GEOTECHNICAL INVESTIGATION
Proposed Commercial Development
2700 - 2790 South El Camino Real
San Mateo, California

Prepared for:
L.F. George Properties
P.O. Box 424001
San Francisco, California 94142
Attention: Mr. George Lam

Dated: September 12, 2013
Job 1130.14.00

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September 12, 2013
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P.O. Box 424001
San Francisco, California 94142-4001

Attention: Mr. George Lam

RE: **GEOTECHNICAL INVESTIGATION**
Proposed Commercial Development
2700-2790 South El Camino Real
San Mateo, California

Dear Mr. Lam:

INTRODUCTION

Location and Proposed Project

Pursuant to your authorization, we have completed the referenced project, located on So. El Camino Real between 27 and 28th Avenues (Plate 1, Vicinity Map). This project area includes 3 parcels that will be re-developed after existing commercial improvements on 2700 and 2750 are removed. We understand a service station was removed from the parcel at 2790 So. El Camino Real years ago and it has remained vacant since then.

A proposed plan was unavailable at the time of this investigation; however, we anticipate the re-development will be commercial or possibly mixed-use commercial and residential with basement parking.

Purpose and Scope of Services

The purpose of this investigation was to characterize the site foundation soils, development feasibility, and to provide preliminary geotechnical design parameters pertaining to grading, drainage, foundations, and basement retaining walls. The scope of services included:

- Review of regional topographic and geologic mapping covering the site area. Plates 1 and 2 contain the excerpts of the topographic and geologic maps. You provided us on September 12, 2103 analytical data pertaining

to 2750 and closure of a Texaco Service Station formerly located at 2790 So. El Camino Real. There was a June 26, 2001 memorandum prepared by San Mateo County Groundwater Projection Program Staff containing a statement pertaining to depth to ground water, which was submitted with a service station closure analytical report;

- Site observations and advancement of four (4) truck-mounted hollow-stem auger borings on July 19, 2013 at the locations depicted on Plate 2 (Site Aerial View & Generalized Cross Section A-A'). The borings were supervised, logged and sampled by our field engineer. Logs of the borings are on Plates 4-7. Descriptions of the terms and symbols on the logs is contained on Plate 8;
- Laboratory testing of selected samples from the borings. Moisture content, dry density, pocket penetrometer unconfined compressive strength, and torvane shear strengths of selected samples are tabulated on the boring logs at the respective sample depths. Atterberg limit test results and percent passing the #200 ASTM sieve are contained on Plate 9;
- Analysis of the data and preparation of pertinent geotechnical recommendations for the proposed project. A representative soil profile is contained on Plate 2.

GENERAL SETTING

The site is located at an approximate elevation of 20 feet above sea level on a very gentle northeasterly sloping to flat alluvial plain (Plates 1 and 3). There are no drainage courses or springs mapped on or near the site. There a number of seasonal drainages that convey runoff to the plain from the hillside front approximately 7000 feet to the southwest. The principal perennial drainage is Laurel Creek mapped approximately 3000 feet to the southeast.

The alluvial deposits are described as Holocene (11,000 years old or less) medium-grained, unconsolidated to moderately consolidated, moderately sorted sand, silty to clayey sand locally containing interbeds of well sorted clay, silt and gravel (Pampeyan, 1994). According to the geologic mapping depicted on Plate 2, it is believed to interfinger with fine- and coarse-grained to the southwest Bay Mud mantled by artificial fill to the northeast. The analytical report prepared by E2C Environmental/Engineering Consultants (undated) indicates environmental closure of the Texaco service station involved excavations of unknown depths across the entire parcel at 2790 So. El Camino Real (Plate 2). As reported by the San Mateo Health Services Agency, the measured depth to ground water was 10 feet.

FAULTS AND SEISMICITY

The site lies in a tectonically active area between the active San Andreas fault zone mapped in Crustal Springs Reservoir approximately 3 miles to the southwest and the active Hayward fault zone mapped at the foot of the East Bay Hills, approximately 16 miles to the northeast. Historic crustal movements on The San Andreas and Hayward faults have produced major Bay Area earthquakes affecting the site area with very strong ground shaking. The San Andreas fault has a 21 percent chance of producing a magnitude 6.7 or greater earthquake by the year 2036, and the Hayward fault has a 31 percent chance of a similar scenario (Working Group, 2008). There has been no reported incident of liquefaction in the immediate site area associated with the historic, strong ground shaking (Lawson, 1906; Youd and Hoose, 1978; Plafker and Galloway, 1989). Very strong to very violent earthquake shaking is expected to occur in the event of nearby, major earthquake, mainly because of the thick accumulation of sediment overlying bedrock in this area (Petersen and others, 1999).

SITE CHARACTERISTICS

Surface Features

The northern two-thirds of the site are occupied by generally intact commercial developments including paved parking lots and commercial buildings, and isolated landscaping (Photos 1 and 2; Plate 2). The vacant lot (2790) was occupied by a service station The rear of the site is bordered by a dense stand of mature trees, and there isolated landscaping elsewhere, with exposed soil and sparse weed distribution on the vacant parcel.

The asphalt pavement apparently drains to the municipal storm drain. Runoff on the vacant parcel would tend to pool on the irregular soil surface and eventually percolate into the subsurface. There was no evidence of seepage or springs detected during our site investigation.

Evidence of the former service station was not detected during our site investigation, however the limited data provided in the environmental report you submitted indicate virtually the entire site was excavated during closure of the service station (Plate 2). Soils exposed on the surface the southern third of the site were silt and clayey sand with gravel, fill. There was visible evidence of the late 1990's – early 2000's excavations.

