VEI | VINEYARD ENGINEERING, INC

EARTH AND ENVIRONMENTAL SERVICES
425 19th Street, Bakersfield, CA 93301-4907
P 661.323.5402 • F 661.323.5414 • E VineyardEng@gmail.com

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT AND INFILTRATION STUDY

Proposed Commercial Development
Panther Avenue
Adelanto, CA 92301

APN: 459-432-48

CLIENT

Mike Tokathyan
Mojave Sun LLC
e.mojavesonllc@gmail.com
c. 818-731-4664

June 27, 2022

Job No. V22-070

THIS REPORT IS ONLY VALID FOR TWO (2) YEARS FROM DATE OF ISSUANCE ABOVE

SUMMARY OF RECOMMENDATIONS

Geotechnical Element	**Recommendation**
On-Site Soils	
Native or Fill	NATIVE
Over-Excavation	n/a
Scarification	12” compacted at 90%
Lateral Extents	3 feet beyond foundation perimeter
Soil Expansion	Very Low
Soil Sulfate Content	Very Low
Soil pH	Normal
Soil Chloride Content	Normal
Soil Corrosivity	Moderately Corrosive
Interior Concrete Slab-on-Grade	
Thickness	6” minimum
Reinforcement	Per structural engineer’s recommendation
Continuous Footings	
Allowable Bearing Pressure	2000 psf
Width	12”
Embedment	12”
Reinforcement	#4 bars, one at top and one at bottom, min.
Isolated (Pad) Footings	
Allowable Bearing Pressure	2200 psf
Width	12”
Embedment	12”
Reinforcement	Per structural engineer’s recommendation

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

INTRODUCTION

Purpose

This preliminary geotechnical report presents the results of our work in connection with the proposed development of commercial structures on a 2.67 acre lot on the east side of Panther Avenue in the City of Adelanto, County of San Bernardino, California. The purpose of the study was to evaluate the general subsurface conditions at the site and provide geotechnical parameters to aid in the design of the project.

Project Description

The proposed development will consist of five commercial structures. Three structures of approximately 9,225 square feet and two structures of approximately 3,500 square feet will be developed onsite. The structures are to be placed in the locations shown on the enclosed Geotechnical Map (Appendix A). It is expected that less than one foot of soil will be added to achieve final grade.

Scope of Work

Our work included site reconnaissance, subsurface exploration, soil sampling, laboratory testing, engineering analyses and preparation of this report. The scope of work included performance of the following tasks:

*Excavation of (4) test pits.

*Visually classify and continuously log substrata encountered in the test pits.

*Conduct laboratory tests on selected soil samples.

*Assess geotechnical factors affecting the design of the proposed structure.

*Provide recommendations pertaining to potential settlement, foundation design parameters and site grading.

*Provide recommendations pertaining to retention basin design parameters, including an infiltration study.

*Provide R value design parameters for paving.

FIELD AND LABORATORY TESTING

Subsurface Exploration

The subsurface exploration was performed on May 2, 2022 and consisted of (4) 24-inch-wide test pits. TP-1 and TP-2 were excavated to a maximum depth of 14 feet, and TP-3 and TP-4 were excavated to a depth of 4 feet. The test locations on the Geotechnical Plan are shown relative to future development and based on information provided by the client. Test pits were backfilled with spoils to natural compaction

Bulk samples of soil on the site were obtained for laboratory testing from the test pits. Samples were obtained by means of 2.5–inch I.D. samplers manually driven in conformance with ASTM D2937. The exploration and sampling operations were performed by a senior technician from this office, who logged the exploratory pit and prepared the samples for subsequent examination and laboratory testing.

Laboratory Tests

Laboratory tests were performed to provide a basis for recommendations. Selected samples were tested to determine moisture/density, shear strength, expansion index, chemical analysis, sieve analysis, and R-value. The results of the moisture/density tests are shown on the Test Pit Logs in Appendix A. A brief description of other laboratory testing procedures and the test results are presented in Appendix B.

SITE CONDITIONS

Surface Conditions

The site is located on the east side of Panther Avenue in the City of Adelanto, County of San Bernardino, California and is approximately 2 miles west of California State Route 395. An address was not available, but the assessor parcel number (APN 0459-432-48) has been confirmed as accurate (Portion of Parcel 3 of Parcel Map No. 11268, also in the northwest ¼ of Section 31, T. 6 N., R. 5 W., S.B.M.).

The lot has a multisided figure and contains 2.67 acres. The dimensions are: 456.97' along the north boundary, 312.95' along the east boundary, 122.11' along the west boundary on the Panther Avenue frontage, and a total of 452.70' along 2 portions of the southerly boundary. The record parcel map indicates a public utilities easement adjacent to the easterly boundary of the parcel. The easement varies in width from 73.70' to 63.63' and is outside the expected construction area. It does not appear to affect the locations of the proposed buildings or retention basin.

Three commercial structures will be located along the northly and easterly sides of the lot. Three proposed parking and an underground retention basin will be located in the center portion of the lot. There are no existing structures on site. Panther Avenue and most of the surrounding roads are unpaved. The site descends from south to north across the property at approximately 0.6% or less. Natural vegetation including several Joshua trees are scattered across the site.

Earth Material

Earth material was visually classified in the field according to the Unified Soil Classification System by examination of the samples and the trench walls.

Earth material encountered in the upper 1 foot for TP-1 and TP-2 consists of light-brown silty sand with medium to coarse sand content. From 1 to 5 feet, the soil changes to a light-brown silty sand with fine sand content. From 5 to 9 feet, the soil changes to a light-brown silty sand with medium to coarse sand content. **Hardpan was encountered consistently at 9 feet on the property.**

It is noted that the soil encountered in the upper 3 foot for TP-3 consists of light-brown silty sand with fine to coarse sand content. From 3 to 4 feet, the soil changes to a light-brown silty sand with fine to medium sand content.

Additional differences were observed in the soil encountered in TP-4. Earth material encountered in the upper 1 foot consists of a light-brown silty sand with fine to medium sand content. From 1 to 4 feet, the soil changes to a light-brown silty sand with fine to medium sand content.

A more detailed description of the earth–material profile encountered is presented in the Test Pit Logs (Appendix A).

Ground Water Conditions

Ground water was not encountered in the soil test pits. Regional groundwater is located at a depth of greater than 136 feet below ground surface from the nearest well (SGMA 2021).

ENGINEERING SEISMOLOGY

Local Faulting

The site is not located within the currently established Alquist–Priolo Earthquake Fault Zones. Based on the CDMG 1994 Maps, there is no fault trace through the project site.

Regional Faulting

The project is located within the regional influence (within 100 kilometers) of known active or potentially active faults. The closest fault to the site is the Mirage Valley fault at approximately 11.19 kilometers northwest of the site. It is a Fault Class A zone. The San Andreas Fault is also approximately 28.98 kilometers southwest from the site. Per the existing site conditions, applicable codes, and laboratory results, it is our opinion that **Site Class D** is appropriate for the proposed construction at this site. The table below lists the applicable seismic coefficients for the project:

Seismic Coefficients

Soil Profile Type	S_D
Seismic Coefficient (0.2 sec)(S_S)	1.137
Seismic Coefficient (1 sec)(S_1)	0.445
MCE Spectral Response Accel. (0.2 sec) (S_{MS})	1.188
MCE Spectral Response Accel. (1 sec) (S_{M1})	null
Design Spectral Response (0.2 sec) (S_{DS})	0.792
Design Spectral Response (1 sec) (S_{D1})	null

Liquefaction Potential

The depth to groundwater would preclude any potential for liquefaction.

