GEOTECHNICAL INVESTIGATION
PROPOSED EXPANSION
PIONEERTOWN MOTEL
5240 CURTIS ROAD
PIONEERTOWN AREA
SAN BERNARDINO COUNTY, CALIFORNIA

-Prepared By-

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June 3, 2020

Project No. 544-20190
20-05-295

Pioneertown Motel, LLC
P.O. Box 45
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Subject: Geotechnical Investigation

Project: Proposed Expansion
Pioneertown Motel
5240 Curtis Road
Pioneertown Area
San Bernardino County, California

Sladden Engineering is pleased to present the results of the geotechnical investigation performed for the expansion project proposed for the existing Pioneertown Motel complex located at 5240 Curtis Road in the Pioneertown area of San Bernardino County, California. Our services were completed in accordance with our proposal for geotechnical engineering services dated April 21, 2020 and your authorization to proceed with the work. The purpose of our investigation was to explore the subsurface conditions at the site in order to provide recommendations for foundation design and site preparation. 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 by Sladden Engineering (Sladden) for the expansion project proposed for the existing Pioneertown Motel complex located at 5240 Curtis Road in the Pioneertown area of San Bernardino County, California. The site is located at approximately 34.1577 degrees north latitude and 116.4934 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

Based on the preliminary site plans (Loescher Meachem, 2020), it is our understanding that the proposed project area consists of four parcels (A-D). The proposed new project will consist of constructing a new two-story bunkhouse/restaurant building, a 279 sf trash area, a 438 sf storage building, a 424 sf laundry building and a 757 sf office building. In addition, new retail buildings and an equestrian area are proposed for Parcel A. Multiple new patio rooms and cabins are proposed for Parcel B. A new 3,447 sf multipurpose barn, a 923 sf pool and a 387 sf gym/sauna along with additional patio rooms are proposed for Parcel C. The preliminary plans indicate that Parcel D will be utilized for parking. Seepage pits are proposed to serve to the new expansion project. Sladden anticipates that the proposed project will also include new concrete flatwork, landscaped areas and various associated site improvements. For our analyses we expect that the proposed new buildings will consist of relatively lightweight wood-frame structures supported on conventional shallow spread footings and slabs on grade.

Based on the relatively level nature of the site, Sladden expects that grading will consist of limited remedial over-excavation and re-compaction of the native surface soil and the placement of engineered fill soil to attain the design grade. Upon completion of the project plans, Sladden should be retained in order to ensure that the recommendations presented within in this report are 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 structures, we expect that isolated column loads will be less than 20 kips and continuous wall loads will be less than 2.0 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 drilling eleven bores (11) exploratory boreholes to depths of approximately 5 to 50 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 eleven (11) exploratory boreholes to depths of approximately 5 to 50 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 site is located at 5240 Curtis Road in the Pioneertown area of San Bernardino County, California. The four parcel site occupies a total of approximately 5.79 acres. At the time of our investigation, Parcel A was occupied by the existing main Pioneertown Motel and office building. The remaining parcels were undeveloped. The Motel area was enclosed by wood fencing with dirt parking areas. Generally, the site is bound by Curtis Road to the east, tourist attractions to the west, Pappy and Harriet's restaurant to the south and to the north by vacant parcels. The current alignment of Rawhide Road transects the Pioneertown Motel property in the east/west direction.

Based on our review of the USGS (2012), the site is situated at an approximate elevation of 4,035 feet above mean sea level (MSL).

No natural ponding of water or surface seeps were observed at or near the site during our investigation conducted on May 7 & 8, 2020. Site drainage appears to be controlled by sheet flow and surface infiltration.

GEOLOGIC SETTING

The site is located within the Transverse Ranges Geomorphic province. The Transverse Ranges are characterized by roughly east-west trending, convergent (north-south compressional) deformational structural features. The convergent deformational features of the Transverse Ranges are a result of north-south crustal shorting due to plate tectonics, locally folding and uplifting of the mountains and lowering of the intervening valleys, along with propagation of thrust faults (including blind thrusts) and in filling of the valley basins with sediments. The Transverse Ranges are considered to be one of the most rapidly rising orogenic regions on earth (CGS, 2002).

The site has been mapped by Bortugno and Spittler (1986) to be immediately underlain by Quaternary-age older alluvium (Qo). The regional geologic setting for the site vicinity is presented on the Regional Geologic Map (Figure 3).

SUBSURFACE CONDITIONS

The subsurface conditions at the site were investigated by drilling eleven (11) exploratory boreholes to depths of approximately 5 to 50 feet bgs. The approximate locations of the boreholes are illustrated on the Borehole Location Plan (Figure 3). The boreholes were advanced using a truck-mounted Mobile B-61 drill-rig equipped with 8-inch outside diameter hollow stem augers. A representative of Sladden was on-site to log the materials encountered during drilling.

During our field investigation a thin mantel of artificial fill/disturbed soil was encountered to a maximum depth of approximately four (4) feet bgs. The artificial fill/disturbed soil consists primarily of silty sand (SM). Underlying the fill soil native alluvium was encountered. The native soil encountered throughout the site consists primarily of dark yellowish brown, slightly moist, loose to dense and fine-to coarse-grained clayey sand (SC) and gravelly sand (SP) interbedded with minor portions of silty sand (SM).

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/or variable across the site.

Groundwater was not encountered to a maximum explored depth of 50 feet bgs during our field investigation. As such, it is our opinion that groundwater should not be a factor during construction of the proposed project.

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) and 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). 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
Pinto Mountain	5.2	7.2
Landers	7.0	7.3
North Frontal Fault Zone (East)	7.1	6.7
Burnt Mountain	9.1	6.5
Eureka Peak	9.9	6.7
Johnson Valley (northern)	18.3	6.7
Emerson Southern - Copper Mountain	21.7	7.0
San Andreas - Southern	24.9	7.2
San Andreas – San Bernardino	24.9	7.5
Lenwood – Lockhart – Old Woman Springs	25.4	7.3
San Andreas - Coachella	26.3	7.2
Calico - Hidalgo	30.8	7.3
North Frontal Fault Zone (West)	29.9	7.2

SITE SPECIFIC GROUND MOTION PARAMETERS

Sladden has reviewed the 2019 California Building Code (CBC) and ASCE7-16 and developed site specific ground motion parameters for the subject site. The project Seismic Design Maps and site-specific ground motion parameters are 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	34.1577/-116.4934
Risk Category	II
Site Class	D
Code Reference Documents	ASCE 7-16; Chapter 11 & 21

Description	Type	Map Based	Site-Specific
MCE_R Ground Motion (0.2 second period)	S_S	1.8	---
MCE_R Ground Motion (1.0 second period)	S_1	0.652	---
Site-Modified Spectral Acceleration Value	S_{MS}	1.8	1.480
Site-Modified Spectral Acceleration Value	S_{M1}	null	1.465
Numeric Seismic Design Value at 0.2 second SA	S_{DS}	1.2	0.986
Numeric Seismic Design Value at 1.0 second SA	S_{D1}	null	0.976
Site Amplification Factor at 0.2 second	F_a	1	1
Site Amplification Factor at 1.0 second	F_v	null	2.5
Site Peak Ground Acceleration	PGA_M	0.819	0.761

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 Bortugno and Spittler (1986) and CDOC (2016), the site is not situated within a State of California delineated fault zone. 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. Based on site-specific ground motion parameters developed for the property (Appendix C), the site modified peak ground acceleration (Site Specific PGAm) is estimated to be 0.761g.

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.

During our field investigation, groundwater was not encountered on-site to the maximum explored depth of 50 feet bgs. In addition, groundwater depths in the site vicinity have been recorded at depths exceeding 50 feet bgs (CDWR, 2020). Based on this information, it is Sladden's professional opinion that risks associated with liquefaction 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, risk associated with tsunamis and seiches are considered "negligible".

V. Slope Failure, Landsliding, 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. The site is situated on relatively flat ground and not immediately adjacent to any slopes or hillsides. As such, risks associated with slope instability should be considered "negligible".

VI. Expansive Soil. Generally, the site soil consists of silty sand (SM), clayey sand (SC) and gravelly sand (SP). Based on the results of our laboratory testing (EI=2), 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 minimal provided that the recommendations included in this report are considered in foundation design and construction. The estimated ultimate static settlement is calculated to be approximately 1 inch when using the recommended bearing pressures. As a practical matter, differential static settlement between footings can be assumed as one-half of the total static 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 (USGS, 2001).

Locally, no fissures or other surficial evidence of subsidence were observed at or near the subject site. However, site specific effects resulting from long term regional subsidence is beyond the scope of our investigation.

IX. Ground Fissures. No surface features indicative of ground fissuring were identified on the site during our field investigation. Accordingly, risks associated with ground fissuring are considered low.

X. 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). Based on the flat nature of the site and the composition of the surface soil, we judge that risks associated with debris flows should be considered remote.

XI. Flooding and Erosion. No signs of flooding or erosion were observed during our field investigation. However, 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 provided in this report are incorporated into design and carried out through construction. The main geotechnical concern is the presence of loose native near surface soil throughout the subject site.

We recommend that remedial grading within the proposed building areas include over-excavation and re-compaction of the primary foundation bearing soil. Specific recommendations for site preparation are presented in the Earthwork and Grading section of this report.

Caving did occur to varying degrees within each of our exploratory bores and the surface soil may be susceptible to caving within deeper excavations. All excavations should be constructed in accordance with the normal CalOSHA excavation criteria. On the basis of our observations of the materials encountered, we anticipate that the subsoil will conform to that described by CalOSHA as Type C. 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 on the basis of our field and laboratory investigation.

EARTHWORK AND GRADING

All earthwork including excavation, backfill and preparation of the subgrade 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 soil engineer. 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 surface improvements, foundations, underground utilities, vegetation, associated root systems, and debris. All areas scheduled to receive fill should be cleared of old fill 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 the Building Areas: All undocumented artificial fill soil should be removed to competent native soil. In order to provide for firm and uniform foundation bearing conditions, the primary foundation bearing soil should be overexcavated and recompacted. Overexcavation should extend to a minimum depth of 3 feet below existing grade or 2 feet below the bottom of the footings, whichever is deeper. Once adequate removals have been verified, the exposed native soil should be moisture conditioned to near optimum moisture content and compacted to at least 90 percent relative compaction. The previously removed material may then be placed as compacted engineered fill as recommended below. Removals should extend at least 5 feet laterally beyond the footing limits.

c. Fill Placement and 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 should be compacted with acceptable compaction equipment, to at least 90 percent relative compaction. The bottom of the exposed subgrade should be observed by a representative of Sladden Engineering prior to fill placement. Compaction testing should be performed on all lifts in order to verify proper placement of the fill materials. Table 2 provides a summary of the excavation and compaction recommendations.

Table 2
SUMMARY OF RECOMMENDATIONS

*Remedial Grading	Excavation and recompaction within the building envelope and extending laterally for 5 feet beyond the building limits and to a minimum of 3 feet below existing grade or 2 feet below the bottom of the footings, whichever is deeper
Native / Import Engineered Fill	Place in thin lifts not exceeding 6 inches in a loose condition and compact to a minimum of 90 percent relative compaction at near optimum moisture content.

*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 shallow spread (continuous) footings are expected to provide adequate support for the proposed new structures. 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. Footings should have minimum widths of 24 inches. Footings ssupported upon properly compacted engineered fill soil may be designed using an allowable (net) bearing pressure of 2000 pounds per square foot (psf). Allowable increases of 250 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 previously described in this report. Differential static settlement is anticipated to be approximately one-half of the total static settlement for similarly loaded footings spaced 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 300 psf per foot of depth up to a maximum of 2000 psf may be used for design purposes. An allowable coefficient of friction 0.48 may be used for dead and sustained live loads to compute the frictional resistance of the footing placed directly on compacted fill. Either the coefficient of friction or the passive pressure may be increased by one-third when considering transient loading, but not both.

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.

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 native backfill soil with level drained backfill conditions. "At rest" pressures should be utilized when considering restrained walls. An equivalent fluid weight of 55 pcf is recommended for restrained walls with level drained backfill conditions.

SLABS-ON-GRADE

In order to provide uniform and adequate support, concrete slabs-on-grade should 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 will be dependent upon the intended use and should be determined by the Structural Engineer. We recommend a minimum slab thickness of 4.0 inches and minimum reinforcement of #3 bar 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. 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.

CORROSION SERIES

The soluble sulfate concentrations of the surface soil were determined to be 200 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 should not be necessary. 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 level of the surface soil was 7.5. Based on soluble chloride concentration testing (210 ppm) the soil is considered to have "moderate" corrosive with respect to normal grade steel. The minimum resistivity of the surface soil was found to be 1,030 ohm-cm that suggests the site soil is considered to have a "moderate "corrosive potential with respect to ferrous metal installations. A corrosion expert should be consulted regarding appropriate corrosion protection measures.

