GEOTECHNICAL INVESTIGATION
PROPOSED RECOVERY FACILITY
PARADISE VALLEY RANCH
43700 CACTUS VALLEY ROAD
HEMET AREA
RIVERSIDE COUNTY, CALIFORNIA

-Prepared By-

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Project No. 644-20047
21-03-025

PVR Management, LLC
c/o Camfield Partners, LLC
8895 Research Drive, Suite 200
Irvine, California 92618

Subject: Geotechnical Investigation

Project: Proposed Recovery Facility
Paradise Valley Ranch
43700 Cactus Valley Road
Hemet Area
Riverside County, California

Sladden Engineering is pleased to present the results of the geotechnical investigation performed for the proposed facility conversion and new buildings planned for the Paradise Valley Ranch Retreat located at 43700 Cactus Valley Road in the Hemet area of Riverside County, California. Our services were completed in accordance with our proposal for geotechnical engineering services dated December 14, 2020 and your authorization to proceed with the work. The purpose of our investigation was to explore the subsurface conditions at the site to provide recommendations for foundation design and for the design of the various site improvements. Evaluation of environmental issues and hazardous wastes was not included within the scope of services provided.

The opinions, recommendations and design criteria presented in this report are based on our field exploration program, laboratory testing and engineering analyses. Based on the results of our investigation, it is our professional opinion that the proposed project should be feasible from a geotechnical perspective provided that the recommendations presented in this report are implemented in design and carried out through construction.

We appreciate the opportunity to provide service to you on this project. If you have any questions regarding this report, please contact the undersigned.

Respectfully submitted,
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INTRODUCTION

This report presents the results of the geotechnical investigation performed for the proposed facility conversion and new building proposed for the Paradise Valley Ranch Retreat located at 43700 Cactus Valley Road in the Hemet area of Riverside County, California. The subject site is located at approximately 33.6684 degrees north latitude and 116.9008 degrees west longitude. The approximate location of the site is indicated on the Site Location Map (Figure 1).

Our investigation was conducted in order to evaluate the engineering properties of the subsurface materials, to evaluate their *in-situ* characteristics, and to provide engineering recommendations and design criteria for site preparation, foundation design and the design of various site improvements. This study also includes a review of published and unpublished geotechnical and geological literature regarding seismicity at and near the subject site.

PROJECT DESCRIPTION

It is our understanding that the proposed project will consist of constructing a new administrative and lodge building and converting existing site structures into living quarters for use as a recovery facility. The new structures and some renovated structures are anticipated to be serviced by new septic systems consisting of septic tanks and leach lines. For our analyses, we expect that the proposed new structures will consist of relatively lightweight wood-frame, steel-frame, reinforced masonry or modular structures supported on conventional shallow spread footings and concrete slabs-on-grade.

Sladden expects that grading will be limited to minor cuts and fills in order to accomplish the desired elevations and to provide adequate gradients for site drainage. This does not include the removal and re-compaction of the loose surface soil and primary foundation bearing soil within the proposed building areas. Upon completion of precise grading plans, Sladden should be retained in order to verify that the recommendations presented within in this report are properly incorporated into the design of the proposed project.

Structural foundation loads were not available at the time of this report. Based on our experience with relatively lightweight wood-frame, steel-frame and reinforced masonry structures, we expect that isolated column loads will be less than 30 kips and continuous wall loads will be less than 3.0 kips per linear foot. If these assumed loads vary significantly from the actual loads, we should be consulted to verify the applicability of the recommendations provided.

SCOPE OF SERVICES

The purpose of our investigation was to determine specific engineering characteristics of the surface and near surface soil in order to develop foundation design criteria and recommendations for site preparation. Exploration of the site was achieved by advancing a total of fourteen (14) percolation test holes, three (3) exploratory test pits and six (6) boreholes to depths between approximately three (3) and thirty-four (34) feet below the existing ground surface (bgs). Specifically, our site characterization consisted of the following tasks:

- Site reconnaissance to assess the existing surface conditions on and adjacent to the site.
- Advancing fourteen (14) percolation test holes, three exploratory (3) test pits and six (6) boreholes to depths between approximately three (3) and thirty-four (34) feet bgs in order to characterize the subsurface soil conditions. Representative samples of the soil were classified in the field and retained for laboratory testing and engineering analyses.
- Performing laboratory testing on selected samples to evaluate their engineering characteristics.
- Reviewing geologic literature and discussing geologic hazards.
- Performing engineering analyses to develop recommendations for foundation design and site preparation.
- The preparation of this report summarizing our work at the site.

SITE CONDITIONS

The proposed building sites are located within the Paradise Valley Ranch property located at 43700 Cactus Valley Road in the Hemet area of Riverside County, California. The Paradise Valley Ranch retreat consists of five (5) parcels that occupy a combined area of approximately 290 acres. The parcels are identified by the County of Riverside as APNs 569-020-010, 013, 024, 025, and 026. The existing Paradise Ranch complex consists of scattered facility structures, a swimming pool, a tennis court/ play court and paved driveways. The remaining areas of the property were covered by undeveloped turf fields and natural rolling hills. Generally, the Paradise Valley Ranch is bounded by and situated within an area of natural rolling hills.

Based on our review of the Hemet 7.5-Minute Quadrangle Map (USGS, 2015), the site is situated at an approximate elevation of 2,080 feet above mean sea level (MSL).

No natural ponding of water or surface seeps were observed at or near the site during our field investigation conducted on December 30, 2020 and February 23, 2021. Site drainage appears to be controlled via sheet flow and surface infiltration. A "blue line" stream is mapped approximately 400 feet to the south of the existing residence on the Paradise Valley Ranch property.

GEOLOGIC SETTING

The project site is located in the Peninsular Ranges Physiographic Province of California. The Peninsular Ranges are mountainous areas that extend from the western edge of the continental borderland to the Salton Trough and from the Transverse Ranges Physiographic Province in the north to the tip of Baja California in the south. The Peninsular Ranges Physiographic Province is characterized by northwest-trending topographic and structural features that locally include the San Jacinto Structural Block. The San Jacinto Structural Block is a northwest-southeast trending elongated structural block bounded on the southwest by the San Jacinto Fault and by the San Andreas Fault Zone to the northeast. The province is characterized by elongated, northwest-southeast trending mountain ranges and valleys and is truncated at its northern margin by the east-west grain of the Transverse Ranges. Mountainous areas of the Peninsular Ranges Physiographic Province generally consist of Igneous, metasedimentary and metavolcanic rocks. However, plutonic rocks of the Southern California Batholith are the dominant basement rock exposed (Jahns, 1954).

The site has been mapped by Morton & Matti (2005) to be immediately underlain by old alluvial fan deposits (Qof) overlying Cretaceous age tonalite bedrock (kh). The regional geologic setting for the site vicinity is presented on the Regional Geologic Map (Figure 2).

SUBSURFACE CONDITIONS

The subsurface conditions at the site were investigated by excavating a total of fourteen (14) percolation test holes, three exploratory (3) test pits and six (6) boreholes to depths between approximately three (3) and thirty-four (34) feet bgs. The approximate locations of the test holes, test pits and boreholes are illustrated on the Exploration Location Photographs (Figure 3A & 3B). The test holes and test pits were excavated with a John Deere 30G excavator equipped with an 8-inch diameter auger attachment and 24-inch wide bucket. The exploratory boreholes were excavated using a truck mounted hollow stem auger rig (Mobile B-61) equipped with 8-inch outside diameter hollow-stem augers. A Geologist employed by Sladden was on-site to log the materials encountered and retrieve samples for laboratory testing and engineering analyses.

During our field investigation, alluvium was encountered overlying intrusive bedrock (granitoid). Generally, the Alluvial materials consists of yellowish-brown sand (SP) and silty sand (SM). The underlying bedrock appeared gray in in-situ color, moderately strong, moderately hard, highly weathered and readily breaks down into a silty sand (SM) and sand (SP) soil type.

The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and tests of the field samples. The final logs are included in Appendix A of this report. The stratification lines represent the approximate boundaries between soil types although the transitions may be gradual and variable across the site.

Groundwater was not encountered within any of our exploratory boreholes. Based upon our review of groundwater levels within the vicinity of the site (CDWR, 2021), it is our opinion that groundwater should not be a controlling factor in the design or construction of the proposed new facility buildings.

SEISMICITY AND FAULTING

The southwestern United States is a tectonically active and structurally complex region, dominated by northwest trending dextral faults. The faults of the region are often part of complex fault systems, composed of numerous subparallel faults which splay or step from main fault traces. Strong seismic shaking could be produced by any of these faults during the design life of the proposed project.

We consider the most significant geologic hazard to the project to be the potential for moderate to strong seismic shaking that is likely to occur during the design life of the project. The proposed project is located in the highly seismic Southern California region within the influence of several fault systems that are considered to be active or potentially active. An active fault is defined by the State of California as a "sufficiently active and well defined fault" that has exhibited surface displacement within the Holocene epoch (about the last 11,000 years). A potentially active fault is defined by the State as a fault with a history of movement within Pleistocene time (between 11,000 and 1.6 million years ago).

As previously stated, the site has been subjected to strong seismic shaking related to active faults that traverse through the region. Some of the more significant seismic events near the subject site within recent times include; M6.0 North Palm Springs (1986), M6.1 Joshua Tree (1992), M7.3 Landers (1992), M6.2 Big Bear (1992), M7.1 Hector Mine (1999), and M7.1 Ridgecrest (2019).

Table 1 lists the closest known potentially active faults that was generated in part using the EQFAULT computer program (Blake, 2000), as modified using the fault parameters from The Revised 2002 California Probabilistic Seismic Hazard Maps (Cao et al, 2003), Southern Earthquake Data Center (SCEDC, 2020) and the Quaternary Fault and Fold Database of the United States (USGS, 2020a). This table does not identify the probability of reactivation or the on-site effects from earthquakes occurring on any of the other faults in the region.

TABLE 1
CLOSEST KNOWN ACTIVE FAULTS

Fault Name	Distance (Km)	Maximum Event
San Jacinto - Anza	5.2	7.2
San Jacinto – San Jacinto Valley	8.1	6.9
Elsinore - Temecula	30.6	6.8
Elsinore - Julian	34.0	7.1
San Andreas – Southern	36.7	7.2
San Andreas – San Bernardino	36.7	7.5
Elsinore – Glen Ivy	41.5	6.8

GROUND MOTION PARAMETERS

Sladden has reviewed the 2019 California Building Code (CBC) and ASCE7-16 and developed ground motion parameters for the subject site. Based on the shallow bedrock in the proposed building areas and our review of ASCE-7-16 (Chapter 20 and Section 11.4.3), Site Class B (Estimated) was determined to be appropriate for seismic design. The project Seismic Design Map & Report is summarized in the following table and included within Appendix C. The project Structural Engineer should verify that all design parameters provided are applicable for the subject project.

TABLE 2
GROUND MOTION PARAMETERS

Latitude / Longitude	33.6684/-116.9008
Risk Category	II
Site Class	B (Estimated)
Code Reference Documents	ASCE 7-16; Chapter 11 & 21

Description	Type	Map Based
MCE_R Ground Motion (0.2 second period)	S_S	1.835
MCE_R Ground Motion (1.0 second period)	S_1	0.721
Site-Modified Spectral Acceleration Value	S_{MS}	1.835
Site-Modified Spectral Acceleration Value	S_{M1}	0.721
Numeric Seismic Design Value at 0.2 second SA	S_{DS}	1.223
Numeric Seismic Design Value at 1.0 second SA	S_{D1}	0.480
Site Amplification Factor at 0.2 second	F_a	1
Site Amplification Factor at 1.0 second	F_v	1
Site Peak Ground Acceleration	PGA_M	0.775

GEOLOGIC HAZARDS

The subject site is located in an active seismic zone and will likely experience strong seismic shaking during the design life of the proposed project. In general, the intensity of ground shaking will depend on several factors including; the distance to the earthquake focus, the earthquake magnitude, the response characteristics of the underlying materials, and the quality and type of construction. Geologic hazards and their relationship to the site are discussed below.

I. Surface Rupture. Surface rupture is expected to occur along preexisting, known active fault traces. However, surface rupture could potentially splay or step from known active faults or rupture along unidentified traces. Based on our review of CDMG (1980), Jennings (1994), Morton & Matti (2005) and RCPR (2021) known faults are not mapped on or projecting towards the site. In addition, no signs of active surface faulting were observed during our review of non-stereo digitized photographs of the site and site vicinity (Google Earth, 2021). Finally, no signs of active surface fault rupture or secondary seismic effects (lateral spreading, lurching etc.) were identified during our field investigation. Therefore, it is our opinion that risks associated with primary surface ground rupture should be considered "low".

II. Ground Shaking. The site has been subjected to past ground shaking by faults that traverse through the region. Strong seismic shaking from nearby active faults is expected to produce strong seismic shaking during the design life of the proposed project. The site modified peak ground acceleration is estimated to be 0.775g.

III. Liquefaction. Liquefaction is the process in which loose, saturated granular soil loses strength as a result of cyclic loading. The strength loss is a result of a decrease in granular sand volume and a positive increase in pore pressures. Generally, liquefaction can occur if all of the following conditions apply; liquefaction-susceptible soil, groundwater within a depth of 50 feet or less, and strong seismic shaking.