Soil Profile

Borings drilled for this investigation encountered 21 ½ feet of unconsolidated consisting of stiff to hard, low to high plasticity, sandy clays, and medium dense, clayey sands/sandy clays all containing a variable gravel content. All of the soil encountered in Borings 1 and 2 is interpreted as native alluvium. The upper 12 feet of soil encountered in Boring 3 is interpreted as undocumented fill, consisting of approximately 7 ½ feet of stiff, sandy clay with gravel, overlying approximately 4 ½ feet of medium dense, gravelly, clayey sand. Similarly, Boring 4, drilled near a reclaimed underground tank location site, encountered approximately 12 feet of undocumented fill, consisting of 3 ½ feet of medium dense, gravelly, silty sand overlying 8 ½ feet of medium dense, gravelly, clayey, silty sand.

The soils were generally damp for to the depth drilled of 21 ½ feet in Boring 1 at the northeastern corner of the site. With the exception of perched seepage at that depth of 6 feet, the soils in Boring 2 were generally damp. In the southern part of the site, soils became wet to saturated beneath the damp soils to a depth of 17 ½ feet in Boring 3 and to a depth of 19 feet in Boring 4 with damp soils and damp soils again to the bottoms of the borings. After the drilling was completed, standing water was measured in the undocumented fill in Boring 3 approximately 9 ½ feet below the ground surface, and approximately 9 feet below the ground surface in undocumented fill encountered in Boring 4.

DISCUSSION AND CONCLUSIONS

The results of this investigation indicate that the proposed project is feasible from a geotechnical standpoint. The site is underlain by more than 21 ½ feet of unconsolidated soil that was interpreted to be alluvial deposits the full depth of Borings 1 and 2. On the vacant parcel formerly occupied by a Texaco service station, the alluvial deposits encountered at Boring 3 and 4 locations were mantled by approximately 12 feet of undocumented fill (see Generalized Cross Section A-A' illustrated on Plate 2. It is our opinion the native soils are adequate for footing foundation support for street-level structures. However, we recommend remedial grading of the upper 2 feet of the undocumented fill underlying the southern third of the site to create uniform bearing for pavements and foundations.

The soils below an approximate average depth of 7 feet increase in moisture content and could be susceptible to perched ground water seepage. It would therefore be necessary to implement dewatering of seepage that could accumulate at the bottom of excavations exceeding 7 feet in depth. Saturation of

unconsolidated soils below that depth are susceptible to caving in steep walled excavations below that depth requiring consideration of shoring unless the cut slopes are reclined to a maximum of 1 ½H:1V, or an inclination judged stable by the engineering geologist during grading.

The site is in a seismically active region where very strong to very violent ground shaking will occur during a nearby major earthquake. The distance to the nearest fault makes the risk of fault ground rupture low. Further, we judge the risk of liquefaction during a nearby major earthquake to be low given the occurrence of generally cohesive and/or dense alluvial soils underlying the site. Saturated, granular soils in the southern part of the site have potential for localized differential settlement from strong ground shaking during a major nearby earthquake. We judge potential damage from seismic settlement to proposed structures in the southern third of the site can be adequately mitigate by building support on a reinforced mat slab. Similarly, mat slabs should be used for basement floors.

RECOMMENDATIONS

Seismic Design

The proposed structures should be designed for the following seismic design criteria derived from the subsurface exploration data and the 2010 California Building Code (CBC):

- Site Location: Latitude =37.542; Longitude = -122.303
- Site Soil Class: D
- Spectral Response Acceleration Values: Ss = 1.8380; S1 = 1.425; SMs = 1.838; SM1 = 1.425; SDs = 1.225; SD1 = 0.950; Fa = 1.0; Fv = 1.5

Demolition, Site Preparation and Grading

Grubbing of the southern third of the site will be required to remove the existing weeds and organic soils to an estimated depth of 4 inches. After grubbing, any highly expansive soil exposed in pavement subgrade and proposed footing areas should be removed to a depth of 2 feet and replaced with non-expansive soil. Similarly, the upper 2 feet of undocumented fill minus highly expansive soil underlying the southern third of the site, as assessed by the field engineer during rough grading, should be removed, moisture conditioned to near optimum and replaced as engineered fill compacted to at least 90 percent relative to the

maximum dry density of the materials as assessed by the ASTM D 1557 laboratory test procedure. Prior to replacement of the overexcavated soil in the southern third of the site, we recommend that the exposed fill soils be scarified to a minimum depth of 12 inches and recompacted to at least 90 percent relative to the maximum dry density of the materials.

Where drive isle and parking pavements are proposed in the overall project area, the upper foot of soil should be scarified and recompacted to at least 95 percent relative to the maximum dry density of the material used.

To the extent practical, achieve a positive slope of the ground surface to avoid pooling of runoff against the foundations or adjacent to pavement subgrades.

Shoring and Underpinning

Underpinning/shoring design should be provided by the project engineer or specialty contractor. The underpinning piers for any of the adjacent buildings should be installed in a number of phases so that a center-to-center spacing between underpinning piers does not exceed 6 feet. The underpinning piers, if required, should be at least 24 inches wide, and extend at least 24 inches below the lowest adjacent grade. The bottom of piers should have a minimum lateral confinement of 5 feet. At a depth of 24 inches, the underpinning piers can be designed for an allowable bearing value of 2000 pounds per square foot (psf) for dead plus live loads. This value can be increased by 1/3 to account for short-term wind and seismic loads. To mitigate loss of soil between the underpinning piers, it may be necessary to install wood lagging between the piers extending downward from the ground surface to the base of the excavation. The underpinning piers should be designed for a passive equivalent fluid pressure of 250 pounds per cubic foot (pcf) acting over 1 ½ pier diameters and to resist an active equivalent fluid pressure of 40 pcf, acting over one pier diameter beginning are the ground surface.

