SOILS SOUTHWEST, INC.
SOILS, MATERIALS AND ENVIRONMENTAL ENGINEERING CONSULTANTS

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Due Diligence Report of Geotechnical Evaluations

Proposed 80+ acre U.S. Freezer/Cold Storage Distribution Center
NEC U.S. Highway 395 and Yucca Terrace Drive
City of Hesperia, San Bernardino County, California 92344
A.P.N. 3064-421-01-0000, 02 & 03

Project No. 19042-F
April 20, 2020

Prepared for

Fisher Construction
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Burlington, WA 98233

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Established 1984

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Fisher Construction Group
625 Fisher Lane
Burlington, WA 98233

Attention: Mr. Juan Ozuna, Project Manager

Subject: Due Diligence Report of Geotechnical Evaluations
Proposed 80+ acre U.S. Freezer/Cold Storage Distribution Center
NEC U.S. Highway 395 and Yucca Terrace Drive
City of Hesperia, San Bernardino County, California 923443

Reference: Preliminary site layout plan as provided by Fisher Construction Group

Gentlemen:

Presented herewith is the due diligence initial report of geotechnical evaluations conducted for the site of the proposed U.S. Freezer/Cold Storage Distribution Center to be located near the northeast corner of U.S. Highway 395 and Yucca Terrace Drive, City of Hesperia, California.

In absence of development details review, the primary purpose of this investigation is to access site-specific geotechnical properties and to evaluate obvious presence of any significant geotechnical constraint that may impact the proposed development. Accordingly, this report is not intended to be a design level document. For design and construction, it is our opinion that supplemental geotechnical evaluations should be considered based on the development plan review, when completed.

The soils encountered primarily consist of upper compressible and potentially hydro-collapsible slightly silty semi-cemented fine to medium coarse sands with traces of Caliche, overlying medium dense to dense, slightly silty gravelly medium to coarse sand with rock fragments and minor rocks. No shallow-depth groundwater was encountered within the maximum refusal depth of 31 feet explored.

Based on review of the available CGS publication it is understood that the site is not situated within an A-P Special Studies Zone, and with groundwater table at a depth in excess of 50 feet, as per the DMG Special Publication SP117, potential for seismically induced site soils liquefaction susceptibility should be considered "remote".

Based on the preliminary site assessment completed as described, it is our opinion that the site should be considered free of obvious geotechnical constraint and should be suitable for the planned development provided supplemental geotechnical evaluations are considered based on the detailed development plan review. No other warranty is included, express or implied.

Respectfully submitted,
Soils Southwest, Inc.

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1.0 Introduction

This report of initial geotechnical evaluations is prepared for the site of the proposed 80+ acre U.S. Freezer/Cold Storage Distribution Center to be located near the northeast corner of U.S. Highway 395 and Yucca Terrace Drive, City of Hesperia, California.

The purpose of this evaluation is to determine the nature and preliminary engineering properties of the near grade and subsurface soils, and to provide tentative geotechnical recommendations for foundation design, industrial concrete slab-on-grade, paving, parking, site grading and inspection during construction. Supplemental test explorations and geotechnical evaluations are suggested once the development details and development plans with anticipated structural loadings etc. are established.

The initial geotechnical information described herein reflect our best estimate of the soils conditions as encountered during this feasibility study as completed as requested. It is not to be considered as a warranty of the soils for other areas, or for the depths beyond the explorations advanced at this time. The findings and opinions included should be considered valid and applicable provided the detailed development plans, grading plan and structural details, among others, are supplied for review and for use in supplemental geotechnical evaluations.

1.1 Proposed Development

No detailed grading and/or development plan is prepared and none such is available for review. However, based on the initial information supplied, it is understood that the subject development , among others, will include two (2) industrial Automated High Bay Freezer/Warehouse structures of about 120 feet high, about 370,000 square feet each of possibly metal frame and/or concrete construction with industrial concrete floorings on grade. Use of gantry girder with isolated column foundations may be expected. For load bearing support use of concrete mat floating foundations with thickened edge beams, and/or end-bearing caissons with grade beams, or waffle-type ribbed foundations or others may be expected. Associated construction of industrial paving/parking for heavy-duty truck traffic and about 300-400 trailer-drop storage/parking is anticipated. Supplemental installation of solar panel structures is also proposed.

When prepared, development plans and details should be available for review and for future supplemental site-specific geotechnical investigation.

1.2 Site Description

The irregularly shaped parcel of approximately 80 acres is currently vacant and undeveloped. In general, the site is bounded by vacant undeveloped properties and the California Aqueduct at the north-east and on the north, by unimproved Yucca Terrace Drive leading to low-lying areas on the south, by downslopes leading to Oro Grande wash on the east, and by the U.S. Highway 395 on the west. In absence of site topographic map, surface runoff from incidental rainfall estimated to flow towards the south and to the southwest. Except for desert vegetation (e.g. Joshua trees and desert brush) and scattered debris, no other significant features, were noted.

2.0 Scope of Services

For due-diligence study, geotechnical evaluations included limited subsurface explorations, soil sampling, necessary laboratory testing, engineering analyses and the preparation of this report. The primary purpose of this report is to provide an overall geotechnical characteristic for project assessment. For design level parameters supplemental geotechnical evaluations are suggested.

For this initial phase, our Scope of Services include the following:

Field Explorations

Eighteen (18) exploratory test borings using a truck-mounted Hollow-Stem Auger (HSA) drill-rig equipped for undisturbed soils sampling and for record of Standard Penetration Test (SPT) blow-counts. The exploratory depth was advanced to maximum 31.0 feet below grade.

During explorations, the soils encountered were continuously logged, bulk and undisturbed samples were procured and Standard Penetration Test (SPT) blow-counts were recorded at frequent intervals. Collected samples were subsequently transferred to our laboratory for necessary geotechnical testing. Approximate test locations are shown on the attached Plate A. Descriptions of the soils encountered are shown on Log of Boring (B-1 to B-18) in Appendix A.

Laboratory Testing

Representative bulk and undisturbed soils procured were tested in our laboratory to aid in soils classification and to evaluate initial geotechnical properties pertaining to the assumed project requirements. The laboratory testing, among others, includes the following:

- In-situ Moisture Content and Dry Density (ASTM Standard D2216),
- Soils Gradation Analysis (ASTM Standard D422),
- Maximum Dry Density and Optimum Moisture content (ASTM Standard D1557),
- Sand Equivalent, SE, (ASTM Standard D2419),
- Direct Shear (ASTM Standard D3080),
- Expansion Index, EI, (ASTM Standard D4829), and
- Soil Chemical Analyses for pH, Sulfate, Chloride and Resistivity.

Brief descriptions of the test procedures used, and the test results are provided in Appendix B of this report.

Based on field explorations, laboratory testing, and engineering analyses completed as described, tentative recommendations are included exclusively for project estimation purposes only and are not for actual design and construction. Project specific design stage geotechnical are suggested following supplemental geotechnical evaluations once the detailed development plans and details are available for review.

3.0 Site Conditions

3.1 Subsurface Conditions

Soils encountered primarily consist of upper loose to medium dense compressible and potentially hydro-collapsible slightly silty semi-cemented fine to medium coarse sands with traces of Caliche, overlying medium dense to dense slightly silty gravelly medium to coarse sand with rock fragments and minor rocks. No shallow-depth groundwater was encountered.

Laboratory shear tests conducted on undisturbed and on upper bulk samples remolded to 90 percent of the laboratory determined soil's Maximum Dry Density indicate moderate shear strengths under increased moisture conditions. Results of laboratory shear tests are provided in Plate B-1 in Appendix B.

Consolidation tests conducted on the near grade soils indicate potential for soil compressibility and susceptibility to settlement due to hydro-consolidation of the cemented calcified soils as encountered.

Silty gravely sandy in nature, the site soils, in general, are considered "very low" in expansion potential with an Expansion Index (ASTM D4829), EI, less than 20.

3.2 Excavatibility

It is our opinion that site preparations and grading required for the project may be accomplished using conventional heavy-duty construction equipment. No blasting or jackhammering should be warranted.

3.3 Groundwater

Groundwater was not encountered within the maximum depth of 31 feet explored. Based on the State of California Department of Water Resources website (Marcelo Montagna 2008 maps) historical ground water at the site is estimated to about 637.8 feet below grade.

The following table lists the historical groundwater table based on the information as supplied by the reporting agency.

GROUNDWATER TABLE	
Reporting Agency	California Department of Water Resources website, Montagna 2008 maps
Well Number	04N05E-15G001S- Alto-2-a
Well Monitoring Agency	5161
Well Location: Township/Range/Section	T04N-R05E-Section 15
Current Depth to Water (Measured in feet)	649.982
Current Date Water was Measured	August 15,2019
Depth to Water (Measured in feet) (Shallowest)	637.8
Date Water was Measured (Shallowest)	February 4, 2015

Fluctuations in groundwater levels can occur due to seasonal variations in the amount of rainfall, runoff, altered natural drainage paths, and other factors which were not evident at the time the field explorations that were made. It is our opinion that the project designer and contractor should make their own conclusions regarding groundwater conditions while designing and constructing the development planned.

3.4 Subsurface Variations

Based on the results of subsurface explorations and on experience from local projects completed, it is our opinion that variations in subsoils continuity and depths of subsoils deposit may be expected. Due to the nature and depositional characteristics of the soils underlying care should be exercised in interpolating and/or extrapolating of the subsurface conditions existing in between and beyond the test explorations currently completed.

3.5 Soil Corrosivity Analyses

For corrosion potential evaluations soils chemical testing is performed on representative samples procured from boring B-2 @ 0-5ft, and from boring B-12 @3-5ft. The tests performed are based on ACI, CBC and other acceptable test standards as performed by the outside EPA Certified A&R Laboratory for determinations of pH, Chloride, Sulfate, and Resistivity. The test results along with a copy of "Chain-of-Custody" are attached. Based on the test results, the following evaluations are provided.

1. pH (EPA 9045C):

Soils are considered corrosive when pH gets down to around 4.0.

2. Chloride (EPA 300.0):

Large concentrations of chloride in soils adversely affect ferrous materials, such as iron and steel. Soils are considered corrosive and deleterious to ferrous materials when chloride concentration exceeds 10,000 ppm.

3. Sulfate (EPA 300.0):

When sulfate concentrations are greater than 2,000 ppm in soil and 1,000 ppm in groundwater, mitigation measures must be taken to protect any concrete structures in contact with soils. If the soils are not going to be removed, appropriate cement type must be used.

2. Minimum Resistivity (SM 2510B):

The most common factor in determining soil's corrosivity is electrical resistivity. As soil's resistivity decreases, its corrosivity potentials to buried metals increases as described as described below:

Soil's Resistivity, ohm-centimeter	Corrosivity Category
0-1000	Severely corrosive
1,000-2,000	Corrosive
2,000-10,000	Moderately corrosive
Over 10,000	Mildly corrosive

Test Results and Comments:

Soils Samples/ Test Results & Test Standard	pH (EPA 9045C)	Chloride (EPA 300.0)	Water Soluble Sulfate (EPA 300.0)	Minimum Resistivity (SM 2510B)
B-2 @0-5 ft	7.3 units (>4.0)	6.2 mg/kg (<10,00 ppm)	8.2 mg/kg (<200 0 ppm)	14500 ohms/cm (>10,000 ohms/cm
Comments	non-corrosive	non-corrosive to ferrous materials	non-corrosive to concrete	"mildly" corrosive to buried metals
B-12 @3-5 ft.	6.7 units (>4.0)	6.2 mg/kg (<10,00 ppm)	6. 9 (<200 0 ppm)	12500 ohms/cm (>10,000 ohms/cm)
Comments	non-corrosive	non-corrosive to ferrous materials	non-corrosive to concrete	"mildly" corrosive to buried metals

3.6 Faulting and Seismicity

3.6.1 Direct or Primary Seismic Hazards

Surface ground rupture along with active fault zones and ground shaking represent primary or direct seismic hazards to structures. There are no known active or potentially active fault that passes through or towards the subject site. Accordingly, the site is considered not situated within an AP Special Studies Zone.

However, according to the current CBC the site is situated within Seismic Zone 4. As a result, it is likely that during life expectancy of the planned development moderate to severe ground shaking may have potential for adverse effects on the structures proposed.

3.6.2 Induced or Secondary Seismic Hazards

In addition to ground shaking, effects of seismic activity may include surface fault rupture, soil liquefaction, differential settlements, ground lurching, landslides, lateral spreading, and earthquake induced flooding. Potential effects of such are described as below.

3.6.2.1 Surface Fault Rupture

The site is not situated within an AP Special Studies Zone. Based on review of existing geologic information, no major fault is noted to cross through or extends towards the site. The potential for surface rupture resulting from nearby fault movement is not known for certainty but is considered "low" as described earlier.

3.6.2.2 Flooding

Flooding hazards include tsunamis (seismic sea waves) and seiches, and failure of manmade reservoirs. Considering inland nature of the site potentials for these hazards are considered "remote".

3.6.2.3 Land-Sliding

Seismically induced landslides and other slope failures are common occurrences during or soon after an earthquake. Considering the site and its adjacent being relatively flat, it is our opinion that potential for seismically induced landslides should be considered "remote".

3.6.2.4 Lateral Spreading

Seismically induced lateral spreading involves lateral movement of soil mass along a liquefied soil layer due to ground shaking. Lateral spreading is demonstrated by near vertical cracks with predominantly horizontal movement of the soil mass involved. Lateral spreading is not applicable where a site is underlain by fine grained soils or underlain by sandy soils that either have in-situ SPT's in excess of 15, or a layer that is less than one meter in thickness for which in-situ SPT's are less than 15. Based on review of the field and laboratory test data, it is our professional opinion that the risk of seismically induced lateral spreading should be considered "remote".

3.6.2.5 Settlement and Subsidence

Based on laboratory analyses conducted on undisturbed samples procured it is our opinion that the near grade soils existing at their present state should be considered relatively compressible in nature and thus should be considered susceptible to subsidence. To minimize potential for settlement and subsidence under loading, the existing grade soils should be re-worked in for grading as described in this report. No structural loading should be allowed bearing directly on the grade surface currently existing.

The site being with Southern California where seismic activities are common, some seismically induced ground settlement should be expected as a result of strong-motion earthquake, however due to uniform nature of the underlying earth materials, excessive differential settlements are not anticipated.

3.6.2.6 Liquefaction

Liquefaction is caused by build-up of excess hydrostatic pressure in saturated non-cohesive soils due to cyclic stress generated by ground shaking during an earthquake. The significant factors on which soil liquefaction potential depends include, among others, the soil type, soil relative density, intensity of earthquake, duration of ground-shaking and depth of groundwater.

