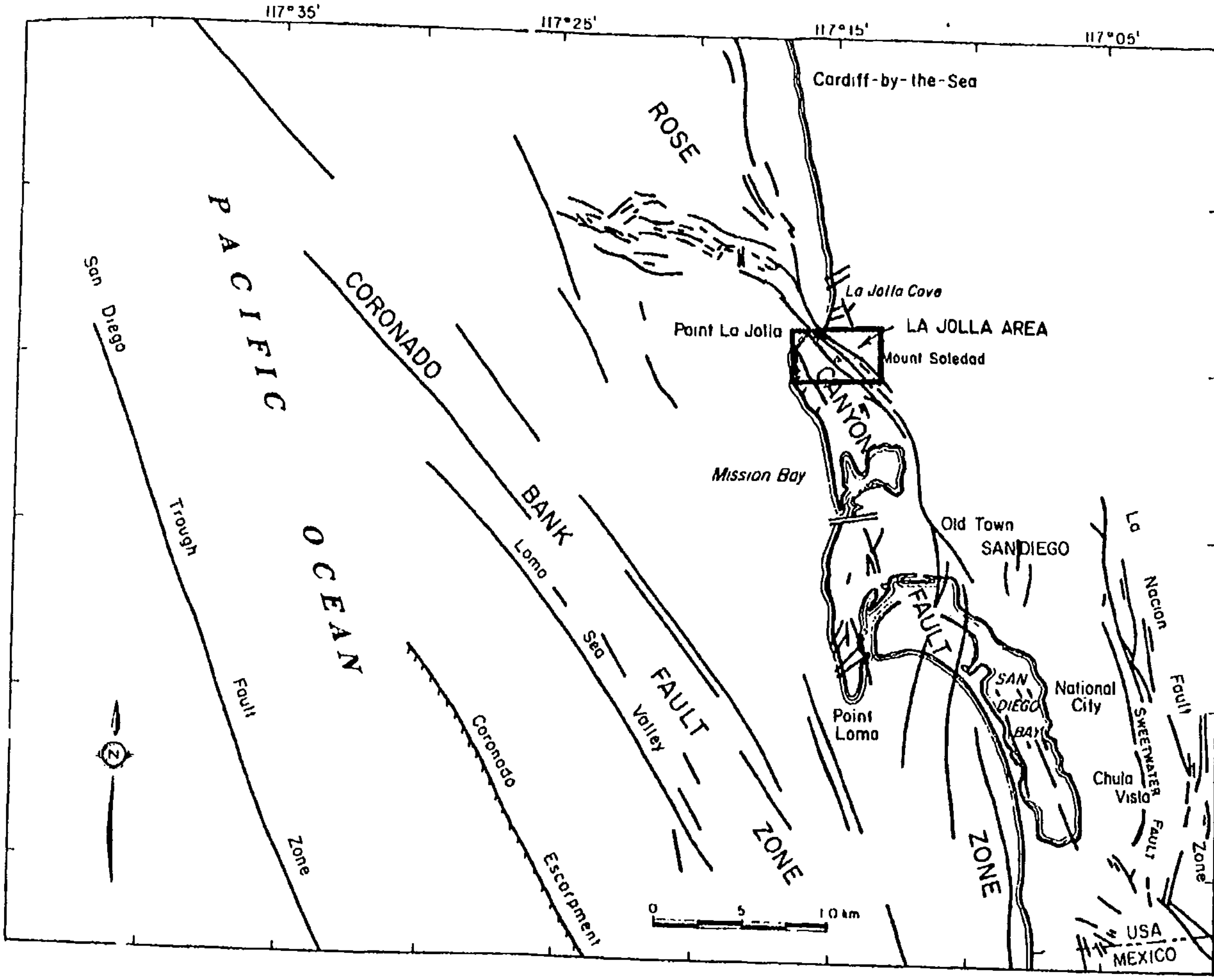
The purpose of this study was to obtain geological data to aid in evaluating the location, degree, and recency of fault activity of the Rose Canyon Fault zone. The study involved logging and evaluating exposures excavated in Quaternary and Tertiary deposits across the mapped traces of the Rose Canyon Fault.

SCOPE OF STUDY

The scope of the investigation for this study included:

(1) Inspection, interpretation, and logging of the exposures in a test trench excavated across the projection of the Rose Canyon Fault.

(2) Dating soil samples by radiocarbon and racemization techniques as well as estimating relative age by physical properties and degree of soil formation.



MODIFIED FROM KENNEDY, CLARK, GREENE & LEGG, 1980.

FIGURE 1. FAULT LOCATION AND AREA MAP, SAN DIEGO, CALIFORNIA

FIELD INVESTIGATION

A trenching program was proposed across the Rose Canyon Fault along Spindrift Drive in the La Jolla area of the City of San Diego, California (Figures 2 and 4). Because the street is narrow (less than 9 meters wide) and has existed for over 50 years, a variety of utility lines (including electric and high pressure gas lines) have been placed under the street. We were requested by the City of San Diego to utilize all precautions to avoid damage to any lines or potential shutdowns of services.

In order to accomplish this, we elected to first make a careful examination of the geological exposures in the sea cliffs and nearby cuts to eliminate the need for trenching adjacent to those areas which the fault does not cross. We then placed a series of small diameter test borings at uniform intervals to give us an indication of the depth of Quaternary sediments and the profile of Quaternary and Tertiary deposits. Anomalous conditions reflected by data from two borings, one just southwest of Roseland Drive and the other northeast of St. Louis Terrace, provided the basis for selecting the trench location. The southern extension of the trench was limited by the increasing depth of Quaternary deposits.

The next step was to have all utility lines located in the area of the proposed trench. Utility locations were marked on the street with an accuracy of ±45 cm by representatives of the utility companies. The final trench location was centered within a zone 1.8 meters to 2.4 meters wide between a main water line and a major sewer line. Several small utility lines as well as service lines crossed the planned trench alignment.

The excavation was made between August 10 and August 28, 1981 at the approximate location shown on Figure 2. Fifteen-meter (50-foot) sections of trench were open for variable time spans. Some sections remained open for a few days, but other sections were open for only a few hours before backfilling operations began. Geologic conditions in the trench were logged and evaluated, and geological samples were collected for dating. Absolute dating techniques used included radiocarbon and amino acid racemization. Relative ages of units were estimated by regional correlation based on physical properties and criteria developed by Quaternary soils specialists.

A private contractor excavated the trench and took field measurements of the trench location. Our log (shown as Figure A-1 in Appendix A) and station locations are based on those field measurements. The beginning, turn point, and end of the trench are given as Lambert Coordinate locations to aid in future reference to the trench location. The boring locations are shown on Figure 2. The logs of the test borings are included in Appendix A as Figures A-3 through A-15.

BACKGROUND

Regional Tectonic Setting

San Diego lies within a region traversed by many faults (Figure 3). Regional fault patterns and plate tectonic theory indicate that the faults are related to the boundary and margin of two crustal plates: the North American Plate and the Pacific Plate. The present boundary of these two plates closest to San Diego is a system of faults in the Imperial Valley commonly referred to as the San Andreas Fault system. Included in this system are the Elsinore Fault, the San Jacinto Fault, the Imperial Fault, and the San Andreas Fault.

Other faults in southern California and northern Baja California that exhibit a general northwest-striking, right lateral, strike-slip pattern include the San Clemente Fault zone, the San Diego Trough Fault zone, and the Coronado Banks Fault zone to the west offshore; and the Agua Blanca Fault, the San Miguel Fault zone, the Vallecitos Fault, and the Calabasas Fault to the south in Baja California.

Historic earthquake records show that the portion of southern California and northern Baja California presently exhibiting the greatest earthquake activity is along the Imperial and San Jacinto Faults. In comparison, the San Diego area, approximately 100 km west of the San Jacinto Fault, has a relatively minor historic record of earthquake activity.

