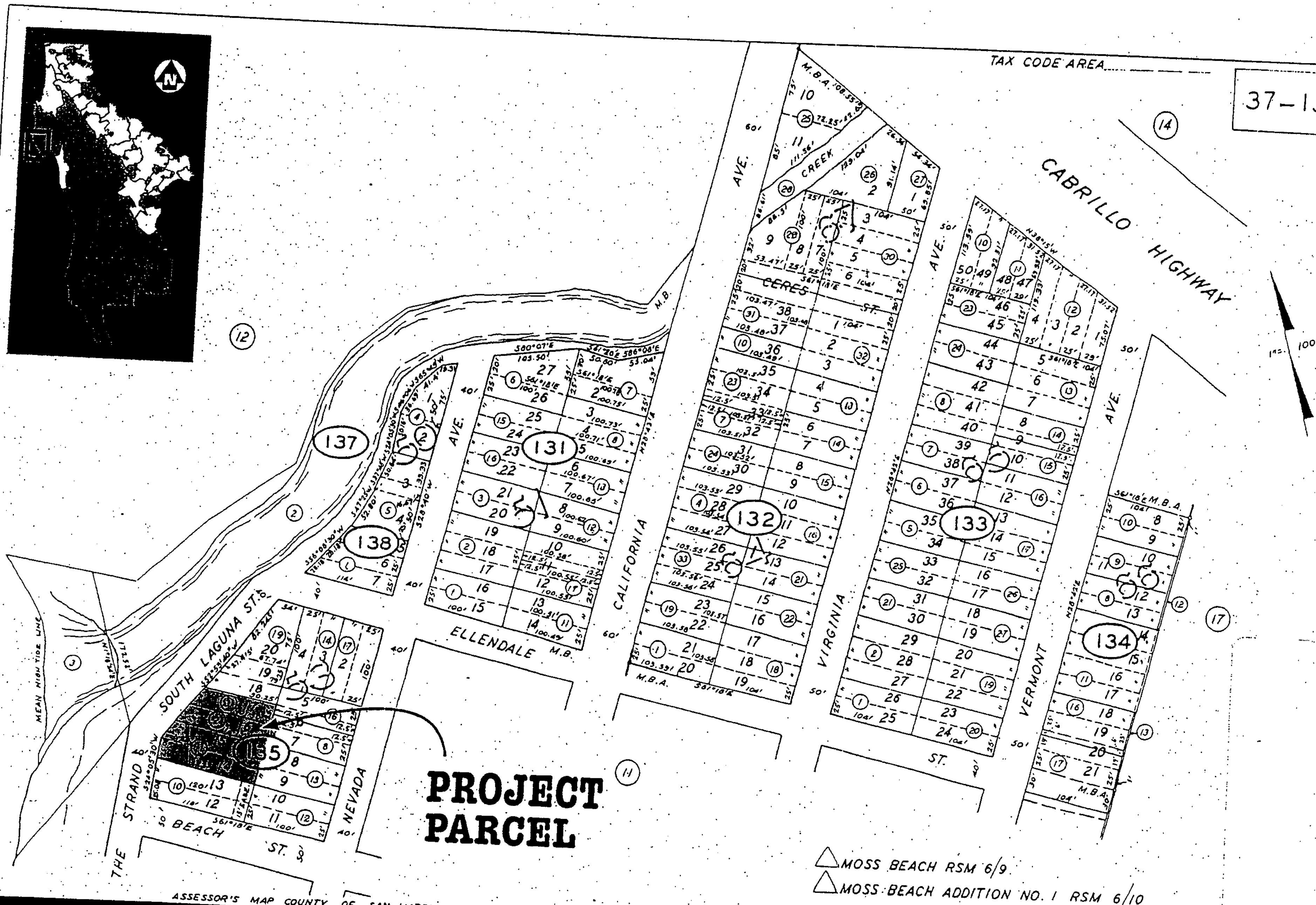

San Mateo County Board of Supervisors' Meeting

Applicant: **Karen Trilevksy**

File Numbers: **PLN 2005-00504**

Attachment: **B**

PROJECT TEAM

OWNER

KAREN TRILEVSKY
PO BOX 31
MOSS BEACH, CA. 94038

TEL: 650.728.2737
FAX: 650.618.2592

EMAIL: karen@fullbloom.com

ARCHITECT

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JOHN DAVIS, PROJECT LEAD

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LANDSCAPE ARCHITECT

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ANDREA COCHRAN, PRINCIPAL
EMILY RYLANDER, PROJECT LEAD

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FAX 415.503.0070

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STRUCTURAL

T.B.D.

MECHANICAL/TITLE 24

T.B.D

CIVIL ENGINEER

BENJAMINI ASSOCIATES INC
720 YORK ST. #114
SAN FRANCISCO, CA. 94110

AVI BENJAMINI, PRINCIPAL

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FAX 415.520.2005

EMAIL. abenjamini@benjamini-inc.com

GENERAL CONTRACTOR

T.B.D

INDEX OF DRAWINGS

PROJECT DATA

PROJECT DESCRIPTION:
PARTIAL DEMOLITION OF EXISTING ONE-STORY SINGLE-FAMILY RESIDENCE AND DETACHED ACCESSORY STRUCTURE (GARAGE). RENOVATION OF REMAINING PORTIONS OF EXISTING RESIDENCE AND ACCESSORY STRUCTURE. NEW TWO-STORY ADDITION TO EXISTING RESIDENCE AND NEW ONE-STORY ADDITION TO ACCESSORY STRUCTURE (STORAGE). NEW EXTERIOR DECKS AND LANDSCAPING.

LOCATION	324 THE STRAND MOSS BEACH, CA. 94038
ASSESSOR'S PARCEL NO	037-135-020, 037-135-110, 037-135-030
ZONING DISTRICT	SAN MATEO CO. COASTAL ZONE DISTRICT S-17
CONSTRUCTION	TYPE V, FULLY SPRINKLERED
USE	SINGLE FAMILY RESIDENTIAL (R1)

	ALLOWED	ACTUAL	
PARCEL SIZE		11,100 SF	
EXISTING HOUSE		1,776 SF	
EXISTING GARAGE		496 SF	
PROPOSED PARCEL COVERAGE	3,[illegible] SF MAX (PARCEL SIZE X 35%)	3,076 SF	OK
PROPOSED FLOOR AREA			
EXISTING HOUSE TO REMAIN		1,213 SF	
EXISTING GARAGE, TO REMAIN		496 SF	
NEW ADDITION, LEVEL 1		1,249 SF	
NEW ADDITION, LEVEL 2		823 SF	
NEW ADDITION, ACCESSORY		118 SF	
	5,885 SF MAX (PARCEL SIZE X 53%)	3,[illegible] SF	OK
SETBACKS	SEE SITE PLAN & ELEVATIONS		
DAYLIGHT REQUIREMENTS	SEE ELEVATIONS		