With historical groundwater table at 637.8 as described earlier, based on the screening procedures as outlined in the Special Publication SP117, Guidelines for Evaluating and Mitigating Seismic Hazards in California published by the State of California Division of Mines and Geology, the site is considered non-susceptible to seismically induced soils liquefaction.

3.7 Seismic Design Coefficients

Based on site Coordinates of 34.435618°N, -117.397158° W, it us understood that the subject is site is situated at about 9.4 miles from the Cleghorn Fault.
For foundation and structural design, the following seismic design parameters are suggested as based on the available publications as currently published by the California Geological Survey and 2019 CBC.

The recommended values are based upon the USGS ASCE 7-Hazard Reports Parameters and the California Geologic Survey: PSHA Ground Motion Interpolator Supplemental seismic parameters are provided in Appendix C of this report.

TABLE 3.7A.1 Seismic Source Type

Peak Horizontal Ground Acceleration (PHGA) is based on an earthquake having a 10 percent probability of "exceedance" in a 50-year period.

Seismic Source Type / Appendix C	
Nearest Maximum Fault Magnitude	M>\=6.6-6.8
Peak Horizontal Ground Acceleration	0.467 g

TABLE 3.7A.2 Seismic Design Parameters

2019 CBC Chapter 16 Paragraph/Table	2019 ASCE 7-16 Standard Seismic Design Parameters	Recommended Values
1613A.5.2	Site Class	D
1613.5.1	The mapped spectral accelerations at short period	S_s
1613.5.1	The mapped spectral accelerations at 1.0-second period	S_1
1613A5.3(1)	Seismic Coefficient, S_s	1.500 g
1613A5.3(2)	Seismic Coefficient, S_1	0.587 g
1613A5.3(1)	Site Class D / Seismic Coefficient, F_a	1.0g
1613A5.3(2)	Site Class D / Seismic Coefficient, F_v	N/A
16A-37 Equation	Spectral Response Accelerations, $S_{Ms} = F_a S_s$	1.5 g
16A-38 Equation	Spectral Response Accelerations, $S_{M1} = F_v S_1$	N/A
16A-39 Equation	Design Spectral Response Accelerations, $S_{Ds} = 2/3 \times S_{Ms}$	1.000 g
16A-40 Equation	Design Spectral Response Accelerations, $S_{D1} = 2/3 \times S_{Ms}$	N/A

In design, vertical acceleration may be assumed to about 1/3 to 2/3 of the estimated horizontal ground acceleration (PGA) as described.

It should be noted that lateral force requirement in design should be intended to resist total structural collapse during an earthquake. Considering the site being within Southern California, during lifetime use of the structures built, it is our opinion that some structural damage may be anticipated requiring minor repair.

4.0 Evaluations and Recommendations

4.1 General Evaluations

Based on the limited field explorations, laboratory testing and engineering analyses the following opinions and tentative recommendations are presented:

(i) From geotechnical viewpoint, the site is considered grossly stable and should be considered suitable for the proposed development provided the preliminary assessments and opinions described are further verified following supplemental geotechnical evaluations. In general, we did not find obvious evidence of extraordinary geotechnical constraints that have or will significantly impact the project site.

(ii) With the presence of the upper dry loose and compressible soils existing as described, it is our opinion that no load bearing foundations and/or concrete slabs or paving/parking should be installed bearing directly on the grade surface currently existing.

(iii) No structural details are available for review. However, for structural support it is our opinion that site preparations should include sub excavations of the upper variable consistency compressible and potentially hydro collapsible soils, followed by the excavated soils replacement as engineered fills compacted to higher density as described herein. Without knowing structural configurations, structural loadings or foundation types that will be used, it is our opinion that, in general, for adequate support use of a minimum 30-inch thick fill mat blanket of local soils compacted to higher density as described herein, should be considered.

(iv) It is recommended that load bearing structural footings should be established exclusively into engineered fills of local sandy soils compacted to minimum 95%. Construction of footings and slabs straddling over cut/fill transition shall be avoided.

(v) Structural design consideration should include probability for moderate to high peak ground acceleration from relatively active nearby earthquake faults. The adverse effects of ground shaking, however, can be minimized by implementing the seismic design parameters and procedures as outlined in the current CBC and as described earlier in this report.

(vi) Although no shallow depth groundwater was encountered, provisions should be maintained during construction to divert incidental rainfall away from the structural pads constructed.

(vii) It is our opinion that, if site preparations and grading are performed as recommended herein, the proposed development will not adversely affect the stability of the site, or adjacent.

4.1.1 Preparations for Structural Pad (tentative)

It is assumed that the project pad grades will be established at or near existing grade surface. Based on such, it is our opinion that, in general, for adequate structural bearing, site preparations and grading should include, in minimum, sub excavations of the near surface soils measuring *vertically* to either (i) the planned deepest footing embedment + 30-inch, or (II) to minimum 6 to 7 feet below the current grade surface, or (III) to the depth of the underlying moist and dense natural soils as approved by soils engineer, whichever is greater.

Site grading should also include 6 to 8-inch scarification, moisture conditioning to near Optimum Moisture Content, followed by replacement of the approved local excavated soils in 6 to 8-inch thick vertical lifts compacted to minimum 95 percent of the soil's Maximum Dry Density as determined by the ASTM D1557 test method. Proper selection of construction equipment during grading and construction will be contractor's responsibility. Such earth work should be in accordance with the applicable grading recommendations as provided in the current CBC, the local City grading ordinance, and as recommended in Section 5.0 of this report.

The subexcavation depths described should be considered as "approximate". Localized additional sub excavations may be required within areas underlain by undocumented old fills, buried utilities, abandoned sewer, buried septic systems and others.

Prior to grading, the site should be cleared of surface and subsurface obstructions, including vegetation, roots, organic matter, debris, septic tanks, and cesspools, etc. During grading, it should be the responsibility of the grading contractor to clearly mark the future building footprint areas and minimum five feet beyond, along with the final pad grade elevations that will be established.

4.2 Structural Foundations

In absence of project details, for estimation purposes, the following alternative foundation design recommendations are included based on assumed load bearing systems. Supplemental detailed recommendations should be warranted following additional geotechnical evaluations and o project details review.

4.3 Alternative Foundation Recommendations(tentative)

The structure planned may be supported by (i) rigid mat type footings, or (ii) by using checkered/grid type rigid foundations using continuous wall and isolated spread footings founded exclusively into engineered fills of local sandy soils or on approved imported fills of non-expansive soils compacted to minimum 95%, or (iii) by using isolated end bearing caissons and grade beams or by others.

4. 3.1 Alternative I: Rigid Concrete Mat or Raft Foundations

With the presence of the underlying variable consistency as described it is our opinion that for structural support, concrete mat with thickened edge beams bearing directly over engineered fills of local soils may be considered. For estimation purposes, minimum recommended mat thickness for such mat foundations is 30-inch, adequately reinforced as recommended by the project structural engineer.

Based on the laboratory determined soils consolidation characteristics, settlements to properly designed and constructed foundations supported exclusively into engineered fills of site soils or its equivalent or better, are expected to be within tolerable limits. Under static loading conditions, over a 40-ft. span, estimated total and differential settlements are estimated to about 1 and ½ inch, respectively. Most of the elastic deformations, however, are expected to occur during construction

4.3.2 Alternative II: Rigid Foundations in form of Exterior Conventional Wall Footings and interior isolated spread foundations:

Under static loading conditions, use of load bearing continuous wall footings and isolated pier may be designed based on allowable soil vertical bearing capacity equations as described below:

Continuous Wall Footing: $q_{allowable} = 4000 + 1500d + 1000b$,
Isolated Square: $q_{allowable} = 5200 + 1500d + 800b$,
Round: $q_{allowable} = 5200 + 1500d + 300b$, where

$q_{allowable}$ = allowable soil vertical bearing capacity, in psf.
d= footing depth, min. 30-inch,
b = footing width, min. 24-inch.

The above soil bearing capacities may be increased for each additional depth in footing and width in excess of the minimum recommended. Total suggested maximum vertical bearing capacity, however, is recommended not to exceed 8000 psf. Supplemental recommendations on such will be supplied following further geotechnical evaluations as described.

If normal code requirements are applied, the above capacities may further be increased by an additional 1/3 for short duration of loading which includes the effect of wind and seismic forces.

Actual foundation dimensions and reinforcement requirements, etc. should be provided by the project structural engineer based on anticipated structural dead load, live load, soil bearing capacities and Peak Ground Accelerations (PGA) described.

4.3.4 Alternative IV: Drilled Cast-in-Place Piles

For structural support, use of cast-in place end bearing or frictional piles may be considered. Detailed recommendations of such will be supplied following review of the project details when supplied.

4.4 Structural Fills

Although not anticipated, when exposed actual soils conditions may vary from those as described in this report. In the event subgrades exposed during grading are found significantly different from those as described, it will be the subcontractor's responsibility to notify Soils Southwest about such variation for revised/updated geotechnical recommendations.

Local soils free of debris, organic, roots and rocks larger than 6 to 8-inch in diameter may be considered suitable for re-use as structural backfills. Import soils, if required, should be gravelly sandy in nature of the local soils, or its better as approved by soils engineer.

In general, fill soils for structural support should meet the following criteria:

Liquid Limit, LL	<35
Plasticity Index, PI	<15
Expansion Index, EI	<20

4.5 Structural Fill Soils Placement

The local gravelly silty soils as encountered should be considered suitable for reuse as structural backfills. Structural fills used shall be placed in 6 to 8-inch loose lifts and uniformly moisture conditioned. Each lift should be compacted to the minimum 95% compaction of the soils Maximum Dry Density at near Optimum Moisture condition as described. No fills shall be placed, spread, or compacted during unfavorable weather conditions.

4.6 Resistance to Lateral Loads

Resistance to lateral loads can be restrained by friction acting at the base of foundation and by passive earth pressure. A coefficient of friction of 0.4 may be assumed with normal dead load forces for footing established on compacted fills comprised of the local soils or similar.

An allowable passive lateral earth resistance of 450 pounds per square foot per foot of depth may be assumed for the sides of foundations poured against compacted fills. The maximum lateral passive earth pressure is recommended not to exceed 4500 pounds.

For design, lateral pressures from local soils when used as level backfill, may be estimated from the following equivalent fluid density:

Active:	35 pcf (level ground)
At Rest:	60 pcf

4.7 Concrete Slab-on-Grade

When adequately designed and constructed, the prepared subgrades to receive footings should be considered suitable for warehouse heavy traffic loading conditions, For estimation purpose, use of 6-inch thick (net) concrete slabs reinforced with #5 rebar at 18-inch o/c, is recommended. Actual thickness and reinforcing requirements, however, should be as designed by the project structural engineer based, among others, estimated soil Modulus of Subgrade Reaction, k_s, of 400 kcf, along with anticipated dead and wheel loadings, seismic design parameters and horizontal peak ground acceleration (PGA) as described in earlier section of this report.

Within areas of moisture sensitive flooring, concrete slabs should be underlain by 2-inch of compacted clean sand with minimum Sand Equivalent, SE of 30, followed by 15-mil thick Stego-Wrap, Visqueen or similar, overlying additional 2-inch thick compacted sand.

Considering potential for moisture migration from underlying subgrades, long term maintenance of floor covering may be warranted. Installation and maintenance of floor covering should be as per the floor covering manufacturer's specifications.

In addition, it is recommended that utility trenches underlying concrete coverings should be thoroughly backfilled with gravelly sandy soils and such should be mechanically compacted to minimum the minimum as described.

Slab subgrades should be verified and certified by soils engineer immediately prior to rebar and concrete placement. Soils Southwest will assume no responsibility for any structural distress in event the slab subgrades are not verified prior to concrete placement.

Supplemental recommendations should be warranted for heavy machinery, large storage vessels, racks, car jacks, or any other high loading equipment.

4.4.1 Concrete Driveway Construction with Thickened Edges

Anticipating heavy truck load traffic, from geotechnical viewpoint, it is our opinion that for driveway traffic, use of a minimum 8-inch (net) thick concrete paving with thickened edges (prevent sliding and/or cracking) may be considered placed over graded fills of local gravelly sandy soils compacted to at least 95%. Alternatively, for design, use of a soil Subgrade Reaction, k_s, of 500 kcf may be considered.

Actual driveway slab thickness, reinforcing, construction and expansion joint requirements, however, should be incorporated as designed by the project structural engineer.

4.5 Concrete Curing and Crack Control

The recommendations presented in this report are intended to reduce the potential for cracking of concrete due to concrete curing or settlement. Even when implemented, foundations, stucco walls and concrete slabs-on-grade may display some minor cracking due to soil movement and concrete shrinkage.

To reduce potential for excessive shrinkage or cracking, concrete slabs shall be "cured" by using commercially available concrete curing agent as selected by the project design engineer. In addition, occurrence of concrete cracking may be reduced and/or controlled by limiting concrete slump, proper concrete placement and by placement of crack control joints at reasonable intervals where re-entrant slab corners occur. For standard crack control, maximum expansion joint spacing should be limited to maximum 24 to 30 times the concrete thickness. Shorter distance between joint spacing would provide greater crack control. Joints at curves and angle points are suggested, as recommended by structural engineer.

4.6 Shrinkage and Subsidence

It is our opinion that, during grading the upper existing soils may be subjected to a volume change. Assuming a 95% relative compaction for structural fills and assuming the over-excavation and re-compaction depth as described earlier, such volume change due to shrinkage may be on the order of 12 to 15 percent. Further volume change may be expected due to supplemental shrinkage during preparation of subgrade soils. For estimation purpose, such may be approximated to about 3-inch.

4.7 Construction Considerations

4.7.1 Unsupported Excavation

Temporary excavations up to 4 feet in depth may be made without rigorous lateral supports. Excavated surface should be" dampened" in order to minimize potential surface soil raveling. No surcharge loading should be allowed within an imaginary 1:1 line drawn upward from toe of temporary excavations.

4.7.2 Supported Excavations

If vertical excavations exceeding 4 feet become warranted, such should be achieved using shoring to support side walls. Supplemental recommendations of such will be supplied on request.

4.8 Soil Caving

Dry and gravelly in nature, the site soils are considered susceptible to caving. Temporary excavations in excess of 4 feet should be made at a slope 2 to 1 (h:v), or flatter, and as per the construction guidelines as provided by the Cal-Osha.