UTILITY TRENCH BACKFILL

All utility trench backfill should be compacted to a minimum relative compaction of 90 percent. 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 conditions, and then mechanically compacted in place to a minimum relative compaction of 90 percent. A representative of the project soil engineer should test the backfill to verify adequate compaction.

EXTERIOR CONCRETE FLATWORK

To minimize cracking of concrete flatwork, the subgrade soil below concrete flatwork areas should first be compacted to a minimum relative compaction of 90 percent. 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 assure 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 penetrate into the recommended 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 the ASTM D1557 test method. Where testing indicates insufficient density, additional compactive effort shall be applied until retesting indicates satisfactory compaction.

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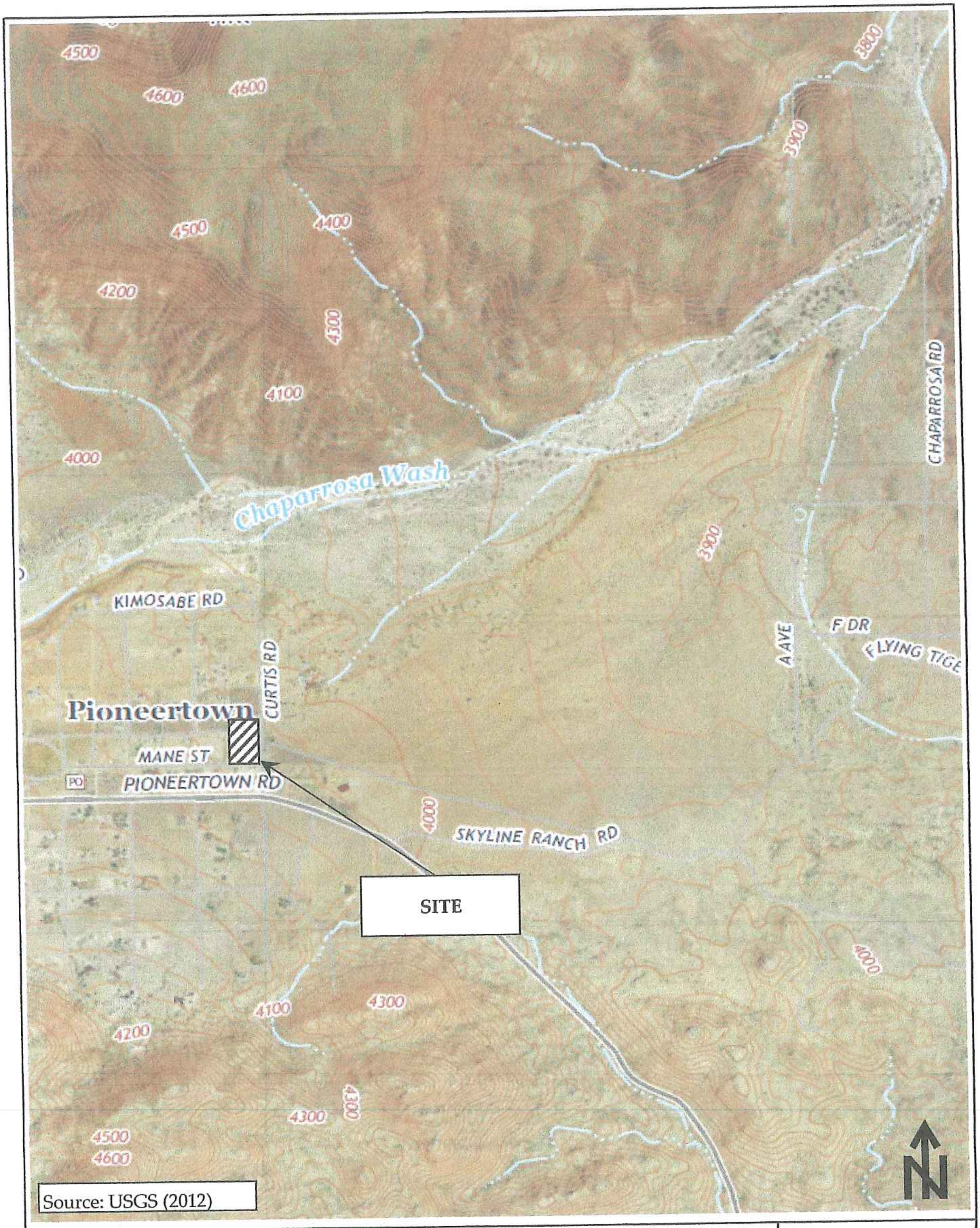
FIGURES



Source: USGS (2012)

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SITE LOCATION MAP

Project Number:	544-20190
Report Number:	20-05-295
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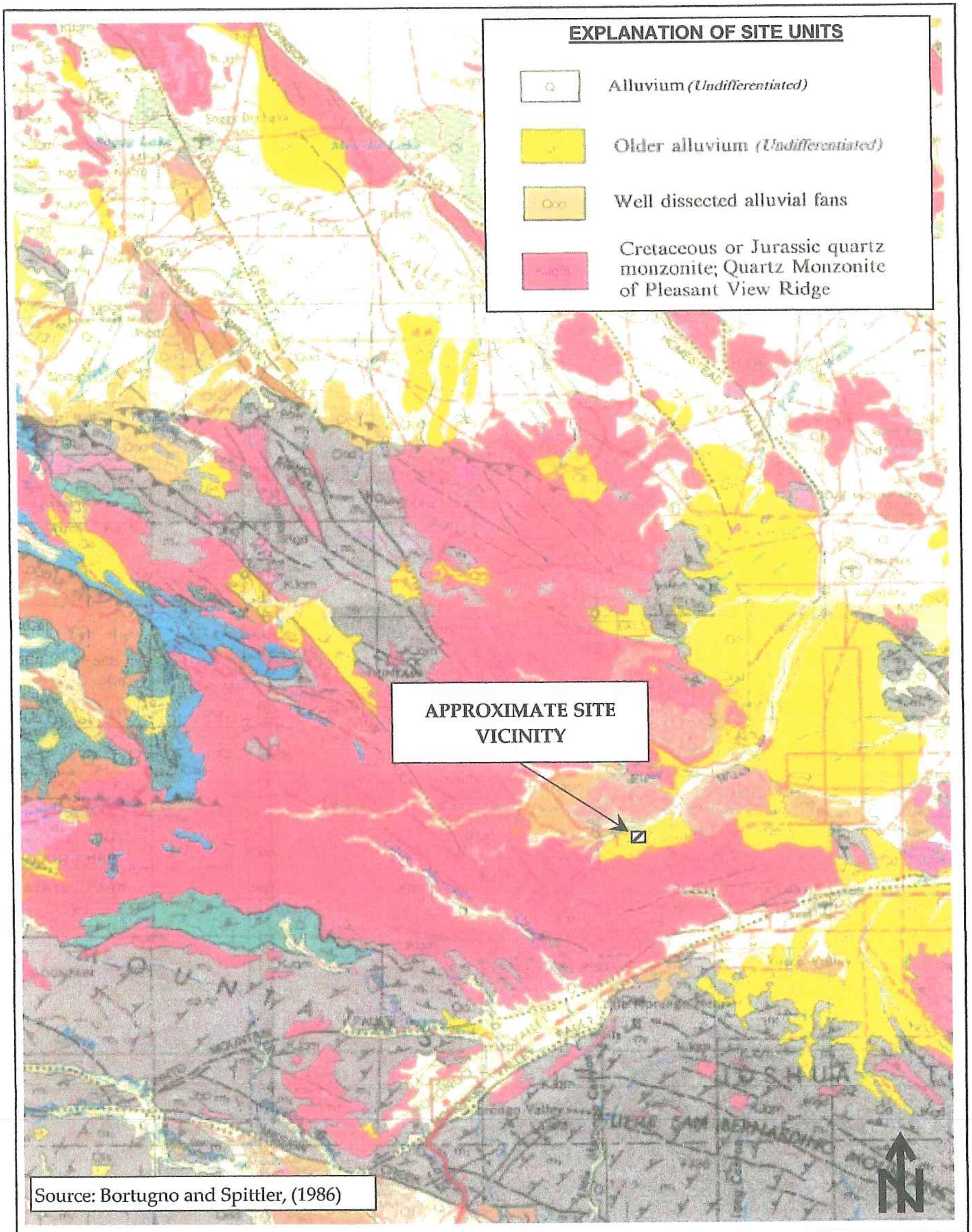
FIGURE

1



Source: Bortugno and Spittler, (1986)

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REGIONAL GEOLOGIC MAP

FIGURE

2

Project Number: 544-20190

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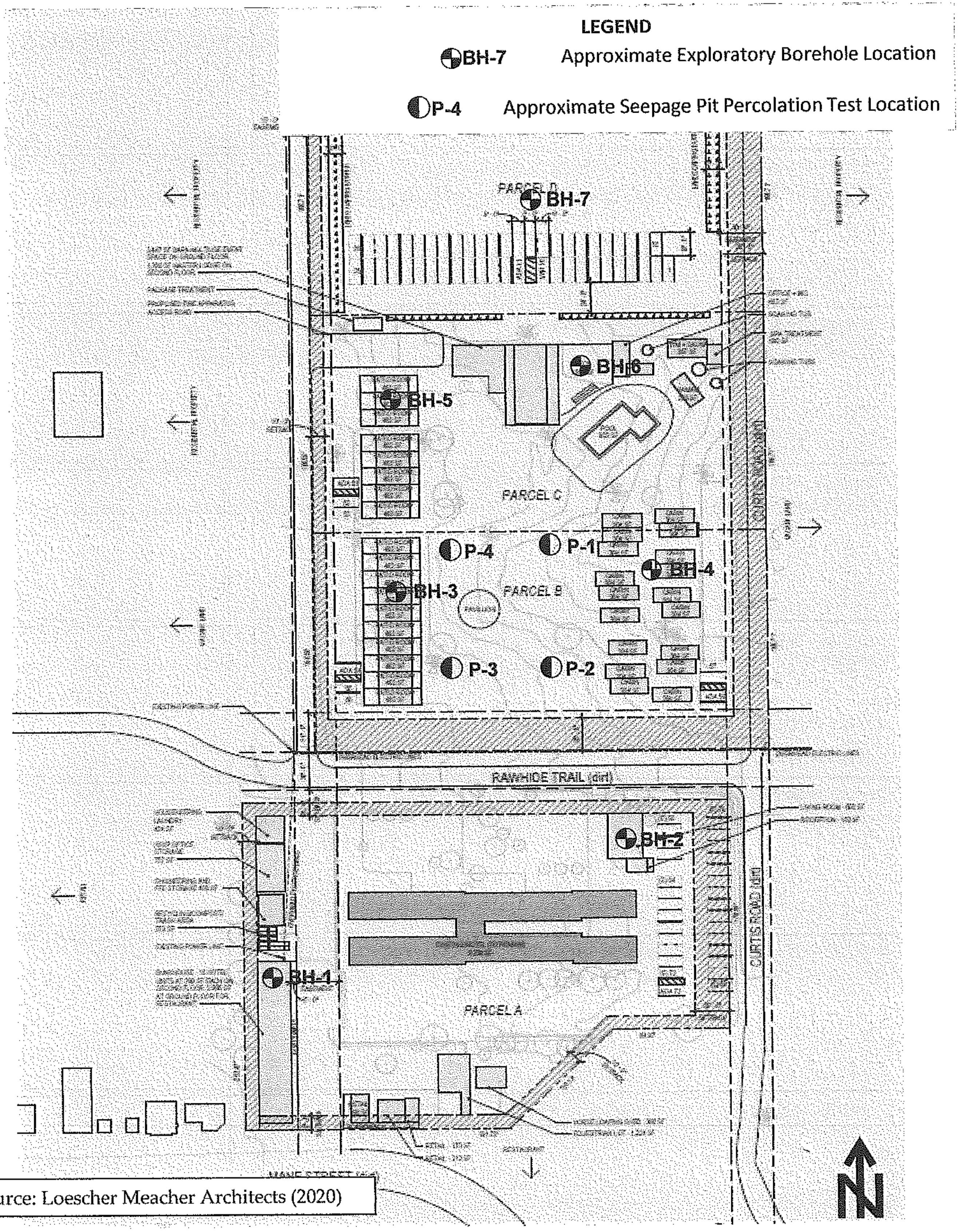
Date: June 3, 2020



Source: Loescher Meacher Architects (2020)

Sladden Engineering

BOREHOLE LOCATION PLAN

Project Number:	544-20190
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FIGURE

3

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

For our field investigation eleven (11) exploratory bores were excavated utilizing a truck-mounted drill rig equipped with 8 inch (O.D.) hollow-stem augers (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 blowcounts 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 in order 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.