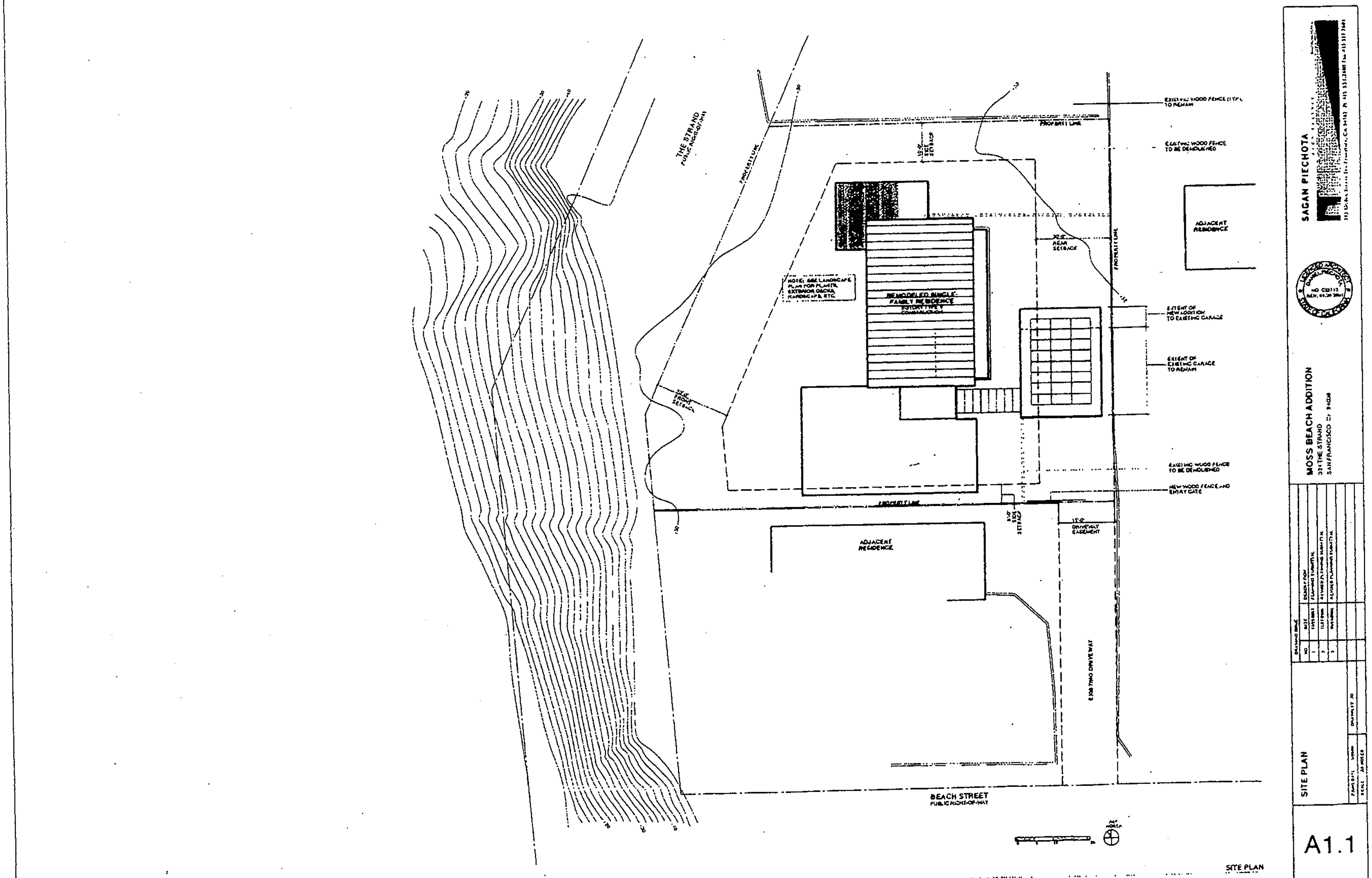
SITE LOCATION

San Mateo County Board of Supervisor's Meeting

Owner/Applicant: **TRILEVSKY KAREN**

File Numbers: **PLN 2005-00504**

ATTACHMENT C - 1

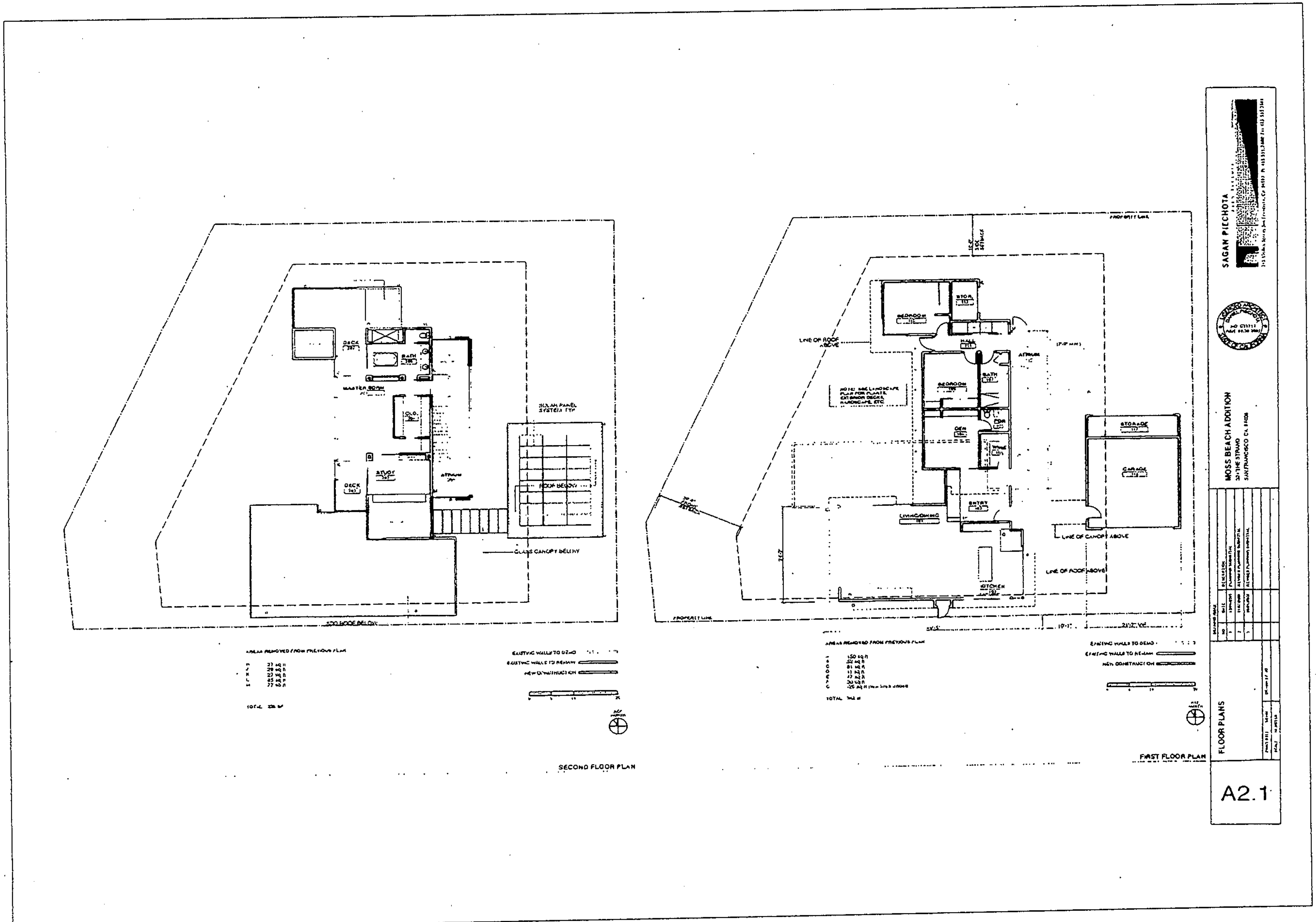


San Mateo County Board of Supervisor's Meeting

Owner/Applicant: **TRILEVSKY KAREN**

File Numbers: **PLN 2005-00504**

ATTACHMENT C -2



San Mateo County Board of Supervisor's Meeting

Owner/Applicant: **TRILEVSKY KAREN**

File Numbers: **PLN 2005-00504**

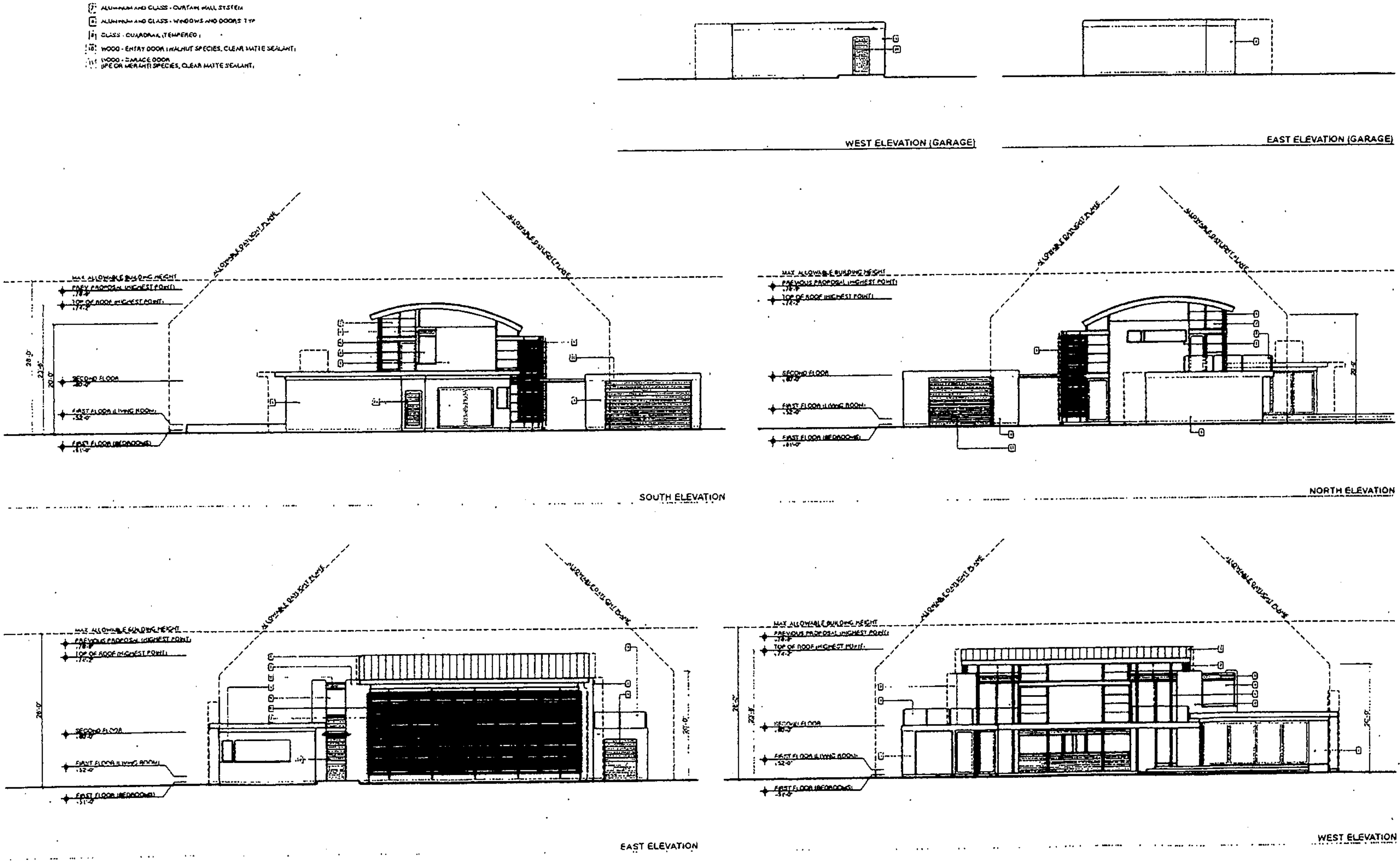
ATTACHMENT D

026

CUR8\pln05-504 07-18-08 ah

MATERIALS NOTES

1. CEMENT STUCCO (TAN COLOR, STEEL-TROWELED)
2. WOOD - V-GROOVE T&G CLADDING (IPE OR MERANTI SPECIES, CLEAR MATTE SEALANT)
3. ALUMINUM - TRELLIS / SCREEN ASSEMBLY (HARD-ANODIZED)
4. ZINC - STANDING-SEAM ROOFING
5. CEMENT STUCCO ('CHAPEL STONE' COLOR, STEEL-TROWELED)
6. STEEL (PAINTED SILVER-METALLIC)
7. ALUMINUM AND GLASS - CURTAIN WALL SYSTEM
8. ALUMINUM AND GLASS - WINDOWS AND DOORS TYP
9. GLASS - GUARDRAIL (TEMPERED)
10. WOOD - ENTRY DOOR (WALNUT SPECIES, CLEAR MATTE SEALANT)
11. WOOD - GARAGE DOOR (IPE OR MERANTI SPECIES, CLEAR MATTE SEALANT)



SAGAN PIECHOTA

MOSS BEACH ADDITION
324 THE STRAND
SAN FRANCISCO CA 94106

EXTERIOR ELEVATIONS

A3.1

San Mateo County Board of Supervisor's Meeting

Owner/Applicant: **TRILEVSKY KAREN**

File Numbers: **PLN 2005-00504**

ATTACHMENT E

CDR8\pln05-504 07-18-08 ah

GEOFORENSICS INC. Consulting Soil Engineering

561 Pilgrim Dr., Suite D, Foster City, California 94404 Phone: (650) 349-3369 Fax: (650) 571-1878

File: 206180
October 9, 2007

Ms. Karen Trilevsky
P.O. Box 31
Moss Beach, CA 94038

Subject: **Proposed Additions**
324 The Strand
Moss Beach, California
REPORT SUPPLEMENT (#2)

Dear Ms. Trilevsky:

This letter has been prepared to update and supplement the information in our original report (6/6/02), and previous supplement report (10/9/06), which were also prepared for the construction of the proposed addition onto the residence on your property on The Strand.

Although we had prepared the previous supplement to address some issues raised by the County Geologist, there have been additional issues raised by the Board of Supervisors regarding supplemental information needed to verify conformance with the policies of the County's Coastal Plan.

Specifically, we have been asked to provide additional information relative to section 9.8b of the plan. In the following sections of this letter, we have identified each of the plan sections, and have then responded to each section.

9.8 Regulation of Development on Coastal Bluff Tops

b. *Require the submittal of a site stability evaluation report for an area of stability demonstration prepared by a soils engineer or a certified engineering geologist, as appropriate, acting within their areas of expertise, based on an on-site evaluation. The report shall consider:*

1) *Historic, current and foreseeable cliff erosion, including investigation of recorded land surveys and tax assessment records in addition to the use of historic maps and photographs were available, and possible changes in shore configuration and transport.*

Our previous report supplement (10/9/06) provided the results of our review of historic aerial photographs spanning the period between 1955 and 2005, which allowed us to measure historic cliff retreat rates over that time, and to project future bluff retreat over the next 50 years. Bluff retreat boundaries were projected for future rates assuming that the existing rip-rap protection is maintained, as well as another boundary location assuming that the rip-rap does not even exist. In either case, the proposed additions are located well outside the anticipated ocean bluff retreat projection.

ATTACHMENT F

File: 206180
October 9, 2007

2) *Cliff geometry and site topography, extending the surveying work beyond the site as needed to depict unusual geomorphic conditions that might affect the site and proposed development.*

In our previous report and supplement, we have generally described the site conditions present along the bluff. The bluff in the area of the subject site is approximately 40 feet tall above the beach. Although the portions of the bluff along the subject property, and property to the south, had been armored with a large diameter rock boulder slope (40 to 45 degree inclination, installed in 1994), the adjacent portions of the bluff are unprotected. The unprotected area just south of the boulders consists of a near vertical, lightly cemented sand cliff, extending from the beach up to the elevation of the level terrace where the houses are situated. These same materials are expected to comprise the native materials located behind the protective rock rip-rap fascia on the subject properties.

To the north of the rip-rap, there is a seasonal creek which empties into the ocean. An old culvert extends under several feet of sand sediments at the mouth of the creek. The presence of the creek and culvert appear to have assisted in limiting erosion of the creek banks, as the banks are well vegetated with native grasses and bushes. Our previous report supplement also considered and projected retreat rates associated with this adjacent creek channel.

3) *Geologic conditions, including soil, sediment and rock types and characteristics in addition to structural features such as bedding, joints, and faults.*

The sandy beach slopes gently down (11 degrees) to the ocean, where exposed hard bedrock (Purisma Formation) materials are exposed. The bedrock on the beach at this location is nearly vertically bedded (dipping 75 degrees down to the northeast and trending N60W. However, the bedrock is part of a regional Moss Beach Syncline (a fold in the bedrock) with its axis running towards the subject site (See Figure 2 - Aerial Photo, and various attached site photographs). Therefore dips and strikes may vary across the axis of the syncline. Based upon the lack of geomorphic expression of the syncline on the shape of the coastline and beach at this location, it is our opinion that the ocean bluff erosional process is not shaped significantly by the orientation of the syncline, but is instead controlled by aspects of the softer upper marine terrace deposits.

Based upon our observations of the bluff and shallow bedrock deposits offshore, it appears that the contact between the underlying bedrock of the syncline and the overlying sandy terrace deposits is relatively level. The shape of the ocean bluff in this area in relatively uniform, indicating that these softer terrace deposits are controlling the rate of bluff retreat in this area. Hence undermining of the ocean bluff is likely to only take the form of wave action acting upon the base of the softer marine terrace deposits which form the base of the sandy bluff along the shoreline. This mechanism has been active since the 1950's photographs, and forms the basis for our previous retreat projections.

4) *Evidence of past of potential landslide conditions, the implications of such conditions for the proposed development, and the potential effects of the development on landslide activity.*

Based upon our review of aerial photographs of the subject area, review of published geotechnical maps, and observations of the exposed bedrock and marine terrace deposits at the subject site, we find that there is no evidence of historic landsliding at the subject site. Bluff failures appear to be solely due to toppling and slumping failures at the face of the bluff associated with undercutting of the toe of the bluff by wave action, and sloughing associated with surface saturation of weathered marine terrace deposits.

5) *Wave and tidal action, including effects of marine erosion on seacliffs.*

As discussed above, the offshore hard bedrock deposits provide a strong base upon which the softer terrace deposits rest. The offshore bedrock is a relatively level, shallow surface which will only permit large waves to impact the ocean bluff during the heaviest of weather at high tide. However, from the previous damage to the rip-rap protection experienced in the El-Nino storms of 1998, it is clear that significant wave action does upon occasion affect the base of the bluff. It is these larger storms which appear to produce more significant episodes of bluff retreat. However, when combined with the more normal years of quiescence, these variable erosion rates combine to yield the average rate used for our 50 year projections of our 2006 report supplement.

6) *Ground and surface water conditions and variations, including hydrologic changes caused by the development (e.g., introduction of sewage effluent and irrigation water to the ground water system, alterations in surface drainage).*

The native bluff materials are not exposed at the site, as this section of bluff is protected by the large rip-rap boulders. Hence the possible presence of any surface or subsurface water flows cannot be seen, but also would not have any affect on the bluff due to the rip-rap (which can be seen to be underlain by filter fabric). However, during our visits to the site, we have observed the condition of the exposed marine terrace deposits on the adjacent lots to attempt to discern if there are ground water issues which may be affecting the stability of the bluff deposits. Our observations did note that there are some localized shallow rills where uncontrolled surface waters spill over the top edge of the bluff and create a minor indentation in the face of the bluff, and slight cut into the soils at the top of the bluff. However, these sources do not appear to have any significant effect on bluff retreat. Further, we did not observe any evidence of bluff instability associated with daylighting of subsurface aquifers. Hence, even in those areas not buttressed by the rock rip-rap, there are no signs of significant bluff retreat associated with groundwater or surface water flows.

The subject site will continue to be serviced by sanitary sewer, and is already irrigated. Recommendations were presented in our original 2002 report for proper handling of surface waters at the site.

7) *Potential effects of seismic forces resulting from a maximum credible earthquake.*

We have assessed the potential effects of a seismic event producing a repeatable ground acceleration of 0.15g on the subject site, using strength parameters measured from the soil samples obtained during our boring program summarized in our 2002 report. Based upon our preliminary calculations, the slope has a factor of safety of over 1.1 for such an event, but with the lowest factor of safety surface intersecting the ground surface approximately 25 feet from the top of the bluff. An earthquake producing a pseudo-static acceleration in excess of 0.27g will drop the factor of safety below 1.0, indicating failures is probable (again with the same failure location). Based upon our analysis, we believe that the most probable affect of a large earthquake on the subject bluff would consist of toppling and landsliding failures occurring near (within 25 feet of the crest of) any unsupported portions of the ocean bluff.

Where the bluff is buttressed by the rock rip-rap, the potential for bluff failure would be substantially reduced as the face inclination of the rip-rap is a relatively flat 40 degrees. Any seismic instability on the rip-rap protected section would most likely take the form of boulders rolling off the face of the rip-rap section, and a possible net drop in the top of the rip-rap relative to the top of bluff.

8) *Effects of the proposed development including siting and design of structures, septic system, landscaping drainage and grading, and impacts of construction activity on the stability of the site and adjacent area.*

In our 2002 report, we provided recommendations to minimize any potential impacts on the ocean bluff which may be associated with the construction of the proposed addition to the existing residence. As stated above, the site is already landscaped and irrigated, the residence is serviced by city sanitary sewers, and the proposed addition is located parallel to the existing residence, thereby not encroaching closer to the bluff than the existing house. In summary, by implementing the recommendations of our 2002 report, we do not anticipate any negative impacts on the stability of the bluff from the proposed addition construction.