Based on the presence of shallow seated bedrock and our experience in the project vicinity, risks associated with liquefaction and liquefaction related hazards should be considered "negligible".

IV. Tsunamis and Seiches. Because the site is situated at an inland location and is not immediately adjacent to any impounded bodies of water, risks associated with tsunamis and seiches are considered "negligible".

V. Slope Failure, Land Sliding, Rock Falls. No signs of slope instability in the form of landslides, rock falls, earthflows or slumps were observed at or near the subject site. Based on our field observations of the site vicinity, risks associated with slope instability should be considered "low".

VI. Expansive Soil. Generally, the near surface soil consists of sand (SP) and silty sand (SM). Based on the results of our laboratory testing, the materials underlying the site are considered to have a "very low" expansion potential.

VII. Static Settlement. Static settlement resulting from the anticipated foundation loads should be tolerable provided that the recommendations included in this report are considered in foundation design and construction. The ultimate static settlement is expected to be less than 1 inch when using the recommended allowable bearing pressures. As a practical matter, differential static settlement between footings can be assumed as one-half of the total settlement.

VIII. Subsidence. Land subsidence can occur in valleys where aquifer systems have been subjected to extensive groundwater pumping, such that groundwater pumping exceeds groundwater recharge. Generally, pore water reduction can result in a rearrangement of skeletal grains and could result in elastic (recoverable) or inelastic (unrecoverable) deformation of an aquifer system. Based upon the presence of shallow seated bedrock throughout the site, the risks associated with subsidence should be considered "negligible".

IX. Debris Flows. Debris flows are viscous flows consisting of poorly sorted mixtures of sediment and water and are generally initiated on slopes steeper than approximately six horizontal to one vertical (6H:1V) (Boggs, 2001). Risks associated with debris flows should be evaluated and mitigated by the project design civil engineer.

X. Flooding and Erosion. No signs of flooding or erosion were observed during our field investigation. However, risks associated with flooding and erosion should be evaluated and mitigated by the project design Civil Engineer.

CONCLUSIONS

Based on the results of our investigation, it is our professional opinion that the project should be feasible from a geotechnical perspective provided that the recommendations presented in this report are incorporated into design and carried out through construction. The main geotechnical concerns in the construction of the proposed project are the presence of loose alluvial surface soil and shallow seated bedrock that may be encountered during site grading, foundation construction and underground utility installation.

The proposed structures may be supported upon conventional shallow spread footings. Remedial grading including over-excavation or re-compaction is recommended for the new building areas. We recommend that remedial grading include over-excavation and re-compaction of the loose surface soil and weathered bedrock to provide uniform foundation bearing conditions and help mitigate potential cut/fill transition related differential settlements.

The surface soil where encountered may be susceptible to caving within deeper excavations. All excavations should be constructed in accordance with the normal CalOSHA excavation criteria. Based on our observations of the materials encountered, we anticipate that the subsoil will conform to that described by CalOSHA as Type C and intact bedrock will be classified as Type A. Soil conditions should be verified in the field by a "Competent person" employed by the Contractor.

The following recommendations present more detailed design criteria that have been developed based on our field and laboratory investigation.

EARTHWORK AND GRADING

All earthwork including excavation, backfill and preparation of the primary foundation and/or slab bearing soil should be performed in accordance with the geotechnical recommendations presented in this report and portions of the local regulatory requirements, as applicable. All earthwork should be performed under the observation and testing of a qualified geotechnical consultant. The following geotechnical engineering recommendations for the proposed project are based on observations from the field investigation program, laboratory testing and geotechnical engineering analyses.

a. Stripping. Areas to be graded should be cleared of any existing vegetation, associated root systems, existing foundation elements and debris. All areas scheduled to receive fill should be cleared of old fills and any irreducible matter. The strippings should be removed off site, or stockpiled for later use in landscape areas. Voids left by obstructions should be properly backfilled in accordance with the compaction recommendations of this report.

b. Preparation of New Building Areas: In order to achieve firm and uniform bearing conditions and to mitigate transition related differential settlement, we recommend over-excavation and re-compaction throughout the proposed new building areas. All low density near surface soil should be removed to a depth of at least 3 feet below existing grade or 2 feet below the bottom of the footings, whichever is deeper. Remedial grading should extend laterally a minimum of five feet beyond the building limits. The soil exposed by over-excavation should be scarified, moisture conditioned to near optimum moisture content and compacted to at least 90 percent relative compaction prior to fill placement. The previously removed soil may then be replaced as engineered fill as recommended below.

c. Compaction: Soil to be used as engineered fill should be free of organic material, debris, and other deleterious substances, and should not contain irreducible matter greater than three inches in maximum dimension. All fill materials should be placed in thin lifts, not exceeding six inches in a loose condition. If import fill is required, the material should be of a low to non-expansive nature and should meet the following criteria:

Plastic Index	Less than 12
Liquid Limit	Less than 35
Percent Soil Passing #200 Sieve	Between 15% and 35%
Maximum Aggregate Size	3 inches

The subgrade and all fill soil should be compacted with acceptable compaction equipment, to at least 90 percent relative compaction. The bottom of all excavations should be observed by a representative of Sladden Engineering prior to fill placement. Compaction testing should be performed on all lifts in order to ensure proper placement of the fill materials. Table 3 provides a summary of the excavation and compaction recommendations.

TABLE 3
SUMMARY OF RECOMMENDATIONS

*Remedial Grading	Over-excavation and re-compaction within the building envelopes to a depth of 3 feet below existing grade or 2 feet below the bottom of the footings, whichever is deeper. Over-excavation should extend laterally at least 5 feet beyond the building limits.
Native / Import Engineered Fill	Place in thin lifts not exceeding 6 inches in a loose condition, at near optimum moisture content and compact to a minimum of 90 percent relative compaction.

*Actual depth may vary and should be determined by a representative of Sladden Engineering in the field during construction.

d. Shrinkage and Subsidence: Volumetric shrinkage of the material that is excavated and replaced as controlled compacted fill should be anticipated. We estimate that this shrinkage should be between 10 and 15 percent. Subsidence of the surfaces that are scarified and compacted should be between 1 tenth and 2 tenths of a foot. This will vary depending upon the type of equipment used, the moisture content of the soil at the time of grading and the actual degree of compaction attained.

CONVENTIONAL SHALLOW SPREAD FOOTINGS

Conventional spread footings are expected to provide adequate support for the proposed new facility buildings. All footings should be founded upon properly compacted engineered fill soil and should have a minimum embedment depth of 12 inches measured from the lowest adjacent finished grade. Continuous and isolated footings should have minimum widths of 12 inches and 24 inches, respectively. Continuous and isolated footings supported upon properly engineered fill compacted soil may be designed using allowable (net) bearing pressures of 1800 and 2000 pounds per square foot (psf), respectively. Allowable increases of 200 psf for each additional 1 foot of width and 250 psf for each additional 6 inches of depth may be used if desired. The maximum allowable bearing pressure should be 3000 psf. The allowable bearing pressures apply to combined dead and sustained live loads. The allowable bearing pressures may be increased by one-third when considering transient live loads, including seismic and wind forces.

Based on the recommended allowable bearing pressures, the total static settlement of the shallow footings is anticipated to be less than one-inch, provided foundation area preparation conforms to the recommendations described in this report. Static differential settlement is anticipated to be approximately one-half of the total settlement for similarly loaded footings spaced up to approximately 50 feet apart.

Lateral load resistance for the spread footings will be developed by passive pressure against the sides of the footings below grade and by friction acting at the base of the footings. An allowable passive pressure of 275 psf per foot of depth may be used for design purposes. An allowable coefficient of friction 0.45 may be used for dead and sustained live loads to compute the frictional resistance of the footing placed directly on compacted fill. Under seismic and wind loading conditions, the passive pressure and frictional resistance may be increased by one-third.

All footing excavations should be observed by a representative of the project geotechnical consultant to verify adequate embedment depths prior to placement of forms, steel reinforcement or concrete. The excavations should be trimmed neat, level and square. All loose, disturbed, sloughed or moisture-softened soils and/or any construction debris should be removed prior to concrete placement. Excavated soil generated from footing and/or utility trenches should not be stockpiled within the building envelope or in areas of exterior concrete flatwork. All footings should be reinforced in accordance with the project Structural Engineer's recommendations.

SLABS-ON-GRADE

In order to provide uniform and adequate support, concrete slabs-on-grade must be placed on properly compacted engineered fill soil as outlined in the previous sections of this report. The slab subgrade should remain near optimum moisture content and should not be permitted to dry prior to concrete placement. Slab subgrade should be firm and unyielding. Disturbed soil should be removed and replaced with engineered fill soil compacted to a minimum of 90 percent relative compaction.

Slab thickness and reinforcement should be determined by the Structural Engineer. We recommend a minimum slab thickness of 4.0 inches and minimum reinforcement of #3 bars at 24 inches on center in both directions. All slab reinforcement should be supported on concrete chairs to ensure that reinforcement is placed at slab mid-height. Final floor slab design and reinforcement should be determined by the Structural Engineer.

Slabs with moisture sensitive surfaces should be underlain with a moisture vapor retarder consisting of a polyvinyl chloride membrane such as 10-mil visqueen, or equivalent. All laps within the membrane should be sealed and at least 2 inches of clean sand should be placed over the membrane to promote uniform curing of the concrete. To reduce the potential for punctures, the membrane should be placed on a pad surface that has been graded smooth without any sharp protrusions. If a smooth surface can not be achieved by grading, consideration should be given to placing a 1-inch thick leveling course of sand across the pad surface prior to placement of the membrane.

RETAINING WALLS

Minor retaining walls may be required to accomplish the proposed construction. Cantilever retaining walls may be designed using "active" pressures. Active pressures may be estimated using an equivalent fluid weight of 35 pcf for level native backfill soil acting in a triangular pressure distribution with drained backfill conditions. "At Rest" pressures should be utilized for restrained walls. "At rest" pressures may be estimated using an equivalent fluid weight of 55 pcf for native backfill soil with level drained backfill conditions.

CORROSION SERIES

The soluble sulfate concentrations of the surface soil were determined to be 20 parts per million (ppm). The soil is considered to have a "negligible" corrosion potential with respect to concrete. The use of Type V cement and special sulfate resistant concrete mixes may be necessary. The soluble sulfate content of the surface soil should be reevaluated after grading and appropriate concrete mix designs should be established based upon post-grading test results.

The pH levels of the surface soil were 8.2 & 9.5. Based on soluble chloride concentration testing (50 ppm) the soil is considered to have a "low" corrosion potential with respect to normal grade steel. The minimum resistivity of the surface soil was found to be 7,000 & 7,700 ohm-cm, which suggests the site soil is considered to have a "low" corrosion potential with respect to ferrous metal installations.

UTILITY TRENCH BACKFILL

All utility trench backfill should be compacted to a minimum of 90 percent relative compaction. Trench backfill materials should be placed in lifts no greater than six inches in a loose condition, moisture conditioned (or air-dried) as necessary to achieve near optimum moisture content, and mechanically compacted to a minimum of 90 percent relative compaction. A representative of the project soil engineer should test the backfill to verify adequate compaction.

EXTERIOR CONCRETE FLATWORK

In order to provide uniform support and minimize settlement related cracking of concrete flatwork, the subgrade soil within concrete flatwork areas should be compacted to a minimum of 90 percent relative compaction. A representative of the project geotechnical consultant should observe and verify the density and moisture content of the soil prior to concrete placement.

DRAINAGE

All final grades should be provided with positive gradients away from foundations to provide rapid removal of surface water runoff to an adequate discharge point. No water should be allowed to be pond on or immediately adjacent to foundation elements. In order to reduce water infiltration into the subgrade soil, surface water should be directed away from building foundations to an adequate discharge point. Subgrade drainage should be evaluated upon completion of the precise grading plans and in the field during grading.

LIMITATIONS

The findings and recommendations presented in this report are based upon an interpolation of the soil conditions between the exploratory bore locations and extrapolation of these conditions throughout the proposed building areas. Should conditions encountered during grading appear different than those indicated in this report, this office should be notified.

The use of this report by other parties or for other projects is not authorized. The recommendations of this report are contingent upon monitoring of the grading operation by a representative of Sladden Engineering. All recommendations are considered to be tentative pending our review of the grading operation and additional testing, if indicated. If others are employed to perform any soil testing, this office should be notified prior to such testing in order to coordinate any required site visits by our representative and to assure indemnification of Sladden Engineering.

We recommend that a pre-job conference be held on the site prior to the initiation of site grading. The purpose of this meeting will be to ensure a complete understanding of the recommendations presented in this report as they apply to the actual grading performed.

ADDITIONAL SERVICES

Once completed, final project plans and specifications should be reviewed by use prior to construction to confirm that the full intent of the recommendations presented herein have been applied to design and construction. Following review of plans and specifications, observation should be performed by the Soil Engineer during construction to document that foundation elements are founded on/or extend into the properly compacted soil, and that suitable backfill soil is placed upon competent materials and properly compacted at the recommended moisture content.

Tests and observations should be performed during grading by the Soil Engineer or his representative in order to verify that the grading is being performed in accordance with the project specifications. Field density testing shall be performed in accordance with acceptable ASTM test methods. The minimum acceptable degree of compaction should be 90 percent for engineered fill soil and 95 percent for Class II aggregate base as obtained by ASTM Test Method D1557. Where testing indicates insufficient density, additional compactive effort shall be applied until retesting indicates satisfactory compaction.

