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34541 Camino Capistrano
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Project No. 72778-00
Report No. 24-9578

Subject: **Geotechnical Investigation for Bluff Edge Determination and Proposed New ADU, Swimming Pool and Garage Foundation Design**
34541 Camino Capistrano
Dana Point, California 92624

INTRODUCTION

This report presents the results and recommendations of a limited geotechnical investigation undertaken to relate onsite and certain regional geotechnical conditions to the design and construction of a new swimming pool and garage/Auxiliary Dwelling Unit (ADU) located at the subject site. Analysis for this investigation is based upon the review of topographic and architectural drawings prepared by Agostino Di Fante Associates (Di Fante, 2017).

As the lot is located within Coastal Zone jurisdiction, the design of the project will be reviewed by the City and State for conformance with the City's requirements and the State's Coastal Act. This study is based on our recent hand auger borings, and laboratory testing and includes the previous investigations conducted by Geofirm (see References). The conclusions and recommendations of this report are considered preliminary as they precede finalized foundation and grading plans, the formulation of which are partially dependent upon the recommendations presented herein.

Scope of Investigation

The investigation included the following:

1. Review and analysis of previous reports in the area prepared by Geofirm, aerial photographs; and published maps and literature pertaining to the site and nearby areas.
2. Field reconnaissance and logging of a total of two hand auger borings (HA-1 and HA-2) to determine the character and geometrical distribution of soil materials within the proposed construction areas. In addition, samples of earth materials were collected for geotechnical laboratory testing.
3. Laboratory testing to determine moisture contents and in-place dry density, particle-size analyses, and soluble sulfate corrosivity.
4. Geotechnical analysis of the field and laboratory data to evaluate conditions supporting the property and certain geotechnical recommendations for preliminary foundation design criteria of the proposed additions and remodel.

5. Preparation of this geotechnical report containing our conclusions and recommendations for design and construction, suitable for use by your Architect, Civil and Structural Engineers, Contractors, and City permit submittal in accordance with the 2022 California Building Code.

Accompanying Illustrations and Appendices

Site Description

The subject site is located at 34541 Camino Capistrano within a residential neighborhood of Capistrano Beach in Dana Point, CA 92646 as depicted on the Geologic Location Map, Figure 1. The subject site is generally rectangularly shaped: ±60 feet on the Camino Capistrano right-of-way and extends southwesterly ±150 feet and ±210 to the rear property line located near the midway of the ±120 descending slope. The site is essentially level at an approximate elevation of 148± feet and is developed with a previously constructed single-family residence. The site is currently landscaped, while the adjacent properties to the southeast and northwest are developed with single-family residences.

The overall slope extends to the Coast Highway at an approximate elevation of 18 feet (NAVD 88) to Camino Capistrano at an approximate elevation of 148 feet (Di Fante, 2017). The overall slope gradient of the coastal bluff is approximately 1.5:1 (horizontal:vertical) with the portion of the slope below the slope concrete v-ditch at a gradient of about 1.2:1 extending to the Rivera Beach & Shores Hotel and Coast Highway, below.

Existing improvements near the slope include a constructed three to five-foot-high retaining wall at the edge of bluff. A concrete v-ditch was constructed perpendicular to the slope face and extended down to the concrete v-ditch that was constructed along the approximate 100-foot contour elevation line. The horizontal-orientated v-ditch appears to end as it trends towards the northwest and encounters the property boundary.

Proposed Development

No foundation plans have been made available for the preparation of this report. However, we reviewed the conceptual design for the construction of a new swimming pool and garage ADU. It is our understanding that the proposed construction will consist of wood and steel frame structures supported by a conventional foundation system. Further, we understand that the new pool/spa is not proposed to include an infinity edge.

SITE INVESTIGATION

Previous Investigations

A previous geotechnical investigation was conducted in the vicinity of the subject site (Geofirm, 2012); and consisted of two bucket-auger borings (BA-1 and BA-2) at 34581 Camino Capistrano located approximately 500 feet southeast of the subject site. The 2012 field investigation and laboratory testing were used to augment the findings and conclusions of the current investigation. Boring logs BA-1 and BA-2, as well as the pertinent laboratory data, are included in the appendices of this report.

Field Exploration

Subsurface conditions were explored on April 5, 2024, and consisted of two hand-auger Borings (HA-1 and HA-2) conducted at the subject site. At each location, the boreholes were excavated to expose near-surface soils, clear utilities, and collect samples. The maximum depth of the field investigation was 18.0 feet below the existing ground surface. The field investigation was observed by our field geologist who logged soils and obtained bulk and relatively undisturbed samples for identification and laboratory testing. Details of the field exploration are presented in Appendix B. The approximate locations of the borings are shown on the attached Plate 1.

Laboratory Testing Program

This investigation included geotechnical laboratory tests on bulk considered representative of the subsurface soils obtained from the upper five feet. These lab tests along with previous and the nearby site were performed to determine the soil classification in accordance with USCS, in-site density and moisture content, expansion index, grain size distribution, soluble sulfate, and corrosivity. Test procedures and results are provided in Appendix C. The previous and nearby laboratory test results are presented in Appendix C-1.

GEOTECHNICAL CONDITIONS

Geologic Setting

The property is situated at the seaward boundary of a regionally extensive marine terrace which lies at the coastal margin of the San Joaquin Hills. The marine terrace was developed as a wave-cut bench and is underlain by bedrock strata which have been uplifted in the geologic past by tectonic forces acting on this region of southern California. During and subsequent to tectonic uplift from the ancient sea level, a succession of marine terrace deposits (ancient beach deposits) and nonmarine terrace deposits were accumulated and subsequently eroded above this wave-cut bench. Marine and subaerial erosion of this terrace during recent geologic time created a sea bluff and lower shoreline that formed the downslope property in the immediate vicinity.

Earth Materials

The site is underlain by artificial fill/residual soil (af) and at shallow depth and by Quaternary-age terrace deposits (Qt). The lower portion of the slope is underlain by bedrock consisting of Tertiary-age Capistrano Formation (Tc); the upper portion of the slope is comprised of fill/residual soil and underlain by terrace deposits.

As exposed in exploratory excavations conducted in previous investigations (Geofirm, 2012), the Capistrano Formation was encountered at 31 feet and 29 feet below ground surface and consisted of very firm, thickly bedded, dark gray to black siltstone. Encountered during our current investigation, the terrace deposits consist of silty clay and silty sand to the explored depth of 18 feet below grade. The near-surface artificial fill consists of silty and clayey sand to a depth of approximately 5 feet below grade. Based on our understanding of the age of the artificial fill placement, we believe it is unlikely that observation and testing were performed during the placement of the existing fill material.

Aerial Photograph Review

Based on a review of historic stereo-pair aerial photographs obtained from the Frame Finder website hosted by the University of California, Santa Barbara Library (UCSB, 2021 and Table A-1), the construction of a residence and detached garage appears on the subject site in the 1929 photograph. Coast Highway, roadways in Capistrano Beach, and one other residence to the north of the subject site are visible.

The current configuration of the residential structures appears different from the current layout, as the 1929 residence appears to be constructed 40± feet further landward from the location of the current residence. No apparent sign of ground modification was noted at the top of the slope in association with the residence.

In the 1939 photograph, the residential structure is present on the subject property; no construction or ground modification appears at the top of slope.

In the 1947 stereo-pair photographs, the residential structure and detached garage are visible. There is one possible top of slope improvement appears at the southern corner of the top of slope level pad area; in the location of the existing retaining wall. There are no structures present on the east, south, or west side of the property. Camino Capistrano and Coast Highway are visible and located in their current configuration. In addition, the single residence previously noted appears on the north side of Camino Capistrano. The geomorphology of the coastal bluff appears unaltered from the previously viewed photographs.

In the 1960 photo, the residential structure and detached garage remain visible. The geomorphology of the coastal bluff appears unchanged since the previously viewed photograph. One additional ground modification appears landward of the previously noted retaining wall; possibly a patio slab.

In the 2001 photo, the previously noted residential structure and detached garage have been reconstructed or renovated. The new construction appears in the same configuration as the previous. The geomorphology of the coastal bluff within the limits of the property appears unchanged since the previously viewed photograph. The slope appears to have been improved with a concrete v-ditch and the hotel benched into the base of the bluff.

Recent aerial photographs depict the geomorphology of the coastal bluff in a similar configuration. Any erosional impacts along the bluff are most likely due to natural weathering from wind and rain. Given the distance from the shoreline and the construction of the hotel at the toe of the slope, there appears to be minimal toe of slope erosion, as evidenced by the analysis of aerial photographs spanning a period of 95 years for this investigation. Overall review of the aerial photographs spanning 85 years, the geomorphology of the coastal bluff at the subject site appears relatively unchanged.

Geologic Structure

As exposed on the adjacent properties, the Capistrano Formation varies from massive to locally fissile and well-bedded. Bedding attitudes mapped and observed on the adjacent slope faces indicate the strata have been folded to strike northwesterly subparallel to the contour of the slope face and dip 12 to 23± degrees northeasterly into the slope slope, generally consistent with that depicted on published geologic maps (CDMG, 1974). This orientation results in a supported topographic-structural relationship.

