

GEOTECHNICAL INVESTIGATION REPORT
8-LOT SUBDIVISION
SKYTT MESA ROAD (APN 137-120-023)
SOLVANG, CALIFORNIA

June 23, 2022
PROJECT
22-0299

FOR

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Subject: Preliminary Geotechnical Investigation, Proposed 8-Lot Subdivision, Skytt Mesa Road, North of Highway 246 (APN 137-120-023), Solvang, California.

Dear Morris:

Pacific Coast Testing (PCT) is pleased to submit this Preliminary Geotechnical Investigation Report for the proposed 8-lot subdivision at Skytt Mesa Road (APN 137-120-023), Solvang, California. This report was prepared in accordance with the scope of services presented in our proposal. The report provides preliminary geotechnical recommendations for site preparation, foundations, slabs-on-grade, retaining walls, pavement sections etc.

As discussed in the report, the primary concerns from a geotechnical standpoint are the expansivity of the near surface soils, the sloping terrain and the potential for differential movements. It is recommended that the residences be supported on conventional stiffened footings over compacted select non-expansive soils. As noted in this report, the driveways/roadways to the lots were not part of this study and additional geotechnical and geological investigations will be required prior to finalizing the grading plans.

Please contact the undersigned if you have any questions concerning the findings or conclusions provided in this report.

Sincerely,

PACIFIC COAST TESTING INC.



Ron J. Church
GE #2184



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1.0 INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed 8-Lot subdivision adjacent to Skytt Mesa Road (APN 137-120-023) in Solvang, California. A site location map is presented in Figure 1.

The property is located northwest of Skytt Mesa Road, approximately 1500 feet north of Highway 246 and is surrounded by vacant land, ranch properties and residential properties. Topographically, the property is slightly to steeply sloping. Gradients are typically in the range of 5:1 (horizontal:vertical) to 2:1 (h:v) in the area of the proposed residences with increasing gradients (1.5:1 to 2:1 h:v) adjacent to these areas. Elevations vary from around 550 feet above mean sea level (MSL) on the northside of the property to 380 feet on the southside. The property covers an area of approximately 44.54 acres. At the time of our field exploration, the boring locations were covered with native grasses and weeds. Trees were observed across the property, particularly in drainage areas. The topographic map provided by Urban Planning Concepts (UPC) forms the basis for the "Site Plan", Figure 2. The locations of the borings drilled for the proposed residences and leachfields are shown on Figure 2.

It is our understanding that the residences will be wood-framed structures with raised wood and concrete slab-on-grade floors. Due to the sloping terrain, some of the foundations will likely incorporate retaining walls. Footing loads for the proposed residences are presently unavailable. For the purpose of this report, loads on the order of 20 kips (columns) and 1.0 kip per lineal foot (continuous) have been estimated.

Figure 2 also shows preliminary locations for driveways/roadways within the proposed 8-lot development. The field exploration for the lots did not include these driveways/roadways. The pavement recommendations provided in this report pertain to the access road to the lots from Highway 246 and was limited to R-Value testing and preliminary pavement sections. Due to the large cuts and fills shown on Figure 2 to construct the driveways/roadways, additional geotechnical and geological investigations will be required prior to finalizing the grading plans.

The project description is based on a site reconnaissance performed by a Pacific Coast Testing, Inc., engineer and information provided by Urban Planning Concepts and Morris Sobhani (owner).

In the event that there is change in the nature, design or location of improvements, or if the assumed loads are not consistent with actual design loads, the conclusions and recommendations contained in this report should be reviewed and modified, if required. Evaluations of the soils for hydrocarbons or other chemical properties are beyond the scope of the investigation.

2.0 PURPOSE AND SCOPE

The purpose of this study was to explore and evaluate the surface and subsurface soil conditions at the site and to develop geotechnical information and design criteria for the proposed project. The scope of this study included the following items.

1. A review of available soil and geologic information for this area of Solvang.
2. A field study consisting of a site reconnaissance and an exploratory boring program to formulate a description of the subsurface conditions.
3. A laboratory testing program performed on representative soil samples collected during our field study.
4. Engineering analysis of the data gathered during our field study, laboratory testing, and literature review. Development of recommendations for site preparation, and geotechnical design criteria for foundations, slab-on-grade construction, retaining walls, preliminary pavement design sections and underground facilities.
5. Preparation of this report summarizing our findings, conclusions, and recommendations regarding the geotechnical aspects for the proposed residences.

3.0 SUBSURFACE SOIL CONDITIONS

The near surface materials generally consist of yellowish brown to light brown silty clays and silty sandy clays to a depth of 4 to 6 feet. These soils were found in a soft to very stiff condition and in a moist state. Laboratory testing indicates that these soils have low to moderate expansivity. Below the near surface soils, similar silty clays and silty sandy clays were found to a depth of 20 feet. These soils were found in a moist state and in a very stiff to hard condition. Based on our experience and deep borings drilled on nearby properties, similar soils and Sisquoc Formation claystone can be expected to a depth of 50 feet. Free ground water was not encountered at the time of the field investigation. Previous borings drilled in this area of Solvang, indicate that groundwater is unlikely to be encountered to a depth of 50 feet below existing grades. However, perched water conditions can be expected during wet winter months.

A more detailed description of the soils encountered is presented graphically on the "Exploratory Boring Logs," B-1 through B-16, Appendix A. An explanation of the symbols and descriptions used on these logs are presented on the "Soil Classification Chart".

The soil profile described above is generalized; therefore, the reader is advised to consult the boring logs (Appendix A) for soil conditions at specific locations. Care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the borings. On the boring logs we have indicated the soil type, moisture content, grain size, dry density, and the applicable Unified Soil Classification System Symbol.

The locations of our exploratory borings, shown on Site Plan, Figure 2, were approximately determined from features at the site. Hence, accuracy can be implied only to the degree that this method warrants. Surface elevations at boring locations were not determined.

4.0 SEISMIC CONSIDERATIONS

4.1 Seismic Coefficients

Structures should be designed to resist the lateral forces generated by earthquake shaking in accordance with the building code and local design practice. This section presents seismic design parameters for use with the California Building Code (CBC) and ASCE 7-16. The site coordinates and ASCE 7 Hazard Tool were used to obtain the seismic design criteria. The peak

ground acceleration was estimated for a 2 percent probability of occurrence in 50 years using the USGS online deaggregation tool.

Seismic Data

California Building Code Seismic Parameter	Values for Site Class C
Latitude, degrees	34.604000
Longitude, degrees	-120.156000
S ₁ Seismic Factor	1.482
S ₁ Seismic Factor	0.543
Site Class	Sc, Very Dense Soil & Soft Rock
F _a , Short-Period Site Coefficient (@ 0.2-s Period)	1.200
F _v , Long-Period Site Coefficient (@ 1.0-s Period)	1.457
F _{PGA} , Site Coefficient For PGA	1.200
S _{MS} , Site Specific Response Parameter for Site Class at 0.2 sec	1.779
S _{M1} , Site Specific Response Parameter for Site Class at 1 sec	0.791
S _{DS} = 2/3 S _{MS}	1.186
S _{D1} = 2/3 S _{M1}	0.527
Peak Ground Acceleration (2% probability in 50 years)	0.787
Likely Magnitude (M)	6.8

4.2 Liquefaction Analysis

Liquefaction is described as the sudden loss of soil shear strength due to a rapid increase of pore water pressures caused by cyclic loading from a seismic event. In simple terms, it means that the soil acts more like a fluid than a solid in a liquefiable event. In order for liquefaction to occur, the following are generally needed; granular soils (sand, silty sand and sandy silt), groundwater and low density (very loose to medium dense) conditions. A liquefaction study was not part of our scope for this project; however, an opinion can be provided based on the results of our soil borings and experience in this area of Solvang. In general, silty clays in a very stiff to hard condition were encountered below a depth of 5 feet. Based on our experience, similar soils over (Sisquoc Formation materials) can be expected to a depth of 50 feet below existing grades. As discussed above, groundwater is unlikely to be encountered to a depth of 50 feet below

existing grades. This information indicates that the potential for liquefaction would be in the negligible category.

4.3 Lateral Spreading

Due to the lack of liquefiable soil zones, the potential for lateral spreading displacements would be negligible.

4.4 Slope Stability

The property is located in slightly to steeply sloping terrain with gradients in the building pad areas in the range of 5:1 to 2:1 (h:v) with increasing gradients adjacent to the pad areas 1.5:1 to 2:1 (h:v). The potential for overall (gross) instability at the property would be low based on available geologic maps; however, there is a moderate to high potential for shallow instability due to the expansivity of the native materials. The preliminary plan for the driveways/roadways shows that slopes up to 40 feet high may be required. As noted previously, detailed geotechnical and geologic studies will be required prior to finalizing the grading plans.

4.5 Faulting

There are no active faults in the direct vicinity of the property. The nearest known active section of the Los Alamos-Baseline Fault is located to the north and west of the site. The property is not within a State of California Fault Hazards Zone (Alquist-Priolo). It is our opinion that there is a negligible potential for fault rupture to impact the proposed construction based on review of the published maps.

5.0 CONCLUSIONS AND RECOMMENDATIONS

1. The site is generally suitable from a geotechnical standpoint for the proposed residences provided the preliminary recommendations presented in this report are incorporated into the project plans and specifications.
2. The main geotechnical concerns at the site are the expansivity of the near surface soils, the sloping terrain and the potential for differential movements. As

indicated below, conventional stiffened footings over compacted select non-expansive soils are recommended for support of the residences.

3. All grading and foundation plans should be reviewed by Pacific Coast Testing Inc., hereinafter described as the Geotechnical Engineer, prior to contract bidding. This review should be performed to determine whether the recommendations contained within this report are incorporated into the project plans and specifications.
4. The Geotechnical Engineer should be notified at least two (2) working days before site clearing or grading operations commence and should be present to observe the stripping of deleterious material and provide consultation to the Grading Contractor in the field.
5. Field observation and testing during the grading operations should be provided by the Geotechnical Engineer so that a decision can be formed regarding the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the project geotechnical specifications. Any work related to grading performed without the full knowledge of, and under direct observation of the Geotechnical Engineer, may render the recommendations of this report invalid.

