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SOIL INVESTIGATION REPORT



March 18, 2026:

APN's: 596-061-63-00 and 596-061-62-00
13755 CALLE DEL SOL
JAMUL CALIFORNIA 91935

Ziad Bayasi



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Mr. & Mrs. Goycoochea

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RE: SOIL INVESTIGATION REPORT

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13755 CALLE DEL SOL

JAMUL CALIFORNIA 91935

Dear Mr. & Mrs. Goycoochea:

Pursuant to your request, Bayasi Engineering has prepared the attached Soil Investigation for the Proposed Single-Family Residence at APN(s): 596-061-63-00 and 596-061-62-00, 13755 Calle Del Sol, in the City of Jamul, California. This investigation was performed in general accordance with Bayasi Engineering standard protocol for soil investigations. The objective of the soil investigation is to assess the soil conditions underlying the site and make recommendations for design and construction of the Proposed Single-Family Residence and driveway at APN's: 596-061-63-00 and 596-061-62-00 AKA: 13755 Calle Del Sol Jamul California. Based upon the results of this investigation, the on-site soils are considered suitable for support of the proposed single-family residence, provided that the recommendations presented herein are implemented in the design and construction of the project.

The complete findings of this investigation and recommendations for site development are presented in the attached report. It is our pleasure to be of service to you and we look forward to providing you with future engineering services. Should you have any questions regarding the information contained in the attached report, please contact the undersigned at your convenience.

Respectfully submitted,

Ziad Bayasi

Ziad Bayasi

Bayasi Engineering

Principal

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1 Introductory Information

1.1 Authorization and Limitations

This report presents the results of a soil investigation performed at the request of Mr. & Mrs. Goycoochea, owner of 13755 Calle Del Sol, Jamul CA 91935. This report is prepared for the purpose of construction of a proposed single-family residence (SFR) and driveway at APN's: 596-061-63-00 and 596-061-62-00. This report has been prepared for the design consultants to be used solely in the design of the proposed project, as described above. The report may not contain sufficient information for other uses or the purposes of other parties.

1.2 Purpose

This report is prepared to fulfill the requirement of a building permit at the subject site:

13755 Calle Del Sol
Jamul, CA 91935
APN's: 596-061-63-00 and 596-061-62-00

That encompasses the construction of a Proposed SFR and Driveway at 13755 Calle Del Sol.

1.3 Site Description

The subject site is located at 13755 Calle Del Sol, Jamul, California 91935, within the unincorporated community of Jamul, County of San Diego. The property is identified as Assessor's Parcel Numbers 596-061-63-00 and 596-061-62-00 and based on the project plans, encompasses approximately 206,910 square feet (4.75 acres). The plans indicate the proposed development consists of a new 4,079-square-foot two-story single-family residence with an attached three-car garage, approximately 2,578 square feet of lower-level storage, and associated deck and site improvements.

Access to the site is obtained from Vista Diego Road via Calle Del Sol, which serves the surrounding rural-residential development. Based on the site layout and field description provided, the subject parcel is situated to the rear of the existing residence at 13759 Calle Del Sol and is reached by way of a descending access driveway. The driveway serving the site is understood to partially traverse a separate parcel identified as APN 596-061-62-00 before reaching the subject property. Along this access route, the residence at 13759 Calle Del Sol lies generally to the left, while a fence of approximately 4 feet in height borders portions of the right side. The overall neighborhood appears to consist of custom residential homes developed on relatively large hillside lots in the Jamul area. Nearby public real estate/map sources also show 13759 Calle Del Sol as an adjacent developed residential property and identify 13755 Calle Del Sol as a 4.75-acre lot, which is consistent with the project plans.

The site is presently characterized as a largely undeveloped hillside parcel with native and ornamental vegetation distributed throughout the access corridor and building area. Based on the field information provided, surface cover along the driveway and onsite areas includes grass, scattered trees, low vegetation, and localized rock outcrops/rock fragments. Vegetation is present along both sides of the access drive, with several trees observed along the left side while descending toward the property. The general character of the parcel is consistent with a semi-rural Jamul homesite, with natural ground and vegetation extending over much of the lot. This is also consistent with listing/map sources that identify the property as a land parcel rather than an already developed homesite.

Based on the grading and site plan information, the parcel exhibits significant topographic relief typical of hillside terrain. Contours shown on the plans range from approximately Elevation 1215 feet to 1325 feet across the parcel, while the ground within 5 feet of the proposed residence ranges from approximately Elevation 1266'-4" at the low point to Elevation 1287'-6" at the high point, indicating about 21 feet of relief in the immediate building vicinity. The proposed homesite is therefore situated on sloping terrain rather than on a naturally level pad. The plans also show a proposed pervious/paver driveway, a fire-vehicle turnaround, planter areas, and associated site improvements integrated into the hillside setting.

In summary, the subject property consists of a large rural-residential hillside parcel accessed by a descending private drive from Calle Del Sol, with adjacent residential development near the frontage and more open, vegetated terrain across the remainder of the site. The parcel is characterized by natural vegetation, isolated trees, surface rock, and sloping topography, with the proposed residence located on the interior portion of the lot behind the neighboring home at 13759 Calle Del Sol. From a geotechnical standpoint, the site should be considered a sloping hillside residential development site where earthwork, drainage control, foundation support, and any cut/fill transitions will be important design and construction considerations.

1.4 Proposed Development

The design and construction of the Proposed SFR and Driveway is feasible if the following recommendations of this report are followed.

1.5 Scope of Investigation

Soil design parameters and recommendations for the proposed development are determined based on site soil investigation, review of the available literature.

2 Geologic/Geotechnical Site Conditions

The subject property is located in the Peninsular Ranges geomorphic province. The northwesterly trending mountain ranges of this province generally consist of Jurassic metamorphic rocks intruded by Cretaceous igneous rocks. During the past approximately 54 million years, the coastal and inland flanks of these mountainous areas have undergone several episodes of uplift, erosion, and localized sediment deposition. This has resulted in a complex geologic environment characterized by shallow residual soils overlying granitic bedrock.

Based on available geologic mapping and regional geologic literature, the site is underlain by Mesozoic-age plutonic rocks consisting primarily of granite, quartz monzonite, granodiorite, and quartz diorite. These materials are typically hard, crystalline, and well indurated at depth but may weather near the surface into decomposed granite (DG). The presence of decomposed granite encountered during field exploration is consistent with the weathering profile of these underlying bedrock formations.

Based on: “Soil Survey Geographic (SSURGO) database for San Diego County, California, USA,” the site is underlain by **Cieneba very rocky coarse sandy loam (CmrG)**, 30 to 75 percent slopes, typically light brown to brown in color. Cieneba soils generally consist of coarse sandy materials with a high percentage of rock fragments derived from granitic parent material. These soils are typically shallow, well-drained, and exhibit rapid runoff characteristics due to the steep terrain and coarse-grained nature. The soils are classified as not prime farmland. Depth to bedrock is typically shallow and may occur within a few feet of the ground surface.

