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

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Report of Geotechnical Evaluations

Planned Office/Warehouse Complex
1527 Rialto Avenue w/o Linden Avenue, Rialto
APN: 0246-201-51

Project No. 24021-F

July 30, 2024

Prepared for:

Lord Constructors, Inc.
1920 West Eleventh Street
Upland, California 91786

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Established 1984

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Lord Constructors, Inc.
1920 West Eleventh Street
Upland, California 91786

Attention: Mr. Gregg Lord

Subject: Report of Geotechnical Evaluations
Planned Office/Warehouse Complex
1527 Rialto Avenue w/o Linden Avenue, Rialto
APN: 0246-201-51

Reference: (i) Site Plan Provided by the Addressee
(ii) Report of WQMP-BMP Stormwater Disposal System dated May 30,2024

Gentlemen,

Presented herewith is the report of Geotechnical Evaluations for the site of the proposed office/warehouse development and associated paving/parking/driveways to be located at 1527 Rialto Avenue in Rialto, California. In absence of detailed development plans, the recommendations included should be considered as "preliminary. Revised and/or updated recommendations may be warranted following grading/development plan review.

Based on the referenced site plan supplied, it is understood that the subject development will primarily include one warehouse structure at/near existing grade, to accommodate a 2-story interior office facility with recessed loading dock. Construction of concrete tilt-up or concrete framed, concrete block construction with concrete slabs-on-grade is assumed. Supplemental construction is anticipated to include on-site driveways, auto and light truck paving/parking, a recessed dock, along with the installation of an underground WQMP-BMP stormwater disposal system as discussed. Moderate site preparations and grading should be expected with the proposed development. For design, anticipated structural loadings of 80 kips and 10 klf are assumed.

Based on the test explorations and laboratory testing completed at this time, it is our opinion that the soils encountered primarily consist of upper four (4) to five (5) feet of dry to damp, fine to medium coarse undocumented fill sands with some silts overlying medium to coarse gravel, sand along with gravels of rocks and cobbles with little or no sands to the maximum 31 feet depth explored. Descriptions of the soils encountered are provided in the attached Log of Borings.

No shallow-depth groundwater was encountered. Historical and shallow depth groundwater is reported at about 388 feet below grade. Based on review of the available USGS (California Geologic Survey) publication, it is understood that the site is not situated within an A-P Special Studies Zone where a known seismic fault passes through the site or its adjacent. The information supplied by USGS, it is understood that the historical shallow groundwater is at a depth in excess of 50 feet below grade as measured at the nearest water well (01S05W10H002S). Based on such and as described in the Special Publication 117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction thereby requiring no special geotechnical design recommendations other than those as recommended herein.

Based on the evaluations completed at this time, it is our opinion that from a geotechnical viewpoint, the site should be considered suitable for the proposed development, provided that the recommendations included are considered in design and construction.

Final grading and detailed development plan review is suggested to verify the applicability of the assumptions used in preparing this report.

This report has been substantiated by subsurface explorations and mathematical analysis made in accordance with the generally accepted engineering principles, including those field and laboratory testing considered necessary in the circumstances.

We offer no other warranty, expressed or implied.

Respectfully submitted,
Soils Southwest, Inc.

Malay Gupta, RCE 31708

John Flippin
Project Coordinator

1.0 Introduction

1.1 Purpose and Scope of Work

This report presents the results of Geotechnical Evaluations and Soils Infiltration Testing for WQMP-BMP Stormwater Disposal Design for the proposed office/warehouse development and associated paving/parking/driveways to be located at 1527 Rialto Avenue in Rialto, California. In absence of grading and/or detailed development plans the recommendations included may require updated/revised recommendations following detailed development plans review.

The soils encountered as described are based on visual observations made during test explorations, supplemented by the necessary laboratory testing completed at this time. Being beyond scope of work, no geologic or Phase I Environmental Site Assessment (ESA) are included. Reports of such will be supplied upon request.

The recommendations contained reflect our best estimate of the soils' conditions as encountered during field explorations as conducted for the site. It is not to be considered as a warranty of the soils' conditions for other areas or for the depth beyond the explorations advanced at this time.

The recommendations supplied should be considered valid and applicable following review of the final grading and development plans when supplied and when the following conditions are observed:

i. Pre-grade meeting with the contractor, public agency, and the soils engineer,
ii. Excavated bottom inspections and verifications by the 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. Plumbing trenches backfill placement prior to concrete slab-on-grade placement,
vi. On and off-site utility trenches backfill testing and verifications, and
vii. Consultations as required during construction or upon your request.

1.2 Site Description

The rectangular shaped subject parcel of 2.19 acres currently vacant and undeveloped. In general, the site is bounded by Rialto Avenue on the north, by an industrial complex on the south, by Linden Avenue on the east, and by an apartment complex on the west. Overall vertical relief within the property is currently unknown; however, based on site reconnaissance sheet flow from incidental rainfall is estimated to flow towards the south. Other than scattered debris and debris stockpiles, concrete block walls, k-rails, decomposing asphalt pavement, presence of no other significant features were noted.

1.3 Proposed Development

No detailed grading and/or detailed development plans are available for review; however, it is understood that the subject development will include one warehouse structure near existing grade to accommodate a 2-story interior office facility. Use of concrete tilt-up or concrete framed, concrete block construction with concrete slabs-on-grade is assumed. Supplemental construction is anticipated to include on-site driveways, parking, a recessed dock, parking paving, along with installation of an underground WQMP-BMP stormwater disposal chamber.

Moderate site preparations and grading are anticipated as described in the following sections.

1.4 Subsurface Investigation

The geotechnical evaluations include subsurface explorations, soil sampling, necessary laboratory testing, engineering analyses, and preparation of this report. Being beyond scope of work, no geologic investigations or Phase I Environmental Site Assessments are included. Reports on such will be supplied upon request.

In general, our scope of work included the following: review of the referenced site plan supplied along with five (5) test borings (B-1 to B-5) explored by using a Hollow-Stem Auger (HSA) drill rig advanced to maximum depth of 31 feet below grade along with two (2) infiltration test borings to maximum depth of ten (10) feet (P-1 & P-2) for WQMP-BMP Stormwater Disposal Design. During explorations, the soils encountered were continuously logged, bulked, and undisturbed samples were procured and recorded. Collected samples were subsequently transferred to our laboratory for necessary geotechnical testing.

Descriptions of the soils encountered are provided on the Log of Borings attached. Approximate test locations are shown on the attached Plate A.

- Laboratory testing conducted on the selected bulk and undisturbed samples were programmed according to the project requirements. The laboratory testing included determinations of:

    - Moisture Density Determination (ASTM D2937),
    - Maximum Dry Density and Optimum Moisture Content (ASTM D1557),
    - Soils Peak and Residual Shear Strengths (ASTM D3080),
    - Soils Consolidation Characteristics (ASTMD2435),
    - Soils Sieve Analyses (ASTM D1140),
    - Expansion Index, EI (ASTM D4928), and
    - Soil Sand Equivalent, SE (ASTM D2419).

- Based on the field investigation and laboratory testing completed the necessary engineering analyses and evaluations were made on which to base our preliminary recommendations for foundation design, slab-on-grade, site preparations and grading, utility trenches backfill, and

- Preparation of this report for initial use by the project design professionals.

The recommendations supplied should be considered "tentative" and may require revisions and/or upgrading following final grading and detailed development plans review.

2.0 Geotechnical Evaluations

2.1 Site Soils Description

The soils encountered primarily consist of upper five (5) feet of dry to damp, fine to medium coarse undocumented fill sands with some silts overlying medium coarse to coarse gravel and sand mixtures along with layers of gravels consisting of rocks and cobbles with little to no sands to the maximum 31 feet depth explored. Descriptions of the soils encountered are provided in the attached Log of Borings.

Based on review of the USDA Natural Resources Conservation Service: Web Soil Survey for the subject area, it is our understanding that the predominant soil classification for the subject area is identified as being TuB-Tujunga loam sand, 0 to 5 percent slopes consisting of upper 60 inches of loamy sands.

Based on review of the available USGS (California Geologic Survey) publications, it is understood that the site is not situated within an A-P Special Studies Zone, where seismic fault passes through the site or its immediate adjacent.

No groundwater was encountered within the maximum 31 feet depth explored. According to Water Master Support Services-San Bernardino Valley Conservation District/Western Municipal Water District Cooperative Well Measuring Program, Fall 2018, the current water level is at a depth (about 418 feet) in excess of 50 feet below land surface as measured at the nearest water well (01S05W10H002S). Based on such and as described in the Special Publication 117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction.

Laboratory shear tests conducted on the upper soils remolded to 90% indicate moderate shear strengths under increased moisture conditions. Results of the laboratory shear tests are provided on Plate B of this report.

Consolidation tests conducted on remolded samples indicate "low" potential for compressibility under anticipated static structural loadings with potential for "tolerable" settlements to footings and concrete slabs-on-grade. Results of the laboratory determined soils consolidation potential is shown on Appendix B of this report.

Fine to medium coarse to coarse slightly silty sands with rocks and cobbles encountered are considered "low" in expansion potential requiring no special construction requirements other than those as recommended herein. Supplemental soil expansion testing, however, is recommended following mass grading completion to provide supplemental/revised foundation recommendations, if warranted.

2.2 Subsurface Variations

During site preparations and grading, buried irrigation, debris, organic and others may be encountered. In addition, variations in soil strata, their continuity and orientations may be expected. Due to the deposition characteristics of the soils encountered, care should be exercised in interpolating or extrapolating the subsurface soils conditions existing in between and beyond the test explorations conducted.

2.3 Excavatibility

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

2.4 Soil Corrosivity

Reference Soil Sample B-3 @ 0-4 feet below grade

1. Chloride concentration equal to 6.9 mg/Kg does not exceed 10,000 ppm is non-corrosive to ferrous metals,
2. pH equal to 8.95 units exceeding 4.0 units is non-corrosive to buried metals,
3. Sulfate concentration equal to 22 mg/Kg does not exceed 2000 ppm is non-corrosive to concrete, and
4. Resistivity equal to 10,600 ohms/cm is mildly corrosive to buried metals.

Soil chemical test results are included in Appendix B.

It is suggested that following mass grading completions, soils corrosivity potential evaluations should be made to determine, at a minimum, concentrations of pH, sulfate, chloride, and resistivity. Further corrective recommendations should be provided by Corrosion Engineer.

2.5 Groundwater

No groundwater was encountered within the maximum 31 feet depth explored. However, following review of the available recorded groundwater well data as shown in the table below, historical shallow groundwater was measured at about 388 feet below existing well grade. The following table describes the historical and the current groundwater level as recorded in the nearest well as listed by the local reporting agency.

GROUNDWATER TABLE	
Reporting Agency	Water Master Support Services-San Bernardino Valley Conservation District/Western Municipal Water District Cooperative Well Measuring Program, Fall 2018
Well Number	01S/05W-10H002S Chino #1
Well Monitoring Agency	City of Rialto
Well Location: Township/Range/Section	T1S-R5W-Section 10
Well Elevation:	1235
Current Depth to Water (Measured in feet)	418
Current Date Water was Measured	November 12, 2018
Depth to Water (Measured in feet) (Shallowest)	388
Date Water was Measured (Shallowest)	May 1, 2001

Fluctuations in groundwater levels, however, can occur due to seasonal variations in the amount of rainfall, runoff, altered natural drainage paths, and other factors not evident at the time the test borings completed. Accordingly, for the planned development, it is our opinion that provisions should be maintained to dispose incidental surface runoff away from the individual structural pads, once constructed.

3.0 Faulting and Seismicity

3.1 Faulting and Seismicity

Based on the information published by the USGS (currently known as California Geologic Survey) Department of Conservation, State of California, it is understood that the site is not situated within an A-P Special Study Zone where earthquake fault(s) runs through or adjacent to the subject site. In the absence of shallow (less than 50 feet) depth groundwater, the site is considered non-susceptible to soil liquefaction in the event of a strong motion earthquake. However, the site being within Southern California where potentials for seismically induced structural hazards could not be ignored, it is our opinion that implementation of the current CBC seismic design parameters in structural design as described herein may reduce the potential for seismically induced structural distress to some "acceptable tolerable limits".

Seismically induced site-specific potential hazards are discussed in the following sections.

