Exhibit E

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GEOLOGIC HAZARDS REPORT AND BLUFF RETREAT STUDY
255 HIGHWAY 1
CARMEL HIGHLANDS
MONTEREY COUNTY, CALIFORNIA

November 6, 2017

Prepared for
Ms. Heide Cortopassi

Prepared by
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November 6, 2017

File No.: SH-13425-GA

Ms. Heide Cortopassi
11039 N Highway 88
Stockton, CA 95212

PROJECT: CORTOPASSI RESIDENCE
255 HIGHWAY 1
CARMEL HIGHLANDS, CALIFORNIA

SUBJECT: Geologic Hazards and Bluff Retreat Report

REF.: Proposal for a Geologic Hazards and Bluff Retreat Study, Cortopassi Residence, 255 Highway 1, Carmel Highlands, California, by Earth Systems Pacific, dated September 25, 2017

Dear Ms. Cortopassi:

In accordance with authorization of the above-referenced proposal, this geologic hazards and bluff retreat report has been prepared for use in the development of plans and specifications for additions to your residence at 255 Highway 1 in the Carmel Highlands area of Monterey County. This report is based upon our review of geologic maps and literature, a site reconnaissance, and information from the soil engineering investigation report for the site prepared by Haro, Kasunich, and Associates, 2017. This report describes the general site geologic characteristics of the site and identifies potential geologic hazards. Three bound copies and an electronic copy of this report are being furnished for your use.

We appreciate the opportunity to have provided geological services for this project and look forward to working with you again in the future. If there are any questions concerning this report, please do not hesitate to contact the undersigned.

Sincerely,

Earth Systems Pacific

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CERTIFIED
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TABLE OF CONTENTS

APPENDIX

1.0 INTRODUCTION

Site Location

The site is located at 255 Highway 1 in Carmel Highlands, California (Assessor's Parcel Number 241-182-020). The property is occupied by a single-story home on the southeast-central portion of the parcel and lies along the central California coastline. The parcel is approximately centered at 36.5008°N latitude and 121.9388°W longitude on the United States Geological Survey's Monterey 7.5-Minute Quadrangle and shown on the appended Vicinity Map. The site is situated on the northern portion of a hammerhead-shaped peninsula that juts out from the coastline. Residential properties are present in the surrounding areas.

Proposed Additions

The proposed additions to the house consist of extending the foundation to the south away from the cove and addition of a second story. An additional parking area cut is planned to the west at the front of the house. Based on the geotechnical report by Haro, Kasunich and associates (2017), a deepened foundation is recommended for the additions.

Purpose and Scope of Work

Earth Systems Pacific (ESP) performed this Geologic Hazards Evaluation and Bluff Retreat Study on behalf of Ms. Heide Cortopassi. The purpose of the Geologic Hazards Evaluation and Bluff Retreat Study was to evaluate the potential geologic and seismic conditions which may affect the site.

The scope of work for the Geologic Hazards Evaluation is intended to satisfy the requirements of California Geologic Survey (CGS) Note 42: Guidelines to Geologic/Seismic Reports. Our scope included a review of published and unpublished geologic literature, review of geologic mapping and aerial photography of the site and vicinity, a general site reconnaissance, evaluation of the data collected, and preparation of a written report with supporting graphics. The bluff retreat study was principally based on review of historic aerial photographs. A review of County assessor records was also performed.

The report and recommendations are intended to comply with the considerations of the California Building Code (CBC), 2016 Edition, and common geologic practice in this area at this time under similar conditions.

Analysis of the soil for percolation rates, mold or other microbial content, asbestos (present in building materials or naturally occurring), radioisotopes, hydrocarbons, or other chemical properties are beyond the scope of this report. Geotechnical engineering recommendations are also not part of our scope of services for this report.

To verify that pertinent issues have been addressed and to aid in conformance with the intent of this report, it is requested that grading and foundation plans be submitted to Earth Systems Pacific for review as they near completion.

In the event that there are any changes in the nature, design, or locations of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained herein will not be considered valid unless the changes are reviewed and the conclusions of this report are verified or modified in writing by the engineering geologist. The criteria presented in this report are considered preliminary until such time as they are verified or modified in writing by the engineering geologist in the field during construction.

This report does not address issues in the domain of the contractor such as, but not limited to, site safety, subsidence of the site due to compaction, loss of volume due to stripping of the site, shrinkage of soils during compaction, excavatability, shoring, temporary slope angles, construction means and methods, etc. Ancillary features such as temporary access roads, fences, signs, flag poles, and nonstructural fills are also not within our scope and are not addressed.

Site Setting

This site is located west of Highway 1 at Highlands Drive and accessed by a private street. Topographically, the peninsula is a relatively short northwest trending ridgeline separated from the coast by a narrow cove at its northern end and Wildcat Cove at its southern end. Ground surface on the property slopes northward with bluffs approximately 40 feet in height next to the northern cove of the peninsula. Elevation at the site range from about 80 feet along the ridge crest to mean sea level within the cove. The existing home lies at an elevation of about 50 feet.

2.0 GEOLOGIC REVIEW

Regional Geologic Setting

The site is located within the geologically complex Coast Ranges Geomorphic Province of

California. Discontinuous northwest-southeast trending mountain ranges, valleys and faults formed by tectonic, mountain-building processes characterize the province. The site is situated atop a coastal terrace remnant along the Pacific Coast.

The predominant structural feature in the California Coast Ranges is the San Andreas fault, which is the structural boundary between two tectonic plates: the Pacific Plate to the southwest and the North American Plate to the northeast. The San Andreas Fault zone in the region of the site is a steeply southwest-dipping shear zone that juxtaposes Jurassic-Cretaceous age Franciscan Complex basement rocks on the northeast against Salinian Block rocks on the southwest. The subject site lies westward of the plate boundary within the Salinian Block (Salinia) tectonic unit. Salinia is an elongate northwest-southeast trending region within the Coast Ranges that is bounded on the north and northeast by the aforementioned San Andreas Fault, on the southwest by the Sur Nacimiento and Rinconada Faults, and by the Big Pine Fault of southern California. It consists of a basement of Paleozoic age high-grade metamorphic and Cretaceous age plutonic rocks overlain by late Mesozoic age and younger folded sedimentary rocks (Hall, 1991). Salinia is part of the Southern California allochthon terrain that is more than 55 miles wide and 340 miles long. The terrain has been detached and moved northward along the San Andreas Fault system to its present position (Hall, 1991).

Geologic Literature Review

Soil Mapping

We reviewed the USDA Soil Conservation Service web soil survey maps (accessed 2017). Soil mantling the site is designated San Andreas fine sandy loam and is described as a well-drained silty sand to silt (SM to ML).

Geologic Mapping

Based on Clark et al (1997), the site is underlain by porphyritic granodorite (granitic) rocks of Cretaceous age (Kgdp) mantled by coastal terrace deposits of Quaternary age (Qct). The terrace deposits are described as semiconsolidated, moderately well-sorted marine sand containing thin discontinuous gravel-rich layers. Geology in the area is shown on the appended Local Geologic Map.

Erosion

Monterey County notes in their Environmental Impact Report for the 2007 General Plan that coastal terrace deposits are the least resistant to erosion from surface water and seepage. In addition to sheet flow of overland runoff, the interface between the terrace deposits and bedrock at the site is subject to seepage.

Faulting

Active faults are defined by the California Geological Survey (CGS) as faults that are well defined and have experienced movement within the last 11,700 years (Hart and Bryant, 2007). The definition of potentially active faults varies, however. A generally accepted definition of a potentially active fault is one that shows evidence of displacement older than 11,700 years and younger than 1,600,000 years (i.e., Pleistocene in age). However, potentially active is no longer used as criteria for zoning by the state. The terms sufficiently active and well-defined are now used by the CGS as criteria for zoning faults under the Alquist-Priolo Act (Hart and Bryant, 2007). Inactive faults are classified as not having been active within the last 1.6 million years.

The site is located within the seismically active Monterey-Carmel area. The California Geological Survey has not published an Alquist-Priolo Earthquake Fault Zones map for the Monterey Quadrangle.

Nearby unzoned faults shown by Jennings (2010) include the Palo Colorado fault (on-shore portion; Late Quaternary displacement), Tularcitos fault (Quaternary/Late Quaternary displacement), Navy fault (Holocene displacement), Monterey Bay fault zone (Holocene to Quaternary displacement), and the Reliz/Rinconada fault (Late Quaternary displacement). The above listed faults have been mapped as having Holocene through Quaternary displacements indicating that they are potentially active faults. As these faults have not been zoned under the Alquist-Priolo Act, they are either not sufficiently active or well-defined enough to warrant zoning.

The major active (zoned) faults in this area of California are the San Gregorio/Palo Colorado Sur and San Andreas faults. The San Gregorio/Palo Colorado Sur fault is approximately 1.7 miles west of the site, and the San Andreas fault is approximately 33 miles east of the site (Jennings, 2010).

The nearest faults to the site, irrespective of zoning, are the Cypress Point, Hatton and Palo Colorado Sur faults. The Palo Colorado fault is considered by the USGS (Bryant and Cluett, 1999) as part of the southern section of the San Gregorio fault zone (zoned by the State of California). The Palo Colorado fault is shown by Jennings (2010) as exhibiting Holocene displacement in the off-shore portions, and Late Quaternary displacement in the on-shore portions. A County Active Fault Map is appended.

Landsliding and Debris Flows

The state of California has not published landslide hazards maps for the Monterey Quadrangle. According to the Monterey County Relative Landslide Susceptibility Map (2003) the site lies in an area deemed to have a low susceptibility to earthquake induced landsliding. Furthermore, Haro, Kasunich and Associates (2017) analyzed slope stability at the site and concluded that site slopes were stable under static conditions though the slope fronting the house could become unstable in the event of a nearby large earthquake. To mitigate this condition, they recommended that the additions be supported by a deepened foundation extending into bedrock.

Liquefaction and Seismically-Induced Settlement

The term liquefaction refers to the liquefied condition and subsequent softening that can occur in soils when they are subjected to cyclic strains, such as those generated during a seismic event. Studies of areas where liquefaction has occurred have led to the conclusion that saturated soil conditions, low soil density, grain sizes within a certain range, and a sufficiently strong earthquake, in combination, create a potential for liquefaction.

The state of California has not published liquefaction hazard maps for the Monterey Quadrangle. The Monterey County Relative Liquefaction Susceptibility map (Monterey County, 2001) shows the site as being in an area having a low liquefaction potential.

Seismically-induced settlement occurs when unsaturated granular soils experience a loss of volume when subjected to sufficiently strong ground shaking. Although seismically induced settlement is not a form of liquefaction, it is a related phenomenon that can occur in conjunction with liquefaction. Because shallow bedrock is present on the site, the potential for seismically-induced settlement to occur is deemed low.

Tsunami

The California Geological Survey in co-operation with the California Emergency Management Agency (CalEMA) and the University of Southern California (USC) have published a tsunami inundation map for the Monterey Quadrangle (CalEMA, 2009). The areas seaward of the bluff crest at the site are shown to be within a tsunami inundation zone. The map indicates that the maximum wave run-up does not crest the bluff. A Tsunami Inundation Map is presented in the Appendix. Because the map is based on quantitative models and was prepared at a scale of 1:24,000, the maximum wave run-up is considered only an estimate. Local variations in bathymetry and seafloor geometry can cause variations in predicted tsunami heights and therefore run-up distances and inundation levels. However, because the house is located at an elevation of 50-feet above sea level, the potential for tsunami impacts to the residence are deemed low.

Earthquake History

Several strong earthquakes have occurred on the active faults in the San Francisco and Monterey Bay regions within the last 200 years. Especially notable are the 6.8M 1836 Monterey Bay area earthquake, the 1926 6.1M Monterey Bay doublet, the 6.2M 1897 Calaveras earthquake, and the 7.1M 1989 Loma Prieta earthquake.

The epicenter of the 1989 Loma Prieta (Mw 6.9) earthquake was approximately 37 miles north of the subject site and produced ground shaking equivalent to a modified Mercalli intensity of VI in the Carmel/Big Sur area (Stover and Coffman, 1993). It should be expected that the subject site will be affected by future earthquakes of comparable or greater magnitude than the 1989 Loma Prieta earthquake.

Aerial Photograph Interpretation – Faulting and Landsliding

Earth Systems Pacific reviewed aerial photographs and imagery taken between 1949 and 2017 showing the site and its vicinity for the presence of terrain features indicative of landslides, active fault zones and evidence of bluff retreat. The residence is situated atop costal terrace deposits overlying granitic rock.

A lineament is seen in stereo aerial photographs as a feature having tonal differences on either side. These differences may be due to changes in soil or rock type, vegetation, groundwater levels, geologic structure, or sedimentary bedding characteristics. Lineaments are sometimes associated with topographic features characteristic of faults, such as linear and shutter ridges, sag ponds, spring zones, and offset drainages. In addition to lineaments associated with Wildcat Cove on the south and the narrow cove on the north, prominent north-south oriented lineaments are present crossing the site peninsula. Because regional faulting trends northwesterly, these lineaments appear to be associated with differential weathering along fractures rather than faulting.

The aerial photographs were also examined for geomorphic features characteristic of ancient (dormant) and active landslides. The terrain in the vicinity is not suggestive of landsliding, and no landslide features are present on or near the subject site.

3.0 FIELD INVESTIGATION

Site Reconnaissance

A geologist with Earth Systems Pacific visited the site on October 27, 2017. The property is located on a hammer-head shaped peninsula and along a near-vertical coastal bluff above a narrow, isolated cove that forms the northern side of the peninsula. A peninsula consists of a ridgeline flanked by moderately steep to steeply inclined slopes. The existing residence is located about 35 feet beyond the head of the cove and is set into a ridge line. Terrace deposits are visible overlying granitic rocks on the bluff face. Cuts adjacent to the residence expose granitic rocks and there are minor amounts of colluvial slope wash soil near the base of the cuts. A larger deposit of colluvial soil was present outside the northwest corner of the residence where a new parking area is planned. There was no obvious evidence on the house or private street indicating ground instability. Additionally, we did not observe features suggestive of faulting or landsliding on the site. A Site Geologic Map is appended.

4.0 DATA ANALYSIS

Site Soil/Rock Classification

Based on our reconnaissance observations, the site is assigned to Site Class B (Rock) as defined by Chapter 16 of the 2016 CBC.

Deterministic Seismic Hazard Evaluation

Estimated peak horizontal ground acceleration is one of the basic parameters used to characterize the ground shaking potential at a given site. Actual ground accelerations at a locality are influenced by topography, geologic structure, condition of subsurface materials, and groundwater level. Table 1 lists the estimated seismic parameters for known active faults in the Monterey Bay region that could impact the site.

The estimated mean peak horizontal ground accelerations presented in Table 1 are based upon the mean, 5% damped, peak ground acceleration derived from three Next Generation Attenuation (NGA) relationships. The NGA relationships used were Campbell & Bozorgnia (2008), Boore & Atkinson (2008), and Chiou & Youngs (2008). The fault parameters used in our analysis were obtained from the WGCEP Uniform California Earthquake Rupture Forecast (UCERF1; 2002), and UCERF2 (2008) with estimated Type B source recurrence intervals from the CGS Open File Report 96-08 (1996). For our seismic analysis we used an estimated shear wave velocity (Vs_{30}) of 1140 m/s, based on the site geology and the soil classification (Site Class B) determined in accordance with Chapter 16 of the 2016 California Building Code.

This method of seismic analysis is a deterministic approach in that the maximum considered earthquake (MCE) along each active fault within the region that may be reasonably expected to generate strong ground shaking at the site is evaluated. Table 1 also lists the distance of the causative faults from the site as derived from the computer program EQFAULT (Blake, 2004), and supplemented by data obtained from published geologic maps, the possible earthquake magnitudes that may be generated by the faults, the recurrence interval for the faults, and the fault type classification of WGCEP UCERF2 (2008).

TABLE 1
Deterministic Estimates of Ground Acceleration for
Significant Known Faults in the Site Region ("Rock" Site[2])

Fault	Closest Distance (mi/km)	Maximum Magnitude (Mw)[1]	Estimated Ground Acceleration (g) Mean[2] PGA	T_s	T_1	Recurrence Interval[3] (years)	Source Type[4]
San Gregorio (Palo Colorado)	1.7/2.8	7.1	0.458	1.221	0.262	110	B
Monterey Bay-Tularcitos	7.1/11.4	7.3	0.360	1.018	0.192	2841	B
Rinconada	15.7/25.3	7.5	0.305	0.813	0.154	1764	B
Zayante-Vergeles	28.2/45.4	7.0	0.219	0.607	0.109	8821	B
San Andreas	32.9/52.9	8.05	0.267	0.644	0.143	223	A

[1] Moment magnitude from WGCEP UCERF2 (2008) or Cao et al (2003)
[2] Ground Accelerations estimated from mean of NGA relationships using Vs30=1140m/s (assumed) (2016 CBC Site Class B Soil)
[3] Recurrence intervals from WGCEP UCERF2 (2008) or CGS OFR 96-08.
[4] Seismic source type from WGCEP UCERF2 (2008).
*Not included in 2002 CGS Data, (Cao et al, 2003) or 2008 WGCEP data.

Based on the data presented in Table 1, above, it appears that the highest peak ground acceleration will result from an earthquake occurring on the Palo Colorado segment of the San Gregorio fault. The values given are conservative in that it is assumed that the earthquake will occur at the near-point of a fault relative to the site.

Seismic Design Parameters

The seismic design parameters for the site per Chapter 16 of the California Building Code (2016 Edition) are as follows. The values were determined utilizing the USGS U.S. Seismic Design Maps web-based tool.

Site Class = B

Short Term Spectral Acceleration Parameter, $S_s = 1.767$ g

1 Second Spectral Acceleration Parameter, $S_1 = 0.699$ g

Site Coefficient, $F_a = 1.00$

Site Coefficient, $F_v = 1.00$

Adjusted Spectral Acceleration Parameter, $S_{MS} = 1.767$ g

Adjusted Spectral Acceleration Parameter, $S_{M1} = 0.699$ g

Design Spectral Acceleration Parameter, $S_{DS} = 1.178$g

Design Spectral Acceleration Parameter, $S_{D1} = 0.466$ g

Bluff Retreat

Aerial Photographs

For our aerial photograph review we created a composite overlay of aerial photographs dated 1949, 1971, and 1990, and Google Earth imagery dated 2017 with the private street and Highway 1 used as references between the photographs and imagery. The apparent bluff crest near the site was then traced on each and mutually compared to each other. There were inherent difficulties tracing the bluff position because in cases vegetation obscured the bluff crest and because reduction in scale of the photographs (enlargement of photograph) caused the bluff location to appear smudged. As such, the bluff crest locations shown on the attached Bluff Position Map should be considered approximations prior to 2017. However, there are several points where at least three of the four traced bluff locations closely coincide suggesting little if any retreat. Alternately, there are several areas where the apparent bluff locations widely diverge, but are inconsistent in that there is not a consistent chronological progression and in some places the apparent bluff position erroneously advances ocean-ward. A Bluff Position Map and copies of the aerial photographs used for this study are appended.

Whereas it appears that there may be localized bluff retreat, the average bluff location seems to be consistent through the time interval reviewed and any perceived change appears negligible. However, the coastal terrace deposits at the site are susceptible to erosion and runoff water should not be allowed to freely flow over the bluff crest.

Monterey County Assessor Records

On October 27, 2017, we visited the Monterey County Assessor's office to review current and historic assessor map records covering the subject property. The parcel was first recorded in 1962 and there were no records of changes to the surveyed boundaries since that time.