9) *Any other factors which may affect slope stability.*

We are unaware of any other potential impacts on the stability of the ocean bluff, other than those described above.

10) *Potential erodibility of site and mitigating measures to be used to ensure minimized erosion problems during and after construction (i.e. landscaping and drainage design).*

As discussed above, recommendations for proper drainage have been provided in our original report. We also noted that minimal surface water induced erosion was noted on the unprotected portions of the adjacent bluffs, without the rip-rap protection offered at the subject site. Potential erosion on the subject site is further mitigated by the presence of the engineered rock rip-rap fascia at the subject site. Finally, normal County procedures require an erosion control plan be submitted as part of all construction documents for a project of this nature. That plan should essentially eliminate any potential erosion on the subject site associated with construction activities. After construction, revegetation is anticipated as the current landscaping is restored.

In summary, the geologic and geotechnical aspects of the site and surrounding areas fail to indicate any significant localized anomalies which would affect the rates projected in our previous 2006 report supplement. The ocean bluff retreat rates and projections identified in our previous study remain valid, and may continue to be used for design and support of the proposed residential addition.

Respectfully Submitted;
GeoForensics, Inc.

Daniel F. Dyckman, PE, GE
Senior Geotechnical Engineer, GE 2145

cc: 4 to addressee
1 to John Davis (Fax: 415-551-7601 - text only)

August 29, 2008

PLN2005-00504
Project is located at 324 The Strand, Moss Beach

Due to problems associated with the photocopying of a photocopy the referenced photos in this staff Report packet are not entirely legible. The photos in the original report are available at the Planning and Building Department office and will be available at the September 9, 2008 Board of Supervisor's hearing if the Board or any other member of the public wishes to review them.

GEOFORENSICS INC. Consulting Soil Engineering
561 Pilgrim Dr., Suite D, Foster City, California 94404 Phone: (650) 349-3369 Fax: (650) 571-1878

File: 206180
October 9, 2006

Ms. Karen Trilevsky
P.O. Box 31
Moss Beach, CA 94038

Subject: **Proposed Additions**
324 The Strand
Moss Beach, California
REPORT SUPPLEMENT

Dear Ms. Trilevsky:

This letter has been prepared to update and supplement the information in our original report prepared for the construction of an addition onto the subject residence originally proposed by the previous owners (Mr. and Mrs. Druker). Our original report was issued on June 6, 2002.

Since our report was prepared, it has been submitted to the County as part of your application for the addition. The County Geologist has requested additional information be provided, including a cliff bluff retreat study and updating of the geologic maps. This letter summarizes the results of our cliff bank retreat study, and provides updated geologic mapping.

<u>Cliff Bank Retreat Study</u>

In order to determine the rate of cliff bank retreat along the ocean bluff on the western side of the property, we have obtained aerial photographs of the subject site between 1955 and 2005. Specifically, we used the following photographs:

Date	Photo Number
5/6/55	AV 170-1-21
9/7/95	AV4916-201-8
10/31/05	KAC 9200-71-2

These photographs were chosen as there was substantial bluff improvements made to stabilize the bluff in 1994/5. This permitted the rate of unprotected bluff retreat occurring over 40 years to be calculated, along with an additional 10 years of retreat after protection.

The photograph provider has enlarged the photographs to a scale of 1"= 40' based upon USGS mapping. Unfortunately, as the photographs cover a wide area, the subject site is often located towards the periphery of the photograph, which will tend to distort dimensions. In conducting our study, we have prepared a clear overlay of the 2005 photograph, then adjusted the other photographs such that the dimensions between fixed points in the photographs is consistent. These adjusted photos were then overlain using the same clear film overlay to plot the position of the cliff bluff in 1955 and 1995.

Unprotected Bluff Retreat Rates - the overlays suggest that between the 1955 and 1995 photographs, the rate of cliff bluff retreat in the area of the subject residence was on the order of 0.6 to 0.9 feet per year. To the north of the residence, the ocean bluff retreat rates were slightly less ranging from about 0.4 to 0.6 feet per year, and the creek bank retreat rates were even smaller at 0.2 to 0.4 feet per year.

Protected Bluff Retreat Rates - In 1995, the ocean bluff was protected from erosion using large rock boulders placed in front of the subject residence and adjacent residence to the south. These large rip-rap boulders were also used to help stabilize the ground at the mouth of the adjacent creek to the north of the site. However, the rip-rap boulders did not extend to protect the small section of ocean bluff between the subject residence and creek mouth. In the protected areas, the rate of bluff retreat has been immeasurable. In the non-protected area of the adjacent site, the rate has been as great as 0.6 feet per year, consistent with the maximum rate measured in the preceding 40 years.
Projected Ocean Bluff Retreat - using the measured rates of recent bluff retreat, we have projected the anticipated 50 year bluff location. The depicted bluff assumes that:

1 - the rock rip-rap in front of the residence will be maintained;

2 - the rate of retreat on the northern parcel will continue at the same maximum rate of 0.6 feet per year;

3 - the rate of retreat along the creek bluff will continue at the original 1955-1995 rate of (0.2 to 0.4 feet per year.

A second bluff retreat line has also been projected to show a worst case scenario in which the rip rap bluff is not maintained, and the 1955-1995 bluff erosion rates are used to project the future bluff location. We note that even if the rip rap were to be permitted to fail completely, the location of the unprotected bluff in 2055 would not encroach into the existing house (or proposed addition) footprint.

Updated Geologic Mapping

According to Pampeyan (1981 and 1994), late Pleistocene marine terrace deposits underlie the subject property (see Figure 1, Regional Geologic Map and Figure 2, Local Geologic Map). The terrace deposits are likely about 122,000 years old and are composed of generally fine-grained, moderately consolidated, shallow marine sands. Middle Pliocene (about 3 million years old) Purisima Formation underlies the marine terrace deposits at depth.

The State of California (1982) maps the Seal Cove fault about 500 feet to the southwest of the property (see Figure 3, Earthquake Fault Zone Map). The property is near the edge of the State Fault Zone. Pampeyan (1981 and 1994) also maps the Seal Cove fault approximately 500 feet to the southwest of the property. The Seal Cove fault is part of the San Gregorio-Hozgri fault zone, which exists primarily offshore but comes onshore for a short distance at the north end of Half Moon Bay.

Since the Seal Cove-San Gregorio fault zone is located offshore for much of its length, there is limited data about its history of activity.

Limitations

The opinions and conclusions presented in this letter have been based upon our review of aerial photographs, and our consultations with a certified engineering geologist regarding geologic mapping of the area. The information contained in this letter is intended to supplement that of our original report. All recommendations, opinions, and conclusions expressed in our original report remain valid and should be used for design of the proposed additions. Similarly, all limitations of our original work remain valid as well.

We note that historic rates of erosion have been used to predict the future. While this is the best tool we have for making such projections, nature has an imprecise and constantly varying impact. Therefore, the anticipated location of the bluff may eventually be located further inland, or not encroach as far inland as projected, by natural conditions beyond our ability to project. We therefore encourage the owner to maintain the rock rip-rap protection for the property to minimize to the greatest degree the erosive nature of the ocean in this area.

Respectfully Submitted;
GeoForensics, Inc.

Daniel F. Dyckman, PE, GE
Senior Geotechnical Engineer, GE 2145

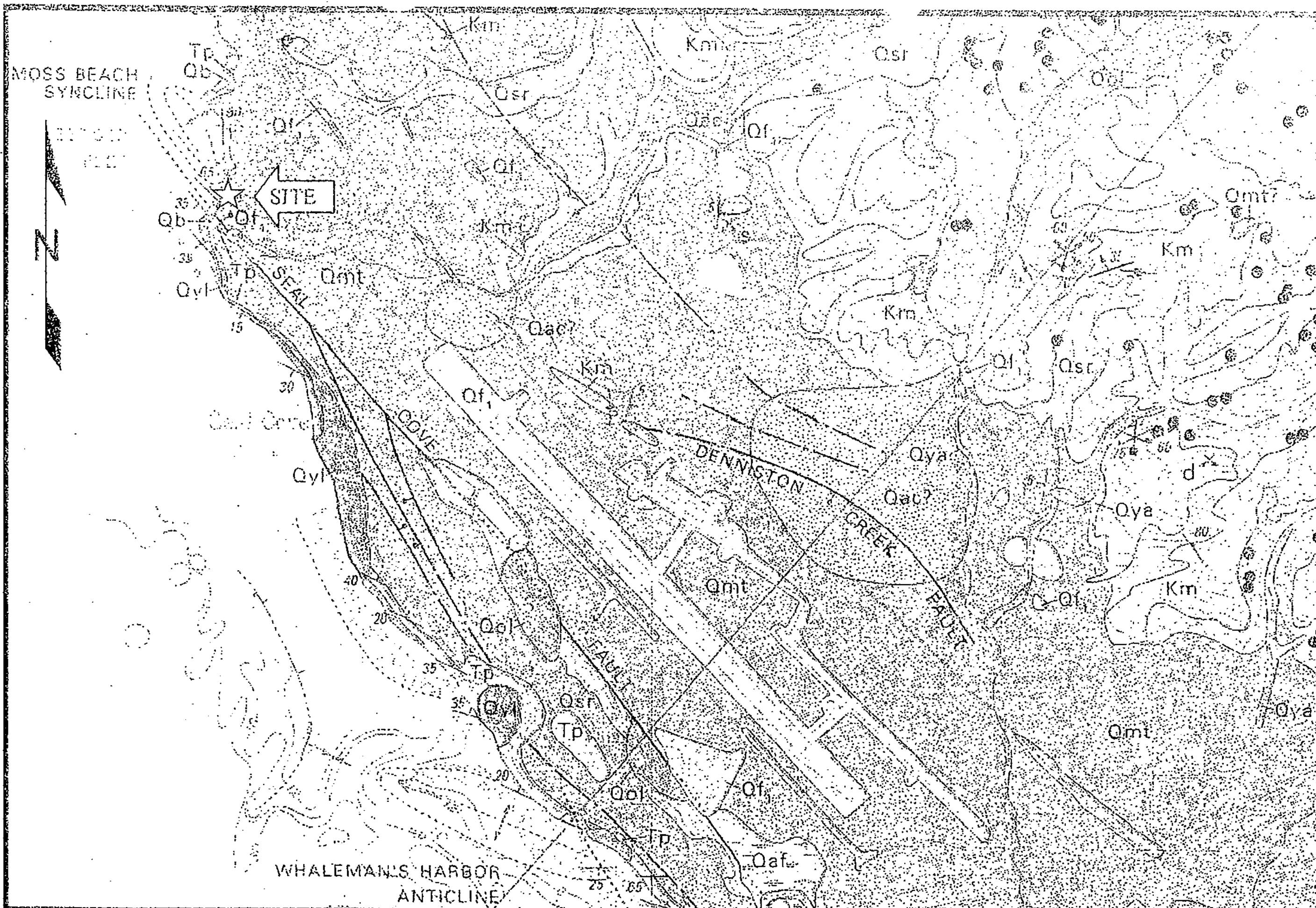
cc: 4 to addressee

Geologic References

California Division of Mines and Geology, 1982, State of California Special Studies Zones, Montara Mountain Quadrangle, Map Scale 1:24,000.

Pampeyan, Earl H., 1981, Geologic Map of the Montara Mountain Quadrangle, San Mateo County, California, U.S. Geological Survey Map Open File Report 81-451, Map Scale 1:12,000.

Pampeyan, Earl H., 1994, Geologic Map of the Montara Mountain and San Mateo 7-1/2' Quadrangles, San Mateo County, California, U.S. Geological Survey Map I-2390.



EXPLANATION

	Geologic Contact, dashed where approximate, dotted where concealed
	Fault Trace, dashed where approximate, dotted where concealed, queried where uncertain
	Thrust or Reverse Fault
35	Strike and Dip of Bedding
35	Strike and Dip of Foliation

Qaf	Fine-grained alluvium (Holocene)
Qac	Coarse-grained alluvium (Holocene)
Qsr	Slope wash and colluvium (Holocene)
Qb	Beach deposits (Holocene)
Qyl	Younger landslide deposits (Holocene)
Qol	Older landslide deposits Holocene and Pleistocene?)
Qmt	Marine terrace deposits (upper Pleistocene)
Tp	Purissima Formation (Pliocene)
Km	Granitic rock of Montara Mountain (Cretaceous)

