Attachment 5

GEOTECHNICAL INVESTIGATION
For
PROPOSED MIXED-USE RETAIL AND CONDOMINIUM PROJECT
3800 Portola Drive, Santa Cruz
APN 032-092-01, 05
Santa Cruz County, California

Prepared
For
NPI FUND II, LLC
% Hamilton Swift and Associates
Santa Cruz, California

Prepared By
DEES & ASSOCIATES, INC.
Geotechnical Engineers
Project No. SCR-0818
JULY 2014

Dees & Associates, Inc.
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July 31, 2014

Project No. SCR-0818

NPI FUND II, LLC
% Hamilton Swift and Associates
500 Chestnut Street, Suite 100
Santa Cruz, California 95060

Attention: John Swift

Subject: Geotechnical Investigation

Reference: Proposed Mixed-Use Retail and Condominium Project
3800 Portola Drive, Santa Cruz
APN 032-092-01, 05
Santa Cruz County, California

Dear Mr. Swift:

As requested, we have completed a Geotechnical Investigation for the new mixed retail and condominium project proposed at the referenced site. The purpose of our investigation was to evaluate the soil conditions at the site and provide geotechnical recommendations for design and construction of the proposed improvements.

This report presents the results, conclusions and recommendations of our investigation. If you have any questions regarding this report, please call our office.

Very truly yours,

DEES & ASSOCIATES, INC.

Rebecca L. Dees
Geotechnical Engineer
G.E. 2623

REGISTERED PROFESSIONAL ENGINEER
REBECCA LYNN DEES
No. 2623
EXP 12/15
GEOTECHNICAL
STATE OF CALIFORNIA

Copies: 4 to Addressee

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GEOTECHNICAL INVESTIGATION

Introduction

This report presents the results of our Geotechnical Investigation for the new mixed retail and condominium project proposed at the referenced site.

Purpose and Scope

The purpose of our investigation was to explore and evaluate surface and near surface soil conditions at the site and provide geotechnical recommendations for design and construction of the proposed improvements.

The specific scope of our services was as follows:

1. Site reconnaissance and review of available data in our files pertinent to the site and vicinity.

2. Exploration of subsurface conditions consisting of logging and sampling of three (3) exploratory borings drilled to 16.5 feet.

3. Laboratory testing to evaluate the engineering properties of the subsoils.

4. Engineering analysis and evaluation of the resulting field and laboratory test data. Based on our findings, we have developed geotechnical design criteria for general site grading, foundations, concrete slabs-on-grade, pavements and general site drainage.

5. Preparation of this report presenting the results of our investigation.

Project Location and Description

The nearly level site is located at 3800 Portola Drive in Santa Cruz County, California, Figure 1. The 0.81 acre combined parcel is bordered by Portola Drive to the north, 38th Avenue to the west, a single family residence to the south and commercial development to the east. The property is developed with an existing warehouse building and a combination of asphalt, oil and screen and gravel covering the remaining areas of the site.

The project consists of removing the existing improvements and constructing a new three story combined retail and condominium building and a detached garage. The building will have retail space on the ground floor and eight condominiums on the second and third floors. The three story building will be located on the western side of the parcel adjacent to 38th Avenue and the garages will be located in the southeast corner of the site. Paved parking and a driveway will be provided on the eastern side of the parcel. See Figure 2.

Field Investigation

Subsurface conditions at the site were explored on July 3, 2014 with three (3) exploratory borings drilled with 6-inch diameter continuous flight augers advanced with truck mounted drilling equipment. Our borings were drilled to 16.5 feet. The approximate locations of the exploratory borings are indicated on Figure 2.

The soils observed in the test borings were logged in the field and described in accordance with the Unified Soil Classification System (D2487 and D2488), Figures 3. The Test Boring Log denotes subsurface conditions at the locations and times observed, and it is not warranted it is representative of subsurface conditions at other locations or times.

Representative soil samples were obtained from the exploratory borings at selected depths, or at major strata changes. These samples were recovered using the 3.0-inch O.D. Modified California Sampler (L), 2.5-inch O.D. California Sampler (M), or the Standard Terzaghi Sampler (T). The penetration resistance blow counts for the (L), (M), and (T) noted on the boring logs were obtained as the sampler was dynamically driven into the in situ soil. The process was performed by dropping a 140-pound hammer a 30-inch free fall distance and driving the sampler 6 to 18 inches and recording the number of blows for each 6-inch penetration interval. The blows recorded on the boring logs present the accumulated number of blows that were required to drive the last 12 inches.