5.1 Clearing and Stripping

1. All surface and subsurface deleterious materials should be removed from the proposed building pad and improvement areas and disposed of off-site. This includes but is not limited to any trees and associated rootballs, buried utility lines, loose fills, septic systems, debris, building materials, and any other surface and subsurface structures within proposed building areas. Voids left from site clearing should be cleaned and backfilled as recommended for structural fill.
2. Once the site has been cleared, the exposed ground surface should be stripped to remove surface vegetation and organic soil. The surface may be disced, rather than stripped, if the organic content of the soil is not more than three

percent by weight. If stripping is required, depths should be determined by a member of our staff in the field at the time of stripping. Strippings may be either disposed of off-site or stockpiled for future use in landscape areas if approved by the landscape architect.

5.2 Site Preparation

1. The intent of these recommendations is to support the residences on a uniform mat of moisture conditioned select non-expansive import soils.
2. Where fill placement extends on to existing slopes exceeding 10 percent gradients benching will be required, where slopes exceed 20 percent gradients, keyways will be required. After construction of keyways and benches the building pad areas should be overexcavated to a minimum depth of four (4) feet below lowest existing grade or finish pad grade or two (2) feet below the bottom of the deepest footing or two-thirds the greatest fill on the pad, whichever is greater. The geotechnical engineer should observe and approve the bottom of all excavated areas (keys, benches, o/x) prior to the placement of fill. The exposed surfaces should be scarified to a depth of eight (8) inches, wetted to slightly above optimum moisture (3%) and compacted to at least ninety (90) percent of maximum dry density (ASTM D1557-02). The removed native materials can be replaced and similarly compacted; however, the residence pad areas should be capped with at least 30 inches of a suitable non-expansive import material such as decomposed granite or Class II/III base (compacted to 90%). Expansion index testing should be performed on the native fill soils prior to placement and compaction. The lateral limits of excavation, scarification and fill placement should be at least 5 feet beyond the perimeter building and footing lines. Cut and fill slopes should not exceed 2:1 (horizontal:vertical) and should be properly compacted to 90 percent.
3. Keys and benches should penetrate competent material a minimum of 3 feet and be at least 10 feet wide, with a minimum 2 percent gradient back into the slope, see Figure 5. The geotechnical engineer should provide specific recommendations for keys, benches and overexcavation during grading.

Keyways drains will be required, the need for bench drains should be evaluated by a representative of PCT during grading.

4. Cal-OSHA provides maximum allowable slopes and allowable configurations for sloping and benching based on soil classification. Based on our exploratory borings, the native materials to a depth of 5 feet would generally be classified as cohesive clay soils with properties similar to Type B soil. This classification should be verified by the geotechnical engineer during site excavation. Short term temporary excavations in a Type B material (upper 5') can be sloped at an inclination of 1:1 (horizontal:vertical).
5. In order to help minimize potential settlement problems associated with structures supported on a non-uniform materials, the soils engineer should be consulted for specific site recommendations during site excavation and grading. In general, all proposed construction should be supported on a uniform thickness of compacted soil.
6. The above grading is based on the strength characteristics of the materials under conditions of normal moisture that would result from rain water and do not take into consideration the additional activating forces applied by seepage from springs or subsurface water. Areas of observed seepage should be provided with subsurface drains to release the hydrostatic pressures.
7. The near-surface soils may become partially or completely saturated during the rainy season. Grading operations during this time period may be difficult since the saturated materials may not be compactable, and they may not support construction equipment. Consideration should be given to the seasonal limit of the grading operations on the site.
8. All final grades should be provided with a positive drainage gradient away from foundations. Final grades should provide for rapid removal of surface water runoff. Ponding of water should not be allowed on building pads or adjacent to foundations.

5.3 Preparation of Paved Areas

1. After clearing and grubbing, the existing soils should be removed to a depth of at least two (2) feet below the existing ground surface or one (1) foot below the proposed structural section, whichever is deeper. The bottom of the excavation should then be scarified, moisture-conditioned and compacted to at least 90 percent. Native fill materials can then be placed and similarly compacted.
2. The upper 12 inches of subgrade beneath all paved areas should be compacted to at least 95 percent relative compaction. Subgrade soils should not be allowed to dry out or have excessive construction traffic between the time of water conditioning and compaction, and the time of placement of the pavement structural section.

5.4 Structural Fill

1. On-site soils free of organic and deleterious material may be used as landscape fill or below the select non-expansive import cap in the building pad areas. The native materials should be moisture-conditioned to slightly above optimum moisture (3 to 4%) prior to compaction. These fills should not contain rocks larger than 3 inches in greatest dimension and should have no more than 15 percent larger than 1.5 inches in greatest dimension.
2. Select import (decomposed granite or Class II/III Base) should be free of organic and other deleterious material and should be non-expansive with a plasticity index of 10 or less and a sand equivalent of at least 30. Before delivery to the site, a sample of the proposed import should be tested in our laboratory to determine its suitability for use as structural fill.
3. Structural fill using approved import should be placed in layers, each not exceeding eight inches in thickness before compaction. The imported soil should be conditioned with water, or allowed to dry, to produce a soil water content at approximately optimum value and should be compacted to at least 90 or 95 percent relative compaction based on ASTM D1557-02.

5.5 Foundations

1. Conventional stiffened continuous footings and spread footings may be used for support of the residences. All of the foundation materials should be competent after preparation in accordance with the grading section of this report. Due to the relatively steep slopes, building footings should be setback a minimum of 10 feet from edge of footings to competent face of downward slopes or one-third of the maximum slope height of adjacent downward slopes, whichever results in a greater setback.
2. Continuous perimeter footings and grade beams should be at least 15 inches wide and extend a minimum of 24 inches below pad grade or below adjacent finished grade, whichever is lower. Isolated spread footings should be a minimum of 2 feet square, similarly embedded and tied to the perimeter footings with grade beams. The reinforcement for the footings and grade beams should be designed by the structural engineer; however, a minimum of four (4) No. 5 bars should be provided, two (2) on the top and two (2) on the bottom for continuous footings and grade beams with No. 4 dowels spaced at 18 inches on center to tie the footings and grade beams to the slab. Reinforcing steel should be held in place by stirrups (min. #3 bars at 30" on-center) at appropriate spacing to ensure proper positioning of the steel.
3. An allowable dead plus live load bearing pressure of 2,000 psf may be used for design. Total settlements on the order of 1-inch are anticipated with differential settlements being $\frac{3}{4}$ -inch over 30 feet.
4. The above allowable pressures are for support of dead plus live loads and may be increased by one-third for short-term wind and seismic loads.
5. Lateral forces on structures may be resisted by passive pressure acting against the sides of shallow footings and/or friction between the soil and the bottom of the footing. For resistance to lateral loads, a friction factor of 0.35 may be utilized for sliding resistance at the base of the spread footings in engineered fill. A passive resistance of 350 pcf equivalent fluid weight may be used against the

side of shallow footings. If friction and passive pressures are combined, the lesser value should be reduced by 33 percent.

5.6 Slab-On-Grade Construction

1. Concrete slabs-on-grade and flatwork should not be placed directly on unprepared loose fill materials. Preparation of subgrade to receive concrete slabs-on-grade and flatwork should be processed as discussed in the preceding sections of this report.
2. To minimize floor dampness a section of capillary break material at least 4 inches thick and covered with a 15-mil Stego-Type vapor barrier should be provided between concrete slabs-on-grade and compacted soil subgrade. All seams through the vapor barrier should be overlapped and sealed. Where pipes extend through the vapor barrier, the barrier should be sealed to the pipes. The capillary break should be a clean free-draining material such as clean gravel or permeable aggregate complying with Caltrans Standard Specifications Section 68, Class I, Type A or Type B, to service as a cushion and a capillary break. It is suggested that a 2-inch thick sand layer be placed on top of the membrane to assist in the curing of the concrete. The sand should be lightly moistened prior to placing concrete.
3. Concrete slabs-on-grade should be a minimum of 5 inches thick and should be reinforced with at least No. 4 reinforcing bars placed at 18 inches on-center both ways at or slightly above the center of the structural section. Reinforcing bars should have a minimum clear cover of 1.5 inches, and hot bars should be cooled prior to placing concrete. The aforementioned reinforcement may be used for anticipated uniform floor loads not exceeding 100 psf. If floor loads greater than 100 psf are anticipated, the slab should be evaluated by a structural engineer.
4. All slabs should be poured at a maximum slump of less than 5 inches. Excessive water content is the major cause of concrete cracking. For design of concrete floors, a modulus of subgrade reaction of $k = 100$ psi per inch would be applicable to on-site engineered fill soils.

5.7 Retaining Walls

- Retaining walls should be designed to resist lateral pressures from adjacent soils and surcharge loads applied behind the walls.