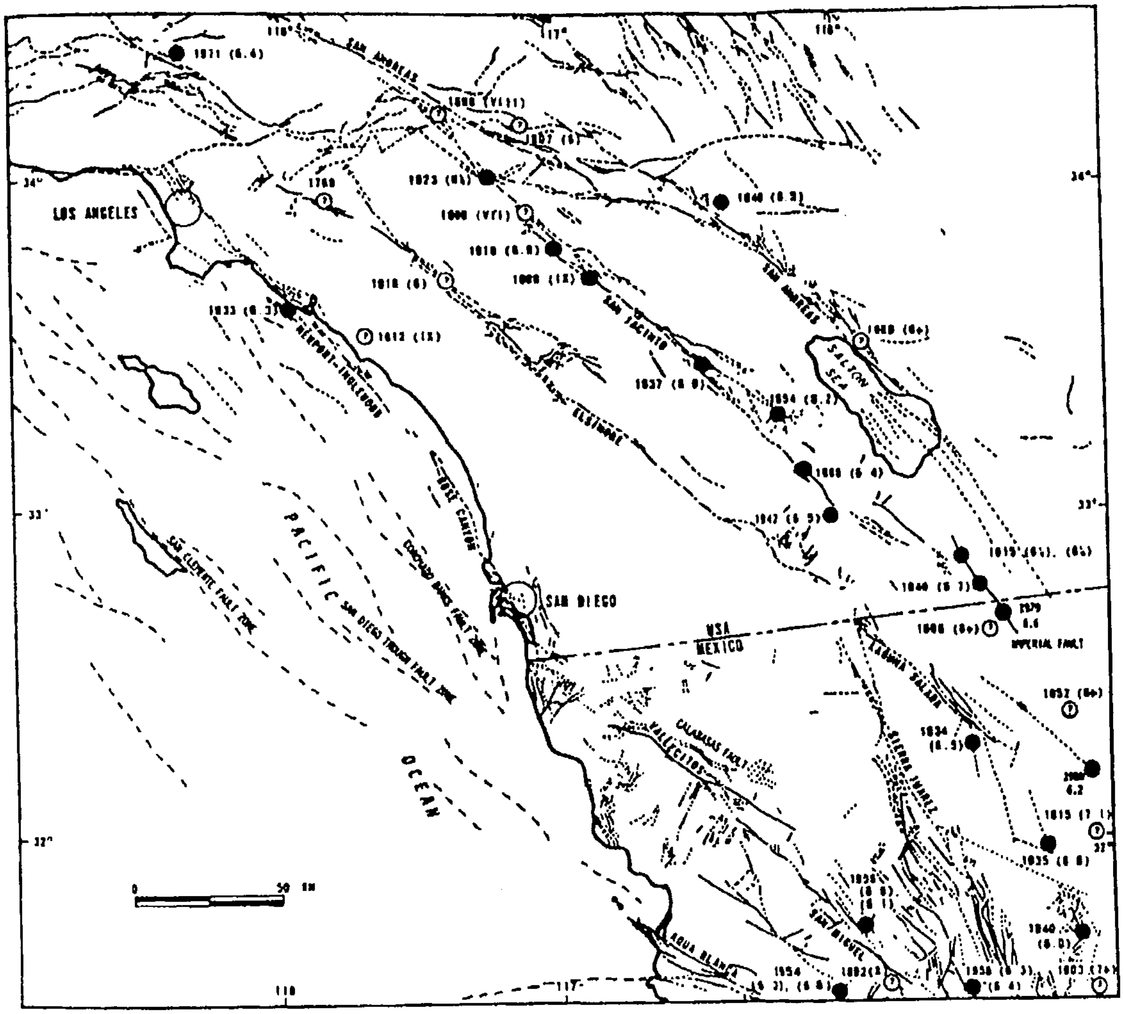


FIGURE 3. GENERALIZED REGIONAL FAULT MAP

Fault map of the Southern California area showing epicenters of earthquakes of magnitude 6 and greater. Solid circle show epicenters with year of earthquake and magnitude of maximum intensity. Open circles with question marks indicate poorly known epicenters. Epicenters are compiled from Hileman, and others (1973), and Thatcher, and others (1975); faults are compiled from Gastil, and others (1975), Jennings (1977)and Legg and Kennedy, 1979.

Local Tectonic Setting

The San Diego area is within the coastal subprovince of the Peninsular Range Province. The area is characterized primarily by Cretaceous, Tertiary and early Quaternary sedimentary formations, capped by later Quaternary marine and non-marine deposits. Generally, the Teritary and Quaternary sedimentary formations are nearly flat-lying, except for locally deformed areas such as Mount Soledad.

A relatively recent erosion surface has been incised onto the Tertiary and Quaternary sedimentary formations. The topographic features and geologic setting have also been partially modified by Quaternary and older faulting.

The geologic structure of the San Diego area includes en echelon, north-northwest-striking faults that characteristically dip steeply and have normal, reverse, and normal and reverse oblique displacement. These faults lie subparallel to the regional tectonic grain and are believed to result from rotational and extensional stress environments. The component of extensional stress in southwestern San Diego is aligned generally east- west; the resulting strain is expressed by normal faults that strike generally north-south.

The roughly-defined San Diego Bay graben, a structurally depressed block, is bounded on the east by the La Nacion Fault zone, on the west by the San Diego Bay Faults and offshore faults, and on the north by the Rose Canyon Fault (Figure 1).

The Rose Canyon Fault is discussed in more detail in the following section.

Rose Canyon Fault Zone

The Rose Canyon Fault zone comprises a number of closely spaced subparallel faults that displace Cretaceous and Tertiary strata near Mount Soledad. The fault zone, as mapped, continues offshore to the north, and it has been suggested that the fault continues to the south under San Diego Bay and offshore of Coronado. The Rose Canyon Fault zone has been shown on land to extend for approximately 15 km south of the La Jolla Cove and Shores area (Kern, 1973a; Ziony, 1973; Kennedy, 1975) (Figure 1).

The Rose Canyon Fault is dominated by slightly northwest trending, en-echelon faults and folds. Onshore adjacent to La Jolla the fault has been interpreted as having evidence of right-lateral displacement (Kennedy, 1975; Moore and Kennedy, 1975; Kern, 1977; Schmalfuss, 1979). The strike-slip style of deformation has been suggested on the basis of postulated displaced stratigraphic units (Kennedy, 1975), displaced geomorphic features (Kern, 1977; Keis, 1980), and reported horizontal slickensides (Kennedy, 1975). In our opinion, however, actual measurements of laterally displaced features are neither well documented nor confirmed by supportive evidence.

Approximately 140 meters of vertical separation of the base of the Lindavista Formation has been recognized near Mount Soledad (Peterson, 1970). Evidence for vertical displacement has been documented at several locations (Kennedy, 1975; Kern, 1977); however, the sense of displacement (normal and reverse) varies throughout the zone. Kennedy (1975) reported that the rocks on the west side of the zone have moved relatively up in some areas and down in other areas. Kennedy (1975) indicates that continental-type igneous and metamorphic rocks form the basement on both sides of the fault zone.

Investigators have suggested evidence of tectonic displacement of the Rose Canyon Fault zone in Late Pleistocene and younger sediments (Kennedy, 1975; Moore and Kennedy, 1975; Kern, 1977; Kennedy and others, 1978; Schmalfuss, 1979). Published evidence includes scattered earthquake activity in the general San Diego area (Simons, 1979), and suggested displacement of postulated Holocene age sediments on the sea floor (Moore, 1972; Moore and Kennedy, 1975; Kennedy and Welday, 1980; Kennedy and others, 1980a and 1980b).

Kennedy (1975) states, "The possibility of Holocene fault activity in the area is not ruled out, though no direct field evidence supports this fact." Kennedy and Peterson (1975) conclude, "Holocene seismic activity along several faults that lie within 10 km of the area (La Mesa and Poway Quadrangles) is supported by the historic seismicity believed to be associated with the Rose Canyon Fault zone in the San Diego Bay area. . ."

Ages of Local Faults

Geologically young materials in San Diego have been displaced by faults. Faulted sediments in the southeast Mission Bay area, approximately 9 km southeast of the trench site, have been radiocarbon dated at 28,000 ±1,500 years old (Liem, 1977). Information from Mr. William Elliot* (unpublished personal communication, 1980) indicates that a fault in Chula Vista has displaced sediments radiocarbon dated as approximately 25,000 years old. Sediments in the downtown San Diego area, dated by amino acid methods as approximately 200,000 to 300,000 years old, may have up to 3 meters of displacement (Artim and Streiff, 1981). A deposit on Point Loma dated as approximately 120,000 years old has up to about 4.6 meters of displacement (Kern, 1973a). However, topographic features such as sag ponds, offset stream courses, or sharply defined scarps, commonly associated with Holocene faulting elsewhere in California, are not generally associated with local faulting. This would suggest that local faults, if they are active, have a very low rate of activity.

---

* Consulting Geologist, San Diego, California.

GEOLOGICAL CONDITIONS IN THE TRENCH

Stratigraphy

Seven significant stratigraphic units were exposed in the trench. These units are described below in order of increasing age. Each unit name is followed by a symbol used to identify that unit on the trench log. Where possible, absolute ages of the materials are given. Absolute dating of geologic materials can be difficult because of a lack of datable geologic materials or because the age of the materials is not within the age range of available dating techniques. Where materials for dating techniques were lacking, other methods such as degree of weathering and soil formations or stratigraphic correlations were used to estimate the ages of materials. Recent fill soils, possibly placed during road construction or utility line emplacement, are shown on the trench log, but their description is omitted from this report.

Residual Soil and Slopewash Deposit (Q_1)

These deposits consist primarily of dark brown to grayish-brown, clayey silty fine- to medium-grained sand with fine pieces of charcoal, bones, ash, gravel chips, shell and shell fragments, as well as remnants of two fire pits, which indicate the presence of man. The deposits range in thickness from less than 35 cm to approximately 1.5 m. The deposits are friable, porous, and contain numerous worm and small animal burrows.

The deposits postdate paleosols and formational units upon which they have been deposited. The results of radiocarbon dating performed on shells from the base of this unit indicate an age range of approximately 660±75 to 1,140±80 years old.

Paleosol (S_1)

This unit consists primarily of dark brown to dark yellowish brown, sandy clay. The soils are firm to stiff, and contain small roots and animal burrows. The soil has a poorly to moderately well developed, medium angular to crumbly structure, and thin to moderately thick clay skins. The lower contact is gradational into the underlying deposits.

Based upon a visual interpretation of the degree of weathering and soil development, these soils are estimated to be at least 10,000 years old. The soils are overlain by a residual soil and colluvial deposit age dated as approximately 660±75 to 1,140±80 years old and are underlain by Pleistocene alluvial deposits, radiocarbon age dated as about 27,700±2,600 years old.

Pleistocene Alluvial Deposits (Q_2)

These alluvial deposits consist of light reddish-brown to dark brown, poorly bedded clayey, silty fine- to medium-grained sand with a few thin lenses and pods of coarse sandy clay. The deposit also contains irregular thin beds of coarse sand and pebbles. Concentrations of hematite and poorly formed manganese nodules are common and result in reddish-brown staining. Charcoal flecks and zones of charcoal are scattered throughout the deposit. A radiocarbon date performed on a bulk sample from a depth of 8 feet at Station 28 gave a result of 27,700±2,600 years.

This unit predates the paleosol (S_1) developed on the deposits and postdates the paleosol (S_2) upon which it has been unconformably deposited.

Buried Paleosol (S_2)

This unit consists primarily of dark brown to dark reddish-brown, sandy clay to clayey sand. The soils are firm to hard and contain numerous small roots and some animal burrows. The soils have a poorly to moderately developed, medium angular to crumbly structure, and very thin clay skins. Manganese oxide staining is common and often concentrated in the lower part of the unit. The upper contact is marked by a thin discontinuous layer of poorly formed manganese nodules. This soil is overlain by alluvial deposits age dated as about 27,700±2,600 years old. Based on a comparison of the degree of soil profile development in other areas of San Diego, we estimate that some parts of the paleosol may be as old as Oxygen Isotope Stage 5 (Shackleton and Opdyke, 1973).