Laboratory Testing

The laboratory testing program was directed toward a determination of the physical and engineering properties of the soils underlying the site. Moisture content and dry densities were performed on representative soil samples to determine the consistency of the soil and the moisture variation throughout the explored soil profile. Atterberg Limit tests were performed to evaluate the relative shrink/swell potential of the foundation zone soils. The results of our field and laboratory testing appear on the "Logs of Test Borings", opposite the sample tested.

Subsurface Soil Conditions

The Santa Cruz County Geologic Map indicates the site is underlain by Terrace deposits, undifferentiated (Pleistocene), which is described as, "Weakly consolidated to semiconsolidated heterogeneous deposits of moderately to poorly sorted silt, silty clay, sand, and gravel. Mostly deposited in a fluvial environment. Thickness highly variable; locally as much as 60 ft thick. Some of the deposits are relatively well indurated in upper 10 ft of weathered zone".

The soils encountered in our borings were consistent with Terrace Deposits and consisted of thinly bedded silty sand, clayey sand, clay and silt over sand with varying amounts of gravel to the depths explored. The top 2 feet of soil consisted of loose to medium dense silty sand over a 1.5 to 2 foot thick layer of highly expansive stiff clay. The soils from 3.5 to 10 feet generally consisted of thin discontinuous layers of medium dense to dense silty sand, clayey, sand, silt, clay and gravel. The soils below 10 feet generally consisted of well graded sand with varying amounts of gravel. Visual examination of the soils indicates the samples collected from 10 to 15 feet varied from about 25 to 60 percent gravel. The soils below the site are classified as a Site Class "D" for analysis using the 2013 California Building Code.

Groundwater

Groundwater was not encountered in our borings. The Test Boring Log denotes groundwater conditions at the location and time observed, and it is not warranted it is representative of groundwater conditions at other locations or times. Groundwater levels can vary due to seasonal variations and other factors not evident during our investigation.

Seismicity

The project site is located in a seismically active region and several active and potentially active faults are located in the vicinity of the site. The following is a general discussion of seismicity in the project area. A more detailed discussion of faulting and seismicity is beyond the scope of our services.

The closest faults to the site are the Zayante Fault, the offshore Monterey-Tularcitos Fault, the San Andreas Fault and the offshore San Gregorio Fault. The San Andreas Fault is the largest and most active of the faults in the site vicinity. However, each fault is considered capable of generating moderate to severe ground shaking. It is reasonable to assume that the proposed development will be subject to at least one moderate to severe earthquake from one of the faults during the next fifty years.

Structures designed according to the 2013 California Building Code may use the following parameters in their analysis. The following ground motion parameters may be used in seismic design and were determined using the USGS Ground Motion Parameter Calculator.

Ss	S1	SMs	SM1	SDs	SD1
1.500 g	0.600 g	1.500 g	0.900 g	1.000 g	0.600 g

PGAm	0.5 g
Seismic Design Category (SDC) Occupancy Categories I and II	D

	Zayante Fault	Monterey Bay-Tularcitos Fault	San Andreas Fault	San Gregorio Fault
Distance Miles	6.4	8.4	9.6	11.5
Distance Kilometers	10.5	13.7	15.6	18.8

Liquefaction

Liquefaction occurs when saturated fine grained sands, silts and sensitive clays are subject to shaking during an earthquake and the water pressure within the pores builds up leading to loss of strength. There is a low potential for liquefaction to affect the proposed development due to the density of the subsoils and lack of a groundwater table.

Landsliding

The site is nearly level and there are no slopes in the project vicinity. There is no potential for landslides to affect the proposed development.

DISCUSSIONS AND CONCLUSIONS

Based on the results of our investigation, the proposed development at the site is feasible provided the recommendations presented in this report are incorporated into the design and construction of the project.

Primary geotechnical concerns for the project include mitigating shrink/swell of the expansive clays, controlling site drainage and designing structures to resist strong seismic shaking.

There is an 18 to 24 inch thick highly expansive clay layer located 2 feet below the ground surface. The clay should be removed from below foundations and concrete slab-on-grade floors. As an alternative, a mat foundation designed to resist shrink/swell of the foundation soils may be used.

If the expansive clays are removed, the top 3 feet of soil should be removed and replaced with non-expansive fill. The fill should consist of non-expansive, well graded soil with low permeability. A conventional foundation system embedded into the engineered fill may be used to support the building.

A mat slab foundation may also be used to support buildings. The top 12 inches of subgrade below the foundation should be compacted to provide a firm base for slab support and the mat slab should be designed to resist movement associated with shrinking and swelling of the subsoils.

Surface runoff should be controlled and not allowed to pond or flow adjacent to foundations. We understand runoff from improvements will be collected and retained on-site.

Structures should be designed to resist strong seismic shaking. Structures designed in accordance with current seismic design requirements should react well to seismic shaking.