DESIGN RECOMMENDATIONS

General

Either the dense natural soil or properly compacted fill are suitable for structural support of the proposed building. Provided the recommendations of this report are followed during grading and construction of the site, the proposed structures should be free of geotechnical hazards and are feasible from a geotechnical engineering standpoint.

Site Grading

Surface Preparation– To provide a fairly stable foundation for the building with regard to potential differential settlement, the site should be cleared of all concrete, A.C. vegetation and other debris and any old fill material. Any tree wells left by the removal of trees shall be cleaned entirely of debris, roots, and root balls.

Extending a minimum of 3 feet beyond the limits of the proposed foundations (where obtainable), the native soil present at the subgrade elevation shall be scarified to a depth of 12 inches, thoroughly watered, and compacted to at least 90 percent of the maximum density of the soil. The site should then be brought to finish grade with native soil or properly compacted fill, if necessary, as noted the following "General Site Grading Recommendations."

The geotechnical engineer shall approve the bottom of the excavation prior to proceeding with any compaction efforts.

Excavation Characteristics– All excavations should be made in accordance with applicable regulations. No appreciable difficulty is expected with excavation performed by conventional grading equipment.

Moisture Conditioning – Construction watering may be required to achieve necessary soil moisture. Experience has shown compaction difficulty can result if fill soil is not allowed to moisture cure prior to attempting compaction. The grading contractor should be prepared to provide water during the excavation process and stockpile the moisture conditioned soil, as necessary, to allow for curing.

General Site Grading Recommendations– All site grading operations should conform with applicable local building and safety codes and to the rules and regulations of those regulatory agencies having jurisdiction over the subject construction.

Import soil (if any) should be at least as good as the firm on–site native soil in strength characteristics and no worse than the on–site soil relative to resistivity and soluble sulfate and

chloride content.

Surface runoff should be collected and disposed of in such a manner as to prevent concentrated erosion. Pad drainage should be directed toward an approved water course swale via non-erosive channel, pipe and/or dispersion devices. We recommend that lot drainage be verified after construction. At no time should drainage be directed toward any descending slope or allowed to pond and should not be allowed to stand and seep into the ground except for engineered swales, catch basins or retention/detention basins specifically designed for drainage waters.

Observations and field tests shall be carried on during grading by the Project Engineer to confirm that the required degree of compaction has been obtained. Where compaction or moisture conditioning is less than that required, additional compactive effort shall be made with adjustment of the moisture content as necessary until the specified compaction or moisture is obtained.

Wherever, in the opinion of the Owner or the Project Engineer, an unstable condition is being created, either by cutting or filling, the work shall not proceed in that area until review has been made and the grading plan revised, if found to be necessary.

Where required, special inspections should be performed in accordance with Table 1705.6 below:

TABLE 1705.6
REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	–	X
2. Verify excavations are extended to proper depth and have reached proper material.	–	X
3. Perform classification and testing of compacted fill materials.	–	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	–
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	–	X

Foundation Design

These recommendations assume proper placement of the foundations in properly compacted soil. Bearing values obtained below were calculated from direct shear strength tests performed on remolded samples of the soil.

Continuous Footings

The allowable vertical bearing capacity of **2,000 pounds per square foot** may be used for dead and sustained live loads. For conditions of temporary loading, such as those produced by wind and seismic forces, the bearing value may be increased by one-third.

Continuous footings shall be a minimum of **12 inches wide** and a minimum of 12 inches below lowest adjacent grade. Reinforcement shall consist of, at minimum, (2) #4 bars, one at top and one at bottom. Actual depth, width, and reinforcement requirements for continuous footings will be dependent on applicable sections of the governing building code and requirements of the structural engineer.

Isolated Pad Footings

The allowable vertical bearing capacity of **2,200 pounds per square foot** may be used for dead and sustained live loads. For conditions of temporary loading, such as those produced by wind and seismic forces, the bearing value may be increased by one-third.

Isolated pad footings shall be a minimum of **12 inches wide** and a minimum of 12 inches below lowest adjacent grade. Actual depth, width, and reinforcement requirements for continuous footings will be dependent on applicable sections of the governing building code and requirements of the structural engineer.

Footing Observation

Prior to placement of forms, reinforcement, or concrete, all footing trenches should be observed by a representative of the project geotechnical consultant to verify that these have been excavated in competent soil. Excavations should be trimmed neat, level, and square. All loose, sloughed, or moisture-softened soil and/or construction debris should be removed prior to placing concrete.

Floor Slab

The slab should measure at least 6 inches in nominal thickness and be reinforced in accordance with the structural engineer's recommendations. The slab shall be underlain by at least 2 inches of either sand or base over a 6-mil vapor barrier.

Excavations and Temporary Slopes

The material encountered at the site is expected to be temporarily stable on a gradient of 1½ horizontal to 1 vertical to a height of about 5 feet. By temporarily, it is meant a time of approximately one month.

All regulations should be followed before allowing workmen in a trench or to work at the base of the excavation. If any seepage is encountered during the excavation, the geotechnical engineer should be notified to re-evaluate the changed conditions.

Settlement

Providing that the recommendations given under "Site Grading" and "Foundation Design" are followed, it is anticipated that the maximum settlement should not exceed one inch and that the maximum differential settlement in a horizontal distance of 20 feet should not exceed 1 inch.

Expansive Soil Considerations

The on-site soil is considered to have a very low expansion potential and provisions for expansive conditions are not necessary. The surface should be sloped away from the structure at a minimum rate of 2% for a minimum distance of 10 feet to provide adequate drainage.

Concrete

On-site soil tested indicated a minimal concentration of soluble sulfate. A **Type I general purpose cement** is acceptable for use in the design mix.

Consistent with good construction practice, attention should be given to placement procedures which provide good concrete density and proper curing. Adequate concrete coverage of reinforcing steel should be provided.

Corrosion Potential – Metal

On–site soil tested indicated a low concentration of chloride. The soil resistivity tests indicate that the soil has a low corrosivity potential at natural moisture. At its minimum resistivity, protective measures against corrosion will not be necessary.

Corrosion Potential – pH

The on-site soil tests indicated a normal pH value in the soil. At its natural chemistry, rehabilitation measures will not be necessary.

Corrosion Potential – Electrical Conductivity

Electrical conductivity, the reciprocal of resistivity, is a measure of the soil's electrical resistance and is considered to be a significant indicator of the potential for corrosion of buried metals. Other factors, including soil pH, soluble salts (type and concentration), soil types, and aerobic versus anaerobic conditions are expected to affect buried metals. If the site grading operations will result in a blend of native and/or imported materials at finished subgrade elevations, additional tests should be performed after rough grading has been completed and prior to concrete and/or mechanical design.

Preliminary test results indicate that soil corrosivity EC @ 250 Celsius was measured at 141 umhos/cm and is moderately corrosive. **Appropriate corrosion protection should be provided for buried improvements based on "moderately corrosive" corrosion potential.** Vineyard Engineering, Inc. does not practice in the specific field of corrosion engineering or electrical engineering. If manufacturers and/or suppliers cannot determine and/or document that materials are compatible with the soil corrosion conditions, it is recommended that a professional consultant or engineer with experience in corrosion protection be consulted to provide design parameters.

INFILTRATION STUDY

The purpose of the section is to provide a review of laboratory and field testing performed and provide recommendations for the expected infiltration rate for the proposed sump.

Scope of Study

It is proposed to excavate one sump to contain any onsite runoff. In accordance with County of Kern Manual for the Standard Water Mitigation Plan, the project geotechnical engineer shall address the following criteria:

a. Site soil classifications in accordance with the Unified Soil Classification System.
b. Potential for liquefaction of site soils.
c. Depth of the ground water level at the project site.
d. Infiltration rate and specification of test method and procedures used to determine the infiltration rate.
e. Analysis of the potential that perched water conditions could be created by the operation of the infiltration system.
f. Statement regarding the effects of infiltration on foundation settlement.
g. Statement regarding the effects of infiltration on hydrostatic pressure.