Discussion and Conclusions

There does not appear to have been significant discernible bluff retreat at the site between 1949 and 2017. The potential for bluff retreat to affect the residence is considered low. As previously noted, surface runoff should be controlled so as not to freely flow over the bluff.

5.0 GEOLOGIC ANALYSIS AND CONCLUSIONS

This Geologic Hazards Evaluation and Bluff Retreat Study was conducted to determine the geologic conditions at the subject site and to evaluate potential geologic hazards that may impact the planned residence additions and improvements at the site. Our Geologic Hazards Evaluation focused on addressing potential geologic hazards associated with the location of the site near seismically active faults. In general, the potential geologic hazards encountered in the Monterey Bay Area include landslides, debris flows, and the hazards concomitant with earthquakes. Earthquake-related hazards include ground rupture along the trace of a fault, ground shaking, ridgetop cracking, lurching, liquefaction, earthquake-induced landsliding, lateral spreading, and tsunami.

The following conclusions are based on the data acquired and analyzed during the course of ESP's Geologic Hazards Evaluation and Bluff Retreat Study.

Primary Seismic Hazards

Ground Rupture

The state of California has not published Alquist-Priolo Earthquake Fault Zone maps for the Monterey Quadrangle. Therefore, either the faults in the area are not well defined or do not meet the criteria for zoning (having had displacement during Holocene time). Based on work which post-dates the most recent phase of Alquist-Priolo mapping for the area, several of the nearby faults have been determined to be Holocene-active including the Palo Colorado segment of the San Gregorio fault zone (Bryant and Cluett, 1999), and the Monterey Bay-Tularcitos fault system (Clark et al, 1997). Therefore these faults may be capable of generating damaging earthquakes. However, no active or potentially active fault traces are mapped on or trend toward the subject site, and no evidence of faulting on the site was observed during our aerial photograph review or site reconnaissance. The potential for surface fault rupture to affect the subject site is deemed low.

Ridge-top Cracking

The effects of topography on relative ground shaking intensity and the resultant ground surface disturbance and structural damage were noted in the Santa Cruz Mountains after the 1906 San Francisco Earthquake (Lawson, 1908) and the 1989 Loma Prieta earthquake (Plafker and Galloway, 1989). Ridge-top cracking during the 1989 Loma Prieta earthquake damaged roadways and structures approximately 10 km from the epicenter in the Summit Road area of the Santa Cruz Mountains. A study by Hartzell et al. (1994) concluded that the apparent amplification of ground shaking is a complex interaction of seismic and topographic conditions that cannot be quantified with existing data. The site is not located in terrain comparable to that affected by the 1989 Loma Prieta earthquake, therefore, the potential for this type of ground failure is considered low at the site.

Ground Shaking

The main identified geologic hazard at the site is the potential for strong seismic ground shaking. A moderate to major earthquake on the San Gregorio/Palo Colorado, Monterey Bay-Tularcitos, or San Andreas faults could cause severe ground shaking at the site. The foundation for the residence should be designed for seismic shaking, including horizontal and vertical accelerations, as required by the latest edition of the California Building Code. These values should be considered minimum design criteria.

Secondary Earthquake Effects

Landslides

The California Geological Survey has not published geologic hazard maps for the Monterey Quadrangle. The County of Monterey deems the potential for landsliding to affect the subject site to be low. We did not observe evidence of landsliding on or near the site during our air photo review or site reconnaissance. It is our opinion that the hazard posed by landsliding is low. However, care should be exercised to prevent uncontrolled runoff from running over the slopes, which could create a potential for small scale sliding due to oversteepening by gullying. Other factors which could adversely affect the stability of the slopes include spring sapping and piping within the underlying terrace deposits; the addition of effluent treatment systems, surface irrigation, or urban runoff. The hazard posed by landsliding at the site is considered low.

Liquefaction

Liquefaction is generally associated with saturated, well-sorted fine to medium grained sands and is expressed as a sudden loss of cohesion and resultant flow and/or settlement of the material during an earthquake. Lurching and lateral spreading may accompany liquefaction, as was observed in areas underlain by relatively loose, unconsolidated sediments following the 1906 San Francisco earthquake (Lawson, 1908) and the 1989 Loma Prieta earthquake (Plafker and Galloway, 1989). Liquefaction may also occur in fine-grained sediments with low plasticity indices (Bray and Sancio, 2006).

Based on the Monterey County Relative Liquefaction Susceptibility map (Monterey County, 2001) the site is in an area having a low liquefaction potential.

Other Geologic Concerns

Debris Flows:

Debris flows are a type of landslide characterized by a rapidly flowing mass of rock fragments, soil, and mud with more than half of the particles being larger than sand size and typically containing cobbles and boulders as well. Debris flows generally are initiated in colluvium filled hollows. These flows almost invariably result from unusually heavy rain, and tend to find their way into drainages and travel for significant distances. Because the site is located away from colluvium filled hollows, the potential for debris flows at the site is considered low.

Tsunami

Tsunami are ocean waves that travel at speeds of up to 590 mph with long wavelengths (up to 200km) and long periods (generally 10 to 60 minutes), and low amplitudes on the open sea. These waves may pile up to 30 meters or more in shallow water and can cause severe to catastrophic damage. A tsunami may be caused by submarine earthquakes, volcanic eruptions, or landslides. The Great Tohoku Earthquake (M9.0) on March 10, 2011, off the coast of Japan generated tsunami heights up to 39 meters and flooding that traveled over 10 kilometers inland in places. It is believed that nearly 20,000 people lost their lives in Japan from this event, and that 97% of the fatalities can be attributed to the tsunami alone (CGS, 2011). This tsunami reached the coast of California and generated wave heights of up to 3 meters roughly 15 hours after the event occurred. Other significant tsunami events which have affected the California coast include the 1700 Cascadia subduction zone earthquake, the 1960 Chile earthquake (M9.5), and the 1964 Alaska earthquake (M9.2).

CalEMA (2009) shows the areas seaward of the bluff crest at the site to be within a tsunami inundation zone. The map indicates that the maximum wave run-up does not crest the bluff. Because the map is based on quantitative models and was prepared at a scale of 1:24,000, the maximum wave run-up is considered only an estimate. Local variations in bathymetry and seafloor geometry can cause variations in predicted tsunami heights and therefore run-up distances and inundation levels. The potential for tsunamis to impact the upland portions of the property is deemed low.

Erosion

Monterey notes in their Environmental Impact Report for the 2007 General Plan that coastal terrace deposits are the least resistant to erosion from surface water and seepage. Runoff water should be controlled so it does not flow freely over the bluff crest.

6.0 SUMMARIZED GEOLOGIC CONCLUSIONS AND RECOMMENDATIONS

The planned additions to the residence and associated improvements are considered feasible from a geologic viewpoint, provided the recommendations of this report are incorporated into the design and construction of the project. The property owner should be aware that development in the seismically active Carmel - Monterey Bay Area entails variable risks, which may include potential structural distress to residences and on-site pavements, plus disruption of local roads and utilities.

The main identified geologic hazard at the site is the potential for strong seismic shaking due to an earthquake on one or more of the more active faults in the Carmel - Monterey Bay Area. A moderate to major earthquake on the San Gregorio/Palo Colorado, Monterey Bay-Tularcitos or San Andreas fault systems could cause severe ground shaking at the site. The foundation for the residence addition should be designed for seismic shaking based on the current California Building Code.

No evidence of active or dormant landsliding which might affect the proposed residence was noted during or our review of aerial photographs or site reconnaissance. No landslides have been mapped by others on or near the proposed building site. It is our opinion that the hazard posed by landsliding at the proposed building site is low.

The bluff crest has experienced little if any apparent retreat between at least 1949 and 2017. To protect the bluff, concentrated surface drainage should be directed away from the bluff crest.

7.0 CLOSURE

This report is valid for conditions as they exist at this time for the type of project described herein. Our intent was to perform the evaluation in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the Scope of Services section. Application beyond the stated intent is strictly at the user's risk.

If changes with respect to the project type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions stated in this report are not correct, this firm shall be notified for modifications to this report. Any items not specifically addressed in this report shall comply with the California Building Code and the requirements of the governing jurisdiction.

The preliminary recommendations of this report are based upon the geologic conditions encountered during the Geologic Hazards Evaluation and Bluff Retreat Study, and may be augmented by additional requirements of the architect/engineer, or by additional recommendations provided by this firm at the time of plan review and during construction.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. This report shall be used in its entirety, with no individual sections reproduced or used out of context. Copies may be made only by Earth Systems Pacific, the client, and his authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.

Thank you for this opportunity to have been of service. Please feel free to contact this office at your convenience if you have any questions regarding this report.

TECHNICAL REFERENCES

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APPENDIX

Vicinity Map

Local Geologic Map

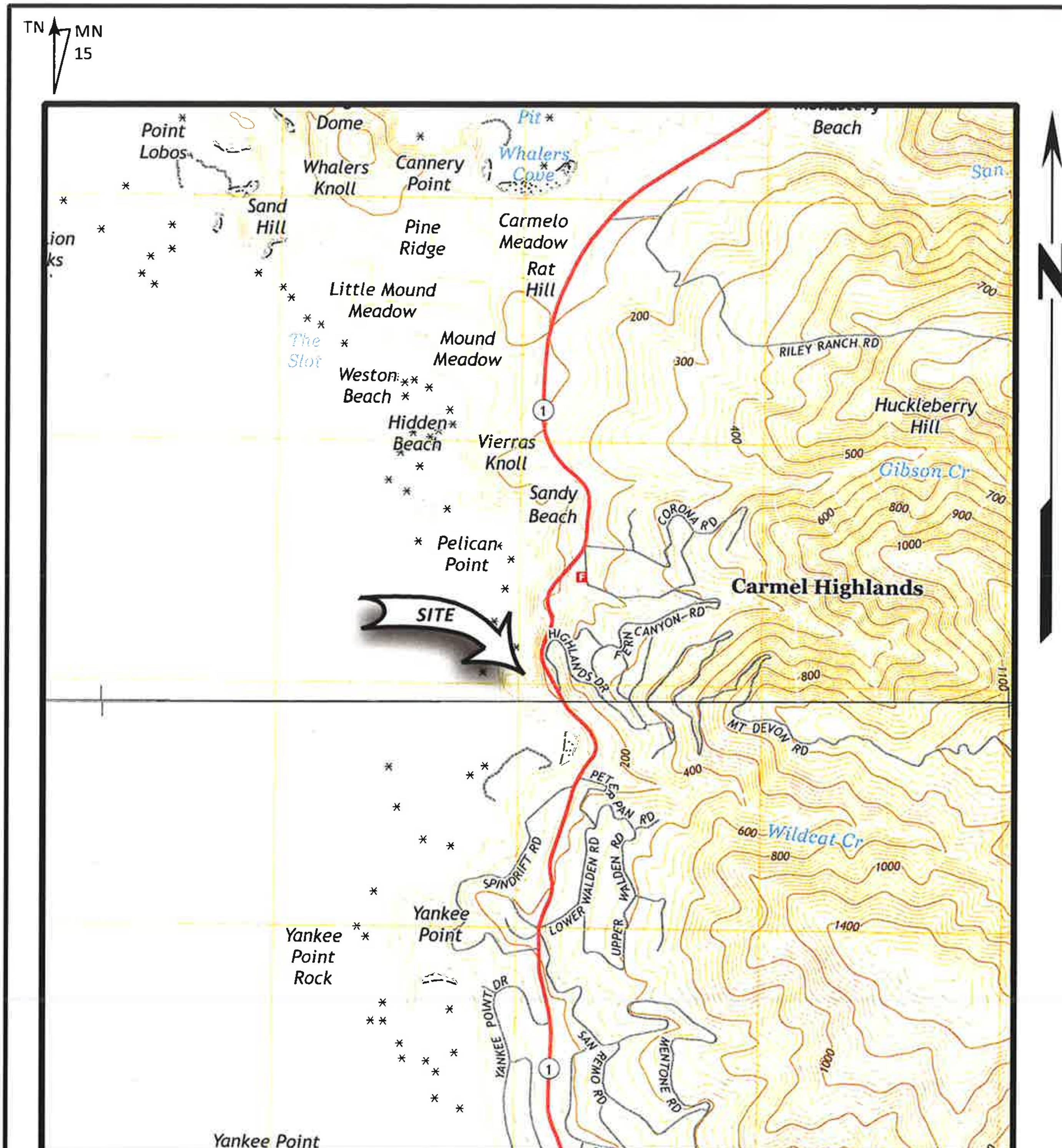
County Active Fault Map

Tsunami Inundation Map

Site Geologic Map

Bluff Position Map

Aerial Photographs



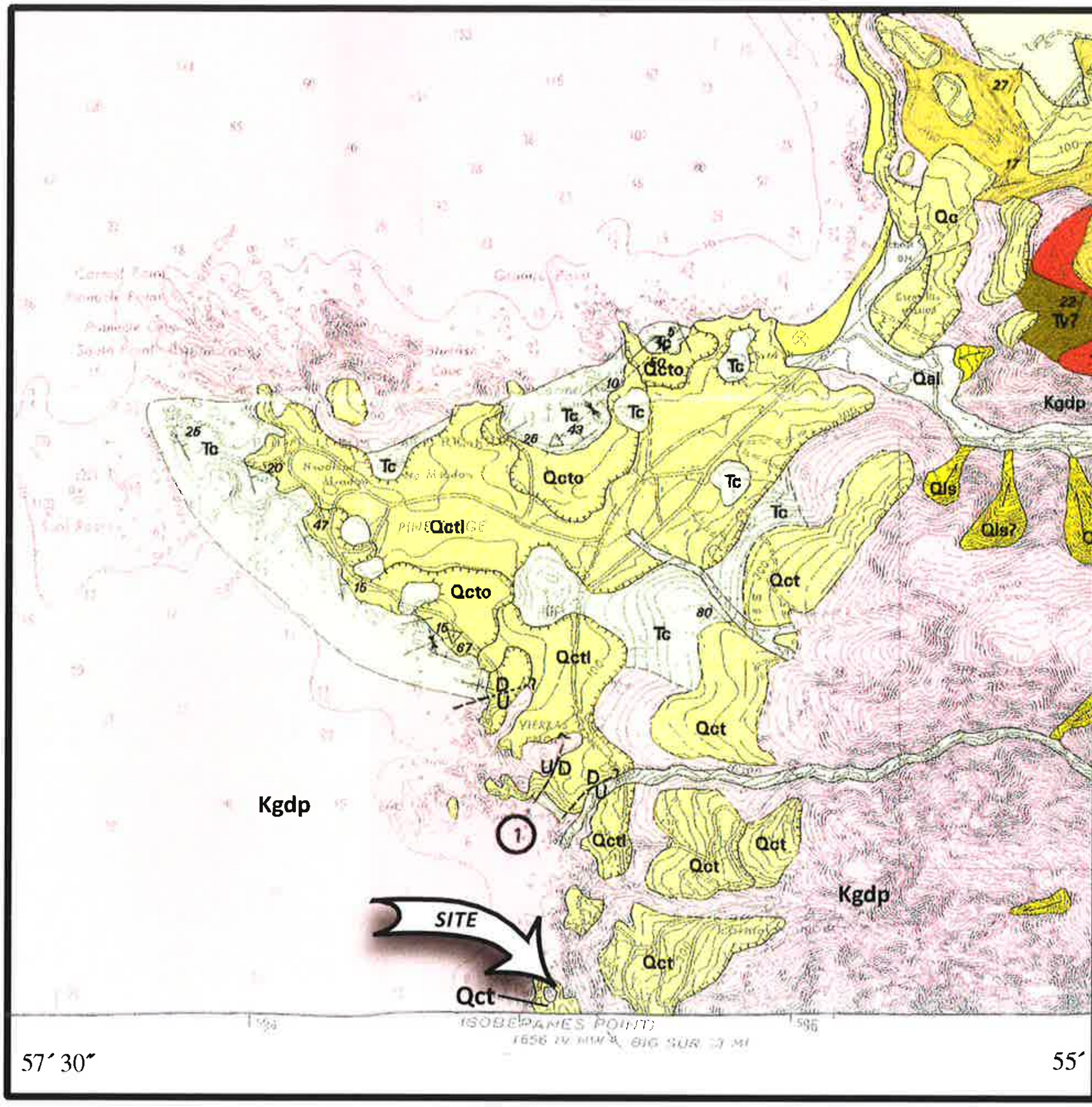
Approximate Scale 1: 24,000

1 0 1 Mile

1 0 1 Kilometer

Base: Majmundar H.H, Landslide Hazards in the Tres Pinos and Paicines Area, San Benito County, California, 1994

Earth Systems Pacific	Cortopassi Residence 255 Highway 1 Carmel Highlands, California	Vicinity Map SH-13425-GA



0 2000 4000 6000

Approximate Scale in Feet

Qls - Landslide Deposit

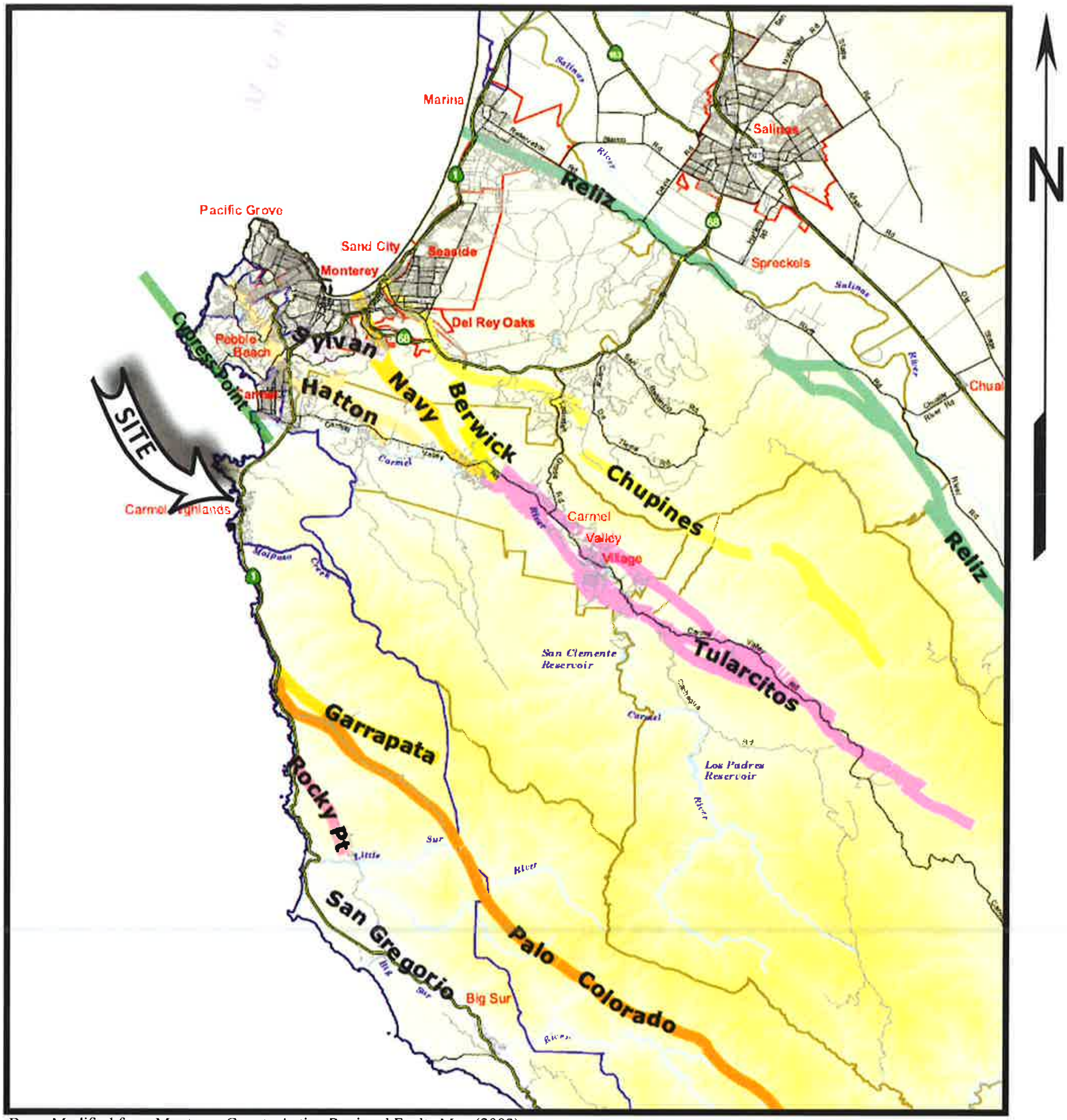
Qct - Coastal Terrace Deposit; undifferentiated