Pleistocene Terrace Deposit (Q_3)

These deposits consist of light to dark reddish brown silty fine- to coarse-grained sandstone. The unit is iron-oxide stained and is locally cemented by clay and iron oxide. Some of the sandstone beds are mottled light red in a generally dark reddish brown sequence. The base of this unit is marked by a layer of pebble to cobble clasts. The clasts are generally well-rounded and range from about 1 cm to more than 15 cm. These deposits are present in the trench above elevations of 28 to 33 feet and are exposed in the sea cliff above an approximate elevation of 30 feet.

This unit has been mapped as the Bay Point Formation by Kennedy (1975). K.R. Lajoie (oral communication, 1980) of the U.S. Geological Survey is of the opinion that many of the Pleistocene deposits in the San Diego area, mapped as the Bay Point Formation, may be significantly older than Oxygen Isotope Stage 5, and that they could be a few thousand to several hundred thousand years old. This has been substantiated at least in part by the recent results of several amino acid age dates performed on shells from similar marine deposits. The results give ages ranging from approximately 220,000 to 560,000 ±75,000 years old (Artim and Streiff, 1981). The deposits exposed in the trench are probably at least equivalent in age to Oxygen Isotope Stage 5.

Ardath Shale (Ta)

This Eocene unit consists predominantly of weakly fissile, olive-gray, thinly laminated siltstone and claystone with thin interbeds of silty sandstone. Grain size distribution typically is about 82 percent silt, 16 percent clay, and a trace of sand. The clay is mostly kaolinite but contains some montmorillonite. Within the trench exposures this geologic unit was highly weathered.

The formation dips to the northeast. Several fractures and bedding plane faults (Pinckney et al, 1979) are exposed in the trench roughly subparallel to bedding, probably formed as a result of shearing along beds during deformation. The unit is in fault contact with the Cretaceous Point Loma Formation, the contact being a high angle reverse fault. The unit is also in both erosional and fault contact with the Pleistocene terrace deposits (Q_3).

Cretaceous Point Loma Formation (Kp)

This formation is exposed in the trench and along the sea cliffs adjacent to Spindrift Drive. The unit consists of olive-gray to light yellowish-brown, fine-grained sandstone with a few thin beds of olive gray shale.

Faulting

The stratigraphic sequence within the depth explored by the excavation has been disrupted by faulting in one general area. The primary fault is located at approximately Station 208 (Figure A-1) and separates the Cretaceous Point Loma Formation and the Eocene Ardath Shale. The fault gouge, approximately 23 cm wide, strikes N 18° W and dips 70° southwest. The main shear is overlain by an unfaulted Pleistocene deposit (Q_3) estimated to be at least 75,000 to 128,000 years old. At the location of the primary fault, no fractures extended up into this deposit and no irregularities that could be construed to be displacements or fault-related were noted at the base of the deposit. The sheared material is composed primarily of wet clay gouge containing sand particles and clasts of Ardath shale. The clay gouge contains numerous short omni-directional striations and several mostly continuous striations with the rake of the striations at angles from 40° to 80°.

A secondary shear approximately 5 to 12 cm wide is located about 1.8 meters northeast of the main shear (at about Station 203). The secondary shear, in the Ardath Shale, strikes N 20° W and dips 60 to 80° northeast. This shear shows an apparent vertical stratigraphic separation based upon projection of the base of an old erosional surface marked by leg gravel of 2.5 to 3 meters in the Pleistocene deposit. The seared zone between the Ardath Shale and Pleistocene deposit consists of wet clay gouge with small clasts of shale. The clay gouge contains numerous striations with the rake of the striations dipping at angles greater than 80°. The sheared material in the Pleistocene deposit is composed primarily of light gray sand that is weathered in part to a clay. A thin fracture extends up into the sand. Neither clay gouge or slickensided surfaces were observed in the Pleistocene deposit.

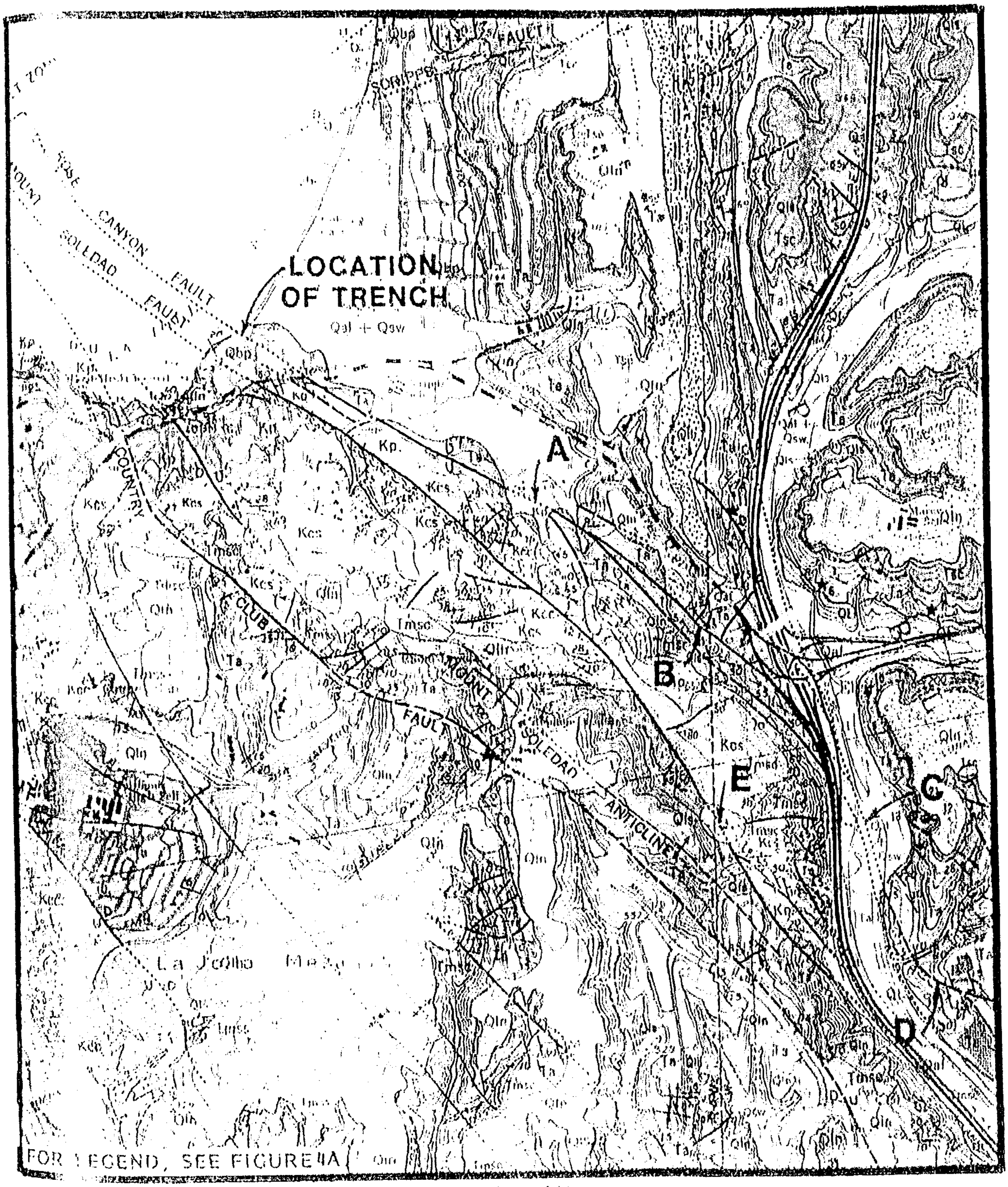
No shears or fractures extended up into an overlying residual soil and colluvial deposit (radiocarbon age dated to be about 1,140±80 years old), and no irregularities that were construed to be fault related or displacements were noted at the base of this deposit.

SUMMARY OF OTHER STUDIES

Prior to commencement of the trenching efforts, the results of both published and unpublished investigations along the Rose Canyon Fault Zone were reviewed and the sites visited. These investigations were conducted on the Rose Canyon and Mount Soledad Faults (see Figure 4), two mapped major faults within the zone. The studies provided the following information.

At point A of Figure 4 on the Rose Canyon Fault there is geologic evidence of no displacement of a soil radiocarbon dated as approximately 1,000 years old (WCC in-house files, Charles J. Pinckney, personal communication).

At point B the rake of striations of two exposures of the Rose Canyon Fault range between 44° and 85° with an average of about 56°, indicating an oblique component of displacement. The logs of the exposures are presented as Figures 5 and 6.



SCALE 1:24,000

FIGURE 4. SITE PLAN AND GEOLOGIC MAP

EXPLANATION

QUATERNARY

Holocene

Qaf

Artificial fill

Qb

Beach sand

Qal | Qsw

Qal + Qsw

Alluvium and Slopewash

Qal, Alluvium; Qsw, Slopewash; Qal & Qsw, Alluvium and Slopewash undifferentiated.

Qls

Landslide deposits

Pleistocene

Qt

Stream-terrace deposits

Qbp

Bay Point Formation

Qlb / Qln

Lindavista Formation

Qln, nearshore deposits. Qlb, beach deposits.