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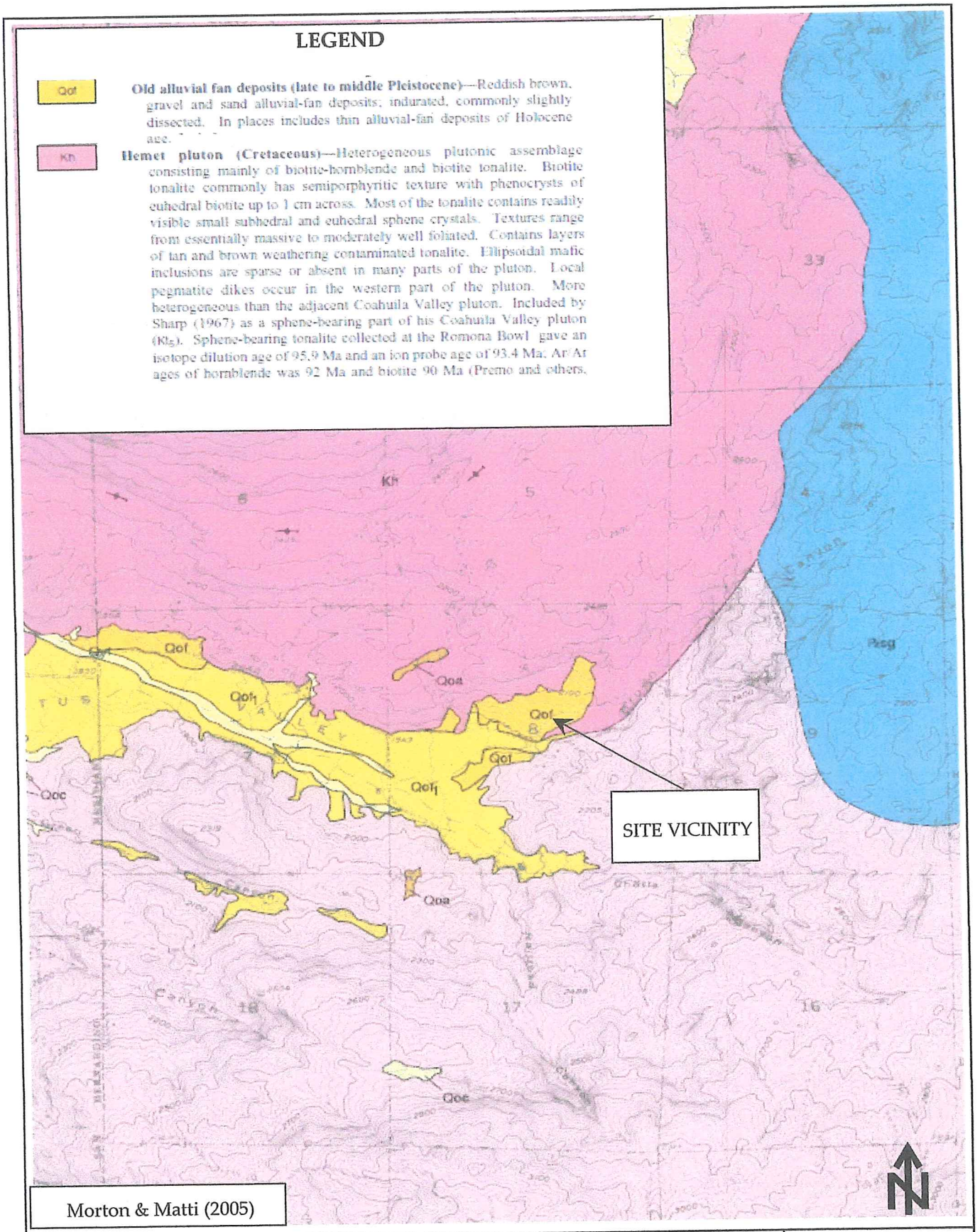
FIGURES

SITE LOCATION MAP
REGIONAL GEOLOGIC MAP
BOREHOLE LOCATION PHOTOGRAPHS

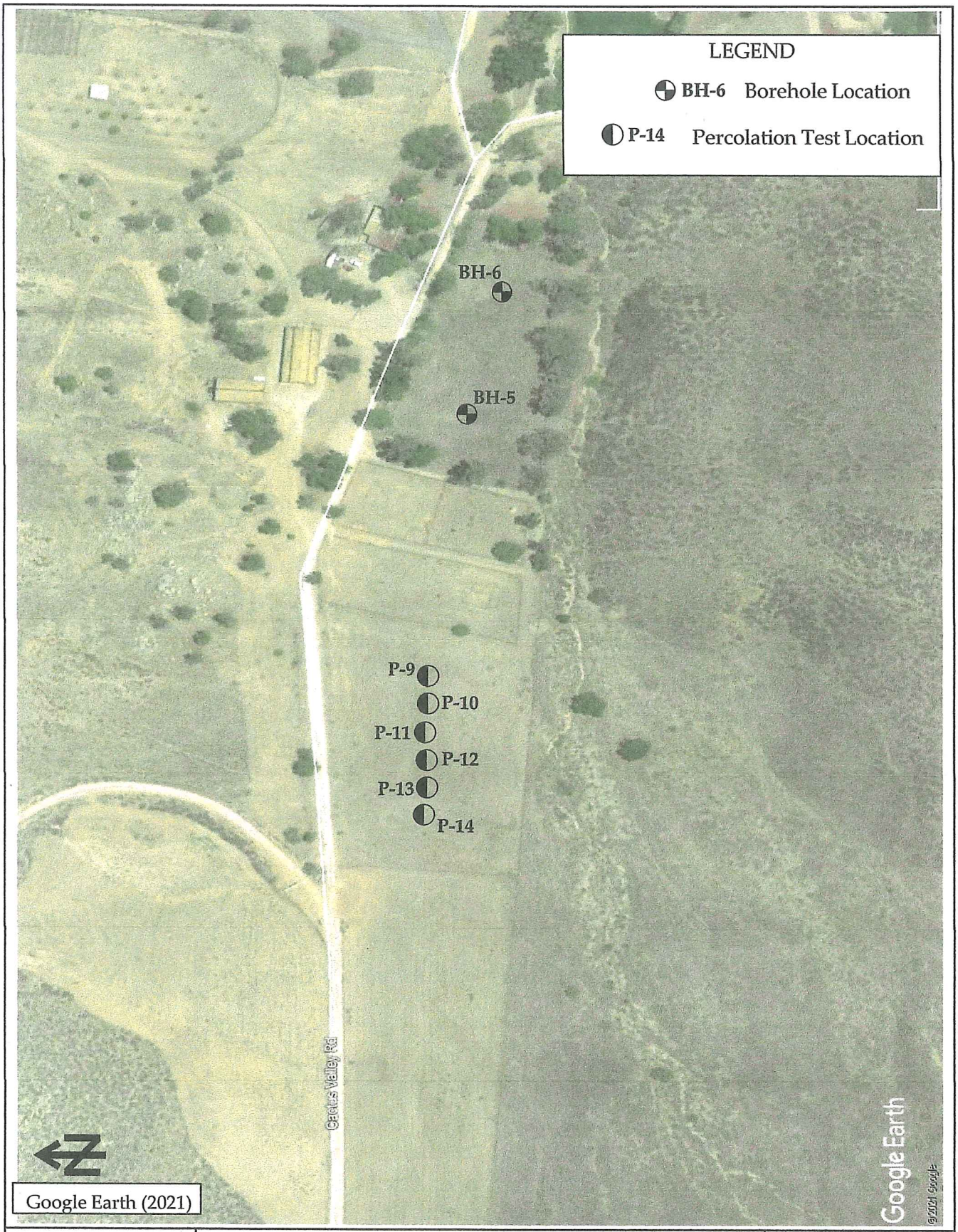
Sladden Engineering	SITE LOCATION MAP		FIGURE 1
	Project Number:	644-20047	
	Report Number:	21-03-025	
	Date:	March 12, 2021	



Morton & Matti (2005)

Sladden Engineering	REGIONAL GEOLOGIC MAP	FIGURE 2
	Project Number: 644-20047	
	Report Number: 21-03-025	
	Date: March 12, 2021	

Sladden Engineering	EXPLORATION LOCATION PHOTOGRAPH		FIGURE
	Project Number:	644-20047	3A
	Report Number:	21-03-025	
	Date:	March 12, 2021	



Google Earth (2021)

Sladden Engineering	EXPLORATION LOCATION PHOTOGRAPH		FIGURE
	Project Number:	644-20047	3B
	Report Number:	21-03-025	
	Date:	March 12, 2021	

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

For our field investigation a total of fourteen (14) percolation test holes, three (3) exploratory test pits and six (6) boreholes to depths between approximately three (3) and thirty-four (34) feet bgs were excavated on December 30, 2021 and February 23, 2021 utilizing a mini excavator with a continuous flight auger attachment and a truck mounted hollow stem auger rig (Mobile B-61). Continuous logs of the materials encountered were made by a representative of Sladden Engineering. Materials encountered in the boreholes were classified in accordance with the Unified Soil Classification System which is presented in this appendix.

Representative undisturbed samples were obtained within our borings by driving a thin-walled steel penetration sampler (California split spoon sampler) or a Standard Penetration Test (SPT) sampler with a 140-pound automatic-trip hammer dropping approximately 30 inches (ASTM D1586). The number of blows required to drive the samplers 18 inches was recorded in 6-inch increments and blow counts are indicated on the boring logs.

The California samplers are 3.0 inches in diameter, carrying brass sample rings having inner diameters of 2.5 inches. The standard penetration samplers are 2.0 inches in diameter with an inner diameter of 1.5 inches. Undisturbed samples were removed from the sampler and placed in moisture sealed containers to preserve the natural soil moisture content. Bulk samples were obtained from the excavation spoils and samples were then transported to our laboratory for further observations and testing.

SLADDEN ENGINEERING

BORE LOG

Excavator:	Mini-Ex	Date Drilled:	12/30/2021
Elevation:	2035 (MSL)	Boring No:	BH-1

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Bedrock (granitoid); moderately hard, moderately strong, highly weathered; breaks down to SP/SM soil type.
							6		Terminated at ~ 2.5 feet bgs. Bedrock Encountered at ~ 1.0 feet bgs. No Groundwater or Seepage Encountered.
							8		
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Completion Notes:

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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	2035 (MSL)	Boring No:	BH-2

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Bedrock (granitoid); moderately hard, moderately strong, highly weathered; breaks down to SP/SM soil type.
							6		Terminated at ~ 2.5 feet bgs. Bedrock Encountered at ~ 1.0 feet bgs. No Groundwater or Seepage Encountered.
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Completion Notes:

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SLADDEN ENGINEERING

BORE LOG

Excavator:	Mini-Ex	Date Drilled:	12/30/2021
Elevation:	2035 (MSL)	Boring No:	BH-3

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							2		Bedrock (granitoid); moderately hard, moderately strong, highly weathered; breaks down to SP/SM soil type.
							4		
							6		Terminated at ~ 2.5 feet bgs.
							8		Bedrock Encountered at ~ 1.0 feet bgs.
							10		No Groundwater or Seepage Encountered.
							12		
							14		
							16		
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SLADDEN ENGINEERING

BORE LOG

Excavator:	Mini-Ex	Date Drilled:	12/30/2021
Elevation:	2035 (MSL)	Boring No:	BH-4

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Bedrock (granitoid); moderately hard, moderately strong, highly weathered; breaks down to SP/SM soil type.
							6		Terminated at ~ 2.5 feet bgs. Bedrock Encountered at ~ 1.0 feet bgs. No Groundwater or Seepage Encountered.
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SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	2/23/2021
Elevation:	2035 (MSL)	Boring No:	BH-5

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
	3/6/9	1	1	5.5	4.8	109.4	2		Sand (SP); yellowish brown, moist, loose, fine-to-coarse grained with gravel (Qof).
	5/7/9			5.5	5.6	108.5	6		Sand (SP); yellowish brown, moist, loose, fine-to-coarse grained with gravel (Qof).
	5/6/7			8.6	6.0		10		Sand (SP); yellowish brown, moist, medium dense, fine-to-coarse grained with gravel (Qof).
	7/7/12			11.5	7.6	113.8	16		Sand (SP); yellowish brown, moist, medium dense, fine-to-coarse grained with gravel (Qof).
	5/7/9			7.6	5.3		20		Sand (SP); yellowish brown, moist, medium dense, fine-to-coarse grained with gravel (Qof).
	6/9/11			9.8	4.8	110.4	26		Sand (SP); yellowish brown, moist, medium dense, fine-to-coarse grained with gravel (Qof).
	27/50-6"			8.5	4.0		30		Bedrock (granitoid); moderately hard, moderately strong, highly weathered; breaks down to SP/SM soil type.
							34		Practical Auger Refusal at ~ 34.0 feet bgs. Bedrock Encountered at ~ 30.0 feet bgs. No Groundwater or Seepage Encountered.