Tc - Carmello Formation; Sandstone

Kgdp - Porphyritic Granodiorite

Base: Mclark J.C et al, 1997, Geologic Map of the Monterey and Seaside 7.5-Minute Quadrangles

Earth Systems Pacific	Cortopassi Residence 255 Highway 1 Carmel Highlands, California	**Local Geologic Map** **SH-13425-GA**

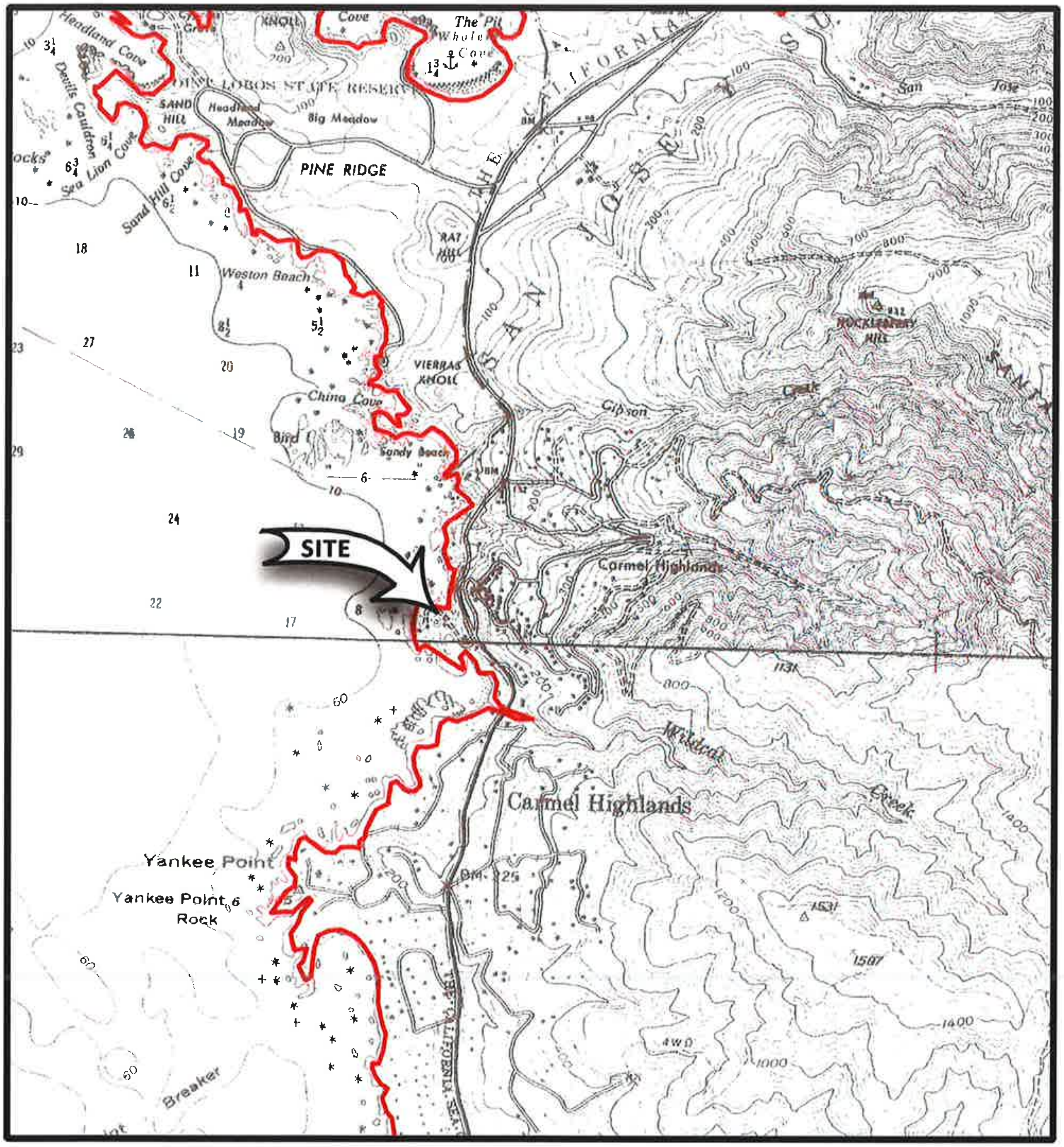


Base: Modified from Monterey County Active Regional Faults Map (2003)

5 0 5 10

Approximate Scale in Miles

Earth Systems Pacific	Cortopassi Residence 255 Highway 1 Carmel Highlands, California	County Active Fault Map SH-13425-GA



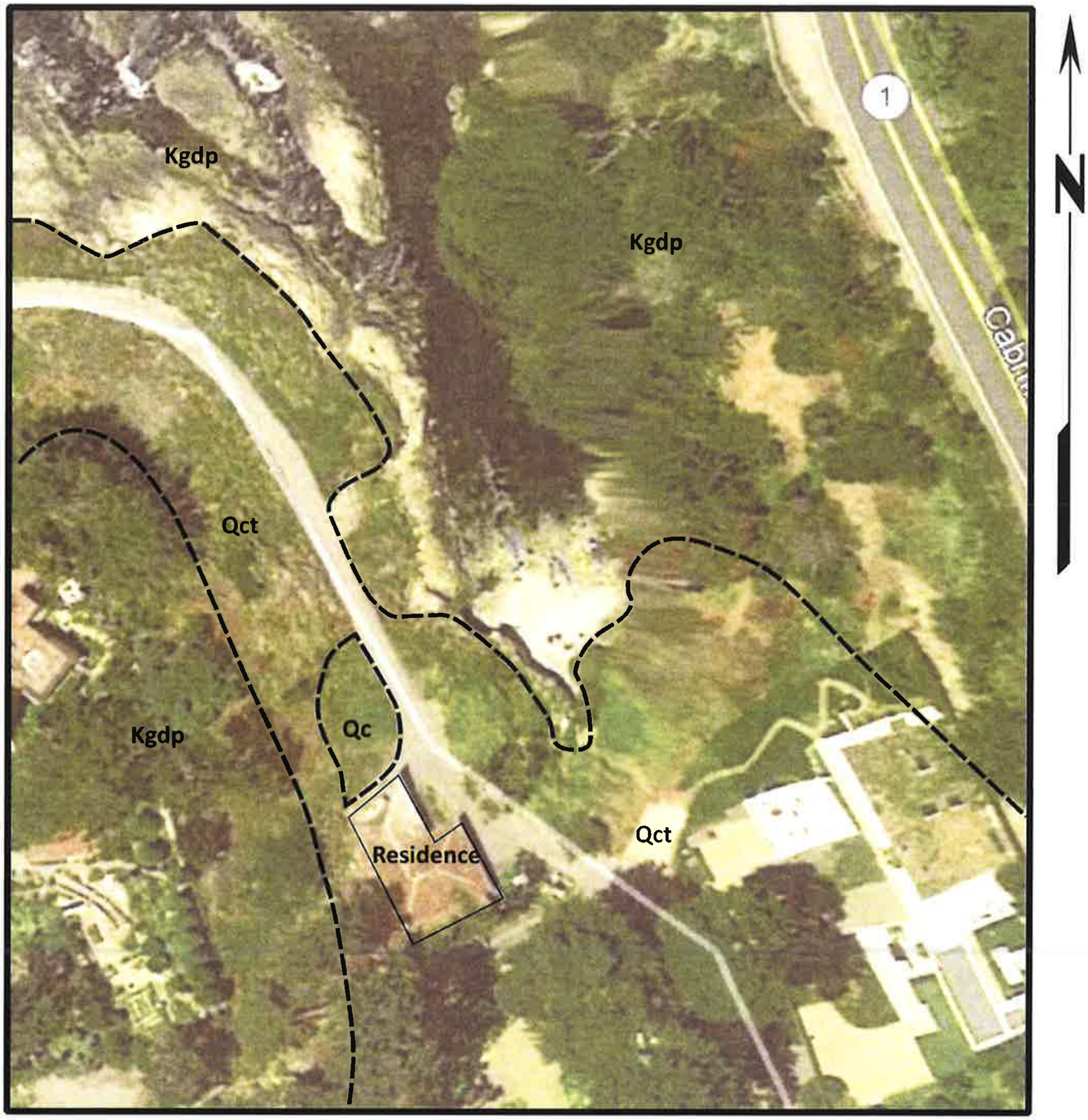
Approximate Scale 1: 24,000

1 0 1 Mile

1 0 1 Kilometer

Base: California Emergency Management Agency, Tsunami Inundation Map for Emergency Planning, Monterey 7.5-Minute Quadrangle, 2009

Earth Systems Pacific	Cortopassi Residence 255 Highway 1 Carmel Highlands, California	Tsunami Inundation Map SH-13425-GA

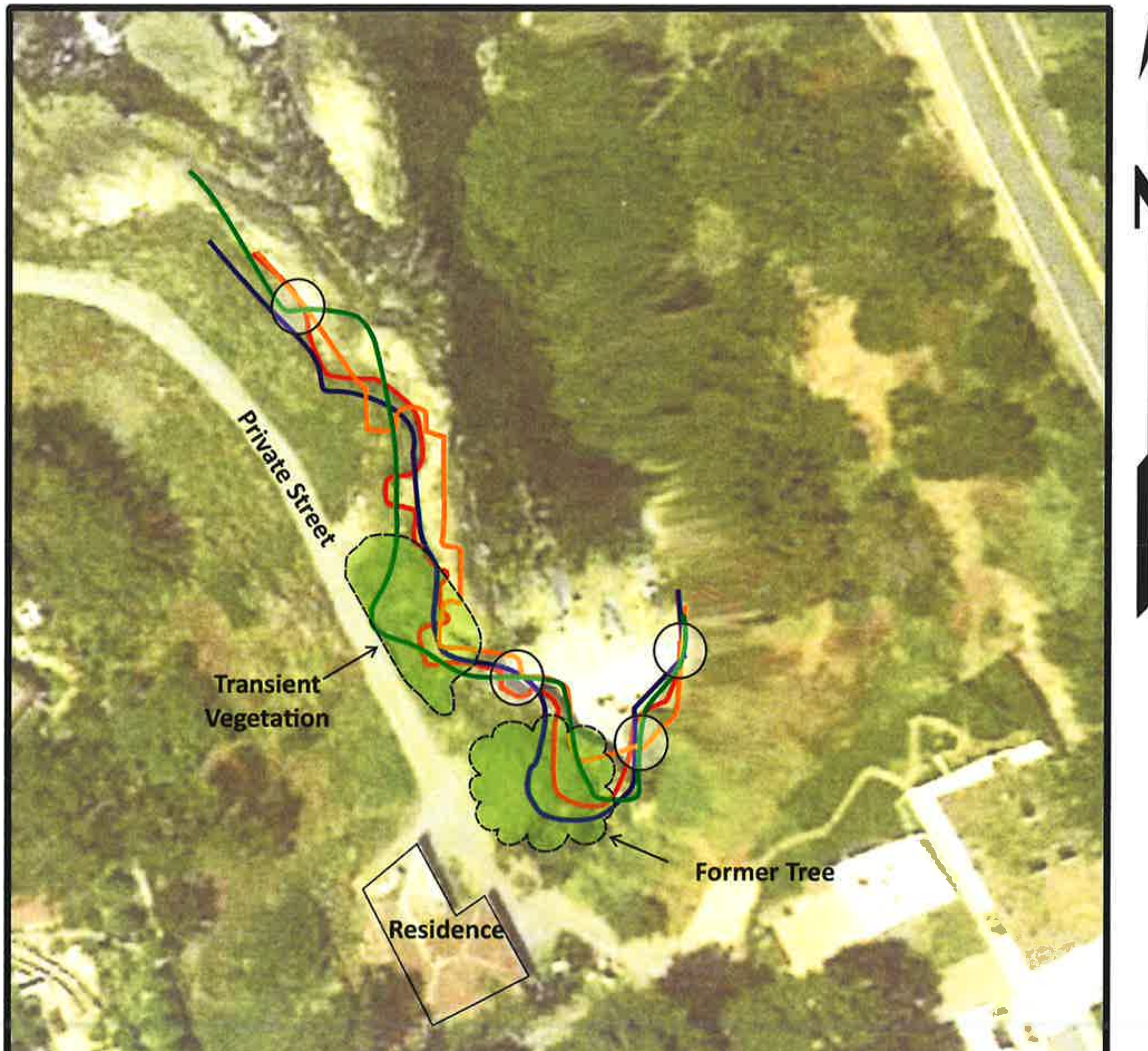


Qc - Colluvium
Qct - Coastal Terrace Deposit; undifferentiated
Kgdp - Porphyritic Granodiorite

0 50 100 150
Approximate Scale in Feet

Base: Google Earth image dated 6/17/2017

Earth Systems Pacific	Cortopassi Residence 255 Highway 1 Carmel Highlands, California	**Site Geologic Map** SH-13425-GA



Apparent Bluff Position
1949
1971
1990
2017

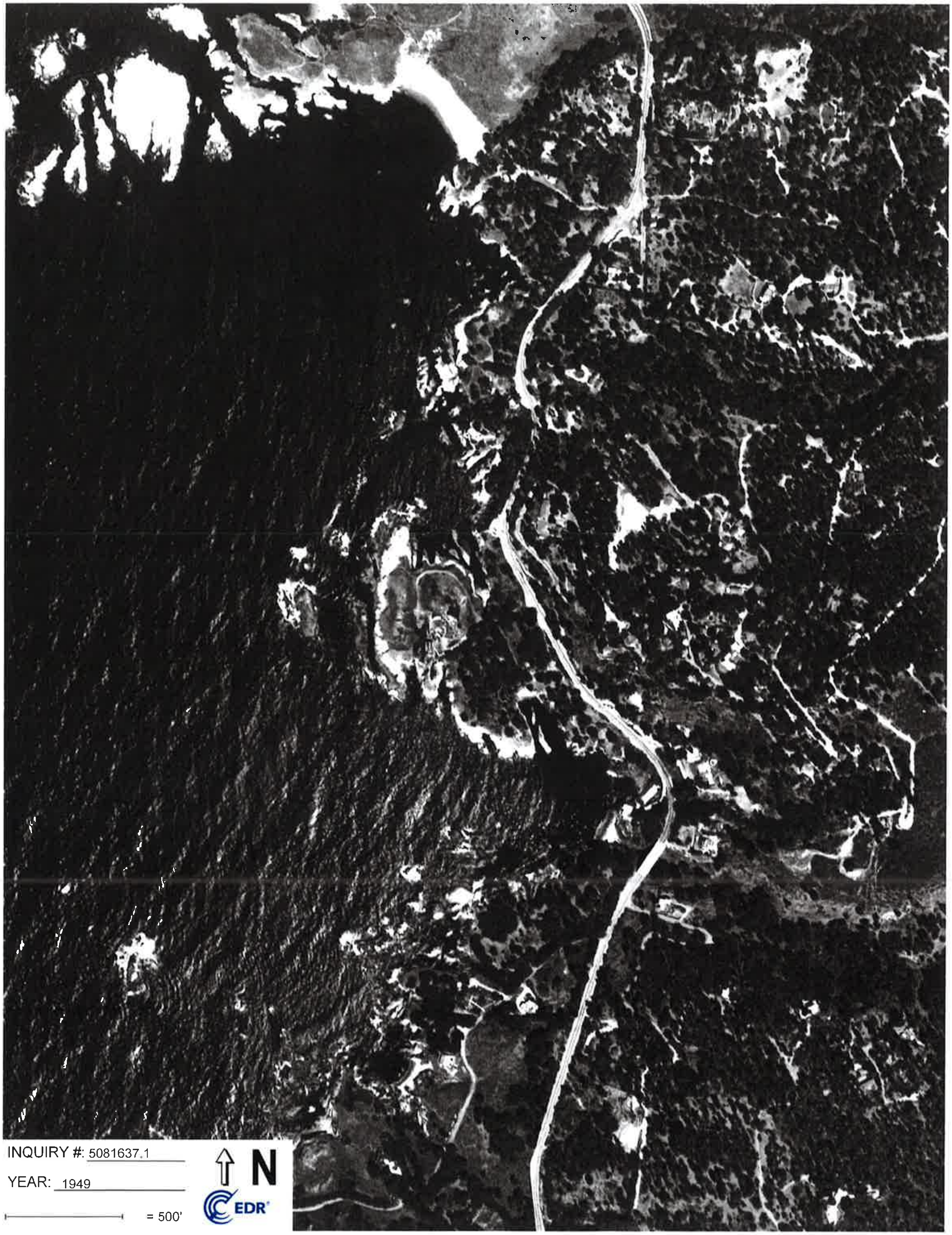
Areas of Little to No Apparent Bluff Retreat

0 50 100 150

Approximate Scale in Feet

Base: Google Earth image dated 6/17/2017

Earth Systems Pacific	Cortopassi Residence 255 Highway 1 Carmel Highlands, California	**Bluff Position Map** SH-13425-GA



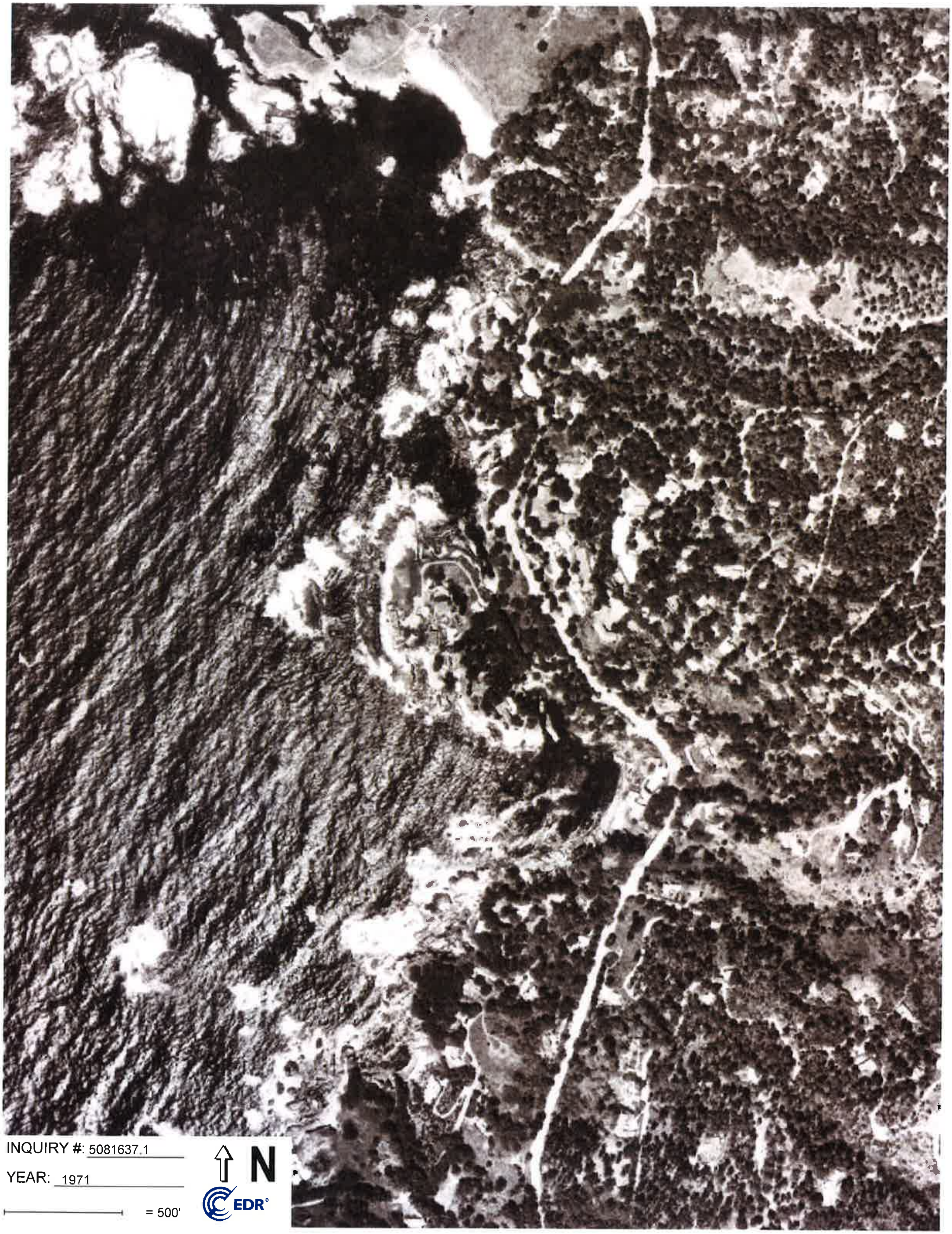
INQUIRY #: 5081637.1

YEAR: 1949

= 500'

N

EDR



INQUIRY #: 5081637.1

YEAR: 1971

= 500'

N


6-27-90
WAC-MONTEREY-90
11-164

GEOTECHNICAL INVESTIGATION
For
255 Highway 1
Wildcat Cove
Carmel Highlands, California

Prepared For
Heidi Cortopassi
Stockton, California

Prepared By
HARO, KASUNICH AND ASSOCIATES, INC.
Geotechnical & Coastal Engineers
Project No. M11188
March 2017

HARO, KASUNICH AND ASSOCIATES, INC.

CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Project No. M11188
March 29, 2017

HEIDI CORTOPASSI
11039 N Hwy 88
Stockton, California 95212

Subject: Geotechnical Investigation

Reference: Remodel, Second Story Addition and Parking Extension
255 Highway 1
Wildcat Cove (APN 241-182-020)
Carmel Highlands, California

Dear Ms. Cortopassi:

In accordance with your authorization, we have performed a Geotechnical Investigation for the proposed additions at the referenced site.

The accompanying report presents our conclusions and recommendations and the results of the geotechnical investigation on which they are based.

If you have any questions concerning the data, conclusions, or recommendations presented in this report, please call our office.

Respectfully Submitted,

HARO, KASUNICH AND ASSOCIATES, INC.

Vicki Odello

Vicki Odello
C.E. 52651, exp. 12/2016

Vco/vo

Copies: 1 to Libby Barnes <libby@desolabarnes.com>
1 to Matthew Kyler <matthewk@kylerengineering.com>

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Table of Contents

GEOTECHNICAL INVESTIGATION

Introduction

This report presents the results of our Geotechnical Investigation for the proposed second story addition/remodel and parking area extension of the existing single-family-residence in Carmel Highlands, California (Figure 1). We used a preliminary layout prepared by DesolaBarnes, dated January 27, 2017 superimposed on the topographic survey by Rasmussen Land Surveying dated November 14 and 16, 2016.

Purpose and Scope

The purpose of our work was to explore and test the surface and subsurface conditions in the vicinity of the proposed improvements to develop geotechnical criteria and recommendations for the project.

Scope of Work

A. Site visit, file and document review, and liaison with design professionals.

B. A field exploration consisting of logging and interval sampling of soils encountered in three exploratory borings.

C. Laboratory classification of select samples obtained during drilling. Moisture content, dry density and plasticity tests and of selected samples were performed to evaluate the consistency and to characterize the soils. Direct shear tests were performed to determine the strength of the pertinent materials.

D. Quantitative Stability Analysis on the slope beneath and behind the house.

E. Based on our findings we developed geotechnical design criteria for foundations, slabs-on-grade, site drainage, and general site grading.

F. We will also provide an estimation of the 2016 California Building Code Site Class based on SPT blow counts, and we will comment briefly on seismic-related effects.

G. Preparation of this Geotechnical Report containing our findings and recommendations.

Site Description

The site is located on the east-facing slope of a knob-shaped granitic peninsula that juts out from the coastline and Highway 1. The peninsula is connected to the coast via a north-south trending topographic saddle-type valley. Although granite bedrock outcrops on the surface on both hillsides of the valley; the valley itself is infilled with deep layers of marine terrace deposits and colluvial soil, which over the granite at great depths. The surface of the underlying granite at the site is steeply inclined toward the valley.

The existing house is cut into the hillside creating a flat area similar to the elevation of the valley floor. It is setback at least 40 feet from a very steep bank that descends to a narrow protected beach about 50 feet below.

The steep (100% gradient) cut face in the back of the house exposes layers of topsoil, terrace/colluvium over granite. However the granite contact in the front of the house was encountered at 23 feet below grade. Therefore, assuming shallow foundations, the house is not founded in hard granite; rather it is supported by highly inclined soil and highly weathered granite layers that increase in thickness towards the valley. The foundation should be verified to confirm assumptions.

The upper soil and topsoil of the cut face show signs of erosion.

Drainage appears to pond or runoff to an established drain inlet on the outboard edge of the access road.

Vegetation consists of minimal low landscape plantings around the house or bare ground. The hillside above is vegetated with typical coastal chaparral.

Project Description

The proposed project consists of adding a second story and extending the structure about 6 feet in back of the house toward the cut. The south end of the addition will be very close to the toe of the cut bank. The north end of the addition will be about 6 feet in front of the toe of the existing cut.

A parking area extension is proposed to be cut into the moderately sloping hillside (30 degree inclination) just north of the house.

Field Exploration

Subsurface conditions were investigated on February 13, 2017. Approximate locations of the test borings are indicated on the Boring Site Plan, Figure 2. The borings were advanced using 4-inch diameter difficult-access power auger equipment and 6-inch diameter continuous flight auger equipment mounted on a truck. The soils encountered were continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2486). Figure 3, Soil Classification Chart, was used to depict the subsoil profile for the respective Logs of Test Borings. The Logs of Test Borings are presented in Appendix A of this report.

Representative soil samples were obtained from the exploratory borings at selected depths. These samples were recovered using the 3.0 inch O.D. Modified California Sampler (L) or the Standard Terzaghi Sampler (T).

The penetration resistance blow counts noted on the borings were obtained as the sampler was dynamically driven into the in-situ soil. The process was performed by dropping a 140-pound hammer 30 vertical inches, driving the sampler 6 to 18 inches, and recording the number of blows for each 6-inch penetration interval. The blows recorded on the boring logs represent the accumulated number of blows required to drive the last 12 inches. The boring logs denote subsurface conditions at the locations and time observed and it is not warranted that they are representative of subsurface conditions at other locations or times.

Laboratory Testing

Laboratory testing was performed to determine the physical and engineering properties of the soil underlying the site. Moisture content and dry density tests were performed on representative relatively undisturbed soil samples to determine the consistency and moisture throughout the explored soil profiles.

Atterberg Limit Tests were performed to check the relative shrink/swell potential of the material. Results suggest the clayey material is moderately expansive.

Saturated direct shear tests were performed in an attempt to determine the shear strength properties of the earth material. However, fragments of rock within the soil test specimen produced skewed results in both tests. Results were adjusted using engineering judgment.

The results of the field and the laboratory testing appear on the Logs of Test Borings opposite the sample tested or on their respective graphics in Appendix A.

Subsurface Conditions

Based on our three subsurface exploratory borings drilled in the vicinity of the proposed project on February 13, 2017, the general soil profile consists of topsoil, over colluvium/terrace material, over a clay layer, over highly weathered granitic bedrock, over very dense bedrock to the depth explored, 24.2 feet.

The topsoil as exposed at the top of the in back yard cut slope is loose and erodible. Below that, the colluvium is sandy, loose to medium dense, and was encountered down to about 7 feet in B-3 in front of the house and to about 1 foot in back. A clayey layer was encountered down to about 13 feet in B-3 in the front yard and was absent in the back yard. Highly weathered granite was encountered below the clay to a depth of 23 feet in the front yard and 10 feet in the back yard. Hard granite bedrock was encountered at the bottom of both borings, producing inclined strata at about a 20 degree angle.

Perched groundwater was not encountered within the test borings; however, a possible seep was encountered at 13 feet in Boring B-3. Fluctuations in seeps and groundwater should be anticipated due to variation in rainfall and other factors which were not uncovered during this study.

ENGINEERING ANALYSIS

Seismicity and Liquefaction

The following is a general discussion of seismicity related to the project site.

The proposed project lies about 32 miles southwest of the active San Andreas Fault zone; and about 2.2 miles east of the potentially active Palo Colorado/San Gregorio Fault.

It is highly probable that a major earthquake in Northern California will occur during the next 50 years. During a major earthquake in the vicinity of the site, ground shaking would probably be severe. The effects of severe ground shaking on the proposed structure can be reduced by earthquake resistance design in accordance with the latest edition of the Uniform Building Code.

The potential for liquefaction or lateral spreading to occur at the site is considered low due the bedrock conditions.

California Building Code Seismic Site Class

The latest CBC (2016 edition) design considerations, specifically the seismic factors and design spectral response acceleration parameters from Chapter 16, should be followed in the design of the proposed structures. Based on our borings and high blow-counts taken within the near surface granite bedrock the Site Class soil is considered a "B" at this site.

Swell Potential

To evaluate the swell potential of the earth materials, Atterberg Limits (ASTM D4318) tests were performed. The test results indicate the clayey material is low to moderately expansive.

Settlement

We anticipate less than about a half inch of total settlement and differential settlement may be experienced by the new structure if the recommendations contained herein are followed.

Erosion and Drainage

The topsoil is erodible and may slough off the top of the existing and proposed cuts. The soil material beneath that is somewhat erodible and the decomposed granite is less so. The granite bedrock is relatively resistant. Avoid runoff flow over new and old slopes and avoid concentrated discharge onto the slope face. Therefore, adequate collection and proper disposal of runoff will need to be provided.

Quantitative Slope Stability Analysis

We performed seismic quantitative slope stability analysis to check the potential for slope failures on the slope beneath and in back of the house.

Discussion and General Methodology

Profile A-A' was used as the representative cross section in the analysis. This profile encompasses the slopes beneath and behind the house. Our office developed values for strength and moisture conditions of the earth materials based on adjusted saturated laboratory direct shear strength tests.

Failure of a slope occurs when driving stress is greater than its resisting strength. Some common variables influencing driving stress are gravity, over steepened slopes, groundwater pressure, vehicular pressures, and earthquake shaking.

Various methods of analyzing stability of slopes yield a factor of safety. A factor of safety is determined by dividing the resisting forces within the slope soils by the driving forces. When a factor of safety less than one is determined, a slope failure is likely. When a factor of safety equal to one is determined, the slope is in a state of equilibrium. When a factor of safety greater than one is determined, the slope is considered stable. General practice and California Geologic Survey's Special Publication 117A suggests seismic slope stability analyses to yield a factor of safety equal to or greater than 1.1; and a static safety factor equal to or greater than 1.5 to be considered stable.

Cross-Section

Our stability model was based on a section through the house and adjacent slopes. The section was based on surface topography furnished by Rasmussen Surveying (November 2016). The subsurface geometry of the underlying soil layers was generated using our boring log information; laboratory results; and engineering and geologic judgment. Four layers were modeled: fill/topsoil; colluvium/terrace; weathered bedrock and fractured bedrock.

Failure Surfaces

The slope beneath the house and the slope below the house were evaluated quantitatively, using the computer program GSTABL7 v.2. Circular type failure surfaces were analyzed. Refer to graphics in Appendix B of this report.

The program uses the Modified Bishop Method to determine normal and resistive forces in many slices through the trial circles. The forces in each slice are then summed up for a total force acting on the mass. The computer program assumes many failure surfaces located between initiation and termination zones on the ground surface selected by the user. These chosen zones represent the most distant toe and headscarp of the potential failure surface.

Seismic Coefficient

In order to develop a pseudo-static condition intended to represent earthquake effects on the slope model, horizontal accelerations generated by a seismic event are typically modeled by applying a seismic coefficient value (k) to the slope stability analysis. A value of 0.33 g was used.

This value was generated by first entering the latitude and longitude of the site into the USGS Design Maps website tool; and choosing a Site Soil Classification of "B unmeasured". A 'maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA), adjusted for site class', of 0.55g was generated. This value represents a '2% chance of structural collapse in 50 years'.

Secondly, in accordance with guidelines suggested in USGS Special Publication 117A (SP117A), the seismic coefficient, k, used in seismic (pseudo-static) slope stability analysis, can be generated by multiplying the 'maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA)' of 0.55g (generated above) by a factor 'feq'. Entering the x-axis of the chart modified from Blake and others (Figure 1, page 30, USGS Special Publication 117A) a value of 0.60 was generated for 'feq'. Lastly multiplying the 'feq' of 0.60 by an MCE of 0.55g arrives at seismic coefficient k = 0.33g, which was used in our pseudo-static slope stability analysis.

Soil Properties

The strength parameters of the underlying layers of earth material were developed using a combination of conservative engineering judgment and laboratory results.

Water Modeling

We added a 20% pore pressure (Pore Pressure Parameter = 0.1) increase in an effort to mimic higher moisture levels due to possible seeps.

Slope Stability Analysis Conclusion

The computer analysis results suggest the slope directly beneath the house is relatively stable statically in that the Factor of Safety is at the minimum suggested threshold of 1.5. However the ground forward of the house, toward the edge becomes less so. In the seismic case, while the back landward half of the house show factors of safety near the minimum seismic threshold of 1.1, the safety factor decreases toward the front of the house (and front of the parking area) and into the street suggesting possible seismic slope instability of the soil layers during the low possibility of the design event occurring.

Therefore we recommend that a new deepened foundation, extending into the stable bedrock, be used to support the structure. Flexible surfacing for the parking area is suggested.

The analysis for the hillside behind the house suggest that the existing cut slope behind the house is seismically and statically relatively stable in its current configuration. This suggests that proposed cuts for the parking extension may be similarly cut at a 1:1 slope where bedrock is encountered. However, the topsoil and upper soil is susceptible to sloughing and erosion.

Therefore we recommend cuts in rock may be inclined 1:1 (horizontal:vertical); and the layout should allow room for erosional slumping in the backyard and subsequent clean up; reduce water flow over the cutslope with drainage swales installed upslope on the native hillside. We recommend the lower half of the back wall of the house consist of concrete to reduce damage should slough or slumps reach the house particularly at the southwestern corner of the addition that is very close to the current toe of the slope. Consider providing more space in the addition layout between the house extension and the slope to provide better access or perhaps retain the cut.

It must be cautioned that slope stability analysis are inexact sciences; and that the mathematical models of the slopes and soils contain many simplifying assumptions, not the least of which is homogeneity. These analyses are tools to be used on engineering decisions and judgment. Density, moisture content and shear strength may vary within a soil type. There may be localized areas of low strength or perched ground water within a soil. Slope stability analyses and the generated factors of safety should be used as indicating trend lines. A slope with a safety factor less than one will not necessarily fail, but the probability of slope movement will be greater than a slope with a higher safety factor. Conversely, a slope with a safety factor greater than one may fail, but the probability of stability is higher than a slope with a lower safety factor.

RECOMMENDATIONS

Based on the results of our investigation, the proposed development is feasible from a geotechnical standpoint, provided the design criteria and recommendations presented in this report are incorporated into the design and construction of the project.

Due to the steeply inclined strata beneath the house, clay layer, potential seep, and seismic safety, a new deep pier and grade foundation system, embedded in the bedrock, should support the structure and floors.

Proposed excavations in rock in the vicinity of the parking extension may be inclined 1:1 (horizontal:vertical); alternatively support the cut with a retaining wall.

We suggest allowing sufficient room behind the house, particularly in the southwest corner, to allow for erosional sloughing/slumping in the backyard and subsequent clean up and provide better access. Otherwise, the lower half of the back wall of the house should consist of concrete to reduce damage if slough or slumps reach the house. Alternatively support the cut with a retaining wall.

Prevent runoff from flowing over old and new cut slopes so as not to induce erosion.

Avoid discharge on to and over the slope in the front yard to so as not to induce erosion.

Refer to the following geotechnical criteria and recommendations for foundations, slabs-on-grade, general grading and drainage.

Plan Review Notice

Haro, Kasunich & Associates should be provided an opportunity to review the project plans during the design phase prior to cost estimating and county submittal. Allow at least one week for this task. **We are however available throughout the design process for consultation.** The review provides an opportunity to check if our recommendations have been interpreted properly, which could reduce possible confusion and costly changes and time delays during construction. Once the plans meet our recommendations sufficiently we can provide the county-required plan review letter. Please contact our office at (reference Project Number M11188):

Haro, Kasunich & Associates
116 East Lake Avenue
Watsonville, California 95076
(831) 722-4175, ext. 1
vodello@harokasunich.com

Construction Observation Notice

Haro, Kasunich and Associates must provide observation and testing services for earthwork performed at the project site. The observation and testing of earthwork allows for evaluation of contractors' compliance with our geotechnical recommendations. It also allows us the opportunity to confirm that actual soil conditions encountered during construction are essentially the same as those anticipated based on the subsurface exploration. Unusual or unforeseen soil conditions may require supplemental evaluation by the geotechnical engineer.

The County usually requires a final grading and/or foundation compliance letter. We can prepare this letter only if we are called to the site to observe and test, as necessary, any grading and excavation operations **from the start of construction**. We cannot prepare a letter if we are not afforded the opportunity of observation from the **beginning of the grading operation**. The contractor must be made aware of this and earthwork testing and observation must be scheduled accordingly. Refer to contact information above.

Pier and Grade Beam Foundations

1. Piers must penetrate the soil layers and embed in the hard stable bedrock. Depth to bedrock varied greatly from about 10 feet in Boring B-3 in the back yard; to 23 feet below grade in B-1 in the front.

2. Piers should embed at least 5 feet into the granite. However, the actual specified depth is to be determined by the structural engineer depending on their lateral analysis.

3. Piers must accommodate lateral earth pressure of 50 pcf (equivalent fluid weight) acting on 2 pier diameters along the portion of the shaft situated above the bedrock granite.

4. It is our opinion, considering the earth material, slope, height, and erosion, the intent of CBC Section 1808.7.5 is satisfied per these recommendations.

5. Pier spacing must not be closer than three times the pier diameter. Actual spacing and will be determined by the structural engineer.