The findings of this soil investigation are generally consistent with the above-described geologic and soil literature. Subsurface soils encountered within the explored depths from approximately 0.5 feet to 5 feet below ground surface consist of silty sand underlain by decomposed granite. Near the surface (approximately 0.5 feet), the soil consists of light to greyish-brown silty sand with trace organics, representing topsoil. At approximately 2 feet, the soil transitions to light brown to tan silty sand with scattered subangular gravel, classified as **SM (Silty Sand)**, exhibiting a loose to medium dense condition and dry to slightly moist moisture content. With increasing depth to approximately 4 feet, the soil becomes reddish-brown to dark brown silty sand with increased fines content, medium dense consistency, and slightly moist to moist conditions, indicating a more structured and cohesive material.

At approximately 5 feet, the soils transition to decomposed granite (DG), consisting of dense granular sand with gravel and occasional cobble-sized rock fragments. This material is light brown to tan, slightly moist, and very dense, exhibiting significant resistance to excavation. In Borings 3 and 4, decomposed granite was encountered at shallower depths of approximately 2 feet, indicating variable depth to weathered bedrock across the site. Boring termination at approximately 5 feet was due to excavation difficulty associated with the dense DG material.

Based on field observations, the near-surface soils exhibit low expansion potential and are predominantly non-plastic granular materials. Thickness of this upper layer varies from 6 inches to 2 feet depending on the location of the boring. The shallow presence of dense decomposed granite and underlying plutonic bedrock is characteristic of Jamul area geology and contributes to increased bearing capacity but may present excavation challenges. Based on the results of this investigation, the on-site soils are considered generally suitable for support of the proposed development, provided that the recommendations of this geotechnical report are followed.

3 Geologic/Geotechnical Analysis

The geologic/ geotechnical analysis for this site included:

- Review of the available literature
- Site visit and observation of existing conditions
- Soil subsurface exploration
- Analysis of soil samples

The site is located at **13755 Calle Del Sol** within the unincorporated area of Jamul, County of San Diego, California, in a predominantly residential, semi-rural setting characterized by sloping terrain. The parcel is developed with an existing single-family residence. The site generally consists of natural ground with localized landscaped areas and native vegetation. Surface conditions include a combination of exposed soil and partially improved access areas. The site topography is variable, with moderate to steep slopes typical of the Jamul area, and localized elevation changes surrounding the structure.

The subsurface soils encountered at the site appeared generally consistent within the explored depths of approximately 0.5 feet to 5 feet below ground surface. The soil profile consists of near-surface silty sand underlain by progressively denser granular materials transitioning into decomposed granite. At shallow depths (approximately 0.5 feet), the soils consist of light to greyish-brown silty sand with trace organics representing topsoil. At approximately 2 feet, the soils consist of light brown to tan silty sand with scattered subangular gravel, classified as **SM (Silty Sand)**, exhibiting a loose to medium dense condition and dry to slightly moist moisture content. With increasing depth to approximately 4 feet, the soils transition to reddish-brown to dark brown silty sand with increased fines content, medium dense consistency, and slightly moist to moist conditions, indicating a more structured and cohesive material.

At approximately 5 feet, the soils transition to decomposed granite (DG), consisting of dense granular sand with gravel and occasional cobble-sized rock fragments. The material is very dense, slightly moist, and exhibits significant resistance to excavation, resulting in termination of the boring at this depth. In additional borings (Borings 3 and 4), decomposed granite was encountered at shallower depths of approximately 2 feet below ground surface, indicating variability in depth to weathered bedrock across the site. No clayey soils, saturated conditions, or groundwater were encountered during the subsurface exploration.

Based on field observations, the on-site soils are predominantly granular, non-plastic, and exhibit low expansion potential. The presence of shallow decomposed granite derived from underlying Mesozoic plutonic bedrock is consistent with regional geologic conditions and contributes to favorable bearing characteristics. However, the dense nature of the material may present moderate to high excavation effort. Based on the results of this investigation, the on-site soils are considered generally suitable for support of development, provided that site preparation,

excavation, and construction are performed in accordance with the recommendations of this geotechnical report.

4 Conclusions and Recommendations

This report concludes that the soil conditions at the site are suitable for the proposed development provided that the recommendations of this report are followed:

Loose top soil layer shall be removed and recompact. All replaced or fill material shall be compacted to 90% relative density in 6-8" lifts based on ASTM D1557, Soil Engineer to approve and inspect compaction of said material. Foundation shall be placed on competent soil. Soil Engineer to approve depth of excavation to competent soil. With the above recommendations in mind, the following parameters are recommended for the foundations at the above site:

Footing:

Allowable Soil Bearing Pressure, $q_{all} = 2,000$ psf to increase 500 psf per ft increase in depth > 3ft and width >3 ft (not to exceed 4,000 psf)

Minimum footing depth = 18 inch below ground surface (bgs)

Minimum footing width = 15 inch

Minimum footing reinforcement 2#4 T&B with #4 Tie@3'O.C.

Footing must be placed on competent soil (soil engineer to inspect)

Design Conditions:

- Footings shall have adequate horizontal reinforcement to substantially reduce any potential shrinkage cracks that may compromise water proofing.
- Footing water proofing shall be made of flexible membrane that can bridge shrinkage cracks resulting in no compromise to the water proofing system.
- Temporary excavation shall be sloped 1/2 to 1 and observed by soils engineer
- Although not anticipated, based on the available data, if temporary slopes conflict with property boundaries, shoring or alternating slot excavations may be necessary
- Foundation excavation shall be inspected by soils engineer

Concrete:

It is recommended that type V low alkali Portland cement with pozzolan with $w/c \leq 0.50$ be used for foundation construction.

Storm Water Management:

The site in question is not subject to inundation. It is important to divert surface water away from the proposed footing using a suitable storm management procedure not the subject of this report.

Slopes:

1. Slope Criteria Earth slopes shall confirm to the following criteria:
 - a. For slopes 7.0 feet high or less, maximum slope should not exceed 1.5:1 (h:v)
 - b. For slopes greater than 7.0 feet high, maximum slope should not exceed 2:1 (h:v).Steeper slopes may be approved subject to a soils engineer's approval.
2. Slopes shall be benched with steps equal to slope angle prior to formation. All slopes shall be protected from erosion.

3. Means of Erosion Control The means of erosion control shall be specified on the grading plan and shall be reviewed and approved by the County of San Diego.
4. Slope formation shall include compaction of soil to 90% relative density.
5. All fill pads shall be compacted in 6 to 8 inch lifts to 90% relative density.
6. Grading near the Property Line Particular attention must be given to grading (either cut or fill) near property lines. Care should be taken to ensure that existing foundations, retaining walls, stable slopes or other structures are not endangered and that the adjacent property is not damaged or its use constrained due to grading at or near the property line.
7. Stormwater management plan shall be included to protect against soil erosion and slope washout.

Liquefaction:

Due to the nature of soil at the site, there is no potential for liquefaction.