RECOMMENDATIONS

The following recommendations should be used as guidelines for preparing project plans and specifications:

General Site Grading

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

2. Grading is expected to consist of foundation excavations, subgrade preparation below concrete slabs and pavements, and minor grading to obtain positive drainage. No other earthwork should be performed without further geotechnical review.

3. Engineered fill should be moisture conditioned, placed in thin lifts less than 8-inches in loose thickness and compacted. Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557.

4. Soils used for engineered fill should be granular, have a Plasticity Index less than 15, be free of organic material, and contain no rocks or clods greater than 6 inches in diameter, with no more than 15 percent larger than 4 inches. The coarse sands located in the top 2 feet of the site are suitable for use as engineered fill. The clay 2 feet below the ground surface is not suitable for use as engineered fill.

5. Engineered fill should be moisture conditioned to about 1 to 2 percent over optimum moisture content and compacted to at least 90 percent relative compaction.

6. At a minimum, the upper 12 inches of subgrade below concrete slabs-on-grade floors, walkways and patios should be moisture conditioned to about 1 to 2 percent over optimum moisture content and compacted to at least 90 percent relative compaction to provide a firm uniform base for slab support. Refer to the *Exterior Concrete Slabs-On-Grade* section for more information regarding subgrade preparation below exterior concrete slabs-on-grade.

7. The upper 12 inches of subgrade below driveway pavement or slabs should be moisture conditioned to about 1 to 2 percent over optimum moisture content and compacted to at least 95 percent relative compaction.

8. Engineered fill should be observed and tested by our firm. In-place density tests should be performed as follows: one test for every 12 vertical inches of material for backfill in trenches or around structures, one test for every 2,000 square feet of area

and one test whenever there is a definite suspicion of a change in the quality of moisture control or effectiveness in compaction.

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

Foundations

10. To mitigate damage to foundations and concrete slab-on-grade floors from expansion of the clayey soils we recommend removing the highly expansive clays or designing the structure to resist soil expansion.

11. If the expansive clays are removed, the top 3 feet of soil should be removed and replaced with engineered fill. The fill should extend at least 5 feet beyond the perimeter of the foundation. Conventional spread footings may then be used to support the structure.

12. As an alternative a mat slab foundation may be used to resist swelling and prevent structural damage to the structure. Deflections and racking of the structure should be controlled to maintained usability and serviceability of the structure.

Conventional Spread Footings

13. Conventional spread footings may be used as long as the footings are embedded into engineered fill as recommended above.

14. One-story footings should be at least 12 inches deep and 12 inches wide, two-story footings should be at least 18 inches deep and 15 inches wide and three-story footings should be at least 18 inches deep and 18 inches wide. Footing depths shall be measured from the lowest adjacent grade.

15. Foundations designed in accordance with the above may be designed for an allowable soil bearing pressure of 2,000 psf for foundations embedded into engineered fill. The allowable bearing capacity may be increased by 1/3 for short term seismic and wind loads.

16. Total and differential settlements are anticipated to be less than 1 inch and 1/2 inch respectively for footings designed and constructed in accordance with the above.

17. Lateral sliding resistance for structures supported on footings may be developed between the foundation bottom and the supporting subgrade. Where foundations are poured neat against the adjacent subgrade surface, an allowable lateral bearing pressure of 275 pcf, equivalent fluid weight may be used.

18. Utility trenches and footings should not extend within an imaginary 1.5:1 plane projected downward from the bottom edge of adjacent footings. Utility trenches that

pass below the foundation should be backfilled with lean concrete slurry to prevent infiltration of water below the structure.

19. The foundation excavations should be kept moist from the time of excavation and thoroughly wetted prior to placing concrete.

20. Prior to placing concrete, foundation excavations should be observed by the soils engineer.

Stiffened Mat and Post-Tensioned Slab-on-Grade Foundations

21. Slab-on-grade should be expected to have up to 1.5 inches of total movement and 0.75 inches of differential movement from shrink/swell of the clayey soils. Slab-on-grade foundations should be designed to reduce deformation to within allowable levels. Allowable deflections should be determined by your designer.

22. The soil parameters provided below may be used in slab design.

Edge Lift (e_m) = 7.7 ft	Maximum Differential Heave (y_m) = 1.5 in	Subgrade Modulus (k_s) = 100 lbs/in^3
Center Lift (e_m) = 3.8 ft	Coefficient of Friction (f_s) = 0.30	Poisson's Ratio (μ) = 0.2

23. The top 12 inches of subgrade soil below mat slabs should be moisture conditioned to 1 to 2 percent over optimum moisture content and compacted to 90 percent relative compaction to provide a firm, uniform base for slab support.