Source: Pampeyan, 1994

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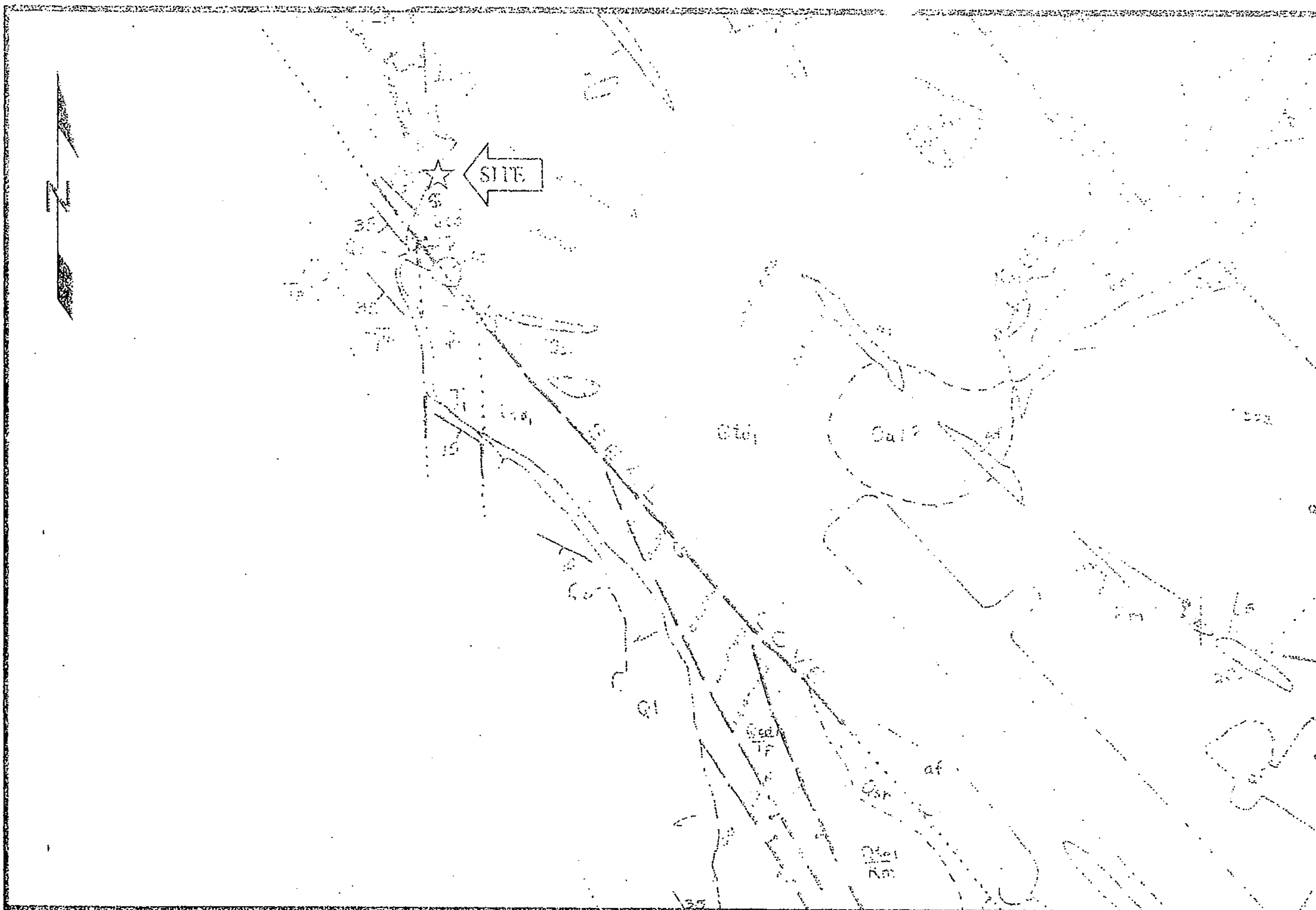
561 Pilgrim Dr., Suite D, Foster City, CA 94404
Tel: (650) 349-3369 Fax: (650) 571-1878

Figure 1. Regional Geologic Map



EXPLANATION

30	Contact, dashed where approximate
40 — Inclined, Vertical	Fault, dashed where inferred, dotted where concealed
Overturned	Strike and dip of bedding
anticline, syncline	Axis of fold

af	Artificial Fill
Ql	Landslide
Qal	Alluvium
Qsr	Colluvium
Qb	Beach Deposits
Qtd1	Marine Terrace Deposits
Tp	Purisima Formation

Source: Pampeyan, 1981

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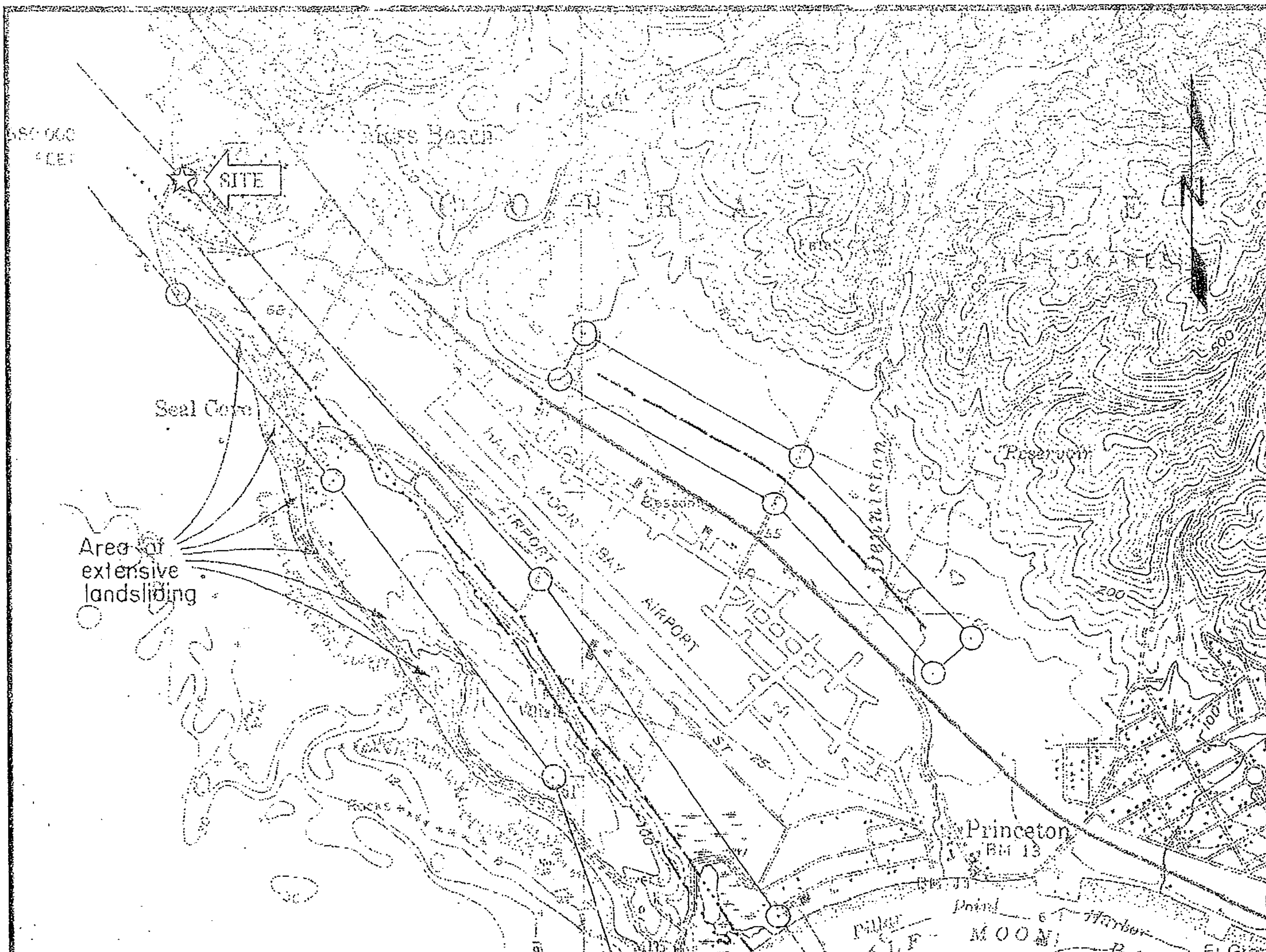
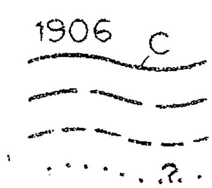
Tel: (650) 349-3369 Fax: (650) 571-1878

Figure 2. Local Geologic Map



EXPLANATION



Faults considered to have been active during Holocene time and to have a relatively high potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query indicates additional uncertainty. Evidence of historical offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Earthquake Fault Zone Boundaries

Base: California Division of Mines and Geology, 1982

038

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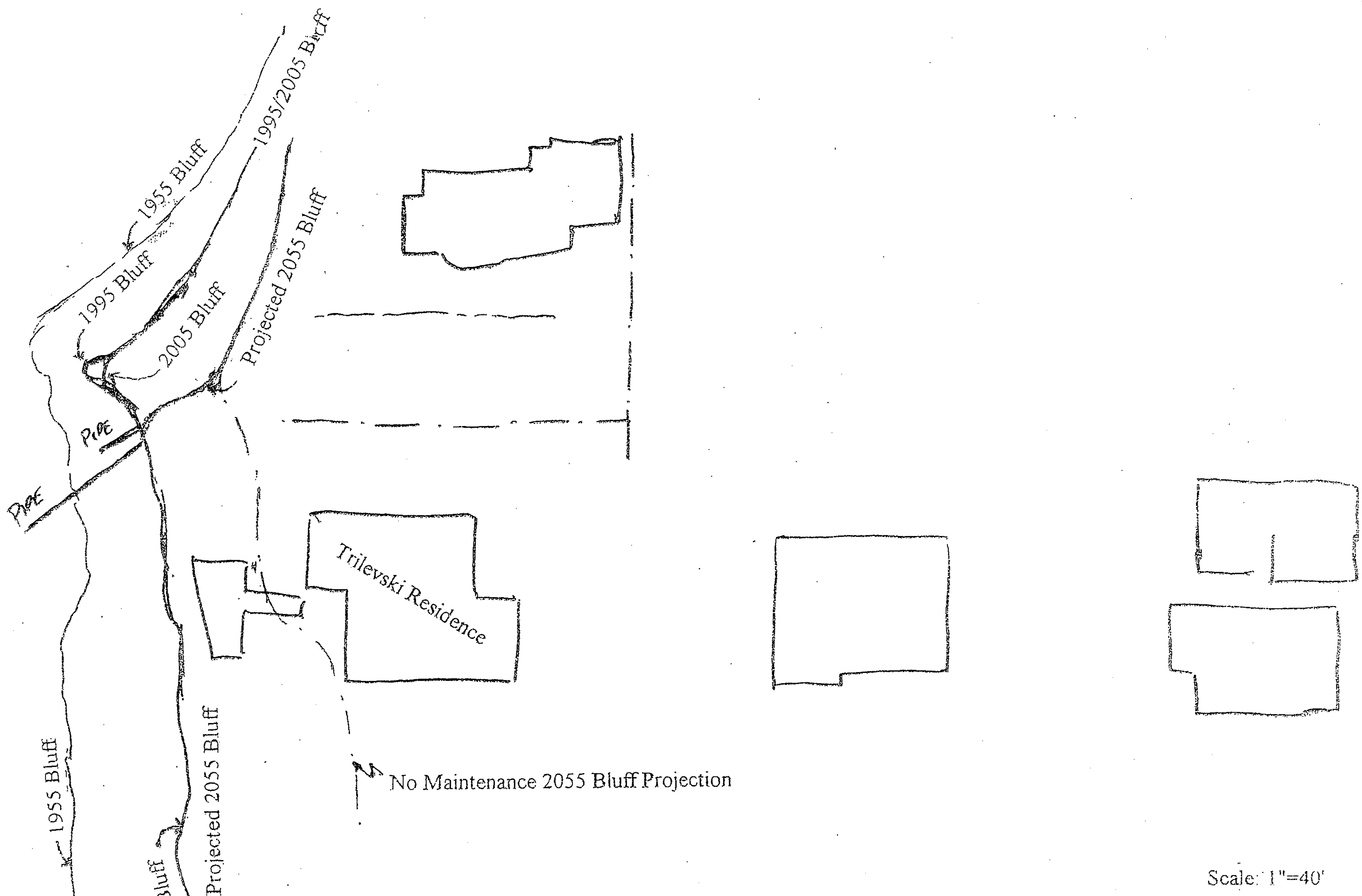
561 Pilgrim Dr., Suite D, Foster City, CA 94404

Tel: (650) 349-3369 Fax: (650) 571-1878

Figure 3. Earthquake Fault Zone Map



GeoForensics Inc.
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PHOTO OVERLAY


1955 Photo


1995 Photo


2005 Photo

GEOFORENSICS INC. Consulting Soil Engineering
561 Pilgrim Dr., Suite D. Foster City, California 94404 Phone: (650) 349-3369 Fax: (650) 571-1878

File: 202073
June 6, 2002

Mr. and Ms. Druker
819 Hillside Drive East
Seattle, WA 98112

Subject: **Druker Property**
324 The Strand
Moss Beach, California
GEOTECHNICAL INVESTIGATION
FOR PROPOSED RESIDENTIAL ADDITIONS

Dear Mr. and Ms. Druker:

In accordance with your authorization, we have performed a subsurface investigation into the geotechnical conditions present at the location of the proposed improvements. This report summarizes the conditions we measured and observed, and presents our opinions and recommendations for the design and construction of the proposed additions.

Site Description

The subject site is a relatively flat-lying, rectangularly-shaped parcel located on the east side of Beach Street (at the approximate location shown on Figure 1). For purposes of description in this report, it is assumed that the property faces east. The property is bounded by other developed single family residential lots to the north and east, a steep ocean cliff to the west, and Beach Street to the south.

The site is currently occupied by a single-story, wood-framed residence situated near the center of the lot. There is a detached garage northeast of the house. The garage has a concrete slab-on-grade floor. A concrete driveway leads from Beach Street to the garage along the eastern edge of the property.

The ground surface in the site vicinity has an overall gentle slope down towards the west (as shown on Figure 2). At the site, the grounds also gently slope down to the west. Surface gradients range from 15:1 to 10:1 (horizontal:vertical, H:V). At the western end of the property is an ocean bluff. The bluff has been supported by a rock rip-rap slope along the subject property and adjacent property to the south. However, the natural unprotected slope extends to the north of the property line of the subject residence about 30 feet, then turns to form a steep slope down to the mouth of a creek where it empties into the ocean. The creek mouth has been stabilized with boulders along top of the beach, so a stable, level terrace has developed above the boulders.

During the original development of the property, it appears that little or no grading work was required to create the existing level building pad.

The grounds around the residence have been landscaped with lawn, small to medium sized bushes, and small to medium sized trees.

In about 1994, we understand that the ocean bluff received some stabilization work in the form of rock rip-rap installation to protect the ocean bluff from undercutting from wave action at its base. This work was partially damaged in the heavy storms of the el-nino winter of 1998. Further remedial work was then undertaken under the geotechnical guidance of BAGG. This work included the placement of additional boulders on the face of the original rip-rap, and the placement of an additional buttress of rock at the back of the original rip-rap. Final geotechnical approval to the as-built condition of the work was provided in a letter by BAGG dated April 15, 1998 (Section II Sign-off).

Proposed Construction

We understand that the current development for the site proposes the construction of a new residence addition and associated improvements. No basement is planned in the scope of work. The house is to be of conventional, wood-framed construction. New foundation loads are expected to be typical for this type of structure (i.e. light).

Excavation work at the site is expected to be limited to crawlspace and foundation excavations. No significant fill placement is anticipated as part of this work. No significant retaining walls are anticipated for this scope of work.