Temporary slopes steeper than 1 ½:1 should be supported by shoring designed to resist an active equivalent fluid pressure of 45 pcf. If soldier beam construction is desired, piers should extend below the lowest adjacent grade a distance equivalent to at least 1 ½ times the height of the wall. An allowable skin friction value of 400 pcf and passive equivalent fluid pressure of 250 pcf acting over 1 ½ pier diameters should be applied to design.

The structural engineer should evaluate the need for tiebacks. Any required tiebacks should be designed for an allowable adhesion of 400 psf. Tiebacks should be proof-loaded to 150 percent of the design capacity for a period of at least 5 minutes.

Utility Trenches

Vertical trench excavations up to 3 feet deep should be capable of standing with minimal bracing for short construction periods. Local conditions may require that trenches less than 3 feet be cut and braced as specified in the State of California Safety Ordinance dealing with Excavations and Trenches.

Utility trenches should be designed to prevent the transportation of water into foundations, slabs or pavement subgrade soils. In particular, where utilities cross foundations, trenches should be plugged with compacted soil or concrete for their full depth, and for a distance of at least 2 feet on either side of the foundations.

On-site, inorganic soil may be used as utility trench backfill. Special compaction of trench backfill will be necessary under and adjacent to the proposed structures, concrete slabs, and engineered fill. In these areas, backfill should be conditioned with water to produce a soil-water content near the optimum value, and placed in horizontal layers, each not exceeding 6 inches in loose thickness. Each layer should be compacted to a density equivalent to at least 90 percent of the maximum dry density of the soil as determined by ASTM test D1557. The top two feet of trench backfill under slabs and pavements should consist of non-expansive, granular soils compacted to at least 95 percent of maximum dry density.

Foundations

Taking soil preparation described in the *Grading* section, proposed buildings can be supported on continuous footings or mat slab designed by the project engineer using the following parameters:

Continuous Footing

- Footings should have a minimum width of 15 inches, and extend at least 24 inches below the lowest adjacent grade to bear in the dense engineered fill or medium dense, native soil;
- Allowable bearing value of 2500 pounds per square foot (psf) for dead plus live loads. Increase this value by 1/3 to account for wind and seismic loads;

- Passive equivalent fluid pressure of 350 pounds per cubic foot (pcf) beginning at the ground surface;
- Coefficient of friction at the base of the footing of 0.35.

Mat Slab

- Mat slab subgrade soils should be scarified to a minimum depth of 12 inches and compacted to at least 90 percent relative to the maximum dry density of the materials;
- Allowable bearing and resistance to lateral loads for footing can be used;
- Mat slab thickness should be at least 12 inches;
- Modulus of subgrade reaction of 100 kips/cubic foot
- Slab reinforcement should be assessed by the project structural engineer, but should be no less than No. 4 bars spaced orthogonally 12 inches apart at top and bottom;
- Capillary moisture break and vapor barrier underlayment of at least 6 inches of clean crushed rock beneath a 15 mil Stego wrap, or better.

Retaining Walls

The basement retaining walls should be supported on the mat foundation designed for the soil parameters defined in the Foundation section of this report. Walls should be designed to resist an active equivalent fluid pressure of 50 pcf acting in a triangular pressure distribution. Walls should be designed for an appropriate surcharge load due to vehicular traffic. Any wall that is restrained from rotation should be designed to resist an additional uniform pressure of 100 psf. Where seismic parameters are required, they should be designed for a pressure equal to 15H psf, where H is the height of the retained soil. The seismic component should be considered a load acting 0.5 times the wall height above the wall base. If the basement wall will be subjected to vehicular loads, add a uniform pressure of 250 psf to wall design.

The pressures described above are contingent upon the basement walls being constructed with a backdrainage system. We recommend that the backdrain pipe be located at least 1 foot below the adjacent lowest grade to mitigate underseepage toward the building foundation or pavement section. The backdrain can consist of a geosynthetic drainage mat (i.e., Miradrain 5000 or equivalent) integrated with a minimum 4-inch diameter, perforated SDR 35 PVC pipe (or better) in accordance with the manufacture's specifications, and sloped to drain to a sump and pump system designed by the project civil engineer.

We recommend that foundation walls be thoroughly waterproofed to prevent detrimental migration of moisture and potential development of unsightly precipitation on the wall face.

Slab-on-Grade

Any exterior slab subgrade should be prepared as discussed above. Slabs should be designed for free-floating. Slabs should be underlain with a capillary moisture break consisting of at least 5 inches of clean, free-draining, crushed rock or gravel. Where migration of moisture vapor through slabs would be detrimental, an impermeable moisture vapor barrier (15 mil Stego wrap) should be provided between the gravel and the slab.

Slabs-on-grade should be reinforced with No. 4 bars spaced orthogonally at 16-inch centers. Control joints should be used to account for cracking.

Pavements

Pavements should be placed on a uniformly compacted soil surface, as described in the *Grading* section. Table 1 defines preliminary, conservative pavement sections, in inches, for various traffic indices. Final pavement design can be evaluated after representative samples of exposed subgrade materials are provided for R-value testing.

Redwood or durable synthetic headers should be provided at edges of the paved areas adjoining planters to prevent surface water from migrating into the pavement section. It would be prudent to gently swale the finished driveway surface to conduct runoff to properly-sized catch basins positioned by the project civil engineer at low points to redirect runoff to the storm drainage system.