24. Dees & Associates are not experts in the field of moisture proofing and vapor barriers. Therefore, in areas where floor wetness would be undesirable, an expert, experienced with moisture transmission and vapor barriers should be consulted. At a minimum, a blanket of four (4) inches of free-draining gravel should be placed beneath the floor slab to act as a capillary break. In order to minimize vapor transmission, an impermeable membrane equivalent to Stego® (10 mil or thicker) should be placed over the gravel.

Interior Concrete Slabs-on-Grade

25. The top 3 feet of soil below the base of interior floor slabs should be removed and replaced with non-expansive engineered fill as recommended above or the floor slab should be part of a mat slab foundation design to resist differential movement from shrink/swell of the clayey soils.

26. All slabs-on-grade can be expected to suffer some cracking and movement. However, thickened exterior edges, a well prepared subgrade including pre-moistening prior to pouring concrete, adequately spaced expansion joints and good workmanship should reduce cracking and movement.

27. Dees & Associates, Inc. are not experts in the field of moisture proofing and vapor barriers. In areas where floor wetness would be undesirable, an expert, experienced with moisture transmission and vapor barriers should be consulted. At a minimum, a blanket of 4 inches of free-draining gravel should be placed beneath the floor slab to act as a capillary break. In order to minimize vapor transmission, an impermeable membrane equivalent to Stego® (minimum 10 mil) should be placed over the gravel. The membrane should be properly sealed along the edges and at all perforations.

Exterior Concrete Slabs-on-Grade

26. The top 3 feet of soil below the base of exterior concrete slabs should be removed and replaced with non-expansive engineered fill as recommended above or the exterior slabs may move with shrink/swell of the underlying clayey soils. If the top 3 feet of soil is not replaced and slabs are allowed to move, the slabs should be adequately sloped to take into account the potential movement to prevent runoff from being directed towards foundations in the future.

27. At a minimum, the upper 12 inches of subgrade below exterior non-load bearing concrete slabs-on-grade should be moisture conditioned to about 1 to 2 percent over optimum moisture content and compacted to at least 90 percent relative compaction to provide a firm, uniform base for support.

28. The upper 12 inches of subgrade below concrete slabs used for driveways or parking should be moisture conditioned to about 1 to 2 percent over optimum moisture content and compacted to at least 95 percent relative compaction.

29. All slabs-on-grade can be expected to suffer some cracking and movement. However, thickened exterior edges, a well prepared subgrade including pre-moistening prior to pouring concrete, adequately spaced expansion joints and good workmanship should reduce cracking and movement.

Site Drainage

30. Controlling surface and subsurface runoff is important to the performance of the project.

31. Surface drainage should include provisions for positive gradients so that surface runoff is not permitted to pond adjacent to foundations or other improvements. Where bare soil or pervious surfaces are located next to the foundation, the ground surface within 10 feet of the structure should be sloped at least 5 percent away from the foundation. Where impervious surfaces are used within 10 feet of the foundation, the impervious surface within 10 feet of the structure should be sloped at least 2 percent away from the foundation. Swales should be used to collect and remove surface runoff where the ground cannot be sloped the full 10 foot width away from the structure. Swales should be sloped at least 2 percent towards the discharge point.

32. Full roof gutters should be placed around the eves of structures. Discharge from the roof gutters should be conveyed away from the downspouts and discharged in a controlled manner.

33. Concentrated runoff may be directed to storm drain facilities or retained on site. If water is retained on site discharge locations should be located at least 10 feet from foundations and at least 5 feet from utility trenches.

Plan Review, Construction Observation, and Testing

34. Dees & Associates, Inc. should be provided the opportunity for a general review of the final project plans prior to construction to evaluate if our geotechnical recommendations have been properly interpreted and implemented. If our firm is not accorded the opportunity of making the recommended review, we can assume no responsibility for misinterpretation of our recommendations. We recommend that our office review the project plans prior to submittal to public agencies, to expedite project review. Dees & Associates, Inc. also requests the opportunity to observe and test grading operations and foundation excavations at the site. Observation of grading and foundation excavations allows anticipated soil conditions to be correlated to those actually encountered in the field during construction.