Completion Notes:

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SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	2/23/2021
Elevation:	2035 (MSL)	Boring No:	BH-6

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							2		Sand (SP); yellowish brown, moist, fine-to-coarse grained with gravel (Qof).
	2/2/2			7.7	5.7		4		
							6		Sand (SP); yellowish brown, moist, very loose, fine-to-coarse grained with gravel (Qof).
							8		
	8/10/26			4.3	3.2	109.2	10		Sand (SP); yellowish brown, moist, medium dense, fine-to-coarse grained with gravel (Qof).
							12		
							14		
	50-3"			7.0	6.1		16		Sand (SP); yellowish brown, moist, very dense, fine-to-coarse grained with gravel (Qof).
							18		Terminated at ~ 16.5 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.
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Completion Notes:

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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	3380 (MSL)	Boring No:	P-1

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
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Completion Notes:

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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	3380 (MSL)	Boring No:	P-2

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
							8		
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Completion Notes:

PARADISE VALLEY RANCH
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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	3380 (MSL)	Boring No:	P-3

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
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Completion Notes:

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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	3380 (MSL)	Boring No:	P-4

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
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Completion Notes:

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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	2025 (MSL)	Boring No:	P-5

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
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Completion Notes:

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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	2025 (MSL)	Boring No:	P-6

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							2		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							4		
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
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Completion Notes:

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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	2025 (MSL)	Boring No:	P-7

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							2		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							4		
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
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Completion Notes:

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SLADDEN ENGINEERING	BORE LOG			
	Excavator:	Mini-Ex	Date Drilled:	12/30/2021
	Elevation:	2025 (MSL)	Boring No:	P-8

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							2		
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
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SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	2/23/2021
Elevation:	1980 (MSL)	Boring No:	P-9

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							2		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							4		
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
							8		
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BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	2/23/2021
Elevation:	1980 (MSL)	Boring No:	P-10

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
							8		
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SLADDEN ENGINEERING	BORE LOG			
	Drill Rig:	Mobil B-61	Date Drilled:	2/23/2021
	Elevation:	1980 (MSL)	Boring No:	P-11

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
							8		
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SLADDEN ENGINEERING	BORE LOG			
	Drill Rig:	Mobil B-61	Date Drilled:	2/23/2021
	Elevation:	1980 (MSL)	Boring No:	P-12

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
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Completion Notes:

PARADISE VALLEY RANCH
43700 CACTUS VALLEY ROAD, HEMET

Project No:	644-20047	Page	18
Report No:	21-01-005		

SLADDEN ENGINEERING	BORE LOG			
	Drill Rig:	Mobil B-61	Date Drilled:	2/23/2021
	Elevation:	1980 (MSL)	Boring No:	P-13

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							0		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							2		
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
							8		
							10		
							12		
							14		
							16		
							18		
							20		
							22		
							24		
							26		
							28		
							30		
							32		
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PARADISE VALLEY RANCH
43700 CACTUS VALLEY ROAD, HEMET

Project No: 644-20047
Report No: 21-01-005

SLADDEN ENGINEERING	BORE LOG			
	Drill Rig:	Mobil B-61	Date Drilled:	2/23/2021
	Elevation:	1980 (MSL)	Boring No:	P-14

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2		Silty Sand (SM); yellowish brown, dry, fine-to-coarse grained with gravel (Qof).
							4		Silty Sand (SM); yellowish brown, dry to slightly moist, fine-to-coarse grained with gravel (Qof).
							6		Terminated at ~ 5.0 feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased with Perforated Pipe for Percolation Testing.
							8		
							10		
							12		
							14		
							16		
							18		
							20		
							22		
							24		
							26		
							28		
							30		
							32		
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PARADISE VALLEY RANCH
43700 CACTUS VALLEY ROAD, HEMET

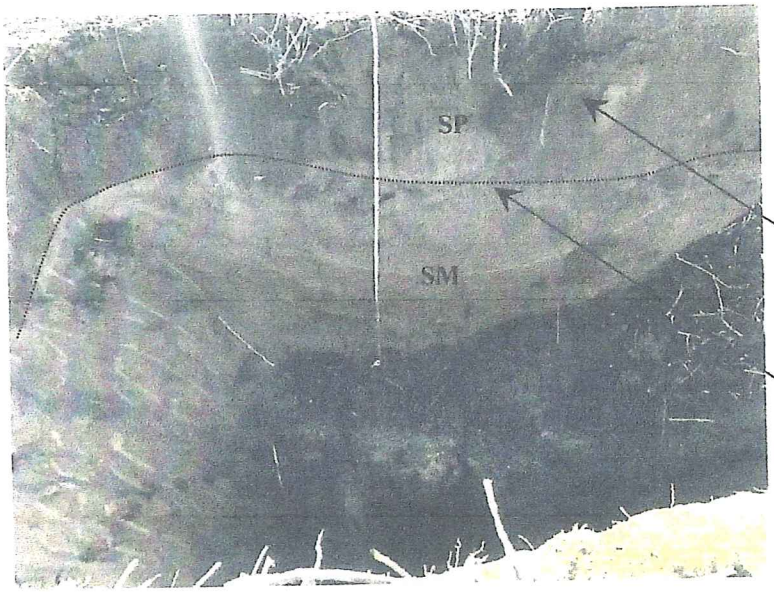
Project No: 644-20047
Report No: 21-01-005

LOG OF TEST PIT: TP - 1

Soil Interval Depth (Feet bgs)	Soil Sample Designation	Soil Sample Depth (Feet bgs)	SOIL DESCRIPTION
0.0-101			Sand (SP); dark grayish brown, slightly moist to moist, fine- to coarse-grained with gravel (Qal).
1.0-12.0			Silty Sand (SM); yellowish brown, dry, fine- to coarse-grained with gravel (Qal).
12.0-13.0			Bedrock (granitoid); moderately hard, moderately strong, highly weathered; breaks down to SP/SM soil type.
			Test Pit Terminated at ~5.0 Feet bgs. Bottom of Test Pit Augured to 13.0 Feet bgs. Bedrock Encountered. At ~12.0 Feet bgs. No Groundwater or Seepage Encountered

GRAPHIC REPRESENTATION

SCALE: N/A BEARING: N49E WALL: North



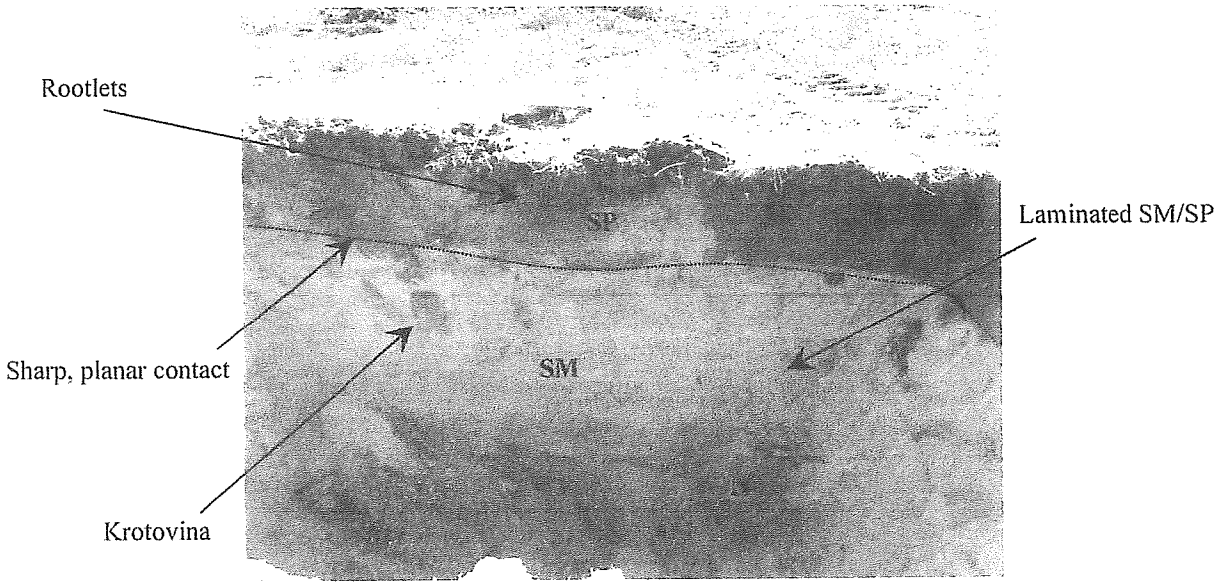
Test Pit Number: TP-1	Date: 12/30/2020	**Sladden Engineering**
Elevation: 2085 Ft. msl	Equipment: Track-Mounted Excavator	Project: Paradise Valley Ranch
Lat/Long: 33.6692/-116.8996	Logged By: J. Minor	Project No.: 644-20047

LOG OF TEST PIT: TP - 2

Soil Interval Depth (Feet bgs)	Soil Sample Designation	Soil Sample Depth (Feet bgs)	SOIL DESCRIPTION
0.0-2.0			Sand (SP); dark grayish brown, slightly moist to moist, fine- to coarse-grained with gravel (Qal).
2.0-12.0			Silty Sand (SM); yellowish brown, dry, fine- to coarse-grained with gravel (Qal).
12.0-14.5			Bedrock (granitoid); moderately hard, moderately strong, highly weathered; breaks down to SP/SM soil type.
			Test Pit Terminated at ~5.0 Feet bgs. Bottom of Test Pit Augured to 14.5 Feet bgs. Bedrock Encountered. At ~12.0 Feet bgs. No Groundwater or Seepage Encountered

GRAPHIC REPRESENTATION

SCALE: N/A BEARING: N27E WALL: North



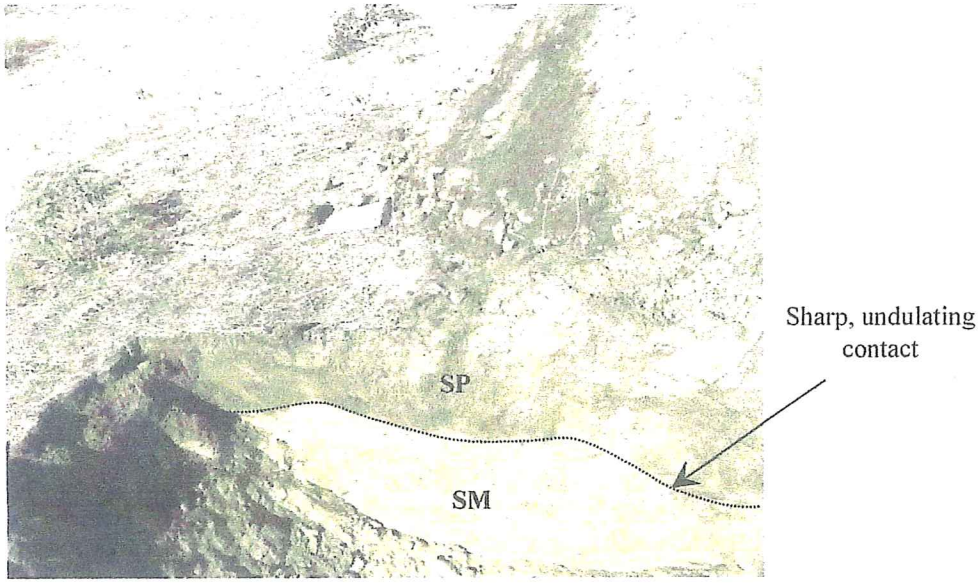
Test Pit Number: TP-2	Date: 12/30/2020	**Sladden Engineering**
Elevation: 2025 Ft. msl	Equipment: Track-Mounted Excavator	Project: Paradise Valley Ranch
Lat/Long: 33.6675/-116.9019	Logged By: J. Minor	Project No.: 644-20047

LOG OF TEST PIT: TP - 3

Soil Interval Depth (Feet bgs)	Soil Sample Designation	Soil Sample Depth (Feet bgs)	SOIL DESCRIPTION
0.0-1.0			Sand (SP); dark grayish brown, slightly moist to moist, fine- to coarse-grained with gravel (Qal).
1.0-5.0			Silty Sand (SM); yellowish brown, dry, fine- to coarse-grained with gravel (Qal).
			Test Pit Terminated at ~5.0 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered

GRAPHIC REPRESENTATION

SCALE: N/A BEARING: N42E WALL: North



Test Pit Number: TP-3	Date: 12/30/2020	**Sladden Engineering**
Elevation: 2032 Ft. msl	Equipment: Track-Mounted Excavator	Project: Paradise Valley Ranch
Lat/Long: 33.6677/-116.9023	Logged By: J. Minor	Project No.: 644-20047

APPENDIX B

LABORATORY TESTING

APPENDIX B

LABORATORY TESTING

Representative bulk and relatively undisturbed soil samples were obtained in the field and returned to our laboratory for additional observations and testing. Laboratory testing was generally performed in two phases. The first phase consisted of testing in order to determine the compaction of the existing natural soil and the general engineering classifications of the soils underlying the site. This testing was performed in order to estimate the engineering characteristics of the soil and to serve as a basis for selecting samples for the second phase of testing. The second phase consisted of soil mechanics testing. This testing including consolidation, shear strength and expansion testing was performed in order to provide a means of developing specific design recommendations based on the mechanical properties of the soil.

CLASSIFICATION AND COMPACTION TESTING

Unit Weight and Moisture Content Determinations: Each undisturbed sample was weighed and measured in order to determine its unit weight. A small portion of each sample was then subjected to testing in order to determine its moisture content. This was used in order to determine the dry density of the soil in its natural condition. The results of this testing are shown on the Boring Logs.