Lateral Pressure and Condition (Compacted Fill)		Equivalent Fluid Pressure, pcf	
		Unrestrained Wall	Rigidly Supported Wall
Active Case, Drained	Level-native soils	55	--
	Level-granular backfill	30	--
At-Rest Case, Drained	Level-native soils	--	75
	Level-granular backfill		50
Passive Case, Drained	Level	300	--
	2:1 Sloping Down	150	
For sloping backfill add 1 pcf for every 2 deg. (Active case) and 1.5 pcf for every 2 deg. (At-rest case)			

- For walls greater than 6 feet, as measured from the top of the foundation, a seismic horizontal surcharge of $10H^2$ (pounds per linear foot of wall) may be assumed to act on retaining walls. The surcharge will act at a height of $0.33H$ above the wall base (where H is the height of the wall in feet). This surcharge force shall be added to an active design equivalent fluid pressure.
- In addition to the lateral soil pressure given above, retaining walls should be designed to support any design live load, such as from vehicle and construction surcharges, etc., to be supported by the wall backfill. If construction vehicles are required to operate within 10 feet of a wall, supplemental pressures will be induced and should be taken into account through design.
- The above-recommended pressures are based on the assumption that sufficient subsurface drainage will be provided behind the walls to prevent the build-up of hydrostatic pressure. To achieve this, we recommend that a filter material be placed behind all proposed walls. The blanket of filter material should be a minimum of 12 inches thick and should extend from the bottom of the wall to within 12 inches of the ground surface. The top 12 inches should consist of

water conditioned, compacted native soil. A 4-inch diameter drain pipe should be installed near the bottom of the filter blanket with perforations facing down. The drain pipe should be underlain by at least 4 inches of filter type material. Adequate gradients should be provided to discharge water that collects behind the retaining wall to an adequately controlled discharge system with suitably projected outlets. The filter material should conform to Class I, Type B permeable material as specified in Section 68 of the California Department of Transportation Standard Specifications, current edition. A typical 1" x #4 concrete coarse aggregate mix approximates this specification.

5. For hydrostatic loading conditions an additional loading of 60 pcf equivalent fluid weight should be added to the above soil pressures. If it is necessary to design retaining structures for submerged conditions, allowed bearing and passive pressures should be reduced by 50 percent. In addition, soil friction beneath the base of the foundations should be neglected.
6. The use of water-stops and impermeable barriers (Paraseal or equivalent) should be provided for basement construction, and for building walls which retain earth. In addition, a sump/pump will be required if flow cannot be day-lighted
7. Deformations should be expected on cantilever walls particularly during backfilling and while the active pressures develop. Winterkorn & Fang (Foundation Engineering Handbook) indicate that wall deflections on the order of $0.001H$, where H is the height of the wall, could be expected for active pressures to develop. For walls supporting framing, allowance should be made for these potential movements.

5.8 Pavement Design

1. The following table provides preliminary pavement sections for the roadways based on an R-Value of 10 for the near surface silty clay soils encountered in Boring B-10.

RECOMMENDED MINIMUM ASPHALT CONCRETE PAVEMENT SECTIONS DESIGN THICKNESS		
T.I.	A.C.-in.	A.B.-in.
4.5	2.5	8.5
5.0	2.5	10.0
5.5	3.0	11.0
6.0	3.0	12.5
T.I. = A.C. = A.B. =	Traffic Index Asphaltic Concrete - must meet specifications for Caltrans Type A Asphalt Concrete Aggregate Base - must meet specifications for Caltrans Class II Aggregate Base (R-Value = minimum 78)	

2. The following table provides preliminary pavement sections for Skytt Mesa Road at the intersection of Highway 246. An R-Value of 24 was obtained for the near surface silty clayey sands encountered.

RECOMMENDED MINIMUM ASPHALT CONCRETE PAVEMENT SECTIONS DESIGN THICKNESS		
T.I.	A.C.-in.	A.B.-in.
4.5	2.5	6.5
5.0	2.5	7.5
5.5	3.0	8.5
6.0	3.0	9.5
7.0	3.5	12.0
8.0	4.5	13.0
T.I. = A.C. = A.B. =	Traffic Index Asphaltic Concrete - must meet specifications for Caltrans Type A Asphalt Concrete Aggregate Base - must meet specifications for Caltrans Class II Aggregate Base (R-Value = minimum 78)	

3. R-value samples should be obtained and tested at the completion of rough grading and the pavement sections confirmed or revised. All asphaltic concrete pavement sections and all sections should be crowned for good drainage.

4. All asphalt pavement construction and materials used should conform with Sections 26 and 39 of the latest edition of the Standard Specifications, State of California, Department of Transportation. Aggregate bases and sub-bases should also be compacted to a minimum relative compaction of 95 percent based on ASTM D1557-02.

5.9 Underground Facilities Construction

1. The attention of contractors, particularly the underground contractors, should be drawn to the State of California Construction Safety Orders for "Excavations, Trenches, Earthwork". Trenches or excavations greater than 5 feet in depth should be shored or sloped back in accordance with OSHA Regulations.
2. For purposes of this section of the report, bedding is defined as material placed in a trench up to 1 foot above a utility pipe and backfill is all material placed in the trench above the bedding. Unless concrete bedding is required around utility pipes, free-draining sand should be used as bedding. Sand proposed for use as bedding should be tested in our laboratory to verify its suitability and to measure its compaction characteristics. Sand bedding should be compacted by mechanical means to achieve at least 90 percent relative compaction based on ASTM Test D1557-02.
3. On-site inorganic soil, or approved import, may be used as utility trench backfill. Proper compaction of trench backfill will be necessary under and adjacent to structural fill, building foundations, concrete slabs and vehicle pavements. In these areas, backfill should be conditioned with water (or allowed to dry), to produce a soil water content of about 2 to 3 percent above the optimum value and placed in horizontal layers each not exceeding 8 inches in thickness before compaction. Each layer should be compacted to at least 90 percent relative compaction based on ASTM Test D1557-02. The top lift of trench backfill under vehicle pavements should be compacted to the requirements given in report section 5.3 for vehicle pavement subgrades. Trench walls must be kept moist prior to and during backfill placement.

5.10 Surface and Subsurface Drainage

1. Concentrated surface water runoff within or immediately adjacent to the site should be conveyed in pipes or in lined channels to discharge areas that are relatively level or that are adequately protected against erosion.
2. Water from roof downspouts should be conveyed in pipes that discharge in areas a safe distance away from structures. Surface drainage gradients should be planned to prevent ponding and promote drainage of surface water away from building foundations, edges of pavements and sidewalks. For soil areas, we recommend that a minimum of five (5) percent gradient be maintained.
3. Maintenance of slopes is important to their long-term performance. It is recommended that slope surfaces be planted with appropriate drought-resistant vegetation as recommended by a landscape architect, and not over-irrigating, a primary source of surficial failures. In addition, an erosion control blanket (American Excelsior Company, AEC Premier Coconut or equivalent) should be placed over the slopes to protect the vegetation while it becomes established. The blanket should be installed in accordance with manufacturers requirements. In addition, water should not be allowed to run over the sides of the slope.
4. Careful attention should be paid to erosion protection of soil surfaces adjacent to the edges of Roads, curbs and sidewalks, and in other areas where "hard" edges of structures may cause concentrated flow of surface water runoff. Erosion resistant matting such as Miramat, or other similar products, may be considered for lining drainage channels.
5. Due to the sloping terrain and the drainage area adjacent to the proposed building sites, perched water should be expected in the upper 3 to 4 feet. Subdrains will likely be required to intercept perched water. The location of subdrains should be determined during site grading. The subdrain outlets should extend into suitable protected areas.

5.11 Percolation Testing

- Three (3) shallow percolation tests (4 to 5 feet deep) were performed in the vicinity of each of the proposed eight (8) residences. In general, soft to very stiff silty clays and silty sandy clays were encountered in the borings. The percolation tests were conducted in general conformance with Santa Barbara County requirements and U.S. Department of Health, Education and Welfare Manual of Septic Tank Practice Guidelines. The results are summarized in the following table.

Lot No.	Test No.	Depth	Soil Description	Percolation Rate
1	P-1, 2 & 3	5, 5 & 4 Feet	Silty Clay (CL)	98, 107 & 96 min/inch
2	P-4, 5 & 6	5, 4 & 4 Feet	Silty Clay (CL)	78, 77 & 84 min/inch
3	P-7, 8 & 9	5, 4 & 5 Feet	Silty Clay (CL)	92, 129 & 89 min/inch
4	P-10, 11 & 12	5, 5 & 5 Feet	Silty Sandy Clay (CL)	58, 49 & 65 min/inch
5	P-13, 14 & 15	5, 4 & 5 Feet	Silty Clay (CL)	67, 55 & 57 min/inch
6	P-16, 17 & 18	4, 4 & 5 Feet	Silty Clay (CL)	47, 45 & 51 min/inch
7	P-19, 20 & 21	5, 4 & 5 Feet	Silty Clay (CL)	112, 69 & 74 min/inch
8	P-22, 23 & 24	5, 4 & 5 Feet	Silty Clay (CL)	127, 119 & 130 min/inch

5.12 Geotechnical Observation and Testing

- Field exploration and site reconnaissance provides only a limited view of the geotechnical conditions of the site. Substantially more information will be revealed during the excavation and grading phases of the construction. Stripping & clearing of vegetation, overexcavation, scarification, fill and backfill placement and compaction should be reviewed by the geotechnical professional during construction to evaluate if the materials encountered during construction are consistent with those assumed for this report.
- Special inspection of grading should be provided in accordance with California Building Code Section 1705.6 and Table 1705.6. The special inspector should be under the direction of the engineer.

