Appendix D:
Geotechnical Investigation Report

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Proposed Copart Palmdale
Geotechnical Investigation Report

Prepared for:
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Project No. 2042546200

February 28, 2019

Stantec Consulting Services Inc.
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February 28, 2019

Mr. Jeremy Meltebager
Copart Inc.
14185 Dallas Parkway, Suite 300
Dallas, Texas 75254

RE: **GEOTECHNICAL INVESTIGATION REPORT**
Proposed Copart Palmdale
Northwest Corner 40th Street East and Avenue L8 (Future)
Palmdale, California 92054

Dear Mr. Meltebager:

This letter transmits Stantec's geotechnical investigation report for the proposed Copart vehicle storage facility located in Palmdale, California. The purpose of this report is to evaluate the subsurface conditions and provide geotechnical recommendations for the proposed development.

We appreciate the opportunity to work with you on this project. If you have any questions, please call us at the numbers below.

Respectfully submitted,

STANTEC CONSULTING SERVICES INC.

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1. INTRODUCTION

This report presents the results of Stantec's geotechnical investigation for the proposed Copart facility in Palmdale, California. The project location is shown on the Site Location Map, Figure 1 and the approximate area of the proposed development is shown on the Site Vicinity Map, Figure 2.

1.1 PROPOSED DEVELOPMENT

We understand the proposed Copart facility will include construction of a new 2,400 square feet (sf) building, approximately 67 acres of parking and drive isles, a perimeter infiltration trench, and landscape areas. The area of the proposed site improvements is shown on the Subsurface Exploration Map, Figure 3.

1.2 PURPOSE AND SCOPE OF WORK

1.2.1 Purpose

The purpose of this report is to evaluate the subsurface conditions at the site and provide geotechnical recommendations for design and construction of the proposed project. This report has been prepared in general accordance with accepted geotechnical engineering principles and in general conformance with the approved proposal.

1.2.2 Scope of Work

Our scope of work consisted of the following:

- Review available subsurface information for the site and nearby locations,
- Perform a site reconnaissance to evaluate general geotechnical and site conditions,
- Perform a field subsurface exploration program consisting of drilling 16 hollow stem auger borings, and converting four of the shallow borings into shallow percolation wells,
- Perform percolation testing,
- Perform geotechnical laboratory tests on selected samples,
- Perform geotechnical engineering analyses, and
- Preparation of this geotechnical investigation report for the proposed project.

2. FIELD INVESTIGATION

2.1 PRE-DRILLING PROCEDURES

DigAlert (Underground Service Alert of Southern California) was notified before commencing subsurface exploration activities to identify underground utilities that could conflict with the proposed borings. In addition, the upper five feet of soil was hand augered to clear the boring locations for potential conflicts with underground utilities.

2.2 DRILLING OPERATIONS

16 test borings (B-1 through B-12, P-1 through P-4) were drilled using a CME 85 drill rig equipped with hollow-stem augers on January 28, 2019 and January 29, 2019 by ABC Liovin Drilling (ABC). The borings were advanced to depths of approximately 6.5 feet to 51.5 feet below the existing ground surface (bgs), and their approximate locations are shown on the Subsurface Exploration Map, Figure 3. The borings were logged by a Stantec field geologist, who also collected samples of the materials encountered for examination and laboratory testing.

2.3 PERCOLATION TESTING

Four of the borings were converted to shallow percolation wells (P-1 through P-4) and percolation testing was performed in the wells by a Stantec field geologist on January 29, 2019 in general accordance with Los Angeles County percolation testing guidelines.

2.4 SAMPLING

Relatively undisturbed samples were obtained using a modified California (CAL) sampler, which is a ring-lined split tube sampler with a 3-inch outer diameter and 2½-inch inner diameter. CAL sampling followed ASTM D3550 (Standard Practice for Ring-Lined Barrel Sampling of Soils) procedures. Disturbed samples were obtained using a Standard Penetration Test (SPT) sampler, which is a split tube sampler with a 2-inch outer diameter and 1⅜-inch inner diameter. SPTs were performed in general accordance with ASTM D1586 (Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils), and D6066 (Standard Practice for Determining the Normalized Penetration Resistance of Sands for Evaluation of Liquefaction Potential). Disturbed bulk samples were also obtained from the drill cuttings.