4.9 Retaining Wall (if any)

Earth retaining walls, if required, should be designed based on following parameters:

Slope of Retained Material (H:V)	Equivalent Fluid Density, pcf	
	Clean Sand	Local Soil
level	30	33
2:1	42	58

For retaining wall design in excess of 6 feet in height, use of a seismic lateral pressure equal to 25 H psf should be considered, where H = wall height in ft.

Walls adjacent to traffic areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, which is a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal traffic. If the traffic is kept back ten feet from the wall, the traffic surcharge may be neglected.

The design parameters do not include any hydrostatic pressure build-up. Consequently, installation of "french-drain" behind retaining walls is recommended to minimize water pressure build-up. Use of impervious material is preferred within upper 18 inches of the backfills placed.

Backfills behind retaining wall should be compacted to a minimum 90 percent relative laboratory Maximum Dry Density as determined by the ASTM D1557 test method. Flooding and/or jetting behind wall should not be permitted. Local sandy soils may be used as backfill.

4.10 Structural Pavement Thickness

Flexible Asphalt Paving: Based on the estimated Traffic Index (TI) and on the estimated soils R-value of 60 as based on soil Sand Equivalent, SE, of 45, the following paving sections are supplied for estimation purposes. Following completion of mass grading, actual paving sections supplied should be verified based on actual soil R-value testing on representative soils sampled from street finish grades.

Service Area	Traffic Index, TI	Paving Type	Paving Thickness (net), inch.
Interior Driveways	7.5	a.c. over Class II base	6" over 6".
Off-Site Street Widening	8.0	a.c. over Class II base	6" over 8""

For ac over Class II base, or on Crushed Miscellaneous Base (CMB), the upper 12-inch of subgrade soils should be processed and compacted to minimum 90% and the base materials used compacted to 95% or greater.

Base material used should conform to the Caltrans Class II specification compacted to minimum 95%. The pavement sections supplied should be verified by the local public agency for their approval prior to their use to the project.

Considering the local silty sandy soils existing as described, it is our opinion that following prolong use, the flexible pavement constructed may experience some cracking, lift or loss of subsoils resulting is costly repair and reconstruction. Accordingly, it is our opinion that to reduce potentials for pavement distress, use of a layer of commercially available Mirafy MPV Paving Fabric or its similar paving fabric may be considered placed on the subgrades prepared to receive paving.

4.11 Rigid Driveways

It is unknown if concrete driveways will be considered for the project under study. It is our opinion that rigid paving, when selected, the following guidelines may be considered in "reducing" potential for excessive irregular cracking and paving distress.

	Private Sidewalks	Private Truck Drives	Entryways
Minimum Thickness (in.)	4" over subgrades compacted to 95%.	6" over 8" Class II base compacted to 95%	6" over 8" Class II base compacted to 95%
Moisturization near Optimum	12 inches	12 inches	12 inches
Reinforcement	—	Min. #4 rebar at 24" o/c.	#4 rebar at 18" o/c
Thickness Edge	—	6"x6"	8" x 8 "
Crack Control	Saw cut or deep open tool joint to a minimum of 1/3 of concrete thickness	Saw cut or deep open tool joint to a minimum of 1/3 of concrete thickness	Saw cut or deep open tool joint to a minimum of 1/3 of concrete thickness
Maximum Joint spacing	5 feet	12 feet or quarter cut whichever is closer	6 feet

The maximum density of base material used should be more than its supporting subgrade material.

4.12 Utility Trench Backfill

Utility trench backfill within the structural pad and beyond should be placed in accordance with the following recommendations:

- Trench backfill should be placed in 6 to 8-inch thin lifts mechanically compacted to 90 percent or better of the laboratory Maximum Dry Density for the soils used. Within areas of paving, upper 1.5 feet of the trench backfill should be compacted to 95%, or better. No water-jetting should be considered for compaction in lieu of the mechanical compaction described.

- Exterior trenches along a foundation or a toe of a slope and extending below a 1:1 imaginary line projected from the outside bottom edge of the footing or toe of the slope should be compacted to 90 percent of the Maximum Dry Density for the soils used during backfill. All trench excavations should conform to the requirements and safety as specified by the Cal-Osha

4.13 Pre-Construction Meeting

It is recommended that no clearing or grading operation of the site be performed without the presence of a representative of this office. An on-site pre-grading meeting should be arranged between the soils engineer and the grading contractor prior to any construction.

4.14 Seasonal Limitations

No fill shall be placed, spread or rolled during unfavorable weather conditions. Where the work is interrupted by heavy rains, fill operations shall not be resumed until moisture conditions are considered favorable by the soils engineer.

4.15 Planters

To minimize potential differential settlement to foundations, use of planters requiring heavy irrigation should be restricted from using adjacent to footings. In event such becomes unavoidable, planter boxes with sealed bottoms, should be considered.

4.16 Landscape Maintenance

Only the amount of irrigation necessary to sustain plant life should be provided. Pad drainage should be directed towards streets and to other approved areas away from foundations. Slope areas should be planted with draught resistant vegetation. Over watering landscape areas could adversely affect the proposed site development during its life-time use.

4.17 Observations and Testing During Construction

Recommendations provided are based on the assumption that structural footings and slab-on-grade be established exclusively into engineered compacted fills. Excavated footings should be inspected, verified and certified by soils engineer prior to steel and concrete placement. Structural backfills discussed should be placed under direct observations and testing by this facility. Excess soils generated from footing trench excavations should be removed from pad areas and such should not be allowed on concrete slab-subgrades.

5.0 Earth Work/General Grading Recommendations

Site preparations and grading should involve over excavation and replacement of local soils as structural fill compacted to the minimum relative compactions as described earlier.

Structural Backfill:

Local soils free of debris, large rocks and organic should be considered suitable for reuse as backfill. Loose soils, formwork and debris should be removed prior to backfilling retaining walls. On-site sand backfill should be placed and compacted in accordance with the recommended specifications provided below. Where space limitations do not allow conventional backfilling operations, special backfill materials and procedures may be required. Pea gravel or other select backfill can be used in limited space areas. Recommendations for placement and densification of pea gravel or other special backfill can be provided during construction.

Site Drainage:

Adequate positive drainage should be provided away from the structure to prevent water from ponding and to reduce percolation of water into backfill. A desirable slope for surface drainage is 2 percent in landscape areas and 1 percent in paved areas. Planters and landscaped areas adjacent to building perimeter should be designed to minimize water filtration into subsoils. Considerations should be given to the use of closed planter bottoms, concrete slabs and perimeter subdrains where applicable.

Utility Trenches:

Buried utility conduits should be bedded and backfilled around the conduit in accordance with the project specifications. Where conduit underlies concrete slab-on-grade and pavement, the remaining trench backfill above the pipes should be placed and compacted in accordance with the following grading specifications.

General Grading Recommendations:

Recommended general specifications for surface preparation to receive fill and compaction for structural and utility trench backfill and others are presented below.

1. Areas to be graded, backfilled or paved, shall be grubbed, stripped and cleaned of all buried and undetected debris, structures, concrete, vegetation and other deleterious materials prior to grading.

2. Where compacted fill is to provide vertical support for foundations, all loose, soft and other incompetent soils should be removed to full depth as approved by soils engineer, or at least up to the depth as previously described in this report. The areas of such removal should extend at least 5 feet beyond the perimeter of exterior foundation limit or to the extent as approved by soils engineer during grading.

3. The fills to support foundations and slab-on-grade should be compacted to minimum 95% of the soil's Maximum Dry Density at near Optimum Moisture conditions. To minimize potential differential settlements to foundations and slabs straddling over cut and fill transition, cut portions following cut, should be further over-excavated and such be replaced as engineered fill compacted to minimum percentage compaction requirements described.

4. Utility trenches within building pad areas and beyond should be backfilled with granular material and such should be mechanically compacted as described earlier.

5. Compaction for structural fills shall be determined relative to the Maximum Dry Density as determined by ASTM D1557 compaction methods. In-situ field density should be determined by the ASTM D1556 (Sand Cone standard method) or by other approved procedures.

6. New imported soils if required, shall be clean, granular, non-expansive in nature or as approved by the project soils engineer.

7. No rocks over six to eight inches in diameter shall be permitted to use as grading material without prior approval of the soils engineer.

8. No jetting and/or water tampering be considered for backfill compaction for utility trenches without prior approval of the soils engineer. For such backfill, hand tampering with fill layers of 8 to 12 inches in thickness is recommended.

9. The presence of any utility trenches at depth, cesspools, or abandoned septic tanks existing within building pad areas and beyond, if any, should be excavated and removed, or such should be backfilled with gravel, slurry or by other material as approved by soils engineer.

10. Imported fill soils if required, should be equivalent to site soils or better. Such should be approved by the soils engineer prior to their use.

11. Grading required for pavement, side-walk or other facilities to be used by general public, should be constructed under direct observation of soils engineer or as required by the local public agencies.

12. A site meeting should be held between grading contractor and soils engineer prior to actual construction. Two days of prior notice will be required for such meeting.

6.0 Closure

The conclusions and recommendations presented are based upon the findings and observations as made during subsurface test excavations and subsequent laboratory testing and engineering evaluations as currently used in the Geotechnical industry. The recommendations supplied should be considered "preliminary" since they are based on soil samples only. If during construction, the subsoil conditions appear different from those as disclosed during field investigation this office should be notified to consider any possible need for modification by the geotechnical recommendations as provided in this report.

Recommendations provided are based on the assumptions that structural footings will be established exclusively into compacted structural fills. No footings and/or slab should be allowed straddling over cut/fill transition interface.

Site grading observations and testing must be performed by a representative of this office. Further, it is recommended that excavated footings should be verified and approved by soils engineer prior to steel and concrete placement to ensure that foundations are founded into satisfactory soils and excavations are free of loose and disturbed materials.

A pre-grade meeting between grading contractor and soils engineer is recommended prior to construction preferably at the site, to discuss the grading procedures to be implemented and other requirements described in this report to be fulfilled.

This report has been prepared exclusively for the use of the addressee for the project referenced in the context. It shall not be transferred or be used by other parties without a written consent by Soils Southwest, Inc.

Should the project be delayed beyond one year after the date of this report, the recommendations presented shall be reviewed to consider any possible change in site conditions.

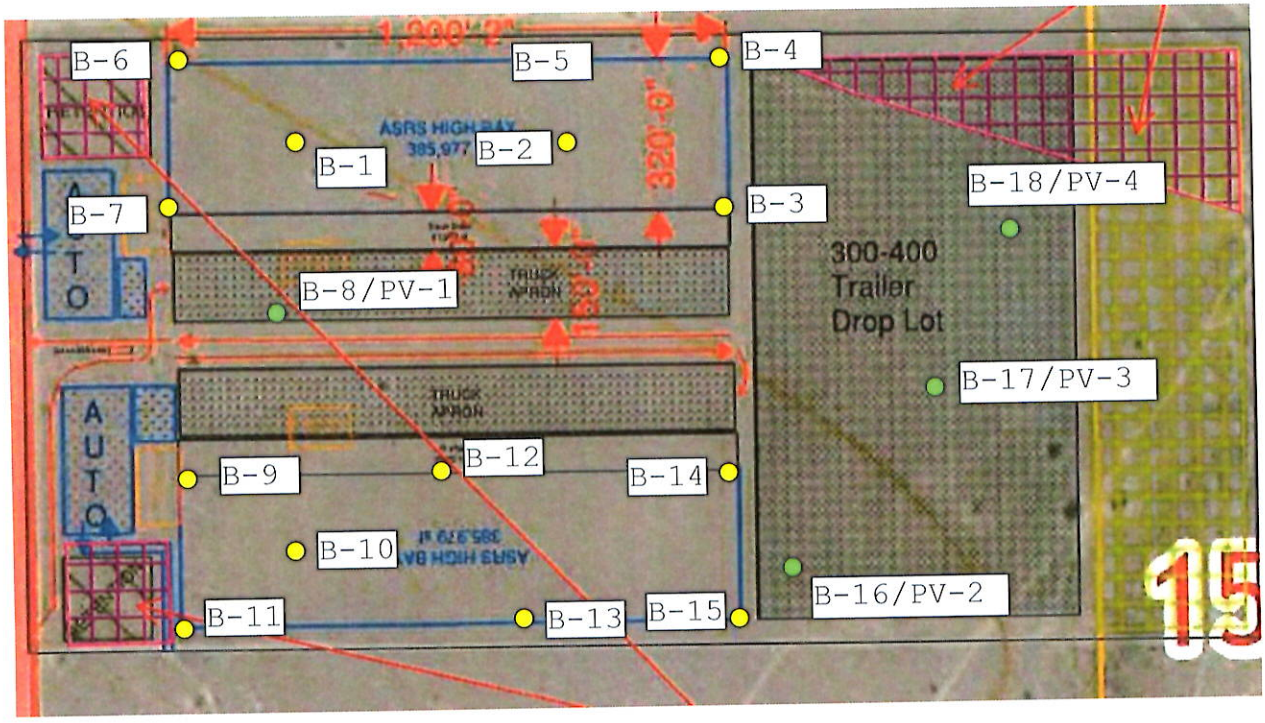
The recommendations presented are based assuming that necessary geotechnical observations and testing during construction will be performed by a representative of this office. The field observations are considered a continuation of the geotechnical investigation performed.

If another firm is retained for geotechnical observations and testing, our professional liability and responsibility shall be limited to the extent that Soils Southwest, Inc. would not be the geotechnical engineer of record. Use of the geotechnical recommendations by others will relieve Soils Southwest of any liability that may arise during lifetime use of the structure constructed.

PLOT PLAN AND TEST LOCATIONS

Proposed 80+ acre U.S. Freezer/Cold Storage Distribution Center
NEC U.S. Highway 395 and Yucca Terrace Drive
City of Hesperia, San Bernardino County, California 92344
A.P.N. 3064-421-01-0000,02,03

(Schematic, Not To Scale)



Legend:

- B-1 Approximate location of sample test boring exploration
- B-8/PV-1 Approximate Location of sample test boring for paving

Plate 1

Plate 1

7.0 APPENDIX A

Field Explorations

For geotechnical evaluations field evaluations included eighteen (18) exploratory test borings (B-1 and B-18) using a hollow-stem auger drilling rig advanced to maximum 31 feet below grade. Approximate test exploration locations are shown on attached Plate 1.

Soils encountered during explorations were logged and such were classified by visual observations in accordance with the generally accepted classification system. The field descriptions were modified, where appropriate, to reflect laboratory test results.

In addition to undisturbed soils sampling during test borings, within areas of excavated test pits portable nuclear gauge is used for determining relative soil density and moisture content (ASTM D2922). The bulk and undisturbed soil samples procured were sent to our laboratory for geotechnical analyses as described in the attached Log of Boring.