Groundwater

Perched groundwater seepage is known to exist at the bedrock-terrace contact in the vicinity of the subject site. The groundwater originates inland as meteoric and irrigation water and migrates coastward along the terrace deposit/bedrock contact and in general, ultimately seeps out the slope face at the contact. Slight seepage due to rain was encountered at the depth of 12½ and 10 feet, in borings HA-1 and HA-2, respectively. Groundwater is not anticipated to be a constraint to the proposed development.

Surficial Runoff

No evidence of significant uncontrolled, concentrated, erosive runoff onto the slope from the property has been observed. Any development that will modify and/or increase post-development discharge, should be controlled and conducted offsite by appropriate engineering design to preclude potential soil saturation and slope erosion.

Bluff Erosion and Surficial Stability

The slope below the subject site is protected from wave erosion by the ATSF railroad tracks, Coast Highway, and Riviera Beach & Shores Resort. Wave erosion is therefore not anticipated to impact the descending slope below the subject site during the design life of the proposed improvements, and shoreline protection systems are not anticipated. As the bluff edge is determined to be at the existing retaining wall at the site, bluff retreat will essentially be negligible, and the 50-year bluff retreat line will be the same as the bluff edge line over the life span of the wall.

Geologic Bluff Edge Location

The definition of the bluff edge includes the following language (Johnsson, 2002):

> *The Oceanfront Edge or Coastal Bluff Edge of The California Coastal Act and Regulations define the oceanfront bluff edge as the upper termination of a bluff, cliff, or sea cliff. In cases where the top edge of the bluff is rounded away from the face of the bluff, the bluff edge shall be defined as that point nearest the bluff face beyond which a downward gradient is maintained continuously to the base of the bluff. In a case where there is a step like feature at the top of the bluff, the landward edge of the topmost riser shall be considered the bluff edge. Bluff edges typically retreat over time as a result of erosional processes, landslides, development of gullies, or by grading (cut). In areas where fill has been placed near or over the bluff edge, the original bluff edge, even if buried beneath fill, shall be taken to be the bluff edge.*

The definition of the Coastal Bluff Edge is generally consistent with fundamental geomorphic principles. The subject site consists of a "text-book" blufftop with scant artificial modification and a thoroughly documented development history. A review of the historic aerial photographs and the well-documented site development history were used to determine the Coastal Bluff Edge. The location of the bluff edge and 40-feet setback lines are depicted on the attached Geotechnical Plot Plan and Geologic Cross Section A-A', Plates 1 and 2, respectively.

Gross Slope Stability

No evidence of former gross instability has been observed in the slope below the site based upon site reconnaissance, review of published maps, and interpretation of aerial photographs. It is noted that the City of Dana Point "Coastal Erosion Technical Report" (Zeiser Geotechnical, Inc., 1990) recommends a minimum 40-feet structural setback from the bluff edge for new construction and residential additions within the Capistrano Bluff/Palisades area in the absence of stability analyses. As the proposed improvements are located beyond 40 feet from the bluff edge, a stability analysis was excluded from the scope of this report. The bluff edge and 40-feet setback lines are indicated on the attached Geotechnical Plot Plan and Geologic Cross Section A-A', Plates 1 and 2, respectively.

Seismic Considerations

Published Studies

One of the principles of seismic analyses and prediction is the premise that earthquakes are more likely to occur on geologically younger faults and less likely to occur on older faults. For many years studies have described faults with the Holocene movement (within the last 11,700 years) as "Active", and faults with documented Pleistocene movement (within the last 1.6 million years) and with undetermined Holocene movement as "Potentially Active". Informally, many studies have described faults documented to have no Holocene movement as “Inactive”. Recent geologic and seismic publications are attempting to clarify the nomenclature describing faults to more accurately represent the potential effects of earthquakes.

Table 1, Definitions of Fault Activity in California

Activity	Category	Recency of Movement
Active	Historic	Within the last 200 years
	Holocene	Within the last 11,700 years
Potentially Active	Late Quaternary	Within the last 700,000 years
	Quaternary	Within the last 1.6 million years
	Late Cenozoic	Possibly within the last 1.6 million years
	Pre-Quaternary	Before the last 1.6 million years

Reports by the California Division of Mines and Geology indicate faults with documented Holocene or Historic (within the last 200 years) movement should be considered Active. However, Potentially Active faults are more appropriately characterized in terms of the last period of documented movement. The Fault Activity Map of California (Jennings, C.W.; 2010) defines four categories for onshore Potentially Active faults. The categories are associated with the time of the last displacement evidenced on a given fault and are summarized in Table 1.

It is important to note these categories embrace all Pre-Holocene faults as Potentially Active, and provide no methodology to designate a given fault as “Inactive”. Although the likelihood of an earthquake or movement to occur on a given fault significantly decreases with inactivity over geologic time, the potential for such events to occur on any fault cannot be eliminated within the current level of understanding.

<u>Local and Regional Faults</u>

The closest published active fault to the site is the Newport-Inglewood Connected Fault Zone, approximately 3.2 miles west-northwest, (CGS, 2008). Other active faults in the vicinity of the site include the San Joaquin Hills Blind Thrust, approximately 9.3 miles to the north, the Palos Verdes Connected Fault and the Coronado Bank Fault, approximately 18.4 miles to the southwest and south, respectively, and the San Andreas Fault, approximately 54.1 miles to the northeast.

The California Geological Survey updated the Fault Parameters and Earthquake Catalog for the probabilistic Seismic Hazards Maps in 2002. This update included the addition of the San Joaquin Hills blind thrust fault indicated above, theorized to exist from Newport Beach to Dana Point, and ramping up inland to the Irvine area, and essentially underlying the site. Earthquakes of Magnitude 6.6 are presently postulated for this structure. With the fault’s location at approximately 3.2 miles distant, it is calculated as the most significant seismic source to affect the site.

Ground Motion Analyses

The potential ground motions from earthquakes that could impact the sites were analyzed through probabilistic methods. The probabilistic method considers the regional seismic history and the slip rates of faults within a 100-mile radius of the subject site. Utilizing attenuation relationships (Bozorgnia, et al.; 1999, unconstrained/pleist. soil), one can estimate the ground motion history of the site and attempt to predict the probability of future accelerations within a given period of time. The study indicates the greatest site acceleration from 1800 to 2024 was approximately 0.09g and occurred during a magnitude 6.3 Long Beach Earthquake 20.1 miles from the site on March 11, 1933.

It is noted that the estimation of peak ground acceleration presented above is provided for the interest of the client and is required by local (City or County) review agencies. The value derived is not directly utilized in the structural design of residential structures. Seismic parameters for use by the structural engineer under the 2022 California Building Code in the design of the proposed structure are presented in the Recommendations section of this report.

Site Classification for Seismic Design

For the purposes of determining seismic design parameters provided in the Recommendations portion of this report for use by the structural engineer, the upper 100 feet of soil underlying the subject site has been classified in accordance with Section 1613.5.5 of the 2022 CBC. Based on the California Geological Survey Map Sheet 48, the shear wave velocity (V_s) within the upper 100 feet of the project site is on the order of 386.6 m/s (1240 ft/s) and therefore is classified as Site Class C, see, "Seismic Structural Design" Section.

Secondary Seismic Hazards

Review of the Seismic Hazards Zones Map for the Dana Point Quadrangle, Figure 3, indicates this lot is not located within a zone of required investigation for either, liquefaction zone, earthquake induced landslide zone, or earthquake fault zone.

Other secondary seismic hazards can include deep rupture, shallow ground cracking, tsunami inundation, and settlement. With the absence of active faulting onsite, the potential for deep fault rupture is not present. The potential for shallow ground cracking to occur during an earthquake is a possibility at any site but does not pose a significant hazard to site development. The subject site is located above the anticipated wave height of tsunami inundation. As the site is underlain by competent natural deposits and bedrock, the potential for seismically induced settlement to occur is considered remote for the site.

CONCLUSIONS

1. The proposed development for the subject site consisting of the construction of a new swimming pool and detached garage/ADU at the subject site is considered geotechnically feasible provided the recommendations of this and subsequent studies are followed during design, construction and maintenance of the subject property. Such construction

should not adversely affect adjacent properties, with due precaution exercised during construction.

2. The site is underlain at depth by bedrock strata that are overlain by terrace marine and non-marine deposits. The fill is generally unsuitable for foundation support, while terrace materials and bedrock are generally suitable for structural support.

3. The onsite shallow soils are anticipated to have low expansion potential and are expected to have a negligible soil soluble sulfate based on the laboratory testing.

4. The materials supporting the slope are expected to remain generally stable for residential construction landward of the 40-foot bluff edge structural setback line. Soil material mantling the slope face is considered prone to surface erosion and creep. Retreat of the edge of bluff is anticipated to be negligible as the bluff edge is defined as the existing retaining wall.

5. No active faults are known to transect the site and, therefore the site is not expected to be adversely affected by surface rupturing. It will, however, be affected by ground motions from earthquakes during the design life of the residence. The potential for seismic hazards, such as liquefaction or seismically induced landslides, to affect the site is considered nil.