5 Seismic Hazards

The following seismic parameters based on Section 1613 of the 2022 California Building Code (CBC) may be used for design of the proposed structure.

Summary of the 2022 CBC Seismic Design Parameters

Latitude (degrees) = 32.7265185N Longitude (degrees) = -116.8828664E

Site Classification = D 2022 CBC Table 1613.5.2

0.2 Sec. Period Spectral Accel, S_s (g.) = 0.84g

1.0 Sec. Period Spectral Accel, S_1 (g.) = 0.27g

$S_{MS} = 1.5 \times S_{DS} = 1.13$

$S_{DS} = 0.75$

6 Effects of Earthquakes in California

6.1 Regional Seismic Setting



Fig 1: The San Adreas Fault

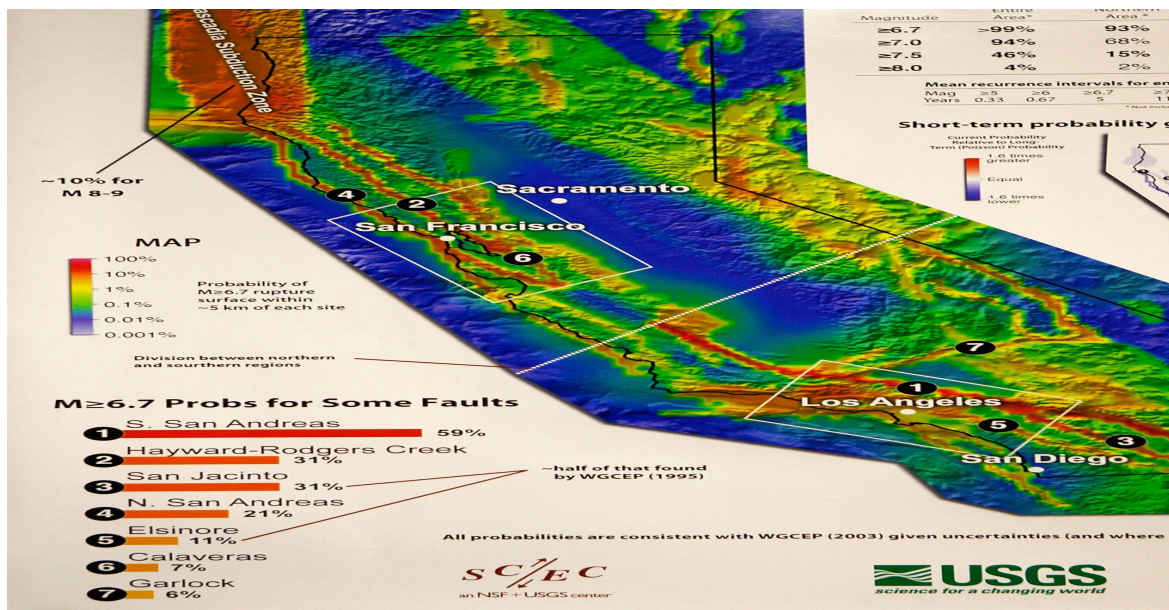


Fig 2: California's Released New Earthquake Forecast

California is located along the boundary between the Pacific Plate and the North American Plate, forming one of the most seismically active regions in the United States. The boundary between these two tectonic plates is primarily defined by the San Andreas Fault system, which extends approximately 800 miles through the state.

The tectonic interaction between these plates is characterized by strike-slip motion, where the Pacific Plate moves northwest relative to the North American Plate at an average rate of approximately 50 mm per year. This continuous movement accumulates strain energy within the Earth's crust which is periodically released in the form of earthquakes.

Southern California, including San Diego County, lies within a complex network of active and potentially active faults. Significant regional faults include:

- San Andreas Fault
- San Jacinto Fault
- Elsinore Fault Zone
- Rose Canyon Fault Zone
- Newport-Inglewood Fault

Although the San Andreas Fault is the largest and most well-known fault system in California, several secondary faults in Southern California are capable of producing significant earthquakes.

According to the California Geological Survey (CGS) and the United States Geological Survey (USGS), nearly all of California is subject to some level of seismic hazard due to the presence of these active fault systems.

6.2 Historic Earthquakes in California

California has experienced numerous damaging earthquakes throughout its history. Several of the most significant events include:



Fig 3: 1906 San Francisco Earthquake

1906 San Francisco Earthquake

- Magnitude: **7.9**
- Caused extensive structural damage and fires.
- Approximately **3,000 fatalities** occurred.
- Over **80% of San Francisco** was destroyed.

1971 San Fernando Earthquake

- Magnitude: **6.6**
- Resulted in major damage to hospitals, freeway structures, and residential areas.
- Led to significant improvements in seismic design requirements in building codes.

1989 Loma Prieta Earthquake

- Magnitude: **6.9**
- Caused collapse of the Cypress Street Viaduct and damage to the Bay Bridge.
- Demonstrated vulnerabilities in older infrastructure.

1994 Northridge Earthquake

- Magnitude: **6.7**
- Caused over **\$20 billion in damage**, making it one of the most costly earthquakes in U.S. history.
- Exposed weaknesses in steel moment frame buildings and freeway overpasses.

These historical events have significantly influenced the evolution of modern seismic design standards, including the California Building Code (CBC).

6.3 Ground Shaking

Ground shaking is the primary hazard associated with earthquakes and is responsible for most structural damage.

When an earthquake occurs, energy radiates outward from the rupture zone as seismic waves. These waves propagate through the ground and cause structures to vibrate.

The severity of ground shaking depends on several factors:

- Earthquake magnitude
- Distance from the fault rupture
- Local soil conditions
- Duration of shaking

Soft soils, particularly unconsolidated sands, silts, and artificial fill, may amplify seismic waves, leading to stronger ground motion compared to bedrock conditions.

According to the 2022 California Building Code, seismic forces used in structural design are derived from mapped spectral accelerations such as:

- **Ss** – Short-period spectral acceleration
- **S1** – 1-second spectral acceleration

These parameters are adjusted based on the **site soil classification** to determine the seismic design forces acting on a structure.

6.4 Surface Fault Rupture

Surface fault rupture occurs when displacement along a fault reaches the ground surface during an earthquake.

Structures located directly on or very near an active fault may experience permanent ground displacement, which can cause severe structural damage.