LOG OF TEST BORING

Soils Southwest, Inc.
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Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-1

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** March 13,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SM			surface weeds and desert brush SAND - light brown, silty, fine to medium, pebbles, scattered rock fragments, dry to damp
					SP		5	- fine to medium coarse with occasional 1/2" - 1" rock, dry to damp
							10	- color change to light yellow brown, traces of silt, fine to medium coarse, pebble, rock fragments, scattered rock 1/2"-1"
23					SM-ML			- medium dense silty semi-cemented with white flecks, fine, pebbles - with rocks 1/2" -1" dry
							15	
					SP			- color change to light brown, gravely, medium coarse to coarse, rock fragments, rock
					SP-SC		20	- color change to light gray-brown, slightly clayey, fine to medium with pebble, rock fragments, damp to moist
26					SP			- gravely, medium to medium coarse, pebbles rock fragments, rock 1", dry to damp
							25	
							30	- gravely, medium coarse to coarse
40								- End of test boring @ 31.0 ft. - no bedrock - no groundwater

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-2

Project: Fisher Construction/U.S. Cold Storage		**Job No.:**	19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:**	March 13,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SM			surface weeds, scattered organic debris SAND - yellow, silty, fine (Max Dry Density = 131 pcf @ 8.5%) - color change to light brown, fine to medium, pebble
		4.5	123.4	93.5	SP		5	- color change to grayish light brown, traces of silt, fine to medium coarse, pebbles, rock fragments, dry - color change to light brown with scattered 2" rock
		6.3	122.2	92.6	SM		10	- color change to yellowish gray to light reddish brown, silty, traces of clay, semi-cemented, fine to medium coarse, occasional pebbles and rock fragments, dense, damp
					SP		15	- gravely, medium coarse to coarse, pebbles rock fragments
					SP-SC		20	- clayey, fine to medium coarse, pebbles, rock fragments, damp to moist
		7.9	128.5	97.3	SM-ML			- color change to grayish brown to pale reddish brown, silty, fine, occasional pebble and scattered rock fragments very dense, damp - End of test boring @ 21.0 ft. - no bedrock - no groundwater
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test Bulk/Grab sample California sampler

Soils Southwest, Inc.
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LOG OF BORING B-3

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** March 13,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
								SAND - light brown to grayish light brown slightly silty, fine to medium coarse pebbles, occasional rock fragments and rock 1/2"-1", dry to damp, loose
7					SP			- color change to brown
							5	- color change to light brown, gravely, fine to medium coarse, pebble, rock fragments loose
					SM			- color change to light yellowish brown, silty, fine to medium, pebble, occasional rock fragments, scattered rock, dry
							10	
					SP-SM			- color transition change from yellow brown to light grayish brown, slightly silty, semi-cemented, fine to medium, pebble, rock fragments, medium dense, dry
							15	
		5.4	124.5	94.3	SP-SC			- color change from light grayish brown to reddish brown with traces of clay, fine to medium, rippible granitic material with fragmented rock, very dense
								- End of test boring @ 16.0 ft.
								- no bedrock
								- no groundwater
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test | Bulk/Grab sample | California sampler

Soils Southwest, Inc.
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LOG OF BORING B-4

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** March 13,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds
								SAND - yellowish light brown, slightly silty fine to medium, pebble, scattered rock fragments, dry
16					SP			
								- color change to light brown, traces of silt, fine to medium, pebbles, rock fragments, dry
							5	- cemented sands, traces of white caliche very dense
		0.8	130.7	99.0				- color change to grayish brown, traces of silt and clay, fine to medium coarse, pebbles, rippible granitic material
							10	- Abandoned test boring @ 10.0 ft. due to resistance (rocks, cobbles) - no bedrock - no groundwater
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Proposed Cold Storage Facility NEC Yucca Terrace Drive and U.S. Highway 395 Hesperia, California	**Plate #**

Standard penetration test California sampler Bulk/Grab sample

Soils Southwest, Inc.
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LOG OF BORING B-5

Project: Fisher Construction/U.S. Cold Storage		**Job No.:**	19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:**	March 13,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
								SAND - yellowish light brown, slightly silty fine to medium, pebble, rock fragment
					SP			- color change to brown, gravely, fine to medium coarse, rock fragments, damp, loose
9							5	- color return to yellowish light brown, traces of silt, gravely, fine to medium coarse, dry to damp, scattered rock 1/2" to 1"
		2.3	113	85.6				- color return to brown, traces of silt, fine to medium coarse, pebble, rock fragments, occasional rock, 1/2"-1", damp
					SP-SM		10	- color change to light yellowish gray-brown slightly silty, semi-cemented, fine to medium, pebble, scattered rock fragments
37					SP			- color change to light yellow to white, traces of silts and caliche, semi-cemented fine to medium, pebbles, rock fragments
							15	- light yellow brown, traces of silt, pebble, rock fragments
								- End of test boring @ 15.0 ft.
								- no bedrock
								- no groundwater
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test Bulk/Grab sample California sampler

Soils Southwest, Inc.
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LOG OF BORING B-6

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP			surface weeds and desert brush
								SAND - light yellowish brown to light brown traces of silt, fine to medium coarse pebbles, rock fragments, scattered rock, dry
							5	- color change to brown, gravely, medium coarse to coarse, rock fragments, damp
5								- loose
							10	
18								- color change to reddish light brown with white flecks, traces of caliche and clays, semi-cemented, fine to medium coarse, pebbles, rock fragments
								- cemented fine to medium coarse, pebble, rock fragments with traces of silts
							15	
26					SM-SC			- color change to light yellowish gray, fine stiff, damp
								- End of test boring @ 16.0 ft. - no bedrock - no groundwater
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test | Bulk/Grab sample | California sampler

Soils Southwest, Inc.
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LOG OF BORING B-7

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
22								SAND - light yellowish brown, slightly silty fine to medium, pebbles - color change to light brown to brown, slightly silty, semi-cemented, fine to medium, pebbles, rock fragments, damp
							5	
					SP			- color change to light brown, fine to medium coarse, pebbles, rock fragments, scattered 1/2" rock, dry to damp
16								- gravely, medium to coarse, pebble, rock fragments, medium dense
							10	
		0.0	128.1	97.0				- color change to light yellow gray-brown, gravely, fine to coarse, rock fragments and scattered rock 1"-2" - scattered 1" rock
							15	
32					ML			SILT- light yellow to white
								- End of test boring @ 16.0 ft. - no bedrock - no groundwater
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Proposed Cold Storage Facility NEC Yucca Terrace Drive and U.S. Highway 395 Hesperia, California	**Plate #**

Standard penetration test Bulk/Grab sample California sampler

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LOG OF BORING B-8/PV-1

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
								SAND - light yellowish brown, slightly silty fine to medium
					SP			- color change to brown, traces of silt, fine to medium coarse, pebble, rock fragments, damp
							5	
31					SP-SM			- color change to light yellowish brown, slightly silty, semi-cemented, fine to medium with pebbles and rock fragments, dry
								- End of test boring @ 6.0 ft.
								- no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Proposed Cold Storage Facility NEC Yucca Terrace Drive and U.S. Highway 395 Hesperia, California	**Plate #**

Standard penetration test Bulk/Grab sample California sampler

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LOG OF BORING B-9

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
								SAND - light yellowish brown, slightly silty, fine to medium, pebble, scattered rock fragments, dry
								- color change to light brown, damp
								- color change to light yellow brown to light brown, slightly silty, semi-cemented fine to medium with scattered rock 1"-2"
13							5	- fine to medium coarse, pebbles, rock fragments, scattered rock 1", traces of silts
		1.4	122	92.4				- color change to orangish brown, traces of silts and clays, fine to medium coarse, pebbles, dense, dry
							10	
					SM			- color change to light yellowish brown to white, silty, semi cemented, fine to medium coarse, pebbles, rock fragments
							15	
42					SM-SC			- silty, clayey, fine to medium, cemented, fine to medium with pebbles, damp with rock fragments, dense to very dense
								- End of test boring @ 16.0 ft.
								- no bedrock
								- no groundwater
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Proposed Cold Storage Facility NEC Yucca Terrace Drive and U.S. Highway 395 Hesperia, California	**Plate #**

Standard penetration test Bulk/Grab sample California sampler

Soils Southwest, Inc.
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LOG OF BORING B-10

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and brush
								SAND - light yellowish brown, slightly silty fine to medium, pebbles, rock rock fragments, dry
25					SP			- color change to light brown, traces of silt, fine to medium coarse, pebbles, rock fragments, damp, scattered rocks 1/2" - 1"
							5	- color change to light yellowish brown, traces of silt, fine to medium, pebbles and rock fragments
17							10	- gravely, medium to coarse, pebbles, rock fragments
							15	- gravely, fine to medium coarse
								- color change to brown, gravely, traces of clays, semi cemented, fine to coarse, rock fragments, occasional rock 1", very dense
26							20	- very dense - color change to gray-brown, traces of clay gravely, semi-cemented, fine to medium coarse, pebbles, rock fragments
								- End of test boring @ 21.0 ft. - no bedrock - no groundwater
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test | Bulk/Grab sample | California sampler

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-11

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
								surface weeds and brush
					SP-SM			SAND - light yellowish brown, slightly silty fine to medium, pebbles, rock fragments, dry
								- color change to light brown
							5	- color change to light yellowish brown, slightly silty, fine to medium coarse, pebbles, rock fragments, dry
26								- medium dense
					SP		10	- traces of silt, fine to medium coarse, pebbles
							15	
30					SM			- silty, traces of clay, cemented, fine to medium, scattered rock 1/2" - 1", dense
								- End of test boring @ 16.0 ft.
								- no bedrock
								- no groundwater
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Proposed Cold Storage Facility NEC Yucca Terrace Drive and U.S. Highway 395 Hesperia, California	**Plate #**

Standard penetration test Bulk/Grab sample California sampler

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-12

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
								SAND - light yellowish brown, slightly silty fine to medium, pebble, occasional rock fragments
								- (Max Dry Density = 132 pcf @ 10%)
							5	
19								- color change transition from light yellow brown to light brown, slightly silty, traces of clay, semi-cemented, fine to medium, pebbles
					SP		10	- traces of silt, fine to medium coarse, pebbles, rock fragments
13					GP-SP			- gravely d.g. origin material, gravely, medium to coarse, rock fragments, dry
							15	
					SP			- cemented fine to medium coarse
								- End of test boring @ 16.0 ft. - no bedrock - no groundwater
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Proposed Cold Storage Facility NEC Yucca Terrace Drive and U.S. Highway 395 Hesperia, California	**Plate #**

Standard penetration test Bulk/Grab sample California sampler

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-13

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
11								SAND - light yellow brown, slightly silty, fine to medium, pebble, scattered rock, low density
					SP		5	- color change to light brown, traces of silt, fine to medium coarse, pebbles, rock fragments
		5.8	127.6	96.7	SP-SM			- color change to light yellowish gray brown slightly silty, fine to medium coarse with pebbles and rock fragments, soft pulvarized rock and scattered 1" rock
21					SP		10	very dense
								- traces of silt, and clays, gravely, d.g origin material, fine to coarse, rock fragments
							15	
16					GP-SP			- gravely, medium coarse, pebble, rock fragments, damp
								- End of test boring @ 16.0 ft. - no bedrock - no groundwater
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Proposed Cold Storage Facility NEC Yucca Terrace Drive and U.S. Highway 395 Hesperia, California	**Plate #**

Standard penetration test Bulk/Grab sample California sampler

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-14

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
11							5	surface weeds and scattered desert brush SAND - yellowish light brown to orangish brown, slightly silty, fine to medium pebble, rock fragments, dry - light brown, silty, fine to medium coarse pebbles, rock fragments, damp - color change to light yellow brown, traces of silt, fine to medium coarse
							10	- Abandoned test boring @ 10 ft. due to resistance (rock) - no bedrock - no groundwater
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test | Bulk/Grab sample | California sampler

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-15

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds
								SAND - light yellowish brown, slightly silty fine to medium, pebble, rock fragments, dry
							5	
9								- slightly silty, semi-cemented fine to medium coarse, pebble, occasional rock fragments, dry to damp
								- low density
							10	
27					SP			- color change transition from light yellow brown to light brown, semi-cemented, fine to medium coarse, pebbles, rock fragments
					SP-SC		15	- color change to light gray-brown, traces of clay, gravely, fine to medium coarse, pebble, rock fragments, scattered 1/2" to 1" rock
24					SM-ML			- color change to light grayish yellowish brown, silty, fine, pebble, damp to moist
							20	- End of test boring @ 16.0 ft. - no bedrock - no groundwater
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test | Bulk/Grab sample | California sampler

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-16/PV-2

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
								SAND- light yellowish brown, slightly silty fine to medium, pebble
					SP			- color change to light brown, traces of silt, fine to medium coarse, pebbles, rock fragments
							5	- color change to light yellowish gray-brown low density
11								- End of test boring @ 6.0 ft.
								- no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test Bulk/Grab sample California sampler

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-17/PV-3

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP			- surface weeds
								SAND - light yellowish brown, traces of silt fine to medium, pebble, rock fragments, dry
							5	- color change to light brown, traces of silt, fine to medium coarse, pebble, rock fragments
								- End of test boring @ 5.0 ft. - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test | Bulk/Grab sample | California sampler

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-18/PV-4

Project: Fisher Construction/U.S. Cold Storage		**Job No.:** 19042-F
Logged By: John F.	**Boring Diam.:** 6" HSA	**Date:** February 25,2020

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM			surface weeds and desert brush
								SAND - light yellowish brown, slightly silty fine to medium, pebble
					SP			- color change to light brown, traces of silt, fine to medium, pebble, rock fragments
							5	
14					SM			- color change to yellow, silty, fine to medium, pebble, rock fragments
								- End of test boring @ 6.0 ft. - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Cold Storage Facility
NEC Yucca Terrace Drive and U.S. Highway 395
Hesperia, California

Plate #

Standard penetration test | Bulk/Grab sample | California sampler

KEY TO SYMBOLS

Symbol Description

Strata symbols

 Silty sand

 Poorly graded sand

 Poorly graded silty fine sand

 Poorly graded sand with clay

 Poorly graded sand with silt

 Poorly graded clayey silty sand

 Silt

 Poorly graded gravel and sand

Soil Samplers

 Standard penetration test

 Bulk/Grab sample

 California sampler

Notes:

1. Exploratory borings were drilled on February 25,2020 using a 4-inch diameter continuous flight power auger.

2. No free water was encountered at the time of drilling or when re-checked the following day.

3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. Results of tests conducted on samples recovered are reported on the logs.