6. Except for seepage water, no groundwater was encountered during our subsurface investigation. Groundwater is not anticipated to be a significant construction nuisance. Long-term subsurface drainage and waterproofing should be integrated into the design.

7. Adverse surface discharge onto or off the site is not anticipated provided proper engineering design and post-construction site grading are implemented. The evaluation and improvement of surface runoff, if desired, may be performed by a landscape architect or civil engineer.

8. The proposed garage/ADU and new pool/spa may be supported by conventional footings embedded in compacted fill in accordance with the 2022 California Building Code. The evaluation of existing foundations to support additional or revised loads should be performed by the structural engineer.

RECOMMENDATIONS

Site Preparation and Grading

1. General

Grading should be performed in accordance with the recommendations herein and the Standard Grading Specifications in Appendix D. In general, grading is anticipated to include the removal and re-compaction of existing earth materials. Proposed improvements will be constructed at or near existing site grades, and only minor cuts or fills are proposed for the planned improvements.

2. Removal of Existing Improvements

   Existing vegetation, organic materials and/or construction debris should be removed and disposed of offsite.

3. Remedial Grading

   Following the demolition of the existing garage, remedial grading for the new garage/ADU is recommended to include the removal and re-compaction of the upper ±3 feet below the lowest adjacent grades or 1 foot below the bottom of the footings, whichever is greater. For exterior hardscapes, pool coping, and site or landscaping walls, remedial grading should extend at least 2 feet below existing site grades, or 1 foot below the bottom of foundations, whichever is deeper.

   Localized deeper removals may be recommended by the geologist during grading if the over-excavation bottom consists of soft or loose soils. Processing, over-excavation, and re-compaction should be observed, tested, and approved in writing by a representative of this firm.

4. Compaction Standard

   Onsite soil materials are anticipated to be suitable for re-use as compacted fill provided oversized fragments (greater than 4-inch, greatest dimension) are excluded from the fills. Fill materials should be placed at 120 percent above optimum moisture content and compacted under the observation and testing of the soil engineer to at least 90 percent of the maximum dry density as evaluated by ASTM D1557.

5. Temporary Construction Slopes

   The anticipated temporary grading slopes are on the order of 3 to 7± feet in maximum height. The grading of temporary construction slopes can create two potentially adverse conditions affecting the property and onsite personnel. These conditions include slope instability and safety. As the geotechnical consultant, we are limited to recommending temporary slope geometries considered stable such that slope failures, should they occur, are not anticipated to adversely impact adjoining properties or structures. While our recommendations may often comply with safety guidelines concerning temporary slopes, our recommendations are not intended to create “safe” working conditions as defined by Cal/OSHA. The safety of onsite personnel is the responsibility of the general contractor as described below.

   A. Protection of Property

      In order to reduce the potential risk to adjoining properties/structures from slope failures, temporary construction slopes may be vertically excavated no higher than 5 feet. Higher slopes should laid back at 1:1 (horizontal:vertical) from the toe pending field review by the geologist during grading. Shoring should be constructed where space or grading limitations preclude temporary slope layback or in locations where workers may be affected by the performance of temporary slopes.

B. Worker Safety

The safety of onsite personnel affected by the performance of temporary construction slopes is the responsibility of the general contractor who is recommended to implement the safety practices as defined in Section 1541, Subchapter 4, of Cal/OSHA T8 Regulations (2006). The earth materials exposed in temporary excavations should be evaluated and classified by the contractor during construction.

Structural Design of Foundations & Slabs

Earth materials exposed at finish grades exhibit a low expansion potential. We recommend that the foundation and slabs be designed to resist the effects of low expansive soils in accordance with the 2022 California Building Code. Foundations and slabs should be designed for the intended use and loading by the Structural Engineer.

Our recommendations are considered to be generally consistent with the standards of practice. They are based on both analytical methods and empirical methods derived from experience with similar geotechnical conditions. These recommendations are considered the minimum necessary for the likely soil conditions and are not intended to supersede the design of the Structural Engineer or criteria of governing agencies.

Conventional Foundations

Conventional spread footings embedded into competent fill or compacted alluvium deposits may be designed for an allowable bearing value of 2,000 pounds per square foot (per CBC Table 1806.2), with a minimum width of 15 inches and a minimum embedment of 18 inches below the lowest adjacent grade.

Actual footing depth and width should be governed by 2022 CBC requirements and the structural engineering design. The design value may be increased one-third for short duration wind or seismic loading. Estimated settlements from structural loading are estimated to be less than ¾ inch total and ½ inch differential over a distance of 20 feet.

Lateral loads may be resisted by passive pressure forces and friction acting on the bottom of the foundations. Passive pressure may be computed from an equivalent fluid density of 150 pounds per cubic foot, not to exceed 1,500 pounds per square foot, and a friction coefficient of 0.25. These values may be combined without reduction and include a 1.5 factor-of-safety.

Conventional foundations should be reinforced in conformance with the requirements of the structural engineer. From a geotechnical viewpoint, a minimum of two No. 5 bars should be incorporated at the top and bottom of footings and grade beams to reduce the potential for soil expansion, and cracking due to seismic shaking.

Slab Subgrade Soils

Conventional slabs should be designed in accordance with the 2022 California Building Code. The minimum recommended thickness for news slabs is 5 inches, with No. 4 bars at a spacing of 16 inches, placed in both directions. Slabs should be underlain by 4 inches of ½ to ¾ inch open graded gravel. Where the new slabs are located adjacent to existing slabs, the new slab rebars should be doweled and epoxied to the existing slabs. Interior slab underlayment is deferred to the project architect or structural engineer; however, in accordance with the American Concrete Institute, we suggest that slabs be underlain by a 15-mil thick vapor retarder/barrier (Stego Wrap or equivalent) placed over the gravel in accordance with the requirements of ASTM E:1745 and E:1643.

Design of Conventional Pool/Spa Shell

The proposed pool/spa structure could be supported utilizing a conventional design supported entirely into competent terrace deposits. Shallow portions of the pool shell may need to be deepened to the appropriate depths as reviewed by the project geologist. Alternatively, the pool/spa may be supported by over-excavation of all existing fill soils and/or exposed terrace soils to at least one foot below the bottom of the pool/spa shell.

The pool shell should be uniformly supported in new engineered fills or terrace deposits designed for an allowable bearing value of 1,500 pounds per square foot. The design value may be increased one-third for short duration wind or seismic loading. A conventional pool/spa shell design founded in engineered fills and terrace materials may experience settlements on the order of ½ inch total and ¼ inch differential over a distance of 20 feet. The allowable passive pressure forces may be computed in engineered fill/terrace deposits using an equivalent fluid density of 100 pounds per cubic foot up to a maximum of 1,500 pounds per square foot. A coefficient of friction value of 0.25 may be used. Friction resistance and passive pressure may be combined without reduction

Earth pressure forces acting on the pool and spa walls embedded in soil materials should be designed using an equivalent fluid pressure of 60 pounds per cubic foot equivalent fluid pressure. These may be modified pending verification of soil conditions during construction. Surcharge loads, both topographic and structural, should be considered by the pool engineer.

The design parameters and recommendations for the above options may be modified pending verification of soil conditions following pool excavation The recommendation above assume a pool of conventional design. If the pool/spa are designed with infinity or zero edge concept, addendum recommendations will be necessary. Surcharge loads, both topographic and structural, should be considered by the structural engineer.

Pool Leak Protection Plan

To satisfy the conditions of approval required by the California Coastal Commission, a Pool Leak Protection system should be installed. The purpose of the system is to alert the owner of leakage, allow leaked water to outlet, and minimize potential distress. We recommend the installation of a durable plastic lower-liner with overlying 6-inch thick filter rock/gravel blanket and geofabric cover underlying the shell, with an encased 4-inch diameter perforated collection pipe at the low point of the pool excavation.

The collection pipe should outlet to a suitable location as designed by the Civil Engineer, or to a well point that allows monitoring and pump access. The outlet or well point should be checked for flow during routine pool maintenance and servicing. Evidence of flow should be reported to the owner for investigation and repair as needed.

Other methods and systems may also provide suitable protection. The planned system should be included in the Pool Design Plan and reviewed for conformance with the recommendations presented by this office.

Concrete

Laboratory test results indicate on-site soils have a negligible soluble sulfate content. It is recommended that a concrete expert be retained to design an appropriate concrete mix to address soil soluble sulfate content and corrosivity as well as the structural requirements. In lieu of retaining a concrete expert, the 2022 California Building Code, Section 1904.1 be utilized, which refers to ACI 318, Tables 4.2.1 and 4.3.1.

Hardscape Design and Construction

Concrete flatwork should be divided into as nearly square panels as possible. Joints should be provided at a maximum of 6-foot intervals to give articulation to the concrete panels. Landscaping and planters adjacent to concrete flatwork should be designed in such a manner as to direct drainage away from concrete areas to approved outlets. Planters located adjacent to principal foundation elements should be sealed and drained.

Flatwork elements should be a minimum of 5 inches thick (actual) and reinforced with No. 4 bars, spaced at 16 inches on-center both ways.