INVESTIGATION

Scope and Purpose

The purpose of our investigation was to determine the nature of the subsurface soil conditions so that we could provide geotechnical recommendations for the construction of the proposed new addition and associated improvements. In order to achieve this purpose, we have performed the following scope of work:

1 - visited the property to observe the geotechnical setting of the area to be developed;

2 - reviewed relevant published geotechnical maps;

3 - drilled two borings near the location of the proposed improvements;

4 - performed laboratory testing on the collected soil samples;

5 - assessed the collected information and prepared this report.

The findings of these work items are discussed in the following sections of this report.

<u>Site Observations</u>

We visited the site on April 23, 2002 to observe the geotechnically relevant site conditions. During our visit, we noted the following conditions:

A - The existing house appears to be supported by a perimeter concrete footing. The foundation system appeared to be in good condition where visible. No cracks were observed in the perimeter footing.

B - The interior house walls appeared to be covered with sheetrock. The walls were generally in good condition. No cracks were observed in the interior walls.

C - The exterior house walls were generally in good condition. No significant cracks were observed in the exterior walls.

D - We consider the drainage around the house to be fair. The ground surface near the house, and over much of the lot, is flat without sufficient slope away from the house to adequately carry water away from the house. There was a low area observed in the northwest corner of the house. "Trapped" planters also exist near the house foundations. Additionally, the roof downspouts discharge collected water onto the ground surface near the house foundations.

E - The rock rip-rap slope to the west of the residence appears to be in fair condition. The upper rock materials were partially covered with cement. While there are some cracks in the cement areas which join adjacent rocks, the cracks do not indicate substantial movements have occurred.

F - The lower portion of the slope has been subject to abuse by ocean waves. Some of the older rock elements are of low durability (particularly the sandstones) and appear to be suffering some deterioration from the wave attacks. It is likely that some additional repairs to the rock rip-rap facia will be necessary in the future.

G - A minor surface slough of the unsupported ocean bluff to the north of the subject site has occurred in the past. This is typical of the mechanism of ocean bluff retreat. This area is still located at least 50 feet from the residence but is contiguous with the area which has been supported by the rock rip rap. Some lateral extension of the rip rap would help to complete the stabilization of the ocean bluff in this area.

H - A 12 inch diameter metal culvert extends out of the slope in the area of previous slope failure, and discharges onto the rock rip-rap slope on the subject property. This will help to limit erosion of the slope face from water exiting the pipeline.

Geologic Map Review

We reviewed the *Geotechnical Hazards Synthesis Map for San Mateo County*, by Leighton and Associates (1976). The County map indicates that the site is underlain by Marine Terrace Deposits (map symbol "4"). A trace of the Seal Cove Fault is located within about 200 feet to the southwest of the site.

We have also reviewed the *Geologic Map of the Montara Mountain and San Mateo 7½' Quadrangles, San Mateo County, California (USGS Map I-2390)*, by Earl H. Pampeyan (1994). The relevant portion of the Pampeyan map has been reproduced in Figure 3. The Pampeyan map also indicates that the site is underlain by the Marine Terrace Deposits (map symbol "Qmt"). The Seal Cove Fault is depicted as exiting from the ocean bluff area near the end of Lake Street, about 200 feet southwest of the subject site.

Pampeyan describes the Marine Terrace Deposit materials as consisting of "poorly to moderately consolidated deposits of marine, eolian, and alluvial sand, silt, gravel, and clay in various proportions and combinations, in indistinct to distinct lenses and beds. Locally includes thin lenses of lignite and asphaltic sand. Lower part of a single terrace unit commonly is marine, fine-grained, moderately well consolidated, and forms near-vertical cliffs along the exposed coast. Unit locally may include some stream terrace deposits, alluvium, beach deposits, and younger eolian sands."

Our subsurface exploration (see below) encountered clay and sand materials judged to be consistent with the mapping.

The active San Andreas fault is mapped approximately 7 mile east of the site, and the Seal Cove fault is mapped approximately 230 feet to the west.

Subsurface Exploration

On April 2, 2002 we drilled 2 borings at the site at the locations shown on Figure 4. The borings were drilled using a Minute Man portable drilling rig 3.25 inch diameter, helical flight augers. Logs of the soils encountered during drilling record our observations of the cuttings traveling up the augers and of relatively undisturbed samples collected from the base of the advancing holes. The final boring logs are based upon the field logs with occasional modifications made upon further laboratory examinations of the recovered samples and laboratory test results. The final logs are attached in Appendix A.

The relatively undisturbed samples were obtained by driving a 3.0 inch (outer diameter) Modified California Sampler into the base of the advancing hole by repeated blows from a 70 pound hammer lifted 30 inches. On the logs, the number of blows required to drive the sampler the final 12 inches of the 18 inch drive, have been recorded as the Blow Counts. These blows have not been adjusted to reflect equivalent blows of any other type of sampler or hammer, or to account for the different samplers used.

Subsurface Conditions

The borings encountered similar subsurface soil and rock conditions. The borings first penetrated 1.5 to 3 feet of a dark brown clayey sand material (topsoil). The topsoil was underlain by orange and brown clayey sand/sandy clay in a stiff condition, which we interpret to be colluvial soil. Below this soil was sand, with varying amounts of clay and decomposed granite, in a medium dense state. This deeper soil material was judged to be Marine Terrace Deposits. Please refer to Appendix A for a more detailed description of each boring.

No free groundwater was encountered during the drilling of the holes. However, during periods of heavy rain or late in the winter, groundwater seepage may exist within the zone penetrated by the borings.

Laboratory Testing

The relatively undisturbed samples collected during the drilling process were returned to the laboratory for testing of engineering properties. In the lab, selected soil samples were tested for moisture content, density, plasticity, and strength. The results of the laboratory tests are attached to this report in Appendix B.

Plasticity Index (PI) testing done on the near surface soils produced a PI of 10, indicating that the near surface materials are generally non-expansive.

Strength testing was conducted on a sample of the colluvial soil (Sample 2-1 @ 4 feet). The testing showed that this material has high strength parameters (cohesion = 1090 psf, friction angle = 42 degrees). The other deeper soils at the site were judged to also have high strengths based upon the blow counts obtained during the sampling process.

CONCLUSIONS AND RECOMMENDATIONS

General

Based upon our investigation, we believe that the proposed improvements can be safely constructed. Geotechnical development of the site is aided by the relatively shallow depth to competent, non-granular soils. The recommendations in this report should be incorporated into the design and construction of the proposed residence addition and associated improvements.

Ocean Bluff Retreat

The subject site is located along the crest of the ocean bluffs which form much of the coastline in this vicinity. These bluffs are subject to sliding and erosion over long periods of time, which result in a gradual "retreat" of the location of the bluff towards the east. Along many areas of the coast, ocean bluff retreat rates as high as 1 foot per year have been reported. Over time, entire properties can be reclaimed by the ocean.

Fortunately, as the subject site, substantial stabilization work has been conducted in the past under the observation and analyses of competent geotechnical engineering companies. This work has helped to reduce the effects of the ocean waves on the bluffs, and to severely decrease the rate of ocean bluff retreat. Provided this protection is properly maintained (periodically repaired/augmented with additional rip rap) we would anticipate that ocean bluff retreat will not threaten the existing residence or proposed addition site within the projected life-span of the structure (50 years).

Seismicity

The greater San Francisco Bay Area is recognized by Geologists and Seismologists as one of the most active seismic regions in the United States. Three major fault zones pass through the Bay Area in a northwest direction which have produced approximately 12 earthquakes per century strong enough to cause structural damage. The faults causing such earthquakes are part of the San Andreas Fault System, a major rift in the earth's crust that extends for at least 700 miles along western California. The San Andreas Fault System includes the San Andreas, Hayward, Calaveras Fault Zones, and other faults.

During 1990, the U.S. Geological Survey cited a 67 percent probability that a Richter magnitude 7 earthquake, similar to the 1989 Loma Prieta Earthquake, would occur on one of the active faults in the San Francisco Bay Region in the following 30 years. Recently, this probability was increased to 70 percent, as a result of studies in the vicinity of the Hayward Fault. A 23 percent probability is still attributed specifically to the potential for a magnitude 7 earthquake to occur along the San Andreas fault by the year 2020.

Ground Rupture - The lack of mapped active fault traces through the site, suggests that the potential for primary rupture due to fault offset on the property is low, despite the relatively close proximity to the Seal Cove Fault.

Ground Shaking - The subject site is likely to be subject to very strong to violent ground shaking during its life span due to a major earthquake in one of the above-listed fault zones. Current building code design should be followed by the structural engineer to minimize damages due to seismic shaking. The site should be considered to have a UBC Soil Type SD. Improvements should be designed to resist shaking from a Seismic Source Type A, located about 11 km from the site, or from a Seismic Source Type B, located less than 1 km from the site (whichever is more conservative). Alternatively, site-specific accelerations may be utilized by the structural engineer for the design of the proposed improvements. The following accelerations were obtained by utilizing the EQFAULT computer program by T.F. Blake. The program provides a deterministic prediction of horizontal ground accelerations from more than 100 digitized faults. Then utilizing an attenuation relationship by Idriss (1994), a maximum-credible site acceleration of 0.52 g, and a maximum-probable site acceleration of 0.49 g, were predicted for the property. These site accelerations were determined assuming a maximum-credible event of magnitude 8.0, and a maximum-probable event of magnitude 7.3, on the San Andreas fault. We note that the repeatable accelerations typically used for seismic design are generally considered to be on the order of 67% of the aforementioned peak values.

Landsliding - The subject site and the surrounding area are gently to steeply sloping. Fortunately, the site is underlain by competent native material at relatively shallow depths. Therefore, the hazard due to large-scale seismically-induced landsliding is, in our opinion, relatively low for the site. Similarly, the steep ocean bluffs on the subject property as supported by a rock rip-rap facia, which should help to limit the potential for even shallow sloughing of the ocean bluff in this area.

Liquefaction - Liquefaction most commonly occurs during earthquake shaking in loose fine sands and silty sands associated with a high ground water table. Based upon the subsurface investigation, the proposed building site is underlain by resistant materials at shallow depths. Additionally, shallow ground water was not encountered under the proposed building site. Therefore, it is our opinion that liquefaction is unlikely to affect the subject property.

Ground Subsidence - Ground subsidence may occur when poorly consolidated soils densify as a result of earthquake shaking. Since the proposed building site is underlain at shallow depths by resistant materials, the hazard due to ground subsidence is, in our opinion, considered to be low.

Lateral Spreading - Lateral spreading may occur when a weak layer of material, such as a sensitive silt or clay, loses its shear strength as a result of earthquake shaking. Overlying blocks of competent material may be translated laterally towards a free face. Such conditions were not encountered on the proposed building site, therefore, the hazard due to lateral spreading is, in our opinion, considered very low.

Site Preparation and Grading

All debris resulting from the demolition of existing improvements should be removed from the site and may not be used as fill. Any existing underground utility lines to be abandoned, should be removed from within the proposed building envelope and their ends capped outside of the building envelope.

Any vegetation and organically contaminated soils should be cleared from the building area. All holes resulting from removal of tree stumps and roots, or other buried objects, should be overexcavated into firm materials and then backfilled and compacted with native materials.

The placement of fills at the site is expected to include: utility trench backfill, slab subgrade materials, and finished drainage and landscaping grading. These and all other fills should be placed in conformance with the following guidelines:

Fills may use organic-free soils available at the site or import materials. Import soils should be free of construction debris or other deleterious materials and be non-expansive. *A minimum of 3 days prior to the placement of any fill, our office should be supplied with a 30 pound sample (approximately a full 5 gallon bucket) of any soil or baserock to be used as fill (including native and import materials) for testing and approval.*

All areas to receive fills should be stripped of organics and loose or soft near-surface soils. Fills should be placed on level benches in lifts no greater than 6 inches thick (loose) and be compacted to at least 90 percent of their Maximum Dry Density (MDD), as determined by ASTM D-1557. In pavement (concrete or asphalt) areas to receive vehicular traffic, all baserock materials should be compacted to at least 95 percent of their MDD. Also, the upper 6 inches of soil subgrade beneath any pavements should be compacted to at least 95 percent of its MDD.

Temporary, dry-weather, vertical excavations should remain stable for short periods of time to heights of 5 feet. All excavations should be shored in accordance with OSHA standards.

Permanent cut and/or fill slopes should be no steeper than 2:1 (H:V). However, even at this gradient, minor sloughing of slopes may still occur in the future. Positive drainage improvements (e.g. drainage swales, catch basins, etc.) should be provided to prevent water from flowing over the tops of cut and/or fill slopes, as well as the ocean bluffs.

Foundations

Due to the relatively non-expansive nature and high strength of the site soils, the foundations for the proposed building may consist of conventional spread footings.

All footings should be a minimum of 12 inches wide. Strip footings should be embedded a minimum of 18 inches below exterior grade and 12 inches below interior grade, *whichever is deeper*. Stepped footings need only be embedded 12 inches below exterior grade at the toe. Isolated footings (e.g. interior pads or exterior post supports) should be embedded at least 18 inches below lowest adjacent grade.

All footings should bear on stiff soils, as verified by our office in the field. Localized deepening of footings may be required if variable conditions are encountered during construction.

The footings should be founded below an imaginary line projecting at a 1:1 slope from the base any adjacent, parallel utility trenches.

The footings should be designed to exert pressures on the ground which do not exceed 2000 psf for Dead plus Live Loads. The weight of the embedded portion of the footings may be neglected when determining bearing pressures. Lateral pressures may be resisted by friction between the base of the footings and the ground surface. A friction coefficient of 0.40 may be assumed. These values may be increased ⅓ for transient loads (i.e. seismic and wind).

Footings should be nominally reinforced with four #4 bars (two at top and two at bottom). The designer should determine actual width, embedment and reinforcement for the footings.

If the above recommendations are followed, total foundation settlements should be less than 1 inch, while differential settlements should be less than ¾ inches.

Retaining Walls

No new retaining walls are planned as part of the project. If the scope of work should change to include retaining walls, our office should be contacted for additional recommendations.

Slabs-on-Grade

If all surficial soils have been removed from the building pad to expose competent native material, then the addition floors may consist of conventional slabs-on-grade. Otherwise slabs should not be used for the addition floors. Patios floors may also consist of conventional concrete slabs-on-grade. Though, it should be expected that some seasonal shifting of such slabs will occur if soils remain beneath the slabs.