TERTIARY

Pliocene

Tsd

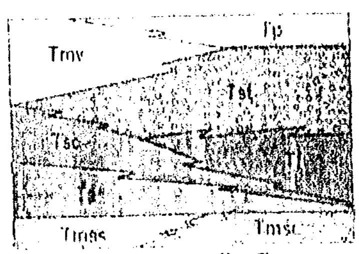
San Diego Formation

Miocene

Tba

Basaltic andesite

Eocene



Poway and La Jolla Groups

Tp Pomerado Conglomerate. Tmv Mission Valley Formation. Tst, Stadium Conglomerate. Tf Friars Formation. Tsc, Scripps Formation. Ta, Ardath Shale. Tmss, Mount Soledad Formation (sandstone part); Tmsc, Mount Soledad Formation (conglomerate part)

Upper Cretaceous

Rosario Group

Kcs, [illegible] Formation (sandstone part); Kcc, La Jolla Formation (conglomerate part); Kp, Point Loma Formation

SYMBOLS

Contact

(dashed where approximately located, dotted where concealed)

Fault, showing dip

(dashed where approximately located, dotted where concealed. U, upthrown side; D, downthrown side)

Anticline, showing direction of plunge.

Syncline, showing direction of plunge.

Strike and dip of bedding.

Strike and dip of joint.

Strike of vertical joint.

(Qls)

Landslide with direction of movement indicated by arrows.

Δ 0-15-18

Clay sample locality.

Fossil mollusk locality.

★ 10

Fossil coccolith locality.

Fossil vertebrate locality.

A, B, C, AND E, REFERENCE POINTS FOR DISCUSSION IN TEXT.

"SITE PLAN AND GEOLOGIC MAP" AND "LEGEND" ADAPTED FROM GEOLOGY OF THE LA JOLLA QUADRANGLE, SAN DIEGO COUNTY CALIFORNIA BY MICHAEL P. KENNEDY, BULLETIN 200 CALIFORNIA DIVISION OF MINES AND GEOLOGY, DATED 1975.

FIGURE 4A. LEGEND FOR FIGURE 4

At point C of Figure 4 on the Rose Canyon Fault there is geologic evidence of no displacement in alluvial deposits up to 18 feet thick in two trenches. These soils have been radiocarbon dated as approximately 7,000 years old (Farrand et al, 1981).

At point D of Figure 4, exposures of the Rose Canyon Fault show striations with the dips of the rake at about 80° (Figure 8) (Hart, 1981).

At point E of Figure 4, an oblique reverse exposure of the Mount Soledad Fault shows no displacement of soil radiocarbon dated as about 8,000 years old (Berggreen and Streiff, 1979).

SUMMARY

Based upon our investigations along the Rose Canyon Fault we have concluded that the Rose Canyon Fault along the northern side of Mount Soledad is primarily an en-echelon series of oblique reverse and normal faults.

The fault exposed in the trench, which was previously identified at this approximate location as the main branch of the Rose Canyon Fault, is overlain by unfaulted Middle to Late Pleistocene deposits. A secondary shear has apparently displaced a Middle to Late Pleistocene deposit about 3 meters. A residual soil and colluvial deposit, radiocarbon dated to be as young as 1,140±75 years old, showed geological evidence for no displacement or stratigraphic separation. Another hypothesis

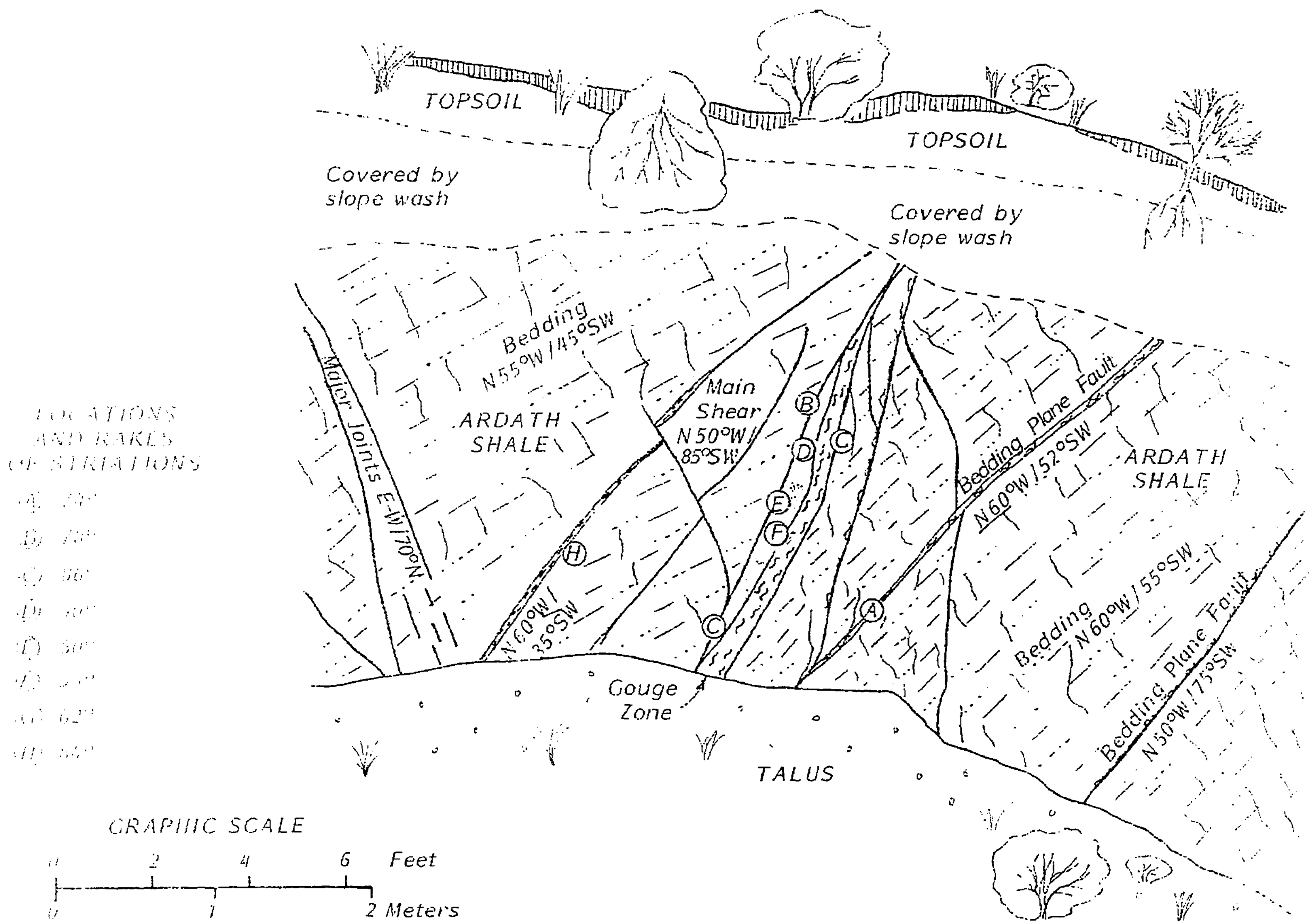


FIGURE 5. VIEW TO WEST OF A 1-1/2:1 CUT SLOPE FACE (TRENDING N-S)
ALONG THE ROSE CANYON FAULT
SOUTHWEST OF ARDATH ROAD AND INTERSTATE 5

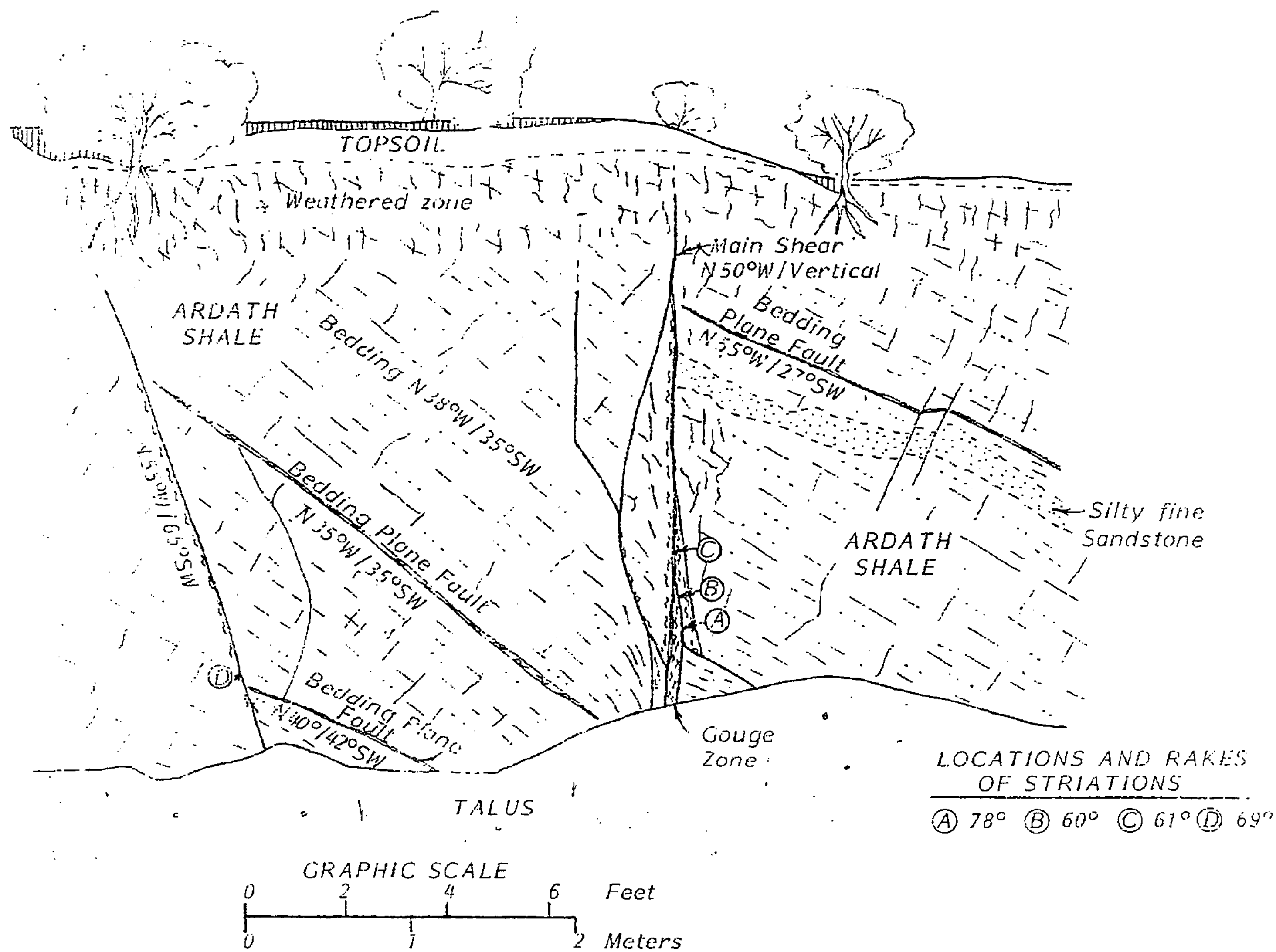


FIGURE 6. VIEW TO SOUTHEAST OF VERTICAL CUT SLOPE FACE (TRENDING N45° E) ALONG THE ROSE CANYON FAULT SOUTHWEST OF ARDATH ROAD AND INTERSTATE 5

that could explain the presence of the secondary shear is movement within the Ardath Shale and Pleistocene deposits of nontectonic origin, such as landsliding or block gliding of the Ardath Shale toward a low to the northeast. Such features are not uncommon within the Ardath Shale in the Mount Soledad area.