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			TYPICAL NAMES	
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN No.200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN No.4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED 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 MORE THAN HALF COARSE FRACTION IS SMALLER THAN No.4 SIEVE SIZE	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 MORE THAN HALF IS SMALLER THAN No.200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS & VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, CLEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS: LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS 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 SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

EXPLANATION OF BORE LOG SYMBOLS

■ California Split-spoon Sample

☒ Unrecovered Sample

□■□ Standard Penetration Test Sample

▼ Groundwater depth

Note: The stratification lines on the borelogs represent the approximate boundaries between the soil types; the transitions may be gradational.

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/8/2020
Elevation:	4037 Ft (MSL)	Boring No:	BH-1

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
		1	2				2	░	Silty Sand (SM); dark yellowish brown, dry to slightly moist, fine to course grained with gravel (Fill/Disturbed).
							4	▒	
▮	3/3/3			21.2	3.0		6	▒	Clayey Sand (SC); dark yellowish brown, slightly moist, loose, fine to coarse grained with gravel (Qo).
							8	▒	
■	10/12/15			19.2	5.5	118.9	10	▒	Clayey Sand (SC); dark yellowish brown, slightly moist, loose, fine to coarse grained with gravel (Qo).
							12	▒	
							14	▒	
▮	11/14/21			33.4	9.2		16	▒	Clayey Sand (SC); dark yellowish brown, slightly moist to moist, loose, fine to coarse grained with gravel (Qo).
							18	▒	
■	15/22/26			19.9	6.7	120.6	20	▒	Clayey Sand (SC); dark yellowish brown, slightly moist, loose, fine to coarse grained with gravel (Qo).
							22		
							24		Terminated at ~ 21.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.
							26		
							28		
							30		
							32		
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No: 544-20190
Report No: 20-05-295

SLADDEN ENGINEERING	BORE LOG			
	Drill Rig:	Mobil B-61	Date Drilled:	5/8/2020
	Elevation:	4032 Ft (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); dark yellowish brown, dry to slightly moist, fine to course grained with gravel (Fill/Disturbed).
■	3/4/5			9.2	2.2	105.2	4 6 8	░	Gravelly Sand (SP); dark yellowish brown, slightly moist, loose, fine to coarse grained (Qo).
▣	6/10/12			5.9	1.9		10 12 14	░	Gravelly Sand (SP); dark yellowish brown, slightly moist, medium dense, fine to coarse grained (Qo).
■	25/37/50-5"			21.2	5.0	130.1	16 18	▒	Clayey Sand (SC); dark yellowish brown, slightly moist, very dense, fine to coarse grained with gravel (Qo).
▣	17/19/22			25.8	6.3		20	▒	Clayey Sand (SC); dark yellowish brown, slightly moist, dense, fine to coarse grained with gravel (Qo).
							22 24 26 28 30 32 34 36 38 40 42 44 46 48 50		Terminated at ~ 21.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:	PIONEERTOWN MOTEL EXPANSION 5240 CURTIS ROAD, PIONEERTOWN AREA		
	Project No: 544-20190 Report No: 20-05-295	Page	2

SLADDEN ENGINEERING	BORE LOG			
	Drill Rig:	Mobil B-61	Date Drilled:	5/7/2020
	Elevation:	4032 Ft (MSL)	Boring No:	BH-3

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
■	4/5/6			12.1	5.3	112.6	2		Silty Sand (SM); dark yellowish brown, slightly moist, loose, fine to course grained with gravel (Fill/Disturbed).
							4		
■	4/7/10			24.3	7.9	116.5	6		Clayey Sand (SC); dark yellowish brown, slightly moist, medium dense, fine to coarse grained with gravel (Qo).
							8		
▮	8/12/13			26.8	8.0		10		Clayey Sand (SC); dark yellowish brown, slightly moist, medium dense, fine to coarse grained with gravel (Qo).
							12		
							14		
■	11/15/20			11.0	4.6	122.3	16		Gravelly Sand (SP); dark yellowish brown, slightly moist, medium dense, fine to coarse grained (Qo).
							18		
▮	15/20/24			28.3	8.7		20		Clayey Sand (SC); dark yellowish brown, moist, dense, fine to course grained with gravel (Qo).
							22		
							24		
■	15/21/31			25.6	9.6	125.6	26		Clayey Sand (SC); dark yellowish brown, moist, dense, fine to course grained with gravel (Qo).
							28		
▮	14/16/17			8.3	2.4		30		Gravelly Sand (SP); dark yellowish brown, slightly moist, dense, fine to coarse grained (Qo).
							32		
							34		
■	15/22/31			4.1	2.3	117.2	36		Gravelly Sand (SP); dark yellowish brown, slightly moist, dense, fine to coarse grained (Qo).
							38		
▮	11/14/18			7.9	2.8		40		Gravelly Sand (SP); dark yellowish brown, slightly moist, dense, fine to coarse grained (Qo).
							42		
							44		
■	15/22/33			6.0	2.9	120.9	46		Gravelly Sand (SP); dark yellowish brown, slightly moist, dense, fine to coarse grained (Qo).
							48		
▮	13/16/20			6.1	2.8		50		Gravelly Sand (SP); dark yellowish brown, slightly moist, dense, fine to coarse grained (Qo).

Completion Notes:
Terminated at ~ 51.5 Feet bgs.
No Bedrock Encoutered.
No Groundwater or Seepage Encountered.

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No:	544-20190	Page	3
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SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/7/2020
Elevation:	4032 Ft (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); dark yellowish brown, slightly moist, fine to course grained with gravel (Fill/Disturbed).
■	8/16/18			21.8	6.9	129.3	4 6 8	▨	Clayey Sand (SC); dark yellowish brown, slightly moist, medium dense, fine to course grained with gravel (Qo).
▮	10/10/11			19.9	6.8		10 12 14	▨	Clayey Sand (SC); dark yellowish brown, moist, medium dense, fine to course grained with gravel (Qo).
■	16/25/29			17.2	6.1	127.6	16	▨	Clayey Sand (SC); dark yellowish brown, moist, dense, fine to course grained with gravel (Qo).
							18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50		Terminated at ~ 16.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No: 544-20190
Report No: 20-05-295

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/8/2020
Elevation:	4030 Ft (MSL)	Boring No:	BH-5

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2	░	Silty Sand (SM); dark yellowish brown, dry to slightly moist, fine to course grained with gravel (Fill/Disturbed).
							4	▒	
■	5/7/9			15.5	2.7	114.0	6	▒	Clayey Sand (SC); dark yellowish brown, moist, loose, fine to course grained with gravel (Qo).
							8	▒	
◫	7/8/11			12.3	2.9		10	▒	Clayey Sand (SC); dark yellowish brown, moist, medium dense, fine to course grained with gravel (Qo).
							12	▒	
							14	▒	
■	16/19/23			6.2	2.3	115.1	16	░	Gravelly Sand (SP); dark yellowish brown, slightly moist, medium dense, fine to coarse grained (Qo).
							18	░	
◫	13/17/19			13.8	3.2		20	▒	Clayey Sand (SC); dark yellowish brown, slightly moist, dense, fine to coarse grained with gravel (Qo).
							22		
							24		Terminated at ~ 21.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.
							26		
							28		
							30		
							32		
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No: 544-20190
Report No: 20-05-295

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/8/2020
Elevation:	4023 Ft (MSL)	Boring No:	BH-6

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
								░	Silty Sand (SM); dark yellowish brown, slightly moist, fine to course grained with gravel (Fill/Disturbed).
							2	░	
							4	░	Gravelly Sand (SP); dark yellowish brown, slightly moist, medium dense, fine to coarse grained (Qo).
■	10/10/10			11.2	1.8	108.6	6	░	
							8	░	
◨	10/1314			13.1	3.6		10	▒	Clayey Sand (SC); dark yellowish brown, moist, medium dense, fine to course grained with gravel (Qo).
							12		Terminated at ~ 11.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.
							14		
							16		
							18		
							20		
							22		
							24		
							26		
							28		
							30		
							32		
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No: 544-20190
Report No: 20-05-295

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/8/2020
Elevation:	4025 Ft (MSL)	Boring No:	BH-7

Sample	Blow Counts	Bulk Sample	Expansion Index	% Minus #200	% Moisture	Dry Density	Depth (Feet)	Graphic Lithology	Description
							2	▨	Silty Sand (SM); dark yellowish brown, slightly moist, fine to course grained with gravel (Fill/Disturbed).
							4	▨	
■	8/13/22			23.6	3.6		6	▨	Clayey Sand (SC); dark yellowish brown, slightly moist, dense, fine to course grained with gravel (Qo).
							8		Terminated at ~ 6.5 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered.
							10		
							12		
							14		
							16		
							18		
							20		
							22		
							24		
							26		
							28		
							30		
							32		
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No: 544-20190
Report No: 20-05-295

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/7/2020
Elevation:	4030 Ft (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); dark yellowish brown, slightly moist, fine to course grained with gravel (Fill/Disturbed).
							4	▒	
							6	▒	
							8	▒	
							10	▒	
							12	▒	
							14	▒	
							16	▒	Clayey Sand (SC); dark yellowish brown, slightly moist, fine to course grained with gravel (Qo).
							18	▒	
							20	▒	
							22	▒	
							24	▒	
							26	▒	
							28	▒	
							30		
							32		Terminated at ~ 30.0 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased for Percolation Testing.
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No:	544-20190	Page	8
Report No:	20-05-295		

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/7/2020
Elevation:	4030 Ft (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); dark yellowish brown, slightly moist, fine to course grained with gravel (Fill/Disturbed).
							4		
							6		
							8		
							10		
							12		Clayey Sand (SC); dark yellowish brown, slightly moist, fine to course grained with gravel (Qo).
							14		
							16		
							18		
							20		
							22		Terminated at ~ 20.0 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased for Percolation Testing.
							24		
							26		
							28		
							30		
							32		
							34		
							36		
							38		
							40		
							42		
							44		
							46		
							48		
							50		

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No: 544-20190
Report No: 20-05-295

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/7/2020
Elevation:	4030 Ft (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); dark yellowish brown, slightly moist, fine to course grained with gravel (Fill/Disturbed).
							4 6 8 10 12 14 16 18 20 22 24	▨	Clayey Sand (SC); dark yellowish brown, slightly moist, fine to course grained with gravel (Qo).
							26 28 30 32 34 36 38 40 42 44 46 48 50		Terminated at ~ 25.0 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased for Percolation Testing.

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No: 544-20190
Report No: 20-05-295

SLADDEN ENGINEERING

BORE LOG

Drill Rig:	Mobil B-61	Date Drilled:	5/7/2020
Elevation:	4030 Ft (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); dark yellowish brown, slightly moist, fine to course grained with gravel (Fill/Disturbed).
							4 6 8 10 12 14 16 18 20	▒	Clayey Sand (SC); dark yellowish brown, slightly moist, fine to course grained with gravel (Qo).
							22 24 26 28 30 32 34 36 38 40 42 44 46 48 50		Terminated at ~ 20.0 Feet bgs. No Bedrock Encountered. No Groundwater or Seepage Encountered. Borehole Cased for Percolation Testing.

Completion Notes:

PIONEERTOWN MOTEL EXPANSION
5240 CURTIS ROAD, PIONEERTOWN AREA

Project No: 544-20190
Report No: 20-05-295

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: One (1) bulk sample was selected for expansion testing. Expansion testing was performed in accordance with the ASTM Standard 10-4289. 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: One (1) bulk sample was 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.