To help reduce cracking, we recommend slabs be a minimum of 4 inches thick and be nominally reinforced with #4 bars at 18 inches on center, each way. Slabs which are thinner or more lightly reinforced may experience undesirable cosmetic cracking. However, actual reinforcement and thickness should be determined by the structural engineer based upon anticipated usage and loading.

In large slabs (e.g. patios, etc.), score joints should be placed at a maximum of 10 feet on center. In sidewalks, score joints should be placed at a maximum of 5 feet on center. All slabs should be separated from adjacent improvements (e.g. footings, columns, etc.) with expansion joints.

Interior slabs, and slabs through which moisture transmission is undesirable, should be underlain by 2 inches of sand over 4 inches of ¾ inch drain rock. The sand and drain rock should be separated by a vapor barrier (e.g. visqueen).

Exterior landscaping flatwork (e.g. patios and sidewalks) may be placed directly on proof-rolled soil subgrade materials (e.g. no granular subgrade), however, they will be potentially subject to shifting and moisture transmission.

Drainage

Due to the flat nature of the site, it will be important to provide good drainage improvements at the property.

Surface Drainage - Adjacent to any buildings, the ground surface should slope at least 4 percent away from the foundations within 5 feet of the perimeter. Impervious surfaces should have a minimum gradient of 2 percent away from the foundation.

Surface water should be directed away from all buildings into drainage swales, or into a surface drainage system (i.e. catch basins and a solid drain line). "Trapped" planting areas should not be created next to any buildings without providing means for drainage.

All roof eaves should be lined with gutters. The downspouts should be connected to solid drain lines, or should discharge onto paved surfaces which drain away from the structure. The downspouts may be connected to the same drain line as any catch basins, but should not connect to any perforated pipe drainage system. Where existing corrugated drain lines exist, we would recommend that they be replaced with new hard-walled rigid pipes.

Footing Drain - Due to the potential for changes to surface drainage provisions, it would be wise (though not required) to install a perimeter footing drain to intercept water attempting to enter the crawlspace. If a footing drain is not installed, some infiltration of moisture into the crawlspace may occur. Such penetration should not be detrimental to the performance of the structure, but can possibly cause humidity and mildew problems within the house.

The footing drain system, if installed, should consist of a 12 inch wide gravel-filled trench, *dug a minimum of 12 inches below the elevation of the adjacent crawlspace.* The trench should be lined with a layer of filter fabric (Mirafi 140N or equivalent) to prevent migration of silts and clays into the gravel, but still permit the flow of water. Then 1 to 2 inches of drain rock (clean crushed rock or pea gravel) should be placed in the base of the lined trench. Next a perforated pipe (minimum 3 inch diameter) should be placed on top of the thin rock layer. The perforations in the pipe should be face down. The trench should then be backfilled with more rock to within 6 inches of finished grade. The filter fabric should be wrapped over the top of the rock. Above the filter fabric 6 inches of native soils should be used to cap the drain. If concrete slabs are to directly overlay the drain, then the gravel should continue to the base of the slab, without the 6 inch soil cap. This drain should not be connected to any surface drainage system.

Drainage Discharge - The surface drain lines should discharge at least 15 feet away from the house, preferably at the street. The outfall lines may also be extended to drain onto the rock rip-rap below the site, although we would recommend that the discharge location be located as far down the sloep sp as practical. The discharge location(s) should be protected by energy dissipaters to reduce the potential for erosion (if not on the rock rip rap). Care should be taken not direct concentrated flows of water towards neighboring properties. This may require the use of multiple discharge points.

The footing drain (if installed) should discharge independently from the surface drainage system. The surface and subsurface drain systems should not be connected to one another.

Drainage Materials - Drain lines should consist of hard-walled pipes (e.g. Schedule 40 PVC or SDR 35). In areas where vehicle loading is not a possibility, SDR 38 or HDPE pipes may be used. Corrugated, flexible pipes may not be used in any drain system installed at the property.

Surface drain lines (e.g. downspouts, area drains, etc.) should be laid with a minimum 2 percent gradient (¼ inch of fall per foot of pipe). Any subsurface drain systems (e.g. footing drains) should be laid with a minimum 1 percent gradient (⅛ inch of fall per foot of pipe).

Utility Lines

All utility trenches should be backfilled with compacted native clay-rich materials within 5 feet of any buildings. This will help to prevent migration of surface water into trenches and then underneath the structures' perimeter. The rest of the trenches may be compacted with other native soils or clean imported fill. Only mechanical means of compaction of trench backfill will be allowed. Jetting of sands is not acceptable. Trench backfill should be compacted to at least 90 percent of its MDD. However, under pavements, concrete flatwork, and footings the upper 12 inches of trench backfill must be compacted to at least 95 percent of its MDD.

Plan Review and Construction Observations

The use of the recommendations contained within this report are contingent upon our being contracted to review the plans, and to observe geotechnically relevant aspects of the construction.

We should be provided with a full set of plans to review at the same time the plans are submitted to the building/planning department for review. A minimum of one working week should be provided for review of the plans.

At a minimum, our observations should include: footing excavations; slab subgrade preparation; installation of any drainage system (e.g. footing and surface), and final grading. A minimum of 48 hours notice should be provided for all construction observations.

LIMITATIONS

This report has been prepared for the exclusive use of the addressee, and their architects and engineers for aiding in the design and construction of the proposed development. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials, and contractors to ensure correct implementation of the recommendations.

The opinions, comments and conclusions presented in this report were based upon information derived from our field investigation and laboratory testing. Conditions between, or beyond, our borings may vary from those encountered. Such variations may result in changes to our recommendations and possibly variations in project costs. Should any additional information become available, or should there be changes in the proposed scope of work as outlined above, then we should be supplied with that information so as to make any necessary changes to our opinions and recommendations. Such changes may require additional investigation or analyses, and hence additional costs may be incurred.

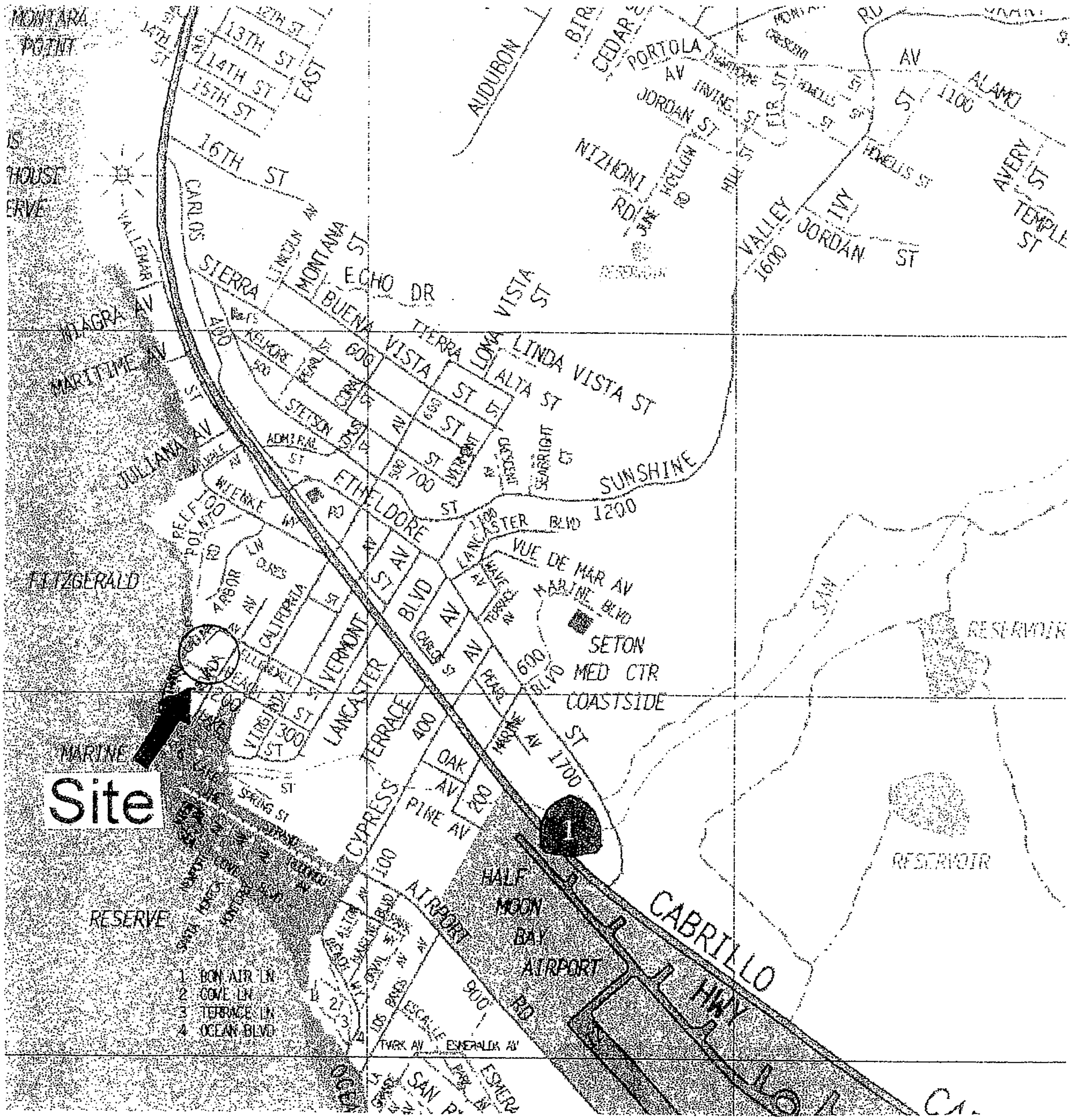
Our work has been conducted in general conformance with the standard of care in the field of geotechnical engineering currently in practice in the San Francisco Bay Area for projects of this nature and magnitude. We make no other warranty either expressed or implied. By utilizing the design recommendations within this report, the addressee acknowledges and accepts the risks and limitations of development at the site, as outlined within the report.

Respectfully Submitted;
GeoForensics, Inc.

Daniel F. Dyckman, PE, GE
Senior Geotechnical Engineer, GE 2145

Bernard A. Atendido
Field Engineer

cc: 1 to addressee
4 to Chris Ridgeway
785 Main Street, Suite G
Half Moon Bay, CA 94019



Source: "Thomas Bros. Maps" CD-ROM (1996).

055

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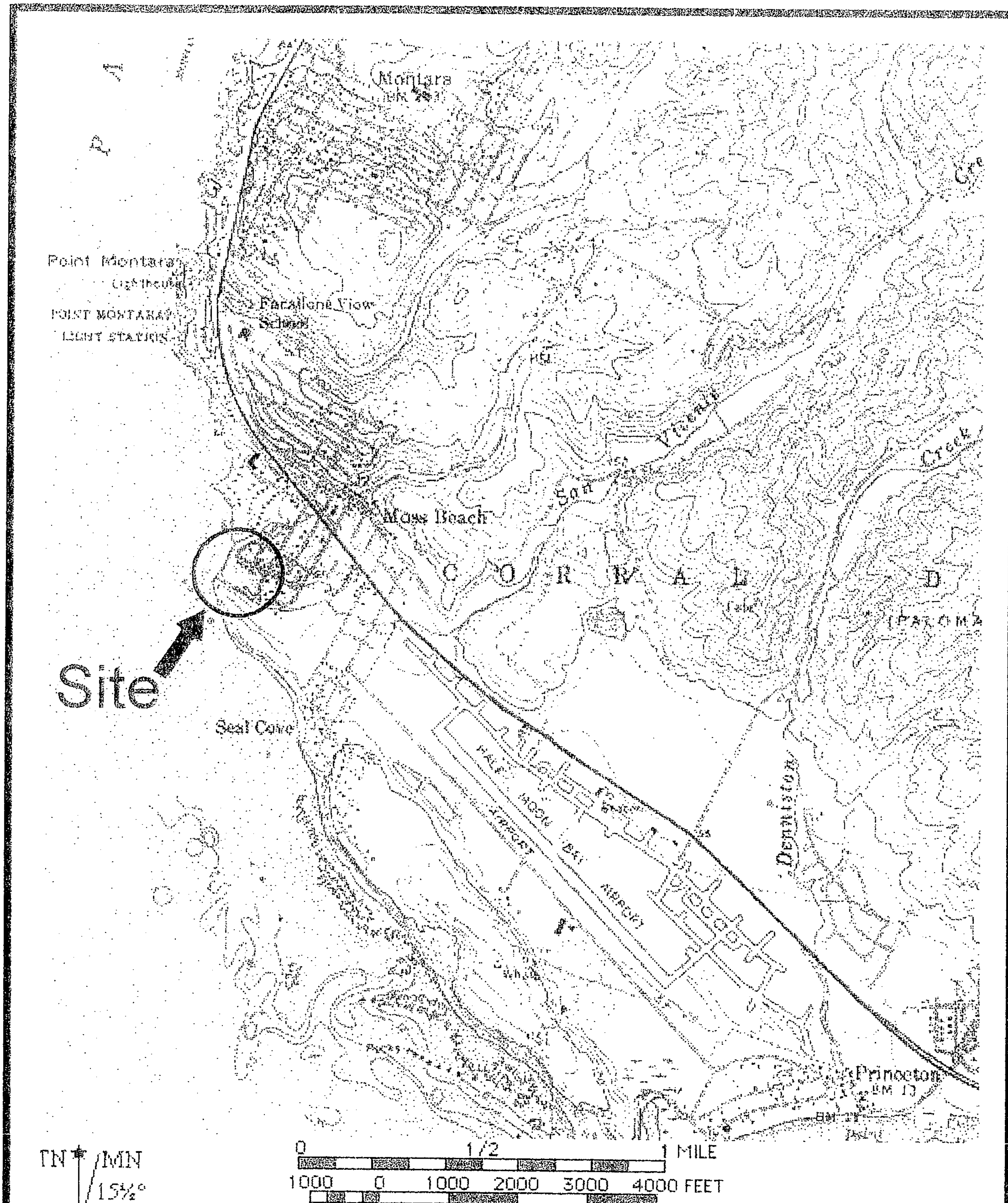
Tel: (650) 349-3369 Fax: (650) 571-1878

