GEOTECHNICAL INVESTIGATION

Proposed Caliber Collision Development
North of 33235 Zeiders Road
Menifee, California 92584

Prepared for

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PSI Project No. 0066-2170

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1 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc. (PSI) has completed a Geotechnical Investigation for the proposed Caliber Collision Development in Menifee, California as referenced above. Our work was performed in general accordance with our proposal (0066-352332) dated August 30, 2021 and authorized by Jessi Fazio on August 30, 2021.

1.2 PROJECT DESCRIPTION AND SCOPE OF WORK

Currently the site consists of an approximately 2.37-acre parcel zoned for light industrial development. The site is located directly north of 33235 Zeiders Road in Menifee, California. The site is bordered by Zeiders Road to the east and by light industrial developments to the north, west, and south.

Based on the project description provided, the proposed construction will consist of a 1-story (17,000 to 18600 square foot) structure. The proposed building's structural system will consist of a steel framed roof, load bearing masonry wall building structure with a brick veneer. PSI understands that column loadings are on the order of 80 to 140 kips, and column foundations will be subjected to uplift forces. Uplift loads were not available at the time this proposal was prepared. Typical column spacing is anticipated to vary between 20 and 40 feet on center. Maximum continuous footing gravity loads are anticipated to be in the range of 2.5 to 3.5 kips per linear foot. Floor slab loading is to be designed to provide a uniform live load of 125 pounds per square foot (psf) and withstand a maximum concentrated load of 8 kips. Slab subgrade is to provide a reaction modulus of 150 psi in minimum with a 4-inch-thick granular sub-base. Interior concrete pit retaining walls with an estimated maximum retaining height of 3 feet are also anticipated.

The maximum allowable differential movements for soils supporting masonry walls shall be L/900. The maximum allowable differential movements for soils supporting interior slabs or interior isolated footings shall be L/500 (where L=40ft). The maximum allowable total settlement shall be 1 inch. In the case of expansive clays, the maximum potential heave shall be 1 inch.

Should any of the above information be inconsistent with your objectives, it is requested that you contact PSI immediately to allow us to make any necessary modifications to this proposal.

2 SITE AND SUBSURFACE CONDITIONS

2.1 TOPOGRAPHY

Based on a topographic map for the Murrieta Quadrangle, the site slopes to the west with elevations ranging between approximately EL 1530 and EL 1540 feet above mean sea level. Drainage flows to the west. We anticipate up to 10 feet of fill will be required to flatten the site with a retaining wall or slope descending toward the west.

2.2 GEOLOGY

Based on geologic mapping of the area by Dibblee and Minch (2008), the geology consists of alluvial deposits (Qa); typically consisting of sand and gravel of valley areas, with possible clay soils at the surface. A USDA soils survey of the site reports Las Posas loam (LaD2) on the east end of the site generally consist of clay loam over bedrock at approximately 4½ feet below the ground surface (bgs) and Wyman loam (WyC2) on the west end of the site (clay loam). The Wyman loam is reported to have a high corrosion potential for steel construction.

2.3 SUBSURFACE CONDITIONS

As indicated in the boring logs provided in Appendix A (with locations shown on Figure 2), the subsurface soils encountered generally consist of very dense sand with silt to the maximum depth explored, approximately 21½ feet bgs. An approximate 4½-foot layer of hard silty lean clay was encountered at the ground surface of boring location B5. Very dense silty sand and sand with silt was observed below this clay. Decomposed granite appeared to be encountered in many of the samples. Medium dense to dense sands; and stiff sandy silt were encountered at B-6 and B-7, respectively, to approximately 6½ feet bgs where these borings were terminated. The soil borings were backfilled with soil cuttings upon completion. Laboratory test results are also included in Appendix A.

The stratification presented on the boring logs is based on a visual examination of the recovered soil samples and the interpretation of field logs by a geotechnical professional. Included on the boring logs are the standard penetration resistances (SPT N-values and California Modified sampler blows) recorded in the individual borings at standard testing intervals to the boring termination depths.

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs, included in Appendix A, should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratification, penetration resistance, locations of the samples and laboratory test data. The stratification shown on the boring logs represents the conditions only at the actual boring locations at the time of our exploration. Variations may occur and should be expected between boring locations. The stratification that represents the approximate boundary between subsurface materials and the actual transition may be gradual.

2.4 GROUNDWATER

Groundwater was encountered during our recent investigation at the site at a depth of approximately 19 to 19½ feet bgs in borings B3 and B4, respectively, on the southside of the site. Based on the California Department of Water Resource database, groundwater was measured 0.4 miles southeast of the site at a depth of approximately 21 feet below ground surface (bgs) in 1993 (Well #06S03W23E001S); however, this well was only measured one time. A 2007 report by Wayne Perry, Inc. for a Shell station located approximately 3 miles north of the proposed site reported finding groundwater at a depth of approximately 90 feet bgs.

We do not believe that groundwater will impact the proposed construction. It is possible, however, that transient, saturated ground conditions at shallower depths could develop at a later time due to periods of heavy precipitation, landscape watering, leaking water lines, or other unforeseen causes. Variations in groundwater levels should be expected seasonally, annually, and from location to location.

2.5 SEISMIC CONSIDERATIONS

2.5.1 Regional Seismicity

The project site is located in Southern California, which has undergone a complex multiphase structural history and remains an active tectonic region with documented historic earthquakes. Generally, the seismicity within California can be attributed to faulting due to regional tectonic movement. This includes the San Andreas Fault and other sub-parallel strike-slip faults, as well as normal and thrust faulting within the State. The area of the subject site is considered seismically active. Seismic hazards within the site can be attributed to potential ground shaking resulting from earthquake events along nearby or more distant faulting.

2.5.2 Faulting

According to the Alquist-Priolo Special Studies Zones Act of 1972 (revised 1994) faults have been classified as active faults which show apparent movement during the last 11,000 years (i.e., Holocene time). Based on the California Department of Conservation Fault Activity Map, the site is not located within an Alquist-Priolo fault zone area and no faults are known to traverse the site. Based on the 2010 CGS Fault Activity Map, the closest known active faults are the Elsinore fault which is located approximately 5.2 miles southwest of the site, and the San Jacinto Fault which is located approximately 14.7 miles northeast of the site. The potentially active Murrieta Hot Springs fault is located approximately 5.1 miles south of the site.

2.5.3 Liquefaction and Lateral Spreading

Based on the County of Riverside GIS database, the site area is mapped as not being within a liquefaction zone. Based on the soil conditions encountered at the site (generally dense to very dense soils), we do not believe that liquefaction and lateral spreading are design concerns at this site. The Menifee General Plan (3/12/14) also shows that this site is not within a liquefaction zone.

2.5.4 Tsunamis and Seiches

Based on the elevation of the site and distance to the ocean, the site is not located within a tsunami prone area. The site is not located near any large bodies of water; therefore, we do not consider seiches to be a design concern for the site.

2.5.5 Seismic Design Parameters

We have employed the 2019 California Building Code (CBC), the locally adopted version of the International Building Code, 2018 edition. As part of this code, the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site.

As part of the procedure to evaluate seismic forces, the code requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface. Our boring extended to a depth of 21½ feet bgs, but to define the Site Class for this project, we have interpreted the results of soil test borings drilled within the project site and estimated appropriate soil properties below the base of the borings to a depth of 100 feet as permitted by the code. The estimated soil properties were based upon the soils encountered at the site, data available in published geologic reports, and our experience with subsurface conditions in the general site area.

Based upon our evaluation, the subsurface conditions at the site are consistent with the characteristics of a **Site Class "C"** as defined in Chapter 20.3-1 of the ASCE 7-16. The associated probabilistic ground acceleration values and site coefficients for the general site area were obtained from the USGS geohazards web page (https://seismicmaps.org/) using ASCE 7-16 and are presented in the table below.

Table 1 - Ground Motion Values*

Period (sec)	Mapped MCE Spectral Response Acceleration (g)		Site Coefficients		Adjusted MCE_R Spectral Response Acceleration (g)		Design Spectral Response Acceleration (g)	
0.2	S_s	1.41	F_a	1.2	S_{Ms}	1.692	S_{Ds}	1.128
1.0	S_1	0.523	F_v	1.477	S_{M1}	0.773	S_{D1}	0.515

**2% Probability of Exceedance in 50 years* *Latitude* 33.6386°N
MCE_R = Maximum Considered Earthquake *Longitude* 117.1767°W

The Site Coefficients referring to ASCE 7-16 Section 11.4.8 require the structural engineer to apply appropriate calculations as needed. Design of structures should comply with the requirements of the governing justification's building codes and standard practices of the Structural Engineering Association of California.

3 CONCLUSIONS AND RECOMMENDATIONS

The following geotechnical related recommendations have been developed on the basis of the subsurface conditions encountered and PSI's understanding of the proposed development. The primary geotechnical consideration at this site is the existence of very dense materials encountered and silty clay encountered at the northwest corner of the proposed building. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to our recommendations will be required.