Seismic Structural Design

Under the Earthquake Design Regulations of Chapter 16, Section 1613A of the CBC 2022, the following coefficients and factors (mapped values) presented in Table 2 were calculated using the USGS website based on the Code Exemptions and Site Class C.

Table 2 - Site and Seismic Design Criteria for 2022 CBC

Design Parameters	Recommended Values
Site Soil Class	C (Very Dense & Soft Rock)
Site Latitude (degrees)	33.460893
Site Longitude (degrees)	-117.674466
Ss (g)	1.224
S1 (g)	0.44

Design Parameters	Recommended Values
SMs (g)	1.468
SM1 (g)	0.661
SDs (g)	0.979
SD1 (g)	0.44
Fa	1.2
Fv	1.5
Seismic Design Category	D
Site Modified Peak Ground Acceleration (PGM_A)	0.639

Utility Trench Backfill

Utility trench backfill should be placed in accordance with Appendix E, Utility Trench Backfill Guidelines. It is the owner's and contractor's responsibility to inform subcontractors of these requirements and to notify Geofirm when backfill placement is to begin.

Finished Grade and Surface Drainage

All finished grades should assure that no water ponds onsite and that discharge is conducted offsite in a non-erosive manner as specified by the project civil engineer in accordance with the 2022 California Building Code, Section 1804.4. A drainage swale designed to collect surface discharge from the slope face is recommended behind the rear wall or slough barrier proposed along the base of the canyon side slope. Regular maintenance of the swale should be anticipated to remove soil, rocks and debris which will collect behind the wall during heavy rainstorms.

Observation and Testing

The 2022 California Building Code, Section 1705.6 requires geotechnical observation and testing during construction to verify proper removal of unsuitable materials, that foundation excavations are clean and founded in competent material, to test for proper moisture content and proper degree of compaction of fill, to test and observe placement of wall and trench backfill materials, and to confirm design assumptions. It is noted that the CBC requires continuous verification and testing during placement of fill, pile installation, and pier/caisson drilling.

A Geofirm representative shall visit the site at intervals appropriate to the stage of construction, as notified by the Contractor, in order to observe the progress and quality of the work completed by the Contractor. Such visits and observation are not intended to be an exhaustive check or a detailed inspection of the Contractor's work but rather are to allow Geofirm, as an experienced professional, to become generally familiar with the work in progress and to determine, in general, if the work is proceeding in accordance with the recommendations of this report. Geofirm shall not supervise, direct, or have control over the Contractor's work nor have any responsibility for the construction means, methods, techniques, sequences, or procedures selected by the Contractor nor the Contractor's safety precautions or programs in connection with the work. These rights and responsibilities are solely those of the Contractor.

Geofirm shall not be responsible for any acts or omission of the Contractor, subcontractor, any entity performing any portion of the work, or any agents or employees of any of them. Geofirm does not guarantee the performance of the Contractor and shall not be responsible for the Contractor's failure to perform its work in accordance with the Contractor documents or any applicable law, codes, rules or regulations. These observations are beyond the scope of this investigation and budget and are conducted on a time and material basis. The responsibility for timely notification of the start of construction and ongoing geotechnically involved phases of construction is that of the owner and his contractor. Typically, at least 24 hours' notice is required.

Jobsite Safety

Neither the professional activities of Geofirm, nor the presence of Geofirm's employees and subconsultants at a construction/project site, shall relieve the General Contractor of its obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending and coordination the work in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. Geofirm and its personnel have no authority to exercise any control over any construction contractor or its employees in connection with their work or any health or safety programs or procedures. The General Contractor shall be solely responsible for jobsite safety.

LIMITATIONS

This investigation has been conducted in accordance with generally accepted practice in the engineering geologic and soils engineering field. No further warranty is offered or implied. Conclusions and recommendations presented are based on subsurface conditions encountered and are not meant to imply a control of nature. As site geotechnical conditions may alter with time, the recommendations presented herein are considered valid for a time period of one year from the report date. The recommendations are also specific to the current proposed development. Changes in proposed land use or development may require supplemental investigation or recommendations. Also, independent use of this report in any form cannot be approved unless specific written verification of the applicability of the recommendations is obtained from this firm.

Thank you for this opportunity to be of service. If you have any questions, please contact this office.

Respectfully submitted,

GEOFIRM

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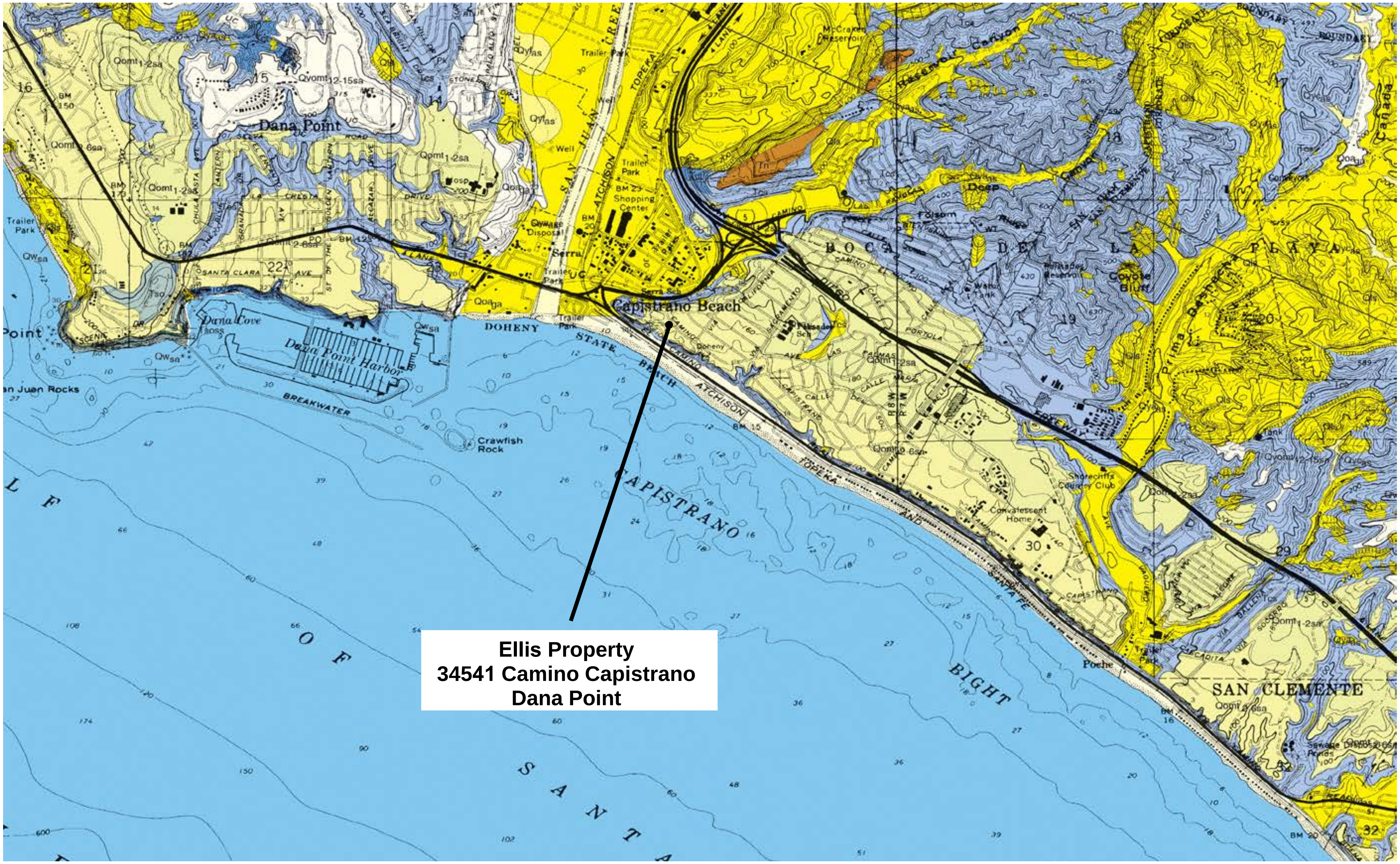

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USGS Geologic Location Map, Dana Point 7.5' Quadrangle