CBC TABLE 1705.6 REQUIRED VERIFICATION AND INSPECTION OF SOILS		
VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODIC DURING TASK LISTED
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity		X
2. Verify excavations are extended to proper depth and have reached proper material		X
3. Perform classification and testing of compacted fill		X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill	X	
5. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.		X

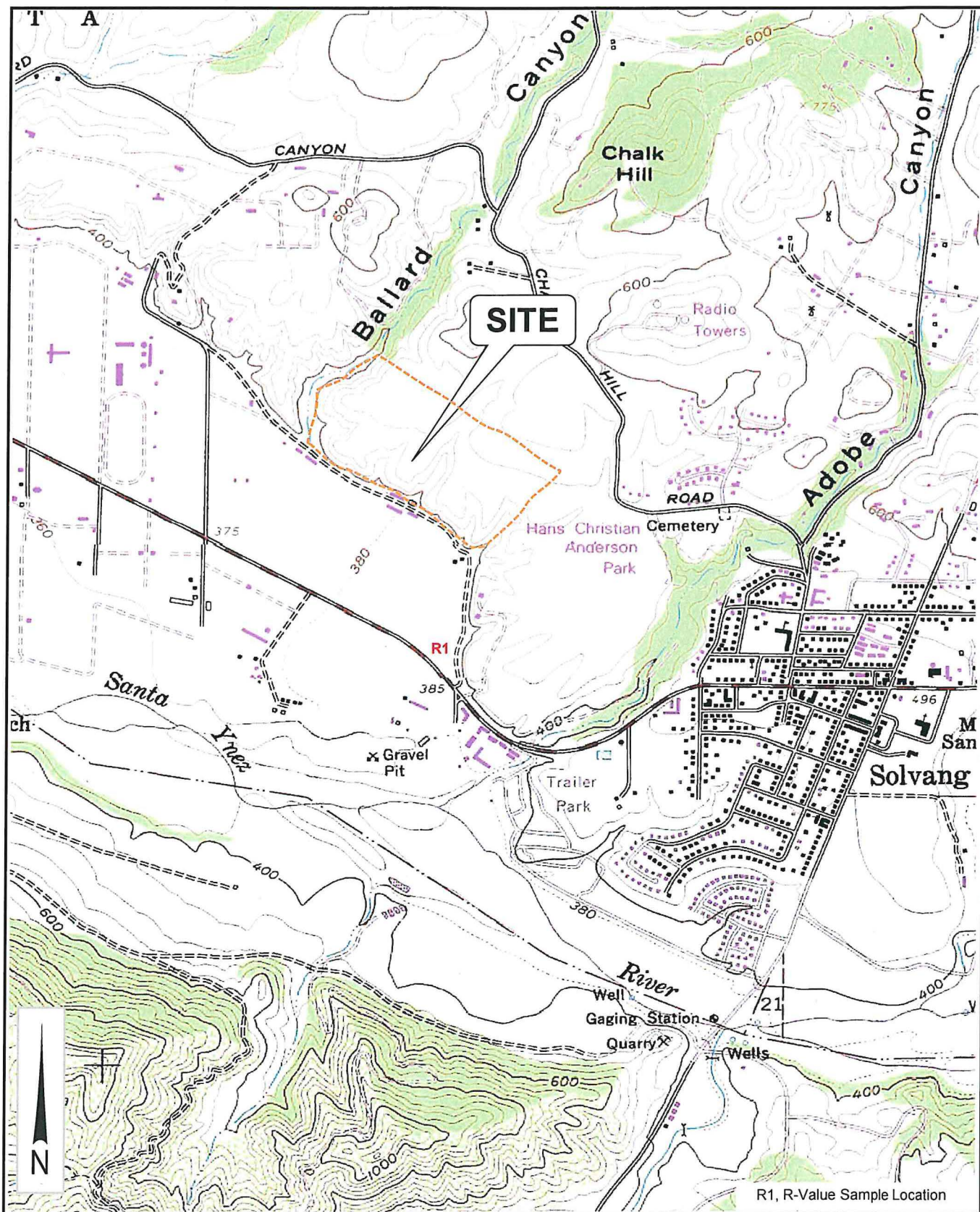
6.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. It should be noted that it is the responsibility of the owner or his/her representative to notify Pacific Coast Testing Inc. a minimum of 48 hours before any stripping, grading, or foundation excavations can commence at this site.
2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed during our study. Should any variations or undesirable conditions be encountered during grading of the site, Pacific Coast Testing Inc. will provide supplemental recommendations as dictated by the field conditions.
3. This report is issued with the understanding that it is the responsibility of the owner or his/her representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the project plans and specifications. The owner or his/her representative is responsible for ensuring that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.
4. As of the present date, the findings of this report are valid for the property studied. With the passage of time, changes in the conditions of a property can

occur whether they are due to natural processes or to the works of man on this or adjacent properties. Legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may find this report to be invalid, wholly or partially. Therefore, this report should not be relied upon after a period of one (1) year without our review nor is it applicable for any properties other than those studied.

5. Validity of the recommendations contained in this report is also dependent upon the prescribed testing and observation program during the site preparation and construction phases. Our firm assumes no responsibility for construction compliance with these design concepts and recommendations unless we have been retained to perform continuous on-site testing and review during all phases of site preparation, grading, and foundation/slab construction. The Geotechnical Engineer should be notified at least two (2) working days before site clearing or grading operations commence to develop a program of quality control.

FIGURES



R1, R-Value Sample Location



Pacific Coast Testing, Inc.

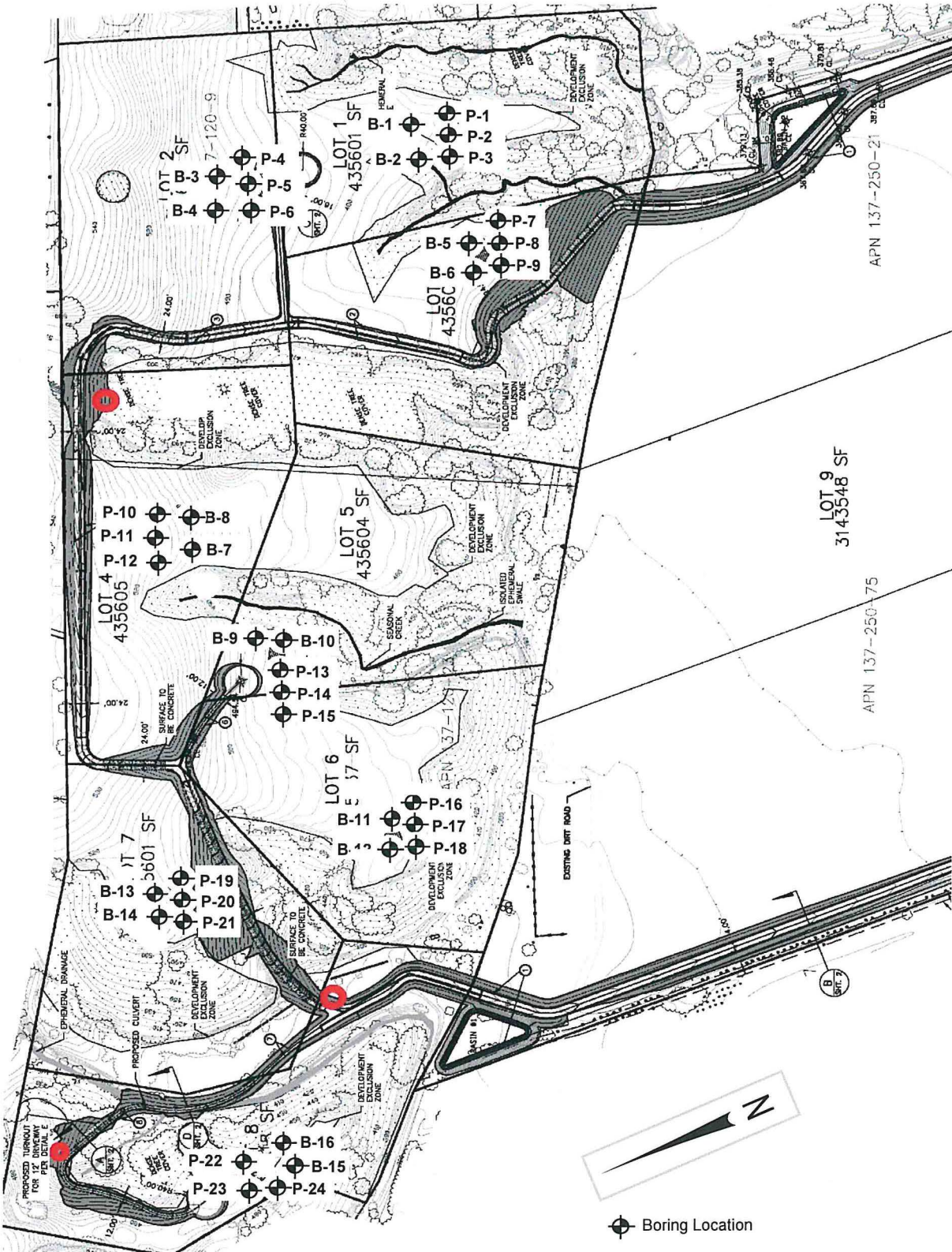
SITE MAP
8-LOT SUBDIVISION
SKYTT MESA ROAD (APN 137-120-023)
SOLVANG, CALIFORNIA