Discussion

Results of laboratory testing indicates that the soil at this site can be generally classified as a ***SILTY SAND*** (SM). Infiltration testing was performed by this office. Recommendations are based upon the results of the infiltration testing, available literature, previous geotechnical reports in the area, and previous laboratory data.

Since the soil is fairly homogeneous throughout the site and below the proposed sump bottom, the site soil classification can be considered to be the same for approximately 15 feet (SM) below the existing surface.

Ground water was not encountered in the soil test pits. ***Regional ground water is located greater than 136 feet below ground surface*** (SGMA 2022). The proposed building areas are relatively flat without any discernible slopes. The potential for lateral spreading of the existing area as a result of operation of the proposed sump can be considered low to nonexistent. ***The potential for liquefaction of the onsite soil as a result of groundwater is very low.***

Converting the 6 minutes per inch test rate from the test pit (log in Appendix A), the ***infiltration rate is 10 inches per hour*** for the soil in the area of the proposed sump (240 inches per day). The procedures are as follows:

- For the test pit, a 12-inch square by 12-inch deep test hole was excavated at the bottom of a five-foot-in-depth trench. The test hole was filled with water to the top to allow presoaking. The percolation test was performed at least 24 hours after the presoak. The hole was filled once again and the time required for each water drop of 1 inch was recorded.

- For a boring, using a hollow-stem auger, advance an 8-inch-diameter boring 1 foot below the invert of proposed BMP. Rotate the auger until all cuttings are removed.

- Install through the auger, a 2- to 4-inch-diameter perforated PVC casing with a solid end cap. Perforations should be a 0.02 inch slot or larger. Pour filter pack down center of auger while withdrawing the auger such that the casing is surrounded by the filter pack. The filter pack and perforated casing must have a larger hydraulic conductivity than the soil or rock that is to be tested.

- Presoak the hole immediately prior to percolation testing. Water should be continually added to the casing to maintain a minimum depth of 1 foot above the bottom for 30 minutes. A sounder or piezometer may be used to determine the water level. Record the water levels and boring diameter.

- After presoaking, for each successive test water should be added to the casing to a minimum depth of 1 foot above the bottom and refilled to this level after each percolation test. The drop in the water during the next 30 minutes should be applied to the following standards to determine the time interval between readings for each test location:

    - If the water remains in the hole, the interval for the readings during the percolation test should be 30 minutes.
    - If no water remains in the hole, the interval for the readings during the percolation test should be 10 minutes.

- Conduct the percolation test by recording the time and drop in water level. Repeat the test a minimum of eight times or until a stabilized rate of drop is obtained, whichever occurs first. A stabilized rate may be assumed when three consecutive tests are within 10 percent of each other.

  The drop in water level over time is the pre-adjusted percolation rate at the test location. The pre-adjusted percolation rate must be reduced to account for the discharge of water from both

the sides and bottom of the boring (i.e., non-vertical flow). The following formula was used to determine the infiltration rate:

Infiltration Rate = Pre-adjusted Percolation Rate divided by Reduction Factor

Where the reduction factor (R_f) is given by $$R_f = \frac{2d_1 - \Delta d}{DIA} + 1$$

with: d_1= Initial Water Depth (in.)
Δd =Average/Final Water Level Drop (in.)
DIA = Diameter of the boring (in.)

The soil within the initial 15 feet below the bottom of the proposed sump meets the current County of Kern criteria for acceptable infiltration rates.

A Test Pit was placed in the immediate area of the proposed infiltration area and was used to determine if any changes in the soil type could provide a perched water condition that could potentially affect the area. In addition, laboratory data was reviewed in order to identify soil types most likely to produce a perched water condition. ***It is our opinion that the potential for the formation of a perched water condition as a result of the proposed infiltration pits is very low.***

The expected flow direction of the subsurface water introduced will be in a direction away from any proposed structures. ***The potential for adverse settlement of any proposed structure as a result of the presence/operation of the sump is very low.***

The potential for excess hydrostatic pressure on walls as a result of the presence/operation of the sump is extremely low.

Sump Recommendations

Based upon the data, observations, and conclusions listed in the previous section, it is our opinion that the use of **one sump is feasible for the subject site.** There exists a very low potential for lateral spreading and/or adverse settlement of the proposed building. An infiltration system or a bio-filtration system that includes an under drain system to prevent extended ponding will not be necessary for this site. The sump should be designed and constructed in accordance with County of Kern criteria.

CLOSURE

Geotechnical Review

Geotechnical review during construction is of paramount importance in engineering practice. The poor performance of many foundations has been attributed to inadequate construction review.

Site clearing, removal of all unsuitable soil, proper moisture conditioning, review of imported fill material, fill placement, observation of foundation excavations and other site grading operations should be observed and tested by this office during construction.

Limitations

This report is based on the project as described and the information obtained from the test excavations at the approximate locations indicated on the plans. Our findings are based on the results of the field, laboratory and office observations, tests and analysis, combined with an interpolation and extrapolation of soil conditions between and beyond the test excavations.

The results reflect our interpretation of the limited direct evidence obtained. The recommendations presented in this report are based on the assumption that sufficient field review (observation and tests) will be provided by this office during construction. Our firm should be notified of any pertinent changes in the project plans that differ from those described in this report. A significant variation may require a re–evaluation of the recommendations expressed in this report.

This report has been prepared for use in design of the described project. It may not contain sufficient information for other purposes. The study focused on the evaluation and analysis of selected physical properties of the earth material, and did not include any investigation or assessment of the presence of toxic or hazardous substances. This report has been prepared in accordance with generally accepted geotechnical practice. We make no other warranties, either express or implied.

Regards,

VINEYARD ENGINEERING INC.

Antoinette V. Algara, P.E.
Principal Engineer

AVA/pjp

enc: Appendix A - Geotechnical Plan
Log of Test Pits
Percolation Test Data Logs
Appendix B - Laboratory Test Results
Appendix C - Guide Specifications for Placement of Fill and Backfill

REFERENCES

Jennings, C.W., 1992, Preliminary fault activity map of California, 1:750,000: California Division of Mines and Geology, DMG Open–file report 92–03.

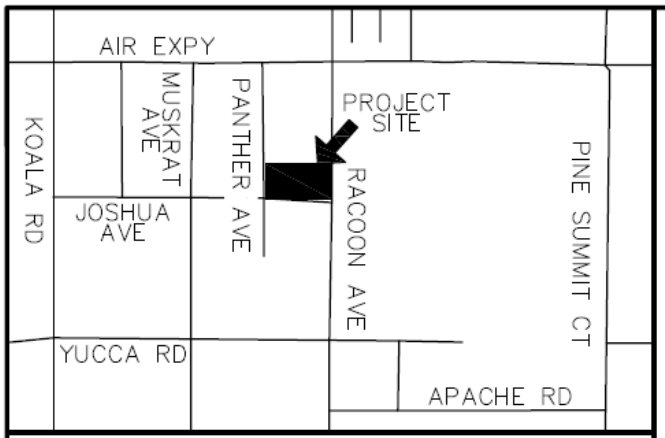
Jennings, C.W., 1992, Appendix for preliminary fault activity map of California: California Division of Mines and Geology, DMG Open–file report 92–03.

California Department of Water Resources. Sustainable Groundwater Management Act Data Viewer, https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#gwlevels. Accessed 30 May 2022.

Mualchin, L. and Jones, A.L., 1987, Peak accelerations from maximum credible earthquakes in California, California Department of Conservation, Division of Mines and Geology, Map Sheet 45: California Department of Transportation, Division of Structures.