3.1 SITE PREPARATION

The site development area should be cleared of any site improvements, undocumented fill, cisterns, and other structures in conflict with the proposed construction and should extend at least 5 feet beyond the proposed building pad and 3 feet beyond the proposed pavement areas. We also recommend that the silty clay encountered at boring location B5 be removed and replaced with material having a very low to low expansion potential (silty sand, sandy silt). This silty clay soil should be removed from below proposed building areas to a depth of at least 5 feet below finish grade. In pavement areas, this silty clay should be removed to a depth of at least 2 feet below pavement sections. Following site clearing and removal of any existing unsuitable materials, excavation bottoms in site improvement areas intended for structures and pavements must be approved by the Geotechnical Engineer prior to fill placement. These exposed subgrades should be proof rolled with a heavy rubber-tired piece of construction equipment (15 tons or similar) in the presence of the Geotechnical Engineer's representative. Any soil that ruts or deflects more than 1 inch during proof rolling should be removed as recommended by the Geotechnical Engineer at the time of grading. Excavation bottoms should be firm and unyielding prior to placing fill above. Once approved, the soils exposed at the base of all excavations should be scarified to a depth of at least 12 inches, moisture conditioned and then compacted as described below prior to placing Engineered Fill above.

3.2 GENERAL GRADING

Grading may be proposed at the project site to establish design grades (we assume up to approximately 10 feet). The adequacy of site clearing operations should be verified by the Geotechnical Engineer's representative during construction as described above. Final grading should be designed to provide positive drainage away from all structures. Soil areas within 10 feet of proposed structures should slope at a minimum of 5 percent away from the structure, if possible. Roof leaders and downspouts should discharge onto paved surfaces sloping away from the structure. Such drainage should not be allowed to saturate soils below building foundations.

3.3 EXCAVATION CONSIDERATIONS

Excavations into onsite soils may be accomplished using conventional earth-moving equipment capable of working in very dense, granitic, sandy material. Open excavations exceeding four feet should be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor should evaluate the soil exposed in the excavations as part of the required safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed limitations specified by local, state, and federal safety regulations. PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

Excavations extending below a 1H:1V plane extending down from any adjacent footings should be shored for safety. Existing foundations must not be undermined. All excavations should be inspected by a representative of the geotechnical engineer during construction to allow any modifications to be made due to variation in the soil types. Equipment and/or soil stockpiles must be maintained a distance away from excavations equal to the depth of the excavation. All work should be performed in accordance with Department of Labor Occupational Safety and Health Administration (OSHA) guidelines. Job site safety is the responsibility of the project contractor.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering the excavations. The bottom of the excavations should be sloped to a collection point. Collected water within the foundation and utility trench excavations should be discharged to a suitable location outside the construction limits.

3.4 UTILITY TRENCH CONSTRUCTION

Utility trenches may be backfilled with suitable onsite native soils or imported soil above the pipe zone. Trench backfill should be moisture conditioned to within 0 to 4 percent above the optimum moisture content, compacted in 6- to 8-inch lifts to a minimum of 90 percent of the maximum dry density as determined by the modified Proctor (ASTM D1557). The top 12-inches of soil subgrade below pavement areas should be compacted to 95 percent relative compaction. If rocks larger than 3 inches in maximum size are encountered, they should be removed from the backfill material prior to placement in the utility trenches. Pipe zone backfill requirements should be in conformance with the requirements of the local agencies having jurisdiction; but should consist of clean granular sand material having a sand equivalent equal to or above 30. Jetting or flooding of utility backfill is not recommended. If smaller compaction equipment such as jumping jacks or plate compactors are used, thinner lifts will be required to achieve compaction. Where utilities cross building perimeters, concrete or concrete slurry should be used for backfill around the utility to prevent moisture from migrating along the utility trench and going beneath the building.

3.5 ENGINEERED FILL

Engineered Fill may include both onsite and import soil. In building areas, per ASTM D1557, such fill should not contain rock fragments greater than 3 inches in diameter or have greater than 30 percent retained on the ¾-inch Sieve and should not contain more than 3 percent (by weight) of organic matter or other unsuitable material. Onsite or imported Engineered Fill soils should have an expansion index (EI) that does not exceed 20 (very low). Based on our subsurface investigation, existing on-site soils (other than the silty clay) appear to be suitable for use as Engineered Fill. Proposed fill materials should be sampled and approved several days prior to grading to allow for testing in the laboratory per ASTM D1557. Import materials meeting the above requirements should be approved by the Geotechnical Engineer several days prior to importing to the site. Soils that are environmentally impacted should not be used as Engineered Fill onsite.

Engineered Fill should be compacted to at least 90 percent of the maximum dry density as determined by the modified Proctor (ASTM D1557). The moisture content of Engineered Fill should be maintained at approximately 0 to 4 percent of the material's optimum moisture content. If the Engineered Fill is too dry, water should be uniformly applied across the affected fill area. If the Engineered Fill is too wet, it must be dried. Engineered Fill should be thoroughly mixed by disking, or other approved methods, to obtain relatively uniform moisture content throughout the lift prior to compaction.

Engineered Fill should be placed in maximum lifts of 8 inches of loose material. Each lift of Engineered Fill should be tested for compaction and moisture content by a PSI soils technician, working under the direction of our Project Geotechnical Engineer, prior to placement of subsequent lifts. Compaction of the backfill should be verified with a sufficient number of density tests, as determined by the Geotechnical Engineer, to determine if adequate compaction is being achieved by the contractor. The properly compacted Engineered Fill should extend horizontally outward beyond the exterior perimeter of the proposed site improvement a distance equal to the height of fill or 5 feet, whichever is greater. If smaller compaction equipment such as jumping jacks or plate compactors are used, thinner lifts will be required to achieve compaction.

3.6 SHALLOW FOUNDATIONS

We understand the new structure will have a maximum column loads may vary from 80 to 140 kips. Wall loadings varying between 2.5 and 3.5 kip/ft are anticipated. In our opinion, the structural loads of the proposed development can be supported on conventional spread footing foundations constructed in accordance with the following design criteria.

Footings should be established at a minimum depth of 12 inches below the lowest adjacent finished grade. In addition, isolated column and continuous footings should have a minimum width of at least 18 inches. We recommend the use of a smooth-edged excavator to make the footing excavations. A geotechnical engineer should observe the footing excavation bottoms at the time of excavation and prior to placing reinforcing steel and concrete.

Based primarily on settlement considerations, footings established in accordance with these criteria can be designed on the basis of an allowable soil bearing pressure of 3,000 psf. This value applies to the total of dead load plus frequently and/or permanently applied live loads and can be increased by one third for the total of all loads; dead, live, and wind or seismic.

If unsuitable soils are encountered at footing excavation bottoms, the unsuitable material should be over excavated to firm subgrade material and replaced with Engineered Fill or granular structural fill. The total width of the over-excavation area beneath the design footing elevation should increase by 1 foot for each foot of over-excavation depth. The over-excavated areas should be backfilled with Engineered Fill or clean crushed rock and compacted to at least 90% of the maximum dry density and 0 to 4 percent above optimum moisture content as determined by ASTM D1557.

The total settlement of footings designed in accordance with the recommendations presented above is estimated to be about 1 inch. Differential settlements between adjacent foundation units should be less than half the total settlement over a horizontal distance of 40 feet.

Horizontal shear forces can be resisted partially or completely by frictional forces developed between the base of spread footings and the underlying soil. The total shearing resistance between the foundation footprint and the soil can be computed as the normal force, i.e., the sum of all vertical forces (dead load plus real live load), times the coefficient of friction equal to 0.35 (ultimate value). If additional lateral resistance is required, passive earth resistance against embedded footings or walls can be computed using a pressure based on an ultimate equivalent fluid with a unit weight of 400 pcf up to a maximum value of 4,000 psf. This design passive earth pressure assumes that Engineered Fill is used to backfill the footing excavations.

3.7 SLABS ON GRADE

We recommend the slab-on-grade be underlain by at least 4 in. of sand or rounded aggregate base to be used as a capillary break. In our opinion, a coefficient of subgrade reaction k of 150 pci can be assumed for concrete slab sections supported by compacted granular soils having an expansion index less than 20.

In addition, it may be appropriate to install a durable vapor-retarding membrane beneath the slab-on-grade to limit the risk of damp floors in areas that will have moisture-sensitive materials placed directly on the floor. The vapor-retarding membrane should be installed in accordance with the manufacturer’s recommendations.

3.8 RETAINING WALLS

3.8.1 General Design Criteria

If retaining walls are proposed, cantilever earth retention structures, which are designed to yield at least 0.001H, where H is equal to the height of the earth retention structure to the base of its footing, may be designed using the active condition. Rigid earth retention structures (including but not limited to rigid walls) should be designed using the at-rest condition.