8.0 APPENDIX B

Laboratory Test Programs

Laboratory tests were conducted on representative soils for the purpose of classification and for the determination of the physical properties and engineering characteristics. The number and selection of the types of testing for a given study are based on the geotechnical conditions of the site. A summary of the various laboratory tests performed for the project is presented below.

Moisture Content and Dry Density (ASTM D2216-80):

Data obtained from these tests performed on undisturbed samples are used to aid in geotechnical soil classification and correlation of the soils and to provide qualitative information regarding in-situ soil strengths.

Direct Shear (ASTM D3080):

Data obtained from this test performed at increased and field moisture conditions on relatively undisturbed and remolded soil sample is used to evaluate soil shear strengths. Samples contained in brass sampler rings placed directly on test apparatus are sheared at a constant strain rate of 0.002 inch per minute under saturated conditions and under varying loads appropriate to represent anticipated structural loadings. Shearing deformations are recorded to failure. Peak and/or residual shear strengths are obtained from the measured shearing load versus deflection curve. Test results, plotted on graphical form, are presented on Plate B-1 of this section.

Consolidation (ASTM D2835):

Drive-tube samples are tested at their field moisture contents and at increased moisture conditions since the soils may become saturated during lifetime use of the planned structure.

Data obtained from this test performed on relatively undisturbed and/or remolded samples, were used to evaluate the consolidation characteristics of foundation soils under anticipated foundation loadings. Preparation for this test involved trimming the sample, placing it in one-inch high brass ring, and loading it into the test apparatus which contained porous stones to accommodate drainage during testing. Normal axial loads are applied at a load increment ratio, successive loads being generally twice the preceding.

Soil samples are usually under light normal load conditions to accommodate seating of the apparatus. Samples were tested at the field moisture conditions at a predetermined normal load. Potentially moisture sensitive soil typically demonstrated significant volume change with the introduction of free water. The results of the consolidation tests are presented in graphical forms on Plate B-2 of this section.

Potential Expansion (ASTM Standard D4829)

Silty sandy to gravely in nature, the upper 10 feet of soils are considered 'very low' in expansion characteristic with an Expansion Index, EI, less than 20. Supplemental soil expansion testing may be warranted following mass grading completion.

Soils Gradation evaluations (ASTM D422), analyses were performed on procured bulk samples at various testing for depths to determine the classification of existing soil conditions.

Laboratory Test Results

Table I. Maximum Dry Density - Optimum Moisture Content

Boring No. & Sample Depth, ft.	Max. Dry Density, pcf.	Optimum Moisture, %
B-2 @ 0-5 ft. Orangish Lt. Brown, silty, fine to med. Pebbles, rock fragments, scattered rock 1"	131.0	8.5
B-12 @ 3-5 ft. Lt. yellowish brown, silty, fine to med. Pebbles, rock fragments, scattered rocks ¾"	132.0	7.5

Table II. In-Situ Moisture-Density Determinations

Test Boring No.	Sample Depth, ft.	Dry Density, pcf.	Moisture Content, %
2	5.0	123.4	4.5
2	10.0	122.2	6.3
2	20.0	128.5	7.9
3	15.0	124.5	5.4
4	7.0	130.7	0.8
5	8.0	113.0	2.3
7	10.0	128.1	0.0
9	8.0	122.0	1.4
13	7.0	127.6	5.8

Table III: Consolidation (D2435)

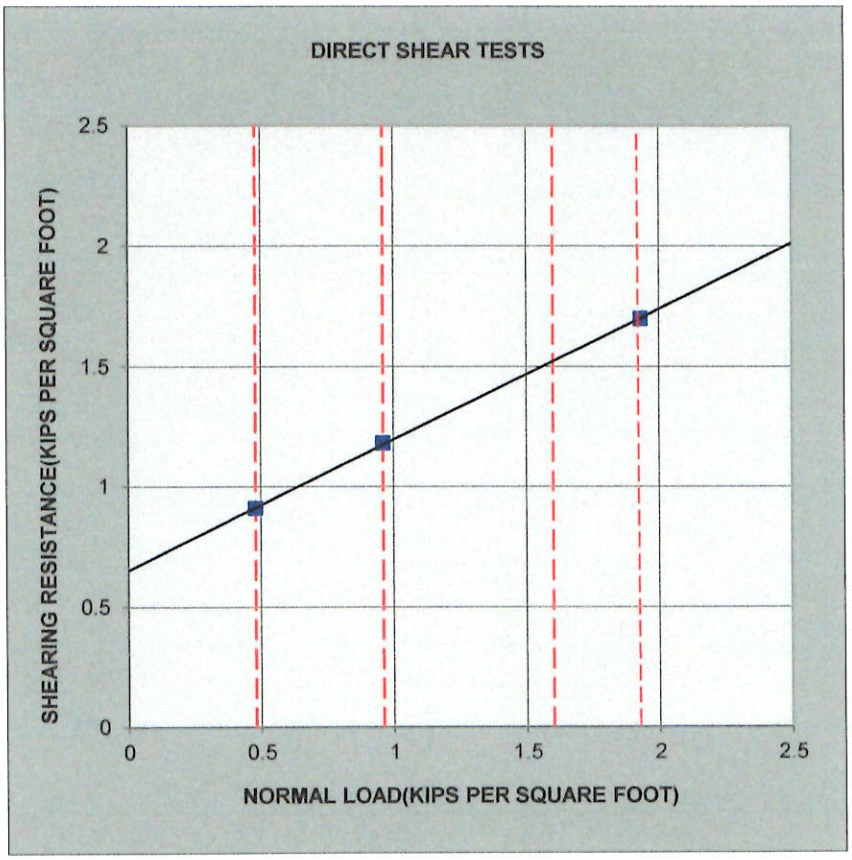
Sample #	Depth (ft.)	Consolidation prior to saturation (%) @ 2 kips	Hydro collapse (%) @ 2 kips	Total Consolidation (%@ 8 kips) (saturated)
B-2 (remolded)	0-5	0.5	0.1	1.5
B-12 (remolded	3-5	0.3	0.3	1.8
B-2 (undisturbed)	5.0	3.9	0.9 slight	8.1
B-9 (undisturbed)	8.0	1.6	3.1 moderate	6.9
B-3 (undisturbed)	15.0	1.0	1.8 slight	5.2

Table IV: Direct Shear (ASTM D3080)

Test Trench or Boring & Sample Depth (ft)	Test Condition	Cohesion (PSF)	Friction (Degree)
B-2 @ 0-5	Remolded to 90%	340	41
B-12 @ 3-5	Remolded to 90%	650	28
B-5 @ 8.0	Undisturbed Presoaked	-20	32
B-2 @ 10	Undisturbed Presoaked	0.0	36

Table V. Soils Expansion Index, EI. (ASTM D4829)

Sample Location & Soils Type	Soil Expansion Index, EI	Expansion Potential
B-2 @ 0-5' Sand-silty, fine to medium coarse with rocks and cobbles	19	"very low"

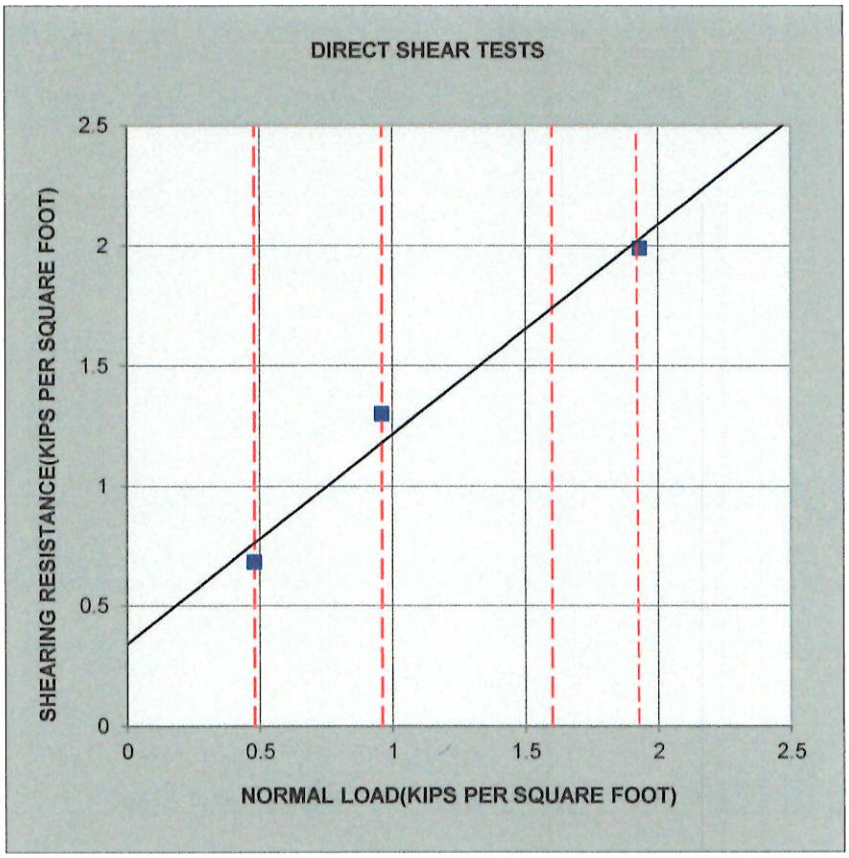


SYMBOL	LOCATION	DEPTH (FT)	TEST CONDITION	COHESION (psf)	FRICTION (degree)
■	B-12	3 to 5	Remolded	650.75	28.58

Proposed U.S. Cold Storage Freezer Warehouse Facililty
NEC U.S. Highway 395 and Yucca Terrace Drive
Hesperia, California

PROJECT NO.	19042-F
PLATE	B-1

SOILS SOUTHWEST, INC.
Consulting Foundation Engineers



SYMBOL	LOCATION	DEPTH (FT)	TEST CONDITION	COHESION (psf)	FRICTION (degree)
■	B-2	0 to 5	Remolded	340.79	41.18

Proposed U.S. Cold Storage Freezer Warehouse Facililty
NEC U.S. Highway 395 and Yucca Terrace Drive
Hesperia, California

PROJECT NO.	19042-F
PLATE	B-1-1

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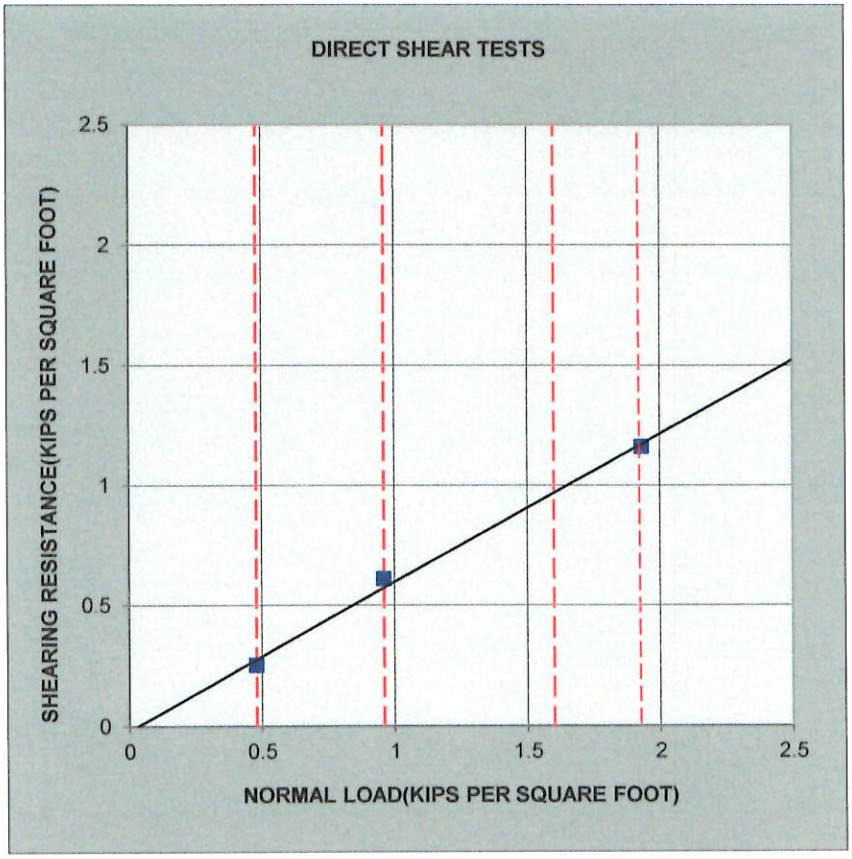

SYMBOL	LOCATION	DEPTH (FT)	TEST CONDITION	COHESION (psf)	FRICTION (degree)
■	B-5	8.0	Undisturbed-Presoaked	-20.28	31.71

Proposed U.S. Cold Storage Freezer Warehouse Facililty
NEC U.S. Highway 395 and Yucca Terrace Drive
Hesperia, California

PROJECT NO.	19042-F
PLATE	B-1-2

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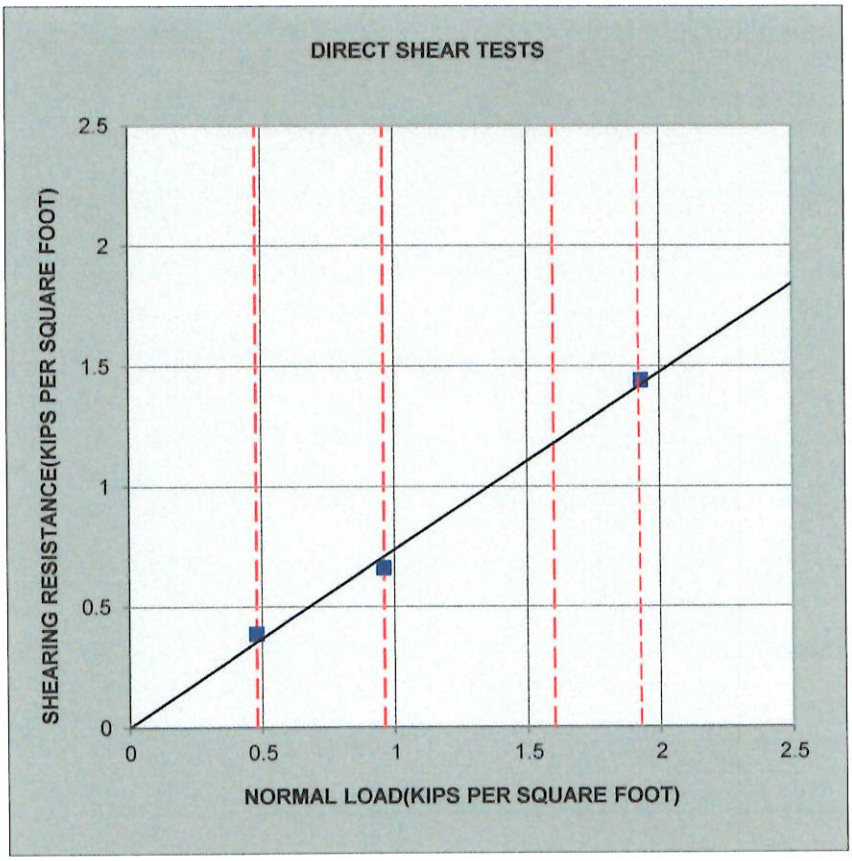