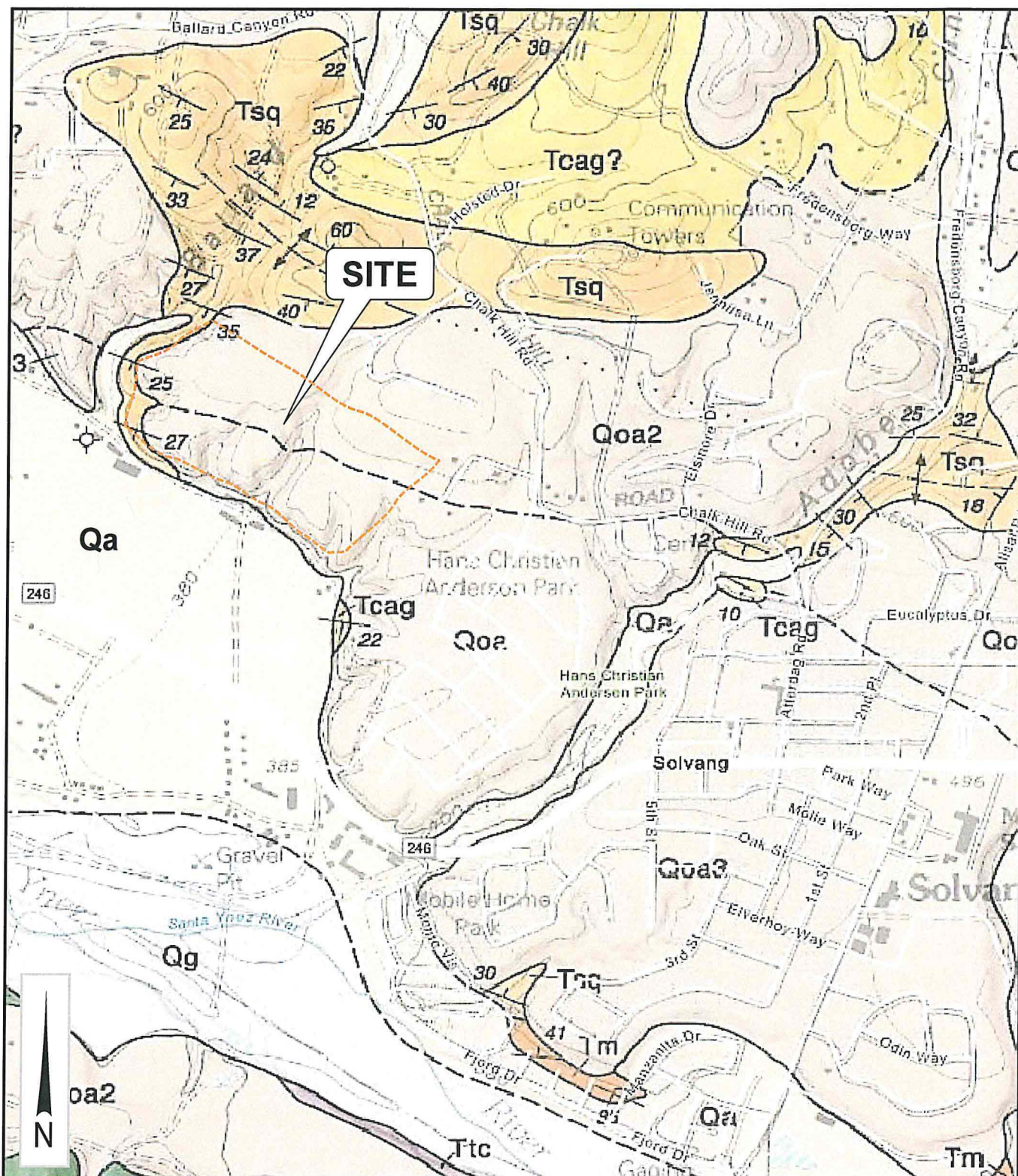
Project No.

Figure No.

22-0299

1





Reference - Geology of Solvang & Gaviota Quadrangles, Dibblee 1988, Qa - Valley & Floodplain Deposits, Qg - Stream Channel Deposits, Qoa - Older Suficial Sediments, Tsq - Sisquoc Formation (Claystone)



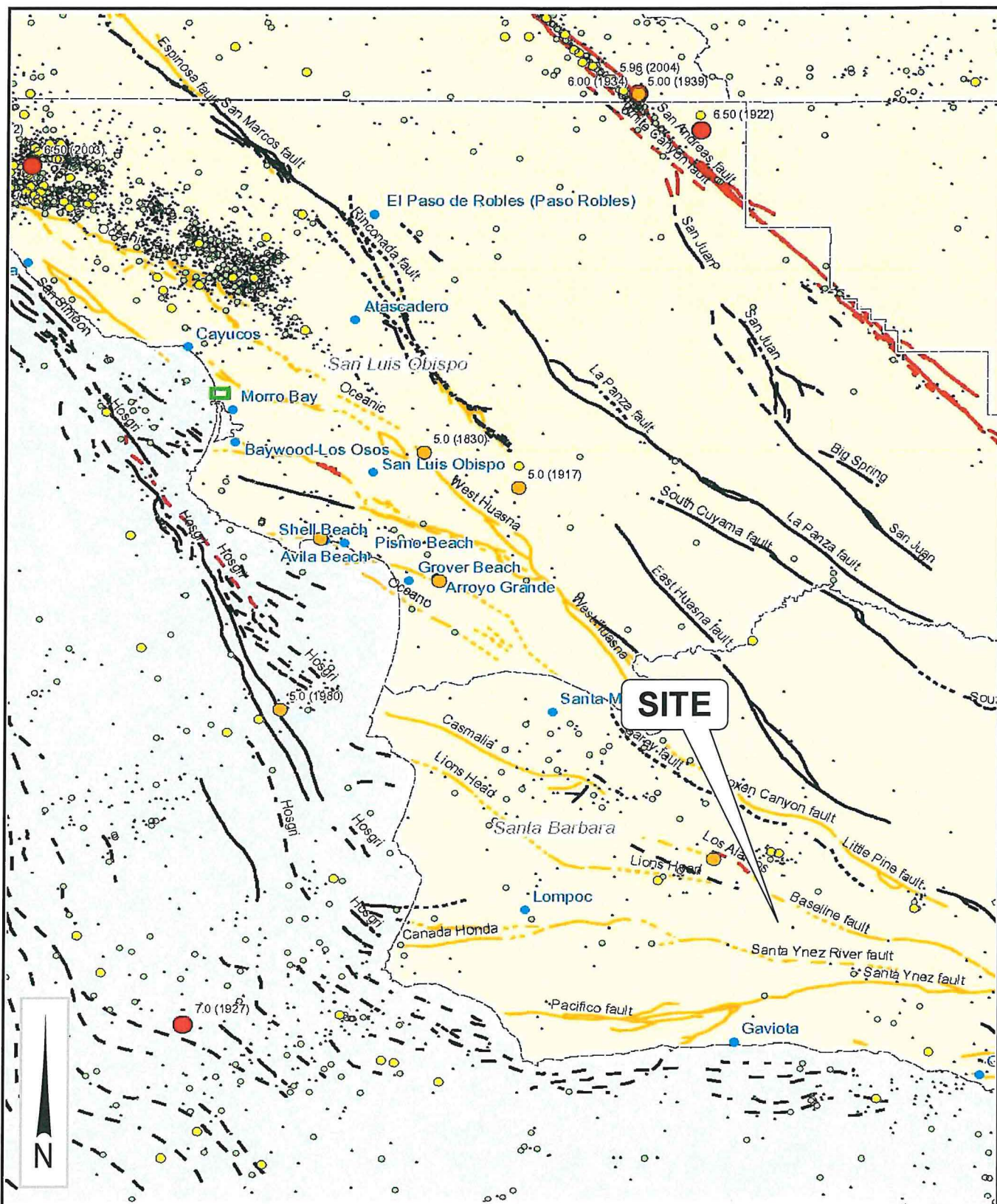
Pacific Coast Testing, Inc.

**GEOLOGIC MAP
8-LOT SUBDIVISION
SKYTT MESA ROAD (APN 137-120-023)
SOLVANG, CALIFORNIA**

Project No. Figure No.

22-0299

3



Base Map Source: Seismotectonics of Central Coast of California (Geologic Society Special Paper)



Pacific Coast Testing, Inc.

**FAULT MAP
8-LOT SUBDIVISION
SKYTT MESA ROAD (APN 137-120-023)
SOLVANG, CALIFORNIA**

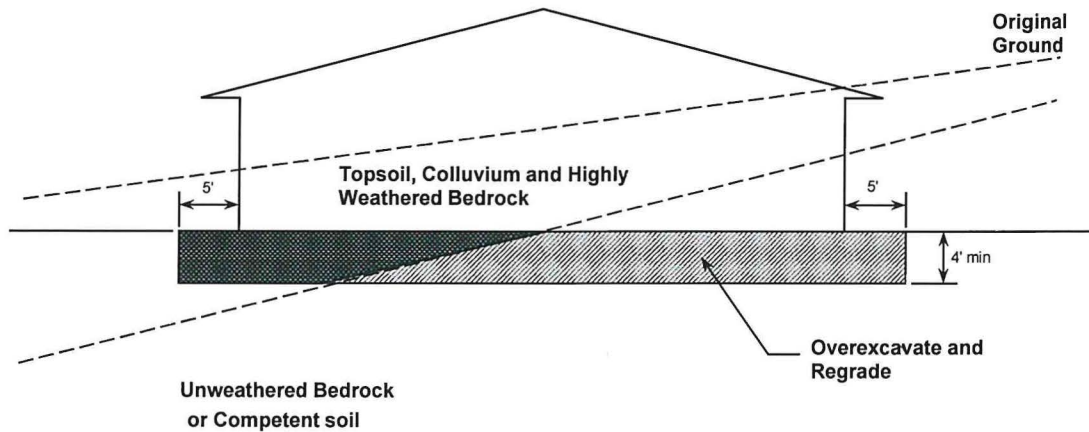
Project No. Figure No.