In addition to the design lateral forces due to retained earth, surcharges due to improvements, such as an adjacent building or traffic loading, should be considered in the design of the earth retention structures. Loads applied within a 1:1 (h:v) projection from the surcharge on the stem and footing of the earth retention structure should be considered in the design.

Final selection of the appropriate design parameters should be made by the designer of the earth retention structures.

3.8.2 Cantilevered Walls

The recommendations presented below are for cantilevered retaining walls. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections.

An equivalent fluid pressure approach may be used to compute the horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific slope gradients of the retained material. These do not include other superimposed loading conditions such as traffic, structures, or adverse geologic conditions.

Table 2 – Active Earth Pressure Recommendations

Surface Slope of Retained Materials (h:v)	Ultimate Equivalent Fluid Pressure (pcf) (Native/Select Backfill)*
Level	40
2:1	60

* The design pressures assume the backfill material has very low expansion index less than or equal to 20. Backfill zone includes area between back of the wall to a plane (1:1 h:v) up from bottom of the wall foundation (on the backside of the wall) to the (sloped) ground surface.

3.8.3 Restrained Retaining Walls

Retaining walls that will be restrained at the top that support level backfill or that have reentrant or male corners, should be designed for an equivalent at-rest fluid pressure of 60 and 80 pcf for level and sloping backfill conditions, respectively. If any vertical surcharge loads will be placed within 1:1 (horizontal:vertical) from the base of wall, PSI should be contacted to estimate additional lateral earth pressures that should be added to the at-rest earth pressures.

3.8.4 Retaining Wall Backfill and Drainage

Retaining walls should be provided with an adequate pipe and gravel back drain system to help prevent buildup of hydrostatic pressures. Weep-holes may be positioned at the base of the drainage system and above the exterior grades a minimum distance of 10 feet apart. Backdrains should consist of a minimum 4-inch diameter perforated collector pipe (Schedule 40, SDR 35, or approved equivalent) embedded in a minimum of one (1) cubic foot per linear foot of ¾- to 1-inch clean crushed rock or an approved equivalent, wrapped in filter fabric (Mirafi 140N or an approved equivalent). The drain system should be connected to a suitable outlet or weep-holes.

Retaining wall backfill should be placed in lifts no greater than eight (8) inches in thickness and compacted to a minimum of 90 percent relative compaction in accordance with ASTM Test Method D 1557 as Engineered Fill. The wall drainage should include a minimum two (2) feet wide section of ¾- to 1-inch clean crushed rock (or an approved equivalent). The rock should be placed immediately adjacent to the back of the wall and extend up from a back drain to within approximately 24 inches of the finish grade. The rock should be separated from the earth with filter fabric as described above. The upper 24 inches should consist of compacted on-site fine-grained material.

As an alternative to the drain rock and fabric, Miradrain 2000, or approved equal, may be used behind the retaining wall. The Miradrain 2000 should extend from the base of the wall to within 2 feet of the ground surface. The subdrain should be placed at the base of the wall in direct contact with the Miradrain 2000.

Waterproofing the back of the retaining walls should be considered to mitigate water staining, infiltration, and moisture migration through the wall. If a waterproofing system is used, it should be designed by a qualified waterproofing consultant.

3.8.5 Retaining Wall Foundations

Retaining walls may be supported by conventional shallow continuous (strip) footings bearing on firm native soil or Engineered Fill as described above for shallow foundations. Construction joints should be installed at all changes in bearing material (native/fill) and above or below foundation steps.

3.9 PAVEMENT DESIGN

In designing the proposed pavement areas, the following conditions were considered:

1. Subgrade support characteristics are typically represented by an R-Value for the design of flexible pavements in this region.
2. Vehicular traffic volumes, in terms of the number and frequency of vehicles and their range of axle loads should be considered.
3. Likely changes in vehicular use over the life of the pavement should also be considered. We have assumed that the pavement areas will not experience additional traffic.
4. Pavement life cycle was considered to be 20 years using Caltrans and Portland Cement Association Design Methods.

All site preparations and grading should be performed as discussed above in Section 3.1 and 0.

Since an evaluation of the characteristics of the actual soils present at pavement subgrade can only be provided at the completion of grading, the following pavement sections should be used for planning purposes only. Final pavement designs should be evaluated after R-value tests have been performed on the actual in-place subgrade materials exposed for use during construction.

It should be noted that additional earthwork and/or ground improvement efforts may be required during grading on the actual subgrade material encountered, in order to achieve the aforementioned design parameters and assumptions. These design thicknesses assume that a properly prepared subgrade has been achieved.

Based on the results of our field exploration and laboratory testing, we recommend the pavement designs presented in the table below. The pavement design criteria are based on the soil conditions present at the site, an R-value of 50 and the assumed Traffic Index indicated below based on the estimated traffic for the site. Final pavement designs should be based on R-value testing of the as-graded subgrade and actual traffic volumes.

Table 3 - Pavement Section Recommendations

Location	**Traffic Index** (TI)	**Asphalt Thickness** (inches)	**+**	**Aggregate Base Thickness** (inches)	**Portland Cement Concrete Thickness** (inches)	**+**	**Aggregate Base Thickness** (inches)
Standard Drive Aisles	5	3	+	4	5	+	4
Truck Drive Aisles	7	3	+	6½	5½	+	4

We recommend rigid pavements (Portland Cement Concrete, PCC) be constructed at all areas requiring heavy braking and turning such as intersections, entrances, docking bays, trash truck loading areas, etc. PCC pavement sections should incorporate appropriate steel reinforcement and crack control joints if needed and as designed by the project structural engineer. We recommend that sections be as nearly squared as possible and no more than 15-feet on a side. Contraction joints may be constructed by saw cutting to a depth of 30 percent of the slab thickness. Expansion/cold/construction joints may be used in lieu of contraction joints. Such joints should be properly sealed. A minimum 4,000 psi concrete mix is recommended having a water/cement ration of 0.5 or lower.

Subgrade soils should be proof-rolled and scarified to a depth of 12 inches, brought to moisture contents of 0 to 4 percent of optimum, then compacted to at least 95 percent of the laboratory standard. The laboratory standard should be ASTM D1557.

Aggregate base below pavement sections should be compacted to at least 95 percent of ASTM D1557 with moisture contents within ±2 percent of optimum. Aggregate base materials should be Caltrans Class II Base.

All materials should conform to and be placed in accordance with the latest revision of the Standard Specifications for Public Works Construction (Greenbook), the American Concrete Institute (ACI), the Portland Cement Association (PCA) and the requirements of the City Public Works.

3.10 SOIL EXPANSION

The expansion potential of the existing near-surface clays soil encountered in the top 2 to 4½ feet at boring location B5 is considered to be **Medium** based on the Atterberg Limits testing performed. This type of clays should be removed and replaced by engineered fill. Following site grading, testing of site soils should be performed by the project geotechnical consultant to confirm the basis of these recommendations. Depending upon the distribution of soil types and expansion/swell characteristics, differing design recommendations may be developed to better suit the types of conditions present at the site.

3.11 CORROSION

Laboratory testing of a selected soil sample indicates that the on-site clays encountered at B-5 have **Severe** levels of soluble sulfates such that they are characterized as having corrosion potential with respect to concrete. Concrete in contact with site clays may use Type V concrete having a minimum 28-day compressive strength of at least 4,500 psi. Soluble chloride levels suggest that the site soils also have a **negligible** potential for corrosion of steel (iron/ferrous materials) according to ACI 318 guidelines. Final concrete mix design should be evaluated after sulfate and chloride tests have been performed on the actual in-place subgrade material used for finished pad grades.

It is possible that similar clays may be encountered during construction in localized areas away from the boring locations. In order to reduce potential design concerns from sulfate and expansion issues, PSI recommends that on-site clays be removed and replaced by engineered fill as suggested in Section 3.1 above.

3.12 CONSTRUCTION CONSIDERATIONS

During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. Furthermore, perched groundwater conditions can develop during periods of heavy rainfall as a result of less permeable layers impeding infiltration. In these instances, overlying subgrade soils may become unstable and require remedial measures. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

Groundwater was encountered during our explorations onsite. It should be noted that variations in the groundwater table may result from changes in precipitation, irrigation, and other factors that may not have been present at the time of our exploration. This sometimes occurs where relatively impermeable and/or cemented materials are overlain by fill soils. We recommend that a representative of PSI be present during grading operations to evaluate areas of seepage if encountered. Drainage devices for reduction of water accumulation can be recommended if these conditions occur.

Water should not be allowed to collect in foundation excavations or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slabs. The grades should be sloped away from the structure and surface drainage should be collected and discharged such that water is not permitted to infiltrate the subgrade areas below the structure.