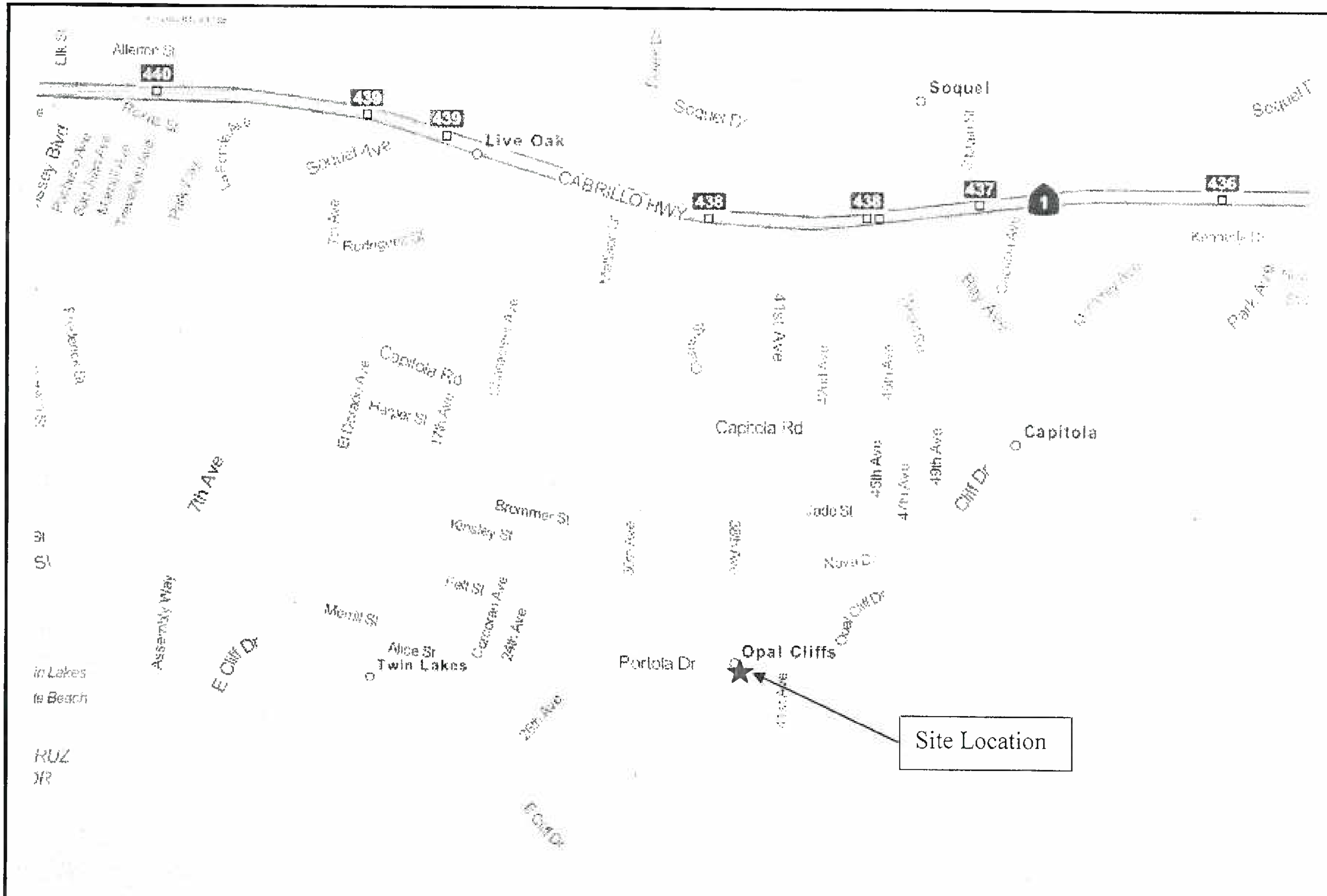
LIMITATIONS AND UNIFORMITY OF CONDITIONS