SYMBOL	LOCATION	DEPTH (FT)	TEST CONDITION	COHESION (psf)	FRICTION (degree)
■	B-2	10.0	Undisturbed-Presoaked	0.02	36.42

Proposed U.S. Cold Storage Freezer Warehouse Facililty
NEC U.S. Highway 395 and Yucca Terrace Drive
Hesperia, California

PROJECT NO.	19042-F
PLATE	B-1-3

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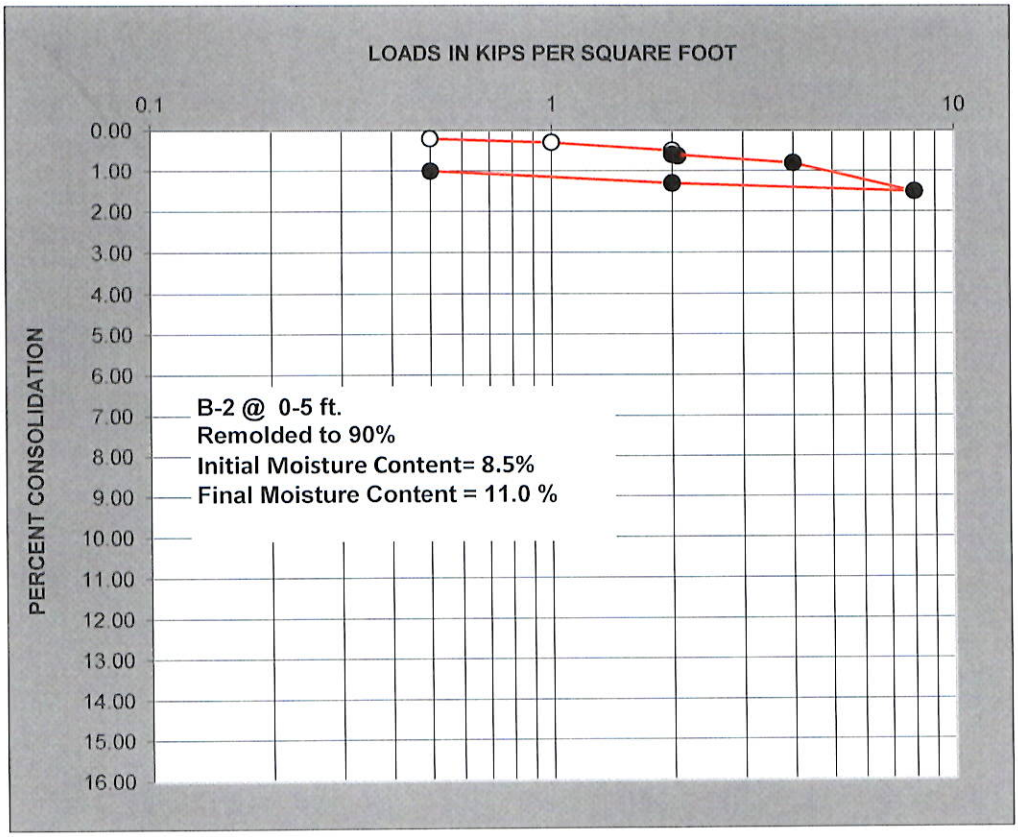
CONSOLIDATION TESTS

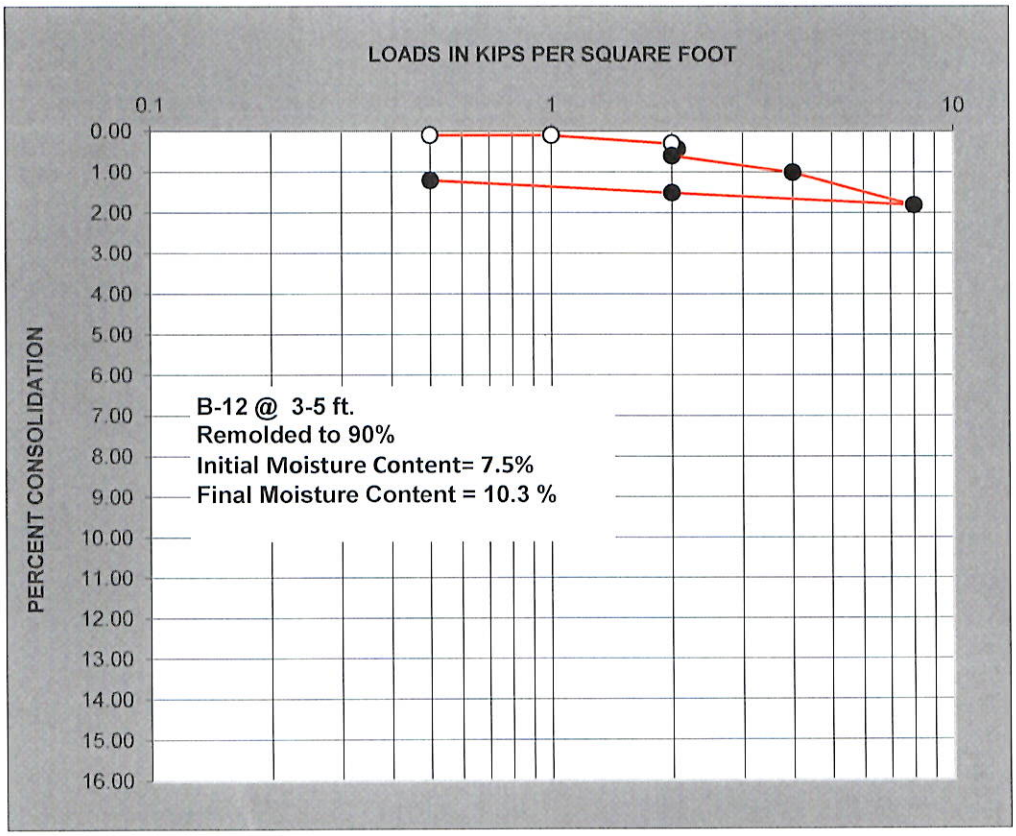


- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed U.S. Cold Storage Freezer Warehouse Facility NEC U.S. Hw 395 and Yucca Terrace Drive, Hesperia		
	PROJECT NO.	19042-F	PLATE	B-2

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

CONSOLIDATION TESTS



- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed U.S. Cold Storage Freezer Warehouse Facility NEC U.S. Hw 395 and Yucca Terrace Drive, Hesperia		
	PROJECT NO.	19042-F	PLATE	B-2-1

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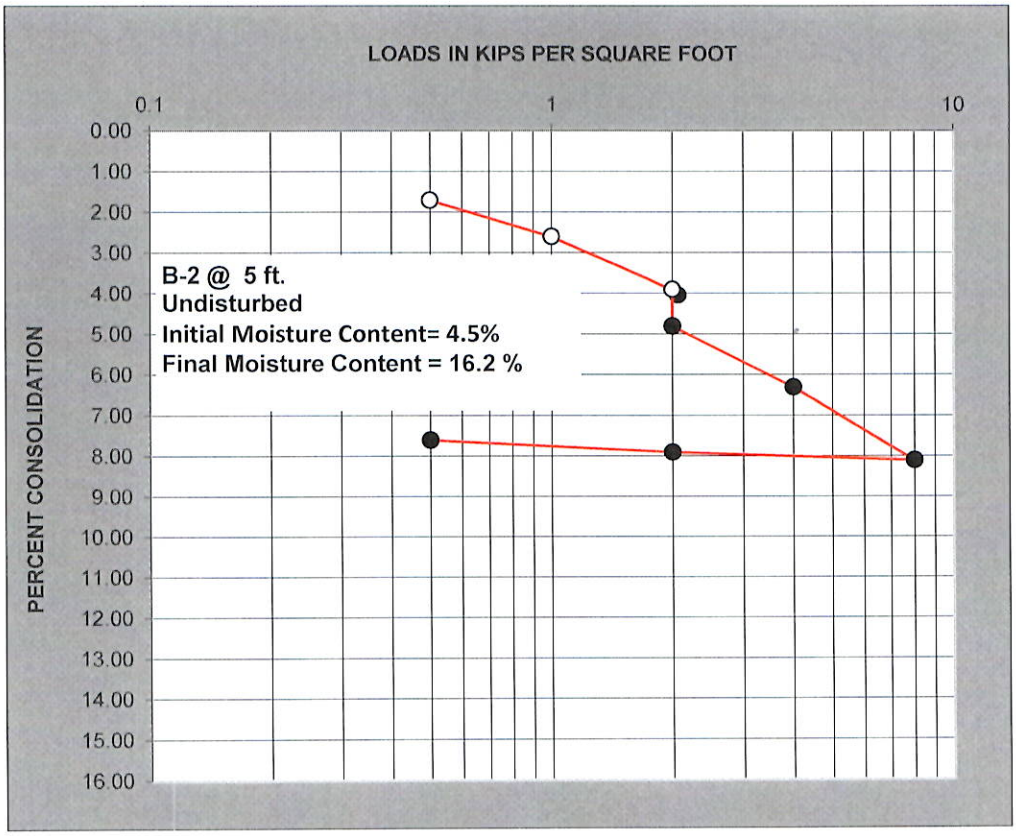
CONSOLIDATION TESTS



- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed U.S. Cold Storage Freezer Warehouse Facility NEC U.S. Hw 395 and Yucca Terrace Drive, Hesperia		
	PROJECT NO.	19042-F	PLATE	B-2-2

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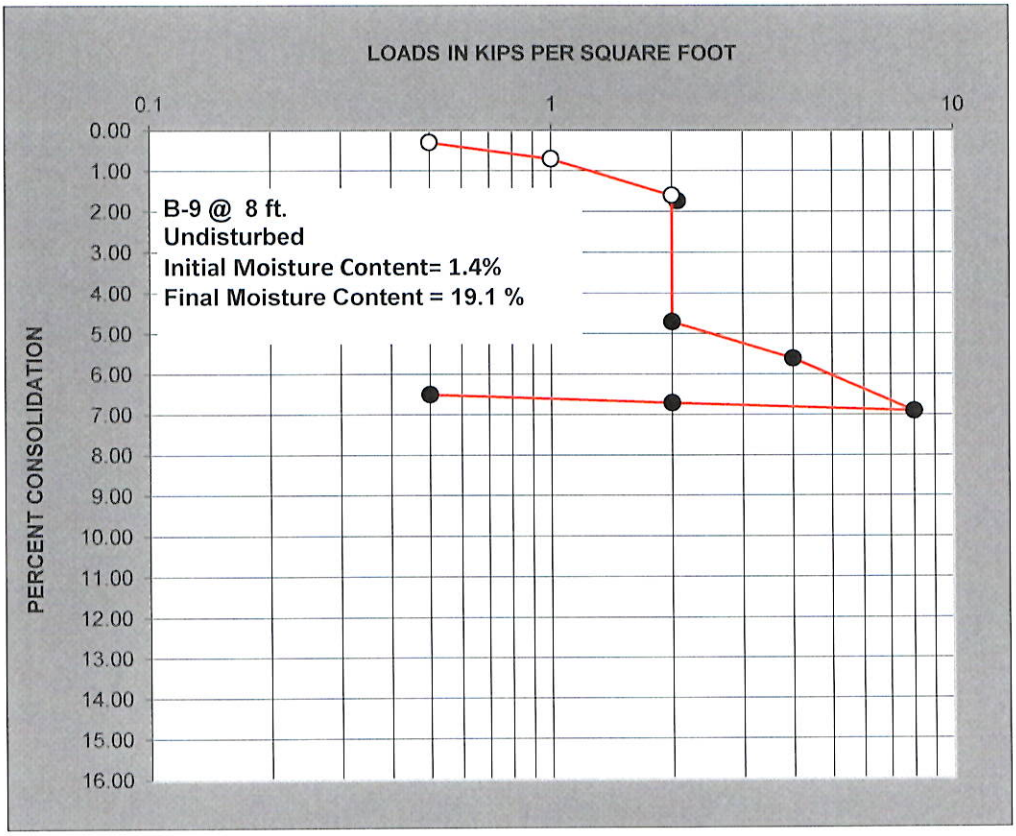
Consulting Foundation Engineers

CONSOLIDATION TESTS



- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed U.S. Cold Storage Freezer Warehouse Facility NEC U.S. Hw 395 and Yucca Terrace Drive, Hesperia		
	PROJECT NO.	19042-F	PLATE	B-2-3

SOILS SOUTHWEST INC.
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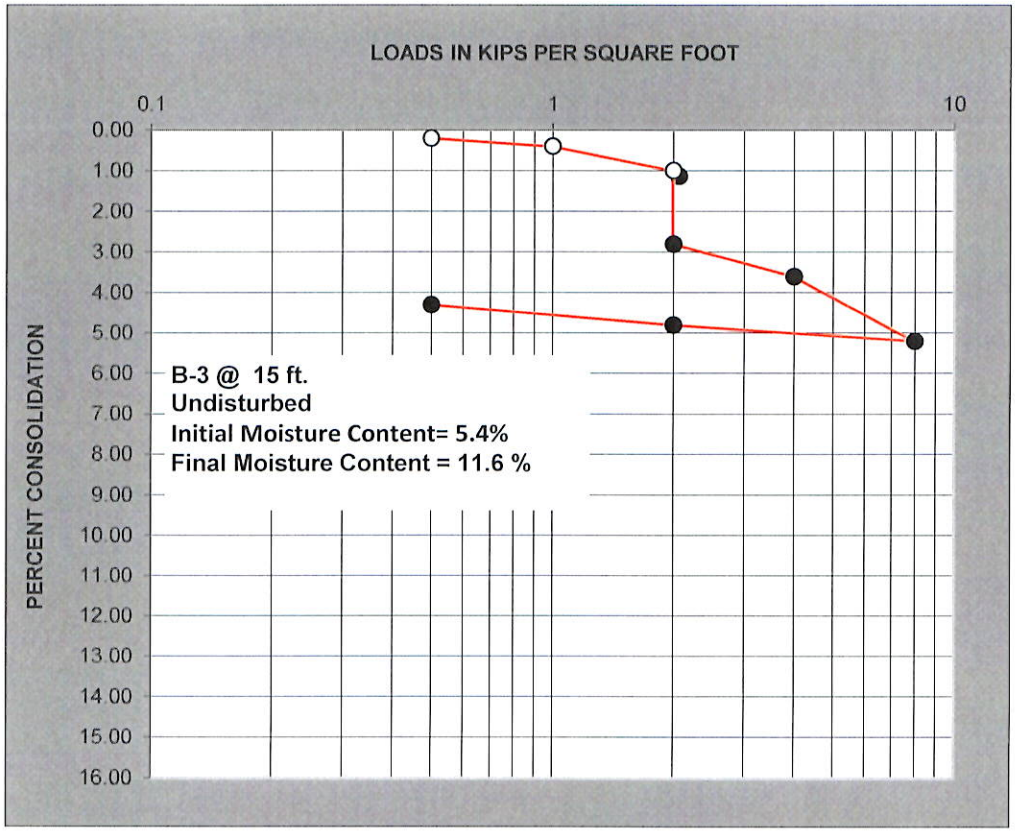
CONSOLIDATION TESTS



- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed U.S. Cold Storage Freezer Warehouse Facility NEC U.S. Hw 395 and Yucca Terrace Drive, Hesperia		
	PROJECT NO.	19042-F	PLATE	B-2-4

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

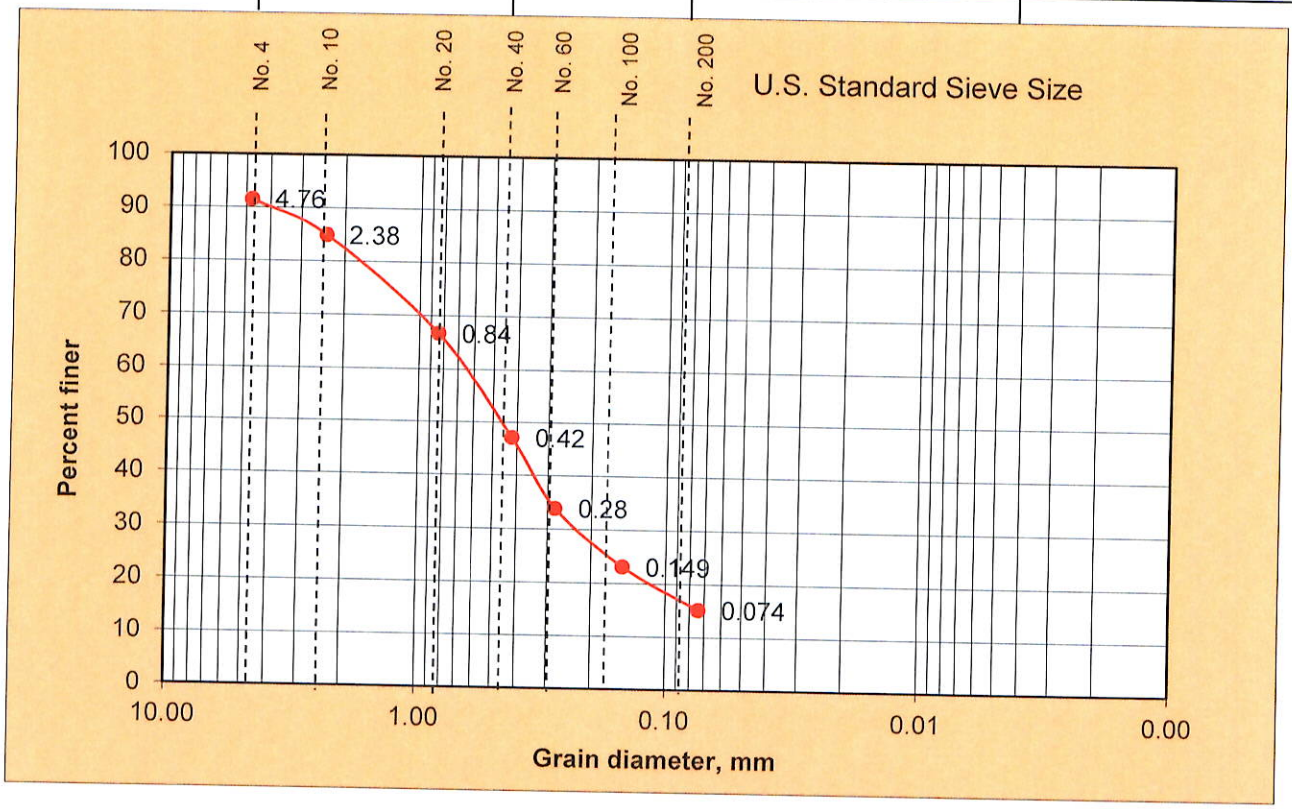
GRAIN SIZE DISTRIBUTION ASTM D422

Project: Fisher-U.S Cold Storage **Job #** 19042-F
Location: NEC Hw 395 and Yucca Terrace,Hesperia **Boring No:** B-8 @ 0-5 **Sample No:** 1
Description of Soil: SP- SM - yellowish lt. brown, fine to medium coarse
Date of Sample: 3/13/2020
Tested By: JPR **Date of Testing:** 3/17/2020

Sieve No.	Sieve Openings in mm	Percent Finer
4	4.76	91.60
10	2.38	85.00
20	0.84	66.80
40	0.42	47.20
60	0.28	34.00
100	0.149	23.20
200	0.074	15.30

Grain Size	% Retained
Gravel	8
Med. to Crs	42
Fines	33
Silts	17

Gravel	Sand			
	Coarse to Medium	Fine	Silt	Clay



Visual Soil Description : SP- SM - yellowish lt. brown, slightlty silty, fine to medium coarse pebbles, rock fragments

Soil Classification: SP-SM

System: USC

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

PLATE B-3

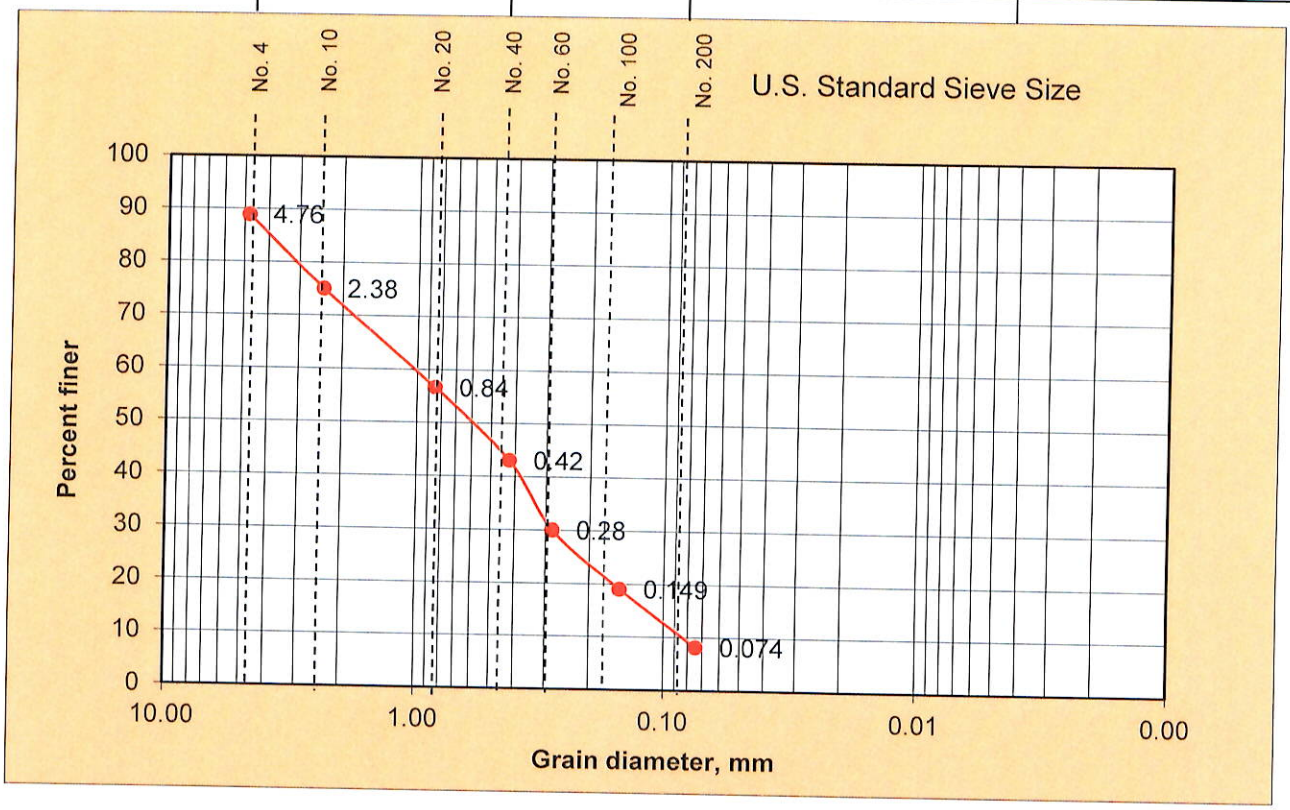
GRAIN SIZE DISTRIBUTION ASTM D422

Project: Fisher-U.S Cold Storage **Job #** 19042-F
Location: NEC Hw 395 and Yucca Terrace,Hesperia **Boring No:** B-4 @ 4-7 **Sample No:** 2
Description of Soil: SP- light brown with some white, traces of silt, fine to medium coarse
Date of Sample: 3/13/2020
Tested By: JPR **Date of Testing:** 3/17/2020

Sieve No.	Sieve Openings in mm	Percent Finer
4	4.76	89.03
10	2.38	75.14
20	0.84	56.70
40	0.42	43.17
60	0.28	30.11
100	0.149	19.18
200	0.074	8.23

Grain Size	% Retained
Gravel	11
Med. to Crs	44
Fines	34
Silts	11

Gravel	Sand			
	Coarse to Medium	Fine	Silt	Clay



Visual Soil Description : SP- light brown with some white, traces of silt, fine to medium coarse pebbles, rock fragments

Soil Classification: SP

System: USC

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

PLATE B-3-1

APPENDIX C

Supplemental Seismic Design Parameters

2008 National Seismic Hazard Maps - Source Parameters

New Search

Distance in Miles	Name	State	Pref Slip Rate (mm/yr)	Dip (degrees)	Dip Dir	Slip Sense	Rupture Top (km)	Rupture Bottom (km)	Length (km)
9.40	Cleghorn	CA	3	90	V	strike slip	0	16	25
10.83	North Frontal (West)	CA	1	49	S	reverse	0	16	50
11.44	S. San Andreas;BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	85		strike slip	0.1	13	390
11.44	S. San Andreas;NSB+SSB	CA	n/a	90	V	strike slip	0	13	79
11.44	S. San Andreas;NSB+SSB+BG	CA	n/a	75		strike slip	0	14	136
11.44	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0.1	13	377
11.44	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0.1	13	421
11.44	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	86		strike slip	0.1	13	479
11.44	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	548
11.44	S. San Andreas;BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	220
11.44	S. San Andreas;SM+NSB	CA	n/a	90	V	strike slip	0	13	133
11.44	S. San Andreas;SM+NSB+SSB	CA	n/a	90	V	strike slip	0	13	176
11.44	S. San Andreas;SM+NSB+SSB+BG	CA	n/a	81		strike slip	0	13	234
11.44	S. San Andreas;SM+NSB+SSB+BG+CO	CA	n/a	83		strike slip	0.1	13	303
11.44	S. San Andreas;BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0	14	263
11.44	S. San Andreas;BB+NM+SM+NSB+SSB+BG	CA	n/a	84		strike slip	0	14	321
11.44	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	512

2008 National Seismic Hazard Maps - Source Parameters

New Search

Fault Name	State
Cleghorn	California

GEOMETRY

Dip (degrees)	90
Dip direction	V
Sense of slip	strike slip
Rupture top (km)	0
Rupture bottom (km)	16
Rake (degrees)	0
Length (km)	25

MODEL VALUES

Slip Rate	3
Probability of activity	1

	ELLSWORTH	HANKS
Minimum magnitude	6.5	6.5
Maximum magnitude	6.80	6.60

b-value	0.8	0.8

Fault Model	Deformation Model	Char Rate[1]	GR-a-value[1]	Weight
Stitched	2.1	1.78e-03 / 3.56e-03	2.316 / 2.867	0.50
UnStitched	2.1	1.78e-03 / 3.56e-03	2.316 / 2.867	0.50
Stitched	2.4	1.78e-03 / 3.56e-03	2.316 / 2.867	0.50
UnStitched	2.4	1.78e-03 / 3.56e-03	2.316 / 2.867	0.50

[1] 1st Value is based on Ellsworth relation and 2nd value is based on Hanks and Bakun relation

Comments

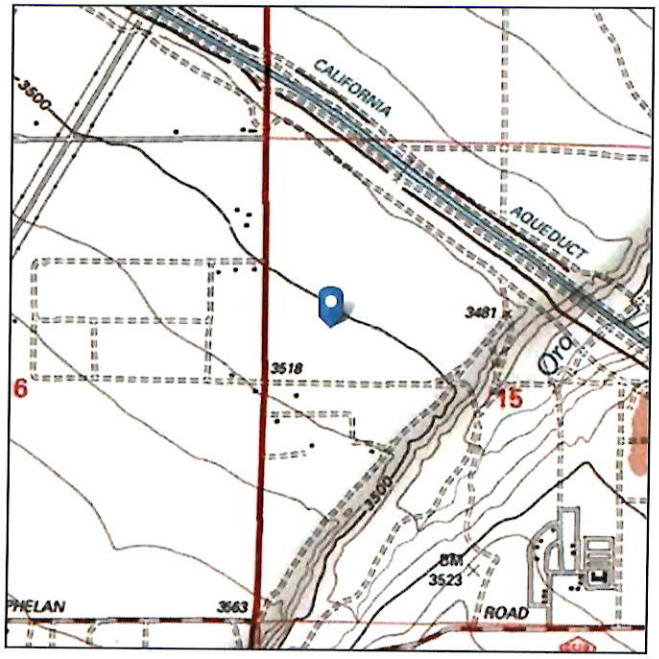
Slip rate based on Meisling (1984).