ACKNOWLEDGMENTS

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We wish to thank Ms. Margaret Kelly, Ms. Cynthia Heyman and Ms. Susan Tanges for their assistance in the preparation of this report.

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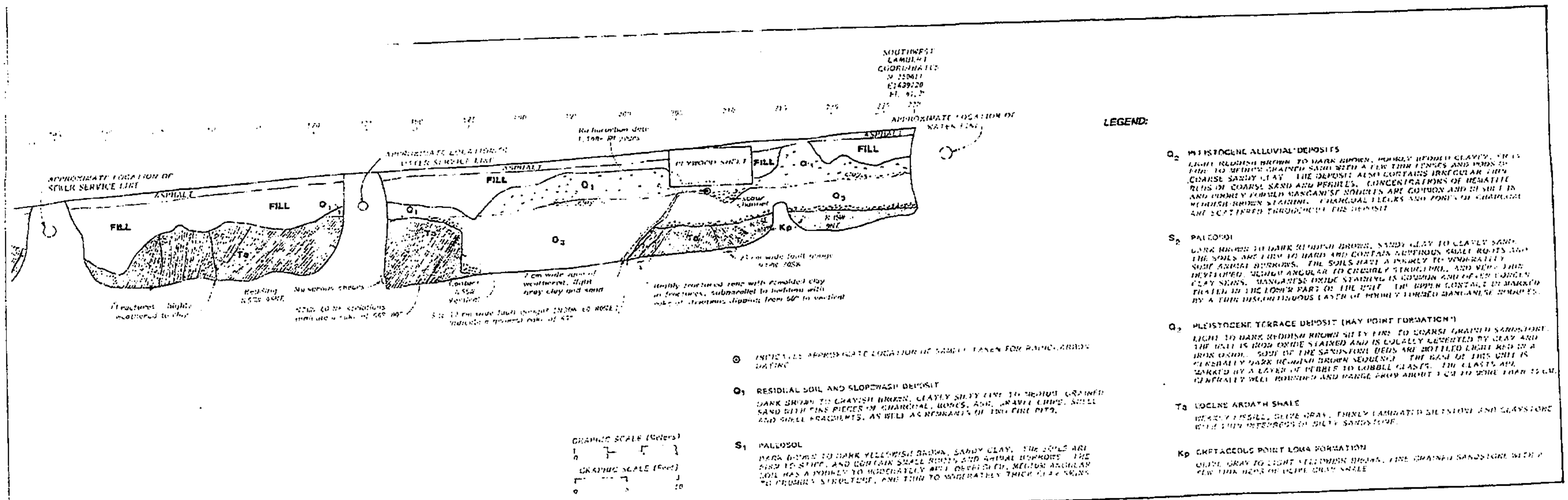
APPENDIX A

Log of Trench, Boring Locations, and
Logs of Test Borings



SOUTHWEST
APPROXIMATE LOCATION OF SEWER SERVICE LINE
APPROXIMATE LOCATION OF WATER LINE
ASPHALT
FILL
PLYWOOD SHELF
LEGEND:
PLEISTOCENE ALLUVIAL DEPOSITS
PALEOSOL
PLEISTOCENE TERRACE DEPOSIT (BAY POINT FORMATION?)
EOCENE ARDATH SHALE
CRETACEOUS POINT LOMA FORMATION
RESIDUAL SOIL AND SLOPEWASH DEPOSIT
GRAPHIC SCALE (Meters)
GRAPHIC SCALE (Feet)

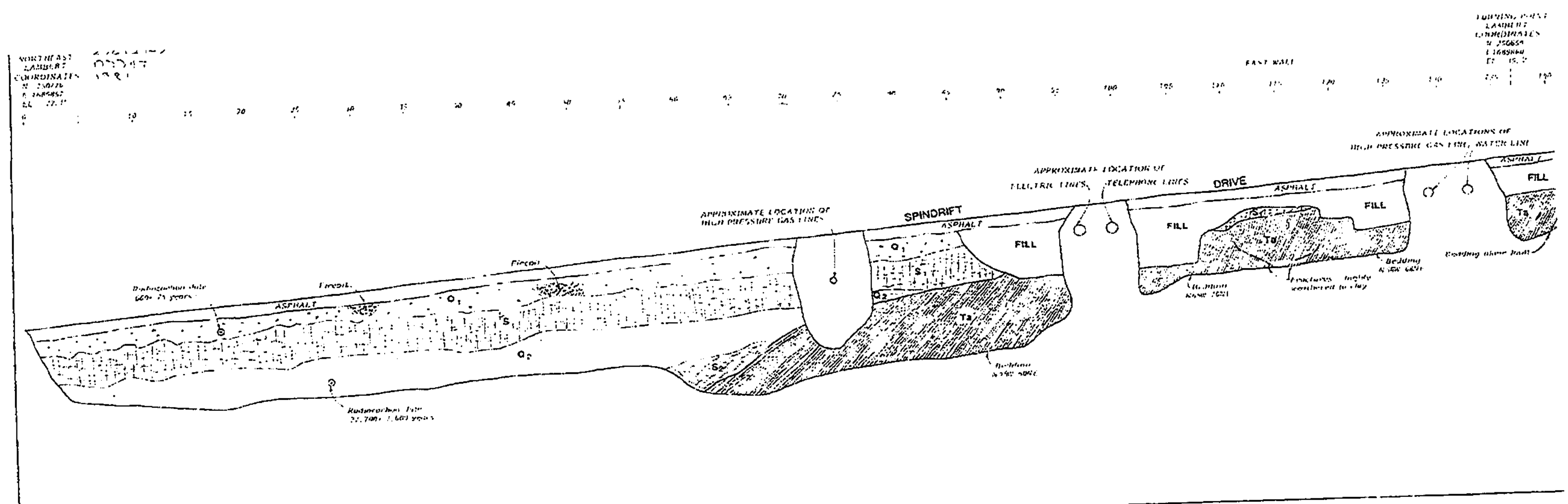


FIGURE A-1 ~ LOG OF TRENCH

Location

Boring Number

Elevation

DEPTH IN FEET	TEST DATA			*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
	*MC	*DD	*BC			
	12	110	65		1	Very dense, damp, brown silty sand (SM)
					2	

WATER LEVEL
At time of drilling or as indicated.

SOIL CLASSIFICATION
Soil Classifications are based on the Unified Soil Classification System and include color, moisture and consistency. Field descriptions have been modified to reflect results of laboratory analyses where appropriate.

DISTURBED SAMPLE LOCATION
Obtained by collecting the auger cuttings in a plastic or cloth bag.

DRIVE SAMPLE LOCATION
MODIFIED CALIFORNIA SAMPLER
Sample with recorded blows per foot was obtained with a Modified California drive sampler (2" inside diameter, 2.5" outside diameter) lined with sample tubes. The sampler was driven into the soil at the bottom of the hole with a 140 pound hammer falling 30 inches.

INDICATES SAMPLE TESTED FOR OTHER PROPERTIES
- GS – Grain Size Distribution
- LC – Laboratory Compaction Test
- PI – Atterberg Limits Test
- ST – Loaded Swell Test
- CC – Confined Compression Test
- CT – Consolidation Test
- UCS – Unconfined Compression Test
- SDS – Slow Direct Shear Test
- DS – Direct Shear Test
- TX – Triaxial Compression Test
- 'R' – R-Value

NOTE: In this column the results of these tests may be recorded where applicable.

BLOW COUNT
Number of blows needed to advance sampler one foot or as indicated.