3.2 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 faults that pass through or towards the subject site and the site is not situated within an A-P Special Studies Zone. According to the current 2022 CBC, the site is considered situated within Seismic Zone 4. As a result, it is likely that during the life expectancy of the structures built, moderate to severe ground shaking may have some adverse effects to the structures built.

3.3 Induced or Secondary Seismic Hazards

In addition to ground shaking, effects of seismic activity may include surface rupture, flooding, land-sliding, lateral spreading, settlements, and subsidence. Potential effects of such are as described below.

3.4. Liquefaction

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

No groundwater was encountered within the maximum depth of 31 feet explored. In absence of groundwater within 50 feet below grade, based on the Special Publication 117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction thereby requiring no special geotechnical design recommendations other than those recommended herein.

3.5 Shallow Depth Ground Rupture

The site is 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; however, in our opinion it is considered "remote" due to the distance of the site to the recorded nearby earthquake fault.

3.6 Flooding

Flooding hazards include tsunamis (seismic sea waves), Seiches, or failure of manmade reservoirs, tanks, and aqueducts. The potential for these hazards is considered "remote" considering the inland site location and in absence of nearby known bodies of water. Based on review of the FEMA National Flood Hazard Layer FIRMette map, it is our understanding that the subject area is delineated as Zone X, Area of Minimal Flood Hazard as shown in the attached Appendix C.

3.7 Landslides

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".

3.8 Lateral Spreading

Seismically induced lateral spreading involves lateral movement of soils due to ground shaking. Lateral spreading is demonstrated by near vertical cracks with predominantly horizontal movement of the soil mass involved. The topography of the site being near level, it is our opinion that the potential for seismically induced lateral spreading should be considered "remote".

3.9 Seismically Induced Settlement and Subsidence

The site is situated at about 3.58 miles from the San Jacinto Fault capable of generating an earthquake magnitude M = 7.6 and Peak Horizontal Ground Acceleration, PGA of 0.748g at 10% in 50 years return period. Considering the proximity of the earthquake fault as described, it is our opinion that potential for some total and differential settlements due to ground shaking may be anticipated as described in the previous section.

3.10 Seismic Design Parameters

The design spectrum was developed based on the 2022 CBC. Site Coordinates of 34.099061°N, -117.401466°W were used to establish the seismic parameters presented below.

3.11 Seismic Design Coefficients

The site is situated at about 3.85 miles from the San Jacinto fault, capable of generating an earthquake magnitude, M = 7.6 and a Peak Ground Acceleration, PGA of 0.748g at 10% in 50 years return period.

For foundation and structural design use of the following seismic parameters are suggested as based on the current 2022 CBC:

Recommended values are based upon the online review of ASCE 7-22 Hazard Tool coefficient parameters as provided in Appendix A of this report. The following presents the seismic design parameters evaluated based on available publications published by the California Geological Survey (CGS), the 2022 CBC, and the ASCE Standard 7-16.

The following presents the seismic design parameters evaluated based on the currently published California Geological Survey and 2019 CBC.

TABLE 3.11 A1: Seismic Design Parameters

Seismic Source Type

Based on California Geological Survey-Probabilistic Seismic Hazard Assessment Peak Horizontal Ground Acceleration (PGA) having a 10% probability of exceedance in a 50-year period is described as below:

Seismic Source Type / Appendix C	
Nearest Maximum Fault Magnitude	M > = 7.6
Peak Horizontal Ground Acceleration (PGA)	0.748g

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

It should be noted that lateral force requirement in design should be intended to resist total structural collapse due to the described PGA of 0.643g or greater. However, during the lifetime use of the structure built, it is our opinion that some structural damage may be anticipated requiring structural repairs and/or replacement. Use of flexible lifeline connections are suggested.

TABLE 3.11 A2: Seismic Design Coefficients

CBC Chapter 16	2022 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	1.778g
1613A5.3(2)	Seismic Coefficient, S_1	0.687g
1613A5.3(1)	Site Class D / Seismic Coefficient, F_a	1g
1613A5.3(2)	Site Class D / Seismic Coefficient, F_v	n/a
16A-37 Equation	Spectral Response Accelerations, $S_{Ms} = F_a S_s$	1.778g
16A-38 Equation	Spectral Response Accelerations, $S_{M1} = F_v S_1$	n/a
16A-39 Equation	Design Spectral Response Accelerations, $S_{Ds} = 2/3 \times S_{Ms}$	1.185g
16A-40 Equation	Design Spectral Response Accelerations, $S_{D1} = 2/3 \times S_{Ms}$	n/a

4.0 Evaluations and Recommendations

4.1 General Evaluations

Based on field explorations, laboratory testing, and subsequent engineering analyses, the following tentative conclusions and recommendations are presented for initial study:

(I) From a geotechnical viewpoint, the site is considered grossly stable for the proposed development, provided that the recommendations supplied herein are incorporated in design and construction. Foundation design should reflect considerations of the seismically induced PGA as described.

(II) Based on the upper dry undocumented fill sands consisting of some silts, gravelly, variable consistency nature of the upper soils existing as encountered, it is our opinion that for structural support the load bearing soils should be reworked in the form of subexcavations, followed by scarification, moisturization, and their replacement as engineered fills compacted to minimum 90%. In the event that new fill soils are required over the current grade surface such should be placed on the original grades when prepared as described.

(III) The subexcavation depths during mass grading as described in the following section should be considered as "minimum". During grading, localized deeper subexcavations may be required within areas underlain by buried debris, utilities, localized fills or soft soils and others. It will be the responsibility of the grading contractor to inform the project soils engineer of the presence of such prior to further site preparations and grading.

(IV) In order to minimize potential for differential settlements, it is recommended that structural footings should be established exclusively into engineered fills of local soils compacted to the minimum as recommended in this report. Construction of footings and slabs straddling over cut/fill transitions shall be avoided.

(V) Structural design consideration should include probability for "moderate" peak ground acceleration from relatively active nearby earthquake faults. Implementing the seismic design parameters and procedures as outlined in the current CBC and as described earlier, however, may minimize the adverse effects for the structures proposed.

(VI) Although no 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 and as per the generally accepted construction practices and current CBC, the proposed development will not adversely affect the stability of the site or its adjacent.

4.1.1 Recommendations for Site Preparations and Grading for Structural Support

In absence of detailed development plans review, the planned structural pad grades are assumed at/or near the existing grade surface. For adequate structural support, it is our opinion that moderate site preparations and grading should be included in the form of subexcavations of the near grade dry, silty, gravelly, variable consistency soils and their replacement as engineered fills compacted to minimum 90%.

In general, site preparations and grading should include subexcavations of the near surface soils to about:

(i) minimum 5 feet below the current grade surface or
(ii) to the depth as required to expose the underlying moist and dense natural subgrades or
(iii) to the depth as required to maintain a 30-inch-thick compacted fill mat blanket below foundation bottoms, whichever is greater.

The site preparations and grading described should encompass, at a minimum, the proposed structural footprint areas and minimum 5 feet beyond or as suggested by the geotechnical engineer during grading. No

cut/fill transition conditions should be allowed.

Within areas requiring fill soils, if any, such may be placed following sufficient subexcavations to expose the underlying dense subgrades as approved by the project soils engineer. During grading, the engineered fills placed should be compacted to near Optimum Moisture and with minimum 90% compaction of soils' Maximum Dry Density as determined by the ASTM D1557 test method.

The subexcavation depths described should be considered as "preliminary". Localized additional subexcavations may be required within areas underlain by undocumented old fills, buried utilities and abandoned sewer and/or buried septic systems. It is recommended that the excavated subgrades should be verified and approved by the soils engineer prior to structural fill soil placement. Supplemental recommendations may be warranted following detailed development plans review.

Mass grading required for the project is recommended to encompass, at a minimum, the entire individual structural pads and beyond.

For reference, supplemental general mass grading recommendations are included Section 5 of this report.

4.2 Structural Fill Material Requirements

The local and/or imported fills, if required, should be gravelly sand, free of organic, roots, debris, and rocks larger than 6 to 8-inch in diameter.

Although no significant variations in soil conditions are anticipated, actual soils conditions may vary during grading. It will be the contractor's responsibility to notify Soils Southwest, Inc. about such variations for revised/updated geotechnical recommendations.

Non-expansive in nature, the on-site soils free of organic, debris, and rocks larger than 8-inch in load bearing structural backfills placed should be compacted to minimum 95% of the soils' Maximum Dry Density as determined by the ASTM D1557 test method. Import soils, if required, should be non-expansive, gravelly sand and meeting the following criteria:

Liquid Limit	<35
Plasticity Index	<15
Expansion Index	<20

4.2.1 Structural Fill Soils Placement

Within the areas of structural loadings, it is our opinion that the near grade soils should be subexcavated to minimum 5 feet depth. For adequate structural bearing, it is our opinion that the excavated soils may be placed in 6 to 8-inch lifts with near Optimum Moisture Conditions compacted to minimum 90%. No structural fills should be placed during unfavorable weather conditions.

4.2.2 Cut/Fill Transition Pad Preparations (if applicable)

Use of cut/fill transitions should be avoided to minimize potentials for differential settlements to footings and concrete slab-on-grade. Within cut/fill transition areas, if becomes essential, it is suggested that following necessary cut, the entire structural pad should be prepared so as to establish a uniform bearing compacted fill mat prepared in conformance to the general guidelines as described below.

Pad Preparation Guideline for Cut/Fill Transition Areas

Fill Depth Required for Finish Grade (Within low-lying areas)	Overexcavation Depth below Finish Grade (Within cut areas)
Up to 5 feet	Equal Depth
5 to 10 feet	5 feet
Greater than 10 feet	One-half the maximum thickness of fills placed on the "fill" portion (20 feet maximum)

Cut portions should be over-excavated beyond the structural perimeter lines for a horizontal distance equal to the depth of over excavation or to a minimum distance of 5 feet, whichever is greater. Actual subexcavation depths should be determined by the soils engineer during grading.

4.3 Structural Foundation Design Parameters

In the absence of detailed development plans review, it is assumed that for load bearing support conventional continuous wall foundations and isolated spread footings will be used bearing directly on the engineered graded fills placed as described earlier in this report.

It is assumed that the subject development will include concrete tilt-up or concrete framed, concrete block construction with concrete slabs-on-grade and concrete footings in the form of isolated pier foundations or continuous wall foundations. Use of load bearing concrete wall and/or isolated spread footings are assumed to be used underlain by at least 30-inch-thick engineered fill mat of local soils compacted to minimum 95% as recommended earlier.

Structural foundations, in the form of exterior load bearing wall foundations and isolated pier foundations, may be considered in design based on the following equations:

Continuous Wall Footing: $q_{allowable} = 2000 + 1500d + 280b$
Isolated Square Footing: $q_{allowable} = 2000 + 1500d + 112b$, where

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

The above soil bearing capacities may be increased for each additional depth in footing and width in excess of the minimum recommended. Under static loading conditions, with a Factor of Safety, FS = 3.0, the total maximum vertical bearing capacity is recommended not to exceed 45

00 psf for continuous wall footings and isolated square footings. 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. The load bearing footings should be reinforced with minimum 2-#5 near the near the top and 2-#5 rebar near bottom of continuous wall footings. For isolated foundations reinforcing requirements shall be determined by the project structural engineer. Actual foundation dimensions (b & d) and reinforcement requirements should be provided by the project structural engineer based on anticipated structural dead loadings, soil bearing capacity, and Peak Ground Acceleration (PGA) described.

The footing depths described should be measured vertically from the lowest adjacent outside grade and not from the finished pad grade or from finished floor surface. Footing depths and dimensions shall be verified by the soils engineer prior to footing-forming, rebar, and concrete placement. It will be the contractor's responsibility to arrange such verifications by the soils 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, and carrying maximum assumed structural loadings, are expected to be within "tolerable" limits.

Under static loading conditions, over a 40-foot-span, the estimated total and differential settlements should be about 1 and 1/2-inch, respectively, provided the foundations being supported by engineered fills of local soils compacted to minimum 90% as described. Most of the elastic deformations, however, are expected to occur during construction.

4.4 Concrete Slabs-on-Grade

No concrete slabs, sidewalks and flatworks should be placed bearing directly on the surface soils currently existing. The prepared subgrades to receive footings should be adequate for concrete slab-on-grade placement. The following is provided for reference only.