22-0299

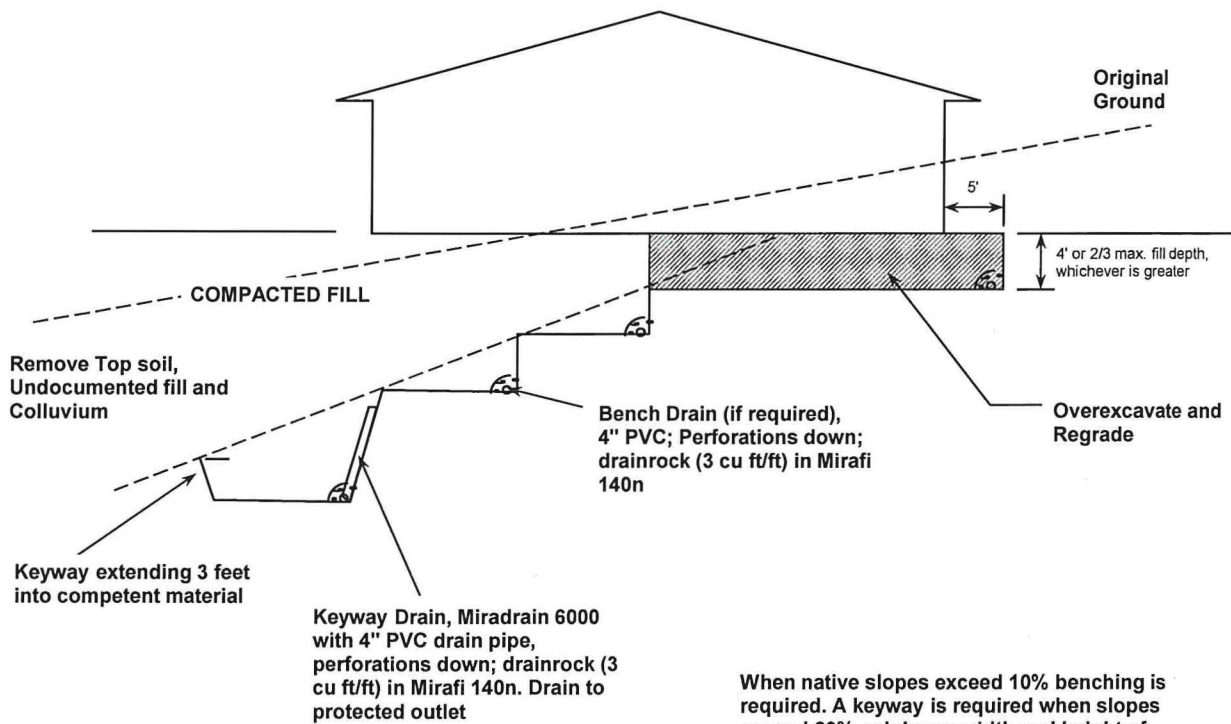
4

GENERAL GRADING RECOMMENDATIONS

CUT LOT



CUT/FILL LOT TRANSITION



When native slopes exceed 10% benching is required. A keyway is required when slopes exceed 20%, minimum width and height of keyways and benches is 10 feet & 4 feet respectively.



Pacific Coast Testing, Inc.

HILLSIDE GRADING
8-LOT SUBDIVISION
SKYTT MESA ROAD (APN 137-120-023)
SOLVANG, CALIFORNIA

Project No. Figure No.

22-0299

5

APPENDIX A

Field Investigation
Key to Boring Logs
Boring Logs

FIELD INVESTIGATION

Test Hole Drilling

The field investigation was conducted on April 28 and 29, 2022. Sixteen (16) exploratory borings and twenty four (24) percolation borings were drilled at the approximate locations indicated on the Site Plan, Figure 2. The locations of these borings were approximated in the field. One (1) shallow boring were drilled adjacent to Highway 246 for R-Value testing. This boring location (R1) is indicated on Figure 1.

Undisturbed and bulk samples were obtained at various depths during test hole drilling. The undisturbed samples were obtained by driving a 2.4-inch inside diameter sampler into soils.

Logs of Boring

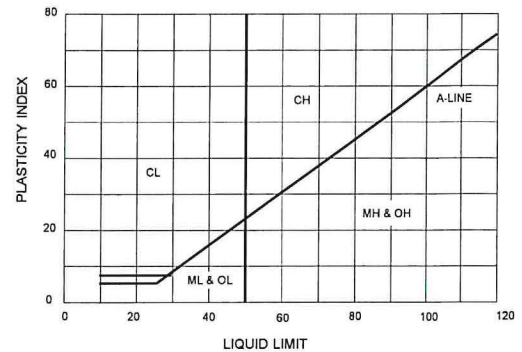
A continuous log of soils, as encountered in the borings was recorded at the time of the field investigation. The Exploration Boring Logs are attached.

Locations and depth of sampling, in-situ soil dry densities and moisture contents are tabulated in the Boring Logs.

UNIFIED SOIL CLASSIFICATION SYSTEMS

MAJOR DIVISION			SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS Over 50% > #200 sieve	GRAVELS Over 50% > #4 sieve	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS Over 50% < #4 sieve	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS Over 50% < #200 sieve	SILTS AND CLAYS Liquid limit < 50	ML	INORGANIC SILTS, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS	
		OL	ORGANIC CLAYS 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 HIGH PLASTICITY, FAT CLAYS	
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
		HIGHLY ORGANIC CLAYS		PT

PLASTICITY CHART USED FOR CLASSIFICATION OF FINE GRAINED SOILS



SOIL GRAIN SIZE

U.S. STANDARD SIEVE		GRAVEL		SAND			SILT	CLAY
6"	3"	3/4"	4	10	40	200		
150	75	19	4.75	2.0	0.425	0.075	0.002	
SOIL GRAIN SIZE IN MILLIMETERS								

SAMPLE DRIVING RECORD

BLOWS PER FOOT	DESCRIPTION
25	25 BLOWS DROVE SAMPLER 12 INCHES, AFTER INITIAL 6 INCHES OF SEATING
50/7"	50 BLOWS DROVE SAMPLER 7 INCHES, AFTER INITIAL 6 INCHES OF SEATING
Ref/3"	50 BLOWS DROVE SAMPLER 3 INCHES DURING OR AFTER INITIAL 6 INCHES OF SEATING

NOTE: TO AVOID DAMAGE TO SAMPLING TOOLS, DRIVING IS LIMITED TO 50 BLOWS PER 6 INCHES DURING OR AFTER SEATING INTERVAL

KEY TO TEST DATA

	Bag Sample	CONS	Consolidation (ASTM D2435)
	Drive, No Sample Collected	DS	Cons. Drained Direct Shear (ASTM D3080)
	2 1/2" O.D. Mod. California Sampler, Not Tested	PP	Pocket Penetrometer
	2 1/2" O.D. Mod. California Sampler, Tested	GSD	Grain Size Distribution (ASTM D422)
	Standard Penetration Test	CP	Compaction Test (ASTM D1557)
	Sample Attempted with No Recovery	EI	Expansion Index (ASTM D4829)
	Water Level at Time of Drilling	LL	Liquid Limit (in percent)
	Water Level after Drilling	PI	Plasticity Index

RELATIVE DENSITY

SANDS, GRAVELS, AND NON PLASTIC SILTS	BLOWS/FOOT
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

RELATIVE DENSITY

CLAYS AND PLASTIC SILTS	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



PROJECT NO.: 22-0299
DATE DRILLED: 4/28/2022

SOIL CLASSIFICATION CHART AND BORING LOG LEGEND

**8-LOT SUBDIVISION
SOLVANG, CALIFORNIA**

FIGURE NO.
A-1

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-1 (lot 1)							
ELEVATION: 470'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022							
GROUNDWATER DEPTH (FT):											
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
469	1		Silty Clay: light yellowish brown, slightly moist, some sand, soft	CL							EI = 46
468	2			B							
467	3		firm								
466	4		olive brown, very stiff	■	32	11.5					
465	5										
464	6										
463	7			B							
462	8										
461	9		hard		33	10.4					
460	10		Silty Clay: olive brown, slightly moist, some sand, hard	CL							
459	11										
458	12			B							
457	13										
456	14										
455	15				45	13.9					
454	16										
453	17										
452	18										
451	19			B							
450	20		Boring terminated at 20 feet								
EXPLORATORY BORING LOGS											
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)							
				PROJECT NO. 22-0299				DATE June-22		FIGURE NO. A-2	

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-2 (lot 1)								
ELEVATION: 470'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
469	1		Silty Clay: light yellowish brown, slightly moist, trace sand, soft	CL-ML								
468	2											
467	3		firm									
466	4		very stiff to hard		33	12.4						
465	5											
464	6											
463	7											
462	8											
461	9											
460	10											
			Boring terminated at 10 feet									
459	11											
458	12											
457	13											
456	14											
455	15											
454	16											
453	17											
452	18											
451	19											
450	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-3		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-3 (lot 2)								
ELEVATION: 500'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASTIC INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
499	1		Silty Clay: light yellowish brown, slightly moist, some sand, soft	CL								EI = 55
498	2		olive brown, moist		B							
497	3											
496	4		very stiff		II	24	12.8					
495	5											
494	6		Silty Sandy Clay: olive brown, moist, very stiff	CL								
493	7				B							
492	8											
491	9				II	33	11.2					
490	10											
489	11											
488	12				B							
487	13											
486	14				II	55	13.1					
485	15		Boring terminated at 15 feet									
484	16											
483	17											
482	18											
481	19											
480	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-4		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-4 (lot 2)								
ELEVATION: 500'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
499	1		Silty Sandy Clay: yellowish brown, slightly moist, soft	CL-ML								
498	2				B							
497	3		firm									
496	4		very stiff		17	8.4						
495	5		olive brown									
494	6											
493	7				B							
492	8											
491	9		hard		34	12.7						
490	10		Boring terminated at 10 feet									
489	11											
488	12											
487	13											
486	14											
485	15											
484	16											
483	17											
482	18											
481	19											
480	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-5		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-5 (lot 3)								
ELEVATION: 480'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
479	1		Silty Clay: olive brown, moist, trace sand, soft	CL								EI = 72
478	2		light olive brown		B		22.4					
477	3											
476	4		very stiff	II	22	21.6						
475	5											
474	6		Silty Clay: light olive brown, moist, some sand, very stiff	CL								
473	7			B								
472	8											
471	9		hard	II	40	18.6						
470	10											
469	11											
468	12			B								
467	13											
466	14			B		17.4						
465	15		Boring terminated at 15 feet									
464	16											
463	17											
462	18											
461	19											
460	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-6		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-6 (lot 3)								
ELEVATION: 480'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
479	1		Silty Clay: olive brown, moist, trace sand, soft	CL								
478	2				B		17.9					
477	3											
476	4											
475	5		hard			36	18.3					
474	6		Boring terminated at 6 feet									
473	7											
472	8											
471	9											
470	10											
469	11											
468	12											
467	13											
466	14											
465	15											
464	16											
463	17											
462	18											
461	19											
460	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-7		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-7 (lot 4)								
ELEVATION: 520'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
519	1		Sandy Clay w/Gravel: yellowish brown, slightly moist, soft	CL								
518	2				B		12.4					
517	3		moist									
516	4				II	23	13.8					
515	5		Silty Sandy Clay: yellowish brown, moist, very stiff									
514	6											
513	7				B							
512	8											
511	9		hard		II	44	17.6					
510	10											
509	11											
508	12											
507	13											
506	14				B							
505	15		Boring terminated at 15 feet									
504	16											
503	17											
502	18											
501	19											
500	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-8		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-8 (lot 4)							
ELEVATION: 520'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022							
GROUNDWATER DEPTH (FT):											
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLAST. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
519	1		Silty Sandy Clay: yellowish brown, moist, some gravel, soft	CL							
518	2				B	16.3					
517	3					19	17.2				
516	4										
515	5										
514	6		Silty Sandy Clay: yellowish brown, moist, very stiff	CL							
513	7				B						
512	8										
511	9					39	15.8				
510	10										
509	11		Boring terminated at 10 feet								
508	12										
507	13										
506	14										
505	15										
504	16										
503	17										
502	18										
501	19										
500	20										