U.S. Geological Survey 7.5 minute quadrangle, GOSFORD, California, 2015,

APPENDIX A



ADELANTO, CA

VICINITY MAP

N

NORTH

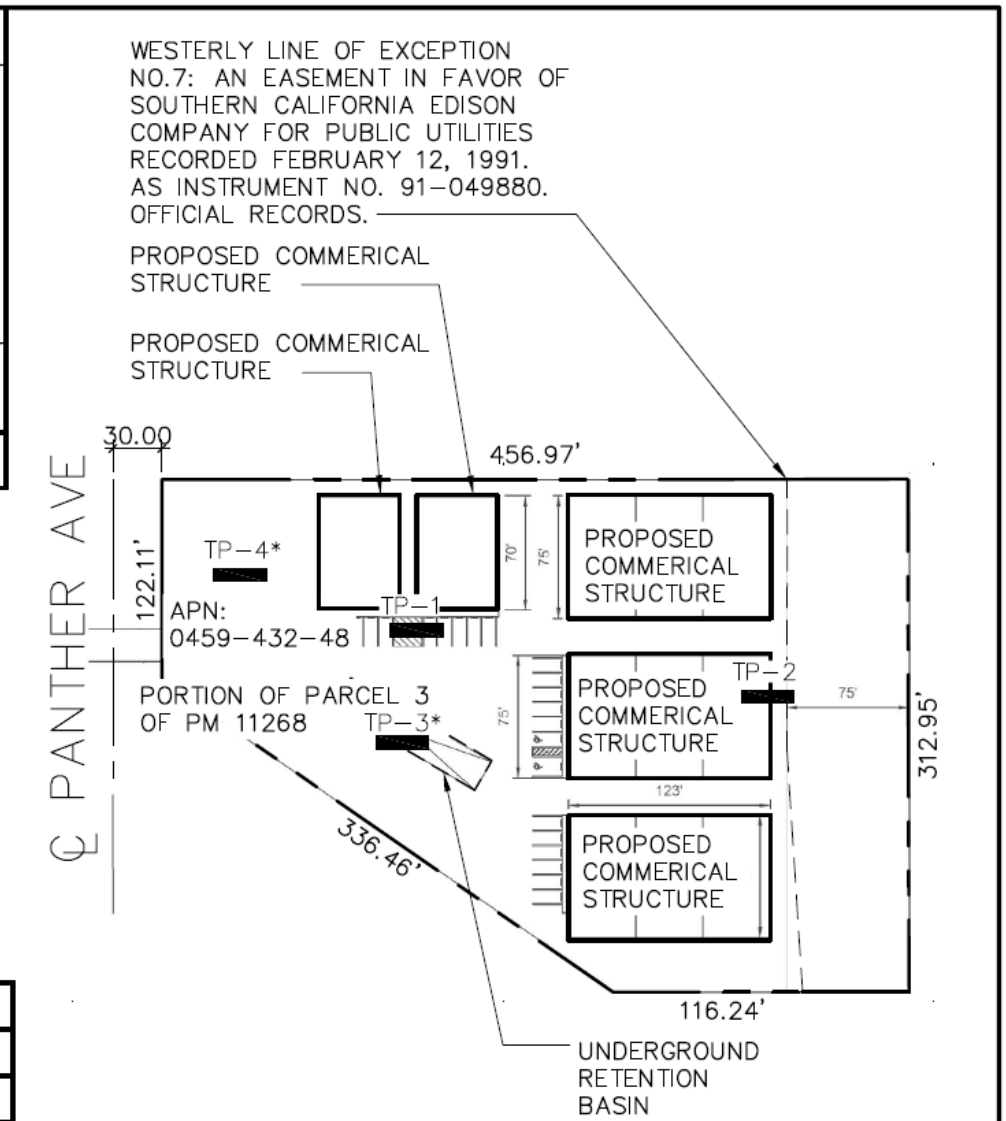
SCALE 1" = 100'

LEGEND

TP−# TEST PIT NO. & LOCATION

* LOCATION OF INFILTRATION TESTS

GEOTECHNICAL PLAN				
PANTHER AVENUE, ADELANTO, CA 92301 APN: 0459-432-48 PORTION OF PARCEL 3 OF PM 11268				
MOJAVE SUN LLC				
VINEYARD ENGINEERING INC.				
FIELD WB	DRAFT BA	APP. PJP	DATE 06/06/2022	JOB# V22-070



LOCATION OF TEST PITS WERE PROVIDED BY CLIENT DATA

VEI | VINEYARD ENGINEERING, INC

Test Pit Log

Type	Elevation	Job No.	Test Pit
AWD Backhoe with 12" bucket	2908 ft	V22-070	TP-1

Relative Compaction	Dry Density (pcf)	Moisture (%)	Blows per Foot (ft-lb)	Sample Size (in)	Sample No.	Depth (ft)	Material Symbol	USCS Classification	
	115.2	0.7%				1'		SM	Light brown SILTY SAND - coarse to medium sand, firm, dry, non-plastic, moderate to trace organics
	113.7	1.4%				2'		SM	Light brown SILTY SAND - fine sand, soft, dry, non-plastic, trace soil clods
						4'			
						5		SM	Light brown SILTY SAND - medium to coarse sand, soft, trace moisture, non-plastic, trace cobbles
					HARDPAN	9'			END OF TEST PIT
						10			
						15			
						20			

NOTES:
1. End of Test Pit at **9** feet.
2. Ground water encountered? **NO**
3. Caving? **YES**
4. Test pit backfilled with spoils? **YES**
5. Sample recovered? **YES**

THIS TEST PIT LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS.

Logged By	Date
Algara	05/02/22

VEI | VINEYARD ENGINEERING, INC

Test Pit Log

Type	Elevation	Job No.	Test Pit
AWD Backhoe with 12" bucket	2908 ft	V22-070	TP-2

Relative Compaction	Dry Density (pcf)	Moisture (%)	Blows per Foot (ft-lb)	Sample Size (in)	Sample No.	Depth (ft)	Material Symbol	USCS Classification	
						1'		SM	Light brown SILTY SAND - coarse to medium sand, firm, dry, non-plastic, moderate to trace organics
	103.9	1.0%				2'		SM	Light brown SILTY SAND - fine sand, soft, dry, non-plastic, trace soil clods
	114.6	1.4%				4'			
						5		SM	Light brown SILTY SAND - medium to coarse sand, soft, trace moisture, non-plastic, trace cobbles
					HARDPAN	9'			END OF TEST PIT
						10			
						15			
						20			

NOTES:
1. End of Test Pit at **9** feet.
2. Ground water encountered? **NO**
3. Caving? **YES**
4. Test pit backfilled with spoils? **YES**
5. Sample recovered? **YES**

THIS TEST PIT LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS.

Logged By	Date
Algara	05/02/22

VEI | VINEYARD ENGINEERING, INC

Test Pit Log

Type	Elevation	Job No.	Test Pit
AWD Backhoe with 12" bucket	2908 ft	V22-070	TP-3

Relative Compaction	Dry Density (pcf)	Moisture (%)	Blows per Foot (ft-lb)	Sample Size (in)	Sample No.	Depth (ft)	Material Symbol	USCS Classification	
	87.0	0.7%				2'		SM	Light brown SILTY SAND - coarse to fine sand, firm to soft, dry, non-plastic, moderate to trace organics
	117.4	1.7%				4'		SM	Light brown SILTY SAND - medium to fine sand, soft, dry, non-plastic, heavy silt, moderate soil clods
						5			PERCOLATION TEST END OF TEST PIT
						10			
						15			
						20			

NOTES:
1. End of Test Pit at **4** feet.
2. Ground water encountered? **NO**
3. Caving? **YES**
4. Test pit backfilled with spoils? **YES**
5. Sample recovered? **NO**

THIS TEST PIT LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS.