3.13 PLAN REVIEW

Once final design plans and specifications are available, a review of grading and structural foundation plans by PSI is recommended prior to submittal as a means to check that our geotechnical recommendations have been properly interpreted and implemented. Reviewing agencies typically require our review and approval. Our review and approval are required prior to our signing and stamping of any plans. Associated drawing edits may be required. Review of plans, responses to review comments by others, and work beyond this report will require a change order.

3.14 OBSERVATION AND TESTING DURING CONSTRUCTION

It is recommended that PSI be retained to provide observation and testing services during site preparation, site grading, utility trench construction, foundation excavation, slab subgrade preparation, and construction of pavement areas. This is to observe compliance with the design concepts, specifications and recommendations, and to allow for possible changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

4 GEOTECHNICAL RISK AND REPORT LIMITATIONS

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding sections constitute PSI's professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

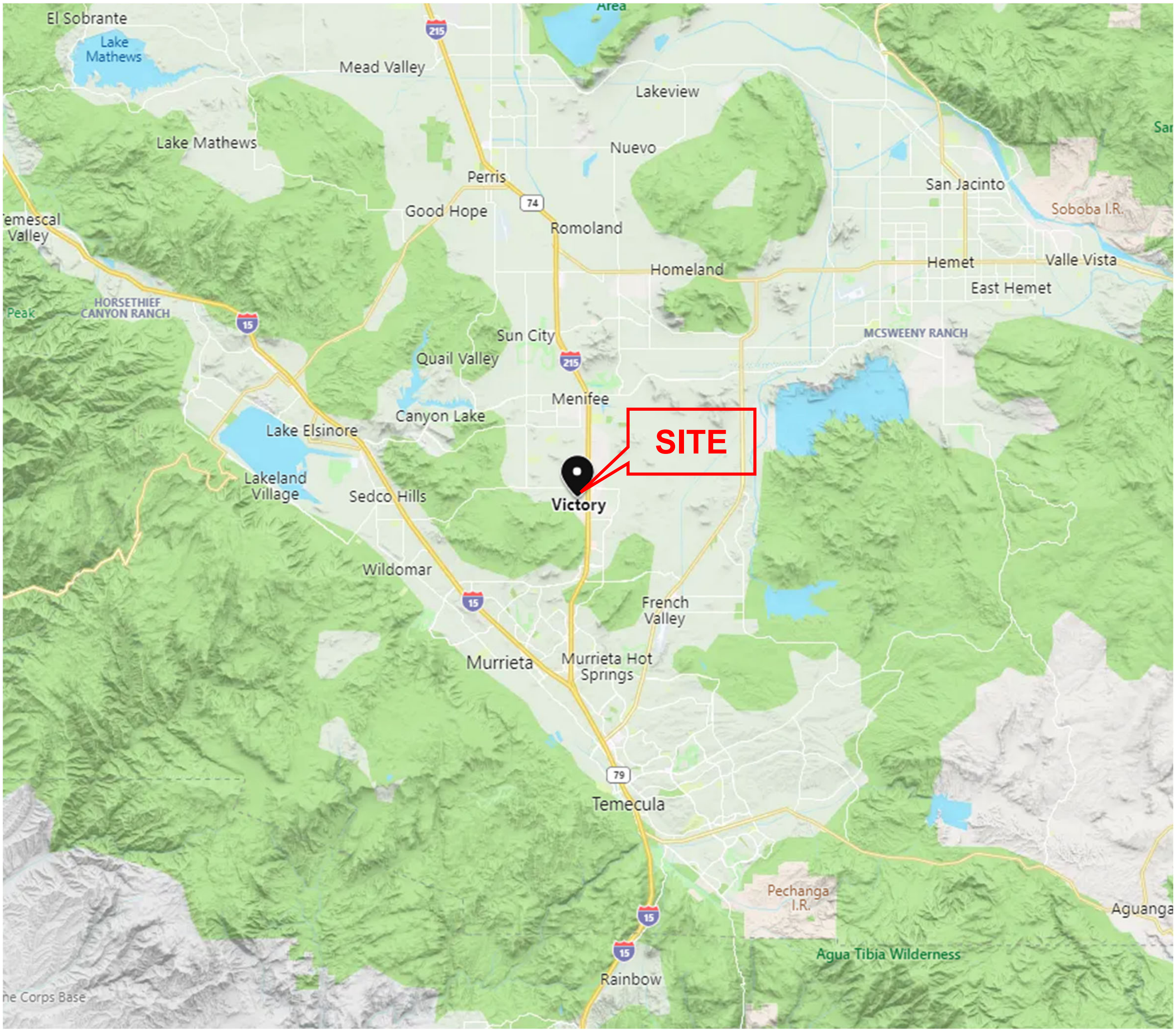
The recommendations submitted are based on the available subsurface information obtained by PSI, and information provided by **Victory Real Estate Development**. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation and/or other recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

This report has been prepared for the exclusive use of **Victory Real Estate Development** and **Caliber Holdings, LLC** for the specific application as described herein.

5 REFERENCES

1. American Concrete Institute, "Building Code Requirements for Structural Concrete", ACI 318-11, 2017.
2. California Geologic Survey, "Fault Activity Map of California", https://maps.conservation.ca.gov/cgs/fam/App/
3. Caltrans, "Highway Design Manual", July 2020.
4. Dibblee, T.W. and Minch, J.A., "Geologic Map of the Murrieta 15 Minute Quadrangle, Riverside County, California", Dibblee Geological Foundation, DF-417, 2008.
5. Menifee General Plan, 3/12/14.
6. Portland Cement Association, "Thickness Design of Concrete Highway and Street Pavements".
7. Riverside County Mapping Portal, ArcGIS Hub.
8. Terzaghi, K. and Peck, R. B., "Soil Mechanics in Engineering Practice", 2nd edition.
9. USDA NRCS, "Custom Soil Resource Report for Western Riverside Area, California", 2021.
10. USGS Website https://seismicmaps.org/ , US Seismic Design Maps.

FIGURES



Reference – Bing Maps

intertek psi	DATE: 10/1/2021	**PROPOSED CALIBER COLLISION DEVELOPMENT** North of 33235 Zeiders Road Menifee, California 92584	PSI PROJECT NUMBER: 0066-2170	N
INTERTEK - PSI, INC. 11980 TELEGRAPH RD, UNIT 104 SANTA FE SPRINGS, CALIFORNIA	PREPARED BY: DTA	**SITE VICINITY MAP**	**FIGURE 1**	

Legend

⊗ B8 **Approximate Boring Location**

Reference Proposed Soil Boring Plan (Victory Developments, revised 07/09/21)

intertek psi	DATE: 10/1/2021	**PROPOSED CALIBER COLLISION DEVELOPMENT** North of 33235 Zeiders Road Menifee, California 92584	PSI PROJECT NUMBER: 0066-2170	N
INTERTEK - PSI, INC. 11980 TELEGRAPH RD, UNIT 104 SANTA FE SPRINGS, CALIFORNIA	PREPARED BY: DTA	**BORING LOCATION PLAN**	**FIGURE 2**	

APPENDIX A

FIELD EXPLORATIONS AND LABORATORY TESTING PROGRAM

FIELD EXPLORATION PROGRAM

On September 20, 2021, the subsurface conditions were explored by drilling eight (8) soil borings (B1-B8) in the proposed building pad area and parking lot areas to maximum depths of approximately 21½ feet below ground surface (bgs). The boring locations are shown on Figure 2. Drilling was performed by 2R Drilling of Chino, California using a hollow-stem auger method of drilling. The soil types encountered at the specific boring locations are presented on the attached Boring Logs.

During the boring sampling procedure, Standard Penetration Tests (SPT) were performed in accordance with ASTM D1586 and relatively undisturbed samples were obtained in general accordance with ASTM D3550. The SPT for soil borings is performed by driving a split-spoon sampler, with an outside diameter of 2 inches, into the undisturbed formation located at the bottom of the advanced borehole with repeated blows of a 140-pound hammer falling a vertical distance of 30 inches. The number of blows required to drive the sampler the last 12 inches of an 18-inch penetration depth is a measure of the soil consistency (blow count). For ASTM D3550 (California Modified Sampler) the split barrel sampler possesses a 3-inch O.D. and is driven in the same manner as the SPT. The field blow counts obtained from the California Modified sampler should be adjusted to obtain a rough correlation to SPT blow counts (SPT-N value). SPT blowcounts in gravel tend to over-estimate density. Samples were identified in the field, placed in sealed containers and transported to the laboratory for further classification and testing.

Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, and other distinguishing characteristics of the soil samples were noted. The terminology used in the soil classifications and other modifiers are depicted in the General Notes and Soil Classification Chart.