Figure 1 - Site Location



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056

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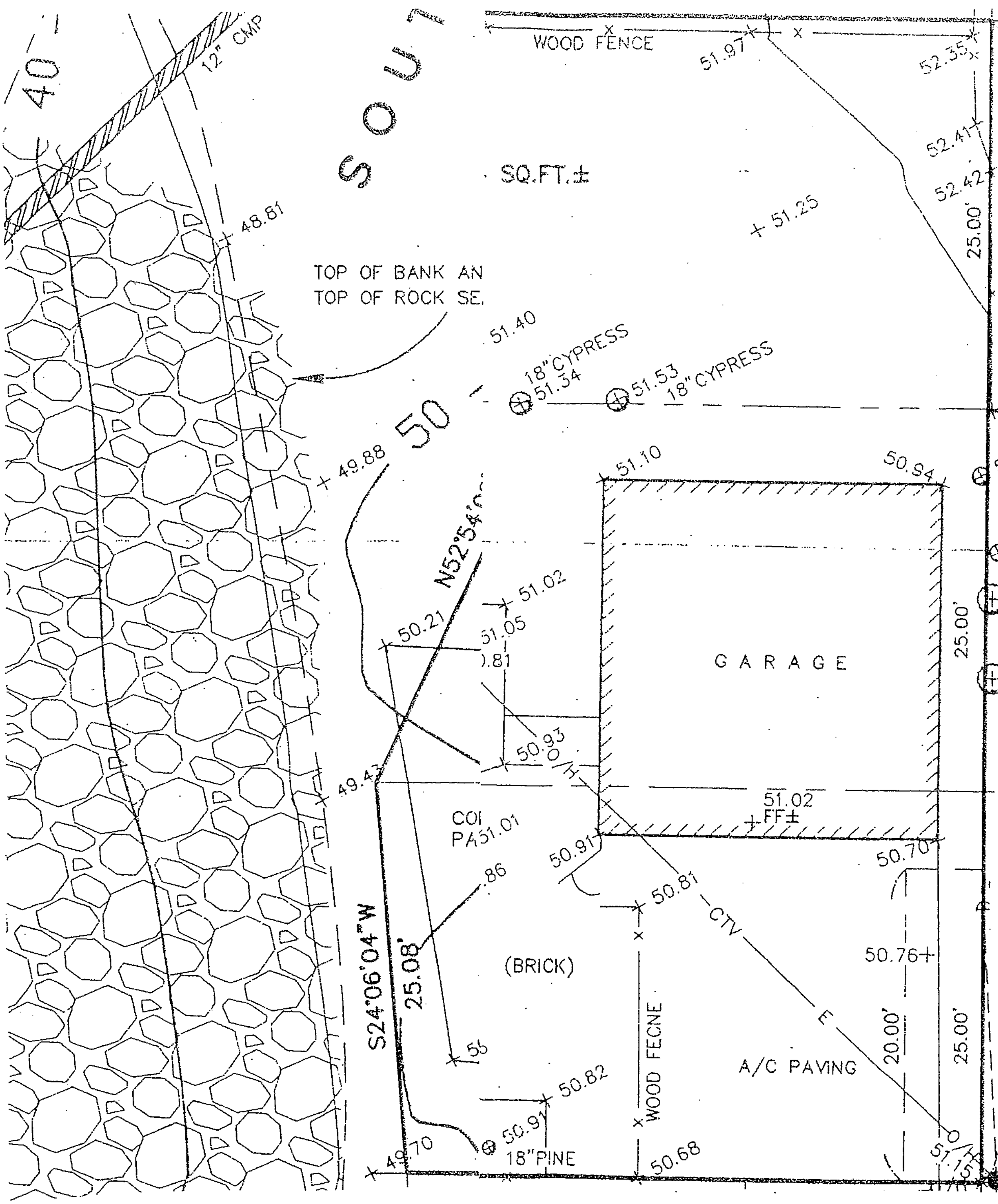
Figure 2 - Vicinity Topographic Map

From *Geologic Map of the Montara Mountain and San Mateo 7½' Quadrangles, San Mateo County, California (USGS Map I-2390)*, by Earl H. Pampeyan (1994).

Scale: 1" = 2000'

GeoForensics Inc. 561 Pilgrim Dr., Suite D, Foster City, CA 94404 Tel: (650) 349-3369 Fax: (650) 571-1878	Figure 3 - Geologic Map



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Scale: 1" = 10'

Figure 4 - Site Plan with Boring Locations

Base drawing by B & H Surveying, Inc.

APPENDIX A - BORING LOGS

LOG OF BORING

DEPTH (ft)	SAMPLE NO.	SAMPLE LOC.	BLOW COUNTS (12 inches)	DESCRIPTION	DRY DENSITY (pcf)	MOISTURE CONTENT (%)
				clayey SAND with rootlets - dark brown; slightly moist (topsoil)		
	1 - 1		31	clayey SAND - dark brown & orange-brown; slightly moist; stiff (native)	-	-
5	1 - 2		68	SAND with clay & decomposed granite - orange-brown; slightly moist; medium dense	106.6	10.2
10						
15						
20						
25						
30						
35						

No groundwater encountered.
Bottom of boring at 6.5 feet
Drilled on 04/23/02
Logged by ba
Minute Man portable drilling rig
Modified California sampler
70# hammer

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Figure A1 - Log of Boring 1

LOG OF BORING

DEPTH (ft)	SAMPLE NO.	SAMPLE LOC.	BLOW COUNTS (12 inches)	DESCRIPTION	DRY DENSITY (pcf)	MOISTURE CONTENT (%)
				clayey SAND - brown & orange-brown; slightly moist		
	2 - 1		46	clayey SAND with decomposed granite - orange-brown; slightly moist; medium dense	111.7	14.1
5	2 - 2		67	SAND with clay & decomposed granite - grey & orange-brown; slightly moist; medium dense	116.7	15.2
10						
15						
20						
25				No groundwater encountered. Bottom of boring at 7.5 feet Drilled on 04/23/02 Logged by ba Minute Man portable drilling rig Modified California sampler 70# hammer		
30						
35						

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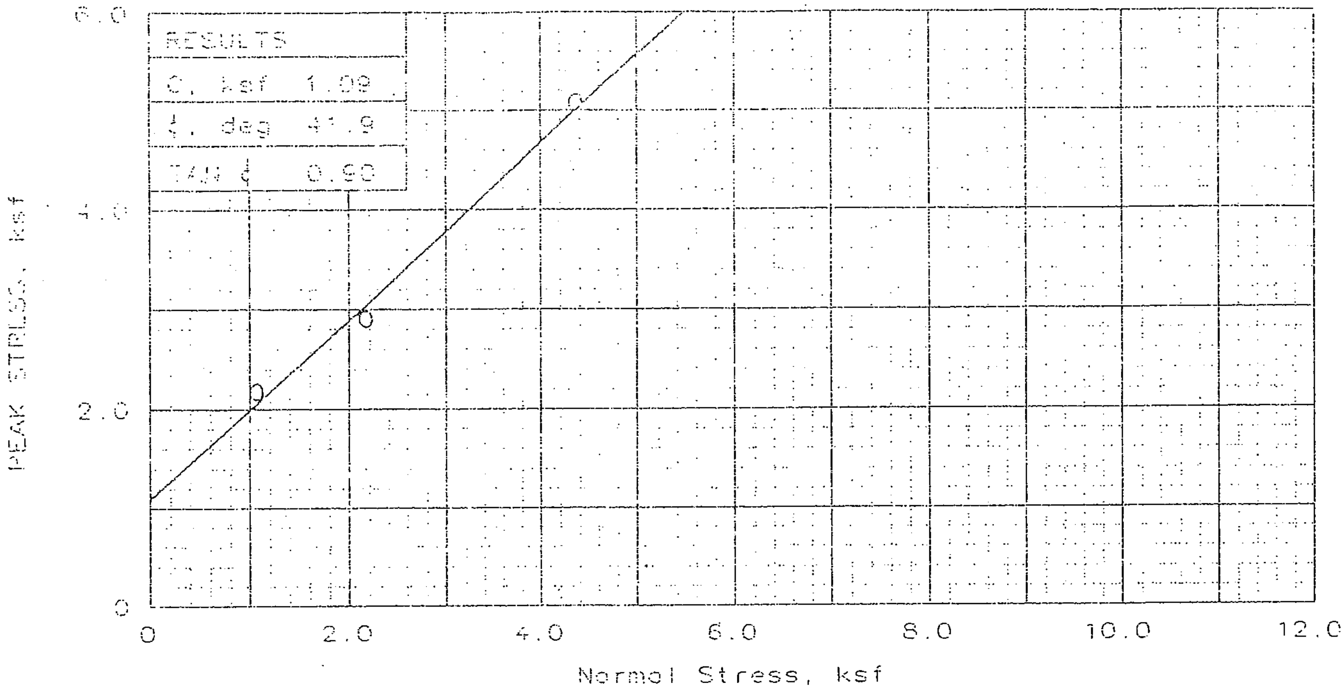
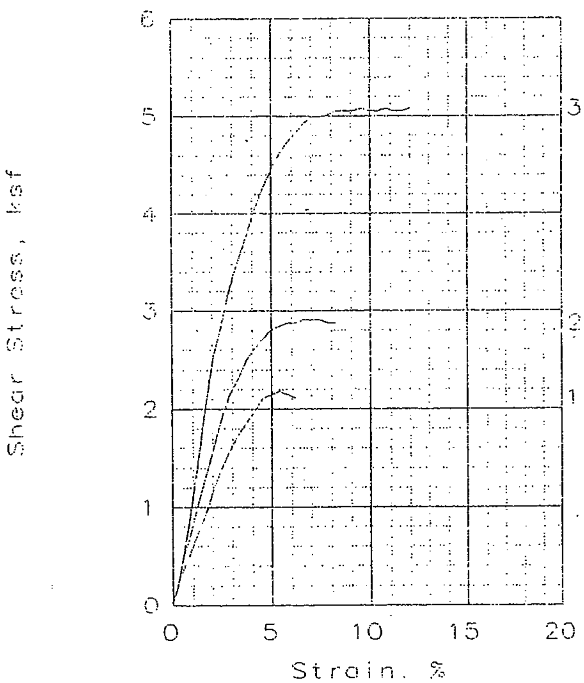
Figure A2 - Log of Boring 2

APPENDIX B - LABORATORY TEST RESULTS





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	14.7	13.9	13.8
	DRY DENSITY, pcf	112.0	112.7	110.5
	SATURATION, %	78.5	75.8	71.1
	VOID RATIO	0.505	0.496	0.526
	DIAMETER, in	2.41	2.41	2.41
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	16.3	15.6	1.7
	DRY DENSITY, pcf	114.0	115.3	114.5
	SATURATION, %	91.6	91.0	9.5
	VOID RATIO	0.479	0.462	0.472
	DIAMETER, in	2.41	2.41	2.41
	HEIGHT, in	0.98	0.98	0.96
NORMAL STRESS, ksf		1.10	2.20	4.40
PEAK STRESS, ksf		2.18	2.90	5.08
STRAIN, %		5.4	6.6	9.5
Ultimate Stress, ksf				
STRAIN, %				
Strain rate, %/min		1.00	1.00	1.00

SAMPLE TYPE: Undisturbed.
DESCRIPTION: brown sandy CLAY

ASSUMED SPECIFIC GRAVITY= 2.7
REMARKS: **DS-CU**
An undrained condition cannot be completely accomplished.

Fig No.: ______

CLIENT: GeoForensics

PROJECT: 202073 / Druker

SAMPLE LOCATION: 2-1 @ 4'