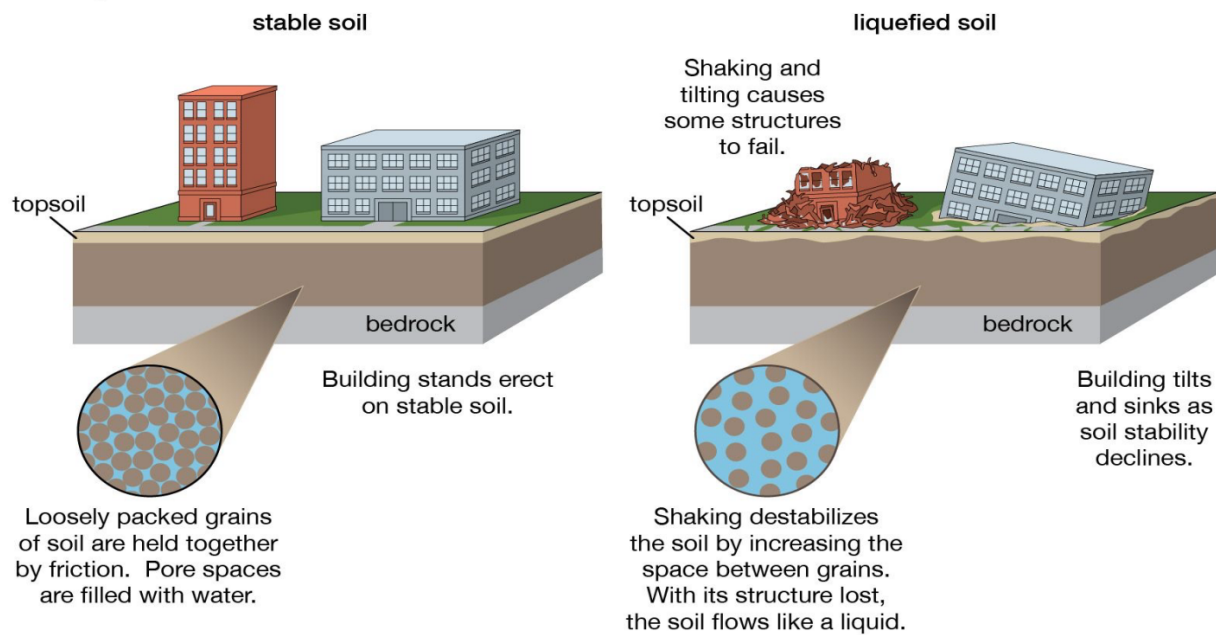
To mitigate this hazard, the Alquist-Priolo Earthquake Fault Zoning Act requires:

- Identification of active fault traces
- Establishment of fault setback zones
- Site-specific fault investigations for development near mapped faults

Development for habitable structures is generally **restricted within active fault zones** unless detailed geologic investigations demonstrate that no active fault traces exist within the building footprint.

6.5 Soil Liquefaction

Soil liquefaction



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Fig 4: Soil Liquefaction



Fig 5: Lateral Spread Caused by Liquefaction

Liquefaction occurs when saturated loose granular soils temporarily lose strength during seismic shaking.

This phenomenon happens when earthquake vibrations increase pore water pressure in soils, reducing the effective stress between soil particles.

Liquefaction can lead to:

- Settlement of structures
- Tilting of buildings
- Ground cracking
- Sand boils
- Lateral spreading

Liquefaction is most likely to occur in:

- Loose sands
- Silty sands
- Artificial fill
- Areas with shallow groundwater

The potential for liquefaction is evaluated during geotechnical investigations by examining:

- Soil type
- Relative density
- Groundwater depth
- Seismic loading conditions

Mitigation methods may include:

- Ground densification
- Deep foundations
- Soil replacement
- Drainage improvements

6.6 Landslides and Slope Instability

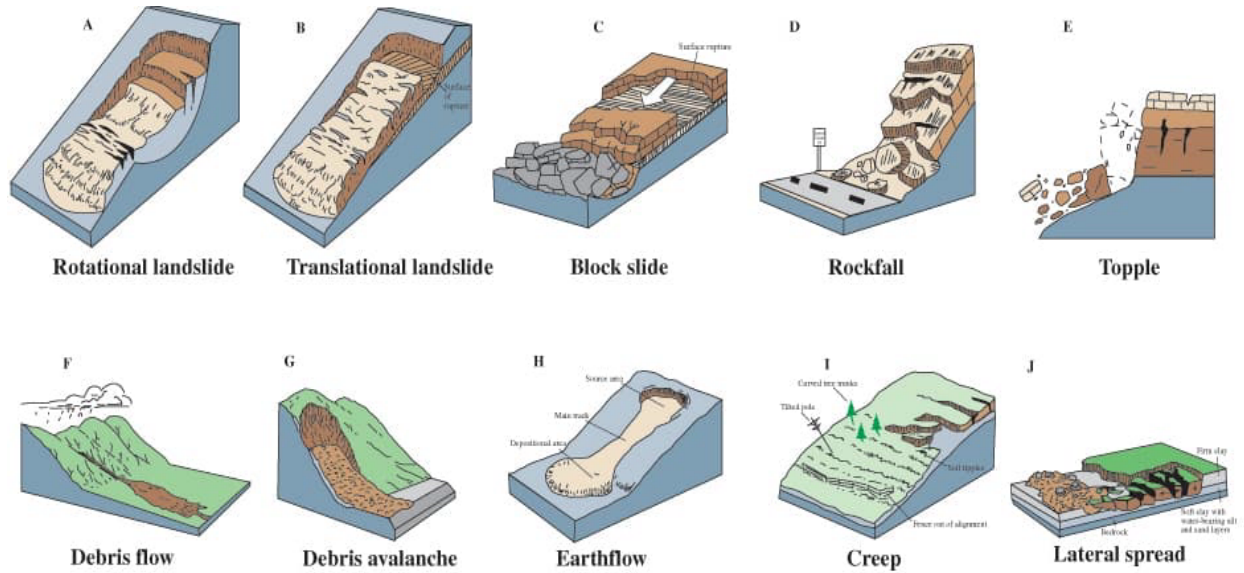


Fig 6: Types of Slope Failures and Their Causes



Fig 7: Landslides Destroying Homes in Southern California

Earthquakes can destabilize slopes and trigger landslides or rockfalls, particularly in steep terrain.

Slope failures may occur due to:

- Increased shear stresses during shaking
- Reduction of soil strength
- Loss of cohesion within soil layers
- Saturated soil conditions

Areas with steep slopes or weak soil formations are particularly susceptible to earthquake-induced slope failures.

Geotechnical investigations typically evaluate slope stability using:

- Soil strength parameters
- Slope geometry
- Groundwater conditions
- Seismic loading factors

If instability is identified, mitigation measures may include:

- Retaining structures
- Slope flattening
- Soil reinforcement
- Drainage improvements

7 Standard Grading Plans

7.1 Purpose of Grading Plans

Grading plans are essential engineering documents used to define existing and proposed ground elevations for a construction project.

The primary objectives of grading plans include:

- Establishing safe building pads
- Controlling stormwater drainage
- Preventing soil erosion
- Ensuring slope stability
- Preparing suitable foundations for structures

Grading plans are typically prepared by licensed civil engineers and reviewed by local municipalities prior to issuance of construction permits.