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA:	Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA:	Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.:	Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.:	Diamond Bit Core Sampler
H.A.:	Hand Auger
P.A.:	Power Auger - Handheld motorized auger

☒	SPT:	Standard Penetration Test sampler - 1 3/8" I.D., 2" O.D.
▥	CMS:	California Modified Sampler - 2 1/2" I.D., 3" O.D.
■	ST:	Shelby Tube - 3" O.D.
▯	RC:	Rock Core
✋	BS:	Bulk Sample

SOIL PROPERTY SYMBOLS

N:	Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}:	A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u:	Unconfined compressive strength, TSF
Q_p:	Pocket penetrometer value, unconfined compressive strength, TSF
w%:	Moisture/water content, %
LL:	Liquid Limit, %
PL:	Plastic Limit, %
PI:	Plasticity Index = (LL-PL),%
DD:	Dry unit weight, pcf
▼,▽,▼	Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated

Description	Criteria
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

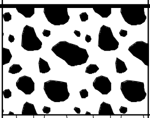
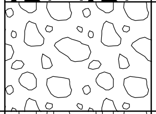
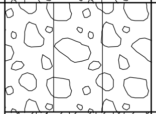
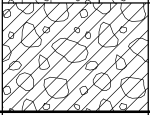
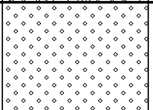
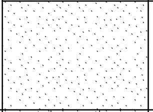
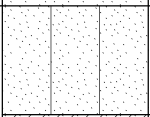
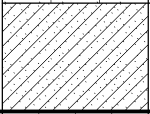
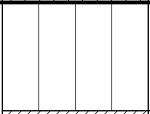
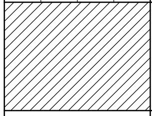
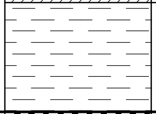
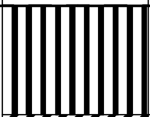
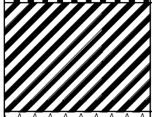
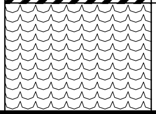
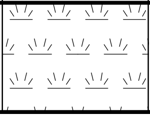
Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

DATE STARTED: 9/20/21
DATE COMPLETED: 9/20/21
COMPLETION DEPTH 5.3 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE: 33.63874°
LONGITUDE: -117.17585°
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: 2R Drilling
DRILLER: Nick **LOGGED BY:** N. Barba
DRILL RIG: CME-75
DRILLING METHOD: 8" Hollow Stem Auger
SAMPLING METHOD: SS: CMS & SPT
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: D. Abernathy

BORING B1

Water ▽ ▼ ▽ NONE

BORING LOCATION:
Proposed Driveway Entrance

Elevation (feet)	Depth, (feet)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL 0 25 50 / STRENGTH, tsf ▲ Qu ✳ Qp 0 2.0 4.0	Additional Remarks
	0						
		Silty SAND with Gravel, reddish-brown, very dense, moist. becomes brown. (Bedrock fragments)	SM	30-50(3")	4	× >>◎	Sieve Analysis
	5	**Gravelly SAND**, brown, very dense, moist. (Decomposed Granite)	SP	50(3")	7	× >>◎	Rings Disturbed
		Boring terminated at 5-1/4 feet below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings.					

intertek psi

Professional Service Industries, Inc.
11980 Telegraph Rd, Unit 104
Santa Fe Springs, CA 90670
Telephone: (714) 484-8600

PROJECT NO.: 00662170
PROJECT: Caliber Collision Development
LOCATION: North of 33235 Zeiders Road
Menifee, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

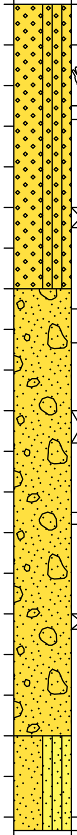
DATE STARTED: 9/20/21
DATE COMPLETED: 9/20/21
COMPLETION DEPTH 20.3 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE: 33.63868°
LONGITUDE: -117.17599°
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: 2R Drilling
DRILLER: Nick **LOGGED BY:** N. Barba
DRILL RIG: CME-75
DRILLING METHOD: 8" Hollow Stem Auger
SAMPLING METHOD: SS: CMS & SPT
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: D. Abernathy

BORING B2

Water ▽ ▼ ▼ NONE

BORING LOCATION:
Northeast Corner of Proposed Building



STANDARD PENETRATION TEST DATA N in blows/ft ◎ — × Moisture ◪ PL ✚ LL (0, 25, 50) — STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)

Elevation (feet)	Depth, (feet)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Standard Penetration Test Data	Additional Remarks
	0	**Well Graded SAND with Silt**, reddish-brown, little gravel, very dense, dry.	SW-SM				Sieve Analysis
				50(4")	2	>>◎	Rings Disturbed
	5	becomes white-reddish, moist.		50(6")	2	>>◎	
		SAND with Gravel, white-brown, very dense, moist.		30-50(4")	3	>>◎	Rings Disturbed
	10			30-50(3.5")	3	>>◎	
		becomes brown.	SP-SW	50(3.5")	3	>>◎	DD = 114 pcf
	15			50(4.5")	2	>>◎	
		SAND with Silt, dark brown, very dense, moist.	SP-SM				
	20			50(4")	7	>>◎	DD = 118 pcf

Boring terminated at 20-1/3 feet below ground surface.
No groundwater encountered.
Borehole backfilled with soil cuttings.

intertek psi

Professional Service Industries, Inc.
11980 Telegraph Rd, Unit 104
Santa Fe Springs, CA 90670
Telephone: (714) 484-8600

PROJECT NO.: 00662170
PROJECT: Caliber Collision Development
LOCATION: North of 33235 Zeiders Road
Menifee, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B3

DATE STARTED: 9/20/21
DATE COMPLETED: 9/20/21
COMPLETION DEPTH 20.9 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE: 33.63842°
LONGITUDE: -117.17597°
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: 2R Drilling
DRILLER: Nick **LOGGED BY:** N. Barba
DRILL RIG: CME-75
DRILLING METHOD: 8" Hollow Stem Auger
SAMPLING METHOD: SS: CMS & SPT
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: D. Abernathy

Water
▽ While Drilling 19 feet
▼
▼

BORING LOCATION:
Southeast Corner of Proposed Building

Elevation (feet)	Depth, (feet)	Sample Type	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎	Additional Remarks
	0							
		▥	**SAND with Silt**, grayish-brown, vey dense, moist.	SP-SM	50(5")	3	>>◎	DD = 108 pcf
	5	☒	appearance of gravel.		36-50(5")	4	>>◎	
		▥	becomes dark gray.		50(6")	5	>>◎	DD = 106 pcf
	10	☒	**Silty SAND**, dark gray, very dense, moist.	SM	17-50(6")	6	>>◎	
		▥	**SAND with Silt**, dark brown, very dense, moist.	SP-SM	50(6")	7	>>◎	DD = 119 pcf
	15	☒	becomes white-brown.		50(6")	7	>>◎	
			▽					
	20	☒	becomes dark brown.		32-50(4.5")	9	>>◎	

Boring terminated at 20-11/12 feet below ground surface.
Groundwater encountered at 19 feet below ground surface.
Borehole backfilled with soil cuttings.

Legend: × Moisture ◪ PL ✚ LL (0, 25, 50); STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)

intertek psi

Professional Service Industries, Inc.
11980 Telegraph Rd, Unit 104
Santa Fe Springs, CA 90670
Telephone: (714) 484-8600

PROJECT NO.: 00662170
PROJECT: Caliber Collision Development
LOCATION: North of 33235 Zeiders Road
Menifee, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B4