DRY DENSITY
Pounds per Cubic Foot

MOISTURE CONTENT
Percent of Dry Weight

NOTES ON FIELD INVESTIGATION

1. REFUSAL indicates the inability to extend excavation practically with equipment being used in the investigation.

KEY TO LOGS

DRAWN BY: [illegible]	CHECKED BY: [illegible]	PROJECT NO: [illegible]	DATE: [illegible]	FIGURE NO: A-[illegible]

Boring 1

Approximate El. [illegible]

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						4" Asphalt Concrete
						Moist, dark brown silty sand FILL
5			8/6"		1-1	Stiff to very stiff, moist to wet, brown to grayish brown sandy clay (CL-CH), iron oxide staining PALEOSOL (S_1)
10			10/6"		1-2	Medium dense, wet to saturated, brown clayey to silty sand (SC-SM) PLEISTOCENE ALLUVIAL DEPOSITS (Q_2)
15			16/6"		1-3	
20			6/6"		1-4	Loose, saturated, light brown to light gray silty fine to medium sand (SM) PLEISTOCENE ALLUVIAL DEPOSITS (Q_2)
25			14/6"		1-5	Medium dense, saturated, gray to light brown silty fine to coarse sand (SW-SM) PLEISTOCENE ALLUVIAL DEPOSITS (Q_2)
30			15/6"		1-6	
						Bottom of Hole
35						
40						

DRAWN BY: [illegible]	CHECKED BY: [illegible]	PROJECT NO: [illegible]	DATE: [illegible]	FIGURE NO: [illegible]

DEPTH IN FEET	TEST DATA *MC	TEST DATA *DD	TEST DATA *BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						4" Asphalt Concrete
						Moist, dark brown silty sand FILL
5			10/6"		2-1	Stiff to very stiff, moist to wet, brown to grayish brown sandy clay (CL-CH) PALESOL (S_1)
10			9/6"		2-2	Medium dense, wet to saturated, light brown to gray silty fine to coarse sand (SM) PLEISTOCENE ALLUVIAL DEPOSITS (Q_2)
15			14/6"		2-3	
20			11/6"		2-4	
25			26/6"		2-5	Dense to very dense, saturated, light yellowish brown to light grayish brown, micaceous silty sanstone (SM) PLEISTOCENE ALLUVIAL DEPOSITS (Q_2)
30			50/2"*		2-6	*Gravel or cobble
						Bottom of Hole

DRAWN BY | CHECKED BY | PROJECT NO. | DATE | FIGURE NO.

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						5" Asphalt Concrete
						Moist, dark brown silty fine sand FILL
5			8/6"		3-1	Stiff to very stiff, moist, brown to grayish brown sandy clay (CL-CH) PALEOSOL (S_1)
10			6/6"		3-2	Medium dense, wet to saturated, light brown to gray silty fine to coarse sand (SM) PLEISTOCENE ALLUVIAL DEPOSITS (Q_2)
15			13/6"		3-3	
20			11/6"		3-4	
25			35/6"		3-5	Dense to very dense, saturated, yellowish brown to light grayish brown micaceous silty sandstone (SM) PLEISTOCENE ALLUVIAL DEPOSITS (Q_2)
30			50/6"		3-6	
35			[illegible]"		3-7	
			[illegible]		[illegible]	
40						

DRAWN BY: [illegible] | CHECKED BY: [illegible] | PROJECT NO: [illegible] | DATE [illegible] | FIGURE NO: [illegible]

Boring 3 (Continued)

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
			58		3-9	Dense to very dense, saturated, yellowish brown to light grayish brown micaceous silty sandstone (SM) PLEISTOCENE ALLUVIAL DEPOSITS (Q_2)
45						Bottom of Hole
50						
55						
60						
65						
70						

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Boring

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
0						4" Asphalt Concrete
						Moist, dark brown silty sand FILL
5			12/6"		4-1	Stiff to very stiff, moist, brown to grayish brown sandy clay (CL-CH) PALEOSOL (S_1)
10			14/6"		4-2	Very stiff to hard, moist, olive gray silty claystone to clayey siltstone (CL-ML) ARDATH SHALE (Ta) Yellowish brown iron oxide stains and manganese oxide stains along fractures. Steeply dipping, thinly bedding.
15			30/6"		4-3	
						Bottom of Hole

DRAWN BY [illegible] | CHECKED BY [illegible] | PROJECT NO. [illegible] | DATE: [illegible] | FIGURE NO: [illegible]

Boring 1

Approximate El. [illegible]

DEPTH IN FEET	TEST DATA *MC	TEST DATA *DD	TEST DATA *BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						6" Asphalt Concrete
						Moist, dark brown clayey silty sand FILL
5			20		5-1	Stiff to very stiff, moist, brown to grayish brown sandy clay (CL-CH) PALEOSOL (S_1)?
10			95		5-2	Very stiff to hard, moist, olive gray silty claystone to clayey siltstone (CL-ML) ARDATH SHALE (Ta) Yellowish brown iron oxide stains and manganese oxide stains along fractures and bedding planes. Steeply dipping
						Bottom of Hole
15						
20						
25						
30						
35						
40						

LOG OF TEST [illegible]

DRAWN BY	CHECKED BY [illegible]	PROJECT NO. [illegible]	DATE: [illegible]	FIGURE NO. [illegible]

Boring [illegible]

Approximate [illegible]

DEPTH IN FEET	TEST DATA *MC	TEST DATA *DD	TEST DATA *BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
0						4" Asphalt Concrete
						Medium dense, moist, light to dark reddish brown, silty fine to coarse sand (SM) PLEISTOCENE TERRACE DEPOSITS (Q_3)
5			24		6-1	Slightly clayey in the upper 2 to 3 feet
10			20		6-2	Medium dense, wet to saturated, light reddish brown silty fine to coarse sand (SM) PLEISTOCENE TERRACE DEPOSITS (Q_3)
15			86		6-3	Very dense, wet to saturated, light yellowish brown, micaceous silty fine to medium sandstone (SM) POINT LOMA FORMATION (Kp)
						With thin clayey siltstone interbeds
20			50/6"		6-4	
25			50/2"		6-5	Bottom of Hole
30						
35						
40						

[illegible]

[illegible]

DRAWN BY [illegible]	CHECKED BY [illegible]	PROJECT NO [illegible]	DATE [illegible]	FIGURE NO [illegible]

Boring 7

Approximate El. [illegible]

DEPTH IN FEET	TEST DATA *MC	TEST DATA *DD	TEST DATA *BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
0						4" Asphalt Concrete
						Medium dense, moist, light to dark reddish brown silty fine to coarse sand (SM) PLEISTOCENE TERRACE DEPOSITS (Q_3)
5			20		7-1	Slight clay content to about 4 feet
10			23		7-2	
						Very dense, moist to wet, yellowish brown micaceous silty fine to medium sand (SM) POINT LOMA FORMATION (Kp)
15			45/6"		7-3	
						Bottom of Hole

DRAWN BY | CHECKED BY | PROJECT NO. | DATE | FIGURE NO.

Approximate [illegible]

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						4" Asphalt Concrete
						Medium dense, moist, light to dark reddish brown silty fine to coarse sand (SM) PLEISTOCENE TERRACE DEPOSITS (Q_3) Clayey to about 3 feet
5			33		8-1	
10			39		8-2	
						Very dense, moist, to wet, yellowish brown micaceous silty fine to medium sand (SM) POINT LOMA FORMATION (Kp)
15			40/6"		8-3	
						Bottom of Hole
20						
25						
30						

LOG OF TEST BORING 8

DRAWN BY [illegible]	CHECKED BY [illegible]	PROJECT NO. [illegible]	DATE [illegible]	FIGURE NO. [illegible]

Boring 9

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						8" Asphalt Concrete
						Medium dense, moist, light to dark reddish brown silty fine to medium sand (SM) PLEISTOCENE TERRACE DEPOSITS (Q_3)
5			32		9-1	Light scattered gravels between 3½' to 4½'
						Scattered layer of gravels with cobbles at base
10			50/6"		9-2	Very dense, moist, yellowish brown silty fine to medium sand (SM) POINT LOMA FORMATION (Kp)
						Bottom of Hole
15						

Boring 10

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						8" Asphalt Concrete
						Medium dense, moist, brown silty to clayey fine to medium sand (SM) PLEISTOCENE SLOPEWASH ?
5			20		10-1	Clayey zones ?
						Very dense, moist, light yellowish brown micaceous silty fine to medium sand (SM) POINT LOMA FORMATION (Kp)
			50/[illegible]"		10-2	
						Bottom of Hole

DRAWN BY [illegible]	CHECKED BY [illegible]	PROJECT NO. [illegible]	DATE [illegible]	FIGURE NO. [illegible]

Boring 11

Approximate [illegible]

DEPTH IN FEET	TEST DATA *MC	TEST DATA *DD	TEST DATA *BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						7" Asphalt Concrete
						Medium dense to dense, moist, brown silty clayey medium sand (SM) OLDER PLEISTOCENE TERRACE DEPOSITS (Qt)
5			50		11-1	Dense, moist, brown silty fine to coarse sand (SM) traces of white carbonate material ($CaCO_3$) OLDER PLEISTOCENE TERRACE DEPOSITS (Qt) Coarse clean sand from 6' to 7'
10			50/6"		11-2	Very dense, moist, yellowish brown, micaceous silty fine to medium sand (SM) POINT LOMA FORMATION (Kp) With thin clayey silt layers
15			60/6"		11-3	
						Bottom of Hole
20						
25						
30						
35						
40						

DRAWN BY [illegible] | CHECKED BY [illegible] | PROJECT NO. [illegible] | DATE [illegible] | FIGURE NO. [illegible]

Boring 12

Approximate El. 71'

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
0						6" Asphalt Concrete
						Dense, moist, brown silty clayey medium sand (SM) OLDER PLEISTOCENE TERRACE DEPOSIT (Qt)
5			42		12-1	Dense, moist, brown silty fine to coarse sand (SM) OLDER PLEISTOCENE TERRACE DEPOSITS (Qt) Traces of white carbonate material ($CaCO_2$) Clean coarse sand
10			88		12-2	Very dense, moist, light yellowish brown micaceous silty fine to medium sand (SM) POINT LOMA FORMATION
15			60/6"		12-3	
						Bottom of Hole
20						
25						
30						
35						
40						

*For description of symbols, see Figure A-2

LOG OF TEST BORING 12

DRAWN BY: mrk	CHECKED BY: DS	PROJECT NO: 501351-GE03	DATE: 10-2-81	FIGURE NO: A-14

Boring 13

Approximate El. 74'

DEPTH IN FEET	TEST DATA *MC	*DD	*BC	*OTHER TESTS	SAMPLE NUMBER	SOIL DESCRIPTION
						7" Asphalt Concrete
						Medium dense, moist, brown silty clayey fine to medium sand (SM) OLDER PLEISTOCENE TERRACE DEPOSITS (Qt)
5			26		13-1	
10			37		13-2	Dense, moist, brown silty fine to coarse sand (SM) with traces of white carbonite material ($CaCO_3$) OLDER PLEISTOCENE TERRACE DEPOSITS (Qt)
						← Clean coarse sand
15			50/6"		13-3	Very dense, moist, light yellowish brown micaceous silty fine to medium sand (SM) POINT LOMA FORMATION (Kp)
						Bottom of Hole
20						
25						
30						
35						
40						

*For description of symbols, see Figure A-2

LOG OF TEST BORING 13

DRAWN BY: mrk	CHECKED BY: DS	PROJECT NO: 501351-GE03	DATE: 10-2-81	FIGURE NO: A-15

RESPONSE TO PROJECT ISSUES WITH REVISED DESIGN
MAY 27, 2026

VM – Paso Real LLC
c/o Alfonso Barragan
Safdie Rabines Architects
925 Fort Stockton Dr.
San Diego, CA 92103

May 27, 2026
File No. 25-0501.1

Subject: **DSD – Geology Project Issues Report**
Moradi Residence
1835 Spindrift Drive
La Jolla, CA 92037

Dear Mr. Barragan:

In accordance with your request, Geowest Consultants, Inc. (GCI) has prepared the following responses to the review comments generated by DSD-Geology. It is our opinion that the responses provided herein adequately address the issues raised.