7.2 Typical Elements of a Grading Plan

A standard grading plan generally includes the following components:

Existing Topography

- Existing contour lines
- Spot elevations
- Natural drainage patterns

Proposed Grades

- Finished pad elevations
- Proposed contour lines
- Cut and fill areas

Slope Information

- Slope ratios (e.g., 2H:1V)
- Slope limits
- Retaining wall locations

Drainage Improvements

- Swales
- Catch basins
- Storm drain pipes
- Energy dissipaters

Earthwork Quantities

- Estimated cut and fill volumes
- Import or export soil requirements

7.3 Cut and Fill Operations

Grading typically involves cut and fill operations to achieve the desired site elevations.

Cut

Cut refers to excavating soil from higher elevations.

Fill

Fill refers to placing and compacting soil to raise ground elevation. Proper compaction of fill soils is essential to ensure stability and prevent settlement. Compaction is typically required to achieve 90–95 percent of maximum dry density, as determined by ASTM testing standards.

7.4 Drainage Considerations

Proper drainage design is critical to prevent erosion and structural damage.

Grading plans incorporate drainage features such as:

- Surface swales
- Down drains
- Storm drain pipes
- Detention basins

The goal is to ensure that stormwater flows away from structures and slopes, reducing the risk of erosion or flooding.

7.5 Regulatory Requirements

Grading operations in California must comply with several regulatory frameworks, including:

- California Building Code (CBC)
- Local municipal grading ordinances
- California Environmental Quality Act (CEQA)
- Stormwater management regulations

Local jurisdictions such as the **City of Oceanside** typically require grading permits for projects involving significant earthwork.

7.6 Role of the Geotechnical Engineer

The geotechnical engineer plays an important role during grading operations, including:

- Reviewing grading plans
- Observing earthwork operations
- Performing compaction testing
- Verifying soil conditions

Field observation ensures that actual subsurface conditions are consistent with those assumed during design.

Limitation

Our conclusions, recommendations and discussions presented herein are:

- (1) based upon an evaluation and interpretation of the findings of the field investigation,
- (2) based upon an interpolation of subsurface conditions between and beyond the explorations,
- (3) subject to confirmation of the actual conditions encountered during construction, and
- (4) based upon the assumption that sufficient observation and testing will be provided by Bayasi Engineering during construction.

Any person using this report for bidding or construction purposes should perform such independent investigations as he deems necessary to satisfy himself as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project.

This report contains information which is valid as of this date. However, conditions that are beyond our control or that may occur with the passage of time may invalidate, either partially or wholly, the conclusions and recommendations presented herein. The conclusions of this report are based on an interpolation of subsurface conditions encountered at the boring locations. The actual subsurface conditions at unexplored locations may be different. Consequently, the findings and recommendations of this report will require reevaluation if subsurface conditions different than stated herein are encountered. Inherent in most projects performed in the heterogeneous subsurface environment, continuing subsurface investigations and analyses may reveal findings that are different than those presented herein. This facet of the geotechnical profession should be considered when formulating professional opinions on the limited data collected on this project. The findings and recommendations contained in this report were developed in accordance with generally accepted current professional principles and practice ordinarily exercised, under similar circumstances, by geotechnical engineers and geologists practicing in this locality. No other warranty, expressed or implied, is made.

References

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GENERAL EARTHWORK AND GRADING SPECIFICATIONS

These general earthwork and grading specifications are for the grading and earthwork shown on the approved grading plan(s) and/or as indicated in this geotechnical report(s). These specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these general specifications. However, observations of the earthwork by the Project Soils Engineer during the course of grading could result in new or revised recommendations that could supersede these specifications or the recommendations of the geotechnical report(s).

PROJECT SOILS ENGINEER

The owner shall contract with the Project Soils Engineer of Record. The Project Soils Engineer shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of grading. During the grading and earthwork operations, the Project Soils Engineer shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Project Soils Engineer shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include natural ground after it has been cleared for receiving fill but before fill is placed, bottoms of overexcavation areas, all key bottoms, and benches made on sloping ground to receive fill. The Project Soils Engineer shall observe the moisture conditioning and processing of the areas to receive fill materials and the fill materials themselves and perform compaction testing of fill to determine the level of compaction. The responsibility of achieving soil compaction is that of the Contractor. The Project Soils Engineer shall provide the test results to the owner and the Contractor on a routine and frequent basis to assist the Contractor in determining the best means to achieve the required soil compaction. The Project Soils Engineer shall schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing as informed by Contractor of the anticipated schedule. The purpose of these specifications, the term Project Soils Engineer includes workman working under the authority of the Project Soils Engineer.

EARTHWORK CONTRACTOR

The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture conditioning, processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications. If requested by the Owner, the Contractor shall prepare and submit to the owner and the Project Soils Engineer a work plan that indicates the sequence of earthwork grading and the estimated quantities of daily earthwork contemplated for the Site prior to commencement of grading. The Contractor shall inform the Owner and the Project Soils

Engineer of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that the Project Soils Engineer is aware of all grading operations.

The Contractor

shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Project Soils Engineer, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Contractor shall rectify the unsatisfactory conditions to the satisfaction of the Project Soils Engineer. If the unsatisfactory conditions cannot be rectified to the satisfaction of the Project Soils Engineer, the Owner should stop construction until an adequate plan to remedy the conditions can be established.

GUIDE SPECIFICATIONS

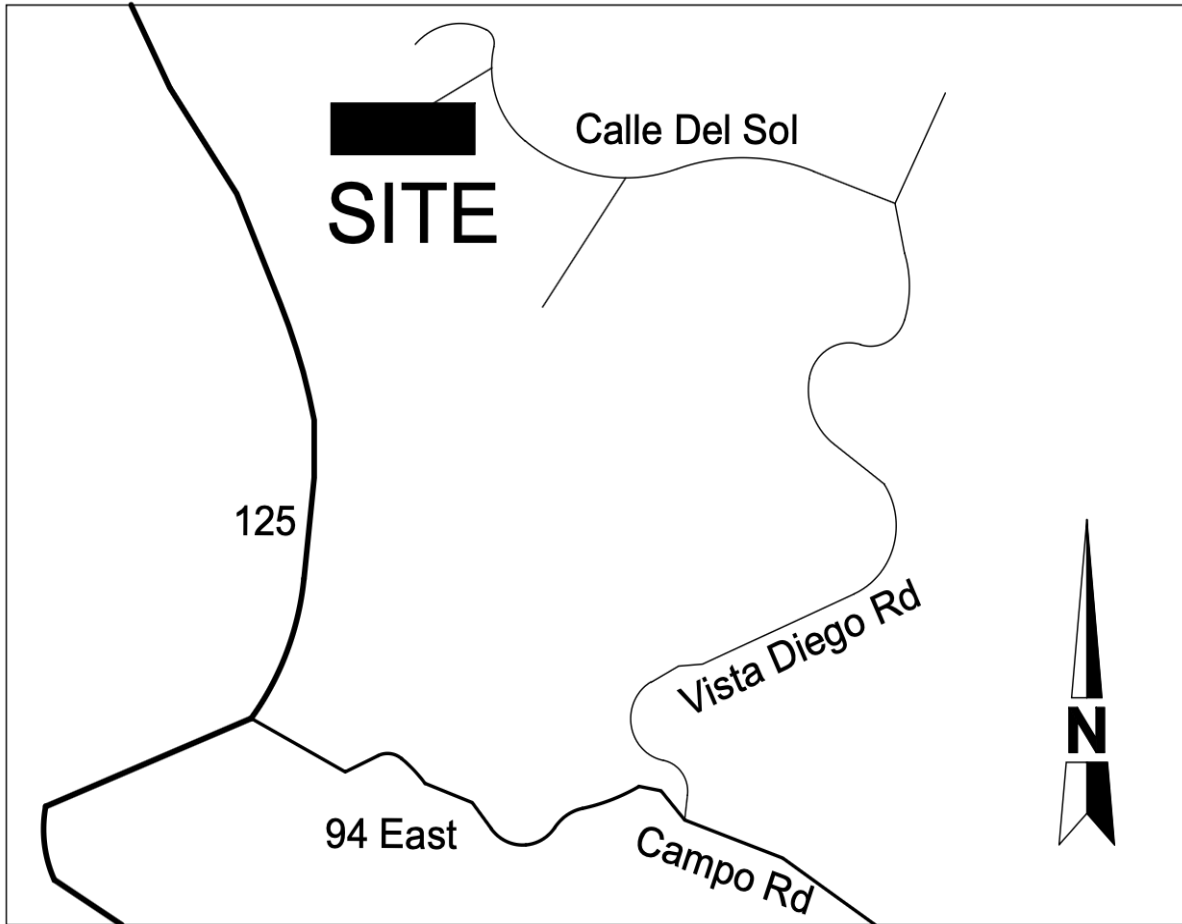
The following items of these guide specifications should be regarded as the minimum requirements for general earthwork and grading operations. On a Site specific basis, local governmental agencies may have more stringent requirements than specified herein.