EXPLORATORY BORING LOGS

 Pacific Coast Testing, Inc.	8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)		
	PROJECT NO. 22-0299	DATE June-22	FIGURE NO. A-9

LOGGED BY: JM	DRILL RIG: Simco 2400	BORING NO.: B-9 (lot 5)
ELEVATION: 490'	BORING DIAMETER (INCH): 5	DATE DRILLED: 28 April 2022
GROUNDWATER DEPTH (FT):		

ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
489	1		Silty Clay: light yellowish brown, slightly moist, trace sand & gravel, soft	CL								EI = 84
488	2				B		20.8					
487	3											
486	4			very stiff	II	27	22.1					
485	5											
484	6			Silty Clay: light brown, moist, Some sand, very stiff	CL							
483	7				B							
482	8											
481	9				II	30	17.6					
480	10											
479	11											
478	12				B							
477	13											
476	14				II	44	16.8					
475	15			Boring terminated at 15 feet								
474	16											
473	17											
472	18											
471	19											
470	20											

EXPLORATORY BORING LOGS			
 Pacific Coast Testing, Inc.	8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)		
	PROJECT NO. 22-0299	DATE June-22	FIGURE NO. A-10

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-10 (lot 5)								
ELEVATION: 490'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLAST. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
489	1		Silty Clay: light yellowish brown, moist, trace sand, soft	CL								
488	2				B		20.1					
487	3											
486	4		hard	II	30	21.8						
485	5		Boring terminated at 5 feet									
484	6											
483	7											
482	8											
481	9											
480	10											
479	11											
478	12											
477	13											
476	14											
475	15											
474	16											
473	17											
472	18											
471	19											
470	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-11		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-11 (lot 6)							
ELEVATION: 500'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022							
GROUNDWATER DEPTH (FT):											
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
499	1		Silty Clay: yellowish brown, slightly moist, some sand & gravel, soft	CL							
498	2				B		10.7				
497	3										
496	4		Silty Clay: light yellowish brown, moist, some sand, very stiff	CL	II	31	12.7				
495	5										
494	6										
493	7				B						
492	8										
491	9				B		15.1				
490	10										
489	11										
488	12				B						
487	13										
486	14				II	55	15.3				
485	15		Boring terminated at 15 feet								
484	16										
483	17										
482	18										
481	19										
480	20										
EXPLORATORY BORING LOGS											
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)							
				PROJECT NO. 22-0299		DATE June-22		FIGURE NO. A-12			

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-12 (lot 6)								
ELEVATION: 500'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLAST. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
499	1		Silty Clay: yellowish brown, moist, trace sand, soft	CL								
498	2				B		10.6					
497	3											
496	4		very stiff		II	27	12.4					
495	5		Boring terminated at 5 feet									
494	6											
493	7											
492	8											
491	9											
490	10											
489	11											
488	12											
487	13											
486	14											
485	15											
484	16											
483	17											
482	18											
481	19											
480	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-13		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-13 (lot 7)								
ELEVATION: 500'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
499	1		Silty Clay: yellowish brown, slightly moist, trace sand, soft	CL								
498	2				B		10.6					
497	3											
496	4		very stiff		II	27	12.4					
495	5		Boring terminated at 5 feet									
494	6											
493	7											
492	8											
491	9											
490	10											
489	11											
488	12											
487	13											
486	14											
485	15											
484	16											
483	17											
482	18											
481	19											
480	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-14		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-14 (lot 7)								
ELEVATION: 500'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
499	1		Silty Clay: yellowish brown, moist, trace sand, soft	CL								
498	2				B		20.4					
497	3											
496	4		very stiff		II	20	21.9					
495	5											
494	6		Silty Clay: light yellowish brown, moist, some sand, trace gravel, very stiff	CL								
493	7				B							
492	8											
491	9				II	36	19.1					
490	10											
489	11											
488	12				B							
487	13											
486	14				II	47						
485	15	Boring terminated at 15 feet										
484	16											
483	17											
482	18											
481	19											
480	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-15		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-15 (lot 8)							
ELEVATION: 485'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022							
GROUNDWATER DEPTH (FT):											
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
484	1		Silty Sandy Clay: yellowish brown, slightly moist, soft	CL							
483	2				B		9.1				
482	3										
481	4			very stiff	II	23	11.4				
480	5			Silty Clay: light yellowish brown, moist, some sand, trace gravel, very stiff	CL						
479	6					B					
478	7										
477	8										
476	9				II	41	14.6				
475	10										
474	11					B					
473	12										
472	13										
471	14				B		16.4				
470	15			Boring terminated at 15 feet							
469	16										
468	17										
467	18										
466	19										
465	20										
EXPLORATORY BORING LOGS											
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)							
				PROJECT NO. 22-0299		DATE June-22		FIGURE NO. A-16			

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: B-16 (lot 8)								
ELEVATION: 485'		BORING DIAMETER (INCH): 5		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
484	1		Silty Sandy Clay: yellowish brown, moist, some gravel, soft	CL								
483	2					10.4						
482	3		very stiff			26	11.1					
481	4											
480	5		Silty Clay: yellowish brown, moist, some sand, trace garvel, very stiff	CL								
479	6											
478	7											
477	8											
476	9		hard			51	14.9					
475	10		Boring terminated at 10 feet									
474	11											
473	12											
472	13											
471	14											
470	15											
469	16											
468	17											
467	18											
466	19											
465	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-17		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: P-1 to 3 (lot 1)								
ELEVATION: 465'		BORING DIAMETER (INCH): 6		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
464	1		Silty Clay: yellowish brown to olive brown, slightly moist, some sand, soft	CL								
463	2											
462	3											
461	4		very stiff									
460	5		Borings terminated at 4 to 5 feet									
459	6											
458	7											
457	8											
456	9											
455	10											
454	11											
453	12											
452	13											
451	14											
450	15											
449	16											
448	17											
447	18											
446	19											
445	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-18		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: P-4 to 6 (lot 2)								
ELEVATION: 490'		BORING DIAMETER (INCH): 6		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
489	1		Silty Clay: brown to olive brown, moist, some sand, soft	CL								
488	2											
487	3							11.2				
486	4		stiff									
485	5	Borings terminated at 4 to 5 feet										
484	6											
483	7											
482	8											
481	9											
480	10											
479	11											
478	12											
477	13											
476	14											
475	15											
474	16											
473	17											
472	18											
471	19											
470	20											



Pacific Coast Testing, Inc.

8-LOT SUBDIVISION
SKYTT MESA ROAD (APN 137-120-023)

PROJECT NO. 22-0299	DATE June-22	FIGURE NO. A-19
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LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: P-7 to 9 (lot 3)								
ELEVATION: 475'		BORING DIAMETER (INCH): 6		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
474	1		Silty Clay: yellowish brown to light olive brown, moist, some sand, soft	CL								
473	2											
472	3				B	15.8						
471	4											
470	5											
			Borings terminated at 4 to 5 feet									
469	6											
468	7											
467	8											
466	9											
465	10											
464	11											
463	12											
462	13											
461	14											
460	15											
459	16											
458	17											
457	18											
456	19											
455	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-20		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: P-10 to 12 (lot 4)								
ELEVATION: 520'		BORING DIAMETER (INCH): 6		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
519	1		Silty Sandy Clay: yellowish brown to brown, moist, some gravel, soft	CL								
518	2											
517	3											
516	4		stiff to very stiff									
515	5	Borings terminated at 4 to 5 feet										
514	6											
513	7											
512	8											
511	9											
510	10											
509	11											
508	12											
507	13											
506	14											
505	15											
504	16											
503	17											
502	18											
501	19											
500	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-21		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: P-13 to 15 (lot 5)								
ELEVATION: 490'		BORING DIAMETER (INCH): 6		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
489	1		Silty Clay: light yellowish brown, moist, some sand, soft	CL								
488	2											
487	3				B		21.3					
486	4		stiff									
485	5	Borings terminated at 4 to 5 feet										
484	6											
483	7											
482	8											
481	9											
480	10											
479	11											
478	12											
477	13											
476	14											
475	15											
474	16											
473	17											
472	18											
471	19											
470	20											

EXPLORATORY BORING LOGS			
 Pacific Coast Testing, Inc.	8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)		
	PROJECT NO. 22-0299	DATE June-22	FIGURE NO. A-22

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: P-16 to 18 (lot 6)								
ELEVATION: 500'		BORING DIAMETER (INCH): 6		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
499	1		Silty Clay: yellowish brown, moist, some sand, soft	CL								
498	2											
497	3		stiff		B		16.7					
496	4											
495	5	Borings terminated at 4 to 5 feet										
494	6											
493	7											
492	8											
491	9											
490	10											
489	11											
488	12											
487	13											
486	14											
485	15											
484	16											
483	17											
482	18											
481	19											
480	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-23		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: P-19 to 21 (lot 7)								
ELEVATION: 500'		BORING DIAMETER (INCH): 6		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
499	1		Silty Clay: yellowish brown, moist, trace to some sand, soft	CL								
498	2											
497	3					B	21.4					
496	4		stiff									
495	5	Borings terminated at 4 to 5 feet										
494	6											
493	7											
492	8											
491	9											
490	10											
489	11											
488	12											
487	13											
486	14											
485	15											
484	16											
483	17											
482	18											
481	19											
480	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-24		