JOB NO.:	DATE:	FIGURE:
72778-00	MAY 2024	1

MAP EXPLANATION

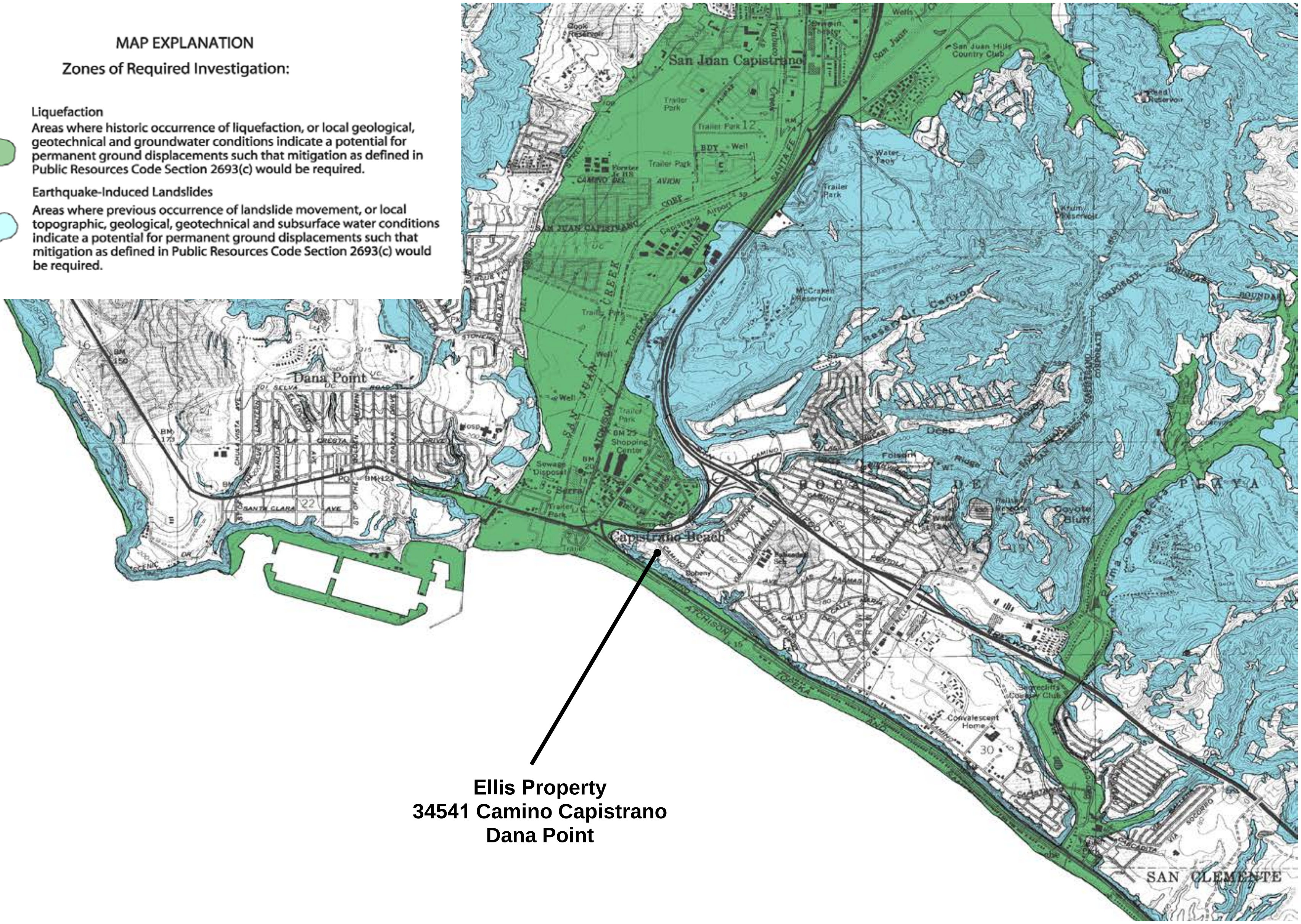
Zones of Required Investigation:

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.



CGS Seismic Hazards Map, Dana Point 7.5' Quadrangle

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JOB NO.:	DATE:	FIGURE:
72778-00	MAY 2024	2

IMAGE ADAPTED FROM GOOGLE EARTH (2024)
NOT TO SCALE
ALL BOUNDARIES PROVIDED ARE FOR ILLUSTRATIVE PURPOSES AND ARE APPROXIMATE

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OBLIQUE AERIAL IMAGE
ELLIS RESIDENCE
34541 CAMINO CAPISTRANO
DANA POINT, CALIFORNIA

PROJECT:	DATE:	FIGURE:
72778-00	MAY 2024	3

APPENDIX A

REFERENCES

APPENDIX A

REFERENCES

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AERIAL PHOTOGRAPHS

TABLE-A1, AERIAL PHOTOGRAPHS

Year	Flight	Frame	Orientation	Agency
10-13-1929	C-703A	2	1:24,000	UCSB
10-13-1939	C-5925	48	1:18,000	UCSB
9-19-1947	C-11730	21-32, 21-33	1:7,200	Fairchild Collection
5-6-1960	C-23870	51	Vertical	UCSB
11-26-2001	CCC-BQK-C	26-11	1:12,000	California Coastal Records Project
1946	GS-CP	8-172, 173	1" = 1000'	Geofirm
1970	AXK-3K	60, 61	1" = 1000'	Geofirm

APPENDIX B

CURRENT & NEARBY BORING LOGS

DATE(S) DRILLED:	4-5-2024	**DRILLING COMPANY:**	MIKES EXCAVATIONS
PROJECT NUMBER:	72778-00	**METHOD:**	4" HAND AUGER HAMMER
CLIENT:	ELLIS RESIDENCE	**WEIGHTS:**	6" SLIDE HAMMER
PROJECT ADDRESS:	34541 CAMINO CAPISTRANO	**DROP:**	--
	DANA POINT, CA	**SURFACE ELEVATION:**	--
LOGGED BY:	CHRISTOPHER TOMLIN	**LOCATION:**	--
		GROUNDWATER DEPTH:	--

BORING NO.: HA-1

DEPTH (FT)	BULK SAMPLE	CAL/SPT SAMPLE	BLOWS PER 6-INCHES	MOISTURE (%)	DRY DENSITY (pcf)	SOIL CLASS. (USCS)	LITHOLOGY (USCS; COLOR, MOISTURE, DENSITY/CONSISTENCY, GEOLOGIC DESCRIPTIONS)	GEOLOGIC ATTITUDES	DEPTH (FT)
0							**FILL/RESIDUAL SOIL (?)** Medium brown clayey very fine grained SAND (SC), moist, medium dense, with SILT.		0
		MC1							
5		MC2		24.0	88.2		@ 5' Gray Sandy SILT (ML), moist, soft.		5
		MC3					**TERRACE DEPOSITS (Qt):** Olive gray Silty CLAY (CL), moist, medium stiff.		
10									10
		MC4					@12.5' becomes wet.		
15									15
		MC5					Total Depth of Boring 18.0 feet Groundwater seepage at 12.5 feet due to rain No Caving Boring Backfilled with cuttings.		
20									20

DATE(S) DRILLED:	4-5-2024	**DRILLING COMPANY:**	MIKES EXCAVATIONS
PROJECT NUMBER:	72778-00	**METHOD:**	4" HAND AUGER HAMMER
CLIENT:	ELLIS RESIDENCE	**WEIGHTS:**	6" SLIDE HAMMER
PROJECT ADDRESS:	34541 CAMINO CAPISTRANO	**DROP:**	--
	DANA POINT, CA	**SURFACE ELEVATION:**	--
LOGGED BY:	CHRISTOPHER TOMLIN	**LOCATION:**	--
		GROUNDWATER DEPTH:	--

BORING NO.: HA-2

DEPTH (FT)	BULK SAMPLE	CAL/SPT SAMPLE	BLOWS PER 6-INCHES	MOISTURE (%)	DRY DENSITY (pcf)	SOIL CLASS. (USCS)	LITHOLOGY (USCS; COLOR, MOISTURE, DENSITY/CONSISTENCY, GEOLOGIC DESCRIPTIONS)	GEOLOGIC ATTITUDES	DEPTH (FT)
0							**FILL/RESIDUAL SOIL(?)** Mottled brown, black, gray Clayey Fine Grained SAND (SC), moist to (wet from runoff), medium dense.		0
		MC1							
5		MC2		20.0	95.6		**TERRACE DEPOSITS (Qt):** Yellow brown, very fine grained to fine grained Silty SAND (SM), damp to slightly moist, medium dense.		5
		MC3							
10		MC4		26.9	90.2				10
15		MC5		24.2	96.5		@ 15' some carbonate inclusions.		15
							Total Depth of Boring 15.5 feet No Groundwater, (@10' slight seepage due to rain) No Caving Boring Backfilled with cuttings.		
20									20

Date(s) Logged: 6/13/2012
Logged By: DRH
Address: 34581 Camino Capistrano; Dana Point, CA

Ground Elev.: ±137'

Method of Drilling: 24-inch bucket auger
Drilling Company: Big Johnny
Drop: 12"
Weight(s): 0-25', 2500 lbs; 25-45', 1500 lbs; 45-65', 750 lbs

BORING NO.: BA-1

Depth (feet)	USCS	Blows/6"	Undisturbed Sample	Bulk Sample	Moisture Content (%)	In-place Dry Density (pcf)	Description	Geologic Attitude	Depth (feet)
0							0-4" Grass - Dead, Root Mat		0
							@4" Fill: (Af): Clayey SILT, damp to moist, medium stiff, brown.		
5		3	X		15.0	110.9	**@5'** Silty CLAY, moist, stiff, brown.		5
							Fill Material as above		
							@8' Color change to medium brown.		
10		2	X	X	16.8	110.1			10
							@11' SILT & SAND layers, moist, dense, light brown & medium brown.		
15		3	X	X	13.4	116.2			15
							@16' CLAY, very moist, medium stiff, dark gray, scattered black rock fragments.		
20									20

Project No.: 71997-00

LOG OF BORING

Figure No.: B-1

Stoney-Miller Consultants Inc.