Logged By	Date
Algara	05/02/22

VEI | VINEYARD ENGINEERING, INC

Test Pit Log

Type	Elevation	Job No.	Test Pit
AWD Backhoe with 12" bucket	2908 ft	V22-070	TP-4

Relative Compaction	Dry Density (pcf)	Moisture (%)	Blows per Foot (ft-lb)	Sample Size (in)	Sample No.	Depth (ft)	Material Symbol	USCS Classification	
						1'		SM	Light brown SILTY SAND - coarse sand, firm, dry, non-plastic, moderate organics
	94.6	1.0%				2'		SM	Light brown SILTY SAND - medium to fine sand, soft, dry, non-plastic, heavy silt
	114.2	1.4%				4'			PERCOLATION TEST
						5			END OF TEST PIT
						10			
						15			
						20			

NOTES:
1. End of Test Pit at **4** feet.
2. Ground water encountered? **NO**
3. Caving? **NO**
4. Test pit backfilled with spoils? **YES**
5. Sample recovered? **NO**

THIS TEST PIT LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS.

Logged By	Date
Algara	05/02/22

KERN COUNTY
Public Health Services
DEPARTMENT

2700 M STREET, SUITE 300 BAKERSFIELD, CALIFORNIA 93301-2370 VOICE: 661-862-8740 FAX: 661-862-8701 KERNPUBLICHEALTH.COM

MATTHEW CONSTANTINE
DIRECTOR

TP-3

PERCOLATION TEST DATA LOG
COMPLETE THE FOLLOWING SHEET AND SUBMIT WITH PERCOLATION REPORT

SITE ADDRESS: Panther Ave, Adelanto

APN: 0459-432-48 TEST PERFORMED BY: ALGARA

TEST DATE: 05/02/22 TEST HOLES WERE **SATURATED** N/A HOURS

HOLE	1				2				3			
DEPTH	4'				4'							
	TIME (MIN)		WATER LEVEL DROP (IN)	PERC RATE (MIN/IN)	TIME (MIN)		WATER LEVEL DROP (IN)	PERC RATE (MIN/IN)	TIME (MIN)		WATER LEVEL DROP (IN)	PERC RATE (MIN/IN)
	INITIAL	FINAL			INITIAL	FINAL			INITIAL	FINAL		
	0: 00	0: 50	1	0.83	0: 00	2: 23	1	2.38	0: 00			
	0: 50	1: 57	1	1.12	2: 23	5: 11	1	2.80				
	1: 57	3: 22	1	1.42	5: 11	8: 21	1	3.17				
	3: 22	5: 30	1	2.13	8: 21	11: 59	1	3.63				

MINIMUM OF 2 TEST HOLES REQUIRED. MINIMUM OF 3 TEST PER HOLE REQUIRED.
AVERAGE PERC RATE MAY BE USED IF 5 OR MORE TEST PER HOLE ARE PERFORMED
OTHERWISE SLOWEST PERC RATE SHALL BE USED.

NUMBER OF TEST PER HOLE: 3

FINAL RATE TO BE USED IN DESIGN: 6 MINUTES PER INCH.

SIGNATURE OF QUALIFIED PROFESSIONAL:

REGISTERED PROFESSIONAL ENGINEER
ANTOINETTE V. ALGARA
No C 69918
CIVIL
STATE OF CALIFORNIA

SOIL TYPE

3

KERN COUNTY
Public Health Services
DEPARTMENT

TP-4

MATTHEW CONSTANTINE
DIRECTOR

2700 M STREET, SUITE 300 BAKERSFIELD, CALIFORNIA 93301-2370 VOICE: 661-862-8740 FAX: 661-862-8701 KERNPUBLICHEALTH.COM

PERCOLATION TEST DATA LOG
COMPLETE THE FOLLOWING SHEET AND SUBMIT WITH PERCOLATION REPORT

SITE ADDRESS: Panther Ave, Adelanto

APN: 0459-432-48 TEST PERFORMED BY: ALGARA

TEST DATE: 05/02/22 TEST HOLES WERE **SATURATED** N/A HOURS

HOLE	1				2				3			
DEPTH	4'				4'							
	TIME (MIN)		WATER LEVEL DROP (IN)	PERC RATE (MIN/IN)	TIME (MIN)		WATER LEVEL DROP (IN)	PERC RATE (MIN/IN)	TIME (MIN)		WATER LEVEL DROP (IN)	PERC RATE (MIN/IN)
	INITIAL	FINAL			INITIAL	FINAL			INITIAL	FINAL		
	0: 00	0: 33	1	0.55	0: 00	1: 29	1	1.48	0: 00			
	0: 33	1: 17	1	0.73	1: 29	3: 15	1	1.77				
	1: 17	2: 19	1	1.03	3: 15	5: 13	1	1.97				
	2: 19	3: 30	1	1.18	5: 13	7: 20	1	2.12				

MINIMUM OF 2 TEST HOLES REQUIRED. MINIMUM OF 3 TEST PER HOLE REQUIRED.
AVERAGE PERC RATE MAY BE USED IF 5 OR MORE TEST PER HOLE ARE PERFORMED
OTHERWISE SLOWEST PERC RATE SHALL BE USED.

NUMBER OF TEST PER HOLE: 3

FINAL RATE TO BE USED IN DESIGN: 4 MINUTES PER INCH

REGISTERED PROFESSIONAL ENGINEER
ANTOINETTE V. ALGARA
No C 69918
CIVIL
STATE OF CALIFORNIA

SIGNATURE OF QUALIFIED PROFESSIONAL:

SOIL TYPE

3

APPENDIX B

LABORATORY TESTING

In the laboratory, samples taken from the test excavations were tested to determine density/moisture content, shear strength, maximum density, and expansion index. The moisture/density test results are shown on the Test Pit Logs in Appendix A, and results of other tests are given in Appendix B. Briefly, these tests were conducted as follows.

Strength characteristics were determined in the laboratory by direct shear tests performed on one relatively undisturbed sample. Each specimen was tested under various normal loads in a 2.5–inch I.D. circular shear box using a controlled displacement rate of 0.058 inch per minute. The soil specimen was saturated before testing.

Settlement and hydroconsolidation characteristics of selected soil samples were evaluated by means of laboratory consolidation tests. The samples were tested in a floating ring consolidometer using a dead weight lever system for load application. The sample was saturated after being loaded to 1.0 ton per square foot.

The concentration of soluble sulfate was determined for one sample of soil in accordance with California Test 417.

The concentration of soluble chloride was determined for one sample of soil in accordance with California Test 422.

The resistivity was determined for a selected soil sample in accordance with California Test 643.