TABLE 1 – PRELIMINARY PAVEMENT DESIGN

	Traffic Index	Asphaltic Concrete	Class 2 Aggregate Base
Auto Parking	3.5	2"	6"
Auto Traffic	4.5	2.5"	7.5"
Truck Traffic	6.0	3"	10.5"

Drainage

Positive surface drainage gradients of at least 2 percent should be provided for a distance of at least 5 feet away from all structures. The driveway and parking areas should drain to inlets that carry water by properly sized, solid PVC pipes to the storm drainage system.

We recommend that proposed structures be provided with roof gutters and downspouts. The downspouts should be connected to solid PVC pipes and these pipes should discharge into the storm drainage system.

MAINTENANCE

Surface and subsurface drainage facilities should be checked frequently, and cleaned and maintained as necessary. Care should be taken to assure that all separations that may occur in the pavements be patched to mitigate water infiltration.

INVESTIGATION LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering principles and practices, and is in accordance with the standards and practices set by the geotechnical consultants in the area. This acknowledgment is in lieu of any warranty. We offer no guarantees.

Subsurface conditions could vary between those indicated by the explorations and interpreted from surface features. We should be retained to provide construction observation services, to observe the exposed geotechnical conditions, to modify recommendations, if necessary, and to ascertain that the project is constructed in accordance with the recommendations.

This report is submitted with the understanding that it is the responsibility of the Client (Owner) to ensure that the applicable provisions of the recommendations contained herein are made known to all design professionals involved with the project; that the recommendations are incorporated into the construction drawings; and that the necessary steps are taken to see that the contractor and subcontractors carry out the recommendations in the field.

If conditions different from those described in this report are encountered during construction, or if the project is revised, we should be notified immediately so that we may modify our recommendations, if warranted.

The practice of geotechnical engineering changes, and, therefore, we should be consulted to update this report if construction is not performed within 12 months.

REFERENCES

E2C Environmental/Engineering Consultants, undated, Excavation and sample locations, 2790 South El Camino Real, San Mateo, California: Figure 9 of Environmental consultant's report, Job E911801, scale 1"=20'.

Pampeyan, E.H., 1994, Geologic map of the Montara Mountain and San Mateo 7 ½' quadrangles, San Mateo County, California: U.S. Geological Survey Miscellaneous Investigations Map I-2390, scale 1:24,000.

Petersen, M. and others, 1999, Seismic shaking maps of California: California Division of Mines and Geology Map 48.

Plafker, G., and Galloway, J. P., 1989, Lessons learned from the Loma Prieta California earthquake of October 17, 1989: U.S. Geological Survey Circular 1045, 48 pgs.

San Mateo Heath Services Agency, 2001, Case Closure Memorandum: San Mateo County Groundwater Protection Program, Site No 110039, pg. 1 containing statement of measured depth to ground water at 2790 So. El Camino Real, San Mateo, California.

Working Group on California earthquake probabilities, 2008, The uniform California earthquake rupture forecast, version 2 (UCERF 2): U.S. Geological Survey Open File Report 2007-1437.

The following photos and plates are attached and complete this report:

Photo 1 – Southerly view across 2700 parking lot...
Photo 2 – Southerly view across 2750 parking lot...
Photo 3 – Northerly view across vacant 2790...

Plate 1 – Vicinity Map
Plate 2 – Site Aerial View & Generalized Cross Section A-A'
Plate 3 – Geologic Map
Plate 4 – Log of Boring 1
Plate 5 – Log of Boring 2
Plate 6 – Log of Boring 3
Plate 7 – Log of Boring 4
Plate 8 – Key to Borings
Plate 9 – Plasticity Chart

We trust that this provides you with the information you require at this time. If you have any questions, please call.

Very truly yours,

Earth Investigations Consultants

Joel E. Baldwin, II
Engineering Geologist 1132 (renewal date 2/28/15)

David W. Buckley
Civil Engineer 34386 (renewal date 9/30/13)