Building Pad Warehouse/ Truck Storage:

1. Suggested 5-inch-thick (net) slab thickness,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. #4 rebar @ 18-inch o/c using chairs or as required by the project structural engineer,
4. Within moisture sensitive areas, it is suggested to use 10-mil-thick commercially available StegoWrap, Visqueen or other approved coverings,
5. Two (2) inches of sand with SE>30 over the installed Stego Wrap System,
6. Saw cuts requirements shall be as per the structural engineer.

Driveways:

1. 6-inch-thick net slab,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. Over native grade compacted to a maximum of 95%.

Flatwork:

1. 3 ½-inch-thick net concrete,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. Over native grade compacted to a minimum 90%,
4. Tooled joints per the structural engineer.

It is recommended that, prior to concrete pours, utility trenches underlying concrete slabs and driveways should be thoroughly backfilled with sandy gravelly soils, mechanically compacted to the minimum compaction requirements as described.

Within moisture sensitive areas, concrete slabs should be underlain by 2-inch of compacted clean sands, followed by 10-mil-thick vapor barrier, such as commercially available StegoWrap, Visqueen or other approved coverings, overlying an additional 2-inch-thick layer of sands. Sands used should have a Sand Equivalent, SE of 30 or greater.

Subgrades to receive concrete foundations and slab-on-grade should be "'dampened" as would be expected in any such concrete placement. Use of low-slump concrete is recommended. In addition, it is recommended that utility trenches underlying concrete slabs and driveways should be thoroughly backfilled with gravelly sandy soils mechanically compacted to minimum 90%. Concrete construction joint requirements should be determined by the project structural engineer.

No concrete should be placed during extreme weather conditions, such as during high outside temperature and/or during high Santa Ana wind conditions. Use of excess water on finished grade is not recommended to prevent post-placement concrete "warping".

4.4.1 Concrete Curing and Crack Control

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

The occurrence of concrete cracking may also be reduced and/or controlled by limiting the slump of the concrete used, proper concrete placement, and curing along with using crack control joints at reasonable intervals where re-entrant slab corners occur. For standard crack control, maximum expansion/construction joint spacing is recommended not the exceed 24 to 30 x the concrete thickness. Shorter distance between joint spacing would provide greater crack control. Joints at curves and angle points are suggested as determined by the project structural engineer.

To minimize potentials for "warping", subgrades to receive concrete shall be free of excess water. Concrete placements during adverse weather conditions should not be allowed.

4.5 Resistance to Lateral Loads

Resistance to foundation lateral displacement can be achieved by friction acting at the base of foundation and by passive earth pressures. A coefficient friction of 0.38 may be assumed with normal dead load forces for footing established on engineered compacted fills of local soils.

An allowable passive lateral earth resistance of 300 psf 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 3000 lbs.

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

CONDITIONS	EQUIVALENT FLUID DENITY, pcf	
	Level Backfill	2:1 Backfill Sloping Upwards
Active	40	55
At Rest	55	70
Seismic	75% of active earth pressures	75% of active earth pressures

4.6 Shrinkage and Subsidence

It is our opinion that during grading the upper soils may be subjected to a volume change. Assuming a 95% relative compaction for structural fills and assuming an overexcavation and recompaction depth as described earlier, such volume change due to shrinkage may be on the order of 8% to 10%. Further volume change may be expected due to supplemental shrinkage during preparation of subgrade soils. For estimation purpose, such may be approximated to about 2-inch when conventional construction equipment is used.

4.7 Construction Considerations

4.7.1 Unsupported Excavation

Gravelly sandy site soils encountered are considered highly susceptible to caving. Temporary excavations up to 4 feet in depth may be made without rigorous lateral supports. Excavated surface should be "'wetted" during construction 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 in depths become warranted, such should be achieved using shoring to support sidewalls.

4.8 Soil Caving

Considering the gravelly sandy site soils encountered as described, it is our opinion that some caving may be expected during deep excavations. Temporary excavations in excess of 5 feet should be made at a slope ratio of 2 to 1 (h:v) or flatter, or as per the construction guidelines as provided by Cal-Osha.

4.9 Site Preparations for Driveways/Parking/Paving

Assuming concrete paving for use by conventional traffic, it is suggested that prior to concrete placement, the subgrades to receive paving should be subexcavated to minimum 18 inches, followed by the local excavated soils replacement in 6 to 8-inch-thick lifts, compacted to minimum 95%. Use of vibratory sheepsfoot roller is suggested during grading.

4.10 Pavement Thickness Design

Alternative I - Rigid Concrete Paving

Rigid paving, if selected, should be of at least 5-inch-thick concrete placed directly over the local sandy gravelly soils compacted to minimum 95%. Actual paving thickness and reinforcement requirements should be supplied by the project structural engineer using soil Subgrade Reaction Modulus, kcf of 350.

Rigid concrete driveways should have thickened edges to prevent potential for lateral sliding under auto and truck traffic loading.

Alternative II - Asphalt Paving

Flexural asphalt paving, if selected, based on the estimated Traffic Indices (TIs) as described and an estimated soils' R-value of 76 and laboratory determined soils' Sand Equivalent, SE of 42, the following flexible (a.c.) pavement sections are provided for initial use:

Service Vehicle	Estimated Traffic Index, TIs	Pavement Type	Paving Thickness (inch)
Auto/ Truck Traffic	6.0 7.0 10.0	a.c. over Class II base or CMB	4.0 over 7.0 5.0 over 6.0 6.0 over 8.0

Within paving areas, subgrade soils should be subexcavated to minimum 18 inches, moisture conditioned to near Optimum Moisture Content, followed by the excavated soils replacement as engineered fills compacted to at least 95% of the soils' maximum Dry Density as determined by the method ASTM D1557. Class II base or CMB used to receive asphalt concretes should be placed directly over the prepared subgrades and compacted to minimum 95%. Use of thicker/deepened paving edges are recommended to minimize potential for edge movement and paving distress.

4.11 Retaining Wall (if planned for walls > 6 feet in height)

It is unknown if any retaining structure will be associated with development proposed. It is our opinion that retaining foundations should be designed based on a soils vertical bearing capacity of 1800 psf, along with the lateral active pressures as described below:

Slope of Retained Material (h:v)	Equivalent Fluid Density, pcf	
	Clean Sand	Local Soil
level	30	35
2:1	42	55

During a local Magnitude 7.2 earthquake along the North Frontal (West) fault zone, additional lateral pressures will occur along the back of the retaining walls. The seismic-induced lateral soil pressure may be computed using a triangular pressure distribution with the maximum value at the top of the wall> The maximum lateral pressure of (20 pcf) H where H is the height of the retained soils above the wall footing should be used in the final design of retaining wall.

Sliding resistance value and passive fluid pressure values may be increased by 1/3 during short-erm wind and seismic loading conditions.

Any applicable short-term construction surcharges and seismic forces should be added to the above lateral pressure values. All walls shall be waterproofed and protected from hydrostatic pressure by a reliable permanent subdrain system.

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 behind retaining walls. Use of impervious material is preferred within upper the 18 inches of the backfills placed.

Backfills behind retaining wall should be compacted to a minimum 90% of the soils' Maximum Dry Density as determined by the ASTM D15571 test method. Flooding and/or jetting behind wall should not be permitted.

Walls adjacent to traffic areas should be designed to resist a uniform lateral pressure of 100 psf, which is a result of an assumed 300 psf surcharge behind the walls due to normal traffic. If the traffic is kept back 10 feet from the wall, the traffic surcharge may be neglected.

4.12 Utility Trenches Backfill

Utility trenches backfills at depth in excess of 2 feet should be placed in thin lifts and compacted to the minimum requirements described. As an alternative, clean granular sand may be used having Sand Equivalent, SE of minimum 30. Jetting is not recommended in lieu of mechanical compaction. Trench excavations should conform to the requirements and safety as specified by Cal-Osha.

4.13 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.

4.14 Planters

To minimize potential differential settlement to foundations, 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.

4.15 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 lifetime use.

4.16 Observations and Testing During Site Preparations and Grading

Recommendations provided assume that structural footings and slabs-on-grade be established exclusively into compacted fills. Excavated footings should be inspected, verified, and certified by the soils engineer prior to steel and concrete placement to ensure their sufficient embedment and proper bearing as recommended. Structural backfills discussed should be placed under direct observations and testing by Soils Southwest, Inc. Excess soils generated from footing excavations should be removed from pad areas.

In general, geotechnical inspections should include, at a minimum, the following:

- Subexcavation depth during grading,
- Fill compaction testing,
- Retaining wall backfill compaction,
- Excavated foundation depth,
- Paving subgrade verification, and
- Utility trenches backfill compaction.

4.17 Plan Review

No precise grading or detailed development plans are prepared and none such are available for review. Prior to the actual mass grading, grading and foundation plans should be available to ensure applicability of the assumptions made in preparing this report. If during construction, conditions are observed different from those as presented, revised and/or supplemental recommendations will be required.

4.18 Pre-Construction Meeting

It is recommended that no clearing of the site or any grading operations 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 the start of construction. Two days advance notice for such meeting is required.

5.0 Earth Work/General Grading Recommendations

The site soils primarily consist of upper low to medium dense fine to medium coarse sand with traces of silt overlying silty fine to medium coarse sand of variable consistencies with rocks and cobbles and gravels to the maximum 31 feet depth explored.

Prior to grading commencement, it is suggested that all debris and loose stockpiles should be cleared and disposed off-site to the satisfaction of the soils engineer. In general, site preparations and grading for the project should include, at a minimum, the following:

Structural Backfill

Local soils free of organic, debris, and rocks smaller than 6-inch in overall diameter should be considered suitable for reuse as structural backfill. Loose soils, formwork, and debris should be removed prior to backfilling retaining walls. Local soils backfill should be placed and compacted in accordance with the recommendations provided as 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 within limited space areas. Additional recommendations on such will be provided during construction.

Percentage Compaction During Mass Grading

With the presence of silty fine to medium coarse gravelly sandy soils with isolated cobbles and rocks existing as described and assuming moderately high dead loads and seismic peak ground acceleration described, it is our opinion that structural fills placed should be compacted to the minimum 95% compaction requirements described. During grading, use of vibratory sheepsfoot roller is recommended.

Site Drainage

Adequate positive drainage should be maintained away from the structural pad in order to prevent water from ponding and to reduce potential percolation into backfill. A desirable slope for surface drainage is 2% in landscape areas and 1% in paved areas. Planters and landscaped areas adjacent to building perimeter should be adequately 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. Buried utilities in excess of 2 feet should be backfilled with local gravelly sandy soils and compacted to at least 95%. Remaining near surface backfills should be compacted to 90%.

General Grading Recommendations:

Recommended general specifications for surface preparation to receive compacted engineered fills for structural support 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. During grading, the estimated subexcavation depths within building pad areas and 5 feet beyond should be minimum 5 feet below the current grade surface.

3. Where compacted fill is used to provide vertical support for foundations, all loose, soft, and other incompetent soils should be removed to full depth as approved by the soils engineer.

4. Compaction for structural fills shall be determined relative to the Maximum Dry Density as determined by ASTM D1557 compaction methods. All in-situ field density of compacted fill shall be determined by the ASTM D1556 standard methods or by other approved procedures.

5. All new imported soils, if required, shall be clean, granular, and non-expansive material requiring prior approval by the soils engineer.

6. During grading, fill soils shall be placed as thin layers, thickness of which following compaction shall not exceed 6 inches.

7. In accordance with the CBC: rock sizes greater than 12 inches (305 mm) and up to 24 inches (610 mm) in maximum dimension shall be three feet (914 mm) or more below grade, measured vertically. Rock sizes greater than 24 inches (610 mm) in maximum dimension shall be 10 feet (3048 mm) or more below grade, measured vertically.

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 or as approved by the soils engineer is recommended.

9. Any and all utility trenches at depth as well as cesspool and abandoned septic tank within building pad area and beyond, should either be completely excavated and removed from the site or should be backfilled with gravel, slurry or by other material, as approved by the soils engineer.

10. Any and all import soils if required during grading should be equivalent to the site soils or better. The soils engineer prior to their use should approve such.