Sladden Engineering

450 Egan Avenue, Beaumont CA 92223 (951) 845-7743 Fax (951) 845-8863

Maximum Density/Optimum Moisture

ASTM D698/D1557

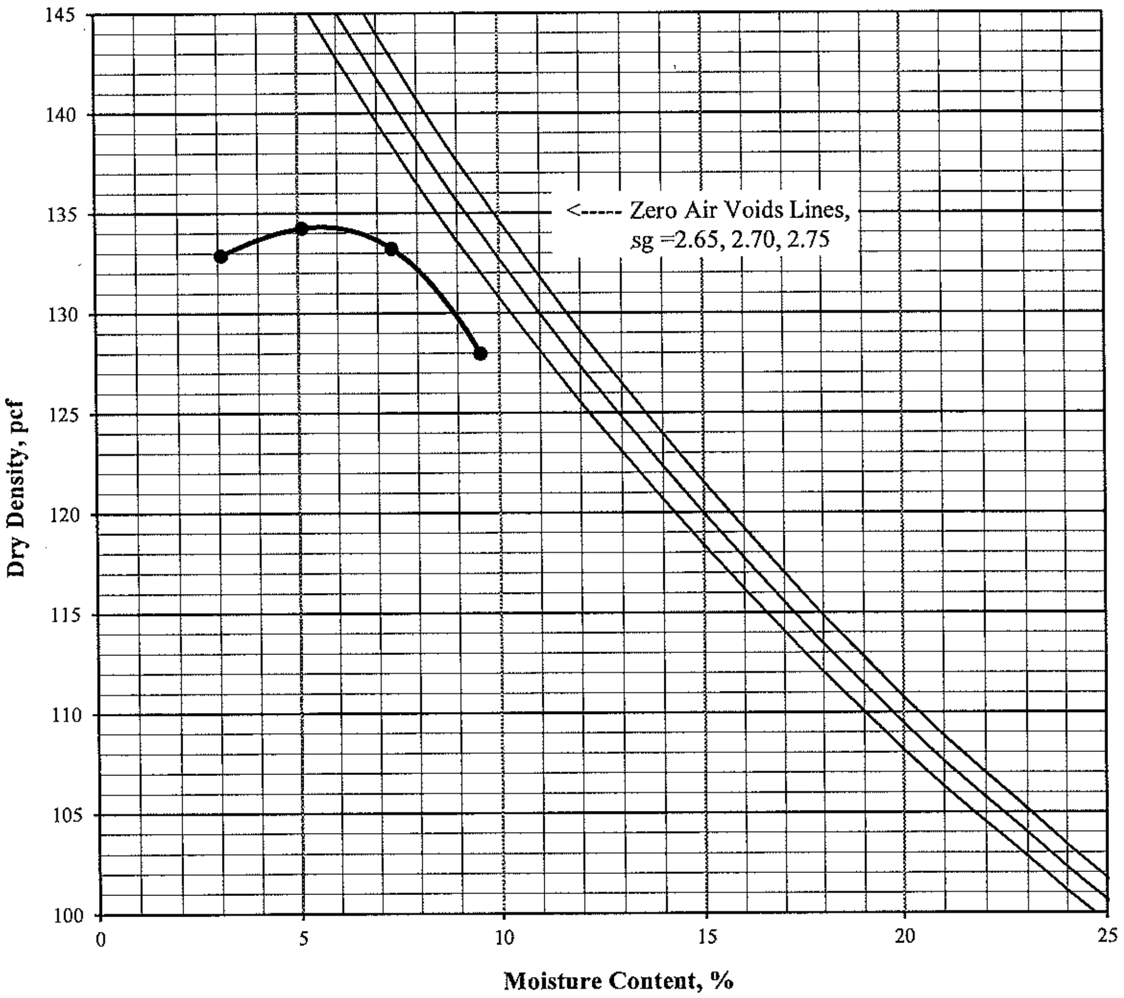
May 14, 2020

Project Number:	544-20190
Project Name:	Pioneertown Motel
Lab ID Number:	LN6-20232
Sample Location:	BH-3 Bulk 1 @ 0-5'
Description:	Brown Silty Sand (SM)

ASTM D-1557 A
Rammer Type: Machine

Maximum Density: **133.5 pcf**
Optimum Moisture: **6.5%**

Sieve Size	% Retained
3/4"	
3/8"	
#4	3.7



Expansion Index

ASTM D 4829

May 14, 2020

Job Number: 544-20190

Job Name: Pioneertown Motel

Lab ID Number: LN6-20232

Sample ID: BH-3 Bulk 1 @ 0-5'

Soil Description: Brown Silty Sand (SM)

Wt of Soil + Ring:	609.5
Weight of Ring:	191.1
Wt of Wet Soil:	418.4
Percent Moisture:	6.0%
Sample Height, in	0.95
Wet Density, pcf:	133.9
Dry Denstiy, pcf:	126.3

% Saturation:	48.5

Expansion **Rack # 2**

Date/Time	5/12/2020	3:05 PM
Initial Reading	0.0000	
Final Reading	0.0019	

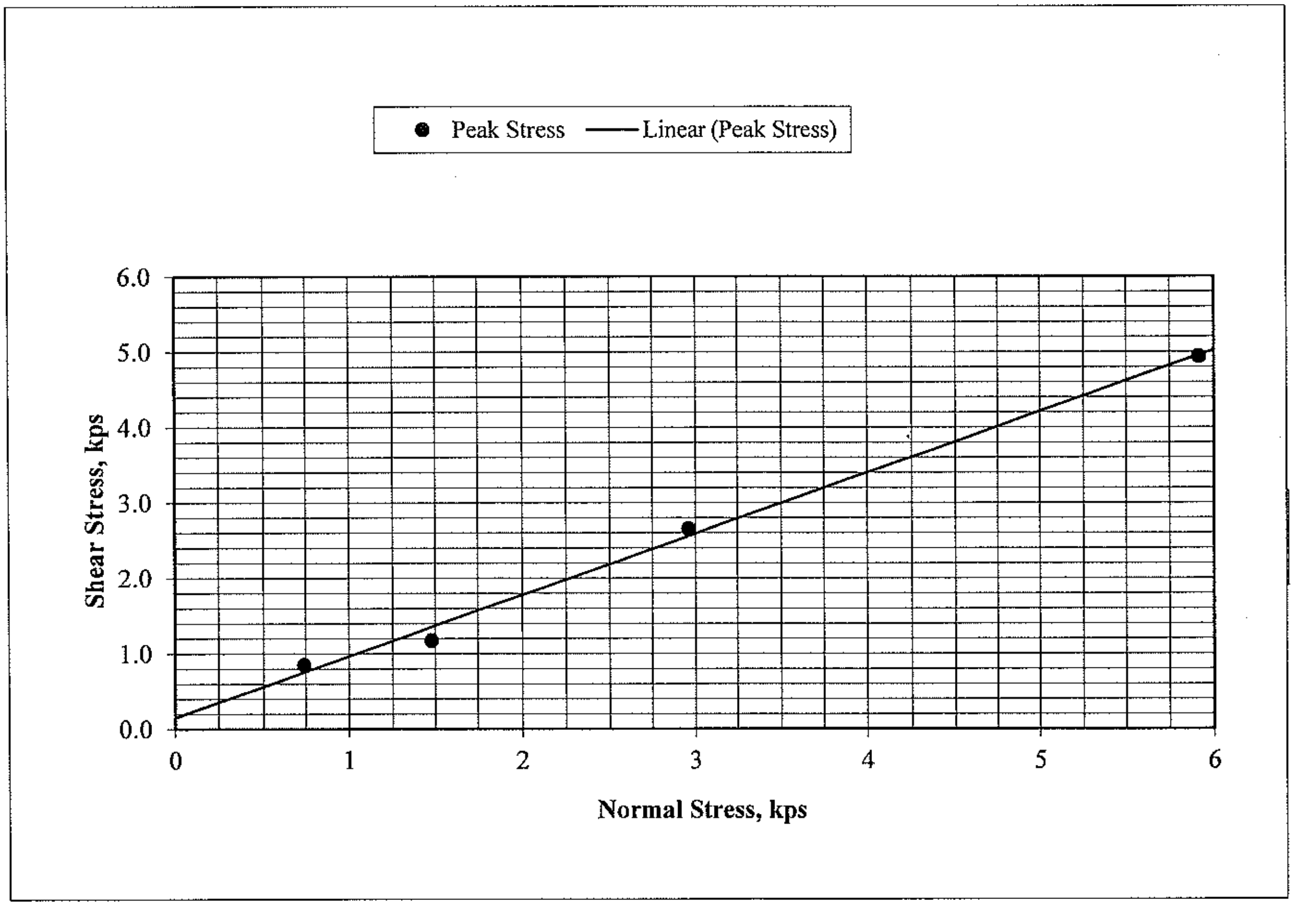
Expansion Index 2

(Final - Initial) x 1000

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

Job Number:	544-20190		May 14, 2020
Job Name	Pioneertown Motel	Initial Dry Density:	120.0 pcf
Lab ID No.	LN6-20232	Initial Mosture Content:	6.7 %
Sample ID	BH-3 Bulk 1 @ 0-5'	Peak Friction Angle (Ø):	39°
Classification	Brown Silty Sand (SM)	Cohesion (c):	150 psf
Sample Type	Remolded @ 90% of Maximum Density		

Test Results	**1**	**2**	**3**	**4**	**Average**
Moisture Content, %	10.1	10.1	10.1	10.1	10.1
Saturation, %	67.5	67.5	67.5	67.5	67.5
Normal Stress, kps	0.739	1.479	2.958	5.916	
Peak Stress, kps	0.848	1.175	2.654	4.937	



Job Number: 544-20190
Job Name: Pioneertown Motel
Date: 5/14/2020

Moisture Adjustment		Remolded Shear Weight	
Wt of Soil:	1,000	Max Dry Density:	133.5
Moist As Is:	3.1	Optimum Moisture:	6.5
Moist Wanted:	6.5		
ml of Water to Add:	33.0	Wt Soil per Ring, g:	153.9

UBC

Sladden Engineering
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863

Gradation

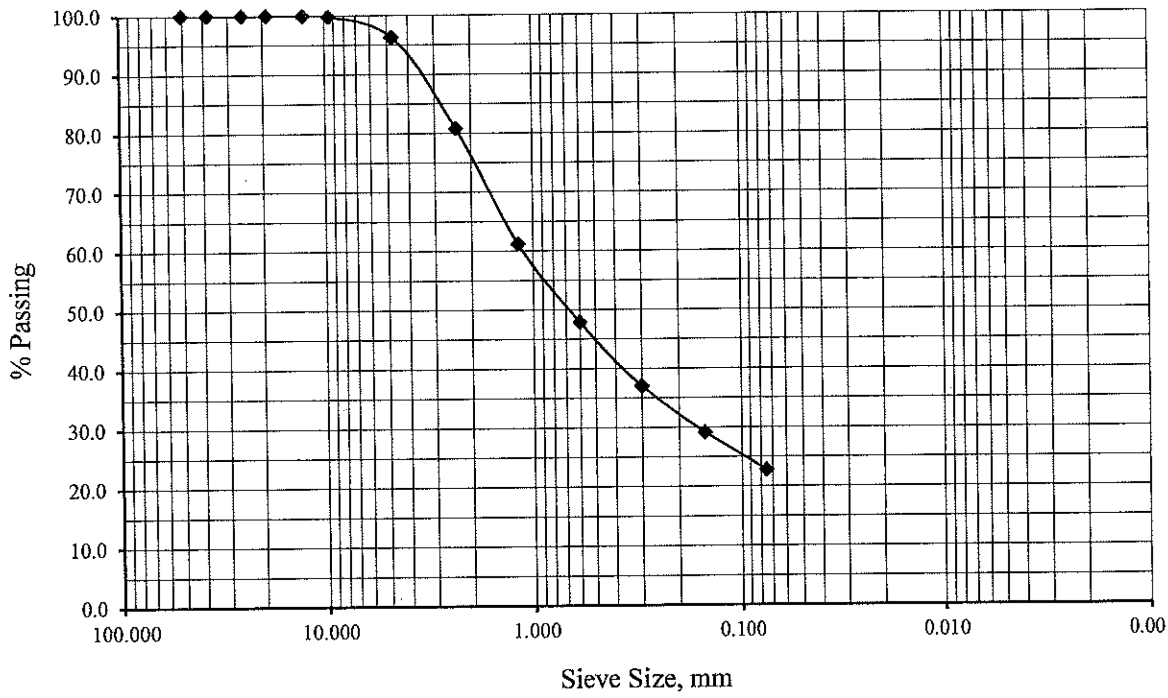
ASTM C117 & C136

May 14, 2020

Project Number: 544-20190
Project Name: Pioneertown Motel
Lab ID Number: LN6-20232
Sample ID: BH-3 Bulk 1 @ 0-5'

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	100.0
3/8"	9.53	99.8
#4	4.75	96.3
#8	2.36	80.8
#16	1.18	61.2
#30	0.60	47.9
#50	0.30	37.0
#100	0.15	29.2
#200	0.075	22.8