Maximum Density-Optimum Moisture Determinations: Representative soil types were selected for maximum density determinations. This testing was performed in accordance with the ASTM Standard D1557-91, Test Method A. Graphic representations of the results of this testing are presented in this appendix. The maximum densities are compared to the field densities of the soil in order to determine the existing relative compaction to the soil.

Classification Testing: Soil samples were selected for classification testing. This testing consists of mechanical grain size analyses. This provides information for developing classifications for the soil in accordance with the Unified Soil Classification System which is presented in the preceding appendix. This classification system categorizes the soil into groups having similar engineering characteristics. The results of this testing is very useful in detecting variations in the soil and in selecting samples for further testing.

SOIL MECHANIC'S TESTING

Expansion Testing: Two (2) bulk samples were selected for Expansion testing. Expansion testing was performed in accordance with the UBC Standard 18-2. This testing consists of remolding 4-inch diameter by 1-inch thick test specimens to a moisture content and dry density corresponding to approximately 50 percent saturation. The samples are subjected to a surcharge of 144 pounds per square foot and allowed to reach equilibrium. At that point the specimens are inundated with distilled water. The linear expansion is then measured until complete.

Direct Shear Testing: Two (2) bulk samples were selected for Direct Shear testing. This test measures the shear strength of the soil under various normal pressures and is used to develop parameters for foundation design and lateral design. Tests were performed using a recompacted test specimen that was saturated prior to tests. Tests were performed using a strain controlled test apparatus with normal pressures ranging from 800 to 2300 pounds per square foot.

Consolidation/Hydro-Collapse Testing: Two (2) relatively undisturbed samples were selected for consolidation testing. For this test, a one-inch thick test specimen was subjected to vertical loads varying from 575 psf to 11520 psf applied progressively. The consolidation at each load increment was recorded prior to placement of each subsequent load.

Corrosion Series Testing: The soluble sulfate concentrations of the surface soil were determined in accordance with California Test Method Number (CA) 417. The pH and Minimum Resistivity were determined in accordance with CA 643. The soluble chloride concentrations were determined in accordance with CA 422.

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Maximum Density/Optimum Moisture

ASTM D698/D1557

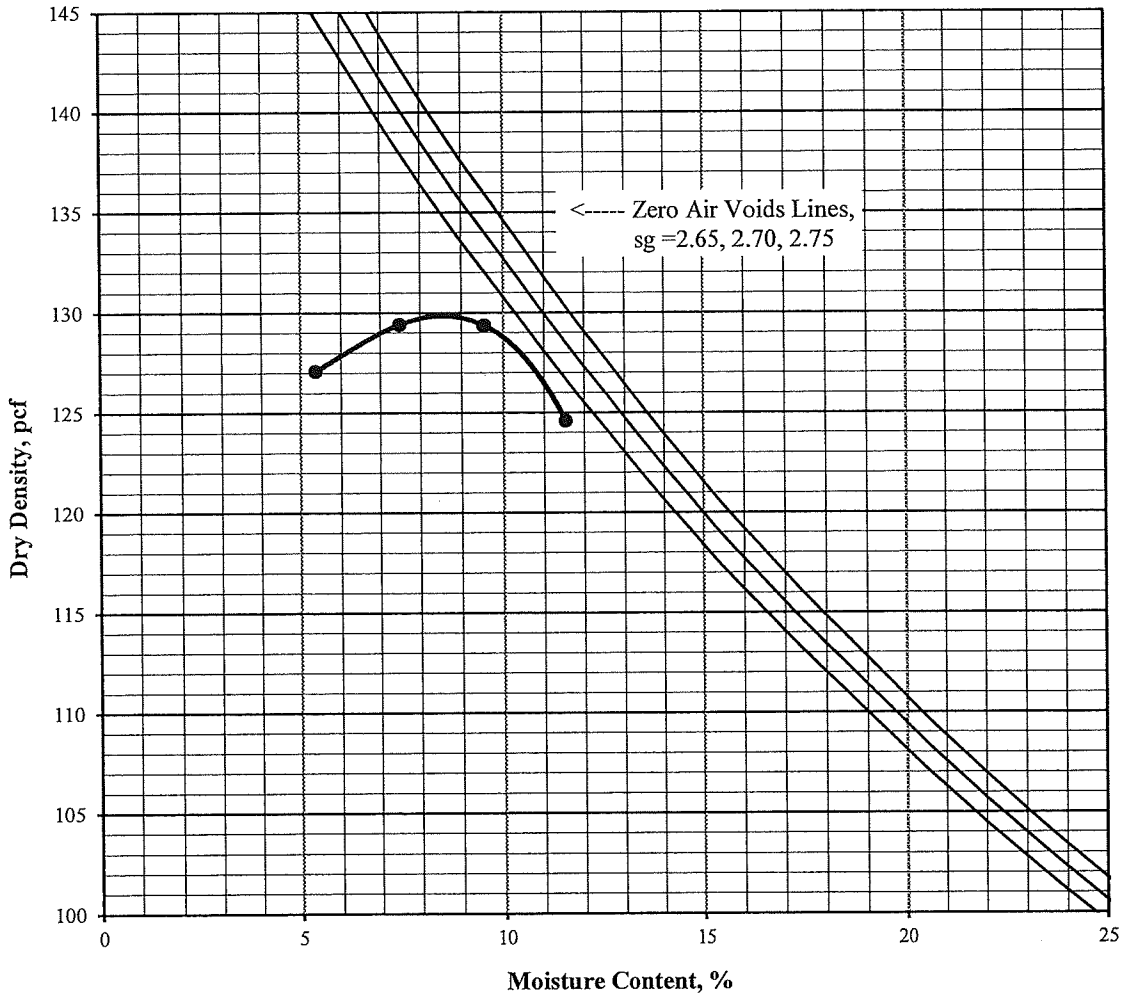
Project Number: 644-20047
Project Name: Retreat Center
Lab ID Number: LN6-20632
Sample Location: BH-1-4 Bulk 1 @ 0-3'
Description: Dark Brown Silty Sand (SM)

January 21, 2021

ASTM D-1557 A
Rammer Type: Machine

Maximum Density: 130 pcf
Optimum Moisture: 8.5%

Sieve Size	% Retained
3/4"	
3/8"	
#4	2.2



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Expansion Index

ASTM D 4829

January 21, 2021

Job Number: 644-20047
Job Name: Retreat Center
Lab ID Number: LN6-20632
Sample ID: BH-1-4 Bulk 1 @ 0-3'
Soil Description: Dark Brown Silty Sand (SM)

Wt of Soil + Ring:	590.7
Weight of Ring:	192.0
Wt of Wet Soil:	398.7
Percent Moisture:	7.5%
Sample Height, in	0.95
Wet Density, pcf:	127.6
Dry Denstiy, pcf:	118.7

% Saturation:	48.2

Expansion **Rack # 3**

Date/Time	1/18/2021	1:10 PM
Initial Reading	0.0000	
Final Reading	0.0032	

Expansion Index **3**

(Final - Initial) x 1000

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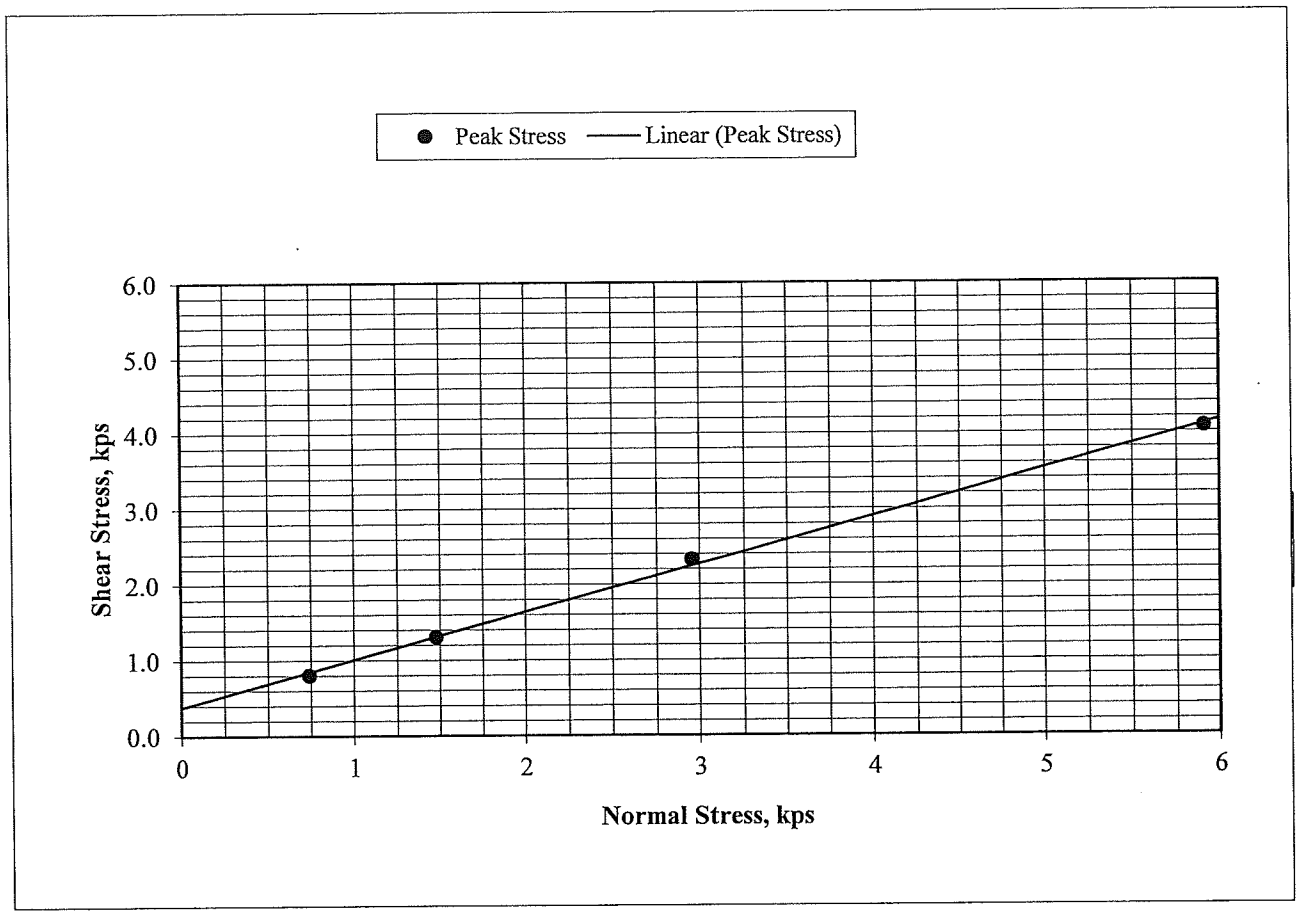
Direct Shear ASTM D 3080-04
(modified for unconsolidated condition)

Job Number: 644-20047
Job Name Retreat Center
Lab ID No. LN6-20632
Sample ID BH-1-4 Bulk 1 @ 0-3'
Classification Dark Brown Silty Sand (SM)
Sample Type Remolded @ 90% of Maximum Density

January 21, 2021
Initial Dry Density: 116.7 pcf
Initial Mosture Content: 8.7 %
Peak Friction Angle (Ø): 32°
Cohesion (c): 380 psf

Test Results	1	2	3	4	Average
Moisture Content, %	15.2	15.2	15.2	15.2	15.2
Saturation, %	92.4	92.4	92.4	92.4	92.4
Normal Stress, kps	0.739	1.479	2.958	5.916	
Peak Stress, kps	0.807	1.308	2.333	4.077	



Job Number:	644-20047
Job Name:	Retreat Center
Date:	1/21/2021

Moisture Adjustment		Remolded Shear Weight	
Wt of Soil:	1,000	Max Dry Density:	130.0
Moist As Is:	7.6	Optimum Moisture:	8.5
Moist Wanted:	8.5		
ml of Water to Add:	8.4	Wt Soil per Ring, g:	152.7