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

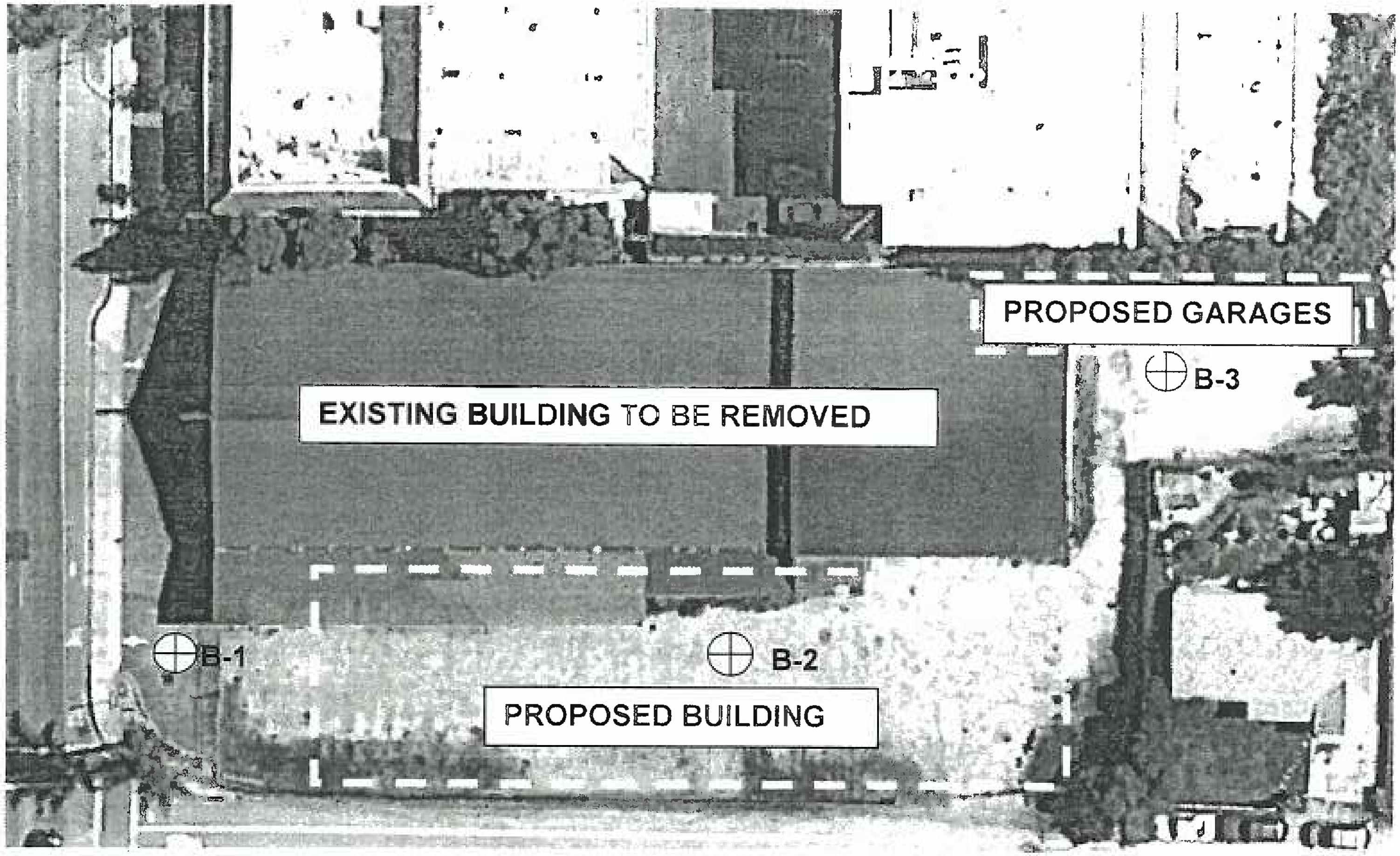
2. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that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

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

APPENDIX A



Dees & Associates, Inc. Geotechnical Engineers	SITE VICINITY MAP	Figure: 1	
	3800 Portola Drive Santa Cruz County, California	Project Number: SCR-0818	
		Scale: N.T.S.	July 2014



Dees & Associates, Inc.
Geotechnical Engineers

BORING SITE PLAN	Figure: 2	
3800 Portola Drive Santa Cruz County, California	Project Number: SCR-0818	
	Scale: N.T.S.	July 2014

THE UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	CLASSIFICATION CRITERIA	
COARSE-GRAINED SOILS** MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE (THE NO. 200 SIEVE SIZE IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE)	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS (< 5% FINES)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Wide range in grain sizes and substantial amounts of all intermediate particle sizes	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Predominantly one size or a range of sizes with some intermediate sizes missing Not meeting all gradation requirements for GW	
		GRAVELS WITH FINES (>12% FINES)	GM	Silty gravels, gravel-sand-silt mixtures	Non plastic fines or fines with low plasticity Atterberg limits below "A" line or PI < 4	Above "A" line with 4 < PI < 7 are borderline cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	Plastic fines Atterburg limits above "A" line with PI > 7	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS (<5% FINES)	SW	Well-graded sands, gravelly sands, little or no fines	Wide range in grain sizes and substantial amounts of all intermediate sizes missing	
			SP	Poorly graded sands, gravelly sands, little or no fines	Predominantly one size or a range of sizes with some intermediate sizes missing Not meeting all gradation requirements for SW	
		SANDS WITH FINES (>12% FINES)	SM	Silty sands, sand-silt mixtures	Non plastic fines or fines with low plasticity Atterburg limits below "A" line or PI < 4	Limits plotting in hatched zone with 4 < PI < 7 are borderline cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	Plastic fines Atterburg limits above "A" line with PI > 7	
FINE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE (THE NO. 200 SIEVE SIZE IS ABOUT THE SMALLEST PARTICLE VISIBLE	SILTS AND CLAYS (LIQUID LIMIT < 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			OL	Organic silts and organic silty clays of low plasticity		
	SILTS AND CLAYS (LIQUID LIMIT > 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH	Inorganic clays of medium to high plasticity, organic silts		
			OH	Organic clays of medium to high plasticity, organic silts		

**Gravels and sands with 5% to 12 % fines are borderline cases requiring use of dual symbols.

RELATIVE DENSITY OF SANDS AND GRAVELS

DESCRIPTION	BLOW / FT*
VERY LOOSE	0 – 4
LOOSE	4 – 10
MEDIUM DENSE	10 – 30
DENSE	30 – 50
VERY DENSE	OVER 50

CONSISTENCY OF SILTS AND CLAYS

DESCRIPTION	BLOWS / FT*
VERY SOFT	0 – 2
SOFT	2 – 4
FIRM	4 – 8
STIFF	8 – 16
VERY STIFF	16 – 32
HARD	OVER 32

*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. 12 vertical inches.