CITY DSD GEOLOGY REVIEW COMMENT:

It is the understanding of this reviewer that Geowest Consultants has received a document from the Law Office of Julie Hamilton dated March 13, 2026, that contained a Third-party review Letter by Engeo, dated March 2, 2026. The third-party review letter indicated that a review of the Geowest and Terrapacific geotechnical documents was performed for conformance with the requirements of the City of San Diego and generally accepted standards of care for investigation and evaluation of fault hazard surface rupture zones in San Diego. Engeo discussed several issues with the Geowest and Terrapacific geotechnical documents and stated that the reports have not been completed in general conformance with the City and State guidelines addressing fault-rupture hazards. In addition, Engeo concluded that subsurface exploration data is not sufficient to determine whether or not the site is crossed by active or potentially active faulting capable of creating surface rupture. Please provide a detailed response to each issue within Engeo’s third-party review letter. Note that the response may require additional subsurface information, surrounding data and geotechnical mapping.

GCI Response:

Before addressing Engeo's specific technical comments, it is essential to establish the correct regulatory framework that applies to this project, because Engeo's review applies a standard of scrutiny that is inconsistent with both State law and the City's own guidelines as they pertain to this type of project.

State of California Requirements for Single-Family Residences

The primary State regulatory framework governing fault investigations is the Alquist-Priolo Earthquake Fault Zoning Act (AP Act), codified in California Public Resources Code Section 2621 et seq. The AP Act prohibits the construction of structures intended for human occupancy across the trace of an active fault within officially designated Earthquake Fault Zones and typically requires a 50-foot minimum structural setback from a confirmed active fault trace.

However, the AP Act contains an explicit and directly applicable exemption. Under California Public Resources Code Section 2621.5, and as reflected in California Geological Survey Special Publication 42, single-family wood-frame and steel-frame structures of two stories or less are exempt from the AP Act's requirements, provided they are not part of a development of four or more units.

The proposed residence at 1835 Spindrift Drive is a single-family home. Under State law, even if this site were located within a designated Alquist-Priolo Earthquake Fault Zone — which based on the fault maps issued by the California Geological Survey it is not — the State of California would not mandate a fault investigation or structural setback for this structure. The fault investigation requirement for this project derives entirely from the City of San Diego's own local requirements under the Seismic Safety Study Zone 12 designation and Information Bulletin 515, not from State law. The City has chosen to impose a more conservative local standard than the State requires for single-family homes, which is within the City's authority. However, this means the applicable standard is the City's Appendix D guidelines, evaluated with the flexibility those guidelines themselves require, and applied appropriately to a Zone 12 site.

Updated San Diego Municipal Code – April 2026

The City's updated Municipal Code §145.1803 which went into effect in April 2026, independently confirms that the level of investigation Engeo describes is inconsistent with the regulatory standard applicable to this project. The Investigation Is Waivable Under the Updated Municipal Code. The updated San Diego Municipal Code §145.1803(b)(3) authorizes the Building Official to waive the geotechnical investigation requirement entirely for residential buildings not located within an Alquist-Priolo Earthquake Fault Zone (Category 11) when three conditions are met: the dwelling is classified as Group R-3 occupancy; it is not more than three stories in height or two stories plus one basement story; and it is not part of a development of four or more dwellings. The proposed residence at 1835 Spindrift Drive satisfies all three conditions. It is not within an AP Zone. It is a single-family Group R-3 dwelling. It is not part of a multi-unit development.

This mirrors the State exemption under California Public Resources Code §2621.5 discussed above, but it operates independently at the local level. Under the City's own Municipal Code, the Building Official has full authority to waive the investigation requirement for this project without any fault study being performed at all. That the investigation was conducted anyway — and conducted thoroughly — is a further demonstration that the applicable standard has been met and exceeded.

The Updated Municipal Code Provides a Recognized Alternative: Notice of Geologic Conditions

San Diego Municipal Code §145.1803(a)(3) expressly authorizes the Building Official to require a recorded "Notice of Geologic and Geotechnical Conditions" as a condition of permit issuance in cases where a geologic investigation cannot conclusively establish safety or where a geologic hazard is suspected. This provision exists precisely to address situations where additional fieldwork is not warranted but where the City wishes to ensure that future owners are informed of site conditions. It is a recognized, codified middle-ground mechanism that the City uses routinely.

To the extent any residual uncertainty remains after the thorough investigation that has been completed, the appropriate regulatory response under the Municipal Code is a recorded Notice — not the additional subsurface exploration program Engeo recommends. Engeo's recommendation for further fieldwork goes beyond what any applicable authority — State law, City Appendix D guidelines, or the Municipal Code — requires for a single-family residence on a Category 12 site. If the City seeks additional protection, §145.1803(a)(3) provides an appropriate means to obtain it.

City of San Diego Zone Classification — Zone 12, Not Zone 11

The City of San Diego Seismic Safety Study establishes two relevant fault hazard categories:

Zone 11 identifies faults with proven surface rupture within the last 11,000 years (Holocene time). These are confirmed active faults subject to the full requirements of the AP Act, including mandatory 50-foot structural setbacks and the most rigorous level of fault investigation per both Special Publication 42 and City Appendix D guidelines.

Zone 12 — which is the designation that applies to this site — identifies areas where a fault may exist but where its age and activity level are uncertain. It does not mean an active fault is present. It means the question needs to be investigated and answered. A fault rupture hazard investigation per Appendix D is required, but the regulatory standard and setback implications are materially less stringent than Zone 11 because active Holocene faulting has not been established.

The subject property at 1835 Spindrift Drive is located in Zone 12, not Zone 11. It is not within an Alquist-Priolo Earthquake Fault Zone. The nearest confirmed active portion of the Rose Canyon Fault Zone is approximately 600 feet away. The entire purpose of the fault investigation required for this site is to determine whether a hazardous fault actually crosses the property. The referenced geotechnical investigation concludes it does not.

Engeo's review references Holocene activity on the Mount Soledad Fault segment and paleoseismic data from distant locations in terms that suggest this site faces an active fault hazard comparable to a Zone 11 or AP Act designation. This framing significantly overstates the applicable regulatory standard for a single-family residence on a Zone 12 site. Under State law no fault investigation is required at all for this type of structure. Under the City's more conservative local standard, an investigation has been completed, and it has produced a well-supported professional opinion that no active or potentially active fault crosses the property.

Reading State law, the City's Appendix D guidelines, and the updated Municipal Code together, a consistent and coherent regulatory picture emerges: the investigation requirement for this single-family home is waivable under both State and local law; a thorough investigation has been completed and has produced a clear professional opinion that no active or potentially active fault crosses the property; and any residual concern can be appropriately addressed through a recorded Notice of Geologic Conditions, not additional fieldwork. Engeo's review does not reflect this framework. The applicable standard has been met.

GEOWEST RESPONSES TO ENGEO COMMENTS:

Engeo claims the TerraPacific/Geowest report does not conform to the City's Appendix D Technical Guidelines for Fault-Rupture Hazard Reports.

The investigations meet the City's Appendix D Guidelines. The City's own Appendix D states clearly: "Not all checklist items will be applicable to every site or every project, but the investigative scope needs to be commensurate with the attributes of the intended use and the physical constraints of the site. No provision in these guidelines is mandatory." Engeo is treating the guidelines as a strict mandatory requirement, which is inconsistent with how the guidelines are written and inconsistent with the flexibility the guidelines expressly provide.

More importantly, the same concerns Engeo raises were already raised by the City's own DSD-Geology reviewers in the Project Issues Report. Those comments — including Comments 76, 77, and 78 regarding fault investigation adequacy — were directly and fully responded to by (GCI) in our June 23, 2025 letter. Upon review of this letter DSD Geology approved the investigation.

Engeo criticizes the boring spacing, depth, and sampling intervals, claiming they do not meet Appendix D Section B.2.b.ii, which calls for borings spaced 10 to 15 feet apart, logged in detail like a fault trench, and deep enough to expose the geologic features used to support conclusions.

The investigation met these requirements in the context of this Zone 12 single-family residential site:

Six borings were drilled across the property, oriented perpendicular to the suspected fault trend as required by Appendix D. The borings were continuously logged within the Old Paralic Deposits, Unit 6 — the Quaternary-aged marine terrace deposits approximately 120,000 years old that are the relevant stratigraphic unit for this fault study. The boring logs include Munsell color notations and detailed lithologic descriptions, consistent with the Appendix D requirement to log borings in detail similar to a fault trench.

GCI's updated Cross Section C-C' correlates four distinct, unbroken marker beds across multiple borings with no offset, no gouge, no breccia, and no slickensides — the specific fault indicators called out in Appendix D. This cross section also incorporates boring data from the 1981 Woodward-Clyde investigation conducted directly in front of the property along Spindrift Drive, extending the effective coverage of the cross section beyond the lot boundaries.