1. All filling and backfilling operations should conform with applicable local building and safety codes and to the rules and regulations of those governmental agencies having jurisdiction over the subject construction. The earthworks contractor is responsible to notify governmental agencies, as required, and the Project Soils Engineer at the initiation of grading, and any time that grading operations are resumed after an interruption. Each step of the grading should be approved in a specific area by the Project Soils Engineer and, where required, by the applicable governmental agencies before proceeding with subsequent work.
2. Prior to the start of grading, the Site shall be cleared and grubbed of all debris, vegetation, deleterious materials, surface obstructions and loose unapproved fill shall be removed and disposed offsite. Any existing irrigation, drainage or utility lines, or other abandoned subsurface structures shall be removed, destroyed or abandoned in compliance with specifications and recommendations from the Project Soils Engineer, owner or local governing agencies. The Project Soils Engineer shall evaluate the extent of these removals depending on Site specific conditions. No fill material or soil supporting structural fill material shall contain more than five percent organic materials (by volume). As allowed by the Owner, unsuitable materials may potentially be utilized in nonstructural fill areas.
3. Existing ground that has been declared satisfactory to support fill by the Project Soils Engineer shall be scarified a minimum depth of six inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

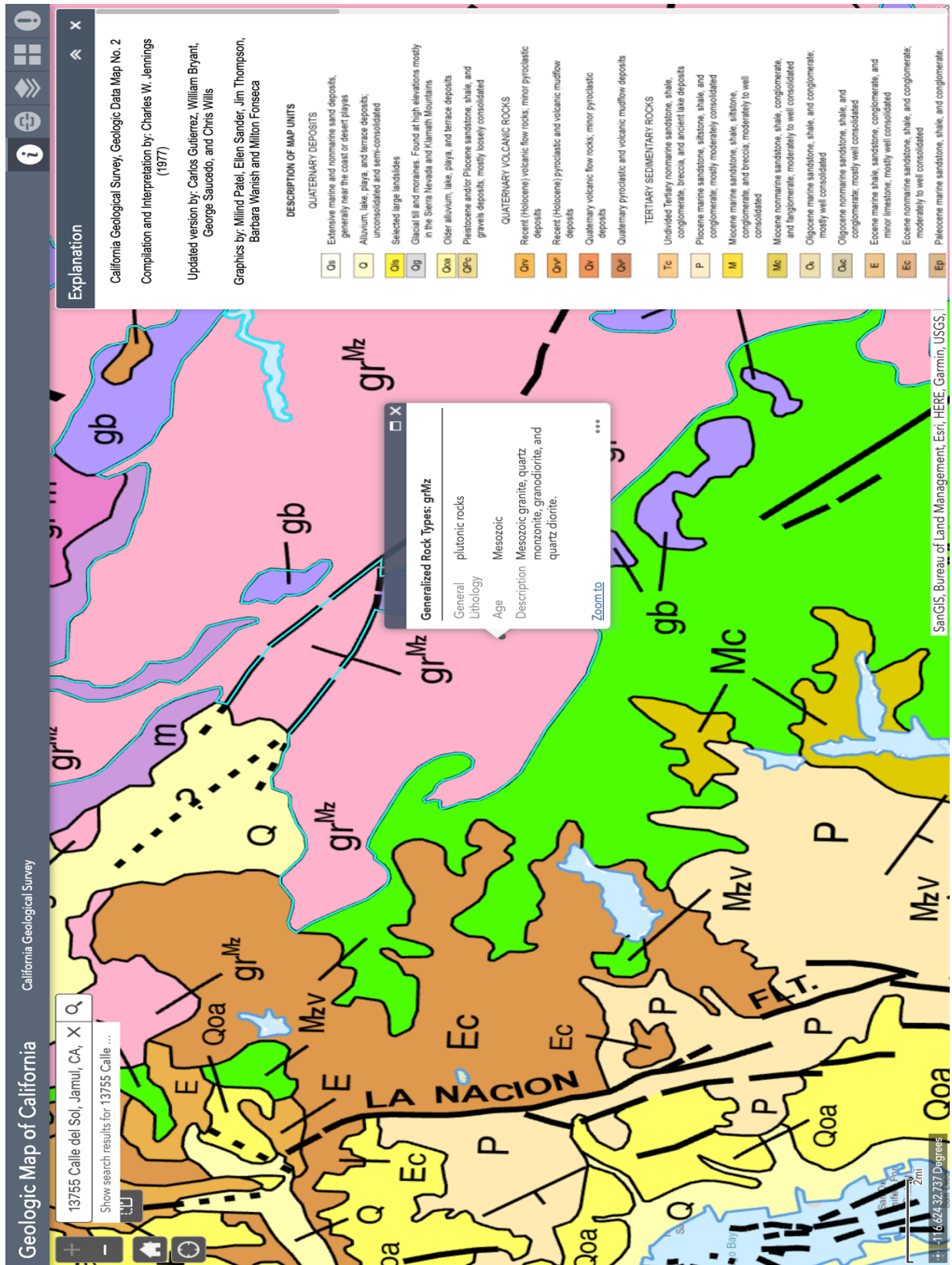
4. In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, uncontrolled artificial fill, soft, loose, dry, saturated, spongy, organic-rich, highly fractured, porous, collapsible or otherwise unsuitable ground shall be overexcavated to competent ground, as evaluated by the Project Soils Engineer during grading. Competent ground may include dense, nonporous natural deposits of soil.
5. If potentially hazardous materials are encountered, the Contractor shall stop work in the area and the Project Environmental Engineer or Project Soils Engineer shall be informed immediately for proper evaluation and handling of these materials prior to continuing work in that area.
6. Where fill is placed on a sloping ground that is steeper than 20 percent, the ground to receive fill shall be prepared by proper keying and benching. The Project Soils Engineer shall determine the vertical and horizontal sizes of the keys and benches. In general, the lowest keyway shall be constructed under the toe of the fill at least 15 feet in width and at least two feet deep, into competent material, as evaluated by the Project Soils Engineer. Subsequent benches shall be excavated a minimum height of four feet into competent material or as otherwise recommended by the Project Soils Engineer. Fill placed on sloping ground that is flatter than 20 percent shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.
7. All areas to receive fill, including processed areas, overexcavation bottoms, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested to evaluate if geotechnically suitable materials have been exposed.
8. Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan or as recommended by the Project Soils Engineer. The Project Soils Engineer may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on the actual subsurface conditions encountered during grading. A registered land surveyor/civil engineer shall survey all subdrains after installation and prior to burial for line and grade.
9. Material to be used as fill shall be approved by the Project Soils Engineer and shall be essentially free of organic matter and other deleterious substances. Soils of poor quality, such as those with unacceptable gradation, expansive potential (import soils with an expansion index greater than 20), or low strength shall be placed in areas acceptable to the Project Soils Engineer and/or mixed with other soils to achieve satisfactory fill material.
10. Oversize material defined as rock, or other irreducible material with a maximum dimension greater than three inches, shall not be buried or incorporated in the fill unless the Project Soils Engineer specifically accepts the placement methods. If approved by the Project Soils Engineer, placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill.