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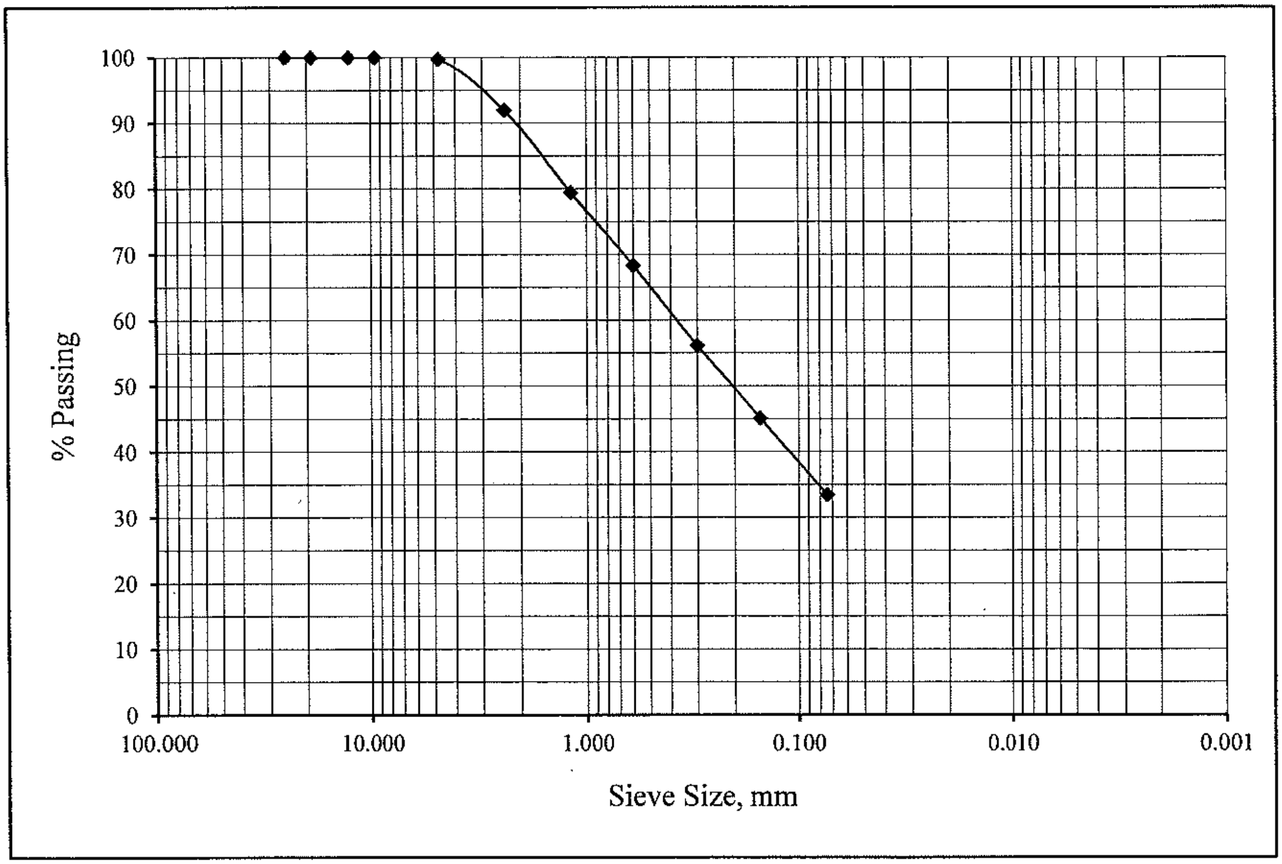
ASTM C117 & C136

May 14, 2020

Project Number: 544-20190
Project Name: Pioneertown Motel
Lab ID Number: LN6-20232
Sample ID: BH-1 S-3 @ 15'

Soil Classification: SC

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	99.7
#8	2.36	92.0
#16	1.18	79.4
#30	0.60	68.3
#50	0.30	56.1
#100	0.15	45.1
#200	0.074	33.4



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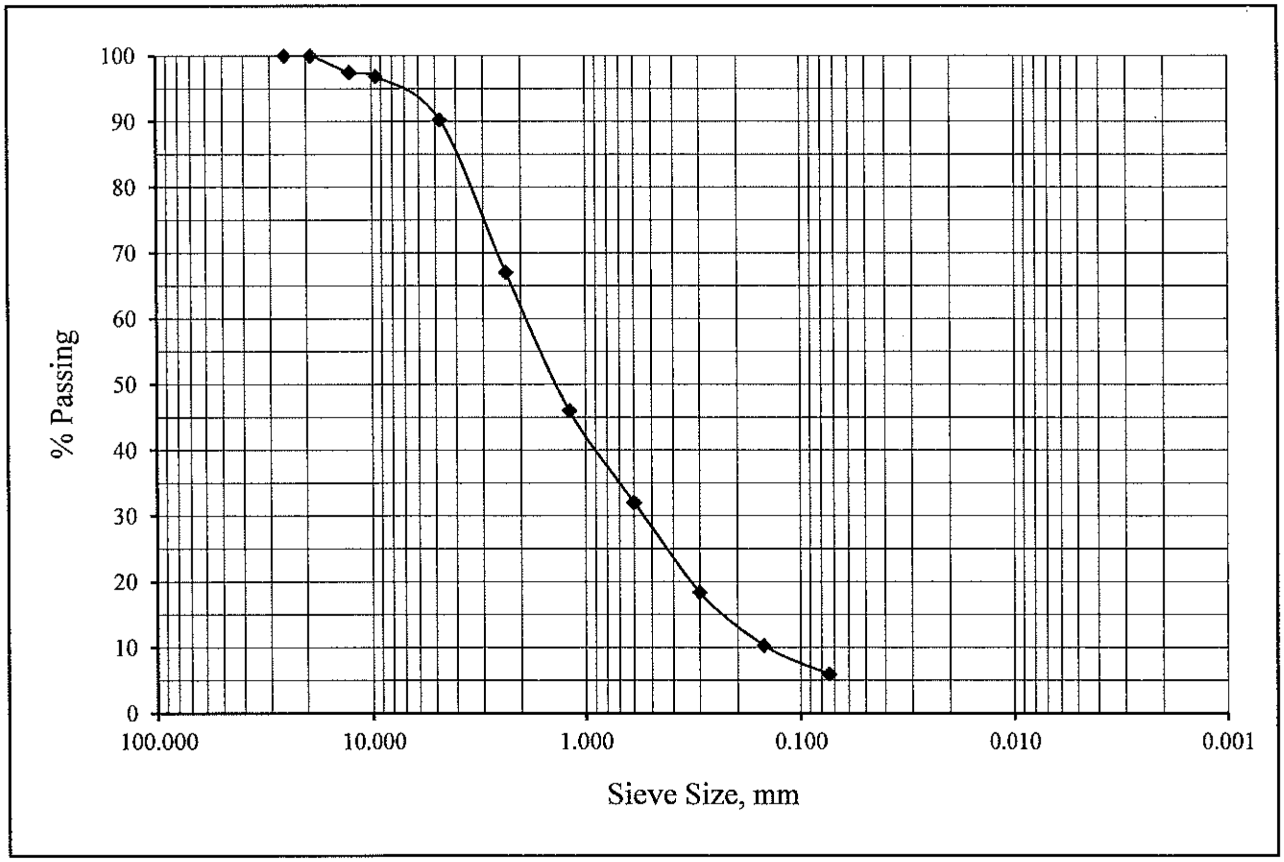
Gradation

ASTM C117 & C136

Project Number: 544-20190 May 14, 2020
Project Name: Pioneertown Motel
Lab ID Number: LN6-20232
Sample ID: BH-2 S-2 @ 10' 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	97.5
3/8"	9.53	96.9
#4	4.75	90.2
#8	2.36	67.0
#16	1.18	46.0
#30	0.60	32.0
#50	0.30	18.4
#100	0.15	10.3
#200	0.074	5.9



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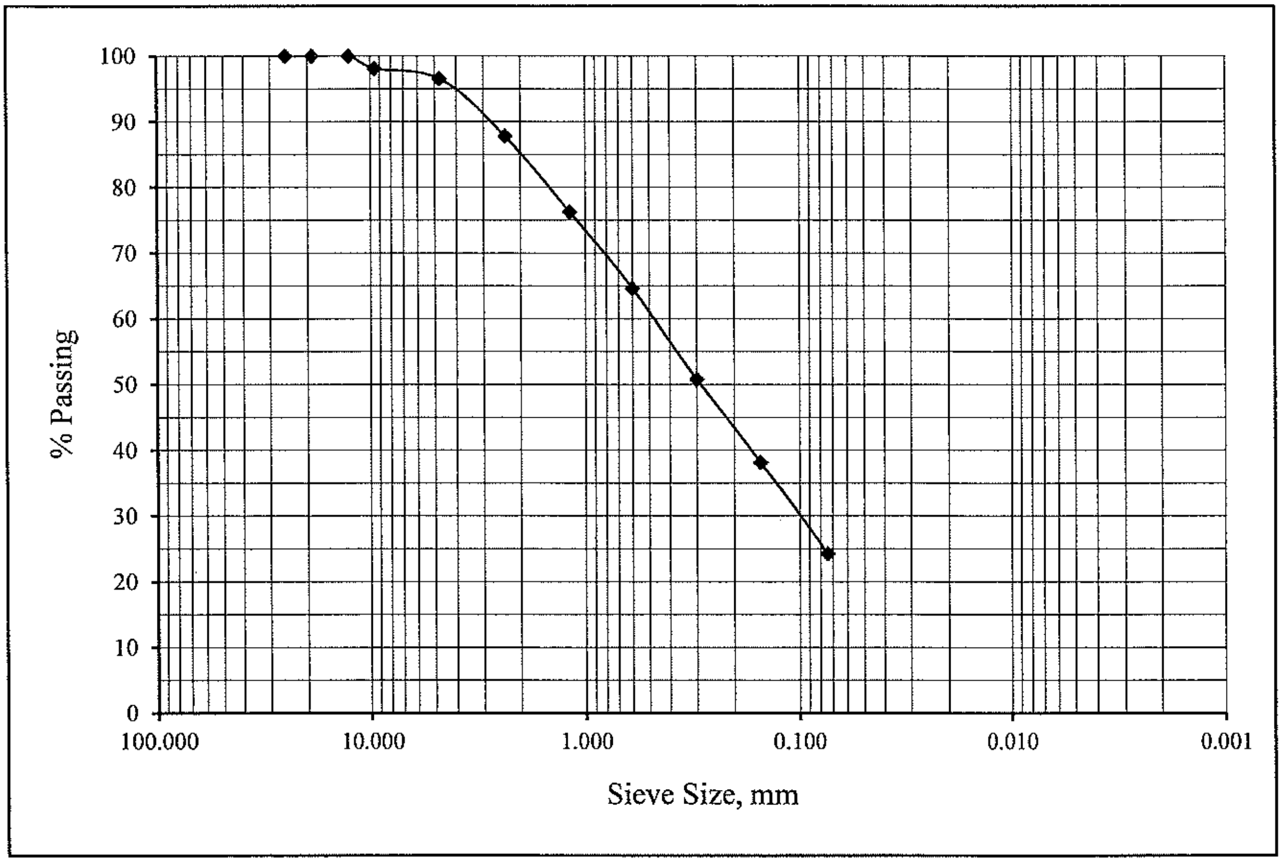
Gradation

ASTM C117 & C136

Project Number: 544-20190 May 14, 2020
Project Name: Pioneertown Motel
Lab ID Number: LN6-20232
Sample ID: BH-3 R-2 @ 5' Soil Classification: SC

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	98.1
#4	4.75	96.5
#8	2.36	87.8
#16	1.18	76.3
#30	0.60	64.6
#50	0.30	50.8
#100	0.15	38.1
#200	0.074	24.3