VINEYARD ENGINEERING, INC

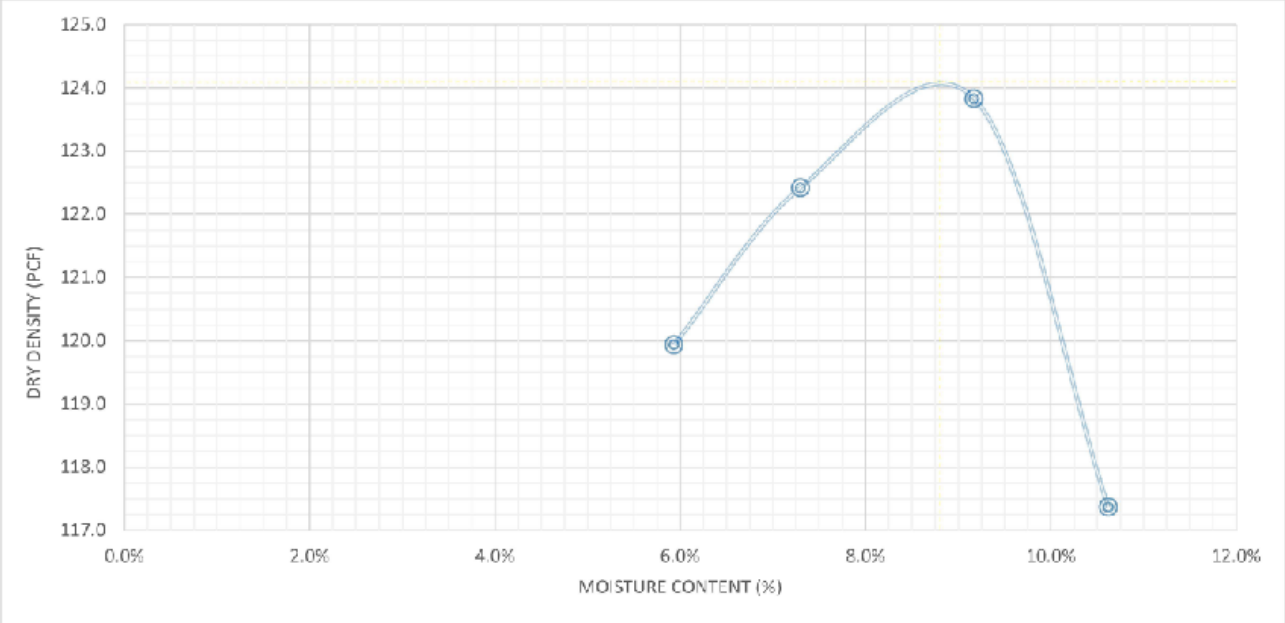
Maximum Density and Optimum Moisture Content

JOB NO. V22-070 TP-1 (Native) Mold Size: 4" ASTM D1557 A

	Test	1	2	3	4
	% Water Added	4%	6%	8%	10%
A	Mass of Wet Soil + Mold (g)	3910	3975	4033	3952
B	Mass of Mold (g)	1989	1989	1989	1989
C	Wet Mass (g) A-B	1921	1986	2044	1963
D	Conversion Factor For 4" mold = 0.06614 For 6" mold = 0.02939	0.06614	0.06614	0.06614	0.06614
E	Wet Density (pcf) C*D	127.1	131.4	135.2	129.8
	Moisture Determination				
F	Mass of Wet Soil (g)	250	250	250	250
G	Mass of Dry Soil (g)	236	233	229	226
H	Moisture (%) (F-G)/G * 100	5.9%	7.3%	9.2%	10.6%
I	Dry Density (pcf) E/(1+H/100)	119.9	122.4	123.8	117.4

Maximum Density (pcf) 124.1

Optimum Moisture (%) 8.8%



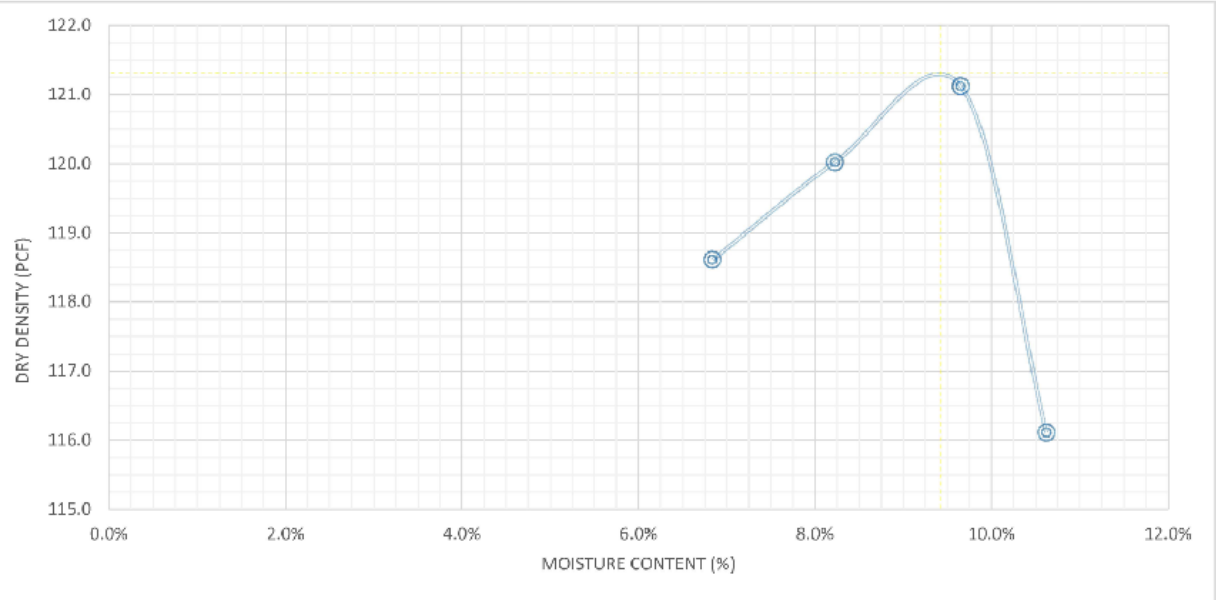
VEI | VINEYARD ENGINEERING, INC

Maximum Density and Optimum Moisture Content

JOB NO. V22-070 TP-2 (Native) Mold Size: 4" ASTM D1557 A

	Test	1	2	3	4
	% Water Added	4%	6%	8%	10%
A	Mass of Wet Soil + Mold (g)	3905	3953	3997	3931
B	Mass of Mold (g)	1989	1989	1989	1989
C	Wet Mass (g) A-B	1916	1964	2008	1942
D	Conversion Factor For 4" mold = 0.06614 For 6" mold = 0.02939	0.06614	0.06614	0.06614	0.06614
E	Wet Density (pcf) C*D	126.7	129.9	132.8	128.4
	Moisture Determination				
F	Mass of Wet Soil (g)	250	250	250	250
G	Mass of Dry Soil (g)	234	231	228	226
H	Moisture (%) (F-G)/G * 100	6.8%	8.2%	9.6%	10.6%
I	Dry Density (pcf) E/(1+H/100)	118.6	120.0	121.1	116.1

Maximum Density (pcf) 121.3
Optimum Moisture (%) 9.4%



VINEYARD ENGINEERING

Geotechnical Services
Miscellaneous Laboratory Testing Services
Project: Mike Tokathyan | Panther Ave, City of Adelanto, Ca. - APN:0459-432-48 (V.I. Job # V22-070)

SEI File No. 17-16079
June 16, 2022

TEST LOCATION	USCS	% < # 200	CONSOLIDATION				DIRECT SHEAR		E.I.	Density / Moisture		ATTERBERG LIMITS			Corrosivity Analysis				MAXIMUM DENSITY		R-VALUE @ 300 psi	
			C_c	C_s	S.P. (psf)	HV %	C, (ksf)	F.A.		lb/ft^3	%	L.L.	P.L.	P.I.	SO_4	pH	cl	E.C.	MDD (pcf)	O.M.	R.V.	E.P. (psi)
Client Job # V22-070 Bulk Sample TP-1 @ 4' Sample ID 82402	SM						0.09	37.0	0						11	7.8	10.0	141				
Client Job # V22-070 Bulk Sample TP-2 @ 4' Sample ID 82403	SM								0													

CONSOLIDATION
Cc - Compression Index
Cs - Swell Index
S.P. (psf) - Swell Pressure
HV % - Heave Precentage / Collapase