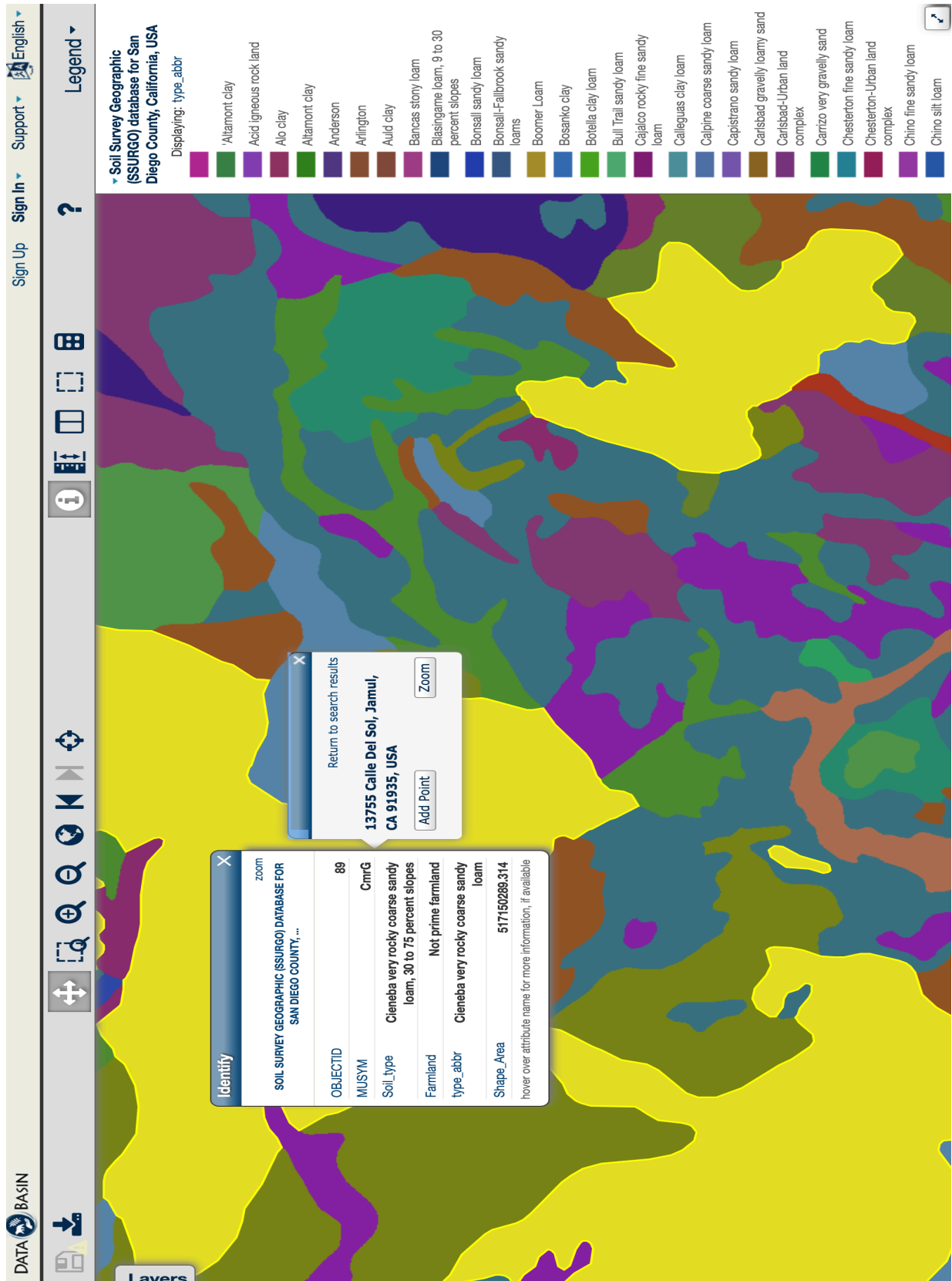
11. If importing of fill material is required for grading, proposed import material shall meet the requirements specified herein. The potential import source shall be given to the Project Soils Engineer at least two working days before importing begins so that its suitability can be determined and appropriate tests can be performed.
12. Approved fill material shall be placed in areas prepared to receive fill in near-horizontal layers not exceeding eight inches in loose thickness. The Project Soils Engineer may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture content throughout. Thinner layers of soil may be necessary if the Contractor is unable to achieve the required compaction.
13. Fill soils shall be moisture conditioned (e.g. watered, dried back, blended, and/or mixed, as necessary) to attain a relatively uniform moisture content near the optimum. The maximum dry density and optimum soil moisture content of fill materials shall be performed in accordance with ASTM Test Method D 1557.
14. After each layer has been moisture-conditioned, mixed, and evenly placed, the soil shall be uniformly compacted to not less than 90 percent of maximum dry density, unless otherwise specified in the approved geotechnical report(s). The contractor shall utilize equipment that is sized to efficiently achieve the specified level of compaction in a uniform manner. The contractor's earthwork operations should not result in movement or damage to completed work.
15. Field tests for moisture content and relative compaction of the fill soils shall be performed by the Project Soils Engineer in accordance with ASTM standards or as required by local governmental agencies. The location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Tests shall be taken at intervals not exceeding two feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. The Contractor shall allow the Project Soils Engineer a safe means to adequately test fill construction. If the Contractor achieves substandard compaction, the contractor shall adjust the earthwork operations (which may include additional compactive energy, adjustment of moisture content, thinner soil lifts, uniform soil placement, etc.) to meet the project specifications.
16. Wherever, in the opinion of the Project Soils Engineer or Owner, an unstable condition is being created by cutting or filling, the work shall not proceed in that area until an investigation has been made and the grading recommendations revised, if necessary.