11. Any and all grading required for pavement, sidewalks or other facilities to be used by general public, should be constructed under direct observation of the soils engineer or as required by the local public agencies.

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

6.0 Closure

The conclusions and recommendations presented are based on the findings and observations made at the time of subsurface test explorations. The recommendations should be considered "preliminary" since they are based on soil samples only. Supplemental investigation and engineering evaluations may be required following detailed development plan review.

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

Final grading and foundation plans should be reviewed by this office when they become available. Site grading must be performed under inspection by a geotechnical representative of this office. Excavated footings should be inspected and approved by the 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-grading meeting between the grading contractor and the soils engineer is recommended prior to the start of construction, preferably at the site, to discuss the grading procedures to be implemented and other requirements described in this report to be fulfilled.

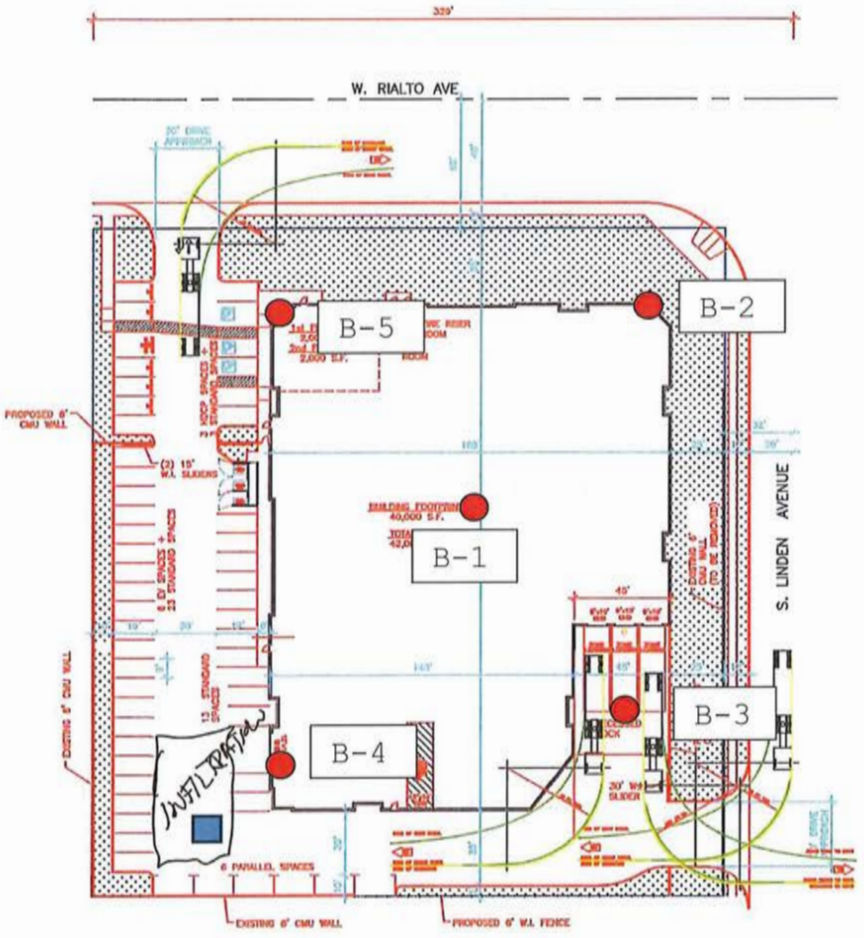
This report has been prepared exclusively for the use of the addressee for the project referenced in the context. It shall not be transferred or be used by other parties without a written consent by Soils Southwest, Inc. We cannot be responsible for use of this report by others without inspection and testing of grading operations by our personnel.

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

The recommendations presented assume that the 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 investigations 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. FURTHER, USE OF THE GEOTECHNICAL RECOMMENDATIONS BY OTHERS WILL RELIEVE SOILS SOUTHWEST, INC. OF ANY LIABILITY THAT MAY ARISE DURING THE LIFETIME USE OF THE STRUCTURES CONSTRUCTED.

PLOT PLAN AND TEST LOCATIONS
Planned Office/Warehouse
1527 Rialto Avenue w/o Linden Avenue, Rialto
APN: 0246-201-51
NTS



Legend:

B-1 Approximate Location of Test Borings for Geotechnical Study

WQMP-BMP Infiltration Rate provided in separate infiltration report by Soils Southwest,Inc. dated May 30,2024

LOG OF TEST EXPLORATIONS

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

LOG OF BORING B-1

Project: Lord Constructors		**Job No.:** 24021-F
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** July 15,2024

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
					FILL			Surface gravels and scattered debris
32							5	SAND (undocumented fill) - light brown, slightly silty, fine to medium coarse, pebbles, rock fragment rocks, dry to damp - color change to grayish light brown, slightly silty, fine to medium coarse, rocks 1"-2", dry - SPT blow counts (6" intervals) = 29,16,16 - with some asphalt and metal debris - (Max Dry Density = 125 pcf @ 9.5 %
					SP		10	NO SAMPLE RECOVERY
37								SAND - medium coarse, pebbles, rock fragment rocks - gravely, medium coarse, rock fragments, rocks, dense, dry - SPT blow counts (6" intervals) = 16,22,15
							15	
					GP-SP			GRAVEL/SAND mixture - color change to grayish tan, medium coarse to coarse, rocks, cobbles, dry
49							20	- SPT blow counts(6" intervals)=18,20,29
							25	- with traces of sil, fine to medium coarse sands, rock fragments, rocks, cobbles, dense to very dense, dry
					GP		30	GRAVELS with little to no soils, rocks and cobbles
62					GM-SM			- +/- 9-inch layer of damp fine silt, silty sand mixture transition to gravely medium coarse with rock fragments and rock, dry - SPT blow counts (6" intervals)= 12,25,37
								- End of test boring @ 31 ft.

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

Site Location

Planned Office/Warehouse
1527 Rialto Avenue
Rialto 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-1

Project: Lord Constructors		**Job No.:** 24021-F
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** July 15,2024

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
								- no bedrock - no groundwater
							40	
							45	
							50	
							55	
							60	
							65	
							70	

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

LOG OF BORING B-2

Project: Lord Constructors		**Job No.:** 24021-F
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** July 15,2024

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
					FILL			surface gravels
								SAND (undocumented fill)- grayish light brown, traces of silt, fine to medium coarse, pebbles, rock fragments, rocks, dry
		3.9	116.9	93.5	GP-SP			- scattered trash (plastic bag pieces)
							5	GRAVEL/SAND mixture - fine to medium coarse sands with traces of silts, rock fragments rocks, occasional cobbles
37								- SPT blow counts (6" intervals)= 10,15,22
		1.9	119.4	95.5	GP			- with traces of silt, fine to coarse, pebbles, rock fragments, rocks 1 1/2", very dense and dry.
							10	
23					SP			SAND - slightly silty, fine to medium coarse rock fragments, rocks, medium dense, dry to damp
					GP			- SPT blow counts (6" intervals)= 16,12,11
								GRAVELS with little to no soils
					GP-SP		15	GRAVEL/SAND mixture
39					SP			SAND - color change to light brown, traces of silt, gravely, fine to coarse,rock fragments, rocks, cobbles, dense, dry to damp
								- SPT blow counts (6" intervals)= 13,17,22
							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

Planned Office/Warehouse
1527 Rialto Avenue
Rialto California

Plate #

California sampler 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-3

Project: Lord Constructors		**Job No.:**	24021-F
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:**	July 15,2024

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 gravels and scattered debris
								SAND - light brown, slightly silty, fine, pebbles, rock fragments, occasional rock and cobbles, damp
35					SP		5	- color change to grayish light brown, gravely, medium coarse to coarse, rock fragments, rocks 1"-2", dense
					GP-SP			- SPT blow counts (6" intervals)= 8,14,21
								GRAVEL/SAND mixture - fine to medium coarse with traces of silt, rock fragments, rocks, cobbles, dry to damp
							10	NO SAMPLE RECOVERY
33								- color change to tannish brown, medium coarse, rock fragments, rocks, cobbles
								- color change to grayish light brown,medium to coarse, rock fragments, rocks, cobbles dense, dry
							15	- SPT blow counts (6" intervals)= 12,16,17
								- End of test boring @ 11 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

Planned Office/Warehouse
1527 Rialto Avenue
Rialto 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-4

Project: Lord Constructors		**Job No.:** 24021-F
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** July 15,2024

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-ML			surface gravels
								SAND - yellowish tannish brown, silty, fine pebbles, occasional rock fragments, rocks
					SM			
50								- color change to gray-tan with rock fragments and rocks
							5	- very dense
								- SPT blow counts(6" intervals)= 50/6"
		2.9	116.6	93.3	SP			- color change to yellowish tan
					GP-SP			- color change to grayish light brown, traces of silt, fine to medium coarse, pebbles, rock fragments, rocks 1/2"
50					GP			
							10	GRAVEL/SAND mixture with rocks and cobbles
								GRAVELS with no soils
								- SPT blow counts (6" intervals) = 50/6"
								- Abandoned test boring @ 8.0 due to resistance due to concentrations of rocks and cobbles
							15	
							20	
							25	
							30	

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

Site Location

Planned Office/Warehouse
1527 Rialto Avenue
Rialto 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-5

Project: Lord Constructors		**Job No.:** 24021-F
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** July 15,2024

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
					FILL			broken asphalt and gravel surface
								SAND (undocumented fill) - tannish light brown, slightly silty,fine to medium coarse, pebbles,rock fragments, rocks, dry
43								
					SP		5	- color change to grayish brown, silty, fine, pebbles, rock fragments, rock fragments, rocks 1"-2", dense, widely scattered debris (tin can lid), damp
		5.9	123.9	99.1				- SPT blow counts (6" intervals)= 10,23,20
					GP-SP			- gravely, medium to coarse, rock fragments rocks, occasional cobbles
							10	- color change to tannish brown, fine to medium coarse with some silts, pebbles, rock fragments, dense, dry to damp
50								
								GRAVEL/SAND mixture - color change to gray light brown, silty, fine to medium coarse
								- medium coarse to coarse, pebbles, rock fragments, rocks, very dense, dry
					GP		15	- SPT blow counts (6" intervals)= 50/6"
40					GP-SP			GRAVELS with little to no soils
								GRAVEL/SAND mixture with medium coarse to coarse sands with pebbles, rock fragments, and rocks, dry
								- SPT blow counts (6" intervals) = 15,19,21
							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

Planned Office/Warehouse
1527 Rialto Avenue
Rialto California

Plate #

Bulk/Grab sample Standard penetration test California sampler

KEY TO SYMBOLS

Symbol Description

Strata symbols


Poorly graded sand with silt


Poorly graded sand


Poorly graded gravel and sand


Poorly graded gravel


Silty sand and gravel


Fill


Poorly graded silty fine sand


Silty sand

Soil Samplers


Standard penetration test


Bulk/Grab sample


California sampler

Notes:

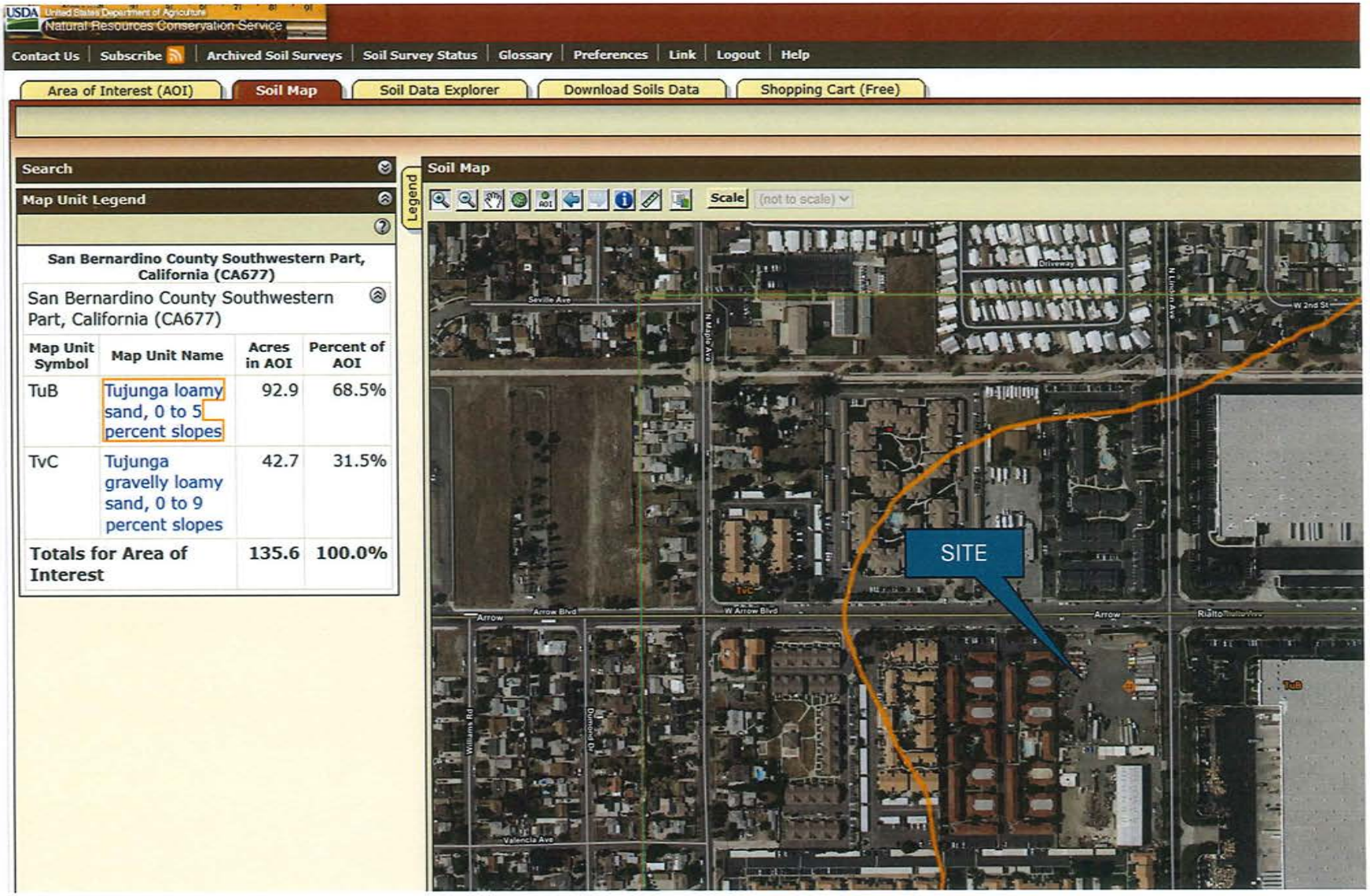
1. Exploratory borings were drilled on July 15,2024 using a 4-inch diameter continuous flight power auger.

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.


USDA United States Department of Agriculture
Natural Resources Conservation Service
Contact Us | Subscribe | Archived Soil Surveys | Soil Survey Status | Glossary | Preferences | Link | Logout | Help
Area of Interest (AOI)
Soil Map
Soil Data Explorer
Download Soils Data
Shopping Cart (Free)
Search
Map Unit Legend
San Bernardino County Southwestern Part, California (CA677)
San Bernardino County Southwestern Part, California (CA677)
Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI
TuB | Tujunga loamy sand, 0 to 5 percent slopes | 92.9 | 68.5%
TvC | Tujunga gravelly loamy sand, 0 to 9 percent slopes | 42.7 | 31.5%
Totals for Area of Interest | 135.6 | 100.0%
Legend
Soil Map
Scale
(not to scale)
SITE
Seville Ave
N Maple Ave
Driveway
N Lincoln Ave
W 2nd St
Arrow Blvd
W Arrow Blvd
Arrow
Rialto
Williams Rd
Diamond Dr
Valencia Ave
TvC
TuB

San Bernardino County Southwestern Part, California

TuB—Tujunga loamy sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2sx6y
Elevation: 650 to 3,110 feet
Mean annual precipitation: 10 to 25 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 325 to 365 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga, Loamy Sand

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 6 inches: loamy sand
C1 - 6 to 18 inches: loamy sand
C2 - 18 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R019XG912CA - Sandy Fan
Hydric soil rating: No

Minor Components

Tujunga, gravelly loamy sand
Percent of map unit: 10 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hanford, sandy loam
Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

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 (D2937):

Data obtained from these tests, performed on undisturbed samples are used to aid in the classification and correlation of the soils and to provide qualitative information regarding soil strength and compressibility.

Direct Shear (D3080):

Data obtained from this test performed at increased and field moisture conditions on relatively 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 (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 a 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.

Potential Expansion (D4829):

Considering silty gravelly sandy nature, the site soils are considered non-expansive in contact with water, and consequently, no expansion tests are performed and none such are considered necessary at this time.

Laboratory Test Results

A. Table I: Moisture-Density Determinations (By ASTM D2216)

Sample Boring Location & Sample Depth (ft)	Dry Density, pcf	Moisture Content, %	Laboratory Maximum Dry Density, pcf	Percent Compaction, %
B-1 @ 5	NR	NR	NR	NR
B-2 @ 3	116.9	3.9	125	93.5
B-2 @ 8	119.4	1.9	125	95.5
B-3 @ 7	NR	NR	NR	NR
B-4 @ 6	116.6	2.9	125	93.3
B-5@ 5	123.9	5.1	125	99.1

NOTE: NR = No sample Recovery

B. Table II: Max. Density/Optimum Moisture Content (ASTM D1557)

Sample Location @ Depth, feet	Max. Dry Density, pcf	Optimum Moisture Content, %
B-1 @ 3-5 SAND (undocumented fill material)– tannish light brown, silty, fine to medium coarse, pebbles, rock fragments, rocks 1"-2", scattered asphalt and metal debris	125	9.5

C. Table III: Direct Shear (ASTM D3080)

Test Boring No. @ Sample Depth, feet	Test Condition	Cohesion, psf	Friction, degrees
B-1 @ 3-5	Remolded to 90%	360	41

D. Table IV: Consolidation (D2435)

Boring No., B	Depth, feet	Consolidation prior to saturation, % @ 2 kips	Hydro Collapse, % @ 2 kips	Total Consolidation, % @ 8 kips (saturated)
1 (remolded)	3-5	0.5	0.0	1.3
5 (undisturbed)	5.0	0.6	2.4 Moderate	5.6
2 (undisturbed)	8.0	0.6	0.3 Slight	2.7

E. Table V: Sand Equivalent, SE (ASTM D2419)

Sample Location @ depth, feet	**Sand Equivalent Average, SE**
B-3/PV-1 @ 0 - 4	48.96
B-5/PV-2 @ 0- 3	42.06

F. Table VI: Sieve Analysis (ASTM D 422)

SAMPLE: B-5 @ 0-3 feet

Grain Size	**% Retained**
Gravels	28
Medium to Coarse	25
Fines	32
Silts	15

G. Table VII: Soils' Chemical Test Results at Sample Location B-3 @ 4 feet

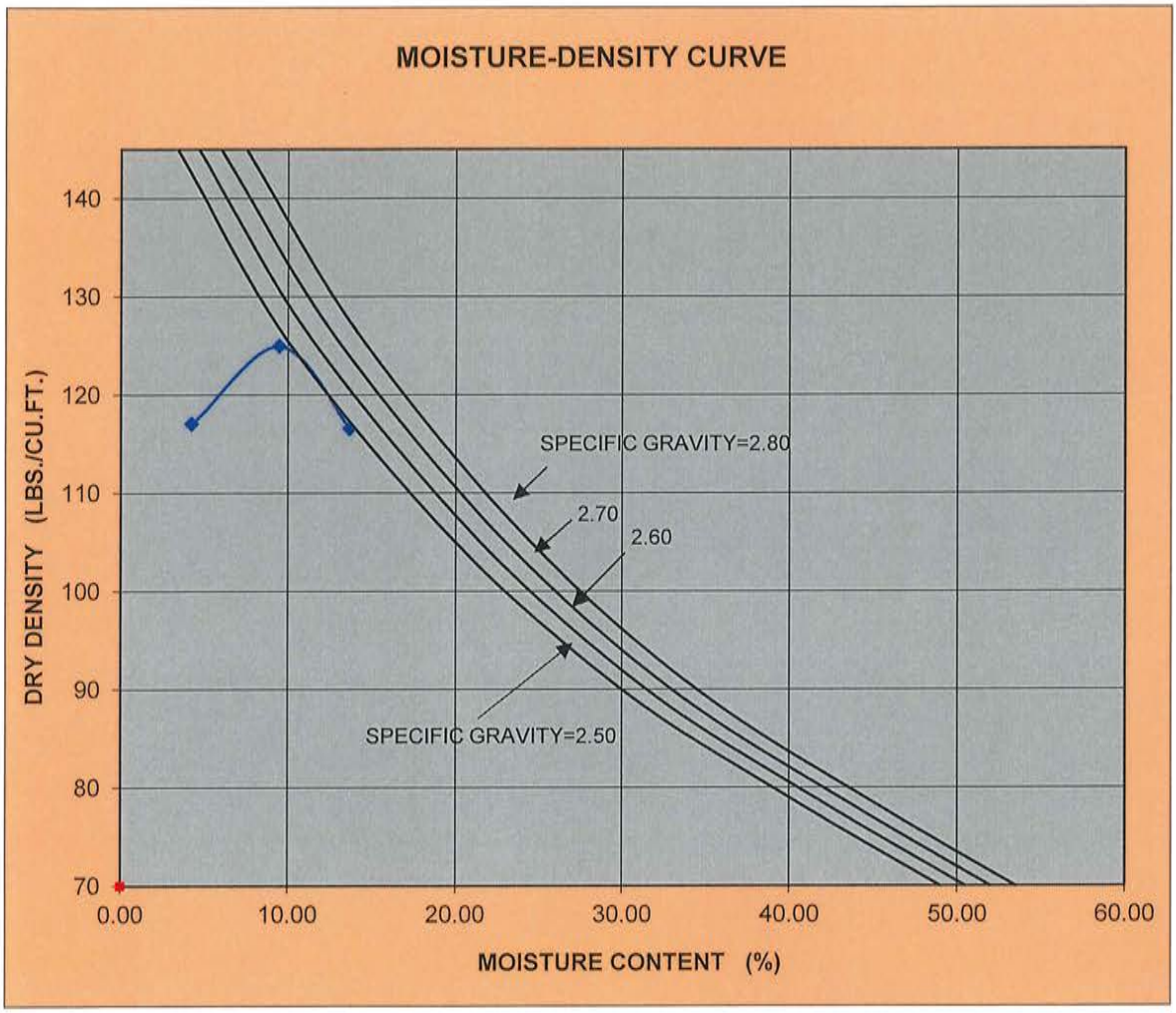
Sample	Method	Result	Units	Remarks
pH	EPA 9040 B	8.95	units	Not corrosive
Resistivity	SM 2510B	10600	ohms-cm	Midly corrosive
Chloride	EPA 300.0	69	mg/kg	Not corrosive
Sulfate	EPA 300.0	22	mg/kg	Not corrosive

H. Table VIII: Soil Density Correlation to SPT Blow Counts

Density/Consistency		**1" Soil Tube -- Blows Per Foot**			**Standard Penetration Blows Per Foot**
Granular	**Cohesive**	**Sand and Gravel**	**Silt**	**Clay**	
Very Loose	Very Soft	0-50	0-50	0-60	0-5
Loose	Soft	50-100	50-180	60-250	5-10
Slightly Compact	Stiff	100-350	180-1000	250-1000	10-20
Compact	Very Stiff	350-525	1000-2000	1000-4000	20-35
Dense	Hard	525-1500	2000-5000	4000-5000	35-70
Very Dense	Very Hard	1500+	5000+	5000+	70+