6. An end-bearing capacity in granite bedrock material of 8,000 psf may be used for piers with at least 5 feet of rock embedment. This value may be increased by 1/3 to account for seismic and short-term loading.

7. A passive resistance equivalent to a fluid weighing 500 pcf (acting on 2 pier diameters) may be used for the portion of the pier embedded in rock. This value may be increased by 1/3 to account for seismic and short-term loading.

8. Piers located adjacent to other piers, footings, or utility trenches should have their bearing surfaces founded below a 1:1 line projected upward from the bottom edge of the adjacent piers, footings, or utility trenches.

9. All concrete piers should be reinforced in accordance with the structural engineer's design.

10. The pier excavations must be thoroughly cleaned of all slough or loose material prior to pouring concrete.

11. The pier drilling from top to bottom must be **observed by the geotechnical engineer prior to placement of forms and rebar** to verify that subsurface soil conditions are consistent with the anticipated soil conditions, so that the county-required foundation excavation conformance letter can be prepared.

Site Grading

12. Our office should observe all drilling from the bottom to the top and preform relative compaction testing of any engineered fill. Testing of the finished surface is insufficient.

13. The geotechnical engineer should be notified **at least four (4) working days prior to any grading or foundation excavating** so the work in the field can be coordinated with the grading contractor and arrangements for testing and observation can be made. The recommendations of this report are based on the assumption that the geotechnical engineer will perform the required testing and observation during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.

14. Compaction during inclement weather or wet conditions may hamper compaction efforts and over-excavation may be necessary.

15. Where referenced in this report, Percent Relative Compaction and Optimum moisture Content shall be based on ASTM Test Designation D1557.

16. Areas to be graded or designated to receive engineered fill, should be cleared of all obstructions and tree roots.

17. In areas to be graded or designated to receive concrete slabs, engineered fill, flatwork, pavements or hardscape, all loose soil and other unsuitable material must be subexcavated to its full depth. The actual depth of unsuitable material should be determined in the field. Existing depressions or voids created during site clearing should be backfilled with engineered fill.

18. Cleared and subexcavated areas should then be stripped of organic-laden topsoil. Strippings should be wasted off-site or stockpiled for use in landscaped areas if desired.

19. Exposed base should be scarified at least 6 inches; moisture conditioned and compacted to 90 percent relative compaction. Engineered fill should be placed in thin lifts not exceeding 6 inches in loose thickness; moisture conditioned, and compacted to a minimum of 90 percent relative compaction, up to desired grade.

20. The aggregate base sections below pavements should be moisture conditioned and compacted to at least 95 percent relative compaction.

21. Non-organic native soil processed to contain no rocks or clods greater than 4 inches in diameter and at optimal moisture contents may be used in engineered fill. Imported material should consist of a predominantly granular soil conforming to the

quality and gradation requirements as follows: The soil should be relatively free of organic material and contain no rocks or clods greater than 4 inches in diameter, with no more than 15 percent larger than 2 inches. The material should be predominately granular with a plasticity index less than 15, a liquid limit less than 35, and not more than 20 percent passing the #200 sieve.

22. Cut slopes may be cut at a 1:1 (H:V) where rock is exposed; and 2:1 where soil is exposed; otherwise retain.

23. Cut slopes should be protected from erosion by preventing runoff from spilling over fresh slopes. Lined V-ditches and/or berms at the top of the slope may be considered for the short and long term.

24. Following grading exposed bare slopes and soil should be planted or covered as soon as possible with erosion resistant vegetation or blanket.

25. After the earthwork operations have been completed and the geotechnical engineer has finished his observation of the work, no further earthwork operations shall be performed except with the approval of and under the observation of the geotechnical engineer.

Flatwork, Hardscape and Concrete Slabs-on-Grade

26. Building floor slabs should be supported on the piered system.

27. Seismic conditions cannot economically be mitigated in exterior slab design. Consider flexible surfacing if warranted.

28. Exterior slabs and flatwork can be expected to suffer some cracking and movement even in a static condition. However, thickened exterior edges, a well-prepared subgrade including pre-moistening prior to pouring concrete, adequately spaced expansion and crack control joints at least at 8 foot intervals and good workmanship should minimize cracking and movement in a static condition.

29. Exterior slabs, hardscapes, statuary, pavements, etc. should not be supported on loose soil. They should be supported either entirely on firm native soil or entirely on engineered fill where feasible.

30. Slab subgrades should be prepared as recommended in the section entitled "Site Grading". The exposed base should be examined by the geotechnical engineer to determine need for scarification and recompaction.

31. Wet, soft or unsuitable material exposed at slab subgrade must be removed and replaced with engineered fill or angular drainrock.

32. Final slab grades should be proof rolled to provide a smooth uniform working surface.

33. Slab reinforcing should be provided in accordance with the anticipated use and loading of the slab. We do not recommend slabs be supported partly on fill and partly on native material.

34. Where floor dampness must be minimized or where floor coverings will be installed, concrete slabs-on-grade should be constructed on a capillary break layer at least 6 inches thick and covered with a waterproof barrier.

35. The capillary break must be kept separate from the retaining wall backdrain system.

36. Capillary break material should be free draining, angular, clean gravel, such as 3/4-inch gravel. The gravel should be washed to remove fines and dust prior to placement on the slab subgrade.

37. The waterproof barrier should be a high quality membrane. A layer of sand about 2 inches thick should be placed between the waterproof barrier and the floor slab to protect the membrane and to aid in curing concrete. The sand should be lightly moistened prior to placing concrete. We defer moisture-proofing recommendations to the floor covering manufacturer's suggested specifications and/or a moisture-proofing expert.

38. Exterior slab reinforcement should **not** be tied to the building foundations.

Site Drainage

39. Surface water should not be allowed to flow towards improvements during construction and for the lifetime of the development. Surface drainage should be directed away from the building foundations. Surface drainage should include provisions for positive gradients (5% for 10 feet) so that water is not permitted to pond adjacent to foundations, Otherwise, drainage devices (e.g. area or strip drains) must be used.

40. Provide provisions for site drainage control and dispersion into established storm drain pipe that daylights on the granite rock slope below. Surface drainage improvements may consist of lined surface swales situated upslope from cuts and/or improvements; catch basins or drain inlets in association with grading; all connected to a storm drain system consisting of solid rigid pipe and clean outs.

41. Runoff and discharge must not be allowed to spill over graded slopes. Water should be directed to drain inlets connected to a drainage system that discharges into a storm drain system that discharges on bedrock.

42. Rain gutters should be placed around roof eaves and conveyed to a drainage system that discharges into storm drain system.

43. Conveyance and storm drain lines should consist of rigid, solid, sturdy pipe.

44. Discharge should be conveyed via tight line to storm drain system. Do not dissipate near the top of a break in slope. Discharge on bedrock.

Erosion Control

45. Intercept slope runoff from cascading over the cut slopes with a lined drainage swale.

46. Do not discharge collected water directly onto slopes.

47. All bare soil and cut slopes should be seeded and mulched immediately after grading with barley, rye, grass, and crimson clover or otherwise provided with erosion control measures.

48. Erosion control measures must be maintained during construction. Refer to construction timeframe constraints and requirements in the Monterey County Erosion Control Ordinances.

Plan Review, Construction Observation and Testing

49. Haro, Kasunich and Associates should be provided an opportunity to review project plans prior to construction to evaluate if our recommendations have been properly interpreted and implemented. We should also provide foundation excavation observations and earthwork observations and testing during construction. This allows us to confirm anticipated soil conditions and evaluate conformance with our recommendations and project plans. If we do not review the plans and provide observation and testing services during the earthwork phase of the project, we assume no responsibility for misinterpretation of our recommendations.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be given.

2. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. No other warranty expressed or implied is made.

3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer.

APPENDIX A

Site Vicinity Map

Boring Site Plan

Cross Section A-A'

Cross Section B-B'

Key to Logs

Logs of Test Borings

Plasticity Chart

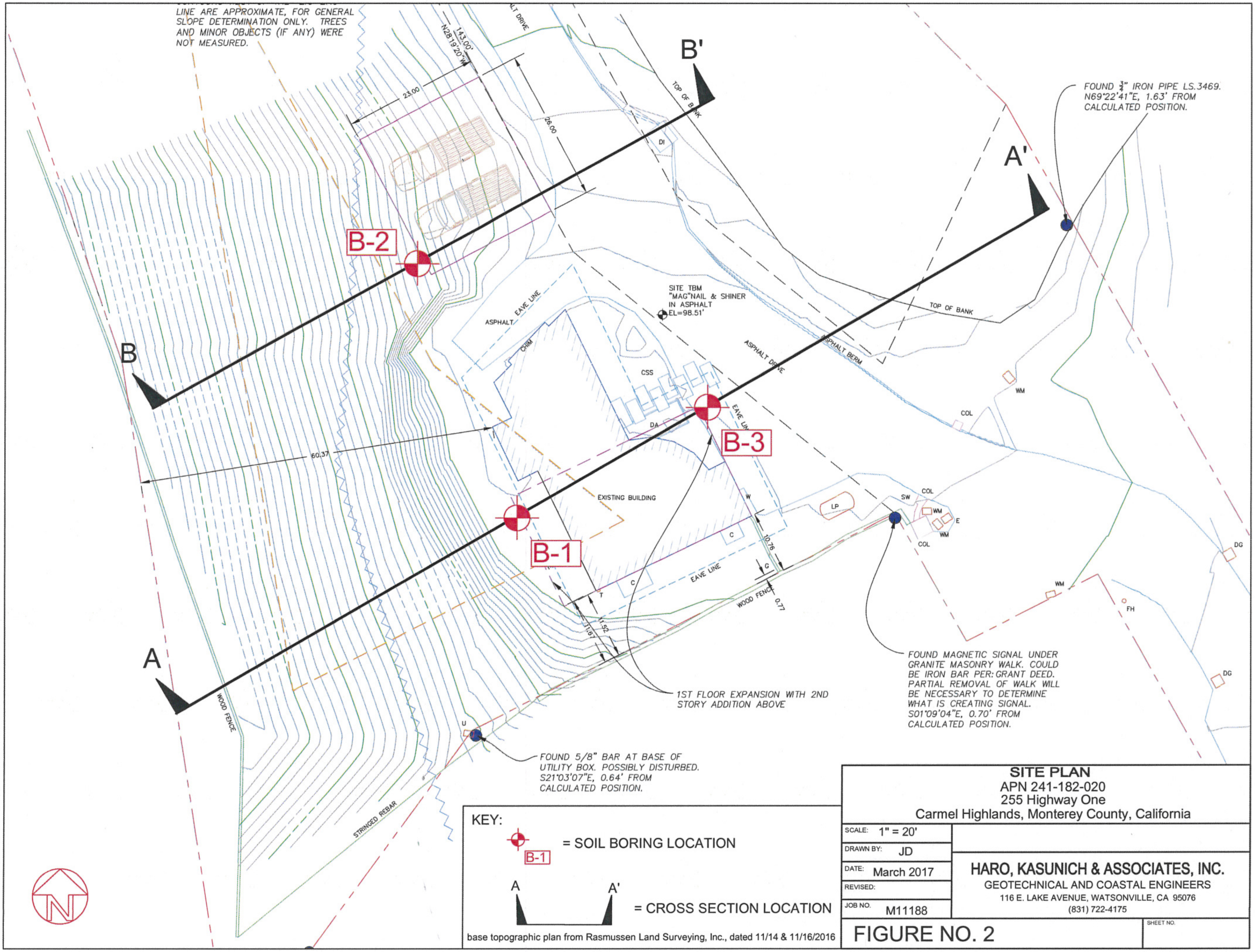
Direct Shear Test

SITE VICINITY MAP
APN 241-182-020
255 Highway One
Carmel Highlands, Monterey County, California

FROM:
USGS Soberanes Point and Monterey Topographic Quadrangle
40 ft. contour interval

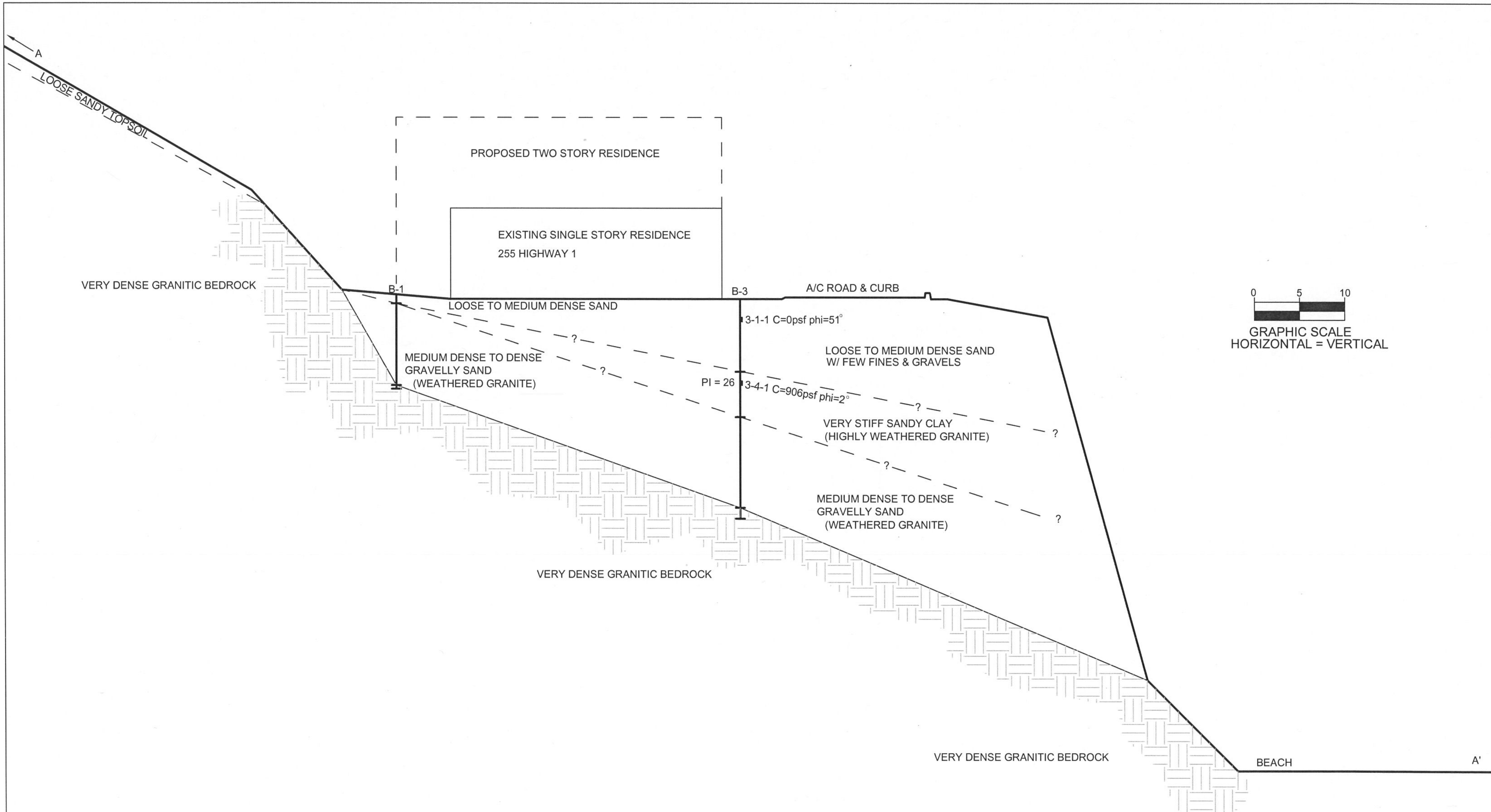
N

SCALE: 1:24,000 (1" = 2,000')	
DRAWN BY: JD	
DATE: March 2017	HARO, KASUNICH & ASSOCIATES, INC. GEOTECHNICAL AND COASTAL ENGINEERS 116 E. LAKE AVENUE, WATSONVILLE, CA 95076 (831) 722-4175
REVISED:	
JOB NO. M11188	
FIGURE NO. 1	SHEET NO.



SITE PLAN
APN 241-182-020
255 Highway One
Carmel Highlands, Monterey County, California

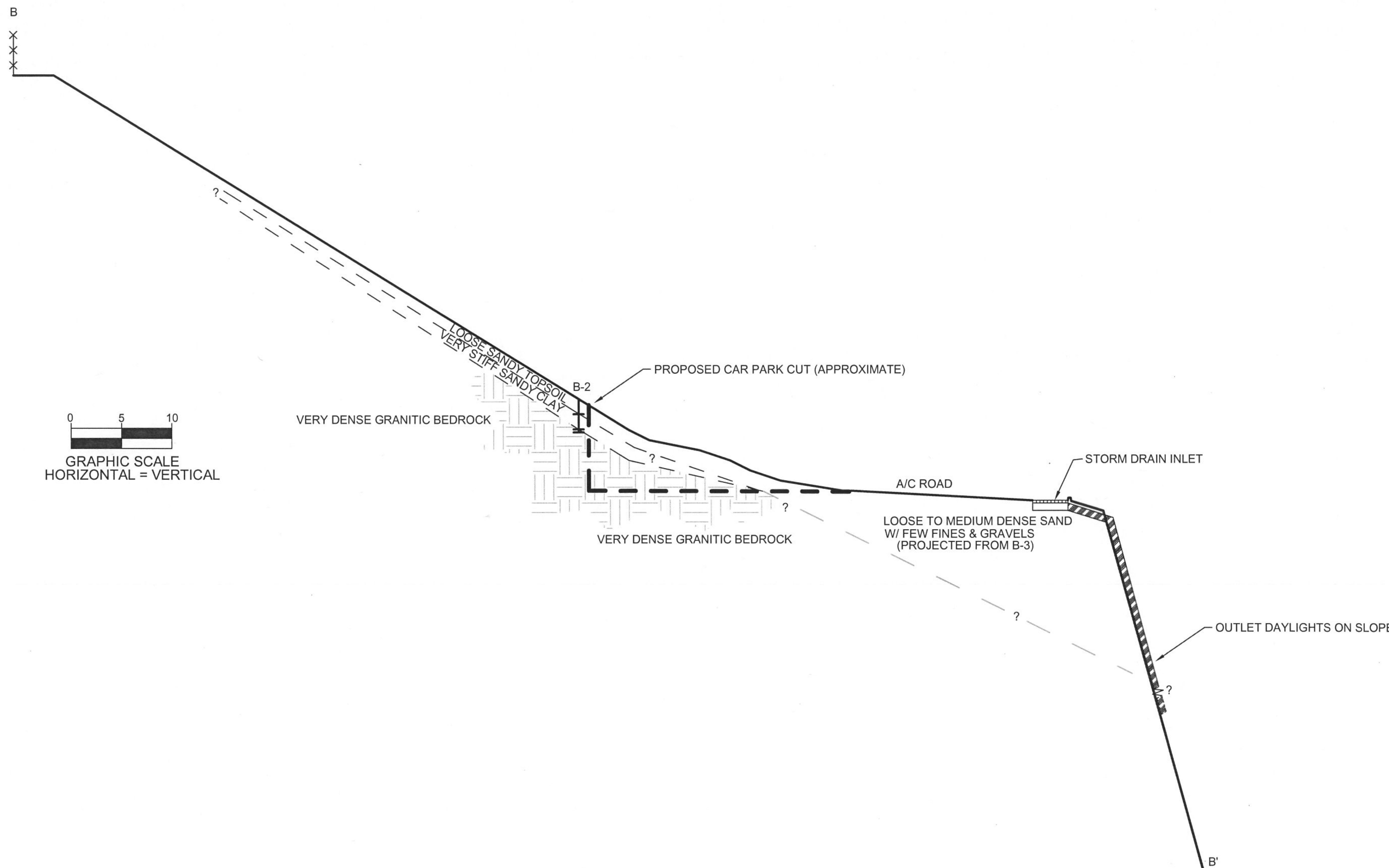
SCALE: 1" = 20'	
DRAWN BY: JD	
DATE: March 2017	HARO, KASUNICH & ASSOCIATES, INC. GEOTECHNICAL AND COASTAL ENGINEERS 116 E. LAKE AVENUE, WATSONVILLE, CA 95076 (831) 722-4175
REVISED:	
JOB NO. M11188	
FIGURE NO. 2	SHEET NO.