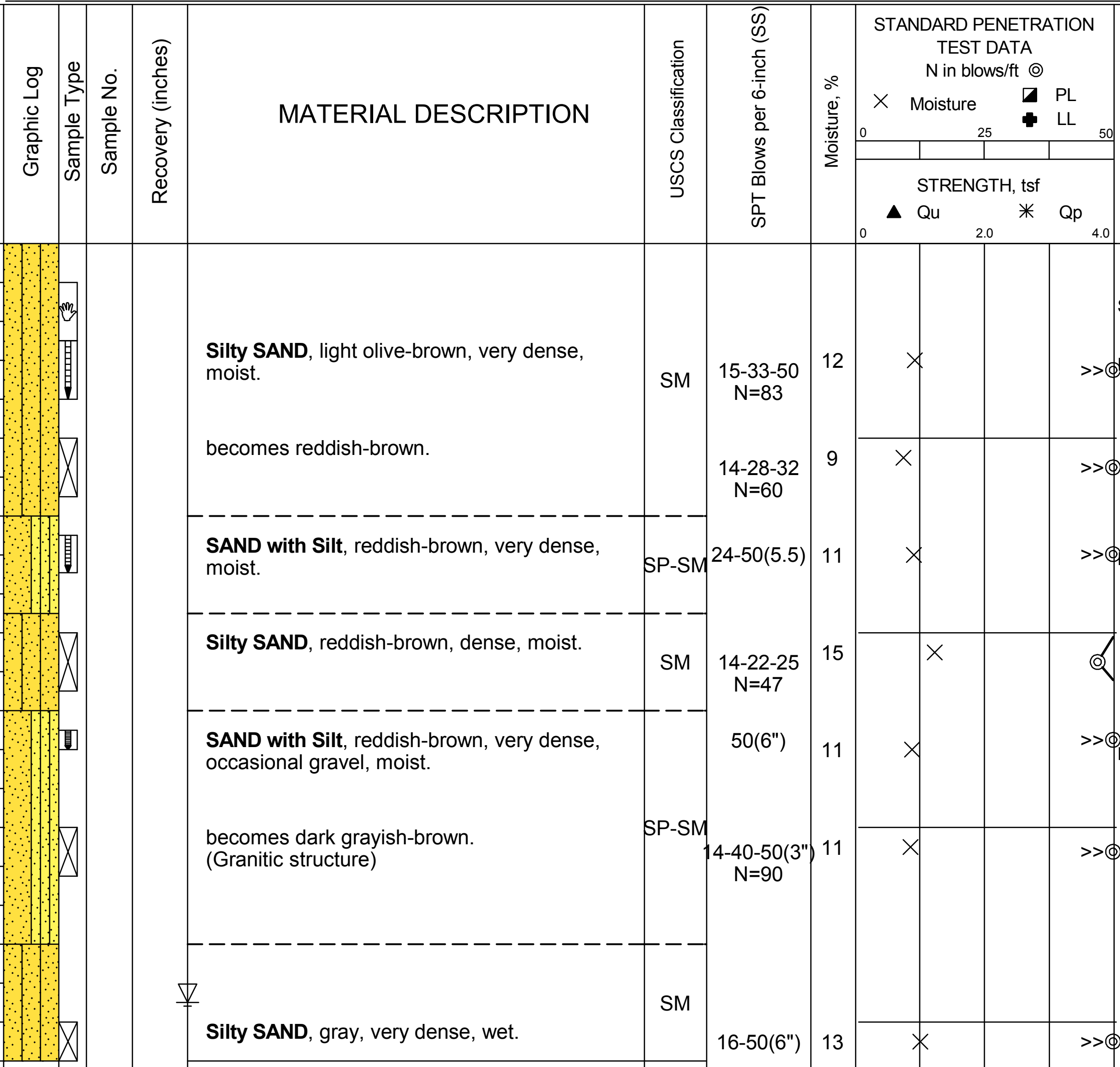
DATE STARTED: 9/20/21
DATE COMPLETED: 9/20/21
COMPLETION DEPTH 21.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE: 33.63842°
LONGITUDE: -117.17662°
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: 2R Drilling
DRILLER: Nick **LOGGED BY:** N. Barba
DRILL RIG: CME-75
DRILLING METHOD: 8" Hollow Stem Auger
SAMPLING METHOD: SS: CMS & SPT
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: D. Abernathy

Water
▽ While Drilling 19.5 feet
▼
▽

BORING LOCATION:
Southwest Corner of Proposed Building

Elevation (feet)	Depth, (feet)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					
						Sieve Analysis
		Silty SAND, light olive-brown, very dense, moist.	SM	15-33-50 N=83	12	DD = 107 pcf
	5	becomes reddish-brown.		14-28-32 N=60	9	
		SAND with Silt, reddish-brown, very dense, moist.	SP-SM	24-50(5.5)	11	DD = 113 pcf
	10	**Silty SAND**, reddish-brown, dense, moist.	SM	14-22-25 N=47	15	
		SAND with Silt, reddish-brown, very dense, occasional gravel, moist.		50(6")	11	DD = 105 pcf
	15	becomes dark grayish-brown. (Granitic structure)	SP-SM	14-40-50(3") N=90	11	
	20	**Silty SAND**, gray, very dense, wet.	SM	16-50(6")	13	



Boring terminated at 21 feet below ground surface.
Groundwater encountered at 19-1/2 feet below ground surface.
Borehole backfilled with soil cuttings.

Professional Service Industries, Inc.
11980 Telegraph Rd, Unit 104
Santa Fe Springs, CA 90670
Telephone: (714) 484-8600

PROJECT NO.: 00662170
PROJECT: Caliber Collision Development
LOCATION: North of 33235 Zeiders Road
Menifee, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B5

DATE STARTED: 9/20/21
DATE COMPLETED: 9/20/21
COMPLETION DEPTH 20.8 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE: 33.63865°
LONGITUDE: -117.17666°
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: 2R Drilling
DRILLER: Nick **LOGGED BY:** N. Barba
DRILL RIG: CME-75
DRILLING METHOD: 8" Hollow Stem Auger
SAMPLING METHOD: SS: CMS & SPT
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: D. Abernathy

Water ▽ ▼ ▼ NONE

BORING LOCATION:
Northwest Corner of Proposed Building

MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
Silty Lean CLAY, dark brown, hard, moist.	CL	14-31-35 N=66	11	DD = 125 pcf Corrosion Series LL = 39 PL = 21
Silty SAND, brown, dense to very dense, moist. (Granitic)	SM	6-14-31 N=45	9	
		40-50(3.5")	7	DD = 131 pcf
SAND with Silt, grayish-brown, very dense, moist.	SP-SM	7-44-50(3")	5	
becomes dark grayish-brown.		50(6")	6	DD = 133 pcf
becomes grayish-brown.		31-50(3")	6	
becomes brown.		20-50(4")	7	

Boring terminated at 20-5/6 feet below ground surface.
No groundwater encountered.
Borehole backfilled with soil cuttings.

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11980 Telegraph Rd, Unit 104
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Telephone: (714) 484-8600

PROJECT NO.: 00662170
PROJECT: Caliber Collision Development
LOCATION: North of 33235 Zeiders Road
Menifee, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 9/20/21
DATE COMPLETED: 9/20/21
COMPLETION DEPTH 6.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE: 33.6386°
LONGITUDE: -117.17683°
STATION: N/A **OFFSET:** N/A
REMARKS:

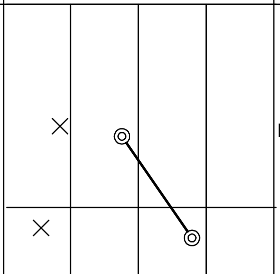
DRILL COMPANY: 2R Drilling
DRILLER: Nick **LOGGED BY:** N. Barba
DRILL RIG: CME-75
DRILLING METHOD: 8" Hollow Stem Auger
SAMPLING METHOD: SS: CMS & SPT
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: D. Abernathy

BORING B6

Water ▽ ▼ ▽ NONE

BORING LOCATION:
Northwest of Proposed Dumpster Enclosure

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL 0 25 50 / STRENGTH, tsf ▲ Qu ✳ Qp 0 2.0 4.0	Additional Remarks
	0					**Silty SAND**, brown, medium dense, moist.	SM	5-9-13 N=22	11		DD = 113 pcf
	5					**SAND with Silt**, grayish-brown, dense, moist. (Granitic)	SP-SM	10-17-18 N=35	7		
						Boring terminated at 6-1/2 feet below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings.					



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Santa Fe Springs, CA 90670
Telephone: (714) 484-8600

PROJECT NO.: 00662170
PROJECT: Caliber Collision Development
LOCATION: North of 33235 Zeiders Road
Menifee, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B7

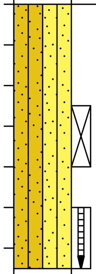
DATE STARTED: 9/20/21
DATE COMPLETED: 9/20/21
COMPLETION DEPTH 6.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE: 33.63863°
LONGITUDE: -117.17733°
STATION: N/A **OFFSET:** N/A
REMARKS:

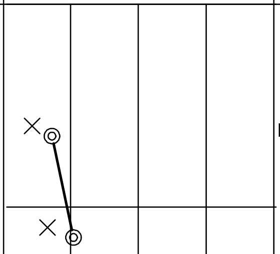
DRILL COMPANY: 2R Drilling
DRILLER: Nick **LOGGED BY:** N. Barba
DRILL RIG: CME-75
DRILLING METHOD: 8" Hollow Stem Auger
SAMPLING METHOD: SS: CMS & SPT
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: D. Abernathy

Water ▽ ▼ ▽ NONE

BORING LOCATION:
End of Proposed Parking Roundabout

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL 0 25 50 STRENGTH, tsf ▲ Qu ✳ Qp 0 2.0 4.0	Additional Remarks
	0										
			⊠			**Sandy SILT**, brown, stiff, moist.	ML	8-5-4 N=9	5		DD = 117 pcf
	5							3-5-8 N=13	8		
						Boring terminated at 6-1/2 feet below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings.					