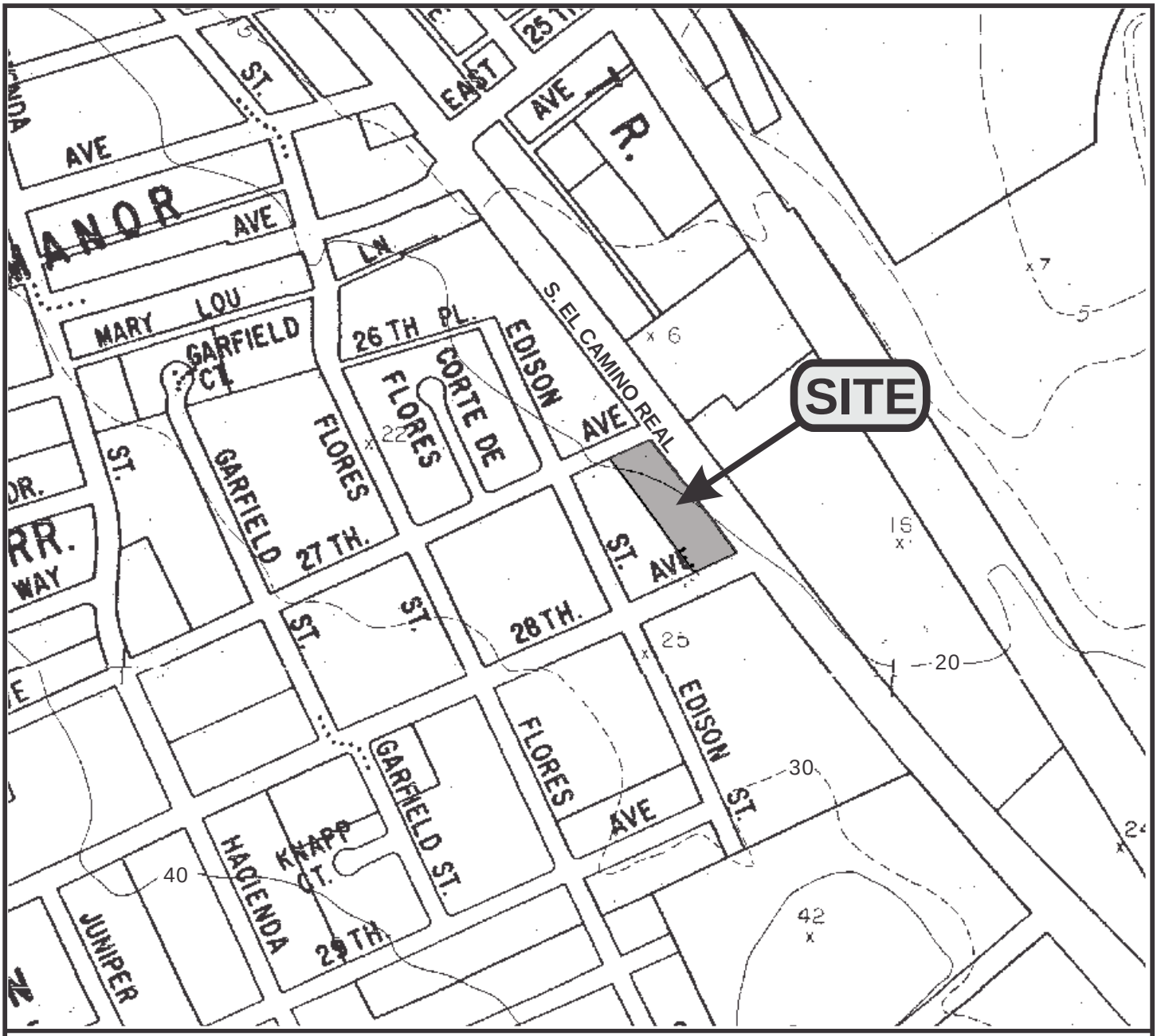
REGISTERED PROFESSIONAL ENGINEER
DAVID W. BUCKLEY
C. 34386
Exp. 9/30/13
CIVIL
STATE OF CALIFORNIA

JEB:DWB:jb:gi
Distribution: 3 copies and e-file to addressee

Photo 1 - Southerly view across 2700 parking lot toward existing building. Multi-residential building borders western side of property in upper right of view.

Photo 2 - Southerly view across 2750 parking lot toward existing building.

Photo 3 - Northerly view across vacant 2790 (former Texaco service station) toward building on southern side of 2750.



N

0 400 ft.

Scale

San Mateo County Topographic Map 8F & 9F (1/1/96)

Earth Investigations Consultants	**Job No.** 1130.14.00 **Date** 9/5/13	**VICINITY MAP** 2700-2790 S. El Camino Real San Mateo, California	**Plate** 1

S. EL CAMINO REAL

27TH AVENUE

28TH AVENUE

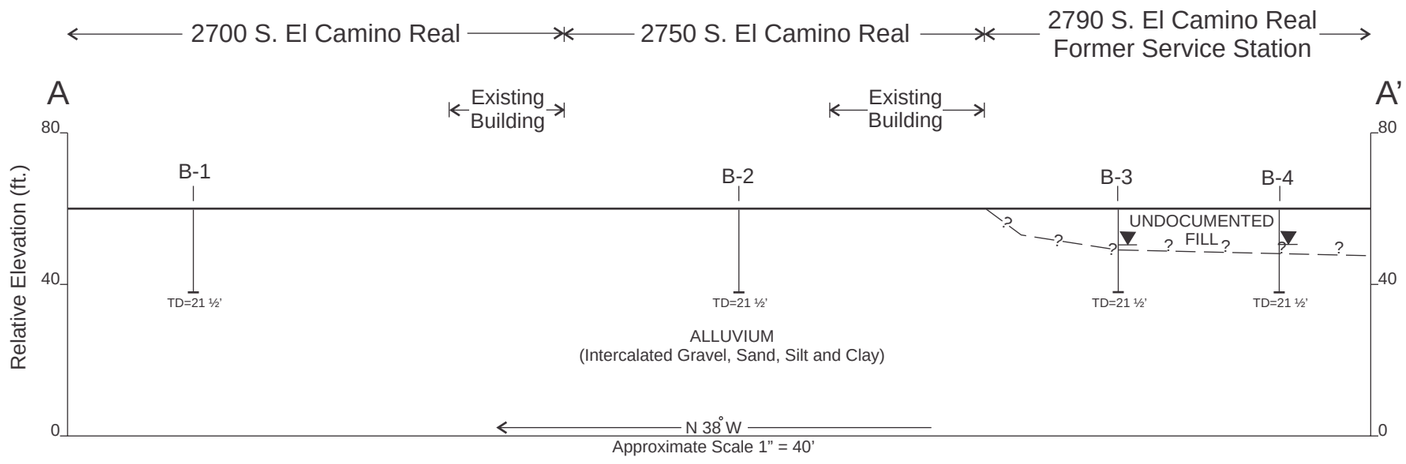
EXPLANATION

Approximate limits of undocumented fill placed during tank removal and site clean-up

B-1 Approximate boring location

A — A' Line of cross section A-A'