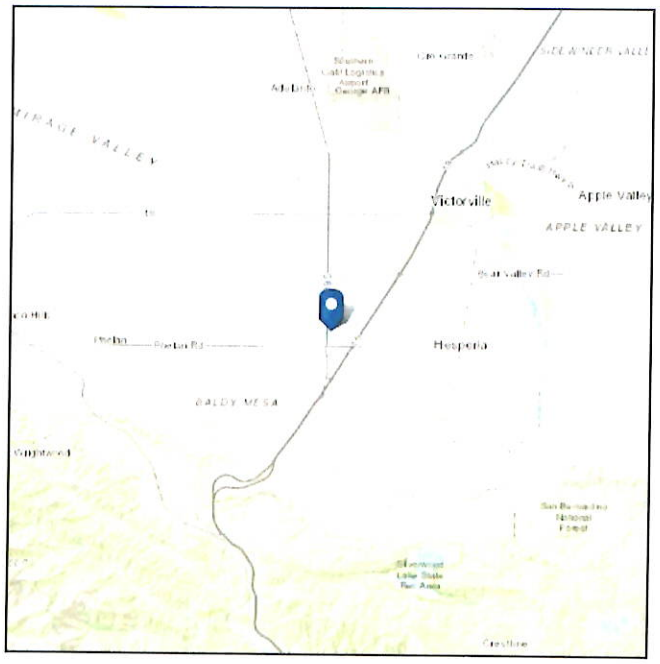
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: III
Soil Class: D - Stiff Soil

Elevation: 3507.09 ft (NAVD 88)
Latitude: 34.435618
Longitude: -117.397158





ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	1.5	S_{D1} :	N/A
S_1 :	0.587	T_L :	12
F_a :	1	PGA :	0.5
F_v :	N/A	PGA_M :	0.55
S_{MS} :	1.5	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1.25
S_{DS} :	1	C_v :	1.4

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Wed Mar 04 2020

Date Source: USGS Seismic Design Maps

Ground Motion Interpolator (2008)

Longitude: -117.397158

Latitude: 34.435618

VS30: 270 (180-1050 m/sec)

Return Period:

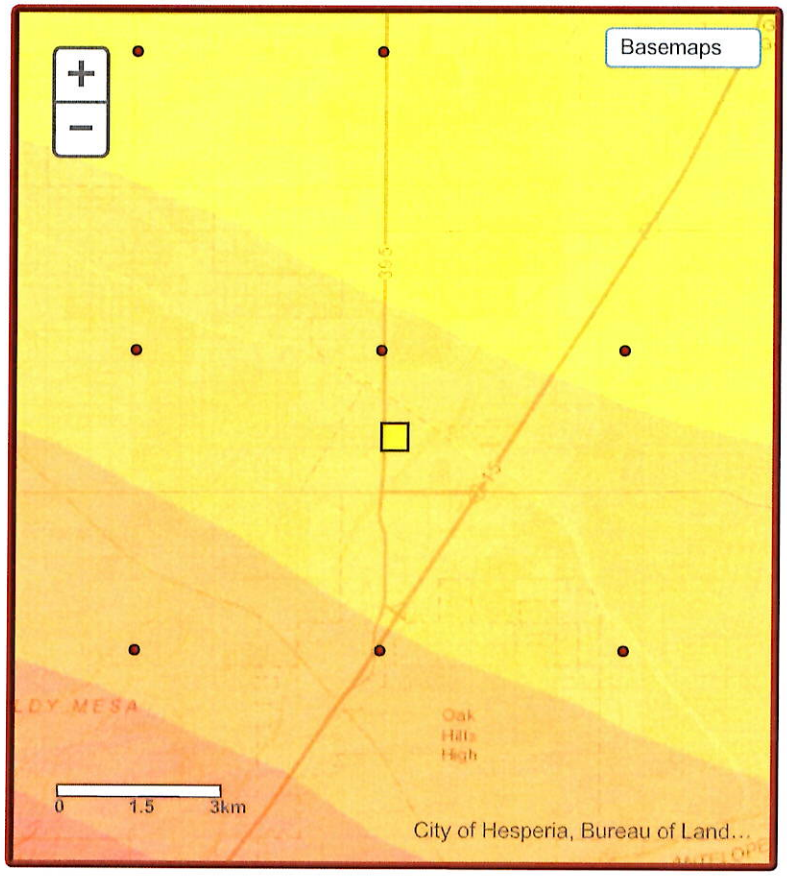
2% in 50 years 10% in 50 years

Spectral Acceleration:

PGA 0.2 second SA 1.0 second SA

Submit

Inputs:	**Result:**
-117.397158, 34.435618 vs30: 270 m/sec 10% in 50 years PGA	**0.467 g**



Information and Disclaimer

APPENDIX D
Soils Corrosivity Test

A & R Laboratories, Inc.

1650 S. GROVE AVE., SUITE C
ONTARIO, CA 91761
951-779-0310 FAX 951-779-0344
www.arlaboratories.com office@arlaboratories.com

FDA#	2030513
LA City#	10261
ELAP#'s	2789
	2790
	2122

CHEMISTRY · MICROBIOLOGY · FOOD SAFETY · MOBILE LABORATORIES
FOOD · COSMETICS · WATER · SOIL · SOIL VAPOR · WASTES

CASE NARRATIVE

Authorized Signature Name / Title (print)	Ken Zheng, President
Signature / Date	Ken Zheng, President 04/24/2020 14:09:37
Laboratory Job No. (Certificate of Analysis No.)	2004-00132
Project Name / No.	US COLD STORAGE 19042-F
Dates Sampled (from/to)	03/27/20 To 03/27/20
Dates Received (from/to)	04/20/20 To 04/20/20
Dates Reported (from/to)	04/24/20 To 4/24/2020
Chains of Custody Received	Yes

Comments:

Subcontracting

Inorganic Analyses

No analyses sub-contracted

Other Analyses

No analyses sub-contracted

Sample Condition(s)

All samples intact

Positive Results (Organic Compounds)

None

A & R Laboratories, Inc.

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FDA#	2030513
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CHEMISTRY · MICROBIOLOGY · FOOD SAFETY · MOBILE LABORATORIES
FOOD · COSMETICS · WATER · SOIL · SOIL VAPOR · WASTES

CERTIFICATE OF ANALYSIS

2004-00132

SOILS SOUTHWEST INC
MOLOY GUPTA
897 VIA LATA SUITE N
COLTON, CA 92324

Date Reported	04/24/20
Date Received	04/20/20
Invoice No.	88693
Cust #	S192
Permit Number	
Customer P.O.	19042-F

Project: US COLD STORAGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 **B-2@0-5FT**					Date & Time Sampled:		03/27/20 @ 8:30	
Sample Matrix: **Soil**								
Chloride	**6.2**		mg/Kg	EPA 300.0	1.0	5.0	04/24/20	TLB
Sulfate	**8.2**		mg/Kg	EPA 300.0	1.0	5.0	04/24/20	TLB
Resistivity	**14500**		ohms/cm	SM 2510B	1.0	1.0	04/24/20	JEN
pH	**7.3**		units	EPA 9045C	1.0	0	04/20/20	JEN
Sample: 002 **B-12@3-5FT**					Date & Time Sampled:		03/27/20 @ 12:00	
Sample Matrix: **Soil**								
Chloride	**6.2**		mg/Kg	EPA 300.0	1.0	5.0	04/24/20	TLB
Sulfate	**6.9**		mg/Kg	EPA 300.0	1.0	5.0	04/24/20	TLB
Resistivity	**12500**		ohms/cm	SM 2510B	1.0	1.0	04/24/20	JEN
pH	**6.7**		units	EPA 9045C	1.0	0	04/20/20	JEN

Respectfully Submitted: Ken Zheng

Ken Zheng - Lab Director

QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.
B1 = BOD dilution water is over specifications . The reported result may be biased high.
D = Surrogate recoveries are not calculated due to sample dilution.
E = Estimated value; Value exceeds calibration level of instrument.
H = Analyte was prepared and/or analyzed outside of the analytical method holding time
I = Matrix Interference.
J = Analyte concentration detected between RL and MDL.
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.
S = Customer provided specification limit exceeded.

ABBREVIATIONS

DF = Dilution Factor
RL = Reporting Limit, Adjusted by DF
MDL = Method Detection Limit, Adjusted by DF
Qual = Qualifier
Tech = Technician

As regulatory limits change frequently, A & R Laboratories advises the recipient of this report to confirm such limits with the appropriate federal, state, or local authorities before acting in reliance on the regulatory limits provided.

For any feedback concerning our services, please contact Jenny Jiang, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at office@arlaboratories.com.

ARL
A & R Laboratories
1650 S. Grove Ave., Ste C, Ontario, CA 91761
Tel: 951-779-0310 / 909-781-6335 Fax: 951-779-0344
E-mail: office@arlaboratories.com

CHAIN OF CUSTODY

A & R Work Order #: 2004-132

Page ____ of ____

Client Name: Soils Southwest, Inc.
E-mail: soilssouthwest@aol.com
Address: 897 Via Lata Suite N, Colton CA
Report Attention | Phone # 909-370-0474 Fax: # | Sampled By: John Flippin
Project No./ Name: US Cold Storage | Project Site: 19042-F Yucca Terrace Drive, Hesperia

☒ Chilled ☒ Intact ☐ Seal

Turn Around Time Requested: ☐ Rush 8 12 24 48 Hours ☒ Normal

Lab # (Lab use)	Client Sample ID	Sample Collection Date	Sample Collection Time	Matrix Type	Sample Preserve	No., type* & size of container	EPA8260B (VOCs & Oxygenates)	EPA8260B(BTEX & Oxygenates)	LUFT / 8015 (Gasoline)	LUFT / 8015 (Diesel)	EPA8081A (Organochlorine Pesticides)	EPA 8082 (PCBs)	EPA 8015M (Carbon Chain C4-C40)	EPA 6010B/7000 (CAM 17 Metals)	Micro: Plate Cnt., Coliform, E-Coli	Chloride	Resistivity	Sulfate	P.H.			Remarks
1	B-2 @ 0-5 ft	3/27/20	9:30	soil	Jar	4 ounce										✓	✓	✓	✓			
2	B-12 @ 3-5 ft	3/27/20	12:00	soil	Jar	4 ounce										✓	✓	✓	✓			

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
		4/20	9:45			4/20	9:45
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Note: Samples are discarded 30 days after results are reported unless other arrangements are made.

Matrix Code: DW=Drinking Water; GW=Ground Water; WW=Waste Water; SD=Solid Waste; SL=Sludge; SS=Soil/Sediment; AR=Air; PP=Pure Product

Preservative Code: IC=Ice; HC=HCl; HN=HNO_3; SH=NaOH; ST=$Na_2S_2O_3$; HS=H_2SO_4

* Sample Container Types: T=Tedlar Air Bag; G=Glass Container; ST= Steel Tube; B= Brass Tube; P=Plastic Bottle; V=VOA Vial; E= EnCore

Sample Acceptance Checklist

CLIENT: Soils Southwest WORK ORDER NUMBER: 2004-132

Temperature:(Criteria:0.0°C-6.0°C)

Sample Temp.(w/CF) °C(w/CF) 3.7°c

☐ Sample(s) outside temprature criteria: PM contacted by :

☐ Sample(s) outside temprature criteria, but received on ice/chilled on same day of sampling.

☐ Sample(s) received at ambient temprature; placed on ice for transport by courier.

Ambient Temprature | Air | ☐ | Filter

CUSTODY SEAL:

Cooler	☐	Present and Intact	☐	Present and Not Intact	☒	Not Present
Sample(s)	☐	Present and Intact	☐	Present and Not Intact	☐	Not Present

Sample Condition:	Yes	No	N/A
Was a COC received	Y		
Were sample IDs present?	Y		
Were sampling dates & times present?	Y		
Was a relingquished signature present?	Y		
Were the tests required clearly indicated?	Y		
Were all samples sealed in plastic bags?			Y
Did all bottle labels agree with COC? (ID, dates and times)	Y		
Were correct containers used for the tests required?	Y		
Was a sufficient amount of samples sent for tests indicated?	Y		
Was there headspace in VOA vials?			Y
Were the containers labeled with correct preservatives?			Y

Explanations/Comments:

Notification:

For discrepancies, how was the Project Manager notified? Verbal

Verbal: PM Initials: _____ Data/Time: _____

Email: Send to: _____ Data/Time: _____

Project Manager's response:

Completed By: _____ Date: 4/20/20

A R Laboratories
1650 S. Grove Ave., Suite C, Ontario, CA 91761
PH: 951-779-0310 Fax: 951-779-0344
Email: office@arlaboratories.com

PROFESSIONAL LIMITATIONS

In absence of development details review, the primary purpose of this investigation is to evaluate obvious presence of any significant geotechnical constraint that may impact the site, and to formulate preliminary geotechnical parameters for initial design for estimation purposes. Accordingly, this report is not intended to be a design level document. For design and construction, it is our opinion that based on development details review, supplemental geotechnical investigations should be considered.

The investigation was performed using the degrees of care and skill as ordinarily exercised under similar circumstances by other reputable Soils Engineers practicing in these general or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice as included in this report.

The investigations are based on soil samples only, consequently the recommendations provided shall be considered 'preliminary'. The samples taken and used for testing and the observations made are believed representative of site conditions; however, soil and geologic conditions can vary significantly between boring. As in most major projects, conditions revealed by excavations may vary with preliminary findings. If this occurs, the changed conditions must be evaluated by the Project Soils Engineer and designs adjusted as required or alternate design recommended.

The report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the project architect and engineers. Appropriate recommendations should be incorporated into structural plans. The necessary steps should be taken to see that out such recommendations in field.

The findings of this report are valid as of this present date. However, changes in the conditions of a property can occur with the passage of time, whether they due to natural process or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur from legislation or broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by change outside of our control. Therefore, this report is subject to review and should be updated after a period of one year.

RECOMMENDED SERVICES

The review of grading plans and specifications, field observations and testing by a geotechnical representative of this office is integral part of the conclusions and recommendations made in this report. If Soils Southwest, Inc. (SSW) is not retained for these services, the Client agrees to assume SSW's responsibility for any potential claims that may arise during and after construction, or during the lifetime use of the structure and its appurtenant.

The recommendations supplied should be considered valid and applicable, provided the following conditions, in minimum, are met:

i. Pre-grade meeting with contractor, public agency and soils engineer,
ii. Excavated bottom inspections and verification s by soils engineer prior to backfill placement,
iii. Continuous observations and testing during site preparation and structural fill soils placement,
iv. Observation and inspection of footing trenching prior to steel and concrete placement,
v. Subgrade verifications including plumbing trench backfills prior to concrete slab-on-grade placement,
vi. On and off-site utility trench backfill testing and verifications,
vii. Precise-grading plan review, and
viii. Consultations as required during construction, or upon your request.