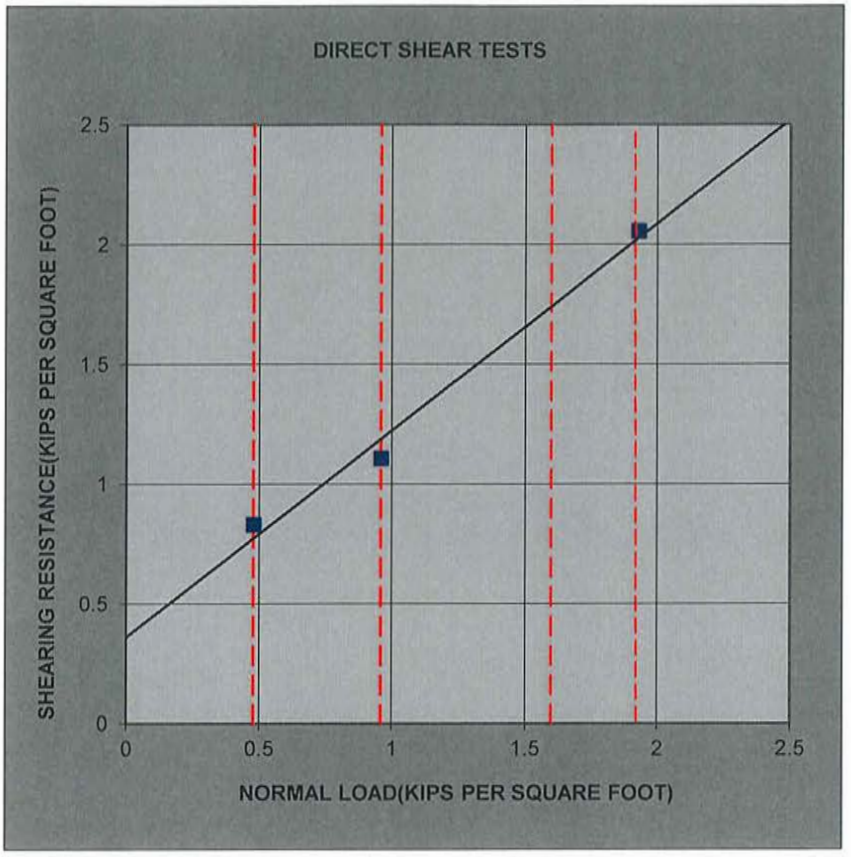
MODIFIED PROCTOR COMPACTION TEST (ASTM STD. 1557)

MOISTURE % (g)	4.25	9.50	13.68	13.68
DRY DENSITY (pcf)	117.1	125	116.6	116.6



CURVE	SOIL DESCRIPTION	OPT MOIST. CONTENT(%)	MAX DRY DENSITY (P.C.F.)
B-1 3-5'	Lord Constructors 1527 Rialto Ave. Rialto, California	9.5	125
SOIL DESCRIPTION: (SP-SM) Slightly Silty sand - tannish light brown, fine to medium coarse pebbles, rock fragments, rocks 2", some asphalt and metal slag (Undocumented FILL)			PROJECT NO. 24021-F PLATE: A-1

SOILS SOUTHWEST INC.
Consulting Foundation Engineers



SYMBOL	LOCATION	DEPTH (FT)	TEST CONDITION	COHESION (psf)	FRICTION (degree)
■	B-1	3 to 5	Remolded to 90%	360.04	40.83

Proposed Office/Warehouse 1527 Rialto Ave. @ Linden Ave. Rialto, California	PROJECT NO.	24021-F
	PLATE	B-1

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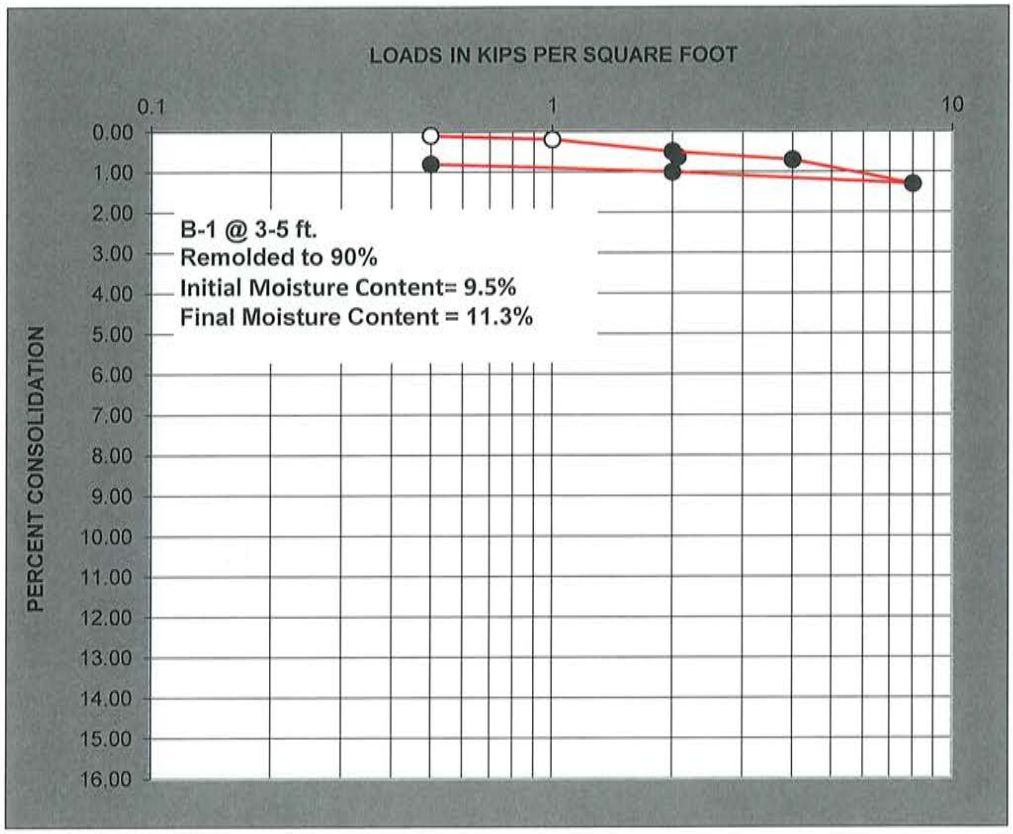
Consulting Foundation Engineers

CONSOLIDATION TESTS

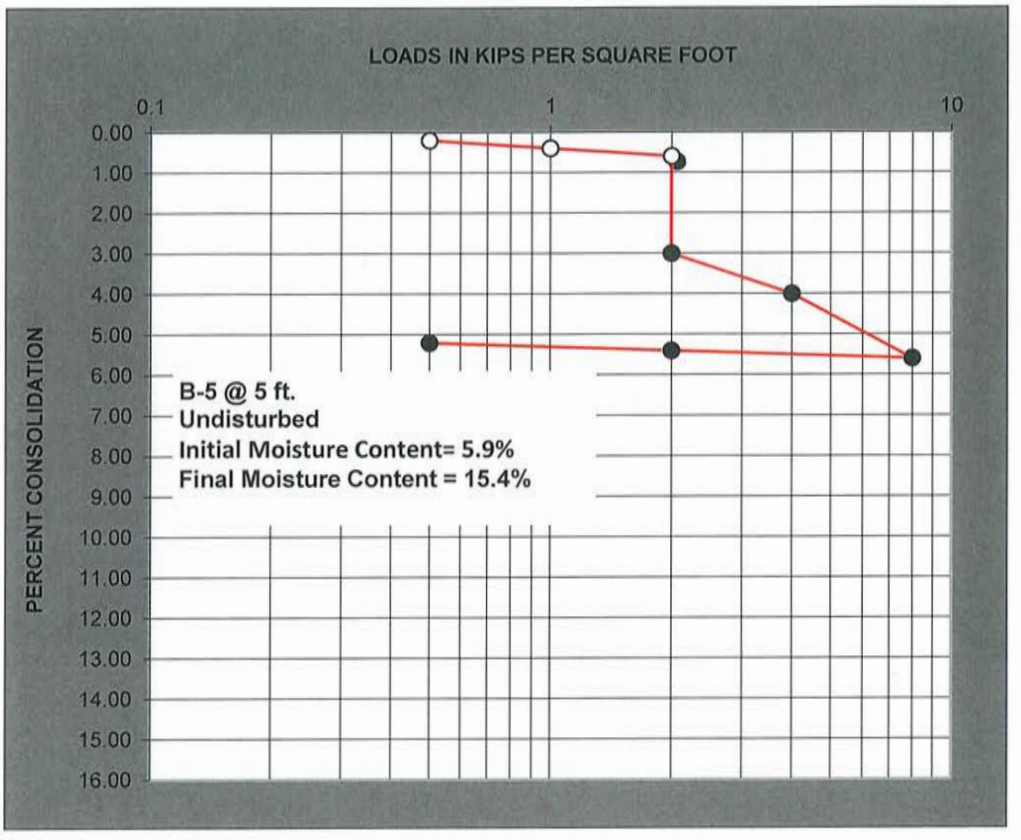


- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed Office/Warehouse 1527 Rialto Avenue, Rialto		
	PROJECT NO.	24021-F	PLATE	B-2

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

CONSOLIDATION TESTS

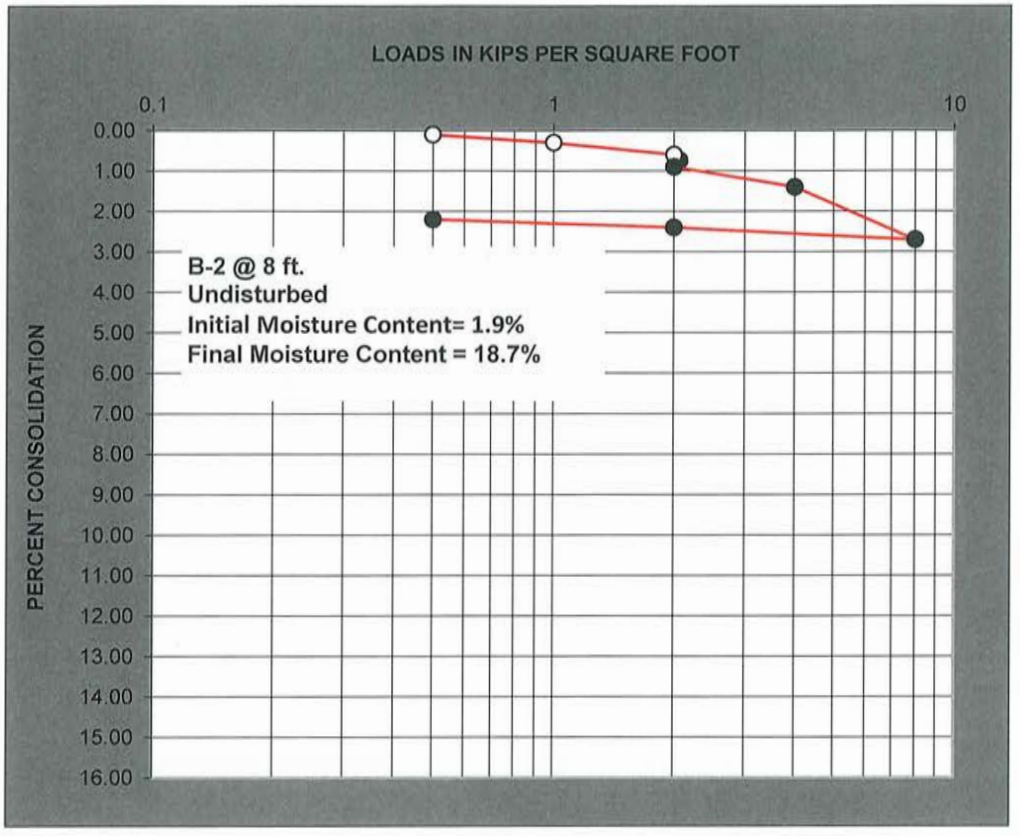


- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed Office/Warehouse 1527 Rialto Avenue, Rialto		
	PROJECT NO.	24021-F	PLATE	B-2-1

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

CONSOLIDATION TESTS



- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed Office/Warehouse 1527 Rialto Avenue, Rialto		
	PROJECT NO.	24021-F	PLATE	B-2-2

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

SAND EQUIVALENT TEST

Test Date: July 17,2024

Project No.: 24021-F

Job Name: Lord Constructors
1527 Rialto Avenue @ Linden Avenue, Rialto
Sample Location: B-3/PV-1 @ 0-4'

Sample by: JF Tested by: JF

LABORATORY DATA

SAMPLE NO.	1	2	3	4
TIME START	2:28	2:33	2:38	
TIME SOAK (10 min.)	2:38	2:43	2:48	
TIME AT LEVEL 15ML	2:40	2:45	2:50	
TIME of READING (20-min)	3:00	3:05	3:10	
FINE, ML	4.8	4.6	4.7	
COARSE, ML	2.2	2.3	2.4	
SE = 100x (coarse/fine)	45.83	50.00	51.06	
SE Average	48.96			