SITE AERIAL VIEW



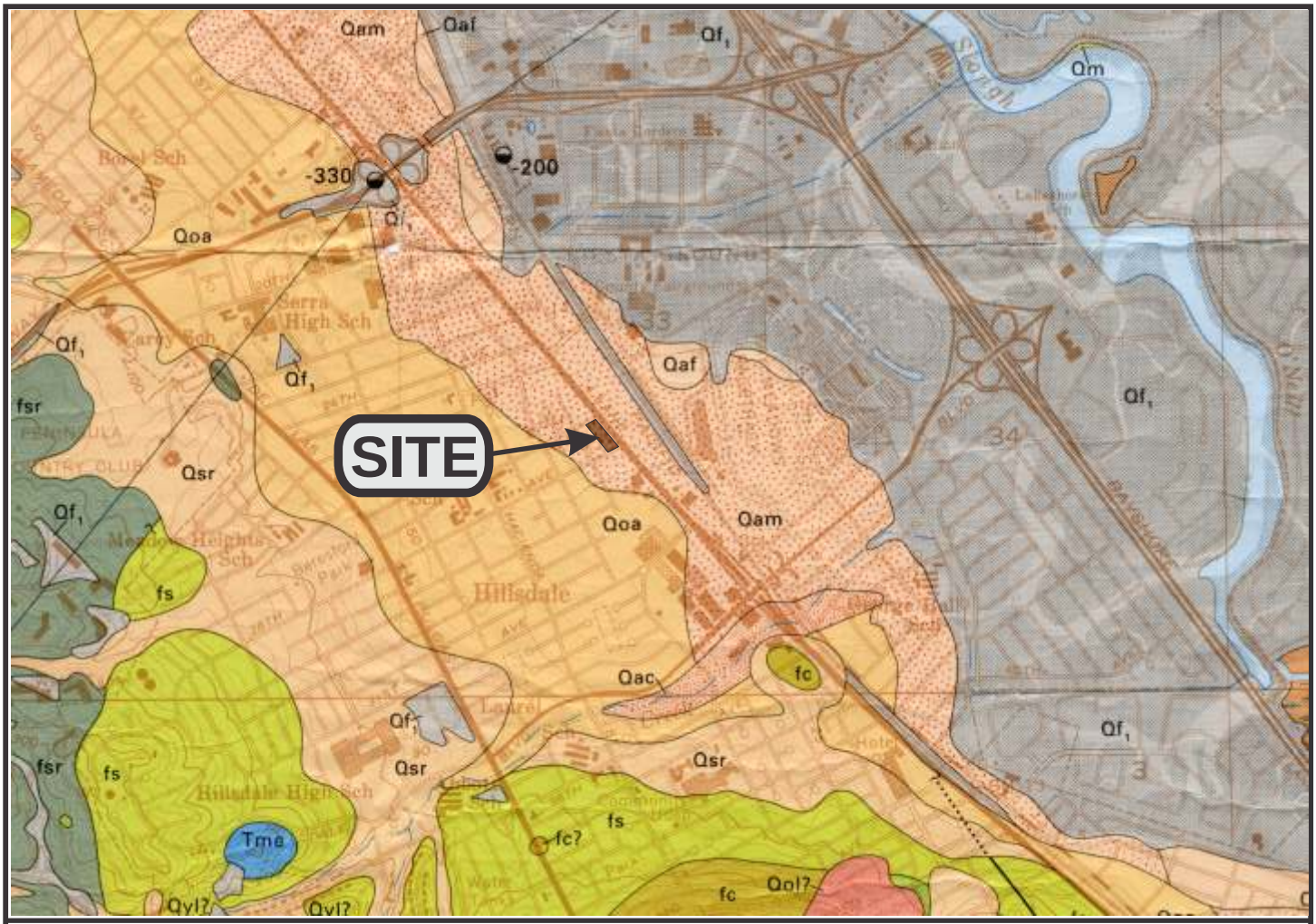
0 ~40 ft.
Scale

1) Aerial view from Google Earth (2011)

2) Site profile inferred from site observations

GENERALIZED CROSS SECTION A-A'

Earth Investigations Consultants	Job No. 1130.14.00 Approved Date 9/5/13	SITE AERIAL VIEW & GENERALIZED CROSS SECTION A-A' 2700-2790 S. El Camino Real San Mateo, California	Plate 2



EXPLANATION

Qf	Artificial fill
Qaf	Fine-grained alluvium
Qam	Medium-grained alluvium
Qac	Coarse-grained alluvium
Qoa	Older alluvium
Qsr	Slope wash, ravine fill and colluvium
Qm	Bay mud
Qyl	Younger landslide deposits
Qol	Older landslide deposits
Tme	Merced formation

Geologic contact - dotted where concealed queried where existence or position is uncertain

Fault - dashed where inferred; dotted where concealed; queried where existence or extension is uncertain

-200 Borehole to basement - showing elevation of top of basement (Franciscan Complex). Datum is mean sea level

Franciscan Complex

fs	Sandstone
fc	Chert
fsr	Sheared Rock

N

0 2000 ft.