DIRECT SHEAR
C (ksf) - Cohesion
F.A. - Friction Angle
S.G. - Specfic Gravity

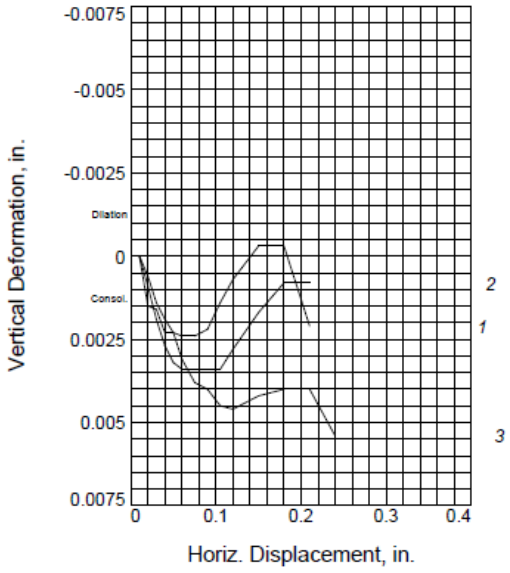
E.I. - EXPANSION INDEX
ATTERBERG LIMITS
L.L. - Liquid Limit
P.L. - Plastic Limit
P.I. - Plasticity Index

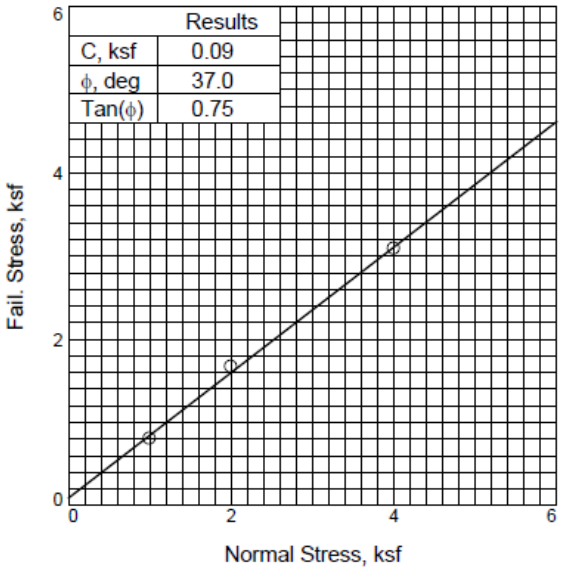
(R)ESISTANCE VALUE
RV - R-Value @ 300 psi
EP - Expansion Press @ 300 psi

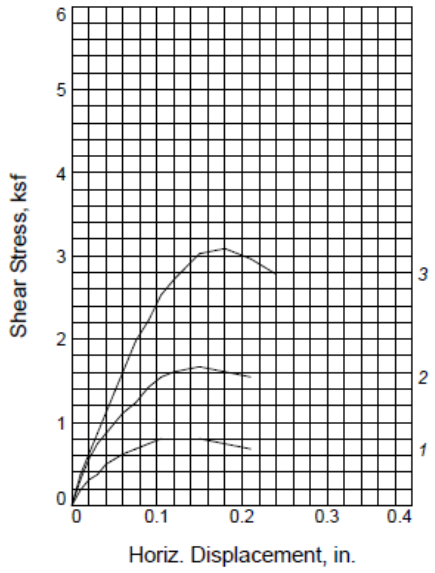
CORROSIVITY ANALYSIS
SO_4 - Sulfate, ppm
cl - Chloride, ppm
pH - Acidic or Alkaline
(7 = Nuetral, lower than 7 is acidic, higher is alkaline.)
E.C. - Electrical Conductivity (uS/cm)

MAXIMUM DENSITY
MDD (pcf) - Max Dry Density
O.M. - Optimum Moisture

© 2022 SOILS ENGINEERING, INC.







Sample No.		1	2	3
Initial	Water Content, %	9.4	8.9	9.1
	Dry Density, pcf	105.1	106.2	106.6
	Saturation, %	43.4	42.3	43.8
	Void Ratio	0.5743	0.5577	0.5515
	Diameter, in.	2.38	2.38	2.38
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	16.9	15.0	14.5
	Dry Density, pcf	105.1	106.2	106.6
	Saturation, %	77.8	71.2	69.8
	Void Ratio	0.5743	0.5577	0.5515
	Diameter, in.	2.38	2.38	2.38
	Height, in.	1.00	1.00	1.00
Normal Stress, ksf		1.00	2.00	4.00
Fail. Stress, ksf		0.80	1.67	3.09
Displacement, in.		0.11	0.15	0.18
Ult. Stress, ksf				
Displacement, in.				
Strain rate, in./min.		N/A	N/A	N/A

Sample Type: REMOLDED
Description: SILTY SAND; light brown, poorly graded, cohesive.
LL= N/A **PI=** N/A
Assumed Specific Gravity= 2.65
Remarks: Material was remolded into a 2.5" x 6" tube and then extruded out into 2.5" x 1" rings for testing. It was remolded to 90% relative compaction according to the Curve provided by
Figure A-1

Client: Vineyard Engineering, Inc.

Project: Misc. Geotechnical Engineering Services for Various Projects

Location: V22-070 | City of Adelanto, APN: 0459-432-48 | TP-1 @ 4'
Sample Number: 82402
Proj. No.: 16079 **Date Sampled:** 05/11/22

DIRECT SHEAR TEST REPORT

SOILS ENGINEERING, INC.

Tested By: DH **Checked By:** AL

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

May 25, 2022

Mr. Andrew Lucas
Soils Engineering Inc.
4400 Yeager Way
Bakersfield, CA 93313

Report No.: 2205170
Project Name: SOIL - 16079

Dear Mr. Andrew Lucas,

This report contains the analytical results for the sample(s) received under chain of custody(s) by Positive Lab Service on May 17, 2022.

The test results in this report are performed in compliance with ELAP accreditation requirements for the certified parameters. The laboratory report may not be produced, except in full, without the written approval of the laboratory.

The issuance of the final Certificate of Analysis takes precedence over any previous Preliminary Report. Preliminary data should not be used for regulatory purposes. Authorized signature(s) is provided on final report only.

If you have any questions in reference to this report, please contact your Positive Lab Service coordinator.

Project Manager

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

Soils Engineering Inc.
4400 Yeager Way
Bakersfield, CA 93313

Attn: Mr. Andrew Lucas Phone: (661) 831-5100 FAX:(661) 831-2111

File #:73443
Report Date: 05/25/22
Submitted: 05/17/22
PLS Report No.: 2205170

Project: SOIL - 16079

Sample ID: V22-070 TP-1 @ 4' Soil (2205170-01) Sampled: 05/11/22 12:00 Received: 05/17/22

Analyte	Results	Flag	D.F.	Units	PQL		Prep/Test Method	Prepared	Analyzed	By	Batch
Soluble Chloride	**10.0**		1	mg/kg	5.00	-	EPA 300.0M	05/19/22	05/19/22	dd	BE22011
Soluble Sulfate	**11.0**		1	mg/kg	5.00	-	EPA 300.0M	05/19/22	05/19/22	dd	BE22011
Analyte	Results	Flag	D.F.	Units	PQL		Prep/Test Method	Prepared	Analyzed	By	Batch
Soluble Specific Conductance (EC)	**141**		1	uS/cm	0.1	-	EPA 120.1M	05/23/22	05/23/22	vc	BE22517
Analyte	Results	Flag	D.F.	Units	PQL		Prep/Test Method	Prepared	Analyzed	By	Batch
pH	**7.8**		1	pH Units	0.1	-	EPA 9045C	05/19/22	05/19/22	jks	BE22001