CROSS SECTION A - A'
APN 241-182-020
255 Highway One
Carmel Highlands, Monterey County, California

SCALE: 1" = 10' (H=V)	
DRAWN BY: JD	
DATE: March 2017	HARO, KASUNICH & ASSOCIATES, INC.
REVISED:	GEOTECHNICAL AND COASTAL ENGINEERS
JOB NO. M11188	116 E. LAKE AVENUE, WATSONVILLE, CA 95076 (831) 722-4175

FIGURE NO. 3 | SHEET NO.



CROSS SECTION B - B'
APN 241-182-020
255 Highway One
Carmel Highlands, Monterey County, California

SCALE: 1" = 10' (H=V)
DRAWN BY: JD
DATE: March 2017
REVISED:
JOB NO. M11188

HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175

SHEET NO.

FIGURE NO. 3

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

GRAINS SIZES

U.S. STANDARD SERIES SIEVE: 200, 40, 10, 4
CLEAR SQUARE SIEVE OPENINGS: 3/4", 3", 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS PER FOOT*
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH (TSF)**	BLOWS PER FOOT*
VERY SOFT	0 - ¼	0 - 2
SOFT	¼ - ½	2 - 4
FIRM	½ - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

SAMPLING METHOD

STANDARD PENETRATION TEST	T	
MODIFIED CALIFORNIA	L or M	
PITCHER BARREL	P	
SHELBY TUBE	S	
BULK	B	

H_2O

Final	▽
Initial	▼
Water level designation	

*Number of blows of 140 lb hammer falling 30 inches to drive a 2" O.D. (1⅜" I.D.) split spoon sampler (ASTM D-1586)
**Unconfined compressive strength in tons/ft² as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

Haro Kasunich & Associates	**KEY TO LOGS**		

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

255 Highway One - Wildcat

PROJECT NO. M11188

LOGGED BY JD **DATE DRILLED** 2-13-17 **BORING DIAMETER** 4" **BORING NO.** B-1

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Cut in about 2" for level bench	SC					
	1-1-1 (L)		10" sandy topsoil with OM	GP	32				
	1-2 (T)		White/black weathered decomposed granite - gravelly SAND, damp, dense		27				
5			Smooth hard drilling coarse SAND spoils						
	1-3 (T)		Weathered decomposed granite medium dense		15				
10	1-4 (T)		Very dense decomposed granite	GP	50/4"				
			Boring terminated at 10.4 feet						
15									
20									
25									
30									
35									

SuperLog CivilTech Software, USA www.civiltech.com File: C:\superlog4\HKALOGS\M11188 255 Highway One - Wildcat.log Date: 3/30/2017

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 4

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

255 Highway One - Wildcat

PROJECT NO. M11188

LOGGED BY JD **DATE DRILLED** 2-13-17 **BORING DIAMETER** 4" **BORING NO.** B-2

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Cut level bench approximately 12" into hillside - sandy topsoil layer +OM about 18" thick at 18" highly weathered decomposed granite, clayey sand and gravel	GC					
	2-1 (T)				6				
	2-2 (T)		Refusal into very dense decomposed granite at 3 feet. Boring terminated at 3 feet		50/3"				
5									
10									
15									
20									
25									
30									
35									

SuperLog CivilTech Software, USA www.civiltech.com File: C:\superlog4\HKALOGS\M11188 255 Highway One - Wildcat.log Date: 3/30/2017

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 5

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

255 Highway One - Wildcat

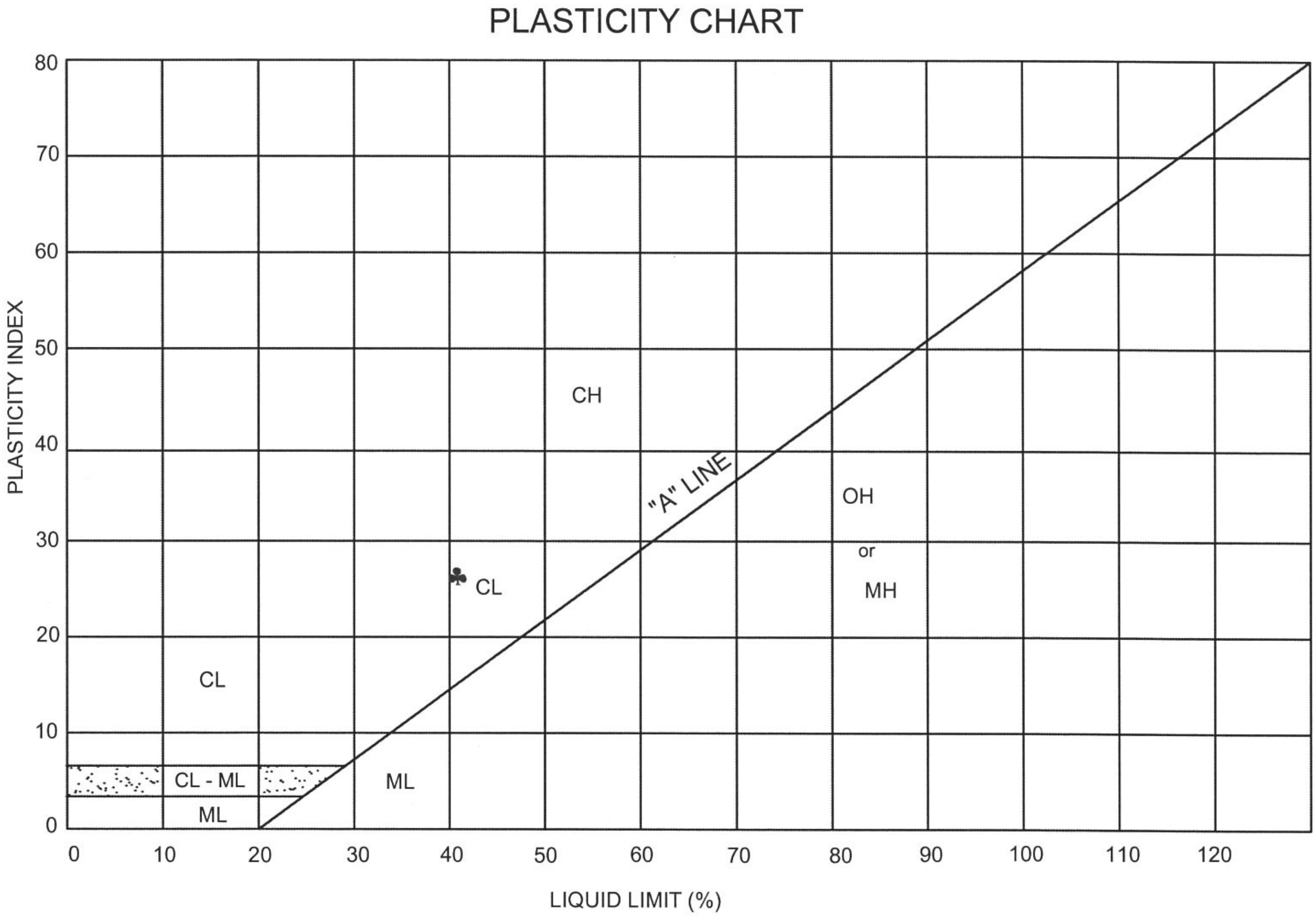
PROJECT NO. M11188

LOGGED BY JD **DATE DRILLED** 2-13-17 **BORING DIAMETER** 6" **BORING NO.** B-3

Depth, ft.	Sample No. and type	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0								
	3-1-1 (L)	Dark brown/black gravelly SAND and minor fines, very damp, loose	SC-GP	14		85.5	20.8	Saturated Direct Shear C = 0 psf ϕ = 51° PI = 26 LL = 40.9% C = 906 ϕ = 2°
	3-2 (T)			6				
5	3-3 (T)			13				
		More fines and damper with depth kept sample in baggie - took out of liner	SC					
	3-4-2 (L) 3-4-1	Spoils gray brown at 8 feet		31		109 96.7	19.4 24.4	
10								
	3-5 (T)	Gray/dark brown with orange zones, CLAY with coarse SAND, moist, very stiff (highly weathered decomposed granite)	CL	30				
15		Contact in sample at 13 feet White/black coarse SAND, decomposed granite, damp, dense, brittle decomposed granite weathered - seems like water flowing through?	GP					
	3-6 (T)	Smooth hard drilling to 18 feet		37				
20								
	3-7 (T)	Very dense decomposed granite at 23 feet not as brittle as above		50/2"				
25		Boring terminated at 24.2 feet						
30								
35								

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 6



PLASTICITY DATA

Key Symbol	Sample Number	Depth (feet)	Natural Water Content (%)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index	Unified Soil Classification Symbol
♣	3-4-2	8.5	19.4	15.3	40.9	26	CL - LEAN CLAY

ATTERBERG LIMITS TEST RESULTS 255 Highway One Monterey County, California	
SCALE:	
DRAWN BY: JD	
DATE: March 2017	**HARO, KASUNICH & ASSOCIATES, INC.** GEOTECHNICAL AND COASTAL ENGINEERS 116 E. LAKE AVENUE, WATSONVILLE, CA 95076 (831) 722-1475
REVISED:	
JOB NO. M11188	
FIGURE NO. 9	SHEET NO.

Direct Shear

Project:	255 HWY 1	**Date**	2/17/2017
Sample #	3-1-1	**Tested By:**	MA/RC
Description	Mottled Orange/Black Sandy Clay		

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	24.4	39.1	87	
Shear Stress (PSF)	718.6	1149.1	2558.9	

Equation of Trendline	
Intercept	Slope
0	1.2373

C (PSF)	PHI
0	51

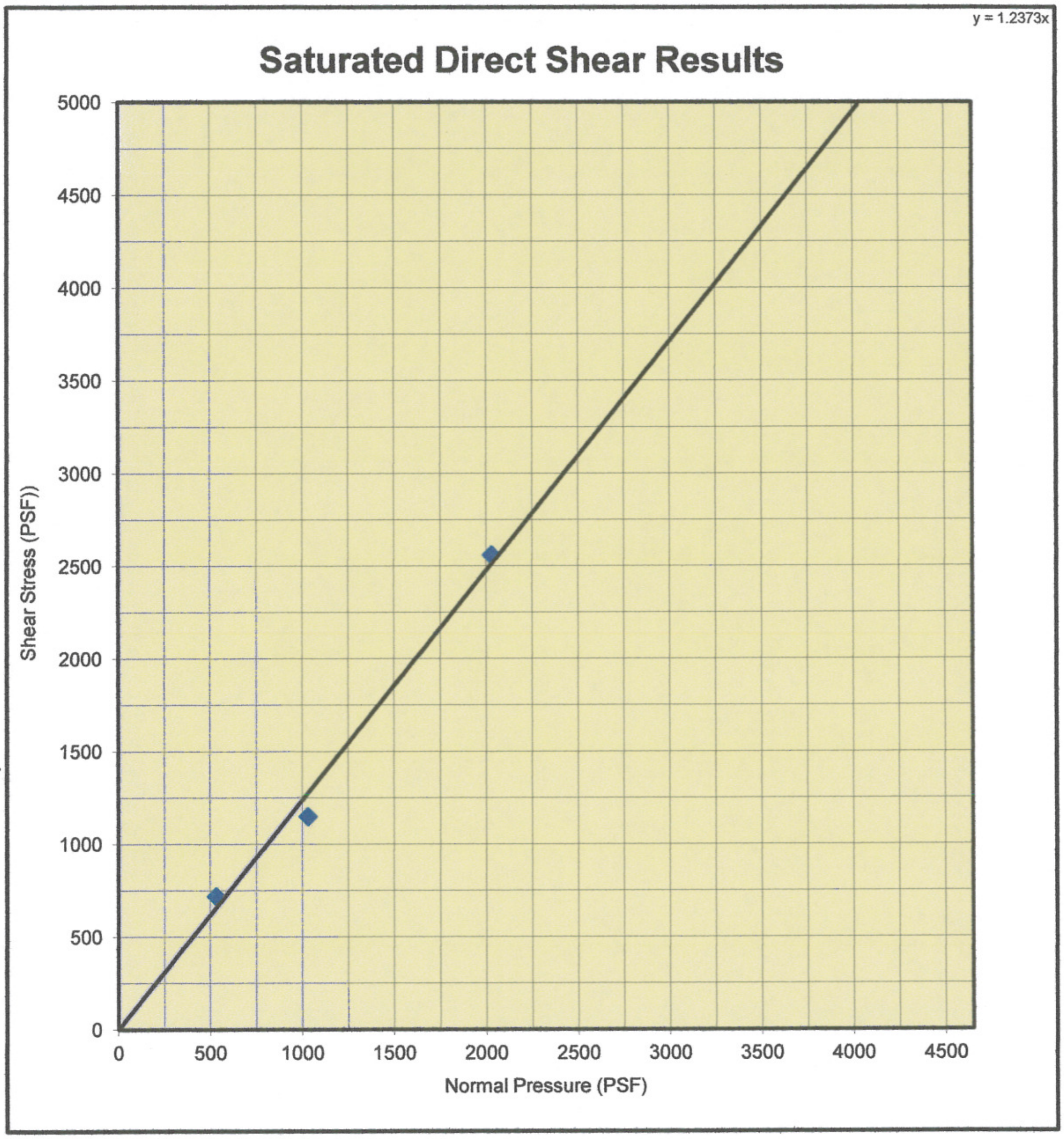


Figure No.

Direct Shear

Project:	255 HWY 1		Date	2/24/2017
Sample #	3-4-1		Tested By:	RC/MA
Description	Dk Grayish Brown Clay w/ sand			

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	39.1	34.5	30.5	37.8
Shear Stress (PSF)	1149.1	1015.2	897.1	1113.1

Equation of Trendline	
Intercept	Slope
905.9	0.0434

C (PSF)	PHI
906	2

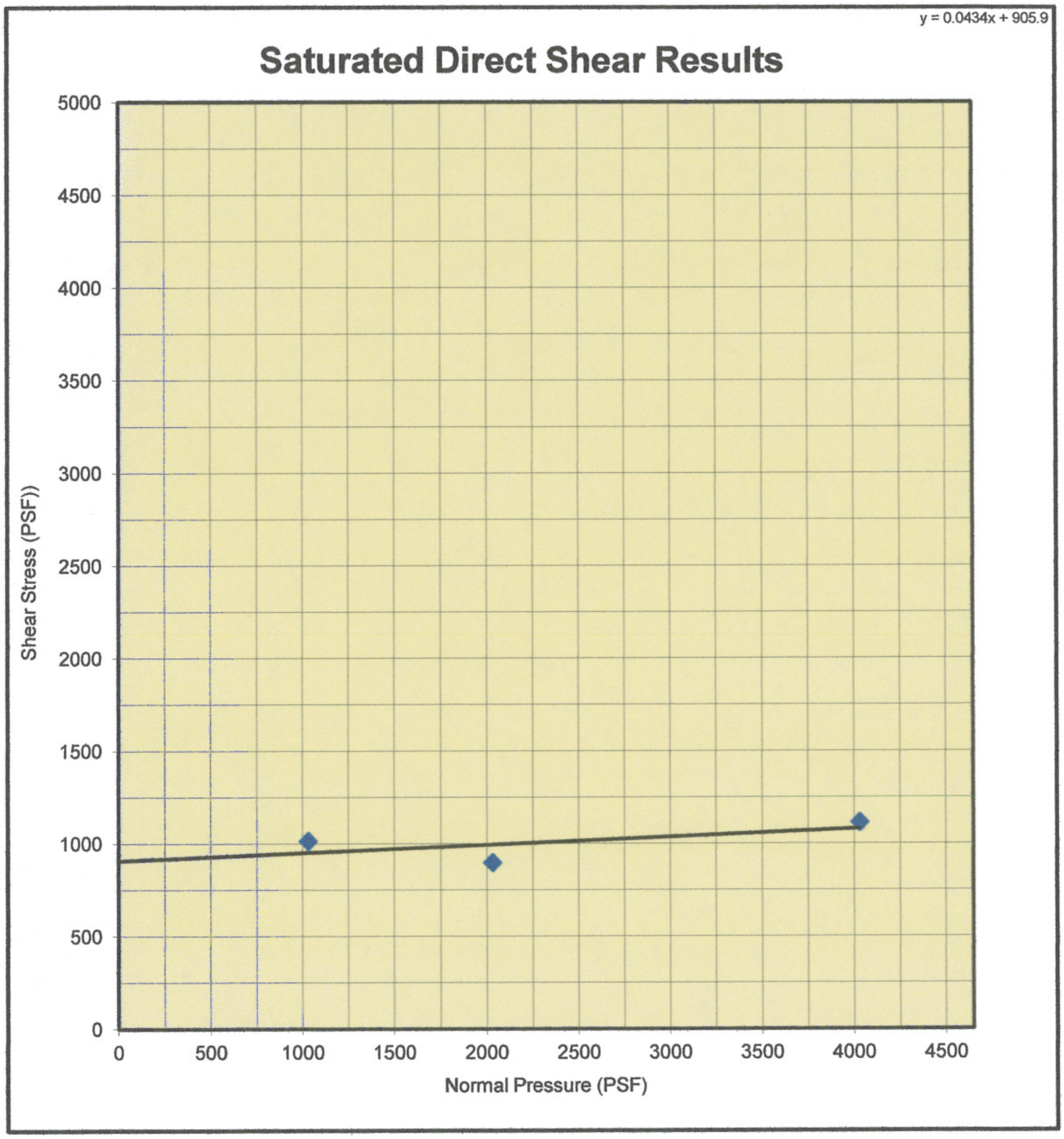


Figure No.