LOGGED BY: JM		DRILL RIG: Simco 2400		BORING NO.: P-22 to 24 (lot 8)								
ELEVATION: 485'		BORING DIAMETER (INCH): 6		DATE DRILLED: 28 April 2022								
GROUNDWATER DEPTH (FT):												
ELEVATION (FT)	DEPTH (FT)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION	SOIL TYPE	SAMPLE	CONV. SPT BLOW COUNT	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASIT. INDEX	UNC. COMP. STRENGTH (PSF)	COMMENTS AND ADDITIONAL TESTS
484	1		Silty Clay: yellowish brown, moist, trace sand, soft	CL								
483	2											
482	3		olive brown, stiff		B		18.7					
481	4											
480	5	Borings terminated at 4 to 5 feet										
479	6											
478	7											
477	8											
476	9											
475	10											
474	11											
473	12											
472	13											
471	14											
470	15											
469	16											
468	17											
467	18											
466	19											
465	20											
EXPLORATORY BORING LOGS												
 Pacific Coast Testing, Inc.				8-LOT SUBDIVISION SKYTT MESA ROAD (APN 137-120-023)								
				PROJECT NO. 22-0299			DATE June-22			FIGURE NO. A-25		

APPENDIX B

Moisture-Density Tests

Direct Shear Test

R-Value Test

Expansion Index Test

LABORATORY TESTING

Moisture-Density Tests

The field moisture content, as a percentage of the dry weight of the soil, was determined by weighing samples before and after oven drying. Dry densities, in pounds per cubic foot, were also determined for the undisturbed samples. Results of these determinations are shown in the Exploration Boring Logs.

Direct Shear Test

Direct shear tests were performed on undisturbed samples, to determine strength characteristics of the soil. The test specimens were soaked prior to testing. Results of the shear strength tests are attached.

Resistance (R) Value Test

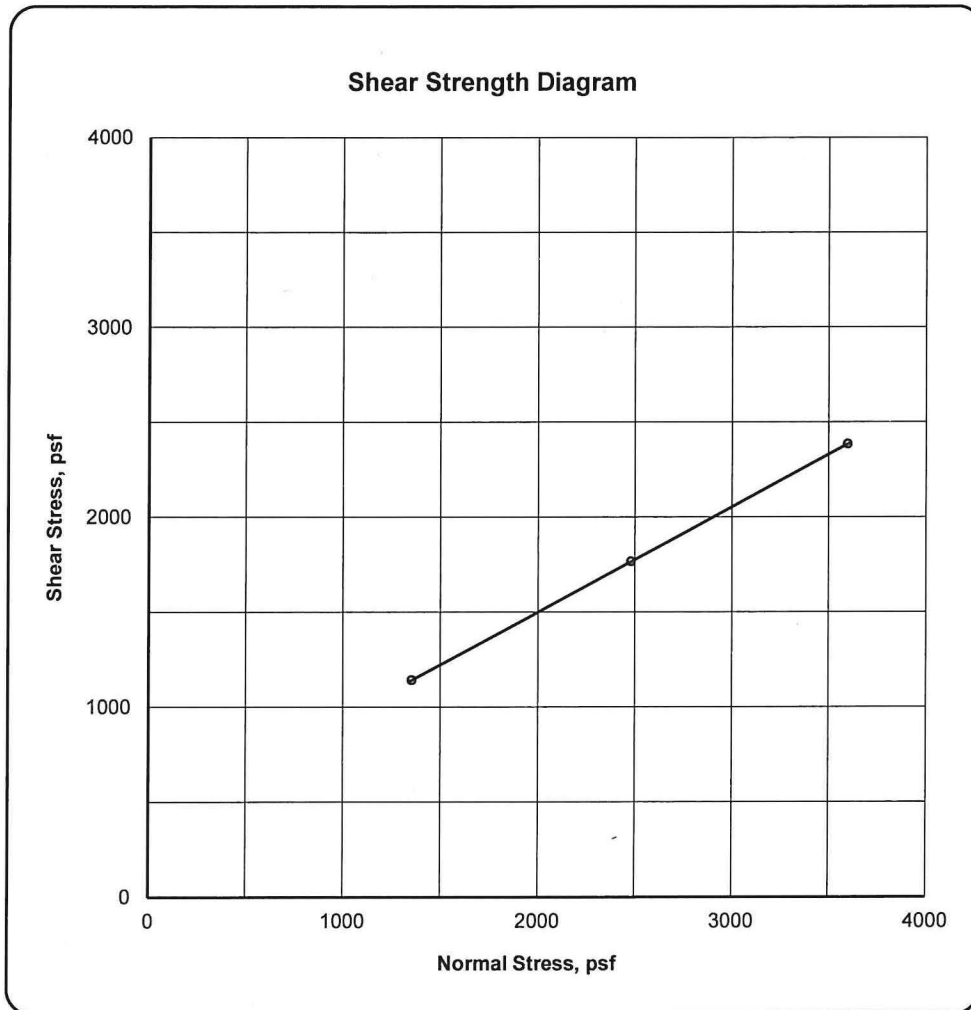
R-Value tests were performed on bulk samples obtained from boring B-10 and on a near surface sample obtained to the west of Skytt Mesa Road just north of Highway 246 (sample R1 on Figure 1). The results show that the silty clay soils from B-10 have an R-Value of 10 while the silty clayey sand sample obtained adjacent to Skytt Mesa Road had an R-Value of 24.

Expansion Index Test

Expansion indices varying from 46 to 84 were obtained for the native silty clay soils encountered in the proposed residence pad areas. The test procedure was performed in accordance with ASTM D4829 – Standard Test Method for Expansion Index of Soils.

DIRECT SHEAR TEST

ASTM D3080-11 (Modified for unconsolidated-undrained conditions)



Project: 8-Lot Subdivision, Skytt Mesa Rd, Sol

Project No. 22-0299

Sample Location: B-1 @ 4 Feet

Initial Dry Density (pcf) 104.3

Soil Description: **Silty Clay**

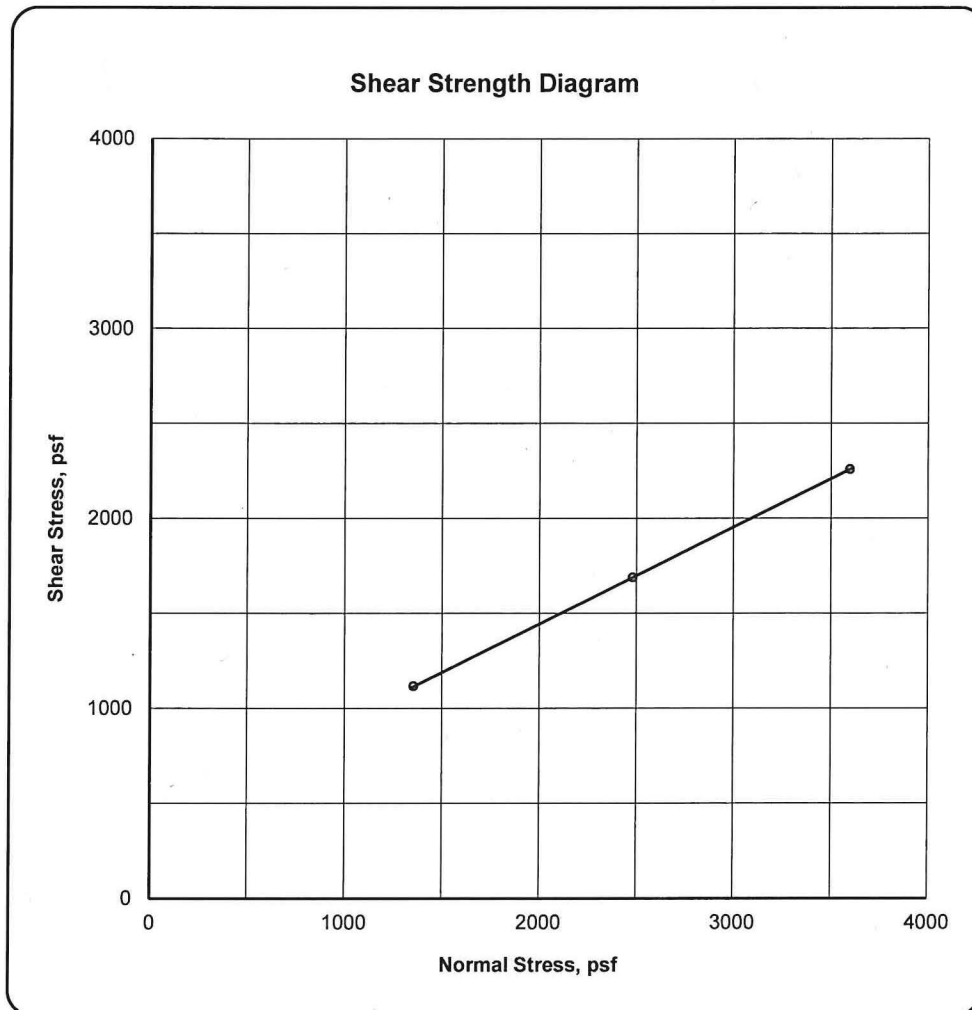
Initial Moisture (%) 11.5

Sample Type: ☐ Remolded
☒ Ring

Peak Shear Angle 29
Cohesion (psf) 390

DIRECT SHEAR TEST

ASTM D3080-11 (Modified for unconsolidated-undrained conditions)



Project: 8-Lot Subdivision, Skytt Mesa Rd, Sol

Project No. 22-0299

Sample Location: B-6 @ 5 Feet

Initial Dry Density (pcf) 101.4

Soil Description: **Silty Clay**

Initial Moisture (%) 18.3

Sample Type: ☐ Remolded
☒ Ring

Peak Shear Angle 27
Cohesion (psf) 425