Scale

Map from Pampeyan, 1994

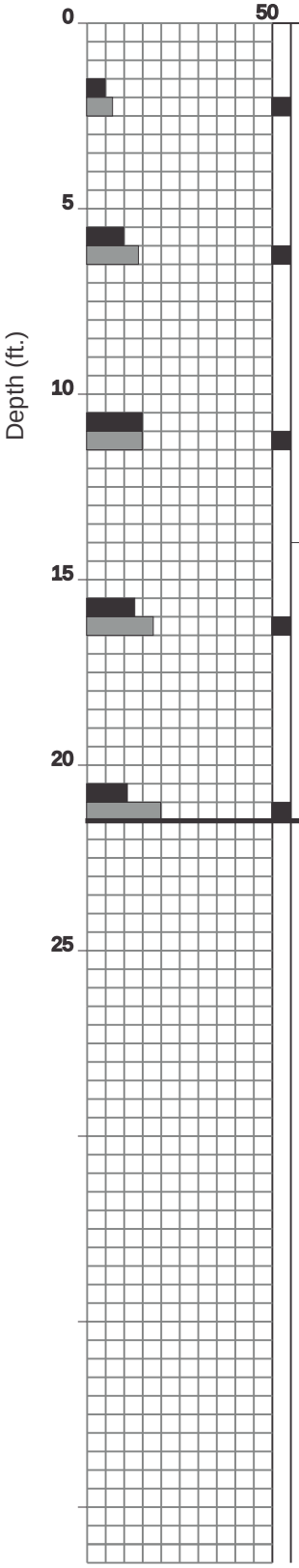
Earth Investigations Consultants	**Job No.** 1130.14.00 **Date** 9/5/13	**GEOLOGIC MAP** 2700-2790 S. El Camino Real San Mateo, California	**Plate** 3

BORING 1

Equipment Truck Mounted Flight Auger

Elevation ✦ ~20' **Date** 7/19/2013

Pocket Pen (tsf)	Torvan (tsf)	Dry Density (pcf)	Moisture Content (%)	Blows/Foot (SPT)
2.25	0.78	111.8	16.0	12
		120.9	12.6	24
		114.4	13.8	30
3.5	0.741	105.0	21.9	31
>4.5	>1	108.7	17.5	31



~5" Asphalt concrete and 4" baserock
Dark greyish brown and dark grey, Sandy CLAY with Gravel, damp, stiff (ALLUVIUM)

color changes to yellowish brown and grey at 4'
becomes very stiff

Yellowish brown Gravelly, Sandy CLAY/Clayey SAND, damp. very stiff/dense (ALLUVIUM)

Terminated at 21 ½'

EXPLANATION

✦ Elevation from Plate 1 - Vicinity Map

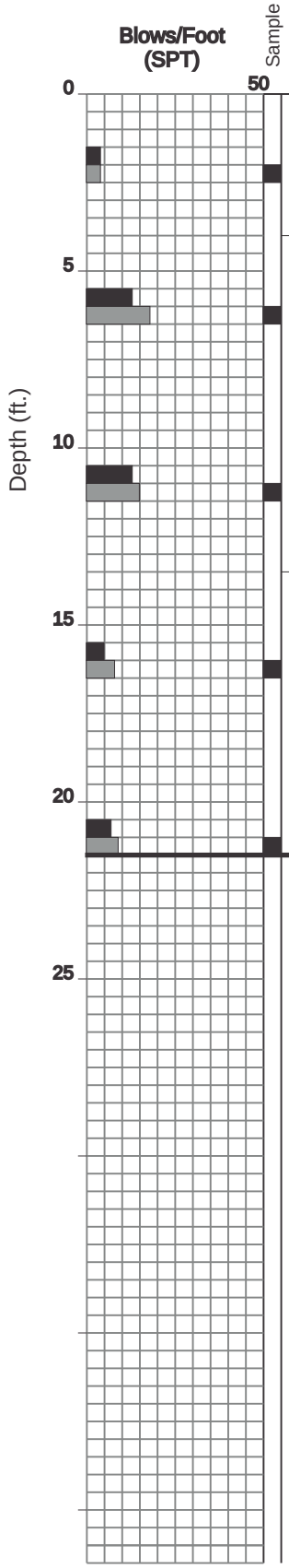
Earth Investigations Consultants	Job No. 1130.14.00 Date 9/5/13	LOG OF BORING 2700-2790 S. El Camino Real San Mateo, California	Plate 4

BORING 2

Equipment: Truck Mounted Flight Auger

Elevation: ~20' ✦ Date: 7/19/2013

Pocket Pen (tsf)	Torvan (tsf)	Dry Density (pcf)	Moisture Content (%)	Blows/Foot (SPT)
2.5	>1	103.9	21.2	8
3.0	0.36	111.2	15.7	31
4.0	>1	109.9	18.2	28
	1	124.2	12.6	13
		116.9	14.6	16



3" Asphalt concrete and 4" baserock
Dark greyish brown ,Sandy CLAY with Gravel, damp, firm (ALLUVIUM)

Yellowish brown and dark yellowish brown, Sandy Gravelly CLAY/Clayey GRAVEL, damp, very stiff/ medium dense to dense (ALLUVIUM)
seepage at 6'

Yellowish brown and brown, Sandy CLAY, damp, stiff (ALLUVIUM)

color changes to dark yellowish brown

Terminated at 21 ½'

EXPLANATION

✦ Elevation from Plate 1 - Vicinity Map

Earth Investigations Consultants	Job No. 1130.14.00 Date 9/5/13	LOG OF BORING 2700-2790 S. El Camino Real San Mateo, California	Plate 5

BORING 3

Equipment: Truck Mounted Flight Auger

Elevation: ~20' ✦ Date: 7/19/2013

Pocket Pen (tsf)	Torvan (tsf)	Dry Density (pcf)	Moisture Content (%)	Blows/Foot (SPT)	USCS	Description
>4.5		114.4	15.4	9	CL	Dark yellowish brown, Sandy CLAY with Gravel, damp, stiff (FILL)
>4.5		111.2	15.1	10		
		111.8	17.5	14	SC	Greyish brown, Gravelly Clayey SAND, wet, medium dense (FILL?) ▼
2.0	0.25	119.2	15.1	20	CL/SC	Yellowish brown, Sandy CLAY/Clayey SAND, wet, stiff/medium dense (ALLUVIUM)
		125.5	12.6	36	CL	Yellowish brown, Gravelly, Sandy CLAY, very damp, hard (ALLUVIUM)
						Terminated at 21 ½'