UBC

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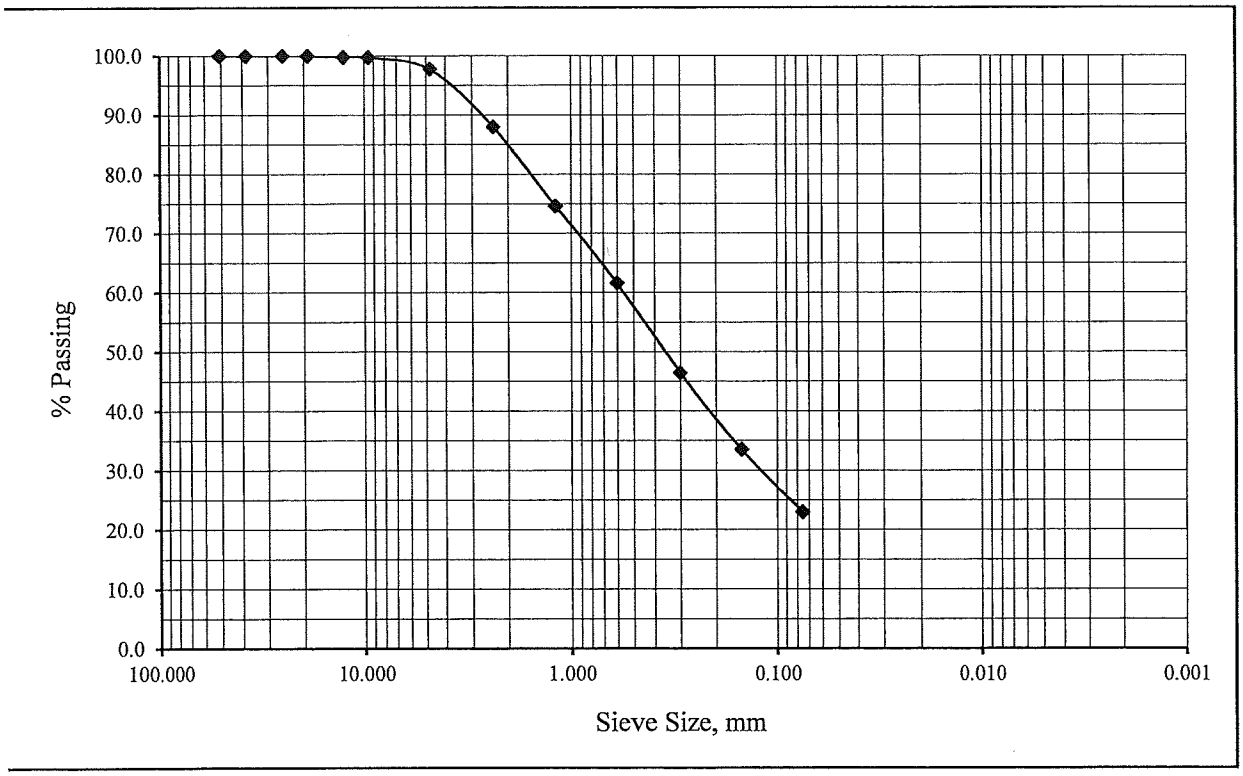
Gradation

ASTM C117 & C136

Project Number: 644-20047 January 21, 2021
Project Name: Retreat Center
Lab ID Number: LN6-20632
Sample ID: BH-1-4 Bulk 1 @ 0-3' Soil Classification: SM

Sieve Size, in	Sieve Size, mm	Percent Passing
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	99.8
3/8"	9.53	99.7
#4	4.75	97.8
#8	2.36	88.1
#16	1.18	74.6
#30	0.60	61.6
#50	0.30	46.5
#100	0.15	33.5
#200	0.075	23.0



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RESISTANCE '*R*' VALUE AND EXPANSION PRESSURE

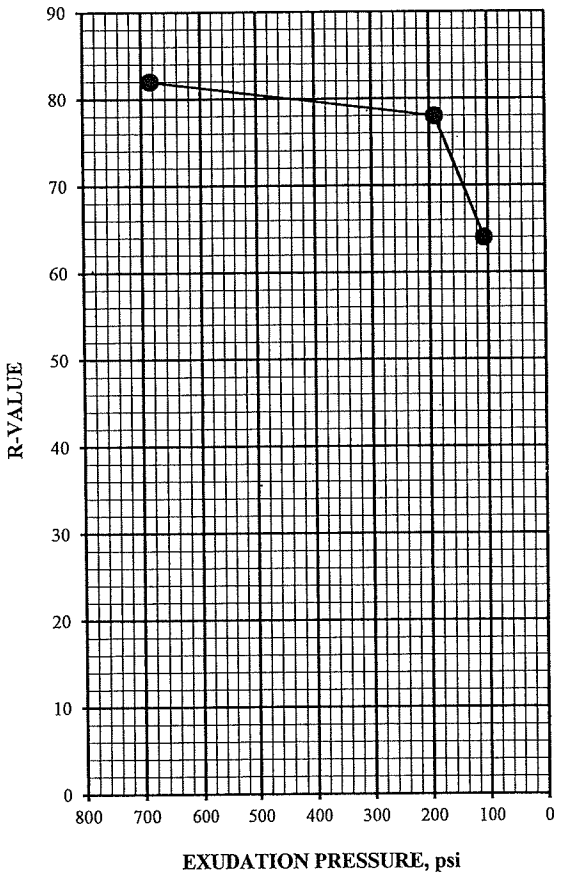
CTM 301

January 21, 2021

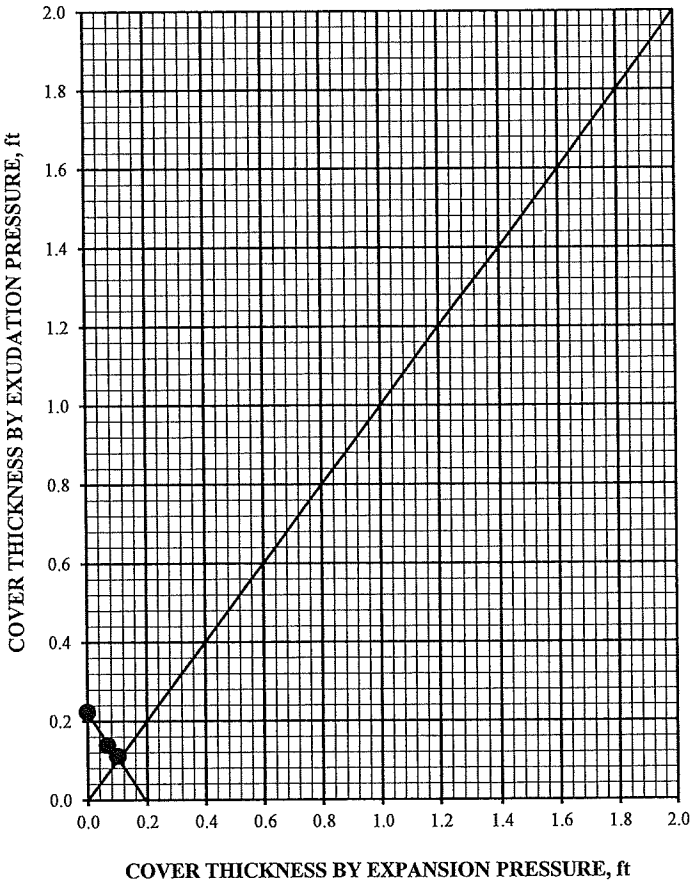
Project Number: 644-20047
Project Name: Retreat Center
Lab ID Number: LN6-20632
Sample ID: Bulk 2
Sample Description: Brown Silty Sand (SM)
Specified Traffic Index: 5.0

Dry Density @ 300 psi Exudation Pressure: 124.1-pcf
%Moisture @ 300 psi Exudation Pressure: 9.9%
R-Value - Exudation Pressure: 79
R-Value - Expansion Pressure: 84
R-Value @ Equilibrium: 79

EXUDATION PRESSURE CHART



EXPANSION PRESSURE CHART



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45090 Golf Center Pkwy, Suite F, Indio CA 92201 (760) 863-0713 Fax (760) 863-0847
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Date: January 21, 2021

Account No.: 644-20047

Customer: PVR Management, LLC c/o Camfield Partners, LLC

Location: APN's 569-020-010, 013, 024, 025 & 026, 43700 Cactus Valley Road, Hemet Area

Analytical Report

Corrosion Series

	pH per CA 643	Soluble Sulfates per CA 417 ppm	Soluble Chloride per CA 422 ppm	Min. Resistivity per CA 643 ohm-cm
BH-1-4 @ 0-3'	9.5	20	50	7700

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Maximum Density/Optimum Moisture

ASTM D698/D1557

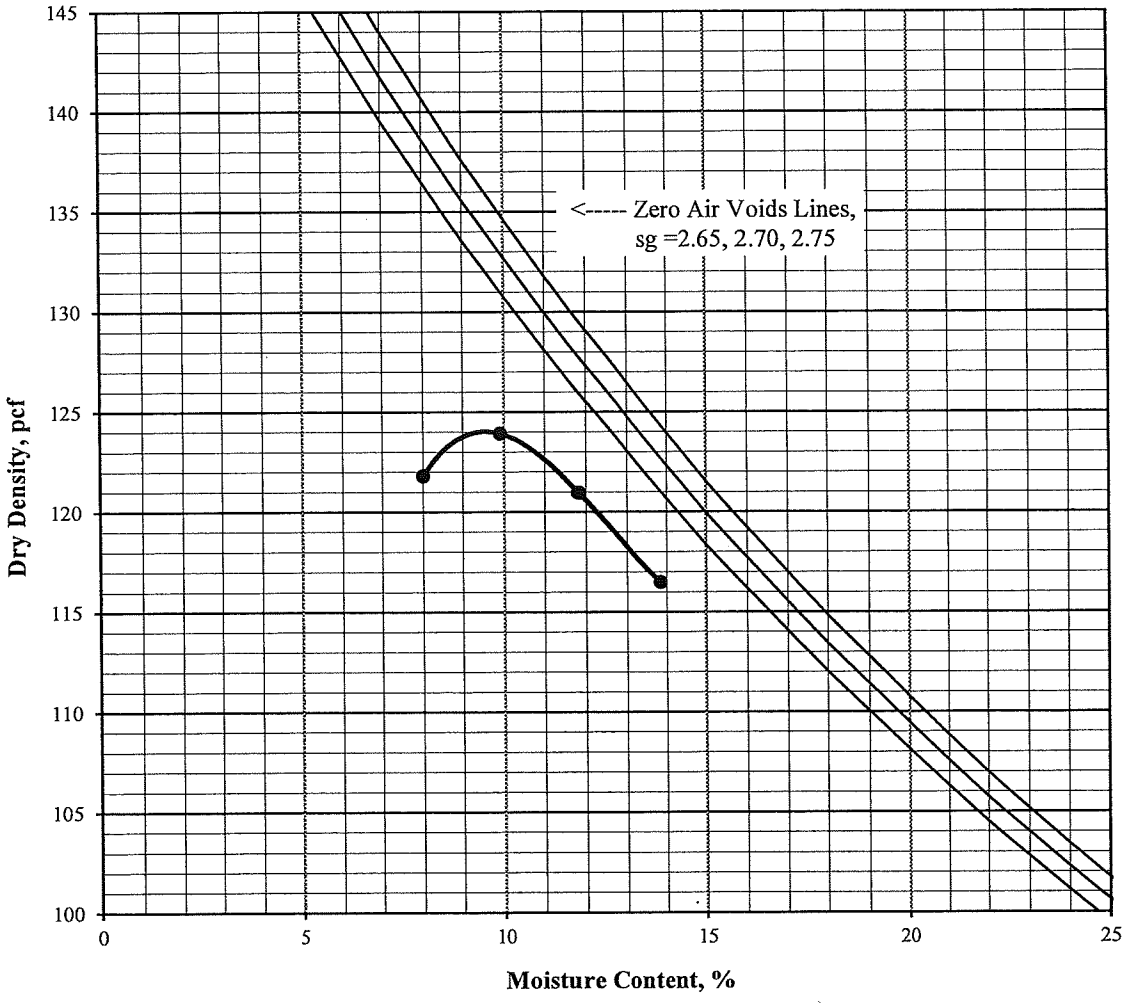
Project Number: 644-20047
Project Name: 43700 Cactus Valley Road
Lab ID Number: LN6-21087
Sample Location: BH-1 Bulk 1 @ 0-5'
Description: Dark Brown Silty Sand (SM)

March 15, 2021

ASTM D-1557 A
Rammer Type: Machine

Maximum Density: 124 pcf
Optimum Moisture: 10%

Sieve Size	% Retained
3/4"	
3/8"	
#4	2.4



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Expansion Index

ASTM D 4829

Job Number: 644-20047

Job Name: 43700 Cactus Valley Road

Lab ID Number: LN6-21087

Sample ID: BH-1 Bulk 1 @ 0-5'

Soil Description: Dark Brown Silty Sand (SM)

March 15, 2021

Wt of Soil + Ring:	589.4
Weight of Ring:	194.8
Wt of Wet Soil:	394.6
Percent Moisture:	7.8%
Sample Height, in	0.95
Wet Density, pcf:	126.3
Dry Denstiy, pcf:	117.1