APPENDIX B

Seismic Slope Stability Analysis Beneath House

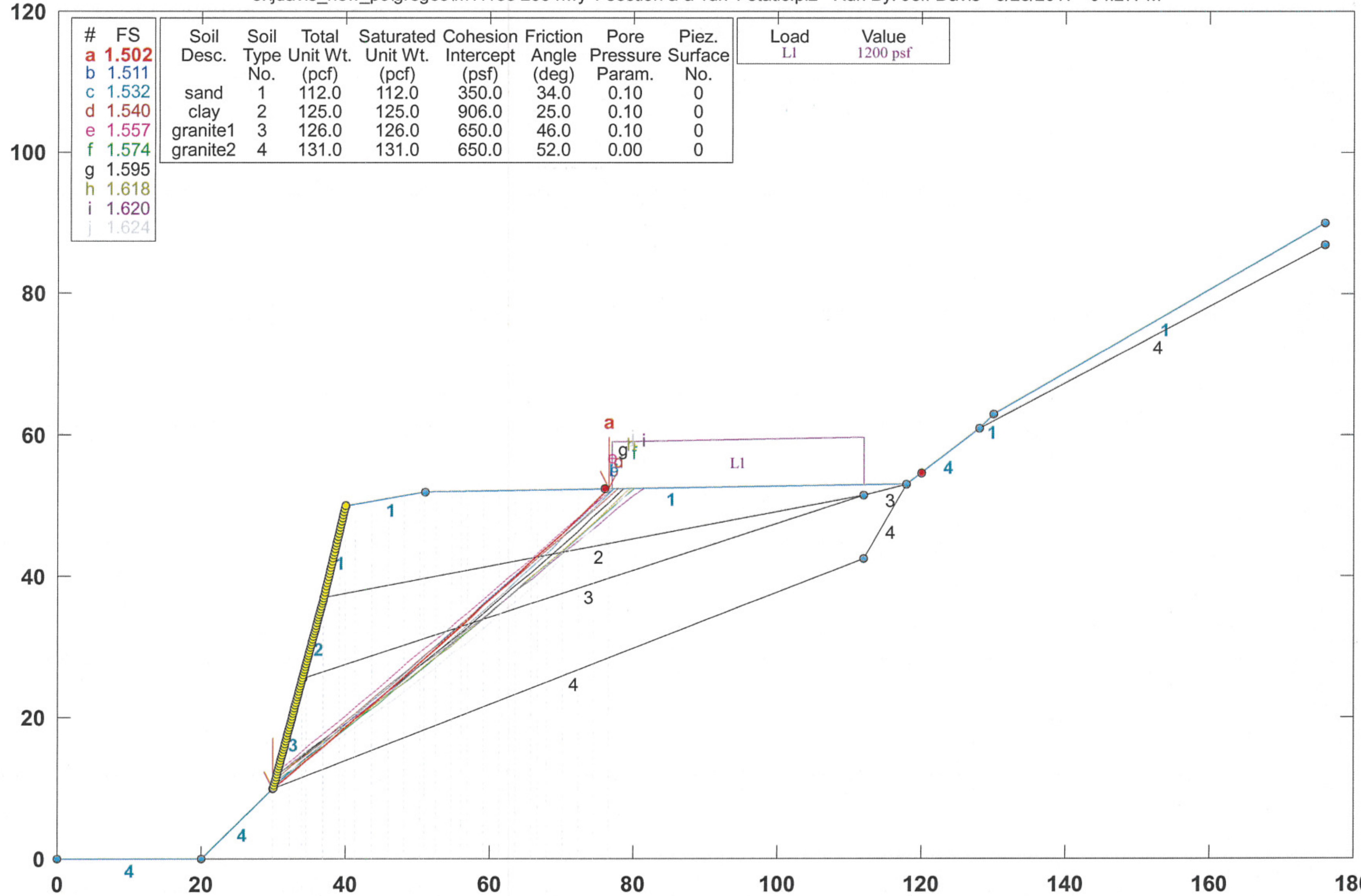
Static Slope Stability Analysis Beneath House

Seismic Slope Stability Analysis Behind House

Static Slope Stability Analysis Behind House

M11188 255 Hwy 1 Section A-A' Run#1 static

s:\jdavis_new_pc\gregeo\m11188 255 hwy 1 section a-a' run 1 static.pl2 Run By: Jeff Davis 3/28/2017 04:27PM



GSTABL7 v.2 FSmin=1.502

Safety Factors Are Calculated By The Modified Bishop Method

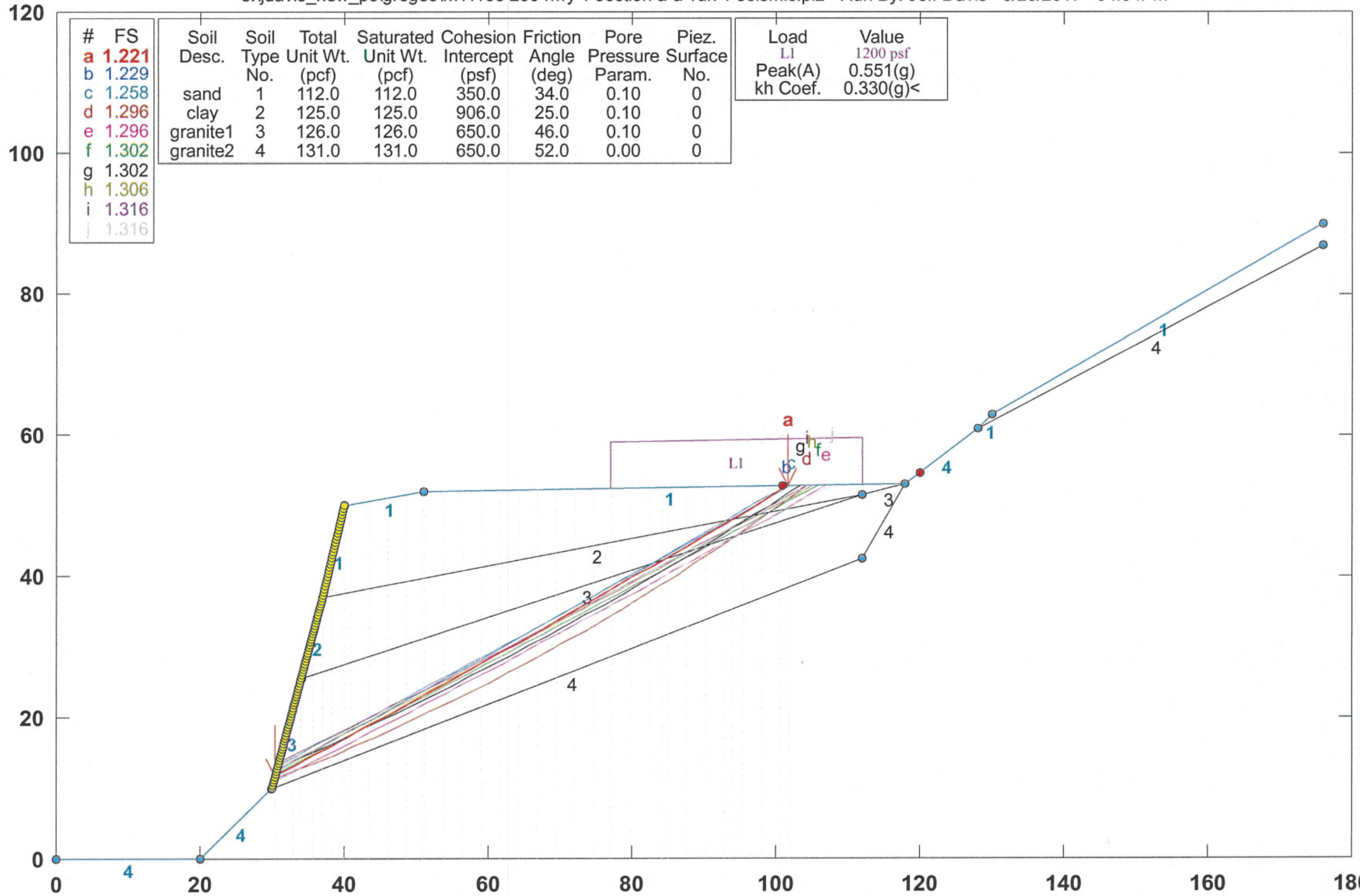
M11188 255 Hwy 1 Section A-A' Run#1 seismic

s:\jdavis_new_pc\gregeo\m11188 255 hwy 1 section a-a' run 1 seismic.pl2 Run By: Jeff Davis 3/28/2017 04:04PM

#	FS
a	1.221
b	1.229
c	1.258
d	1.296
e	1.296
f	1.302
g	1.302
h	1.306
i	1.316
j	1.316

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Piez. Surface No.
sand	1	112.0	112.0	350.0	34.0	0.10	0
clay	2	125.0	125.0	906.0	25.0	0.10	0
granite1	3	126.0	126.0	650.0	46.0	0.10	0
granite2	4	131.0	131.0	650.0	52.0	0.00	0

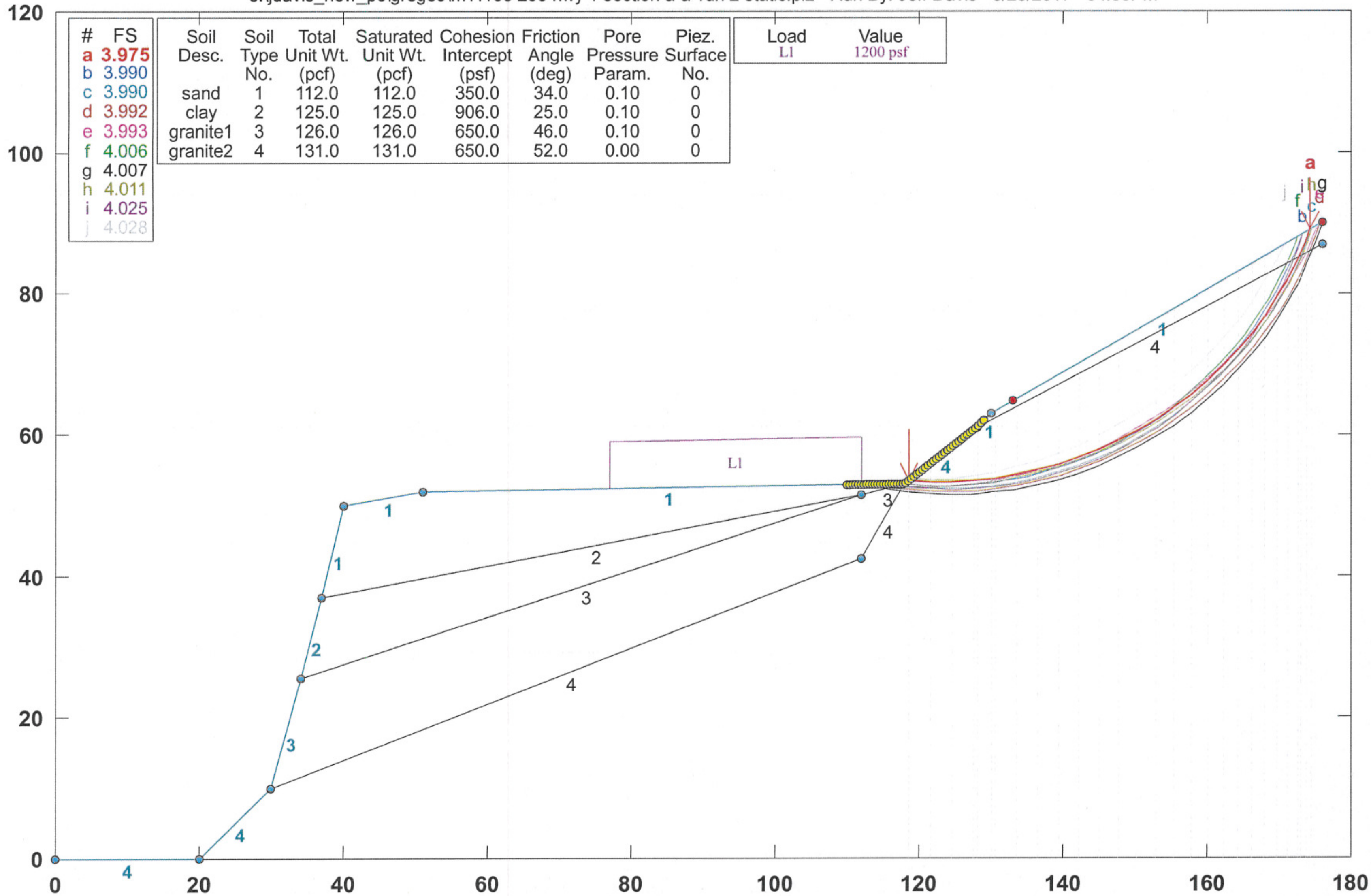
Load	Value
L1	1200 psf
Peak(A)	0.551(g)
kh Coef.	0.330(g)<



GSTABL7 v.2 FSmin=1.221
Safety Factors Are Calculated By The Modified Bishop Method

M11188 255 Hwy 1 Section A-A' Run#2 static

s:\jdavis_new_pc\gregeo\m11188 255 hwy 1 section a-a' run 2 static.pl2 Run By: Jeff Davis 3/28/2017 04:33PM



GSTABL7 v.2 FSmin=3.975

Safety Factors Are Calculated By The Modified Bishop Method

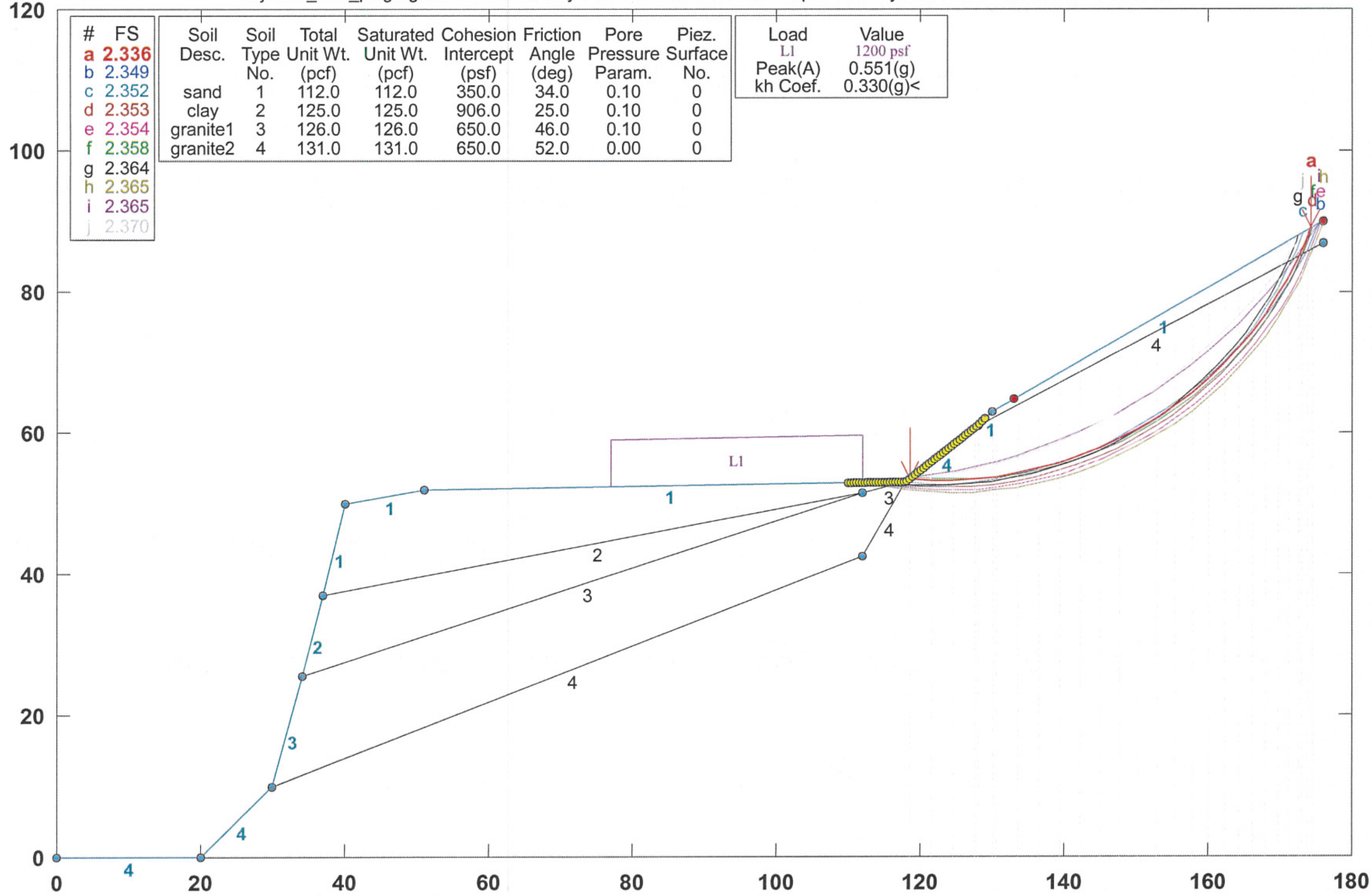
M11188 255 Hwy 1 Section A-A' Run#2 seismic

s:\jdavis_new_pc\gregeo\m11188 255 hwy 1 section a-a' run 2 seismic.pl2 Run By: Jeff Davis 3/28/2017 04:33PM

#	FS
a	2.336
b	2.349
c	2.352
d	2.353
e	2.354
f	2.358
g	2.364
h	2.365
i	2.365
j	2.370

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Piez. Surface No.
sand	1	112.0	112.0	350.0	34.0	0.10	0
clay	2	125.0	125.0	906.0	25.0	0.10	0
granite1	3	126.0	126.0	650.0	46.0	0.10	0
granite2	4	131.0	131.0	650.0	52.0	0.00	0

Load	Value
L1	1200 psf
Peak(A)	0.551(g)
kh Coef.	0.330(g)<



GSTABL7 v.2 FSmin=2.336

Safety Factors Are Calculated By The Modified Bishop Method

THOMPSON
<u>WILDLAND MANAGEMENT</u>
Environmental Management & Conservation Services
International Society of Arboriculture Certified Arborist # WE-7468A
Department of Pesticide Regulation Qualified Applicator Lic. #QL50949 B
Environmental & Arborist Assessments, Protection, Restoration, Monitoring & Reporting
Wildland Fire Property Protection, Fuel Reduction & Vegetation Management
Invasive Weed Control, and Habitat Restoration & Management
Soil Erosion & Sedimentation Control
Resource Ecologist

August 27, 2017

Ms. Heide Cortopassi
255 Highway 1
Carmel Highlands, CA. 93922
APN: 241-182-020-000

Subject: Biological assessment for property located at 255 Highway 1 in the Carmel Highlands

Per construction permit requirements, a biological assessment was performed for the property located at 255 Highway 1 in the Carmel Highlands (APN: 241-182-020) in preparation for a home remodel and addition project. This developed and previously disturbed lot is situated in a coastal bluff residential community on the west side of Highway 1. The purpose of the biotic assessment is to record and document biological resources and habitat characteristics, and determine the presence or absence of special status species and/or sensitive ecological resources that have protection status requiring preservation and/or mitigation.

This ecological evaluation was conducted by performing a thorough walk through and ground level visual assessment of the subject parcel and reviewing property development plans and maps (refer to the *Exhibit A. Site Plans* for proposed design details, property features and characteristics). Where possible the characteristics and conditions described in this report are depicted in the photographs located at the end of the report (refer to *Figures 1-5*).

I. SITE CHARACTERISTICS & DESCRIPTION

The subject property at 255 Highway 1 in the Carmel Highlands is approximately 0.92 acres in size and is located on the west side of Highway 1 in a Monterey cypress and Monterey pine dominated woodland vegetation community that is significantly influenced by seasonally temperate coastal environmental conditions. This property is positioned primarily on a east facing slope that descends into a rugged and turbulent cove of coastal waters below. Currently, there is a small unoccupied home on the parcel that is accessed by a shared paved driveway (refer to *Figures 1 & 2*). The proposed home remodel and addition project (refer to the *Exhibit A. Site Plans*) will utilize the existing building footprint as well as a relatively small previously disturbed area immediately to the northwest of the existing structure that is dominated by non-native invasive ice plant (*Carpobrotus edulis*; refer to *Figure 3*)

This oceanside residential community has been developed on a fairly rugged and topographically dynamic peninsula that is primarily composed of granite substrate and rocky outcroppings. The homes in this upscale community are located in relatively close proximity to one another; however vegetation buffer zones and variations in terrain is assisting in providing some screening and privacy between the homes and properties. The most common tree species occurring in this coastal woodland community include mature and senescing upper-canopy Monterey cypress (*Cupressus macrocarpa*), Monterey pine (*Pinus radiata*) and, to a lesser extent, mid to lower-canopy coast live oak (*Quercus agrifolia*) trees. Understory vegetation is primarily composed of low growing shrub and scrub type flora that consist of an assortment of native and exotic flora. Non-native succulent ground covers (e.g., ice plant and echeveria) are pervasive and widespread on the property and surrounding community.