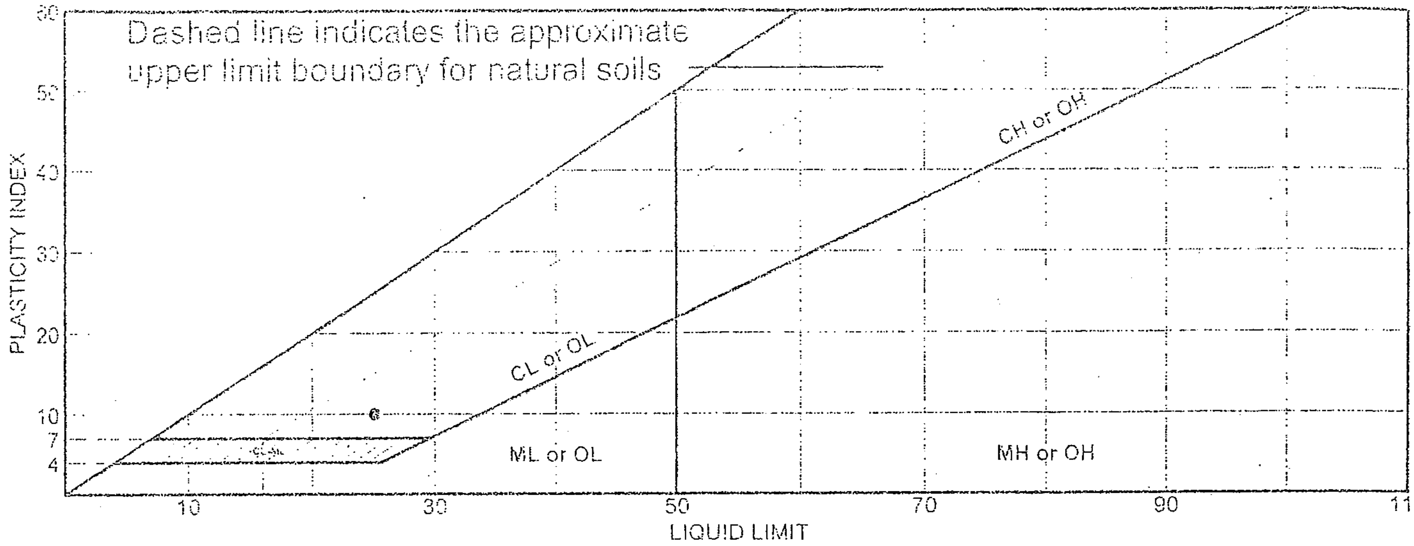
063

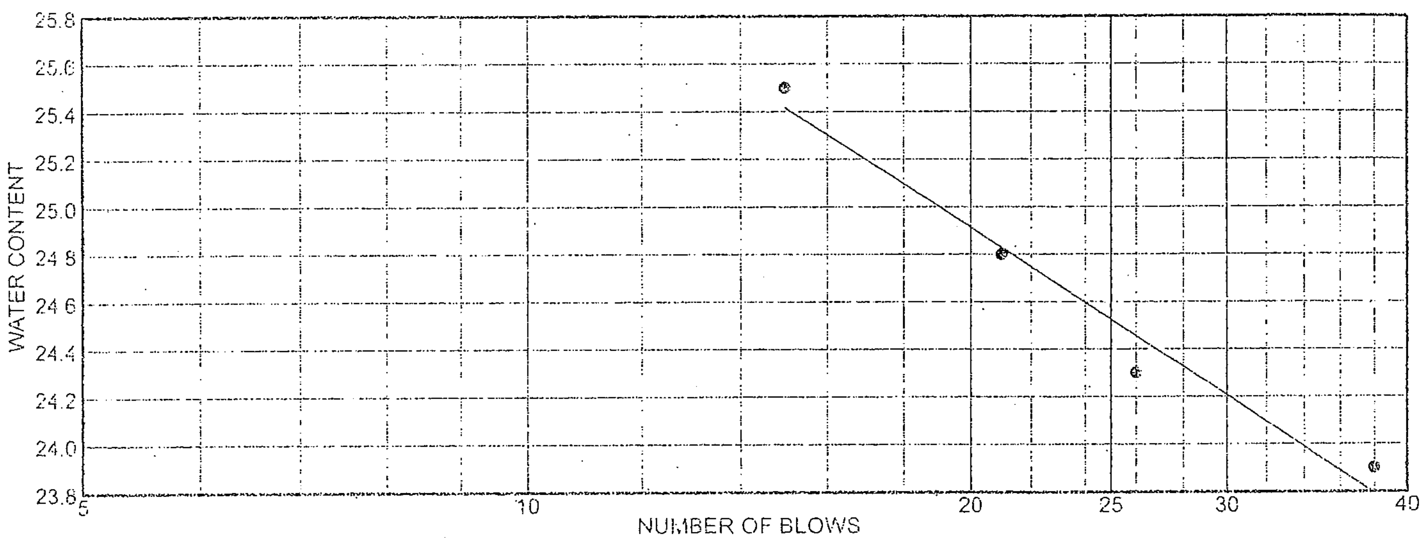
PROJ. NO.: 060-1373 DATE: 05/02/02

DIRECT SHEAR TEST REPORT

COOPER TESTING LABORATORY

LIQUID AND PLASTIC LIMITS TEST REPORT





MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
dark brown silty CLAY with sand and surface organics	25	15	10			

Project No. 060-1373 Client: GeoForensics

Project: 202073 / Druker

Source: Bulk Sample No.: 1-1 Elev./Depth: 1.5'

Remarks:

064

LIQUID AND PLASTIC LIMITS TEST REPORT

COOPER TESTING LABORATORY

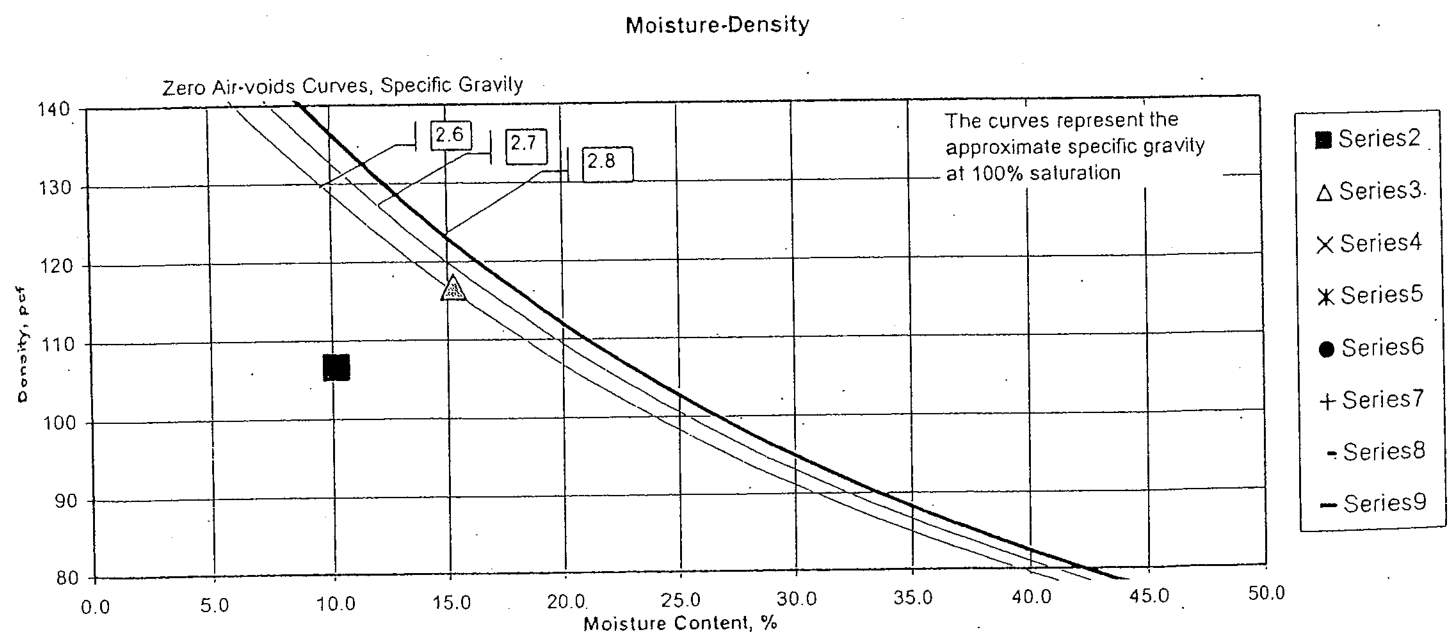
Plate

Moisture-Density-Porosity Report

Cooper Testing Labs, Inc.

Job No:	060-1373	Date:	05/01/02
Client:	GeoForensics	By:	DC
Project:	202073 / Druker	Remarks:	

Boring:	1-2	2-2							
Sample:									
Depth:	6'	7'							
Description	brown silty SAND	brown sandy CLAY							
Actual G_s									
Assumed G_s	2.70	2.70							
Total Vol cc	222.58	222.58							
Vol Solids,cc	140.72	154.03							
Vol Voids,cc	81.86	68.54							
Moisture, %	10.2	15.2							
Wet Unit, pcf	117.5	134.5							
Dry Unit, pcf	106.6	116.7							
Saturation, %	47.2	92.5							
Porosity, %	36.8	30.8							
Void Ratio	0.582	0.445							
Series	2	3	4	5	6	7	8	9	



Information on the occurrence of special-status species in the CNDDB is organized geographically by U.S. Geological Survey (USGS) 7.5 minute quadrangles. The CNDDB search was conducted for the Montara Mountain Quadrangle, within which the project site is located. The special-status species listed in the CNDDB for this quadrangle may have a potential to occur on the project site if suitable habitat is present. Other special-status species (with no CNDDB records occurrence in the Montara Mountain quadrangle) may also have a potential to occur in the area because Moss Beach is within their geographic range and suitable habitat may be present in the area. Special-status species and rare habitat types with CNDDB occurrences within the Montara Mountain Quadrangle are provided in Attachment A.

For the purpose of this report, special-status species are defined as follows:

- Species that are listed, formally proposed, or designated as candidates for listing as threatened or endangered under the federal Endangered Species Act
- Species that are listed, or designated as candidates for listing, as rare, threatened, or endangered under the California Endangered Species Act
- Animal species designated as Species of Special Concern or Fully Protected by the CDFG
- Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA guidelines
- Plant species on Lists 1B and 2 in the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2006)
- Species listed in the San Mateo County Local Coastal Plan (LCP).

LSA Biologist, Eric Lichtwardt, surveyed the project site and surrounding area on November 20, 2007.

EXISTING CONDITIONS

The project site is a developed residential lot which is currently occupied by buildings, driveways, areas landscaped with ornamental plants, and a vegetable garden. The adjacent lot to the north is also developed residential, as is the landscape to the east and south. West of the project site, a sea cliff (reinforced with rip-rap) drops to the Fitzgerald Marine Preserve.

Vegetation and Habitats

Vegetation on the project site and adjacent areas is dominated by non-native ornamental plants. A large Monterey cypress *(Cupressus macrocarpa)* is present on the project site and many others occur in adjacent areas. Monterey cypress occurs naturally in only two populations along the California coast near Monterey, but this species has been planted extensively as an ornamental and for wind-breaks along the central California coast and is now widely naturalized in this area.

chaparral, sand dunes, serpentinite soils etc.). There is no suitable habitat for special-status plants on or adjacent to the project site due to extensive development and dominance of non-native ornamental plantings.

Special-status Wildlife

A list of the special-status animal species known from the Montara Mountain Quadrangle is provided in the Attachment A. As with plants most special-status animal species are restricted to specific natural habitat types (e.g., riparian woodland, freshwater marsh, coastal scrub etc.). No special-status wildlife is expected to occur on or adjacent to the project site, due to the lack of suitable natural habitat.

Aquatic habitat for the California red-legged frog *(Rana aurora draytonii)*, a federally-listed threatened species that occurs along the San Mateo County coast, is not present in the drainage north of the project. The San Francisco garter snake *(Thamnophis sirtalis tetrataenia)*, a federal and State-listed endangered species that also occurs in wetland habitats in San Mateo County, would likewise not be expected to occur along this drainage due to the lack of suitable habitat (e.g. marshy wetlands with grassy edges and abundant frog populations).

IMPACTS

Bird Impacts

It has been suggested that the large windows (planned as part of the proposed project) could have adverse impacts on birds through fatal window collisions. According to the architectural plans the large windows in the addition would be facing to the west. Most large birds such as gulls and cormorants flying over the project site would likely be moving up and down the coast (riding the updraft provided by the sea breezes deflected by the coastal cliffs) and would not be expected to fly into a west facing window. Birds flying east from over the ocean could conceivably hit a large window, but using shades or decals on the windows could help reduce such collisions. In any event, the proposed windows are too small in area to have a significant impact on migratory or resident bird populations in the area. An occasional bird may collide with the proposed large windows. But such bird collisions are not expected to be greater in frequency than bird collisions with similar large windows on other residences in Moss Beach and would not significantly increase bird mortality in the area.

Wetlands and Riparian Corridors

Under the LCP wetlands and riparian areas are considered environmentally sensitive habitat areas (ESHA) and impacts are not allowed. The LCP also establishes buffer zones around wetlands and riparian areas where permitted uses are highly restricted.

The LCP defines wetlands as: *"an area where the water table is at, near or above the land surface long enough to bring about the formation of hydric soils or to support the growth of plants which normally are found to grow in water or wet ground. Such wetlands can include mudflats (barren of vegetation), marshes, and swamps. Such wetlands can be either fresh or saltwater, along streams (riparian), in tidally influenced areas (near the ocean and usually below extreme high water of spring tides), marginal to lakes, ponds, and manmade impoundments. Wetlands do not include areas which*

Please contact me at (510) 236-6810 if you have any questions about our assessment or require further assistance with this project.

Sincerely,

LSA ASSOCIATES, INC.

Eric Lichtwardt
Senior Biologist

cc. John Davis, Sagan Piechota Architecture, 315 Linden Street, San Francisco, CA 94102

Attachment: California Department of Fish and Game Natural Diversity Database, Selected Elements by Scientific Name, Montara Mountain Quad, San Mateo County, California.

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	*Malacothamnus aboriginum* Indian Valley bush mallow	PDMAL0Q020			G3	S3.2	1B.2
25	*Malacothamnus arcuatus* arcuate bush mallow	PDMAL0Q0E0			G2Q	S2.2	1B.2
26	*Malacothamnus davidsonii* Davidson's bush mallow	PDMAL0Q040			G1	S1.1	1B.2
27	*Malacothamnus hallii* Hall's bush mallow	PDMAL0Q0F0			G1Q	S1.2	1B.2
28	*Melospiza melodia pusillula* Alameda song sparrow	ABPBXA301S			G5T2?	S2?	SC
29	*Myotis thysanodes* fringed myotis	AMACC01090			G4G5	S4	
30	*Neotoma fuscipes annectens* San Francisco dusky-footed woodrat	AMAFF08082			G5T2T3	S2S3	SC
31	*Northern Coastal Salt Marsh*	CTT52110CA			G3	S3.2	
32	*Northern Maritime Chaparral*	CTT37C10CA			G1	S1.2	
33	*Nyctinomops macrotis* big free-tailed bat	AMACD04020			G5	S2	SC
34	*Oncorhynchus mykiss irideus* Steelhead - Central California Coast ESU	AFCHA0209G	Threatened		G5T2Q	S2	
35	*Pentachaeta bellidiflora* white-rayed pentachaeta	PDAST6X030	Endangered	Endangered	G1	S1.1	1B.1
36	*Plagiobothrys chorisianus var. chorisianus* Choris' popcorn-flower	PDBOR0V061			G3T2Q	S2.2	1B.2
37	*Plebejus icarioides missionensis* Mission blue butterfly	IILEPG801A	Endangered		G5T1	S1	
38	*Potentilla hickmanii* Hickman's cinquefoil	PDROS1B0U0	Endangered	Endangered	G1	S1.1	1B.1
39	*Rallus longirostris obsoletus* California clapper rail	ABNME05016	Endangered	Endangered	G5T1	S1	
40	*Rana aurora draytonii* California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3	SC
41	*Serpentine Bunchgrass*	CTT42130CA			G2	S2.2	
42	*Silene verecunda ssp. verecunda* San Francisco campion	PDCAR0U213			G5T2	S2.2	1B.2
43	*Speyeria zerene myrtleae* Myrtle's silverspot	IILEPJ6089	Endangered		G5T1	S1	
44	*Taxidea taxus* American badger	AMAJF04010			G5	S4	SC
45	*Thamnophis sirtalis tetrataenia* San Francisco garter snake	ARADB3613B	Endangered	Endangered	G5T2	S2	
46	*Triphysaria floribunda* San Francisco owl's-clover	PDSCR2T010			G2	S2.2	1B.2
47	*Valley Needlegrass Grassland*	CTT42110CA			G1	S3.1	