% Saturation:	48.0

Expansion **Rack # 2**

Date/Time	3/12/2021	3:35 PM
Initial Reading	0.0000	
Final Reading	0.0008	

Expansion Index **1**

(Final - Initial) x 1000

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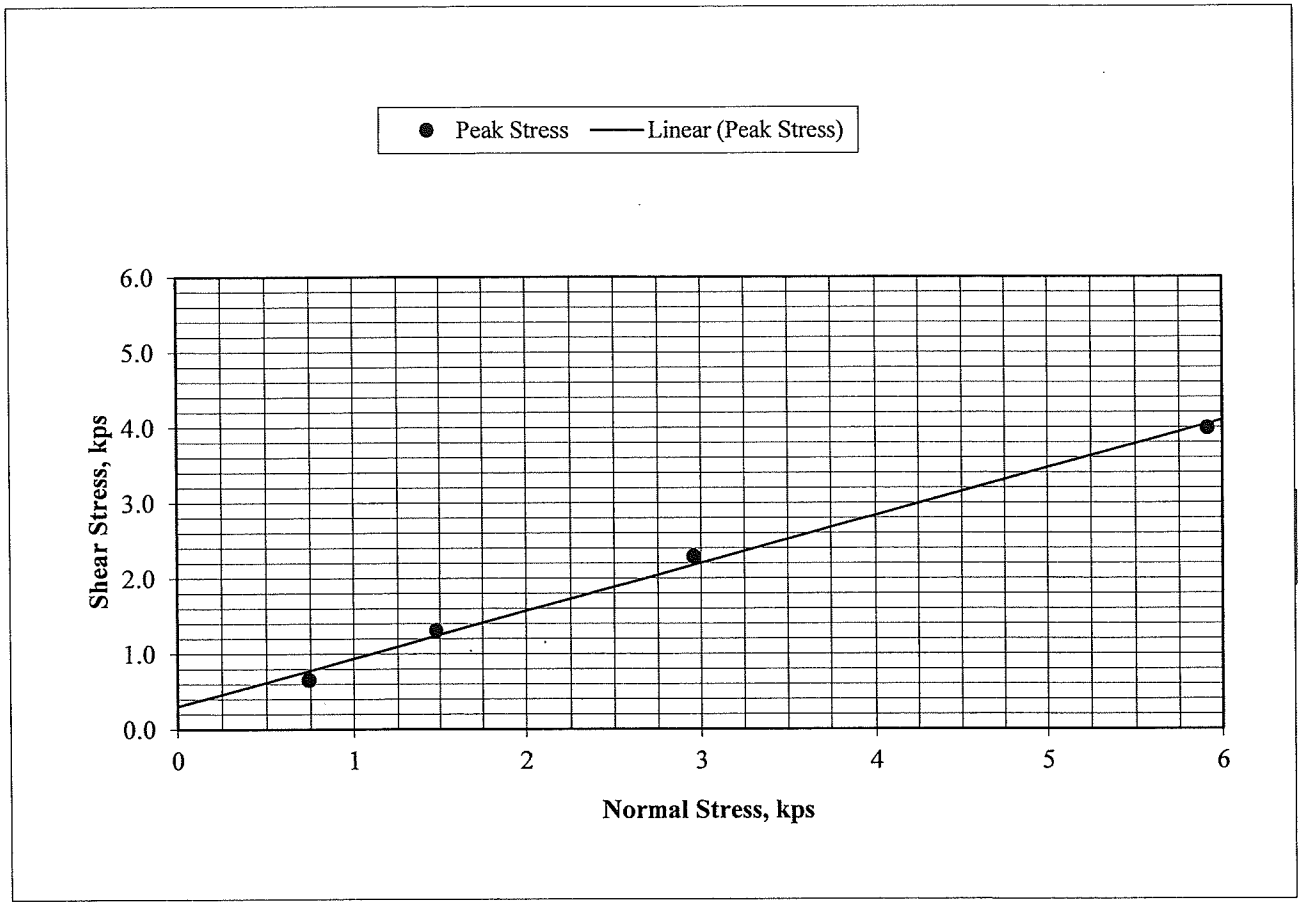
Direct Shear ASTM D 3080-04
(modified for unconsolidated condition)

Job Number:	644-20047		March 15, 2021
Job Name	43700 Cactus Valley Road		Initial Dry Density: 111.8 pcf
Lab ID No.	LN6-21087		Initial Mosture Content: 9.9 %
Sample ID	BH-1 Bulk 1 @ 0-5'		Peak Friction Angle (Ø): 32°
Classification	Dark Brown Silty Sand (SM)		Cohesion (c): 310 psf
Sample Type	Remolded @ 90% of Maximum Density		

Test Results	1	2	3	4	Average
Moisture Content, %	15.6	15.6	15.6	15.6	15.6
Saturation, %	82.8	82.8	82.8	82.8	82.8
Normal Stress, kps	0.739	1.479	2.958	5.916	
Peak Stress, kps	0.654	1.308	2.289	3.989	



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Gradation

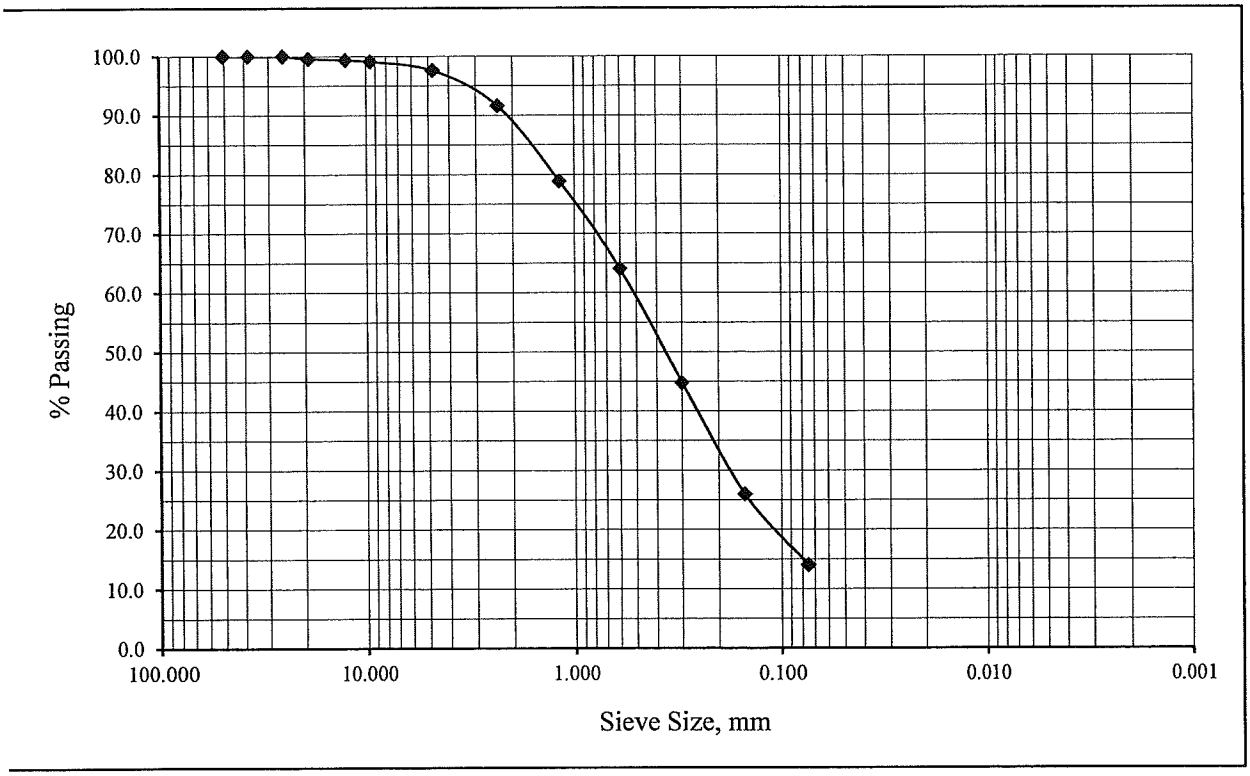
ASTM C117 & C136

Project Number: 644-20047
Project Name: 43700 Cactus Valley Road
Lab ID Number: LN6-21087
Sample ID: BH-1 Bulk 1 @ 0-5'

March 15, 2021

Soil Classification: SM

Sieve Size, in	Sieve Size, mm	Percent Passing
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	99.6
1/2"	12.7	99.4
3/8"	9.53	99.1
#4	4.75	97.6
#8	2.36	91.6
#16	1.18	78.9
#30	0.60	64.1
#50	0.30	44.8
#100	0.15	26.0
#200	0.075	14.0



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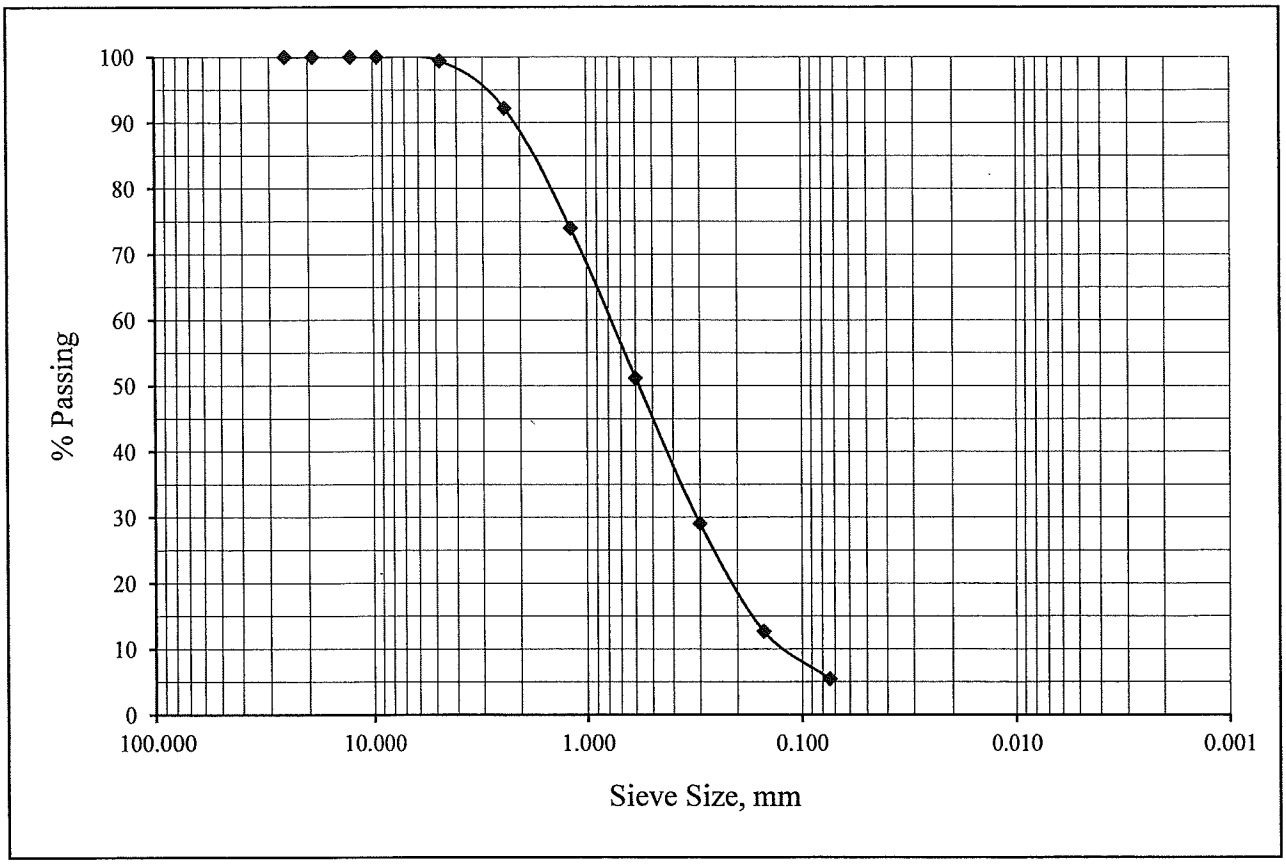
Gradation

ASTM C117 & C136

Project Number: 644-20047 March 15, 2021
Project Name: 43700 Cactus Valley Road
Lab ID Number: LN6-21087
Sample ID: BH-1 R-2 @ 5' Soil Classification: SP-SM

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.53	100.0
#4	4.75	99.4
#8	2.36	92.2
#16	1.18	74.0
#30	0.60	51.2
#50	0.30	29.1
#100	0.15	12.7
#200	0.074	5.5