SAND EQUIVALENT TEST

Test Date: July 17,2024

Project No.: 24021-F

Job Name: Lord Constructors
1527 Rialto Avenue @ Linden Avenue, Rialto
Sample Location: B-5/PV-2 @ 0-3'

Sample by: JF Tested by: JF

LABORATORY DATA

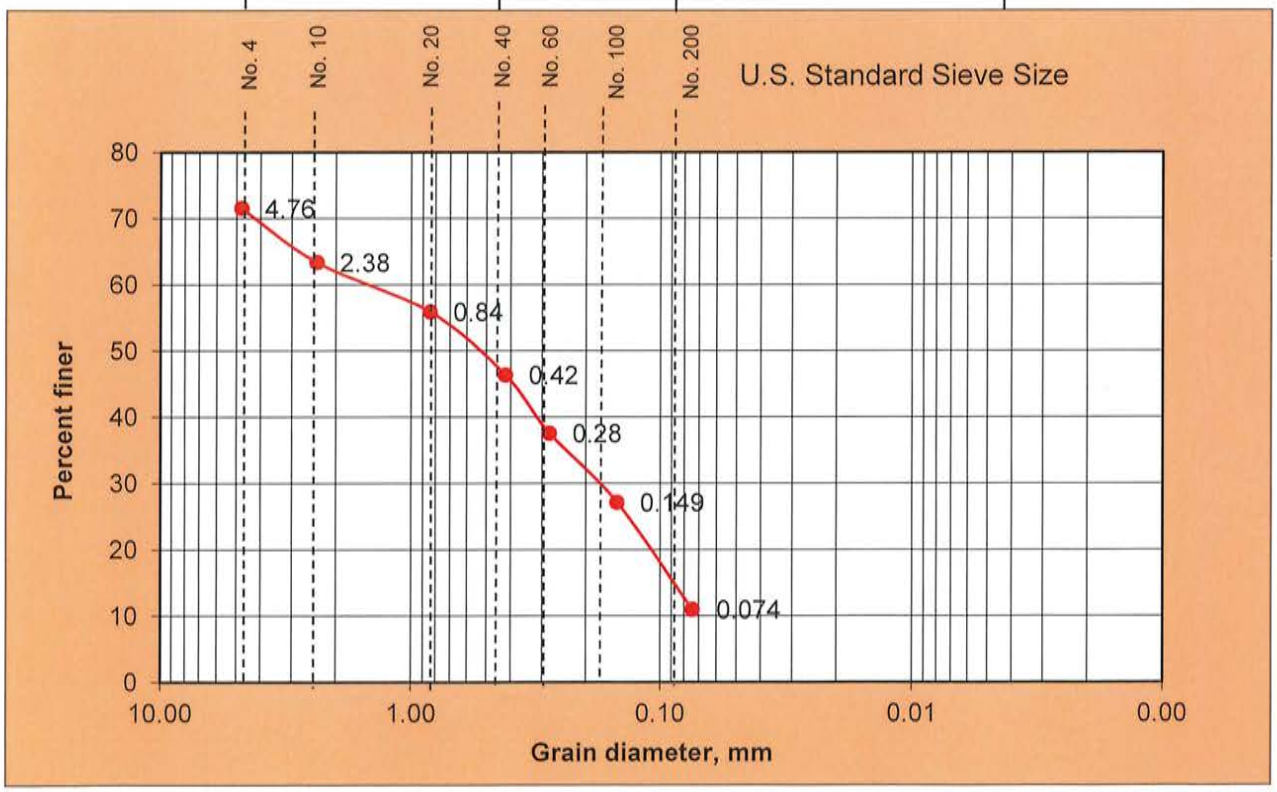
SAMPLE NO.	1	2	3	4
TIME START	3:45	3:51	3:57	
TIME SOAK (10 min.)	3:55	4:01	4:07	
TIME AT LEVEL 15ML	3:59	4:04	4:09	
TIME of READING (20-min)	4:19	4:24	4:29	
FINE, ML	4.8	4.8	4.9	
COARSE, ML	2.1	1.9	2.1	
SE = 100x (coarse/fine)	43.75	39.58	42.85	
SE Average	42.06			

GRAIN SIZE DISTRIBUTION

Project: Lord Constructors **Job #** 24021-F
Location: 1527 Rialto Ave., Rialto **Boring No:** B-5/PV2 @ 0-3' **Sample No:** 3
Description of Soil: SP-SM
Date of Sample: 7/15/2024
Tested By: JF **Date of Testing:** 7/18/2024

Sieve No.	Sieve Openings in mm	Percent Finer	Grain Size	% Retained
4	4.76	71.58	Gravel	28
10	2.38	63.40	Med. to Crs	25
20	0.84	55.92	Fines	32
40	0.42	46.40	Silts	15
60	0.28	37.60		
100	0.149	27.16		
200	0.074	10.98		

Gravel	Sand			
	Coarse to Medium	Fine	Silt	Clay



Visual Soil Description : SAND- gravely fine to medium coarse sands with some silts, rock fragments and rocks

Soil Classification: SP-SM

System: USC

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

A & R Laboratories, Inc.

1650 S. GROVE AVE., SUITE C
ONTARIO, CA 91761
909-781-6335
www.arlaboratories.com office@arlaboratories.com

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 Ken Zheng, President 07/29/2024 11:43:36
Laboratory Job No. (Certificate of Analysis No.)	2407-00196
Project Name / No.	LORD CONTRUCTORSS 24021-F/ 1527 RIALTO AVE, RIALTO
Dates Sampled (from/to)	07/15/24 To 07/15/24
Dates Received (from/to)	07/22/24 To 07/22/24
Dates Reported (from/to)	07/29/24 To 7/29/2024
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

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1650 S. GROVE AVE., SUITE C
ONTARIO, CA 91761
909-781-6335
www.arlaboratories.com office@arlaboratories.com

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CERTIFICATE OF ANALYSIS

2407-00196

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

Date Reported	07/29/24
Date Received	07/22/24
Invoice No.	2156
Cust #	S192
Permit Number	
Customer P.O.	

Project: LORD CONTRUCTORSS 24021-F/ 1527 RIALTO AVE, RIALT

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 **B-3 @ 0-4 ft.** Sample Matrix: **Soil**					Date & Time Sampled:		07/15/24 @	9:30
pH@25C-as Dissolved in Wtr	**8.95**		units	EPA 9040 B	1.0	0	07/22/24	DV
Resistivity	**10600**		ohms/cm	SM 2510B	1.0	1.0	07/22/24	DV
Chloride	**6.9**		mg/Kg	EPA 300.0 (1993 Rev 2.:	1.0	5.0	07/27/24	JEN
Sulfate	**22**		mg/Kg	EPA 300.0 (1993 Rev 2.:	1.0	5.0	07/27/24	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

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 #: 2407-00196

Client Name: Soils Southwest, Inc.
E-mail: soilssouthwest@aol.com
Address: 897 Via Lata, Suite N, Colton
Report Attention | Phone # 909-370-0474 Fax: # | Sampled By: John Flippin
Project No./ Name: Lord Construction 24021-F | Project Site: 1527 Rialto Ave, Rialto

☐ 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)	8260B / 8015 (Gasoline)	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	Sulfate	pH	Resistivity	Chloride			Remarks
1	B-3 @ 0-4 ft	7/15/24	9:30 A.M	Soil	Jar	4 ounce										✓	✓	✓	✓			

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
[signature]	SSW	7-22-24	11:25	[signature]	A&R	7-22-24	11:25
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

ANAHEIM TEST LAB, INC

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949) 336-6544

TO:

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

DATE: 7/24/2024

P.O. NO.: Verbal

LAB NO.: C-8067

SPECIFICATION: CA 301

MATERIAL: Brown, Silty Sand w. Gravel

Project No.: 24021-F
Project: Lord Constructors, Inc.
1527 Rialto Avenue, Fontana, CA
Sample ID: B-5/PV-2 @ 0-3'
Sample Date: 7/15/2024

ANALYTICAL REPORT
"R" VALUE

BY EXUDATION	BY EXPANSION
76	N/A

RESPECTFULLY SUBMITTED

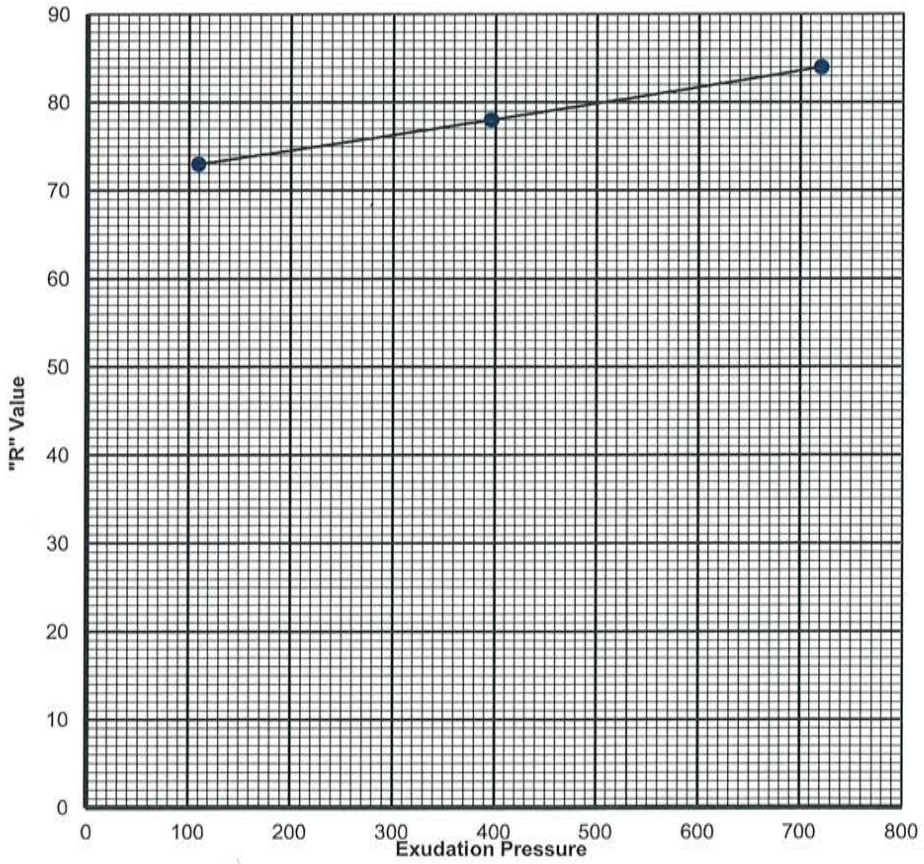
WES BRIDGER LAB MANAGER

"R" VALUE CA 301

Client: Soils Southwest, Inc. **ATL No.:** C 8067 **Date:** 7/24/2024
Client Reference No.: 24021-F
Sample: B-5/PV-2 @ 0-3' **Soil Type:** Brown, Silty Sand w. Gravel