Professional Service Industries, Inc.
11980 Telegraph Rd, Unit 104
Santa Fe Springs, CA 90670
Telephone: (714) 484-8600

PROJECT NO.: 00662170
PROJECT: Caliber Collision Development
LOCATION: North of 33235 Zeiders Road
Menifee, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 9/20/21
DATE COMPLETED: 9/20/21
COMPLETION DEPTH 5.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE: 33.63862°
LONGITUDE: -117.17754°
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: 2R Drilling
DRILLER: Nick **LOGGED BY:** N. Barba
DRILL RIG: CME-75
DRILLING METHOD: 8" Hollow Stem Auger
SAMPLING METHOD: SS: CMS & SPT
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: D. Abernathy

BORING B8

Water ∇ ▼ ∇ NONE

BORING LOCATION:
West End of Property

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL 0 25 50 STRENGTH, tsf ▲ Qu ✳ Qp 0 2.0 4.0	Additional Remarks
	0										
			☒			**SAND with Silt**, grayish-brown, very dense, moist.	SP-SM	8-15-48 N=63	6	× >>◎	
	5					**SAND**, brown, very dense, moist.	SP	50(6")	4	× >>◎	Rings Disturbed
						Boring terminated at 5-1/2 feet below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings.					

intertek psi

Professional Service Industries, Inc.
11980 Telegraph Rd, Unit 104
Santa Fe Springs, CA 90670
Telephone: (714) 484-8600

PROJECT NO.: 00662170
PROJECT: Caliber Collision Development
LOCATION: North of 33235 Zeiders Road
Menifee, CA

The stratification lines represent approximate boundaries. The transition may be gradual.

LABORATORY TESTING PROGRAM AND PROCEDURES

The soil samples obtained during the field exploration were transported to soil laboratories and selected soil samples were tested to determine the material properties for evaluation. Laboratory testing on selected samples included moisture content (ASTM D2216), density (ASTM D2937), grain-size distribution (ASTM D1140), Atterberg limits (ASTM D4318), and corrosion testing [soluble sulfate, soluble chloride, and pH per Caltrans CTM 417, 422, and 643]. Laboratory testing was performed in general accordance with ASTM and Caltrans procedures. Unless otherwise informed, the soil samples will be discarded 60 days from the issuance of this report. Laboratory test results are provided below.

LABORATORY TEST RESULTS

Boring	Depth (ft.)	Test	Result
B1	1 – 2½	Sieve Analysis	See Plot
B2	1 – 2½	Sieve Analysis	See Plot
B4	1 – 2½	Sieve Analysis	See Plot
B5	1 – 2½	Atterberg Limits LL/PI Soluble Sulfate (ppm) Soluble Chloride (ppm) pH	39/19 2971 272 7.9

SOIL EXPANSION

The expansion potential of the existing near-surface site soil encountered at boring location B5 is believed to be **Medium** based on the Atterberg Limits testing performed. Following site grading, testing of site soils should be performed by the project geotechnical consultant to confirm the basis of these recommendations. Depending upon the distribution of soil types and expansion/swell characteristics, differing design recommendations may be developed to better suit the types of conditions present at the site.

CORROSION

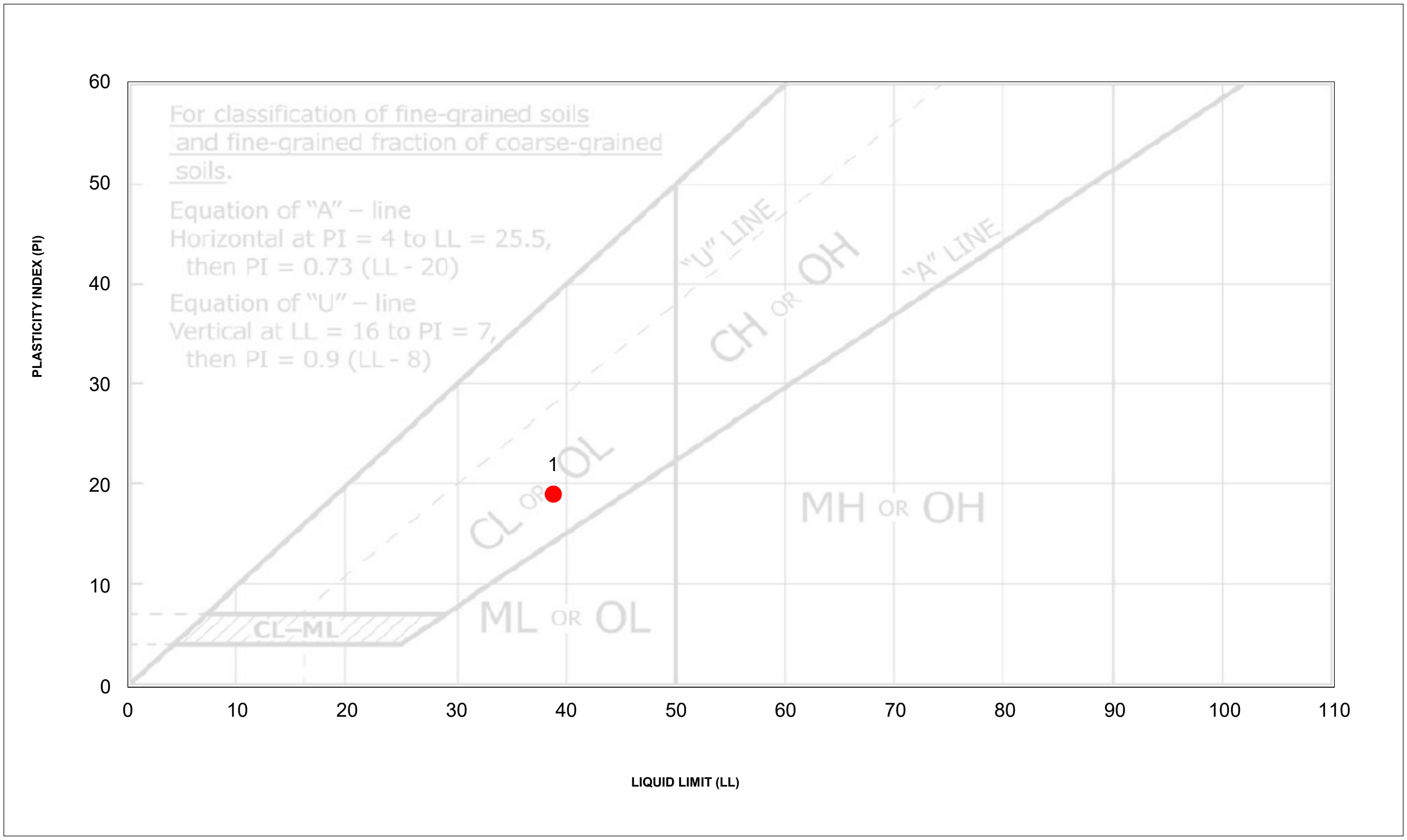
Soluble salt testing was performed by GeoLogic Associates of Anaheim, California to evaluate the corrosivity of the on-site soils and the potential for attack on concrete and subsurface utility pipes, specifically cast iron and ductile iron. The salts tested included soluble sulfate and chloride. Testing was performed using Caltrans Methods CTM-417, 422, and 643 and test results are provided above.

Laboratory testing of a selected soil sample indicates that the on-site soils have **Severe** levels of soluble sulfates such that they are characterized as having corrosion potential with respect to concrete. Concrete in contact with site soils may use Type V concrete having a minimum 28 day compressive strength of at least 4,500 psi. Soluble chloride levels suggest that the site soils also have a **negligible** potential for corrosion of steel (iron/ferrous materials) according to ACI 318 guidelines. Final concrete mix design should be evaluated after sulfate and chloride tests have been performed on the actual in-place subgrade material used for finished pad grades.

Atterberg Limits Summary

(ASTM D4318
ASTM D2116
ASTM D4829)

Project Name	Victory RE Development (Caliber Holdings, LLC)	**Project Number**	0066-2170
Address	North of 33235 Zeiders Road		
	Menifee, CA		



Symbol	Boring ID	Depth (ft)	In-Situ Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plastic Index (%)	Soil Type USCS	Expansion Index
1	B5	2.5	11.2	38.8	20.6	19.1	CL	
2								
3								
4								
5								
6								
7								
8								

Professional Service Industries, Inc.
11980 Telegraph Road, Unit 104
Santa Fe Springs, CA 90670

Phone: (714) 484-8600
Fax: (562) 777-0899

Report No: MAT:00662170-4-S3
Issue No: 1

Material Test Report

These test results apply only to the specific locations and materials noted and may not represent any other locations or elevations. This report may not be reproduced, except in full, without written permission by Professional Service Industries, Inc. If a non-compliance appears on this report, to the extent that the reported non-compliance impacts the project, the resolution is outside the PSI scope of engagement.