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Gradation

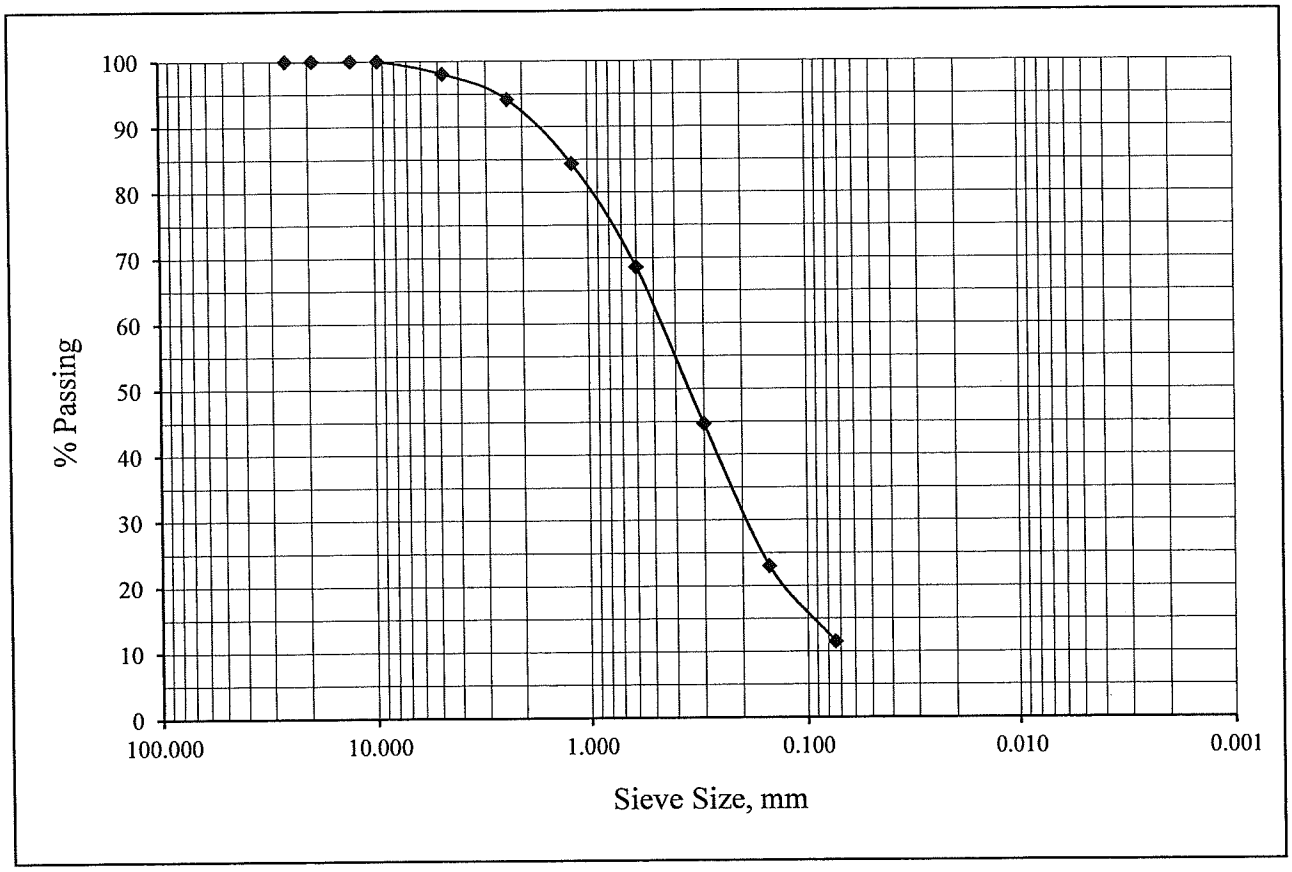
ASTM C117 & C136

Project Number: 644-20047
Project Name: 43700 Cactus Valley Road
Lab ID Number: LN6-21087
Sample ID: BH-1 R-4 @ 15'

March 15, 2021

Soil Classification: SW-SM

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.53	100.0
#4	4.75	98.1
#8	2.36	94.2
#16	1.18	84.3
#30	0.60	68.6
#50	0.30	44.7
#100	0.15	23.0
#200	0.074	11.5



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Gradation

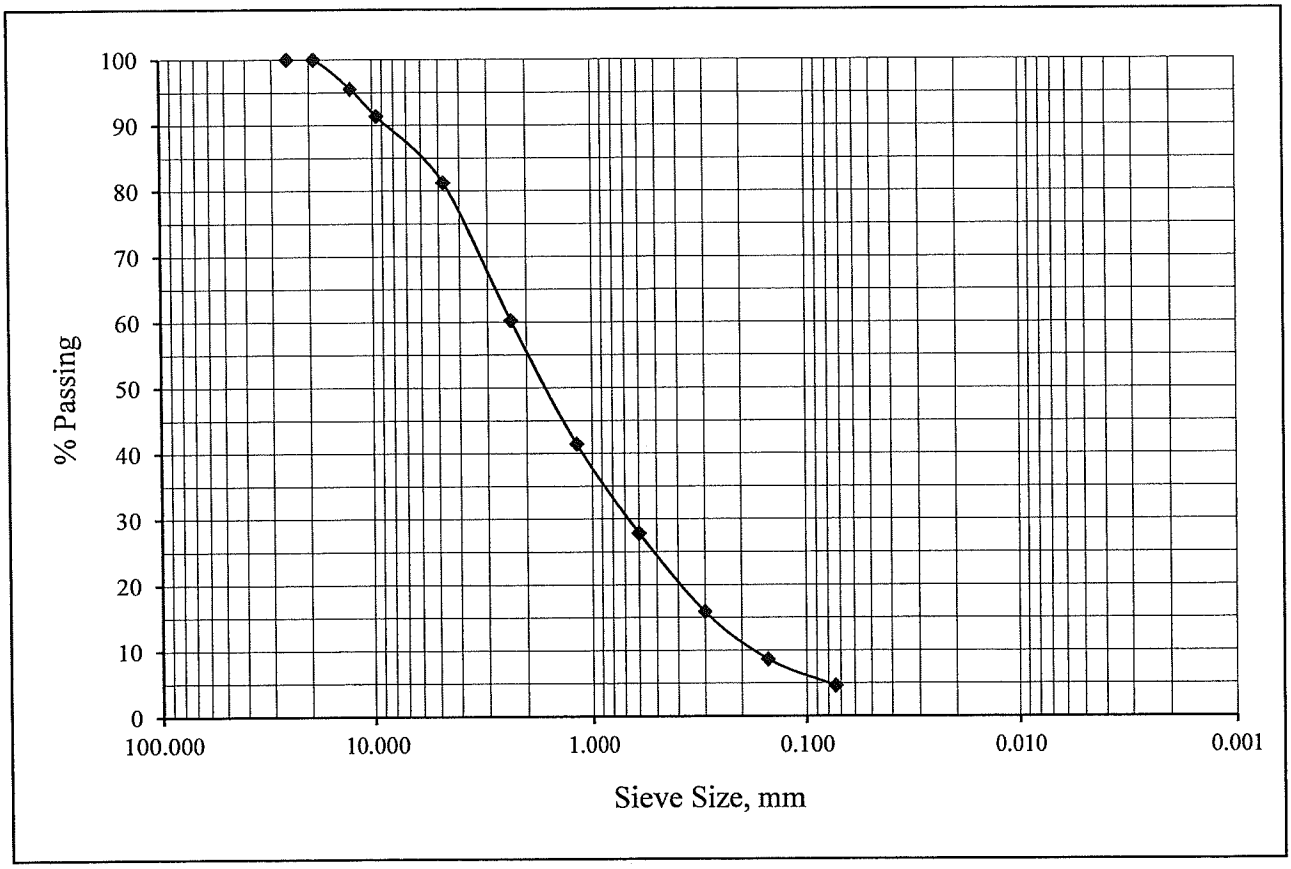
ASTM C117 & C136

Project Number: 644-20047
Project Name: 43700 Cactus Valley Road
Lab ID Number: LN6-21087
Sample ID: BH-2 R-2 @ 10'

March 15, 2021

Soil Classification: SW

Sieve Size, in	Sieve Size, mm	Percent Passing
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	95.5
3/8"	9.53	91.4
#4	4.75	81.3
#8	2.36	60.2
#16	1.18	41.4
#30	0.60	27.8
#50	0.30	15.9
#100	0.15	8.6
#200	0.074	4.6



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One Dimensional Consolidation

ASTM D2435 & D5333

Job Number: 644-20047
Job Name: 43700 Cactus Valley Road

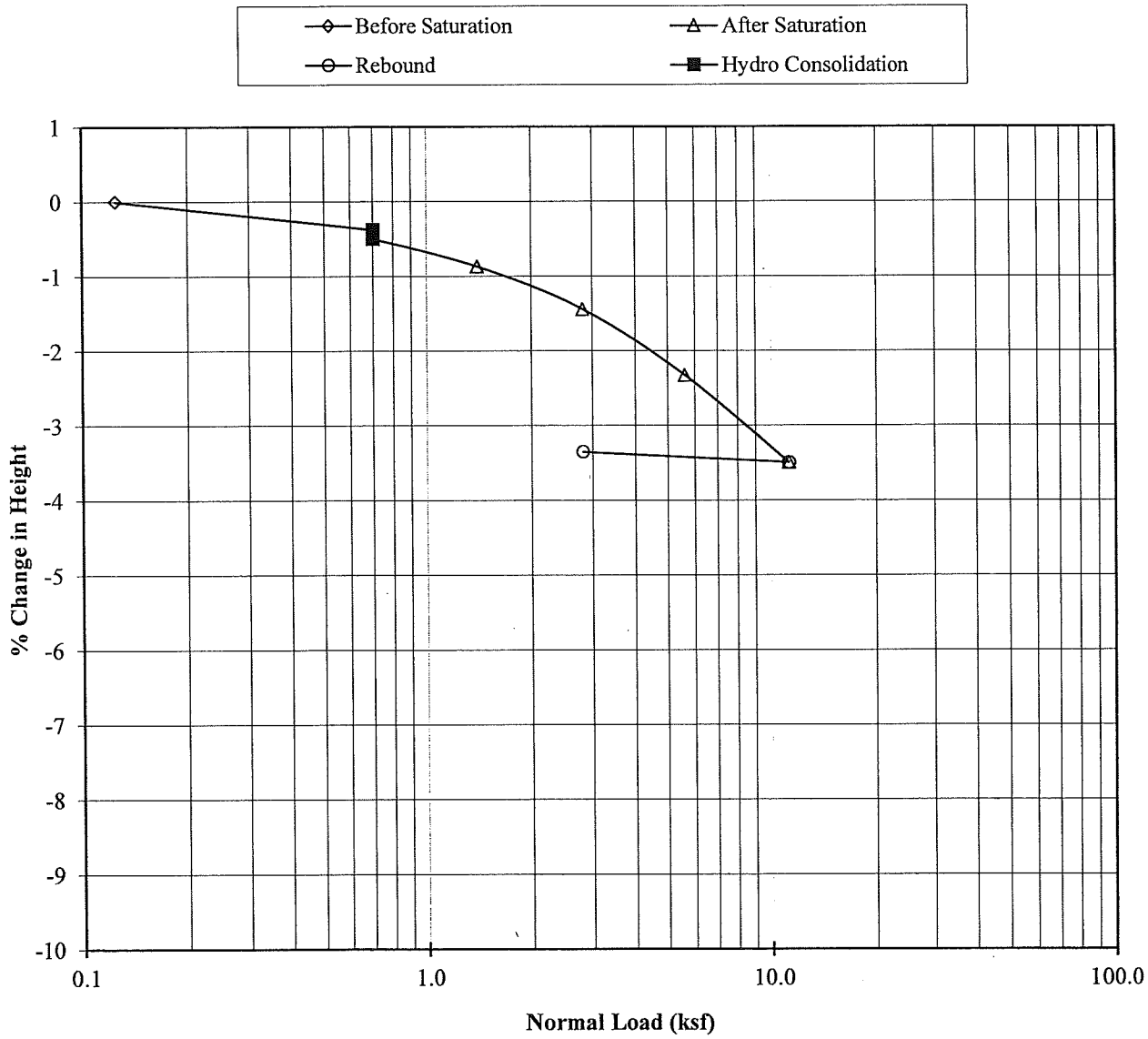
March 15, 2021

Lab ID Number: LN6-21087
Sample ID: BH-1 R-2 @ 5'
Soil Description: Brown Sand w/Silt (SP-SM)

Initial Dry Density, pcf:	108.1
Initial Moisture, %:	5.6
Initial Void Ratio:	0.543
Specific Gravity:	2.67

Hydrocollapse: 0.1% @ 0.702 ksf

% Change in Height vs Normal Presssure Diagram



Sladden Engineering

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Date: March 15, 2021

Account No.: 644-20047

Customer: PVR Management, LLC c/o Camfield Partners, LLC

Location: APN 569-020-010, 013, 024, 025 & 026, 43700 Cactus Valley Road, Hemet Area

Analytical Report

Corrosion Series

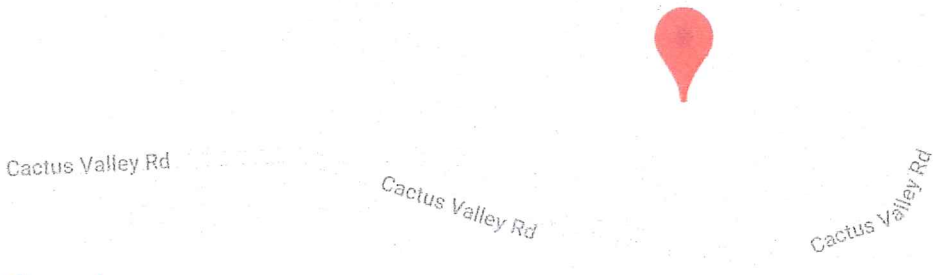
	pH per CA 643	Soluble Sulfates per CA 417 ppm	Soluble Chloride per CA 422 ppm	Min. Resistivity per CA 643 ohm-cm
BH-1 @ 0-5'	8.2	20	50	7000

APPENDIX C

SEISMIC DESIGN MAP & REPORT

OSHPD

Latitude, Longitude: 33.6684, -116.9008



Date	3/10/2021, 9:35:47 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	B - Estimated (see Section 11.4.3)

Type	Value	Description
S_S	1.835	MCE_R ground motion. (for 0.2 second period)
S_1	0.721	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.835	Site-modified spectral acceleration value
S_{M1}	0.721	Site-modified spectral acceleration value
S_{DS}	1.223	Numeric seismic design value at 0.2 second SA
S_{D1}	0.48	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	1	Site amplification factor at 1.0 second
PGA	0.775	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.775	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.973	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.193	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.835	Factored deterministic acceleration value. (0.2 second)
S1RT	0.766	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.867	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.721	Factored deterministic acceleration value. (1.0 second)
PGAd	0.775	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.9	Mapped value of the risk coefficient at short periods
C_{R1}	0.884	Mapped value of the risk coefficient at a period of 1 s

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