Date(s) Logged: 6/13/2012
Logged By: DRH
Address: 34581 Camino Capistrano; Dana Point, CA

Ground Elev.: ±137'

Method of Drilling: 24-inch bucket auger
Drilling Company: Big Johnny
Drop: 12"
Weight(s): 0-25', 2500 lbs; 25-45', 1500 lbs; 45-65', 750 lbs

BORING NO.: BA-1

Depth (feet)	USCS	Blows/6"	Undisturbed Sample	Bulk Sample	Moisture Content (%)	In-place Dry Density (pcf)	Description	Geologic Attitude	Depth (feet)
20		4	X		11.1	122.3	**@20'8"** Top of broken concrete pipe. Upon investigation this is a piece of an old pipe placed in the fill. **@21'** Sandy Clayey SILT/SAND, very moist, dense, dark gray. Piece of concrete pipe with joint found in spoil/drilled cuttings.		20
							@23' <u>Quaternary Marine Terrace Deposits: (Qtm)</u> Slightly Silty SAND, moist, loose, light yellow brown.		
25							**@25'** Start encountering rounded andesite pebbles all aphanitic. Occsaional rounded cobbles. **@25'1"** Silty SAND, moist, dense, light brown, friable. Coarse grains of black mafic sand in matrix of light brown sand.		25
				Bulk			**@27'4""** Zone of caving, the top of the bell goes back into the wall about 2.5' for the entire circumference of the borehole.		
30							**@29'4"** Standing water, water level is not rising - it's static based on visual observation downhole. This is perched water over the bedrock contact.		30
							@+31' <u>Bedrock: Capistrano Formation (Tc)</u> SILTSTONE, very moist, stiff to hard, dark gray to black.		
		9	X		30.8	90.4	Total Depth Drilled 32' Sampled to 33' Standing Water @ 29'4" Backfilled and Tamped with Cuttings		
35									35
40									40

Project No.: 71997-00

LOG OF BORING

Figure No.: B-2

Stoney-Miller Consultants Inc.

Date(s) Logged: 6/13/2012
Logged By: DRH
Address: 34581 Camino Capistrano; Dana Point, CA

Ground Elev.: ±135'

Method of Drilling: 24-inch bucket auger
Drilling Company: Big Johnny
Drop: 12"
Weight(s): 0-25', 2500 lbs; 25-45', 1500 lbs; 45-65', 750 lbs

BORING NO.: BA-2

Depth (feet)	USCS	Blows/6"	Undisturbed Sample	Bulk Sample	Moisture Content (%)	In-place Dry Density (pcf)	Description	Geologic Attitude	Depth (feet)
0							0-4" Grass, Root Mat in irrigated portion of the lawn. **@4"** **<u>Fill: (Af)</u>** Silty CLAY, moist, medium stiff, brown.		0
3				X (3-6)					
5		0 2	X		17.3	111.9			5
6							@6' fill material as above.		
10		3	X	X	16.8	111.6			10
11							**@11'** Clayey SILT, moist, stiff, medium brown. Angular fragment of asphalt in sidewall of borhole @11'		
15		3	X		13.6	115.6	**@15'** Black organics on teeth of bucket.		15
17							**@17'** Soil and asphalt fragments in sidewall of borehole.		
20									20

Date(s) Logged: 6/13/2012
Logged By: DRH
Address: 34581 Camino Capistrano; Dana Point, CA

Ground Elev.: ±135'

Method of Drilling: 24-inch bucket auger
Drilling Company: Big Johnny
Drop: 12"
Weight(s): 0-25', 2500 lbs; 25-45', 1500 lbs; 45-65', 750 lbs

BORING NO.: BA-2

Depth (feet)	USCS	Blows/6"	Undisturbed Sample	Bulk Sample	Moisture Content (%)	In-place Dry Density (pcf)	Description	Geologic Attitude	Depth (feet)
20		3	X	X	3.7	98.5	**@21' Quaternary Marine Terrace Deposits (Qtm)** Slightly Silty SAND, moist, dense, friable to running layer, light brown, scattered pebbles. **@21'2"** Artificial Fill overliying the marine terrace deposit sands.		20
							@24' Zone of caving creating a bell shaped cavity continuous for the circumference of the borehole.		
25							**@25'** No sample due to cobbles in terrace material		25
							@27' Standing water level of perched groundwater over the bedrock contact.		
							@29' Bedrock: Capistrano Formation (Tc) Clayey SILTSTONE, moist, hard, Black. Unoxidized and no indication of bedding.		
30		10	X		30.4	90.7	Total Depth Drilled 30' Sampled to 31' Water Standing @ 27' Backfilled and Tamped with Cuttings		30
35									35
40									40

APPENDIX C

FIELD AND LABORATORY TEST RESULTS

APPENDIX C

FIELD AND LABORATORY TEST RESULTS

I. Field Exploration Procedures

The field exploration consisted of a total of two hand-auger borings (HA-1 and HA-2) that were excavated in April 2024 at the subject site. Hand operated tools were utilized to expose near-surface soils, clear utilities, and collect samples. A previous investigation (Geofirm 2012) was conducted approximately 500 feet southeast of the subject site and consisted of two bucket auger borings (BA-1 and BA-2). The approximate locations of the excavations for the current investigation are shown on the Geotechnical Plot Plan, Plate 1. Boring Logs are included in Appendix B.
The samples were removed from the sample barrel in the brass rings, placed in moisture tight containers, and transported to the laboratory for testing.

II. Laboratory Testing Procedures

A. Moisture Content and Dry Density Test

The moisture content and dry density determination were made in accordance with ASTM test methods. The results are summarized on Figure C-1 and shown on the Boring Logs in Appendix B.

B. Gradation Test

Grain size was evaluated for a representative soil sample in accordance with ASTM D 422. The results are shown on Figure C-2.

C. Corrosion Test Results

A corrosivity series of tests were performed on a specimen of soil. The testing includes an evaluation of sulfate content and minimum resistivity in accordance with California test method 417 and 643, respectively. The test results are presented below.

Sample Designation	-	HA-1 @ 0-5’
Soluble Sulfate	-	23 mg/kg
Minimum Resistivity	-	9090 ohm-cm

D. Expansion Index Test

An expansion index test was performed under UBC Standard No. 29-2. The results of the test are tabulated below:

Sample Designation		HA-1 @ 0-5’
Expansion Index	-	25
Expansion Classification	-	Low

MOISTURE, DENSITY AND SATURATION

Client: Ellis
Project Number: 72778-00

Project Name: Ellis Residence
Address: 34541 Camino Capistrano;Dana Point

Borehole	Depth (ft)	Sample Length (in)	Sample Type	Soil Unit	Classification	Water Content (%)	Dry Density (pcf)	Saturation (%)	Expansion Index
HA-1	0.00				Silty SAND with Clay				25, as corr.
HA-1	5.00				Silty CLAY	24.0	88.2	71	
HA-2	5.00				Silty CLAY	20.0	95.6	71	
HA-2	10.00				Silty CLAY	26.9	90.2	84	
HA-2	15.00				Silty CLAY	24.2	96.5	88	