Client: VICTORY DEVELOPMENT
8201 PRESTON ROAD, STE # 700
DALLAS, TX 75225

CC:

Project: CC MENIFEE, CA-GEO
MENIFEE, CA

Approved Signatory: Douglas Abernathy (Senior Project Engineer)
Date of Issue: 9/30/2021

Sample Details

Sample ID:	00662170-4-S3	**Lift:**	
Client Sample ID:			
Date Sampled:			
Sampled By:	Mohammad Almuzaial		
Specification:	D6913-Soils		
Supplier:	On-Site Material		
Source:	On Site Borrow		
Material:	Silty SAND w/ Gravel (SM)		
Sampling Method:	Hollow Stem Auger - Automatic		
Soil Description:	SM		
General Location:	B1		
Location:	1'-2.5'		

Other Test Results

Description	Method	Result	Limits
Fm	ASTM D 6913	N/A	
Cu		N/A	
Cc		N/A	
CuS		2.82	
CcS		0.75	
D50S (mm)		0.202	
D50G (mm)		9.002	
Method		Method B	
Sample Obtained While		Oven-Dried	
Group Name		Silty SAND w/ Gravel (SM)	
Group Symbol		SM	
Composite Sieving Used		No	
Dispersion Method		No dispersant by hand	
Prior Testing		Moisture	

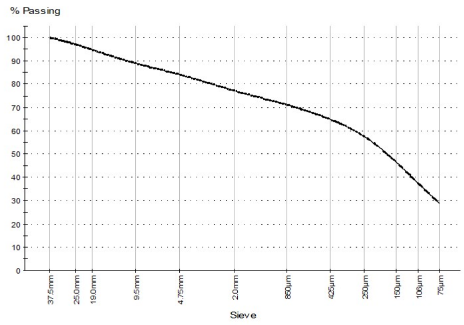
Particle Size Distribution

Method: ASTM D 6913

Date Tested: 9/30/2021
Tested By: Mohammad Almuzaial

Sieve Size	% Passing	Limits
1½in (37.5mm)	100.0	
1in (25.0mm)	97.2	
¾in (19.0mm)	94.8	
3/8in (9.5mm)	89.0	
No.4 (4.75mm)	84.2	
No.10 (2.0mm)	77.3	
No.20 (850µm)	71.1	
No.40 (425µm)	64.8	
No.60 (250µm)	57.6	
No.100 (150µm)	46.6	
No.140 (106µm)	37.5	
No.200 (75µm)	28.7	

Chart



Comments

N/A

Professional Service Industries, Inc.
11980 Telegraph Road, Unit 104
Santa Fe Springs, CA 90670

Phone: (714) 484-8600
Fax: (562) 777-0899

Report No: MAT:00662170-4-S1
Issue No: 1

Material Test Report

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Approved Signatory: Douglas Abernathy (Senior Project Engineer)
Date of Issue: 9/30/2021

Client: VICTORY DEVELOPMENT
8201 PRESTON ROAD, STE # 700
DALLAS, TX 75225

CC:

Project: CC MENIFEE, CA-GEO
MENIFEE, CA

Sample Details

Sample ID:	00662170-4-S1	**Lift:**	
Client Sample ID:			
Date Sampled:	09/02/21		
Sampled By:	Mohammad Almuzaial		
Specification:	D6913-Soils		
Supplier:	On-Site Material		
Source:	On Site Borrow		
Material:	Well-graded SAND w/ Silt (SW-SM)		
Sampling Method:	Hollow Stem Auger - Automatic		
Soil Description:	SW-SM		
General Location:	B2		
Location:	1'-2.5'		

Other Test Results

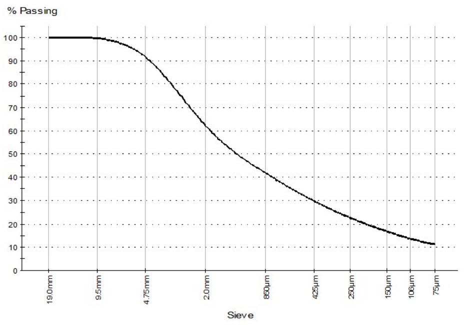
Description	Method	Result	Limits
Fm	ASTM D 6913	N/A	
Cu		28.30	
Cc		1.56	
CuS		5.98	
CcS		0.93	
D50S (mm)		0.626	
D50G (mm)		3.473	
Method		Method B	
Sample Obtained While		Oven-Dried	
Group Name		Well-graded SAND w/ Silt (SW-SM)	
Group Symbol		SW-SM	
Composite Sieving Used		No	
Dispersion Method		No dispersant by hand	
Prior Testing		Moisture	

Particle Size Distribution

Method: ASTM D 6913
Drying by: Oven
Date Tested: 9/30/2021
Tested By: Mohammad Almuzaial

Sieve Size	% Passing	Limits
¾in (19.0mm)	100.0	
3/8in (9.5mm)	99.7	
No.4 (4.75mm)	91.8	
No.10 (2.0mm)	62.2	
No.20 (850µm)	41.9	
No.40 (425µm)	29.9	
No.60 (250µm)	22.5	
No.100 (150µm)	16.8	
No.140 (106µm)	13.6	
No.200 (75µm)	11.1	

Chart



Comments

N/A

Professional Service Industries, Inc.
11980 Telegraph Road, Unit 104
Santa Fe Springs, CA 90670

Phone: (714) 484-8600
Fax: (562) 777-0899

Report No: MAT:00662170-4-S2
Issue No: 1

Material Test Report

Client: VICTORY DEVELOPMENT
8201 PRESTON ROAD, STE # 700
DALLAS, TX 75225

CC:

Project: CC MENIFEE, CA-GEO
MENIFEE, CA

Approved Signatory: Douglas Abernathy (Senior Project Engineer)
Date of Issue: 9/30/2021

Sample Details

Sample ID:	00662170-4-S2	**Lift:**	
Client Sample ID:			
Date Sampled:			
Sampled By:	Mohammad Almuzaial		
Specification:	D6913-Soils		
Supplier:	On-Site Material		
Source:	On Site Borrow		
Material:	Silty SAND (SM)		
Sampling Method:	Hollow Stem Auger - Automatic		
Soil Description:	SM		
General Location:	B4		
Location:	1'-2.5'		

Other Test Results

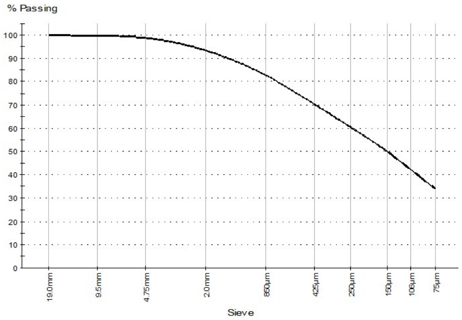
Description	Method	Result	Limits
Fm	ASTM D 6913	N/A	
Cu		N/A	
Cc		N/A	
CuS		4.22	
CcS		0.68	
D50S (mm)		0.299	
D50G (mm)		3.400	
Method		Method B	
Sample Obtained While		Oven-Dried	
Group Name		Silty SAND (SM)	
Group Symbol		SM	
Composite Sieving Used		No	
Dispersion Method		No dispersant by hand	
Prior Testing		Moisture	

Particle Size Distribution

Method: ASTM D 6913
Drying by: Oven
Date Tested: 9/30/2021
Tested By: Mohammad Almuzaial

Sieve Size	% Passing	Limits
¾in (19.0mm)	100.0	
3/8in (9.5mm)	99.7	
No.4 (4.75mm)	98.8	
No.10 (2.0mm)	93.4	
No.20 (850μm)	82.8	
No.40 (425μm)	70.4	
No.60 (250μm)	60.3	
No.100 (150μm)	50.1	
No.140 (106μm)	42.1	
No.200 (75μm)	34.0	

Chart



Comments

N/A

Intertek/PSI # 00662170

SOIL TEST RESULTS

Job No. 2008-026

SAMPLE NO.:	B-5				
Depth:	2' - 5'				
DIRECT SHEAR TEST (type)					
Initial Moisture Content %					
Dry Density (pcf)					
Normal Stress (psf)					
Peak Shear Stress (psf)					
Ultimate Shear Stress (psf)					
Cohesion (psf)					
Internal Friction Angle (degrees)					
EXPANSION TEST UBC STD 18-2					
Initial Dry Density (pcf)					
Initial Moisture Content %					
Final Moisture Content %					
Pressure (psf)					
Expansion Index / Swell %					
CORROSIVITY TEST					
Resistivity (CTM643) (ohm-cm)					
pH (CTM643)	7.9				
CHEMICAL TESTS					
Soluble Sulfate (CTM 417) (ppm)	2971				
Chloride Content (CTM 422) (ppm)	272				
Wash #200 Sieve (ASTM-1140) %					
Sand Equivalent (ASTM D2419)					

Geo-Logic
ASSOCIATES