Quality Control Data

Analyte		Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BE22011 - -											
Blank		**Prepared & Analyzed: 05/19/22**									
Soluble Chloride		ND	5.00	mg/kg							
Soluble Sulfate		ND	5.00	mg/kg							
LCS		**Prepared & Analyzed: 05/19/22**									
Soluble Chloride		57.0	5.00	mg/kg	50.00		114	70-130			
Soluble Sulfate		51.6	5.00	mg/kg	50.00		103	70-130			
Duplicate	**Source: 2205148-04**	**Prepared & Analyzed: 05/19/22**									
Soluble Chloride		49.8	5.00	mg/kg		47.9			3.97	30	R2
Soluble Sulfate		164	5.00	mg/kg		144			12.9	30	R2
Matrix Spike	**Source: 2205148-04**	**Prepared & Analyzed: 05/19/22**									
Soluble Chloride		95.3	5.00	mg/kg	50.00	47.9	94.9	70-130			R2
Soluble Sulfate		196	5.00	mg/kg	50.00	144	104	70-130			R2
Matrix Spike Dup	**Source: 2205148-04**	**Prepared & Analyzed: 05/19/22**									
Soluble Chloride		91.6	5.00	mg/kg	50.00	47.9	87.4	70-130	8.26	30	R2
Soluble Sulfate		177	5.00	mg/kg	50.00	144	66.1	70-130	44.3	30	R2, V-2
Batch BE22517 - -											
Duplicate	**Source: 2205170-01**	**Prepared & Analyzed: 05/23/22**									
Soluble Specific Conductance (EC)		146	0.1	uS/cm		141			3.34	5	
Batch BE22001 - -											
Duplicate	**Source: 2205168-01**	**Prepared & Analyzed: 05/19/22**									
pH		8.8	0.1	pH Units		8.8			0.568	5	

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

Soils Engineering Inc.
4400 Yeager Way
Bakersfield, CA 93313

Attn: Mr. Andrew Lucas Phone: (661) 831-5100 FAX:(661) 831-2111

Project: SOIL - 16079

File #:73443
Report Date: 05/25/22
Submitted: 05/17/22
PLS Report No.: 2205170

Notes and Definitions

V-2	Out-of-Range recovery was due to sample Heterogeneity.
R2	Sample Received Past Holding Time.
NA	Not Applicable
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
MDL	Method Detection Limit
PQL	Practical Quantitation Limit

Environmental Laboratory Accreditation Program Certificate No. 1131, Mobile Lab No. 2534, LACSD No. 10138

Authorized Signature(s)

108449

POSITIVE LAB SERVICE

CHAIN OF CUSTODY AND ANALYSIS REQUEST

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

DATE: 5-16-22 PAGE 1 OF 1

LOG BOOK NO. _____ FILE NO. _____ LAB NO. 220570

CLIENT NAME: S.E.I Project Name/No. 16079 P.O. NO.

AIRBILL NO: _____

ADDRESS: 4400 Yeager Way Ste 1A, Bakersfield, CA, 93313

~~COOLER~~ TEMP: ~~Y~~

PROJECT MANAGER: PHONE NO: FAX NO:

PRESERVATIVE:

SAMPLER NAME: M. Watts (Printed) (Signature)

REMARKS:

TAT (Analytical Turn Around Time): 0 = Same Day; 1 = 1 Day; 2 = 2 Days; 3 = 3 Days; (N) = Normal (5-7 Working Days)

CONTAINER TYPES: B = Brass, E = Encore, G = Glass, (P) = Plastic, V = VOA Vial, O = Other:

UST Project: Y N - Global ID# ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

	SAMPLE NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE DESCRIPTION	MATRIX: WATER	SOIL	SLUDGE	OTHER	TAT	CONTAINER: #	TYPE	SO4	PH	CL	EC					SAMPLE CONDITION/ CONTAINER /COMMENTS:
1	1	5-11-22	12PM	V22-070 TP-1 @4'		X			N		P	X	X	X	X					
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				OBSERV. TEMP: 14.0 °C CORREC. TEMP: 13.7 °C THERMO ID: 16 BY:
10																				

Relinquished By: (Signature and Printed Name) Julian Andrade Received By: (Signature and Printed Name) Date: 5/17/22 Time: 11:25

Relinquished By: (Signature and Printed Name) Received By: (Signature and Printed Name) Date: Time:

Relinquished By: (Signature and Printed Name) Received By: (Signature and Printed Name) Date: Time:

SPECIAL INSTRUCTIONS: VPS: 179578050341741000

SAMPLE DISPOSITION:
1. Samples returned to client? YES NO
2. Samples will not be stored over 30 days, unless additional storage time is requested.
3. Storage time requested: _____ days

By _____ Date _____

PRESERVATIVE: 1-HNO_3, 2-H_2SO_4, 3-HCL, 4-Zinc Acetate, 5-NaOH, 6-NH_4 Buffer, 7-Other

LAB COPY

APPENDIX C

GUIDE SPECIFICATIONS FOR PLACEMENT OF FILL AND BACKFILL

1. Areas to receive any fill, including but not limited to structures, slabs or paving surfaces shall be stripped of all vegetation, debris or disturbed soil. Stripping shall be reviewed by the Project Engineer. Any pre-existing fill soil or non-native soil encountered during grading operations shall be excavated, removed and stockpiled for later use as permitted or specified herein, unless the Project Engineer specifically recommends that such material may remain in place. Any exposed soft, loose, porous or otherwise unsatisfactory native soil shall then be excavated to the depths indicated in the plans or specifications, or by the Project Engineer. The excavation of pre-existing fill or other unsatisfactory soil shall extend laterally beyond the limit of foundations, slabs or pavements the distance indicated in the specifications or plans, or by the Project Engineer. The excavated areas shall be observed by the Project Engineer prior to preparing subgrade and placing compacted fill.

2. The exposed reviewed ground surface shall then be scarified to a depth of at least six inches, uniformly moistened to between optimum moisture and 140 percent of optimum moisture for the material, and then uniformly compacted to at least 90 percent of the maximum laboratory density as determined by ASTM D1557. The project plans may indicate a higher compaction level for areas indicating paved surfaces. Where fill is to be placed on or against sloping ground (steeper than 5:1), keying and benching into firm natural ground shall be performed as the compacted fill is brought to final grade.

3. Fill, consisting of imported or stockpiled soil shall be reviewed by the Project Engineer, prior to being placed in compacted layers with appropriate compaction equipment. Fill should be densified to at least 90% relative compaction at minimum. The project plans may indicate a higher compaction level for areas indicating paved surfaces. The excavated on-site materials are not considered satisfactory for reuse in the fill unless tested and approved by the Project Engineer. All imported fill shall be reviewed by the Project Engineer prior to use in fill areas. Rocks and cobble larger than six inches in diameter shall not be allowed in any fill soil. The moisture content of the fill soil shall be uniformly moistened to between optimum moisture and 140 percent of optimum moisture.

4. Observations and field tests shall be performed during grading operations by the Project Engineer or approved representative to confirm that the required degree of compaction has been obtained. Where compaction or moisture conditioning is less than that required, additional compactive effort shall be made with adjustment of the moisture content as necessary until the specified compaction or moisture is obtained.

5. Wherever, in the opinion of the Owner or the Project Engineer, an unstable condition is being created, either by cutting or filling operations, the work shall not proceed in that area until review and approval has been agreed upon by both parties and the grading plan revised, if found to be necessary.

6. The Project Engineer shall observe the exposed surfaces during removal operations to evaluate excavation stability and confirm that field conditions are as anticipated.

7. Following confirmation of field conditions and/or other Project Plan modifications, the excavated materials may be replaced on the subgrade in accordance with the project specifications unless specifically prohibited.

8. All utility trench backfill shall be compacted to at least 90 percent, except for pipe bedding and six inches of any pipe cover material.

9. These Guide Specifications for Placement of Fill and Backfill are considered the minimum guidelines for any project. The owner and grading contractor shall be responsible for referring to the grading requirements contained in the Design Recommendations section of this report for recommendations specific to this project.