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Gradation

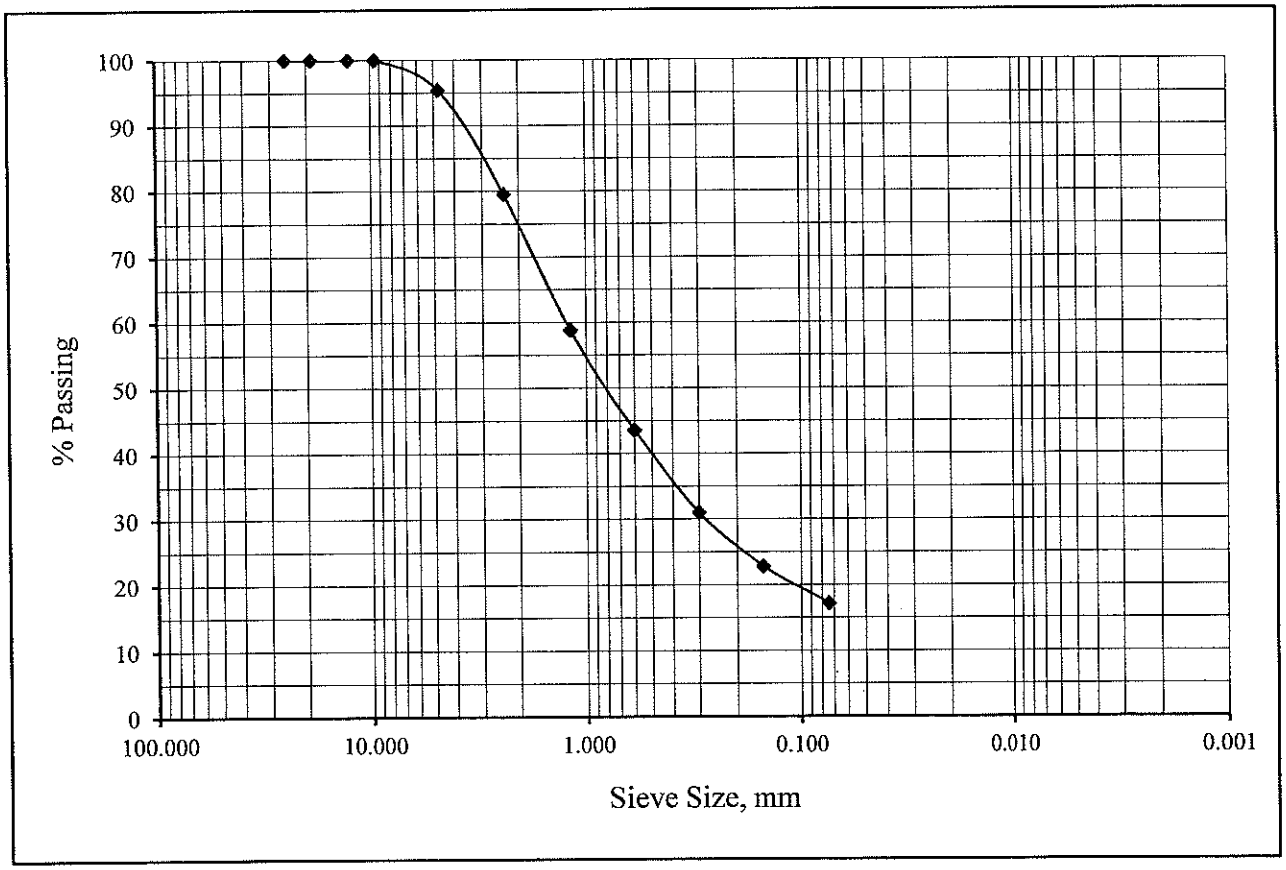
ASTM C117 & C136

May 14, 2020

Project Number: 544-20190
Project Name: Pioneertown Motel
Lab ID Number: LN6-20232
Sample ID: BH-4 R-3 @ 15'

Soil Classification: SC

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	95.4
#8	2.36	79.5
#16	1.18	58.8
#30	0.60	43.6
#50	0.30	31.0
#100	0.15	22.8
#200	0.074	17.2



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Gradation

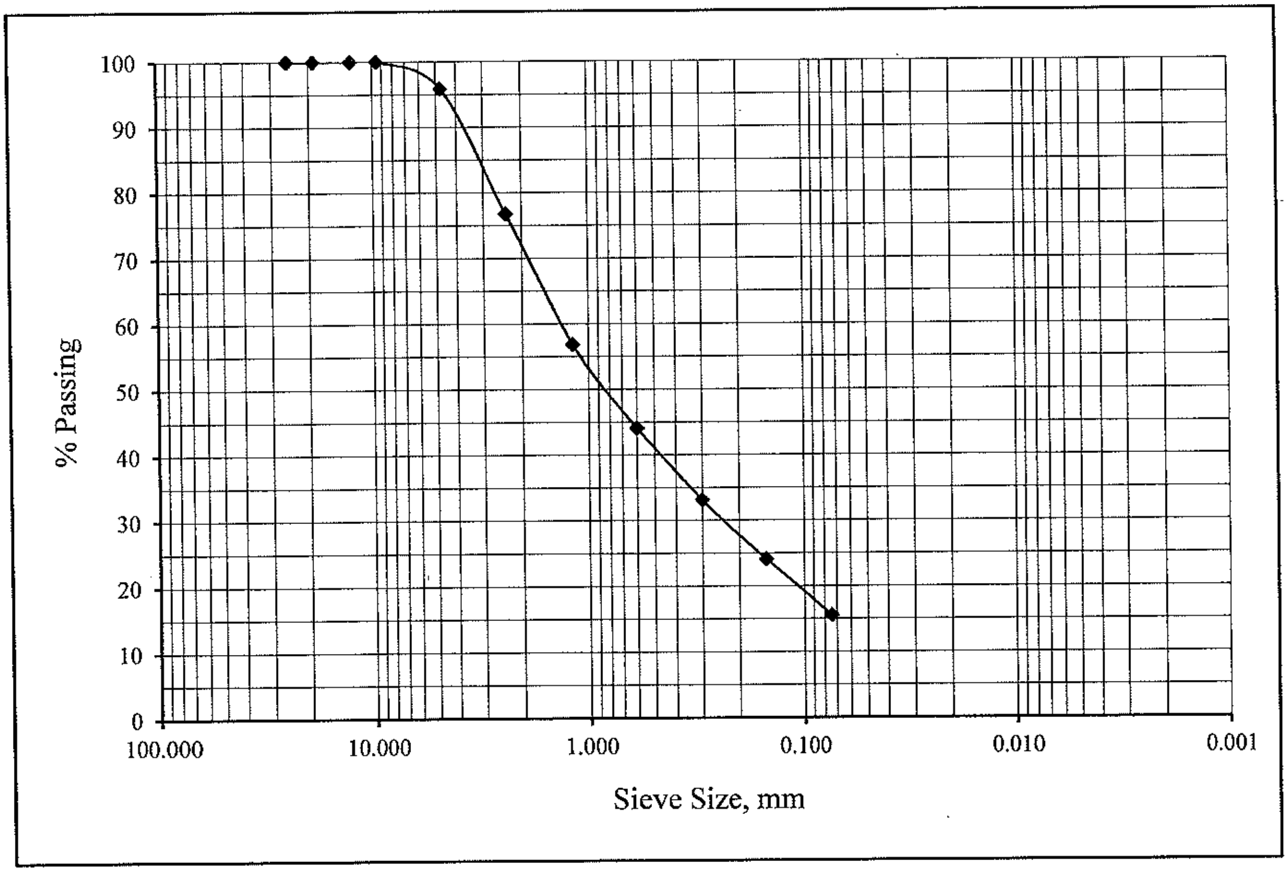
ASTM C117 & C136

May 14, 2020

Project Number:	544-20190
Project Name:	Pioneertown Motel
Lab ID Number:	LN6-20232
Sample ID:	BH-5 R-1 @ 5'

Soil Classification: 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	95.9
#8	2.36	76.8
#16	1.18	56.9
#30	0.60	44.1
#50	0.30	33.1
#100	0.15	24.1
#200	0.074	15.5



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One Dimensional Consolidation

ASTM D2435 & D5333

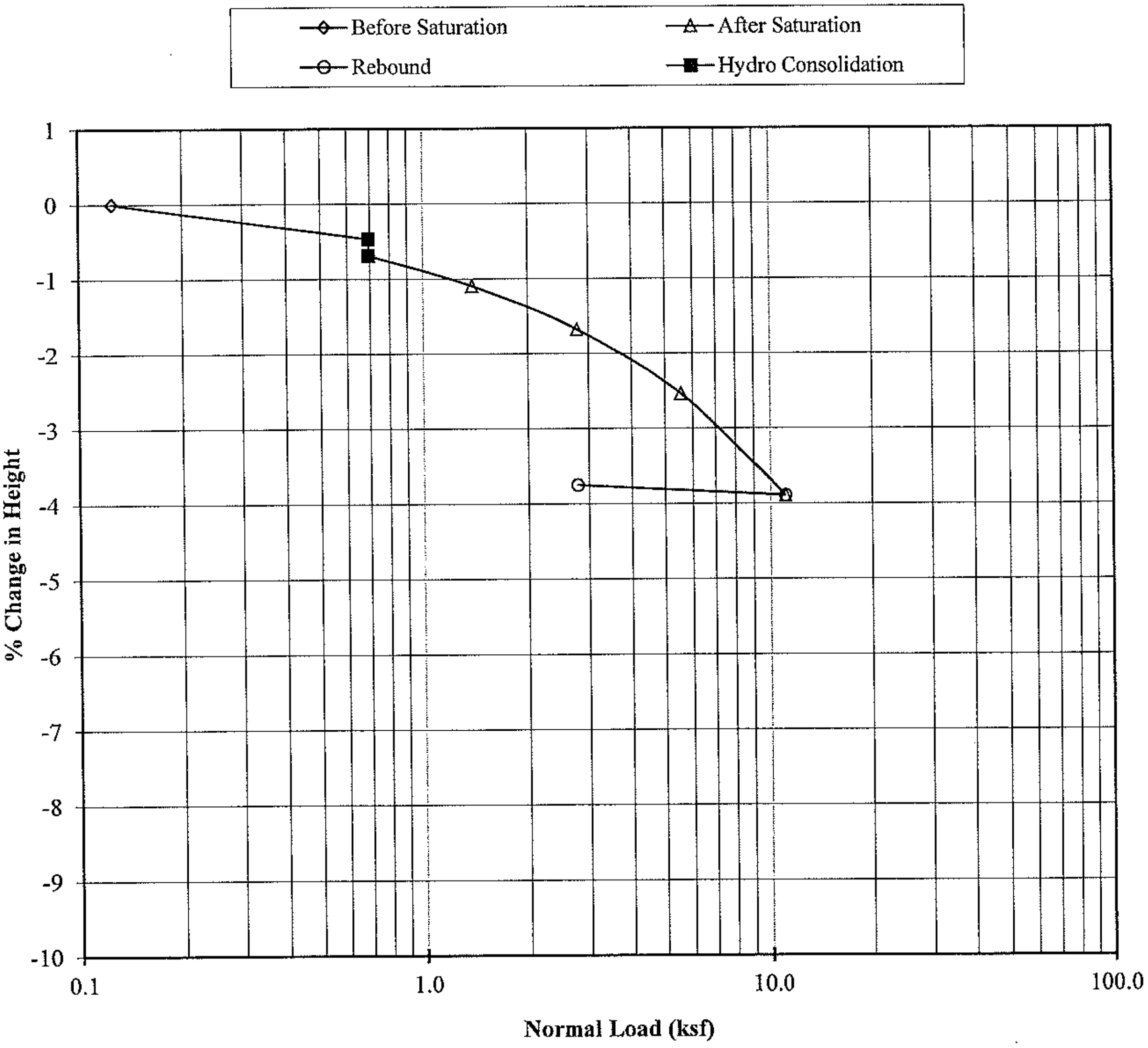
May 14, 2020

Job Number: 544-20190
Job Name: Pioneertown Motel
Lab ID Number: LN6-20232
Sample ID: BH-3 R-2 @ 5'
Soil Description: Red Brown Clayey Sand (SC)

Initial Dry Density, pcf:	111.9
Initial Moisture, %:	7.9
Initial Void Ratio:	0.489
Specific Gravity:	2.67

Hydrocollapse: 0.2% @ 0.694 ksf

% Change in Height vs Normal Presssure Diagram



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One Dimensional Consolidation