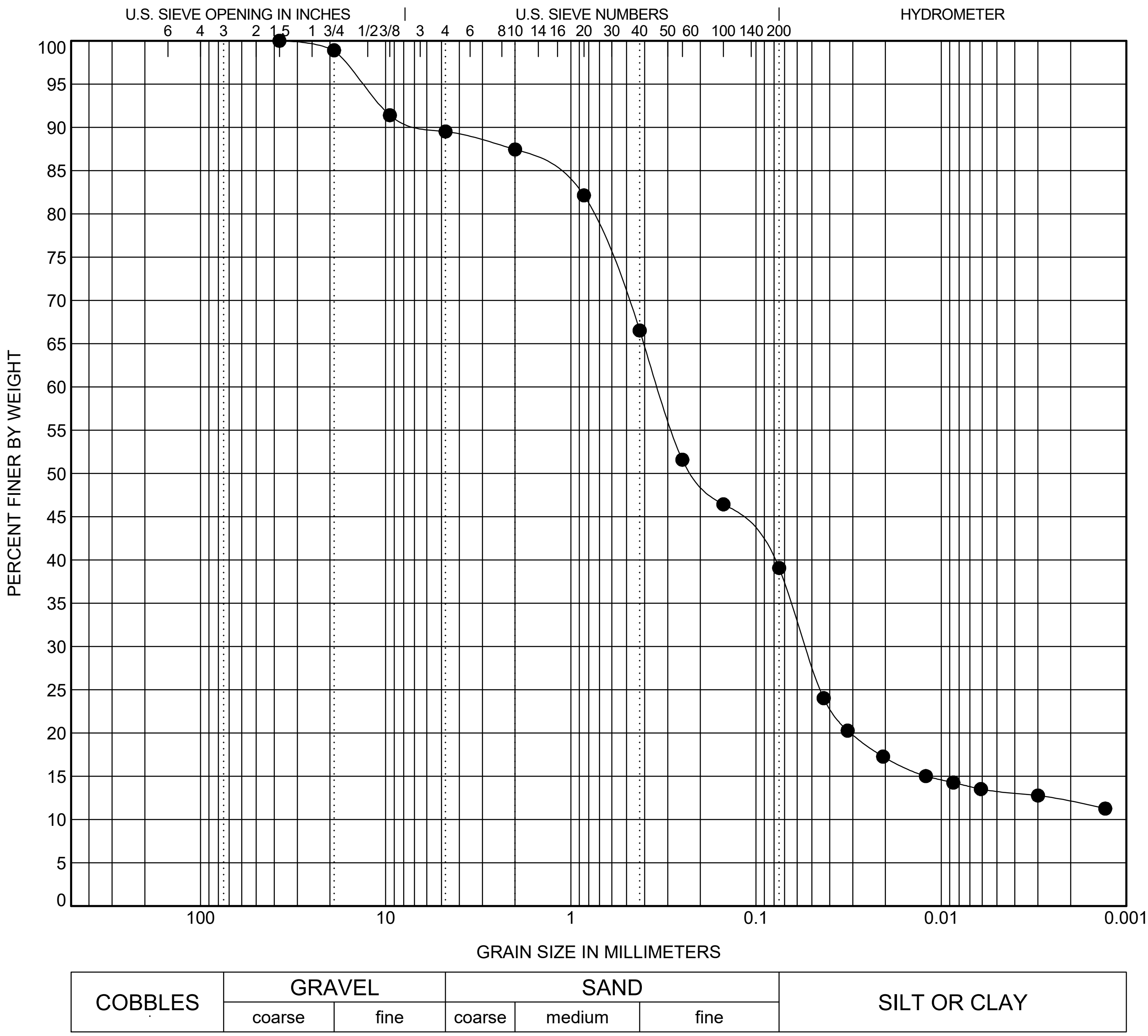
GRAIN SIZE DISTRIBUTION

Client: Ellis

Project Number: 72778-00

Project Name: Ellis Residence

Address: 34541 Camino Capistrano;Dana Point



	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**HA-1**	**0.0**	**Silty SAND with Clay**					

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**HA-1**	**0.0**	**37.5**	**0.337**	**0.054**		**10.5**	**50.5**	**25.8**	**13.3**

Figure No. C-2

APPENDIX D

STANDARD GRADING SPECIFICATIONS

APPENDIX D

STANDARD GRADING SPECIFICATIONS

GENERAL

These specifications present the usual and minimum requirements for grading operations observed by **Geofirm** or its designated representative. No deviation from these specifications will be allowed, except where specifically superseded in the geotechnical report signed by a registered geotechnical engineer.

The placement, spreading, mixing, watering and compaction of the fills in strict accordance with these guidelines shall be the sole responsibility of the contractor. The construction, excavation, and placement of fill shall be under the direct observation of the soils engineer signing the soils report. If unsatisfactory soil-related conditions exist, the soils engineer shall have the authority to reject the compacted fill ground and, if necessary, excavation equipment will be shut down to permit completion of compaction. Conformance with these specifications will be discussed in the final report issued by the soils engineer.

SITE PREPARATION

Brush, vegetation and other deleterious material such as rubbish shall be collected, piled and removed from the site prior to placing fill, leaving the site clear and free from objectionable material.

Soil, alluvium, or rock materials determined by the soils engineer as being unsuitable for placement in compacted fills shall be removed from the site. Any material incorporated as part of a compacted fill must be approved by the soils engineer.

The surface shall then be plowed or scarified to a minimum depth of 6 inches until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment used. After the area to receive fill has been cleared and scarified, it shall be diced or bladed by the contractor until it is uniform and free from large clods, brought to the proper moisture content and compacted to minimum requirements. If the scarified zone is greater than 12 inches in depth, the excess shall be removed and placed in lifts restricted to 6 inches.

Underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines or others not located prior to grading are to be removed or treated in a manner prescribed by the soils engineer.

MATERIALS

Materials for compacted fill shall consist of materials approved by the soils engineer. These materials may be excavated from the cut area or imported from other approved sources, and soils from one or more sources may be blended. Fill soils shall be free from organic vegetable matter and other unsuitable substances. Normally, the material shall contain no rocks or hard lumps greater than 6 inches in size and shall contain at least 50 percent of material smaller than 1/4-inch in size. Materials greater than 4 inches in size shall be placed so that they are completely surrounded by compacted fines; no nesting of rocks shall be permitted. No material of a perishable, spongy, or otherwise of an unsuitable nature shall be used in the fill soils.

Representative samples of materials to be utilized as compacted fill shall be analyzed in the laboratory by the soils engineer to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the geotechnical engineer as soon as possible.

PLACING, SPREADING, AND COMPACTING FILL MATERIAL

The material used in the compacting process shall be evenly spread, watered, processed and compacted in thin lifts not to exceed 6 inches in thickness to obtain a uniformly dense layer.

When the moisture content of the fill material is below that specified by the soils engineer, water shall be added by the contractor until the moisture content is near optimum as specified.

When the moisture content of the fill material is above that specified by the geotechnical engineer, the fill material shall be aerated by the contractor by blading, mixing, or other satisfactory methods until the moisture content is near optimum as specified.

After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted to 90 percent of the maximum laboratory density in compliance with ASTM D: 1557-70 (five layers). Compaction shall be accomplished by sheepsfoot rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compacting equipment. Equipment shall be of such design that it will be able to compact the fill to the specified density. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes to obtain the desired density uniformly.

A minimum relative compaction of 90 percent out to the finished slope face of all fill slopes will be required. Compacting of the slopes shall be accomplished by backrolling the slopes in increments of 2 to 5 feet in elevation gain or by overbuilding and cutting back to the compacted inner core, or by any other procedure which produces the required compaction.

OBSERVATIONS AND TESTING

The geotechnical engineer shall observe the placement of fill during the grading process and will file a written report upon completion of grading stating his observations as to compliance with these specifications.

One density test shall be required for each 2 vertical feet of fill placed, or one for each 1,000 cubic yards of fill, whichever requires the greater number of tests.

Any cleanouts and processed ground to receive fill must be observed by the soils engineer and/or engineering geologist prior to any fill placement. The contractor shall notify the geotechnical engineer when these areas are ready for observation.

PROTECTION OF WORK

During the grading process and prior to the complete construction of permanent drainage controls, it shall be the responsibility of the contractor to provide good drainage and prevent ponding of water and damage to adjoining properties or to finished work on the site.

After the geotechnical engineer has terminated his observations of the completed grading, no further excavations and/or filling shall be performed without the approval of the soils engineer, if it is to be subject to the recommendations of this report.

APPENDIX E

UTILITY TRENCH BACKFILL GUIDELINES

APPENDIX E

UTILITY TRENCH BACKFILL GUIDELINES

The following guidelines pertinent to utility trench backfills have been adopted by the County of Orange, Environmental Management Agency Grading Section, effective March 31, 1986. The application of the guidelines is strictly enforced by the County reviewers and inspectors.

1. Each utility subcontractor (gas, electric, water, sewer, telephone, cable TV, irrigation, drainage, etc.) shall submit to the developer for dissemination to his consultants (civil engineer, geotechnical engineer, and utility contractor) a plot plan of all utility lines installed under his purview which identifies line type, material, size, depth, and approximate location.

2. The developer or his agent shall provide a composite plot plan of all utilities or a copy of <u>all</u> individual utility plot plans to his geotechnical engineer for use in evaluating whether all utility trench backfills are suitable for the intended use.

3. The geotechnical engineer shall provide the County with a report which includes a plot plan showing the location of <u>all</u> utility trenches which:

   A. Are located within the load influence zone of a structure (1:1 projection)

   B. Are located beneath any hardscape

   C. Are parallel and in close proximity to the top or toe of a slope and may adversely impact slope stability if improperly backfilled