L M T B

SAMPLE TYPES REFERENCED ON BORING LOGS

TEST BORING LOGS

LOGGED BY: CL DATE DRILLED: 7-3-14 BORING TYPE: 6" Solid Stem BORING NO: 1

DEPTH (FEET)	SAMPLE NO.	SOIL DESCRIPTION	USC SOIL TYPE	BLOW COUNT (350 Ft. Lb)	BLOWS PER FOOT *	DRY DENSITY (PCF)	MOISTURE IN-SITU	COHESION (PSF)	PHI ANGLE	% PASSING 200 SIEVE	PLASTICITY INDEX	MISC. LAB RESULTS
-		4" Asphalt over 4 inches Baserock										
1	1-1-1	Yellow brown coarse Silty SAND, moist, loose	SP									
-				5								
2				6								LL=
-	L	Olive brown grading to brown CLAY, moist, stiff		11	9	98.6	24.4				48.4	65.5
3	1-2		CH									
-				5								
4	T	Light yellow brown Sandy SILT to Silty SAND, damp, dense	SM	12								
-		Approximate contact		25	27		15.3					
5												
-	1-3	Yellow brown fine to coarse Silty SAND, moist, dense	SW/	20								
6			GP	23								
-	T	Yellow brown Sandy GRAVEL lenses, damp, dense		28	51		10.9					
7												
-												
8												
-												
9												
-												
10	1-4	Presumed contact based on Borings 2 and 3										
-				20								
11		Dark yellowish brown fine to coarse Gravelly SAND, moist,	SW	22								
-	T	dense		24	46		10.9					
12												
-												
13												
-												
14												
-												
15	1-5			17								
-			SW	20								
16	T	Yellow Brown coarse Gravelly SAND, moist to wet, dense		20	40		14.2					
17		Boring terminated at 16.5 feet.										
-		No groundwater encountered.										
18		Soils becoming wet at 15 feet.										
-												
19												
-												
20												
-												
21												
-												
22												
-												
23												
-												
24												
-												
25												
-												
26												

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Project No. SCR-0818

* Blow count converted
L = Field Blow Count/2

TEST BORING LOGS

LOGGED BY: CL DATE DRILLED: 7-3-14 BORING TYPE: 6” Solid Stem BORING NO: 2

DEPTH (FEET)	SAMPLE NO.		SOIL DESCRIPTION	USC SOIL TYPE	BLOW COUNT (350 Ft. Lb)	BLOWS PER FOOT *	DRY DENSITY (PCF)	MOISTURE IN-SITU	COHESION (PSF)	PHI ANGLE	% PASSING 200 SIEVE	PLASTICITY INDEX	MISC. LAB RESULTS
-			2” Asphalt over 3 inches Baserock										
1	2-1-2		Yellow brown coarse Silty SAND, moist, medium dense	SM									
-					10								
2					11								
-	L		Dark gray to dark brown CLAY, moist, stiff		9	10		8.2					
3	2-2			CH									
-					3								
-					5								
4	T		Dark brown and olive brown Silty CLAY, moist, very stiff	CH/ CL	11	16		18.8					
5													
-	2-3				6								
6			Olive brown SILT/CLAY to fine Sandy SILT, moist, very stiff	CL	10								
-	T				17	27		17.2					
7													
-													
8													
-													
9													
-													
10	2-4												
-					9								
11				SM	11								
-	T		Olive brown fine Silty SAND, moist, medium dense		12	23		18.3					
12			Contact per drillers										
-													
13													
-													
14													
-													
15	2-5												
-					15								
16			Olive brown Silty SAND with Gravel, very moist to wet,	SM	20								
-	T		dense		20	40		19.2					
17			Boring terminated at 16.5 feet.										
-			No groundwater encountered.										
18			Soils becoming wet at 16.5 feet.										
-													
19													
-													
20													
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26													

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* Blow count converted
L = Field Blow Count/2