ASTM D2435 & D5333

May 14, 2020

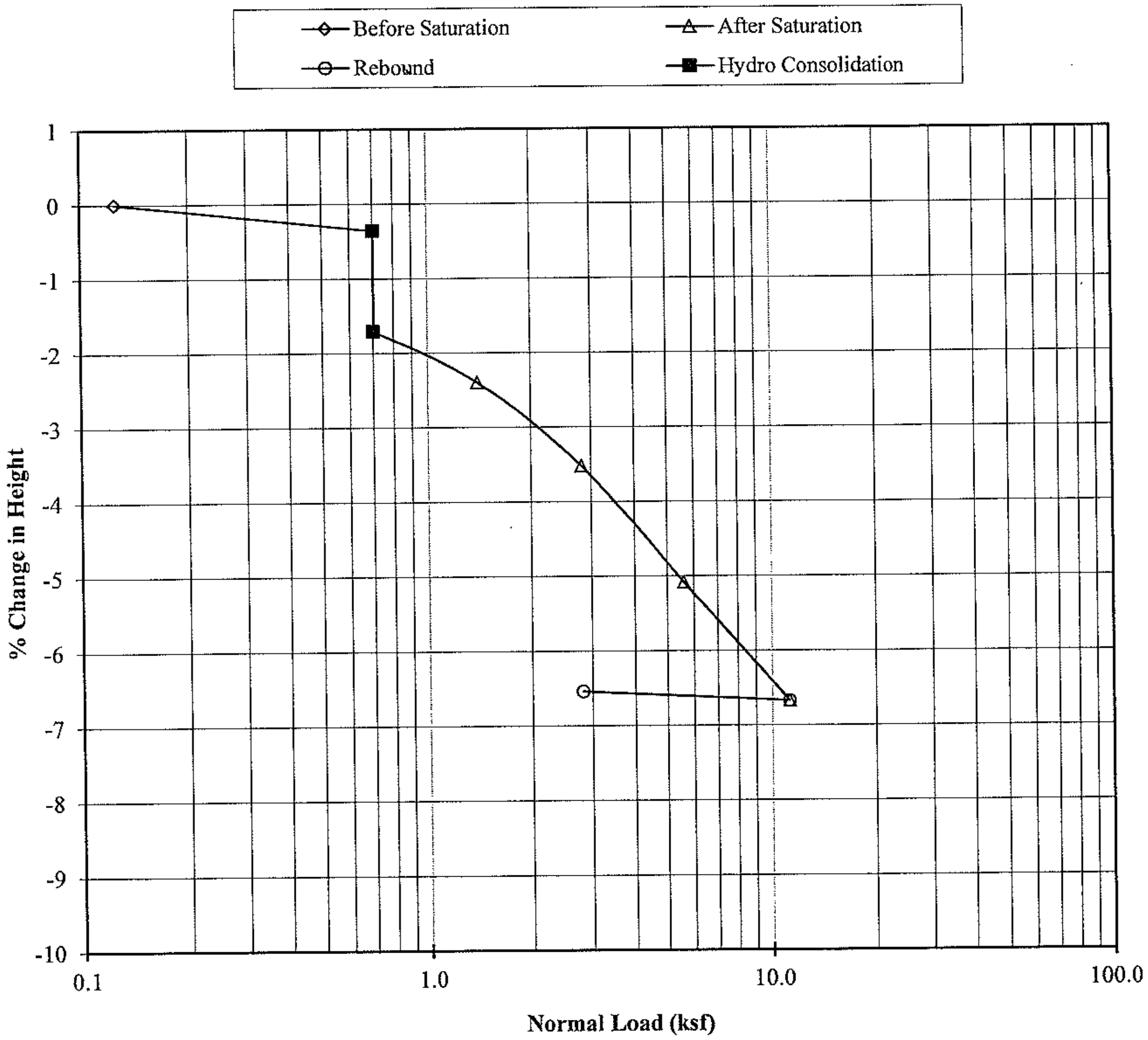
Job Number: 544-20190
Job Name: Pioneertown Motel

Lab ID Number: LN6-20232
Sample ID: BH-5 R-1 @ 5'
Soil Description: Brown Silty Sand (SM)

Initial Dry Density, pcf:	107.5
Initial Moisture, %:	2.7
Initial Void Ratio:	0.550
Specific Gravity:	2.67

Hydrocollapse: 1.4% @ 0.702 ksf

% Change in Height vs Normal Presssure Diagram



Sladden Engineering

6782 Stanton Ave., Suite C, Buena Park, CA 90621 (714) 523-0952 Fax (714) 523-1369
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: May 14, 2020

Account No.: 544-20190

Customer: Pioneertown Motel, LLC

Location: 5240 Curtis Road, Pioneertown Area

Analytical Report

Corrosion Series

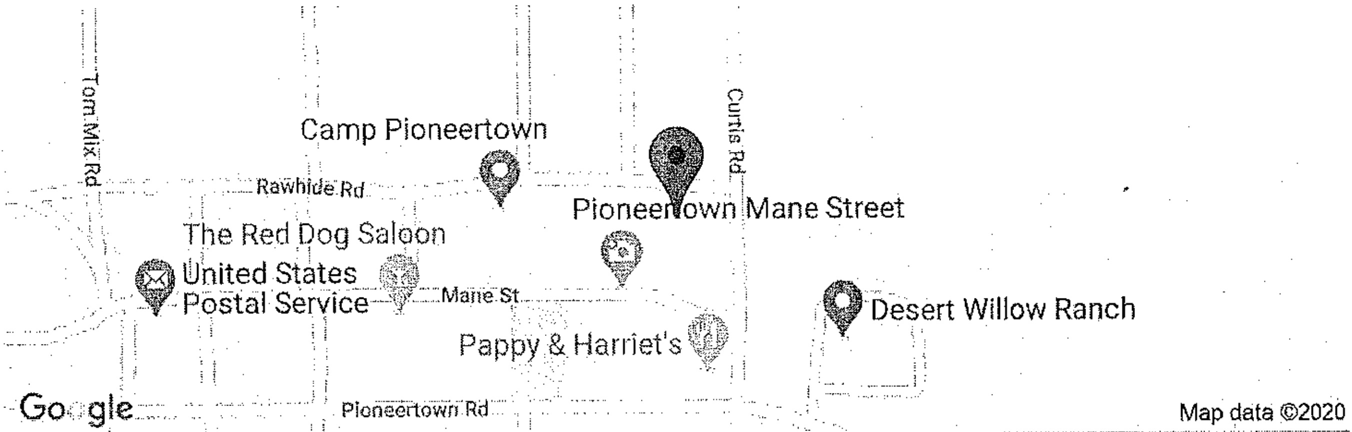
	pH per CA 643	Soluble Sulfates per CA 417 ppm	Soluble Chloride per CA 422 ppm	Min. Resistivity per CA 643 ohm-cm
BH-3 @ 0-5'	7.5	200	210	1030

APPENDIX C

SEISMIC DESIGN MAP AND REPORT
SEISMIC HAZARD ANALYSIS (SHA)

OSHPD

Latitude, Longitude: 34.1577, -116.4934



Date	5/26/2020, 2:11:10 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	**Value**	**Description**
S_S	1.8	MCE_R ground motion. (for 0.2 second period)
S_1	0.652	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.8	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.2	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	**Value**	**Description**
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.745	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.819	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.948	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.11	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.8	Factored deterministic acceleration value. (0.2 second)
S1RT	0.692	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.762	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.652	Factored deterministic acceleration value. (1.0 second)
PGAd	0.745	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.923	Mapped value of the risk coefficient at short periods
C_{R1}	0.908	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

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Project: Pioneertown Motel Expansion
Project Number: 544-20190
Client: Pioneertown Motel, LLC
Site Lat/Long: 34.1577/ -116.4934
Controlling Seismic Source: Pinto Mountain

REFERENCE	NOTATION	VALUE
Site Class	C, D, D default, or E	D measured
Site Class D - Table 11.4-1	F_a	1.0
Site Class D - 21.3(ii)	F_v	2.5
0.2*(S_{D1}/S_{DS})	T_0	0.123
S_{D1}/S_{DS}	T_S	0.616
Fundamental Period (12.8.2)	T	Period
Seismic Design Maps or Fig 22-14	T_L	8
Equation 11.4-4 - 2/3*S_{M1}	S_{D1}	0.739
Equation 11.4-2 - F_V*S_1	S_{M1}	1.108

REFERENCE	NOTATION	VALUE
Fv (Table 11.4-2)[Used for General Spectrum]	F_v	1.7
Design Maps	S_s	1.800
Design Maps	S_1	0.652
Equation 11.4-1 - F_A*S_S	S_{MS}	1.800
Equation 11.4-3 - 2/3*S_{MS}	S_{DS}	1.200
Design Maps	PGA	0.745
Table 11.8-1	F_{PGA}	1.1
Equation 11.8-1 - F_{PGA}*PGA	PGA_M	0.820
Section 21.5.3	80% of PGA_M	0.656
Design Maps	C_{RS}	0.923
Design Maps	C_{R1}	0.908

RISK COEFFICIENT

Cr - At Perods <=0.2, Cr=C_{RS}	C_{RS}	0.923
Cr - At Periods >=1.0, Cr=C_{R1}	C_{R1}	0.908

Cr - At Periods between 0.2 and 1.0 use trendline formula to complete

Period	Cr
0.200	0.923
0.300	0.921
0.400	0.919
0.500	0.917
0.600	0.916
0.680	0.914
1.000	0.908

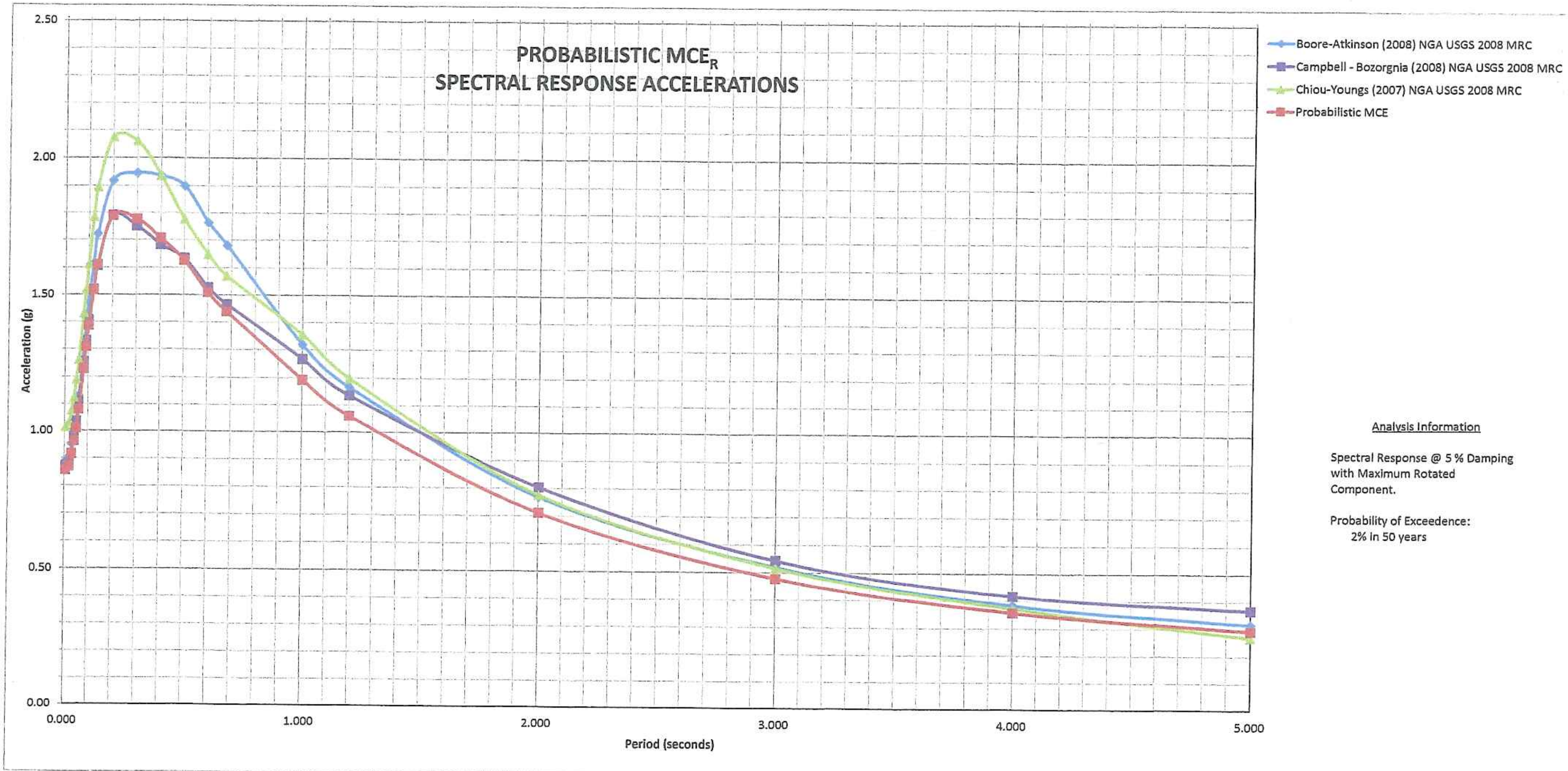
PROBABILISTIC SPECTRA
2% in 50 year Exceedence

Period	B - A	C - B	C - Y	Mean	Risk Coefficient (C_R)	Probabilistic MCE
0.005	0.889	0.873	1.014	0.928	0.923	0.857
0.020	0.906	0.879	1.031	0.944	0.923	0.871
0.030	0.952	0.916	1.075	0.991	0.923	0.915
0.040	1.006	0.986	1.124	1.042	0.923	0.962
0.050	1.043	1.036	1.191	1.094	0.923	1.010
0.060	1.131	1.110	1.262	1.170	0.923	1.080
0.080	1.301	1.253	1.431	1.331	0.923	1.229
0.090	1.389	1.330	1.521	1.417	0.923	1.308
0.100	1.477	1.406	1.612	1.501	0.923	1.385
0.120	1.614	1.519	1.784	1.643	0.923	1.516
0.136	1.720	1.605	1.893	1.743	0.923	1.609
0.200	1.917	1.790	2.074	1.938	0.923	1.789
0.300	1.945	1.750	2.060	1.929	0.921	1.777
0.400	1.936	1.682	1.936	1.855	0.919	1.705
0.500	1.898	1.633	1.776	1.772	0.917	1.626
0.600	1.763	1.528	1.648	1.649	0.916	1.510
0.680	1.680	1.466	1.570	1.574	0.914	1.439
1.000	1.319	1.267	1.355	1.314	0.908	1.193
1.200	1.167	1.136	1.199	1.167	0.908	1.060
2.000	0.768	0.804	0.776	0.783	0.908	0.711
3.000	0.520	0.543	0.516	0.527	0.908	0.478
4.000	0.384	0.418	0.373	0.393	0.908	0.357
5.000	0.317	0.367	0.269	0.323	0.908	0.293

B-A - Boore-Atkinson (2008) NGA USGS 2008 MRC
C-B - Campbell-Bozorgnia (2008) NGA USGS 2008 MRC
C-Y - Chiou-Youngs (2007) NGA USGS 2008 MRC

Probabilistic PGA:	0.857
Is $Sa_{(max)}<1.2F_a$?	NO

Project No: 544-20190



Analysis Information

Spectral Response @ 5 % Damping with Maximum Rotated Component.