   D. Are located on the face of a slope in a trench 18 or more inches in depth.

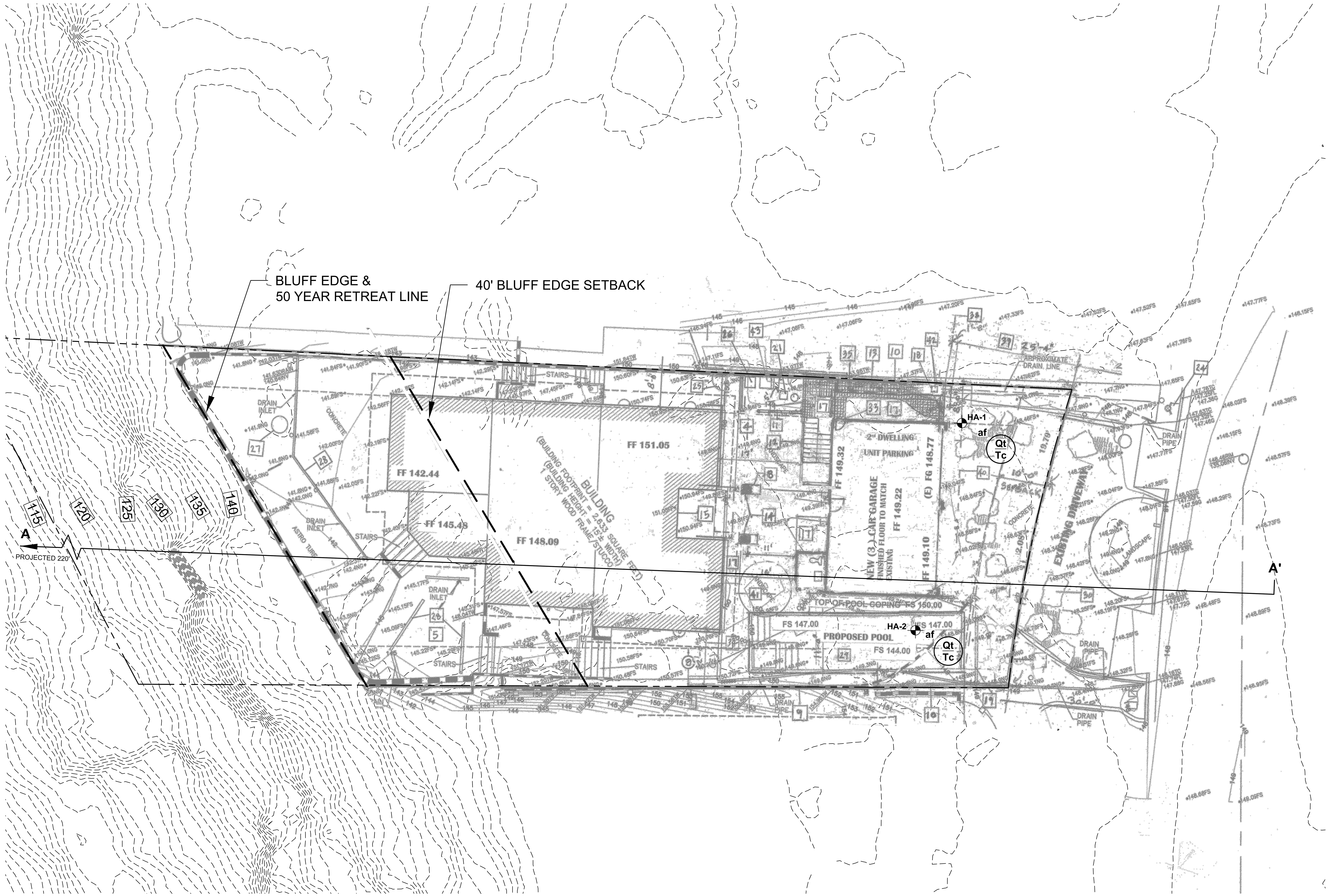
   Typically, trenches that are less than 18 inches in depth will not be within the load influence zone if located next to a structure, and will not have a significant effect on slope stability if constructed near the top or toe of a slope and need not be shown on the plot plan unless determined to be significant by the geotechnical engineer. This plot plan may be prepared by someone other than the geotechnical engineer, but must meet his approval.

4. Backfill compaction test locations must be shown on the plot plan described in No. 3 above, and a table of test data provided in the geotechnical report.

5. The geotechnical report (utility trench backfill) must state that <u>all</u> utility trenches within the subject lots have been backfilled in a manner suitable for the intended use. This includes the backfill of all trenches shown on the plot plan described in No. 3 <u>and</u> the backfill of those trenches which did not need to be plotted on this plan.

EXPLANATION

- af — ARTIFICIAL FILL
- Qt — NON-MARINE AND MARINE TERRACE DEPOSITS
- Tc — CAPISTRANO FORMATION; CIRCLED WHERE BURIED
- —?— · · APPROXIMATE LOCATION OF GEOLOGIC CONTACT; DOTTED WHERE BURIED, QUERIED WHERE UNCERTAIN (NOT SURVEYED)
- HA-2 — APPROXIMATE LOCATION OF HAND AUGER BORING; NUMBER INDICATED
- A A' — LOCATION OF GEOTECHNICAL CROSS-SECTION



BASE TOPOGRAPHY: OCM Partners, 2024: 2018 USGS Lidar: Southern CA Wildfires from 2010-06-15 to 2010-08-15. NOAA National Centers for Environmental Information, https://www.fisheries.noaa.gov/inport/item/58709.
REFERENCE PLAN: AGOSTINO DI FANTE ASSOCIATES , 2024, "ELLIS RESIDENCE, 34541 CAMINO CAPISTRANO, LAGUNA BEACH, CA 92672", SHEET A103, DATED OCTOBER 17.

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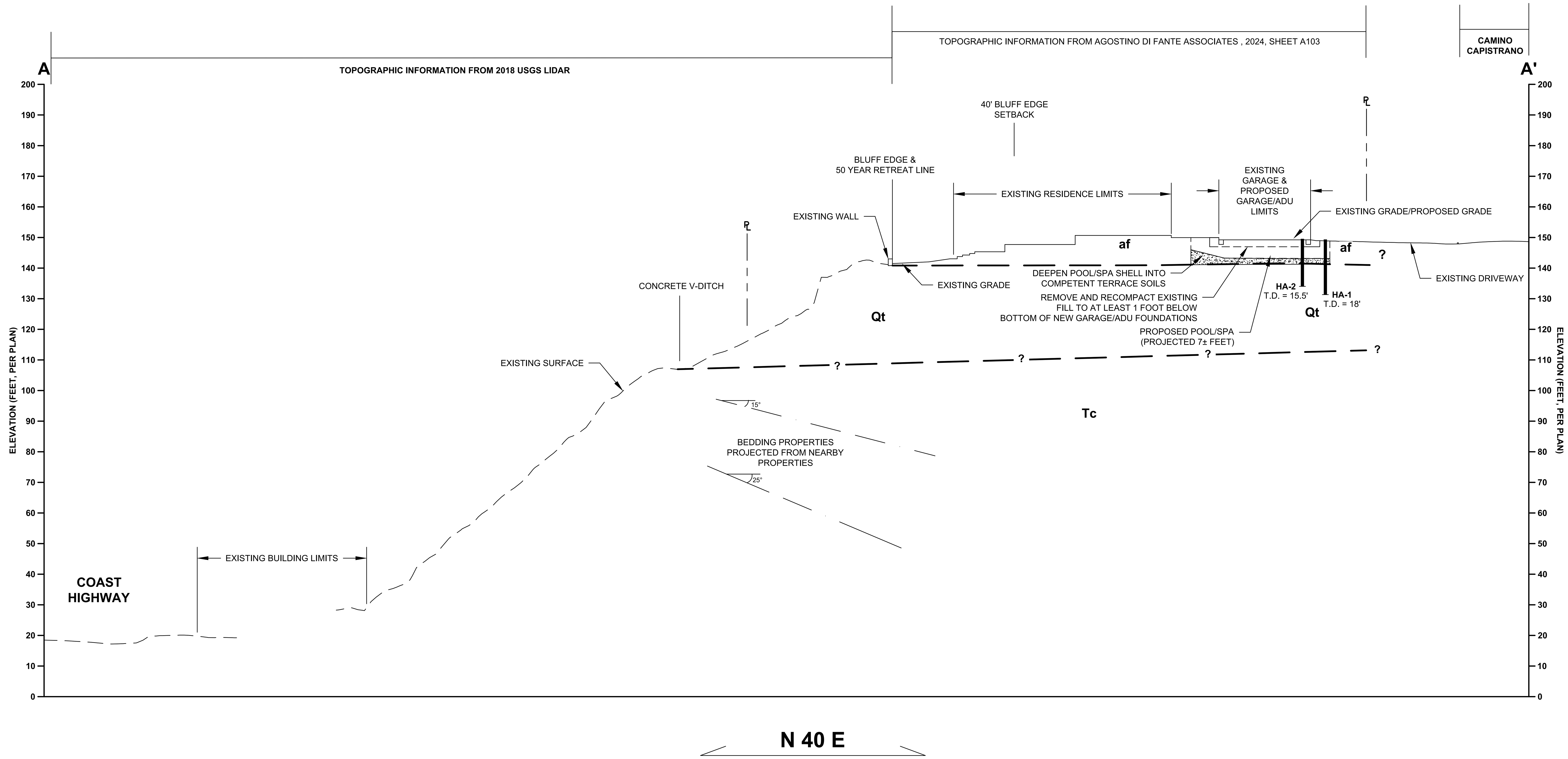
GEOTECHNICAL PLOT PLAN
ELLIS RESIDENCE
34541 CAMINO CAPISTRANO
DANA POINT, CA

PROJECT:	DATE:	PLATE:
72778-00	MAY 2024	1

72778-00_v2_VM.dwg
8-May-24
jbearfield



0 20' 40'
SCALE: 1" = 20'

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GEOTECHNICAL CROSS SECTION A-A'
ELLIS RESIDENCE
34541 CAMINO CAPISTRANO
DANA POINT, CA

PROJECT:	DATE:	PLATE:
72778-00	MAY 2024	2

8-May-24
72778-00_v2_VM.dwg
jbearfield