Regarding boring depth, Appendix D requires borings to be "deep enough to expose the geologic features used to support conclusions" — not deep enough to reach any particular formation regardless of the geologic question at hand. The conclusions here are based on the Old Paralic Deposits marker beds, which were encountered in all six borings at depths between 3.5 and 6.5 feet below grade. Engeo's suggestion that borings must reach the underlying pre-Quaternary Point Loma Formation is not required by Appendix D and would not meaningfully advance the fault rupture hazard evaluation for a Zone 12 site. The relevant question is whether Quaternary-aged units show evidence of displacement — and four continuous, unbroken marker beds within those units demonstrate they do not.

Engeo suggests that because the site may have been graded before 1928 — earlier than the 1953 aerial photo reviewed by TerraPacific — any surface expression of faulting would have been removed, requiring more detailed subsurface work.

Appendix D requires review of aerial photographs to look for surface features suggestive of faulting, but the fault hazard conclusion here does not rest on surface observations. It rests on subsurface data. Whether the site was graded in 1928 or 1953 does not affect the integrity of the boring data or the marker bed correlations.

Appendix D also requires a thorough search of City records for fault investigation reports in the site vicinity. That requirement was comprehensively satisfied. GCI's response incorporates data from three investigations on immediately surrounding properties:

The 1981 Woodward-Clyde fault investigation — a formal fault rupture hazard study sponsored by the U.S. Geological Survey — was conducted along Spindrift Drive directly in front of and west of the subject lot before any current site development, and found no Quaternary-aged faulting. The 2021 Geotechnical Exploration Inc. investigation for the property immediately to the north found no fault offset. The 2017 Geosoils investigation for the property directly across the street also found no fault offset. The 2021 GEI study additionally included bluff mapping across four adjacent lots and found no offset between the paralic deposits and underlying bedrock.

This surrounding data covers multiple directions and spans over four decades of investigation. It is entirely consistent with the site-specific findings and substantially reinforces the conclusion that no active or potentially active fault crosses the subject property.

Engeo states that borings should have been drilled at least 10 feet below the proposed excavation bottom to support shoring design, and that the potential for seismically fractured soils near the surface creates excavation stability risks.

Shoring design is addressed in the geotechnical investigation report, not in the fault rupture hazard study, and the Appendix D boring depth requirement applies to the fault study specifically. The TerraPacific report provides complete shoring design parameters including an allowable bearing capacity of 7,000 psf for temporary soldier pile shoring, minimum pile embedment of 5 feet into competent native soil, active earth pressure of 35 psf/ft, and passive resistance of 350 psf/ft in competent bedrock. These parameters are based on well-characterized subsurface conditions encountered in all six borings and are consistent with standard practice for projects of this type in San Diego.

The site soils are medium dense to dense sandstone beginning at shallow depths, and groundwater was not encountered in any boring to the depths explored — favorable conditions for excavation and shoring.

Engeo's concern about seismically fractured soils is speculative. It presupposes the existence of faulting that no investigation — at this site or on any of the surrounding properties — has actually identified. The four continuous, unbroken marker beds documented in GCI's cross section with no offset, gouge, breccia, or slickensides directly contradict the premise that near-surface soils here have been seismically disturbed. This concern is particularly overstated for a Zone 12 single-family residential site where the State of California does not even require a fault investigation.

Engeo states that boring locations should have been surveyed for accurate elevations and positions.

GCI's updated Cross Section C-C' plots all boring locations and their elevations in feet above mean sea level, referenced to the site topography shown on the project plans. Four marker beds are correlated across all borings on a consistent vertical scale ranging from approximately elevation 40 to 110 feet MSL. The 1981 Woodward-Clyde boring WC B-12 is documented at an established elevation of approximately 71 feet MSL, providing an independent elevation reference that anchors the cross section at the western boundary of the site. The stratigraphic correlations are internally consistent across all data points and fully satisfy the Appendix D requirement for geologic cross sections illustrating subsurface conditions and unit correlations between borings.

Engeo states the TerraPacific study "lacks sufficient data to make a conclusion."

Appendix D Section C.5.a requires "an explicit professional opinion regarding the existence or absence of active faults or potentially active faults on the site." That opinion has been provided. GCI's June 23, 2025 letter states directly: "It is our professional opinion that the site is not transected by active or potentially active faults." This opinion is issued under the seals of a licensed Certified Engineering Geologist and Geotechnical Engineer, is supported by the full body of site-specific and surrounding investigation data, and directly resolves the Zone 12 designation. The investigation has answered the regulatory question that Zone 12 requires to be answered, and the answer is that no active or potentially active fault crosses this site. No structural setback is required.

It bears repeating that under State law, this level of investigation was never required for this single-family residence in the first place. The fact that a thorough investigation has been completed, peer-reviewed by DSD-Geology, supplemented by the Geotechnical Consultant of Record, and has produced a clear professional opinion represents a standard of care that exceeds what State law demands for this structure type.

Engeo recommends trenching or borings at 5 to 10 foot spacing extended to the Point Loma Formation across the entire site.

Appendix D states that trenching is the preferred method but that borings are an acceptable alternative "at sites where trenching is not feasible." It also states that the investigative scope must be "commensurate with the attributes of the intended use and the physical constraints of the site."

This is a developed residential lot in an established urban neighborhood with underground utilities, structures on adjacent properties at or near the property lines, and the physical constraints of a constrained urban site. Trenching across the fault trend is not practicable under these conditions. The use of borings as an alternative is explicitly permitted by the guidelines.

The investigation has already provided what additional work would be intended to demonstrate — continuous correlation of unbroken marker beds perpendicular to the fault trend with no evidence of displacement. When the six site borings are considered alongside four surrounding investigations and the 1981 Woodward-Clyde fault study data, the coverage is thorough and the findings are consistent across all data sources. Additional trenching or borings are not warranted for a Zone 12 single-family residential site where the existing data clearly and consistently demonstrates the absence of fault displacement. The investigative scope is commensurate with the intended use, the physical constraints of the site, and the Zone 12 designation — fully consistent with Appendix D Section A.1.

Engeo characterizes the recommendation to conduct geologic mapping during basement excavation as a "poor method," arguing that discovering faulting at that stage would be too late.

Construction-phase geologic observation by a licensed geologist is a standard and widely accepted condition of approval throughout San Diego County for projects near fault zones. It does not substitute for the pre-construction investigation — it supplements a pre-construction investigation that has already produced a well-supported professional opinion that no active or potentially active fault crosses the site. The recommendation to observe the basement excavation is a prudent confirmation step, not an acknowledgment that faulting is expected.

For a Zone 12 single-family residential site — where the State of California imposes no fault investigation requirement at all, and where the City's local investigation requirement has been fully satisfied — this combined approach of thorough pre-construction investigation plus licensed geologist observation during excavation is entirely appropriate and consistent with standard practice and the City's own guidelines. Engeo's characterization of this standard and prudent condition as inadequate is not supported by the applicable guidelines, State law, the Municipal Code, or professional practice standards for this type and scale of project.

GEOWEST RESPONSES TO DSD GEOLOGY COMMENTS:

DSD GEOLOGY COMMENT 133:

The Owner/Permittee shall submit an interim as-graded geotechnical report that presents the results of detailed geologic mapping/logging of the entire basement excavation to demonstrate the lack of faults crossing the site prior to building inspection of foundation excavations. The interim as-graded geotechnical report shall be reviewed for adequacy by the Geology Section of Development Services.

GCI Response: GCI agrees with this requirement and can provide these services during the construction phase of the project.

DSD GEOLOGY COMMENT 134:

Prior to the issuance of any construction permits (either grading or building), the Owner/Permittee shall submit a geotechnical investigation report and a fault-hazard report or an update letter prepared in accordance with the City's "Guidelines for Geotechnical Reports," which specifically address the proposed construction plans. The geotechnical investigation report or update letter shall be reviewed for adequacy by the Geology Section of the Development Services Department prior to issuance of any construction permits.

GCI Response: This document is intended to serve as the requested update letter. The project as referenced, has been updated with a reduced structural footprint and increased property line setbacks. It is our opinion that the site is suitable for the proposed construction from a geotechnical perspective. The opinions, conclusions and recommendations provided in the referenced geotechnical documents remain valid and applicable to the new design.

We appreciate the opportunity to be of service. If you should have any questions or comments regarding this report or our findings, please contact our office.

Sincerely,
Geowest Consultants, Inc.

Cristopher C. O'Hern, CEG 2397
Engineering Geologist

REGISTERED PROFESSIONAL GEOLOGIST CRISTOPHER C. O'HERN No. 2397 EXP. 10/31/27 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

Octavio Brambila, GE 3259
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Ec: Alfonso Barragan <alfonso@safdierabines.com>

REFERENCES

1) California Public Resources Code Section 2621.5; California Geological Survey Special Publication 42.

2) California Geological Survey, Earthquake Zones of Required Investigation, EqZapp website.

3) City of San Diego Guidelines for Geotechnical Reports, Appendix D — Technical Guidelines for Fault-Rupture Hazard Reports (2018).

4) City of San Diego Seismic Safety Study Geologic Hazards and Fault Maps;

5) DSD Response 1835 Spindrift Dr., La Jolla, CA 92037, February 4, 2024, by TerraPacific.

6) DSD Response, 1835 Spindrift Dr., La Jolla, CA 92037, June 23, 2025, by Geowest.

7) Engeo, Third-Party Review, 1835 Spindrift Dr., La Jolla, CA, March 2, 2026.

8) Geotechnical Investigation, 1835 Spindrift Drive, La Jolla, CA 92037, September 9, 2024 by TerraPacific

9) Project Plans, Moradi Residence, 1835 Spindrift Drive, La Jolla, CA 92037, April 3, 2026, by Safdie Rabines Architects.

10) San Diego Municipal Code §145.1803, April 2026.