Probability of Exceedence:
2% in 50 years

DETERMINISTIC SPECTRUM

Largest Amplitudes of Ground Motions Considering All Sources Calculated using Weighted Mean of Attenuation Equations*

Controlling Source: Pinto Mountain

Period	DETERMINISTIC (RAW)	DETERMINISTIC MCE 84 FRACTILE
0.005	0.761	0.761
0.020	0.774	0.774
0.030	0.809	0.809
0.040	0.852	0.852
0.050	0.894	0.894
0.060	0.953	0.953
0.080	1.072	1.072
0.090	1.134	1.134
0.100	1.193	1.193
0.120	1.296	1.296
0.136	1.368	1.368
0.200	1.541	1.541
0.300	1.616	1.616
0.400	1.644	1.644
0.500	1.638	1.638
0.600	1.566	1.566
0.680	1.517	1.517
1.000	1.311	1.311
1.200	1.178	1.178
2.000	0.806	0.806
3.000	0.554	0.554
4.000	0.415	0.415
5.000	0.335	0.335

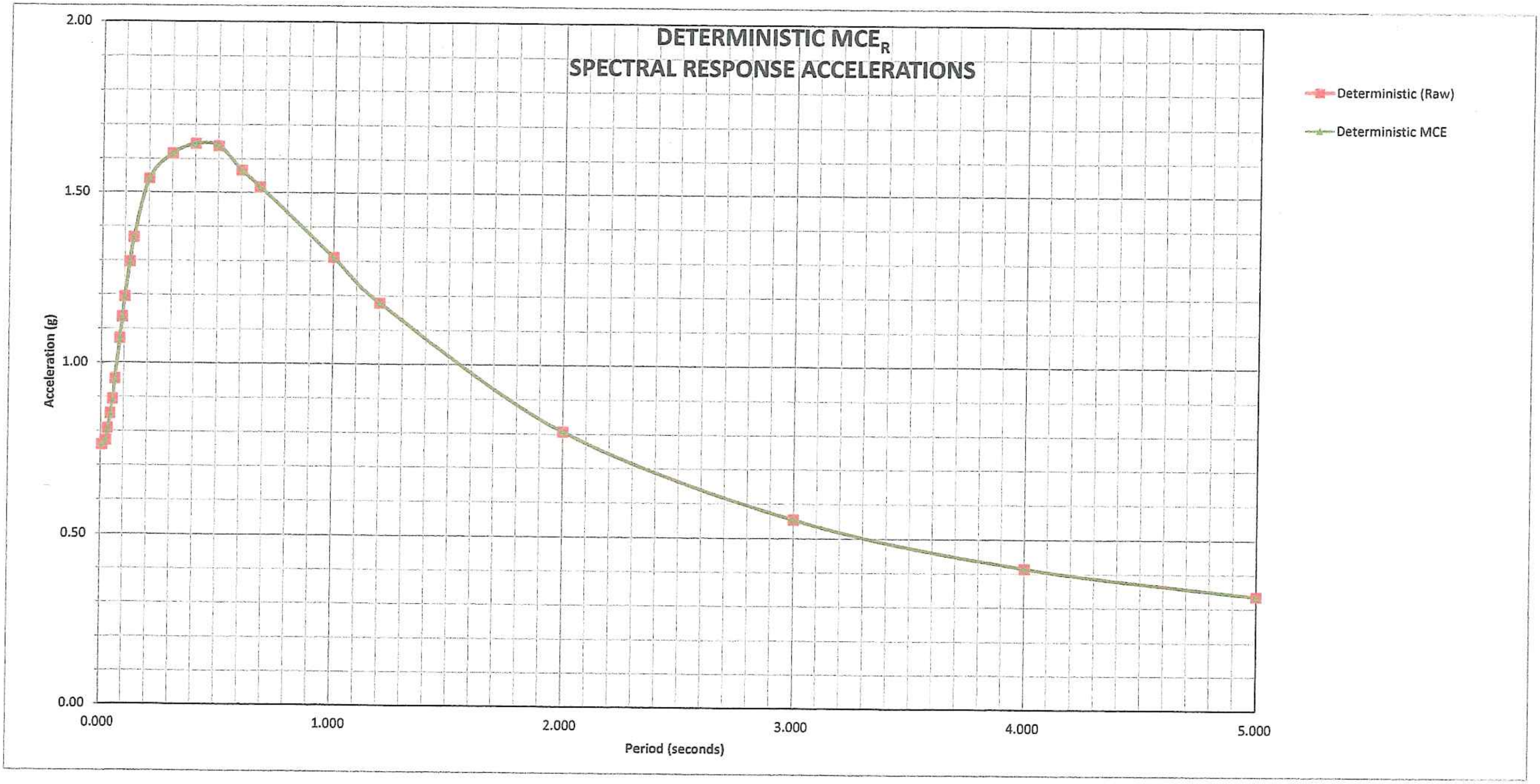
Is Sa(max)<1.2Fa? NO

Deterministic PGA: 0.761

Is PGA >=1.1*0.5? YES

*Attenuation Equations

Boore - Atkinson (2008) NGA USGS 2008 MRC
Campbell - Bozorgnia (2008) NGA USGS 2008 MRC
Chiou - Youngs (2007) NGA USGS 2008 MRC



DETERMINISTIC MCE$_R$
SPECTRAL RESPONSE ACCELERATIONS

Project No: 544-20190

SITE SPECIFIC SPECTRA

Period	Probabilistic MCE	Deterministic MCE	Site-Specific MCE	Design Response Spectrum (Sa)
0.005	0.857	0.761	0.761	0.507
0.020	0.871	0.774	0.774	0.516
0.030	0.915	0.809	0.809	0.540
0.040	0.962	0.852	0.852	0.571
0.050	1.010	0.894	0.894	0.618
0.060	1.080	0.953	0.953	0.665
0.080	1.229	1.072	1.072	0.758
0.090	1.308	1.134	1.134	0.805
0.100	1.385	1.193	1.193	0.852
0.120	1.516	1.296	1.296	0.945
0.136	1.609	1.368	1.368	0.960
0.200	1.789	1.541	1.541	1.027
0.300	1.777	1.616	1.616	1.077
0.400	1.705	1.644	1.644	1.096
0.500	1.626	1.638	1.626	1.084
0.600	1.510	1.566	1.510	1.006
0.680	1.439	1.517	1.439	0.959
1.000	1.193	1.311	1.193	0.795
1.200	1.060	1.178	1.060	0.706
2.000	0.711	0.806	0.711	0.474
3.000	0.478	0.554	0.478	0.319
4.000	0.357	0.415	0.357	0.238
5.000	0.293	0.335	0.293	0.195

Period	ASCE 7 SECTION 11.4.6 General Spectrum	80% General Response Spectrum
0.005	0.509	0.407
0.020	0.597	0.478
0.030	0.655	0.524
0.040	0.714	0.571
0.050	0.772	0.618
0.060	0.831	0.665
0.080	0.948	0.758
0.090	1.006	0.805
0.100	1.065	0.852
0.110	1.123	0.898
0.120	1.182	0.945
0.136	1.200	0.960
0.150	1.200	0.960
0.160	1.200	0.960
0.170	1.200	0.960
0.180	1.200	0.960
0.190	1.200	0.960
0.200	1.200	0.960
0.300	1.200	0.960
0.400	1.200	0.960
0.500	1.200	0.960
0.600	1.200	0.960
0.640	1.155	0.924
0.680	1.087	0.869
0.850	0.869	0.695
0.900	0.821	0.657
0.950	0.778	0.622
1.000	0.739	0.591
1.200	0.616	0.493
2.000	0.369	0.296
3.000	0.246	0.197
4.000	0.185	0.148
5.000	0.148	0.118

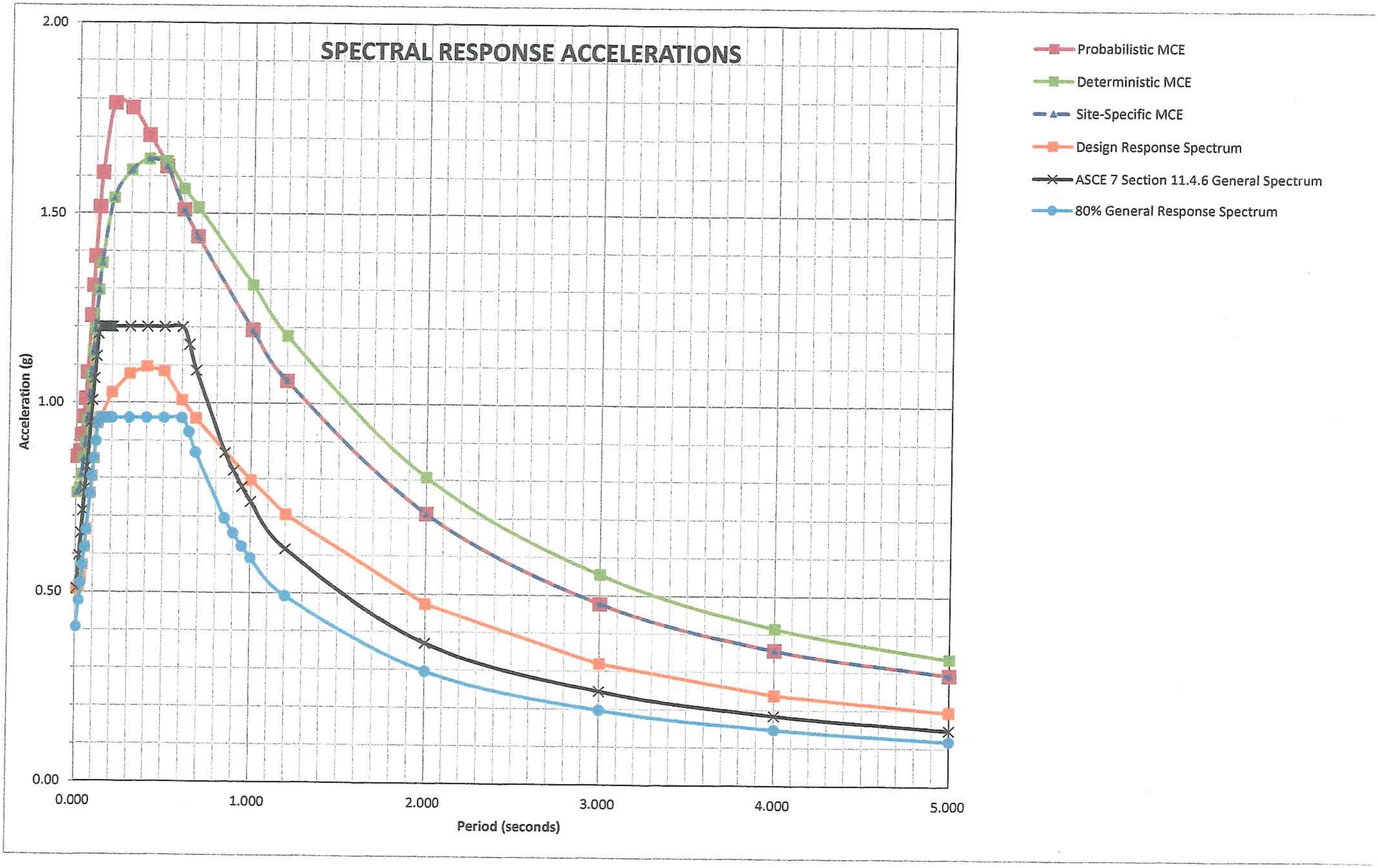
ASCE 7-16: Section 21.4

	Calculated Value	Design Value
SDS:	0.986	0.986
SD1:	0.976	0.976
SMS:	1.480	1.480
SM1:	1.465	1.465
Site Specific PGAm:	0.761	0.761
Site Class:	D measured	

Seismic Design Category - Short*	D
Seismic Design Category - 1s*	D

* Risk Categories I, II, or III

Project No: 544-20190


SPECTRAL RESPONSE ACCELERATIONS