Blows/Foot (SPT) 0 – 50

Depth (ft.): 0, 5, 10, 15, 20, 25

EXPLANATION

✦ Elevation from Plate 1 - Vicinity Map

▼ Ground water elevation after drilling

Earth Investigations Consultants	Job No. 1130.14.00 Date 9/5/13	LOG OF BORING 2700-2790 S. El Camino Real San Mateo, California	Plate 6

BORING 4

Equipment: Truck Mounted Flight Auger

Elevation: ~20' ✦ Date: 7/19/2013

Pocket Pen (tsf)	Torvan (tsf)	Dry Density (pcf)	Moisture Content (%)	Blows/Foot (SPT)	Depth (ft.)	Sample	USCS	
					0			
		119.7	6.5	19			SM	Dark brown, Gravelly Silty SAND, moist, medium dense (FILL)
					5			
		123.9	15.4	17			SM	Greyish brown, Clayey Silty SAND with Gravel, damp, medium dense (FILL?)
					10			▼ saturated, No Recovery
				12				
					15		SP	Yellowish brown, Gravelly SAND, saturated, dense (ALLUVIUM)
				39/9"				No Recovery
					20		CL	Yellowish brown, Gravelly Sandy CLAY, damp, very stiff (ALLUVIUM)
		111.2	15.4	23				
					25			Terminated at 21 ½'

Blows/Foot (SPT): 0 – 50

EXPLANATION

✦ Elevation from Plate 1 - Vicinity Map

▼ Ground water elevation after drilling

Earth Investigations Consultants	Job No. 1130.14.00 Date 9/5/13	LOG OF BORING 2700-2790 S. El Camino Real San Mateo, California	Plate 7

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	Orangic 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.
			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.

Definition of Terms

U.S. Standard Series Sieve — **Clear Square Sieve Openings**

200	40	10	4	3/4"	3"	12"

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

Grain Sizes

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

Relative Density

SILTS AND CLAYS	STRENGTH **	BLOWS/FOOT*
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

Consistency

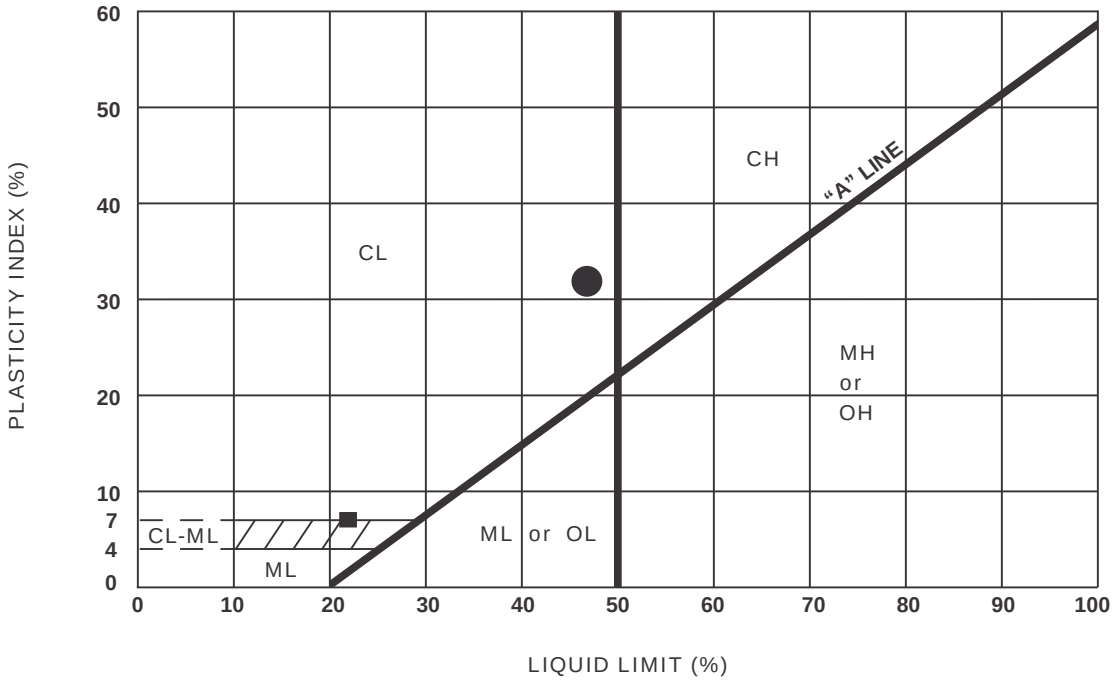
* Number of blows of 140 pound hammer falling 30 inches to drive a split spoon, SPT sampler (ASTM D-1586)

** Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

■ Sample location; blow counts listed are from the bottom 12 inches of 18- inch drive sample.

Unified Soil Classification System (ASTM D-2487)

Earth Investigations Consultants	Job No. 1130.14.00 Date 9/5/13	KEY TO BORINGS 2700-2790 S. El Camino Real San Mateo, California	Plate 8



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING NO. 200 SIEVE (%)	LIQUIDITY INDEX	USCS
●	B-1	2'	21	47	32	73	0.16	CL
■	B-2	2'	16	22	7	68	0.14	CL-ML

Earth Investigations Consultants	**Job No.** 1130.14.00 **Date** 9/5/13	**PLASTICITY CHART** 2700-2790 S. El Camino Real San Mateo, California	**Plate** 9