On this particular lot canopy cover from mature upper canopy cypress and pine trees is relatively sparse (e.g., the existing home and proposed remodel and addition site is located on a sloped east facing clearing with little canopy cover [refer to *Figures 1, 3 & 4*]); however mature upper-canopy and lower growing immature trees are occurring in surrounding areas on and adjacent to the subject property. As previously indicated, mature upper-canopy Monterey cypress is the most dominant and conspicuous native tree specie occurring on this particular parcel. Monterey pine is also fairly abundant with subordinate coast live oak occurring to a lesser extent.

Soils on the subject property are primarily composed of shallow sandy type material and granite substrate, and appear stable and sufficient for supporting indigenous flora. As previously indicated, non-native invasive weeds and introduced plant species are common on this previously disturbed property, as well as in surrounding areas.

II. **BIOLOGICAL RESOURCES & OBSERVATIONS**

The central coast supports a diversity of biological and cultural resources, including sensitive habitats and protected natural resources. The subject property at 255 highway 1 is located in the ecologically sensitive coastal zone, but no sensitive or critical habitat will be adversely affected by the proposed home remodel and addition project.

In regards to biological resources, with the exception of two small and inconspicuous sea cliff buckwheat (*Eriogonum parvifolium*) plants that are located within or directly adjacent to the proposed building footprint (identified with two orange pin flags; refer to *Figures 2, 3, 4 & 5*), no other protected special status species that have the potential of occurring in the area were observed on the subject property. Sea cliff buckwheat is a protected perennial shrub specie that provides essential habitat for the federally protected Smith's blue butterfly (*Euphilotes enoptes smithi*). It should be noted that Smith's blue butterfly was not observed during the site assessment. The two small individual and relatively isolated buckwheat plants that were observed are located in a dense stand of non-native invasive ice plant and are identified on-site with orange pin flags. These two plants appear to be within or directly adjacent to the proposed building footprint and therefore will likely need to be removed or relocated. Additionally, a few other small patches of sea cliff buckwheat were observed in the northern part of the property in close proximity to the shared private driveway. These small populations located in the northern part of the property will not be affected by proposed property development operations due to the installation of resource protection measures, as well as the fact that proposed construction activities are a safe distance away and will be limited and contained to a fairly small building footprint.

As previously indicated, this coastal zone community is dominated by mature Monterey cypress and Monterey pine trees and is significantly influenced by coastal environmental conditions. On this particular property, mature and senescing upper-canopy Monterey cypress trees are the most conspicuous and dominant tree specie. Monterey pine is also present but occurring to a lesser extent. Understory vegetation is comprised of a combination of native coastal scrub type vegetation, as well as several non-native and introduced plant species.

The following is a list of plant species that was observed on the subject property: Monterey cypress (*Cupressus macrocarpa*), Monterey pine (*Pinus radiata*), coast live oak (*Quercus agrifolia*), blue blossom ceanothus (*Ceanothus thyrsiflorus*), Toyon (*Heteromeles arbutifolia*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), lizard tail (*Eriophyllum staechadifolium*), seaside daisy (*Erigeron glaucus*), wood mint (*Stachys bullata*), Douglas iris (*Iris douglasiana*), poison oak (*Toxicodendron diversilobum*), wild blackberry (*Robus ursinus*), bluff lettuce (*Dudleya farinosa*), giant wildrye (*Elymus condensatus*) and the previously mentioned special status specie sea cliff buckwheat (*Eriogonum parvifolium*). Non-native species observed include ice plant (*Carpobrotus edulis*) and *Echeveria* (both are succulents that dominate the site), sea lavender (*Limonium perezil*), pride-of-madeira (*Echium candicans*), *Pittosporum halophilum*, *Myoporum laetum* and cape ivy (*Delairea odorata*).

In regards to wildlife, protected special status species and/or nesting birds were not observed during the property assessment. Fauna observed during the site inspection was limited to a few species of indigenous bird species that were foraging or passing through the site.

As previously noted, proposed home construction activities will utilize the existing footprint of the current structure, as well as a relatively small area immediately to the northwest that will serve as a garage. With the exception of the two previously mentioned sea cliff buckwheat plants, the relatively small areas impacted by proposed home improvement operations are primarily composed of non-native invasive plants (e.g., dense ice plant ground covers/monoculture) that are degrading to habitat (refer to *Figures 1-5*).

III. **RECOMMENDATIONS**

In the interest of protecting and minimizing impacts to ecological resources, as well as preserving conservation values and biological diversity the following conservation and resource protection best management practices (BMP's) should be implemented prior to construction operations commencing:

1) Prior to construction activities beginning, install resource protection measures to clearly identify and delineate the construction zone and to prevent unnecessary construction site expansion and disturbance to surrounding areas. Resource protection BMP's include appropriate erosion and sedimentation control measures, tree protection measures, and high visibility exclusionary fencing that clearly identifies the construction zone. Resource protection measures should be properly maintained for the duration of the project.
2) More specifically, install high visibility exclusionary fencing around nearby retained trees and native plant stands.
3) Relocate two small sea cliff buckwheat (*Eriogonum parvifolium*) plants that were observed within or directly adjacent to the proposed construction site. These two plants should be relocated to an appropriate location on the subject property (e.g., the area on the north end of the property where a few other small patches of sea cliff buckwheat are occurring), ideally during the fall or early winter season when there is sufficient soil moisture to reduce transplant stress. Relocated plants should be monitored for a 2-year period to ensure successful establishment.
4) In the landscape plan consideration should be given to utilizing plants that are appropriate and suitable (e.g., native and naturalized plant species) to this coastal environment. Plants selected for landscaping operations should be drought tolerant, relatively fire resistant, non-invasive to wildland areas, and well adapted to this coastal environment.
5) Control and manage non-native invasive ice plant populations on the property.
6) As previously stated, nesting birds were not observed during the property assessment; however the nesting season in Monterey County may begin as early as February and continue through August. Consequently, if construction activities begin during this nesting period an additional nesting assessment should be conducted within two weeks of tree removal or pruning operations occurring.

IV. **CONCLUSION**

In conclusion, proposed home construction activities will have a insignificant and minimal impact to biological resources located on the property at 255 Highway 1 in the Carmel Highlands. As outlined in the report, construction impacted areas are primarily composed of non-native and invasive ice plant, which is a noxious weed that is degrading to habitat. Implementation of resource protection and mitigation measures provided in this report will assist in sustaining and improving the health and character of property resources, as well as satisfy *Monterey County Planning Department & Resource Management Agency* permit conditions.

Thank you and please let me know if you have any questions or need additional information.

Best regards,

_________________________________ ____________________

Rob Thompson Date

Resource Ecologist
ISA Certified Arborist

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Figure 1. View of subject property looking north. The small unoccupied home (left of center) will be remodeled using the existing building footprint and a garage will be constructed immediately behind the home next to the shared driveway. Most of the impacted areas are dominated by exotic ice plant and impacts to biological resources will be minimal.

Figure 2. View of shared private driveway looking north and coastal cove is to the east of the driveway. Proposed garage will impact the ice plant dominated area along the left edge of photo, which will include the removal and relocation of two small sea cliff buckwheat plants.

Figure 3. Site of proposed garage addition, which is dominated by non-native succulents (i.e., ice plant and echeveria). Edge of existing structure is visible along left edge of photo. Two sea cliff buckwheat plants that are marked with orange pin flags (not visible in photo) are located in this area within or directly adjacent to proposed construction activities.

Figure 4. The ice plant dominated slope behind the existing unoccupied home will not be impacted. A retaining wall will be installed along toe of slope, but the large native ceanothus bush and California sagebrush patches visible in photo will be retained and protected.

Figure 5. This small and relatively isolated single stem sea cliff buckwheat plant is occurring in a dense monoculture of non-native invasive ice plant. This is one of two plants that is located within or directly adjacent to proposed construction activities. These two special status specie plants will likely need to be relocated to a suitable area located toward the north end of the property.

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December 26, 2016

Ms. Heide Cortopassi
11039 N. Highway 88
Stockton, CA 95212

Dear Ms Cortopassi:

Thank you for the opportunity to prepare a Phase I Historic Review for your residential property located at 255 Highway One (APN# 241-182-020) in Carmel Highlands, as required by the California Environmental Quality Act (CEQA) and the County of Monterey.

According to Monterey County Assessor's records the subject property was constructed in 1959. The designer/builder was Floyd V. Hampshire of the Hampshire Construction Co. of Salinas. Mr. William W. Durney, founder and president of the Durney Vineyard was the original owner. The Durney Vineyard was the first modern winery in Carmel Valley

The subject property is a small, one-story, wood-framed Mid-Century Modern Style residence, irregular in plan, resting on a concrete foundation. The exterior wall-cladding is a combination of vertical flush-wood siding, metal and wood-framed glass, and rubble-coursed stone masonry. The low-pitched, hipped roof system has wide overhanging eaves with closed soffits. There is one rubble-coursed, stone eave-wall chimney present, forming part of the north side-elevation. The hipped roof system is covered in wood shakes, and planted with succulents. Fenestration is irregular with a combination of two large, wood-framed full-height fixed focal windows on the north side of the east facing facade, and a patchwork arrangement of smaller, stock metal windows toward the south side, separated somewhat by a glazed entry door, framed in the vertical, flush-wood siding that characterizes the southern portion of the façade and south side-elevation.

The residence is sited on the west side of a narrow serpentine right-of way, abutting a high hill, that services several homes to the west of Highway One, across from the Highland Inn.

Character-defining features of the subject property include its irregular plan; Wood, glass and stone exterior wall-cladding; hipped roof with wide overhanging eaves and closed soffits.

The subject property is framed, immediately to the west by a high hill mass, and is fronted by an informal strip of low shrubbery. It is located on the west side of Highway One in a rural residential neighborhood of one and two-story homes of varying ages, sizes and styles.

The California Environmental Quality Act (CEQA), PRC Sec.21084.1 requires all properties fifty years of age or older to be reviewed for potential historic significance. Criteria for that significance is addressed in PRC Sec. 5024.1 (a). It asks, did any event important to the region, state or nation occur on the property ? Did anyone important to the region, state or nation occupy the property during the productive period of their lives ? Does the building represent an important architectural type, period or method of construction, or is it a good example of the work of a noted architect or master builder ? The criteria also asks if the property is likely to yield information significant to the understanding of the areas history.

Eligibility for historic listing of buildings, structures, objects, sites and districts, i.e., rests on the twin factors of historic significance and integrity to be considered for listing in the National Register of Historic Places, the California Register of Historical Resources, and the Monterey County Historic Resource Inventory.

Loss of integrity, if sufficiently great, will overwhelm the historic significance a resource may possess and render it ineligible for historic listing. Likewise, a resource can have complete integrity, but if it lacks significance, it must also be considered ineligible.

Integrity is measured by the application of seven aspects, defined by the National Register Criteria for Evaluation. They include: Location, the place where the historic property was constructed, or an historic event occurred; Design, the combination of elements that create the form, plan, space, structure, and style of a building; Setting, the physical environment of the historic property; Materials, the physical elements that were combined during a particular period of time and in a particular pattern or configuration to form a historic property; Workmanship, the physical evidence of the crafts of a particular culture or people during any given period in history; Feeling & Association are subjective elements that assess a resources ability to evoke a sense of time and place.

The subject property is not included in the California Office of Historic Preservation-maintained “Historic Data File for Monterey County” (updated September, 2016).

It is not listed in the California Register, or the National Register of Historic Places, nor is it listed in the Monterey County Historic Resources Inventory.

Stylistically, the residence is a contractor designed version of Expressionist architecture from the late 1950s into the 1960s. The form wanted to express a unique, intuitive and romantic aesthetic relating to Frank Lloyd Wright’s concept of organic architecture. At its best it was interested in creating an emotional response by exaggerating light, space and mass through the use of boldly articulated geometric forms and exploiting the sensual quality of materials, especially those close to nature. In this instance primarily through the rough texture of its wood and rubble-patterned local stone for the building envelope.

The building’s low-profile, and orientation, seeking the protection of the hillside is intended to meet the organic dictum that elevations and ornament evolve from the geometry of the floor plan, in this instance a basic ell form with an elliptical glazed bow connecting the inside corners of the ell.

Unfortunately, the designers attempt at proportion was limited to a difficult parcel on a narrow right-of-way at the confluence of several existing entry points for existing residences. Code conformance also forced it into the base of the hill mass. Pieces of the organic puzzle are there, however, because of the employment of standardized stock components, they do not live up to the intent of the floor plan. The glazed ellipse does not curve, but angles as a product of its many separate parts. The desired transparency of the overall glazing design feels “stitched” together. The planted roof seems forced, and the chimney, as symbol of the hearth, is visually lost in the hillside.

Generally speaking, architectural significance for Mid-Century Modern residential design is best reserved for buildings that demonstrate particularly strong artistic merit, or that clearly demonstrate the influence of a noted architect or builder.

The subject property retains its original location and setting, but the design, as constructed in 1959 does not reach the necessary level of high aesthetic merit that would qualify it for historic significance. The original building application indicates its design was from “plans on file”, suggesting a possibility of stock blueprints.

No event of significance to the nation, state or region, nor any significant individuals during the productive period of their lives, have been identified with the existing property. The original owner, Mr. Durney was a significant figure in the wine industry and a civic leader in the larger community. However, his obituary, published in the Monterey Herald newspaper for October, 8, 1989 identifies his primary residences while in Monterey County as his ranch in Carmel Valley, and home in Pebble Beach. It is not clear the subject property was ever intended to be a place of permanent residence.

Lacking both historic significance and sufficiently high artistic merit in the quality of its 1959 design, the subject property does not meet the necessary criterion for listing in the California Register of Historical Resources. Nor does it meet the criterion established by the County of Monterey to qualify for inclusion in the Monterey County Register of Historic Places, and therefore cannot be considered as historic resources as defined by CEQA.

Respectfully Submitted,

Kent L. Seavey

255 Highway One-Carmel Highlands

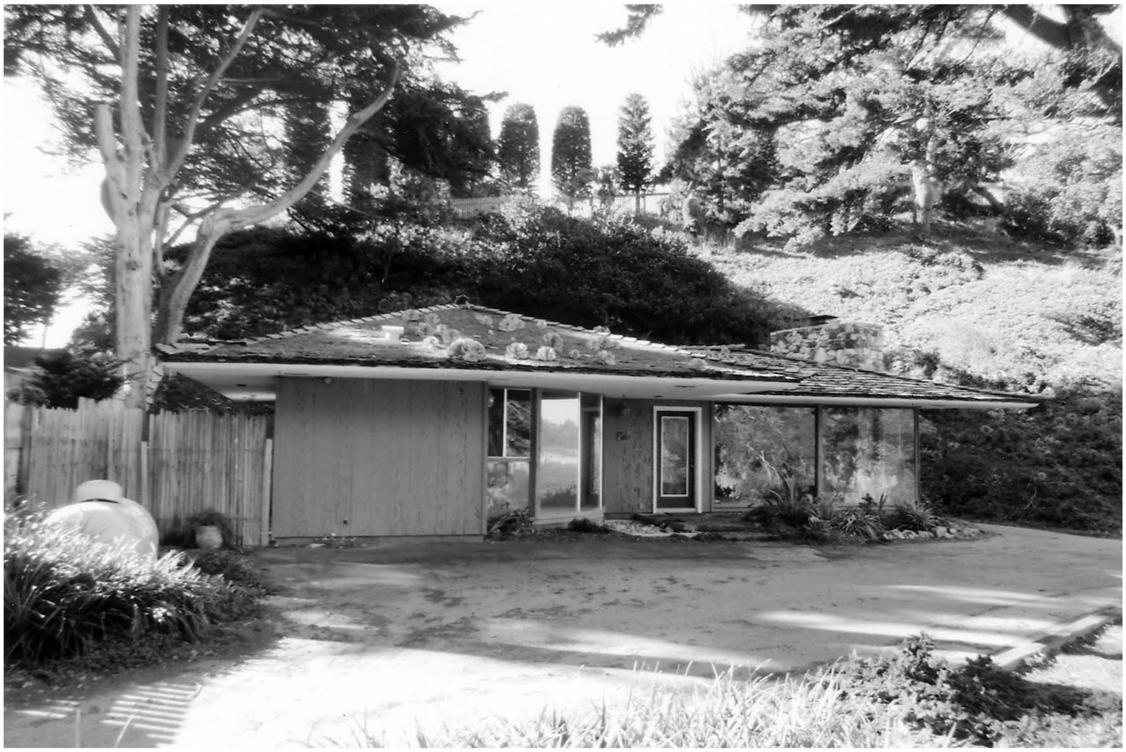

Photo #1. Looking NW at the east facing façade, note the close
Proximity of road bed, Kent Seavey, December, 2016.

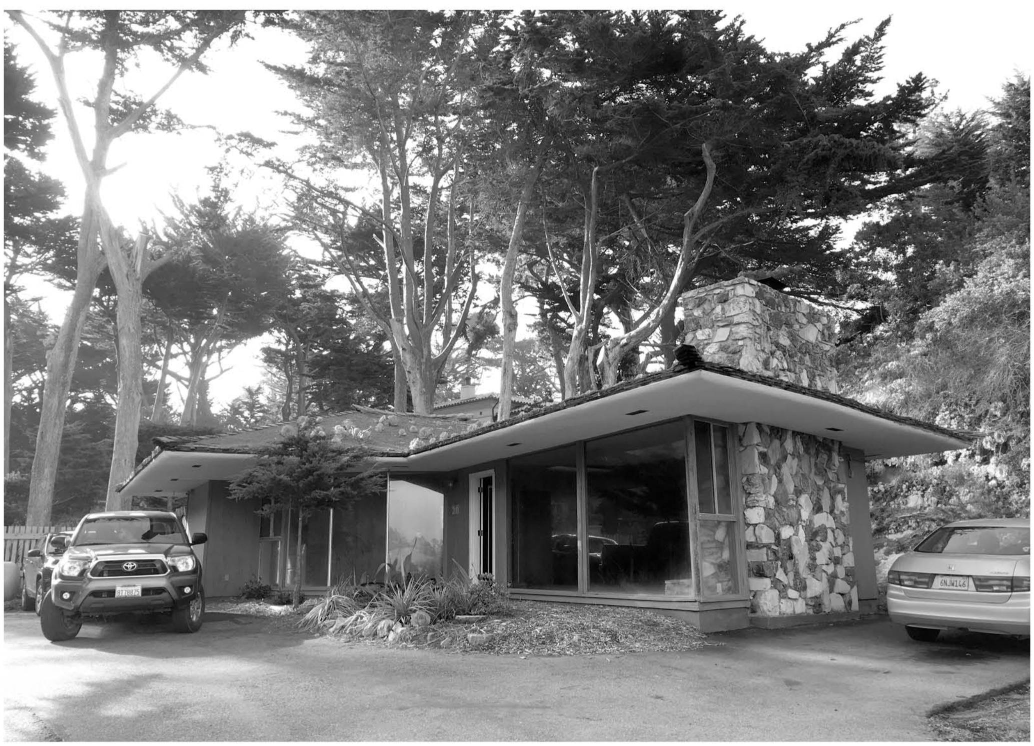

Photo #2. Looking SW at the east facing façade, north side-elevation,
& wide overhanging eaves, Kent Seavey, December, 2016.