TEST BORING LOGS

LOGGED BY: CL **DATE DRILLED: 7-3-14** **BORING TYPE: 6" Solid Stem** **BORING NO: 3**

DEPTH (FEET)	SAMPLE NO.		SOIL DESCRIPTION	USC SOIL TYPE	BLOW COUNT (350 Ft. Lb)	BLOWS PER FOOT *	DRY DENSITY (PCF)	MOISTURE IN-SITU	COHESION (PSF)	PHI ANGLE	% PASSING 200 SIEVE	PLASTICITY INDEX	MISC. LAB RESULTS
-			½ inch Chipseal over 7 inches of Baserock										
1	3-1-1		Yellow brown coarse SAND, moist, medium dense	SP									
-					6								
2					10								
-	L		Olive brown CLAY, moist, very stiff		11	11	111.2	26.1					
3	3-2			CH	4								
-			Light brownish gray CLAY, moist, very stiff		5								
4	T				15	20		18.8					
-													
5				SC/									
-	3-3		Olive brown Clayey SAND with lenses of Clayey GRAVEL, moist, medium dense	GP	8								
6					16								
-	T				16	32		11.8					
7													
-													
8													
-													
9													
-													
10													
-			Contact based on drilling resistance per drillers										
11													
-													
12													
-													
13													
-													
14													
-													
15	3-4												
-			Light olive brown fine Sandy CLAY/SILT with Gravels, very moist to wet	ML/	10								
16				CL	11								
-	T				13	24		15.3					
17													
-			Boring terminated at 16.5 feet. No groundwater encountered. Soils becoming wet at 15 feet.										
18													
-													
19													
-													
20													
-													
21													
-													
22													
-													
23													
-													
24													
-													
25													
-													
26													

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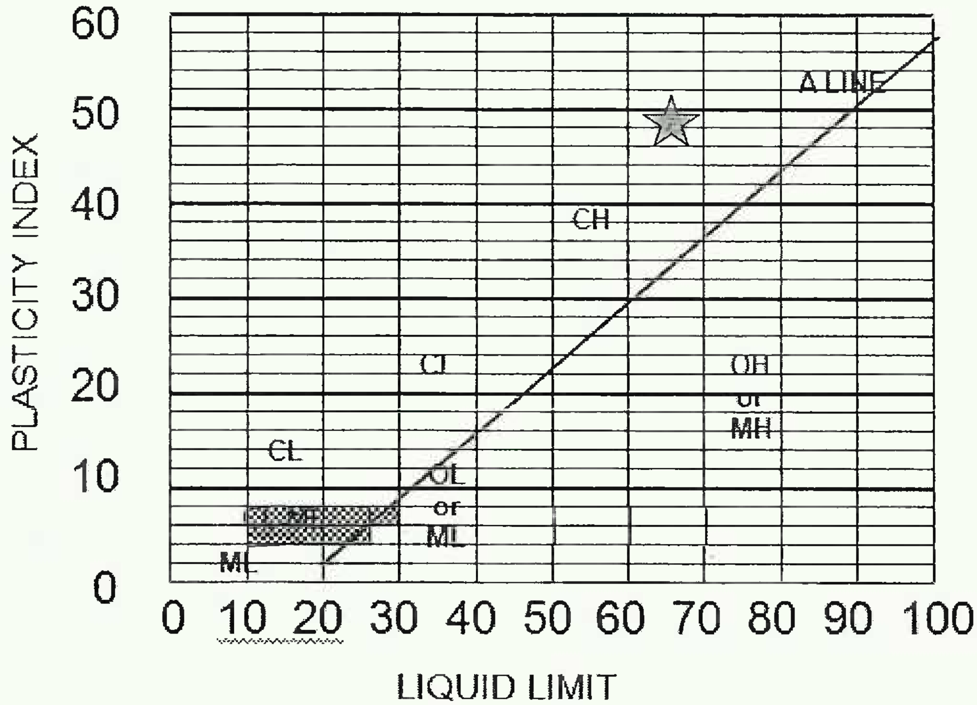
Project No. SCR-0818

* Blow count converted
L = Field Blow Count/2



MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	ML	Inorganic silts and very fine sands, rock flour, silty clayey fine sands or clayey silts with slight plasticit
CH	Inorganic clays of medium to hi plasticity, organic silts, fat clays	CL	Inorganic clays of low to medium plasticity, gravell clays, sandy clays, silty clays, lean clays
OH	Organic clays of medium to hig plasticity, organic silts	OL	Organic silts and organic silty clays of low plasticit
Pt	Peat and other highly organic s		

PLASTICITY DATA

SYMBOL	SAMPLE NO.	DEPTH (FEET)	IN-SITU MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%	PLASTICITY INDEX (%)	LIQUIDITY INDEX (W-PL)/(LL PL)	UNIFIED SOIL CLASSIFICATION SYMBOL
☆	1-1-1	2.0	25.4	65.5	17.1	48.4	0.17	CH