VICINITY MAP



SOIL SURVEY DATA





SEISMIC HAZARDS

Search for Address or Coordinates

Reference	ASCE 7-22	Risk Category	II	Site Class	D
Project Title (optional)		Address	Coords	32.7265185	-116.8828664
					Go

Latitude, Longitude: 32.7265185, -116.8828664

Print

Date		3/24/2026, 1:00:46 PM
Design Code Reference Document		ASCE7-22
Risk Category		II
Site Class		D
Type	Value	Description (Data)
S_5	0.84	The MCE_R spectral response acceleration at 0.2 seconds for Site Class BC, in units of g.
S_1	0.27	The MCE_R spectral response acceleration at 1 second for Site Class BC, in units of g.
S_{MS}	1.13	$S_{MS} = 1.5 \times S_{DS}$, the Risk-Targeted Maximum Considered Earthquake (MCE_R) spectral response acceleration for short periods (of the two-period spectrum) and the user-specified Site Class.
S_{M1}	0.71	$S_{M1} = 1.5 \times S_{D1}$, the MCE_R spectral response acceleration for 1 second (of the two-period spectrum) and the user-specified Site Class.
S_{DS}	0.75	The design spectral response acceleration for short periods (of the two-period spectrum) and the user-specified Site Class, in units of g.
S_{D1}	0.47	The design spectral response acceleration for 1 second (of the two-period spectrum) and the user-specified Site Class, in units of g
Type	Value	Description (Data Contd.)
SDC	D	Seismic design category
PGA_M	0.42	PGA_M , the Geometric-Mean Maximum Considered Earthquake (MCE_G) peak ground acceleration for the user-specified Site Class, in units of g
T_5	0.627	$T_5 = S_{D1}/S_{DS}$, in seconds, for construction of the two-period design spectrum
T_0	0.125	$T_0 = 0.2 \times T_5$, in seconds, for construction of the two-period design response spectrum
T_L	8	T_L , the long-period transition period, in seconds, for construction of the two-period design response spectrum

Approximate Boring Locations & Boring Logs

Soil Exploration Map





Boring 2 Depth Exceeding 4 ft



Boring 3 Depth Exceeding 5 ft



Boring 4 Depth 3 ft

ADDRESS: 13755 Calle Del Sol, Jamul, CA 91935**BORING LOG**

DEPTH (FT)	SAMPLE NO.	SOIL CLASS (USCS)	BY: AQ BORING NO: 1 EQUIPMENT: BACKHOE/BOBCAT	DATE: 3/18/26 5 FT BGS
0.5			Light to greyish brown silty sand topsoil with trace organics.	
2	1	SM	Light brown to tan silty sand with scattered subangular gravel particles. The soil is loose to medium dense, dry to slightly moist, and exhibits a granular texture with low plasticity. Vegetation and root influence diminish with depth. Reddish-brown to dark brown silty sand with increased fines content. The soil is medium dense, slightly moist to moist, and exhibits moderate cohesion compared to the overlying layer. The material appears more compact and structured. Transition to decomposed granite consisting of dense, granular sand with gravel and occasional cobble-sized rock fragments. The material is light brown to tan, slightly moist, and very dense, with significant resistance to excavation.	
4	2	SM		
5	3	DG		
			Boring is terminated due to excavation difficulty at 5 ft BGS	

BAYASI ENGINEERING
401 W LEXINGTON AVE #755
EL CAJON CA, 92022
858-231-1552

ADDRESS: 13755 Calle Del Sol, Jamul, CA 91935**BORING LOG**

DEPTH (FT)	SAMPLE NO.	SOIL CLASS (USCS)	BY: AQ BORING NO: 2 EQUIPMENT: BACKHOE/BOBCAT	DATE: 3/18/26 5 FT BGS
0.5			Light to greyish brown silty sand topsoil with trace organics.	
2	1	SM	Light brown to tan silty sand with scattered subangular gravel particles. The soil is loose to medium dense, dry to slightly moist, and exhibits a granular texture with low plasticity. Vegetation and root influence diminish with depth.	
4	2	SM	Reddish-brown to dark brown silty sand with increased fines content. The soil is medium dense, slightly moist to moist, and exhibits moderate cohesion compared to the overlying layer. The material appears more compact and structured.	
5	3	DG	Transition to decomposed granite consisting of dense, granular sand with gravel and occasional cobble-sized rock fragments. The material is light brown to tan, slightly moist, and very dense, with significant resistance to excavation.	
			Boring is terminated due to excavation difficulty at 5 ft BGS	

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BORING LOG

DEPTH (FT)	SAMPLE NO.	SOIL CLASS (USCS)	BY: AQ BORING NO: 3 EQUIPMENT: BACKHOE/BOBCAT	DATE: 3/18/26 2.5 FT BGS
0.5			Light to greyish brown silty sand topsoil with trace organics.	
2	1	SM	Light brown to tan silty sand with scattered subangular gravel particles. The soil is loose to medium dense, dry to slightly moist, and exhibits a granular texture with low plasticity. Vegetation and root influence diminish with depth.	
2.5	2	DG	Transition to decomposed granite consisting of dense, granular sand with gravel and occasional cobble-sized rock fragments. The material is light brown to tan, slightly moist, and very dense, with significant resistance to excavation.	
			Boring is terminated due to excavation difficulty at 2.5 ft BGS	

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ADDRESS: 13755 Calle Del Sol, Jamul, CA 91935

BORING LOG

DEPTH (FT)	SAMPLE NO.	SOIL CLASS (USCS)	BY: AQ BORING NO: 4 EQUIPMENT: BACKHOE/BOBCAT	DATE: 3/18/26 2.5 FT BGS
0.5			Light to greyish brown silty sand topsoil with trace organics.	
2	1	SM	Light brown to tan silty sand with scattered subangular gravel particles. The soil is loose to medium dense, dry to slightly moist, and exhibits a granular texture with low plasticity. Vegetation and root influence diminish with depth.	
2.5	2	DG	Transition to decomposed granite consisting of dense, granular sand with gravel and occasional cobble-sized rock fragments. The material is light brown to tan, slightly moist, and very dense, with significant resistance to excavation.	
			Boring is terminated due to excavation difficulty at 2.5 ft BGS	

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