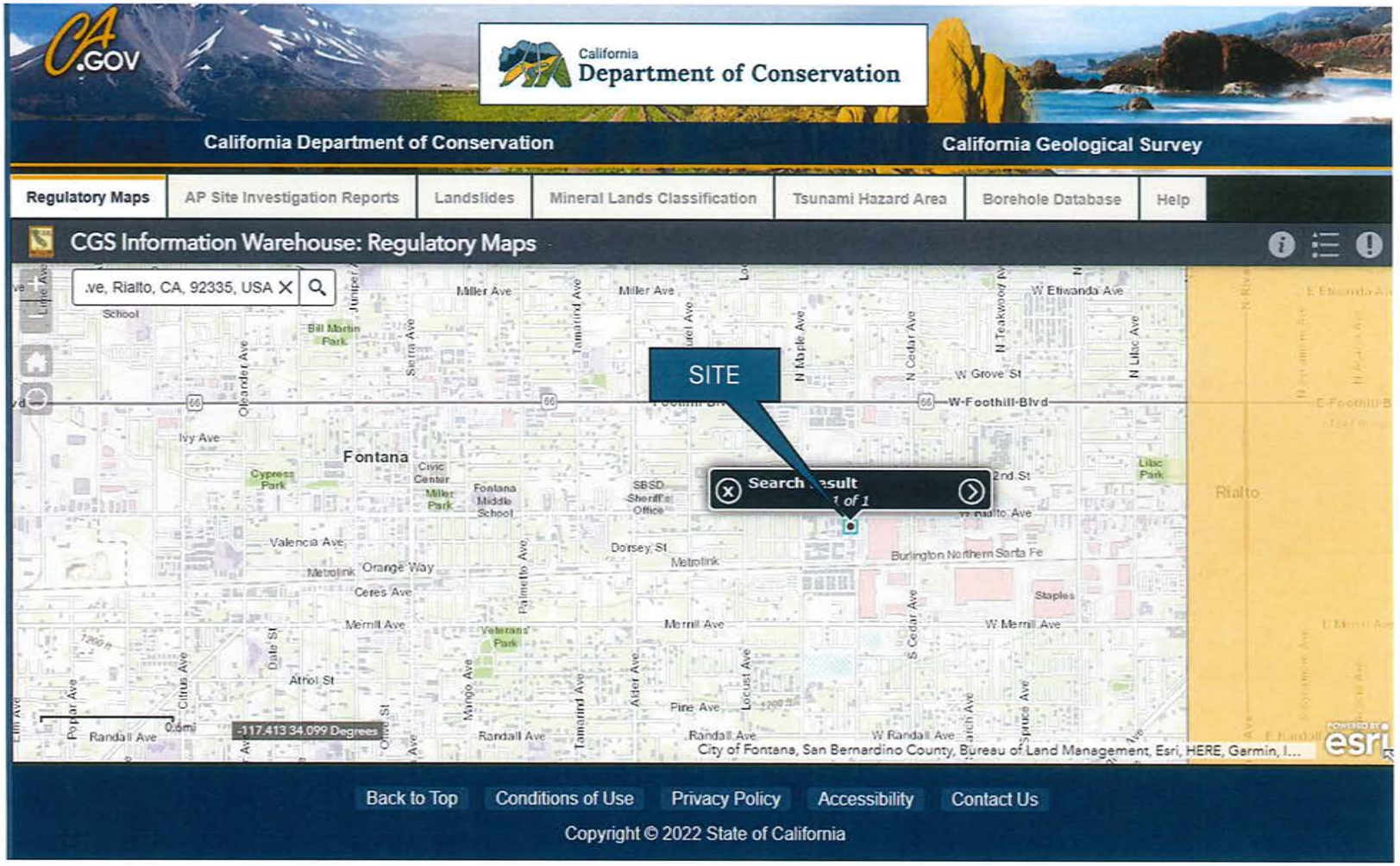
TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	350	350	350	
Initial Moisture Content	%	4.7	4.7	4.7	
Moisture at Compaction	%	8.6	9.0	8.2	
Briquette Height	in.	2.49	2.51	2.47	
Dry Density	pcf	129.2	130.0	86.9	
EXUDATION PRESSURE	psi	396	109	721	
EXPANSION PRESSURE	psf	0	0	0	
Ph at 1000 pounds	psi	13	19	10	
Ph at 2000 pounds	psi	25	31	19	
Displacement	turns	3.76	3.93	3.51	
"R" Value		78	73	84	
CORRECTED "R" VALUE		78	73	84	

Final "R" Value	
BY EXUDATION: @ 300 psi	**76**
BY EXPANSION: TI = 5.0	**N/A**



APPENDIX C

Supplemental Seismic Design Parameters



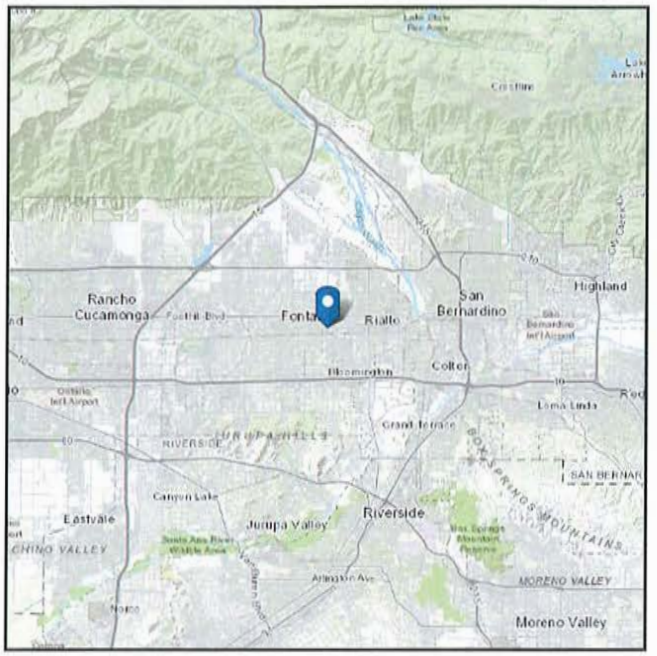
Based on review of the above regulatory map, the subject site appears to be outside the zone of any recorded fault that may, or may not pass through the subject site.

ASCE Hazards Report

Address:
No Address at This Location

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

Latitude: 34.099061
Longitude: -117.401466
Elevation: 1256.6025703031444 ft (NAVD 88)



ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	1.778	S_{D1} :	N/A
S_1 :	0.687	T_L :	12
F_a :	1	PGA :	0.748
F_v :	N/A	PGA_M :	0.823
S_{MS} :	1.778	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1.25
S_{DS} :	1.185	C_v :	1.456

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

Data Accessed: Mon Jun 10 2024

Date Source: USGS Seismic Design Maps

U.S. Geological Survey - Earthquake Hazards Program

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)
3.85	San Jacinto;SBV+SJV+A	CA	n/a	90	V	strike slip	0	16	134
3.85	San Jacinto;SBV+SJV+A+C	CA	n/a	90	V	strike slip	0	17	181
3.85	San Jacinto;SBV+SJV+A+CC	CA	n/a	90	V	strike slip	0	16	181
3.85	San Jacinto;SBV+SJV+A+CC+B+SM	CA	n/a	90	V	strike slip	0.1	15	241
3.85	San Jacinto;SBV+SJV	CA	n/a	90	V	strike slip	0	16	88
3.85	San Jacinto;SBV+SJV+A+CC+B	CA	n/a	90	V	strike slip	0.1	15	215
3.85	San Jacinto;SBV	CA	6	90	V	strike slip	0	16	45
5.98	Cucamonga	CA	5	45	N	thrust	0	8	28
8.18	S. San Andreas;BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	85		strike slip	0.1	13	390
8.18	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	512
8.18	S. San Andreas;NSB+SSB+BG+CO	CA	n/a	79		strike slip	0.2	12	206
8.18	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0.1	13	421
8.18	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	86		strike slip	0.1	13	479
8.18	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	548
8.18	S. San Andreas;BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	220
8.18	S. San Andreas;SM+NSB	CA	n/a	90	V	strike slip	0	13	133

U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Fault Name	State
San Jacinto;SBV+SJV+A	**California**

GEOMETRY	
Dip (degrees)	90
Dip direction	V
Sense of slip	strike slip
Rupture top (km)	0
Rupture bottom (km)	16
Rake (degrees)	180
Length (km)	134

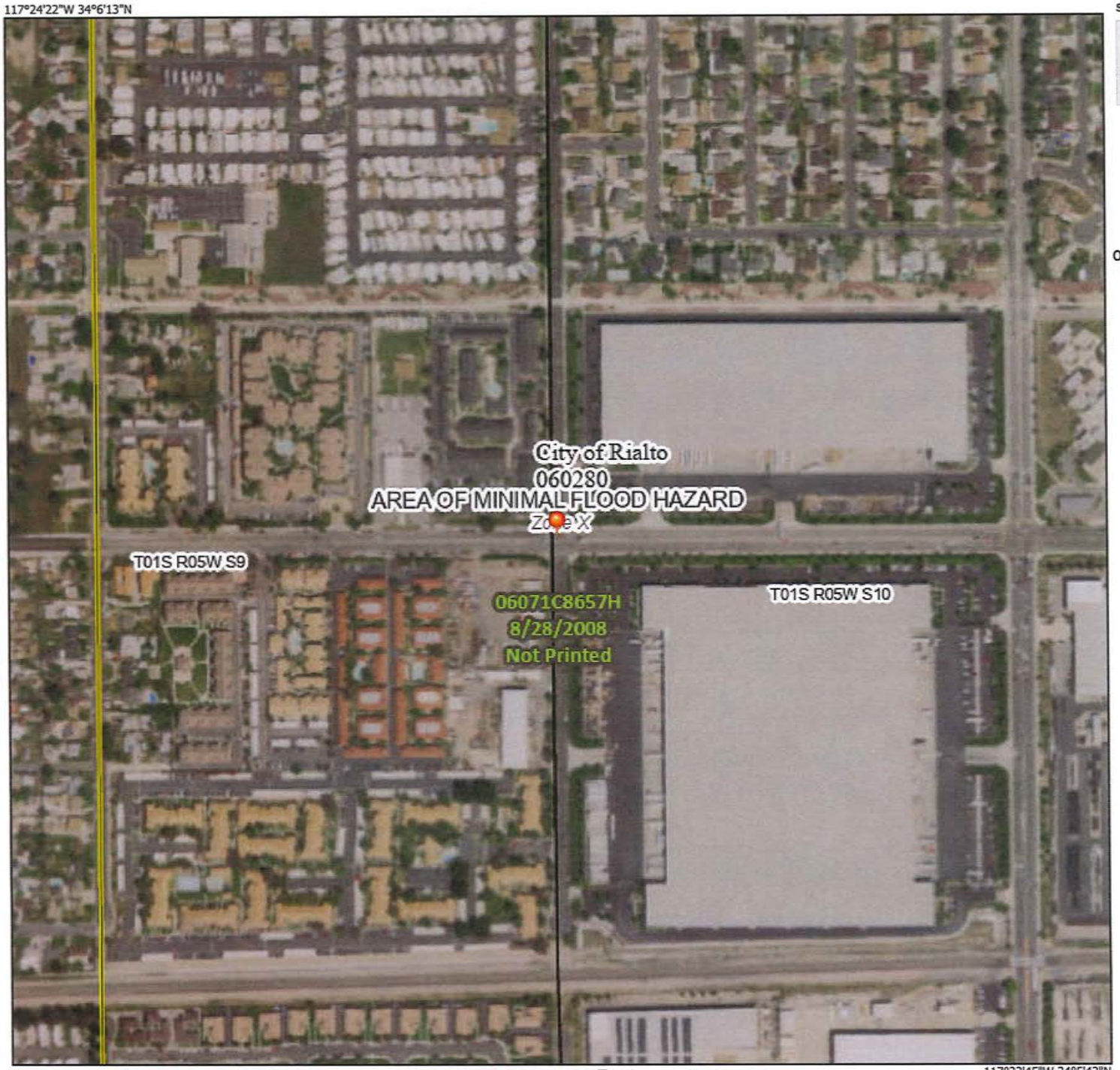
MODEL VALUES		
Slip Rate	n/a	
Probability of activity	1	
	ELLSWORTH	HANKS
Minimum magnitude	6.5	6.5
Maximum magnitude	7.62	7.63
b-value	0.8	0.8

Fault Model	Deformation Model	Char Rate[1]	GR-a-value[1]	Weight
Moment Balanced	2.1	4.81e-04 / 4.81e-04	NA / NA	0.25
Moment Balanced	2.2	4.81e-04 / 4.81e-04	NA / NA	0.10
Moment Balanced	2.3	4.81e-04 / 4.81e-04	NA / NA	0.15

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

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainag areas of less than one square mile *Zone*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zon*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 — Cross Sections with 1% Annual Chance
- 17.5 — Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximat point selected by the user and does not represe an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/11/2024 at 11:57 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

PROFESSIONAL LIMITATIONS

Our investigation was performed using the degree of care and skill 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 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 test excavations. 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 an 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, at a minimum, are met:

i. Pre-grade meeting with the contractor, public agency, and the soils engineer,
ii. Excavated bottom inspections and verifications 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 request.

In the event that the above conditions are not fulfilled, Soils Southwest, Inc. will assume no responsibility for any structural distresses during the lifetime use of the planned development.