The CAL and SPT samplers were driven with a 140-pound weight dropping 30 inches. The number of blows per 6-inch increment is noted on the boring logs. ABC provided a report (Earthspectives, 2018) which indicates the average hammer energy efficiency on the drill rig used at the project was 80%.

Field Investigation
February 28, 2019

Samples were classified in the field using the Unified Soil Classification System (USCS), in accordance with ASTM D2488 (Standard Practice for Description and Identification of Soils [Visual-Manual Method]) procedures. The laboratory testing confirmed or modified field classifications as necessary for presentation on the boring logs. Soil samples were removed from the samplers, placed in appropriate containers, and transported in accordance with ASTM D4220 (Standard Practice for Preserving and Transporting Soil Samples). Upon completion, borings were backfilled with grout and capped with concrete in the upper three feet. The boring logs are included in Appendix A.

3. LABORATORY TESTING

The following laboratory tests were performed in general accordance with ASTM and California Test procedures:

Table 1. Summary of Laboratory Tests

Type of Test	ASTM Designation	Number Performed
In-Situ Moisture and Density	ASTM D-2216	14
Sieve Analysis	ASTM D422 and ASTM C136	18
Direct Shear	ASTM D3080	2
Resistance (R)-Value Analysis	ASTM D2844, California 301G	1
Maximum Dry Density and Optimum Moisture Content	ASTM D1557	2
Chemical Tests for Corrosion Potential	CA DOT test methods	1

The laboratory test results are presented in Appendix B.

4. GEOLOGIC SETTING AND SITE CONDITIONS

4.1 REGIONAL GEOLOGY

The site is located in the Mohave Desert geologic province which consists of a broad interior region of isolated mountains separated by desert plains with an enclosed drainage system. The Mojave Desert Geomorphic Province is wedged in a sharp angle between the San Andreas and Garlock faults (CGS, 2008). The Site resides in the portion of the Province drained by surface runoff toward Little Rock Wash, which drains into Rosamond Lake.

Geologic mapping presented in the United States Geological Survey (USGS) Lancaster Quadrangle (USGS, 2005) indicates the site is underlain by recent alluvial deposits. Literature from the USGS indicates the Quaternary alluvial deposits consist of gravel, sand, and silt.

4.2 SURFACE CONDITIONS

The project site is approximately 82 acres in size and is occupied by vacant former agricultural land. The project site is bound by 40th Street East followed by agricultural land to the east, Avenue L8 (future) followed by vacant land and agricultural land to the south, 35th Street East followed by vacant land to the west, and Avenue L4 (Future) followed by former agricultural and vacant land to the north.

The site is generally flat and slopes from southeast to northwest. Based on Google Earth®, the ground surface of the site is at an approximate elevation of 2,457 to 2,466 feet (WGS84 Datum).

4.3 SUBSURFACE CONDITIONS

The materials encountered in our borings consist of Quaternary Alluvial (Qa) deposits. A brief description of the subsurface conditions is provided in this section. Detailed descriptions of the subsurface conditions are provided in the boring logs included in Appendix A.

Quaternary Alluvial Deposits (Qa) – Quaternary Alluvial deposits were encountered in all borings and extends to depths of at least 51.5 feet bgs. The alluvial deposits encountered at this location primarily consist of sand with variable amounts of clay and silt (SW, SP-SM, SW-SM, SM, and SC USCS soil type) and sandy silt (ML USCS soil type). The sandy deposits encountered were loose to medium dense and generally dry with increasing density below 30 feet. The fine-grained deposits were moist.

Groundwater - Groundwater was not encountered during this investigation. Groundwater monitoring data at the Palmdale Water Reclamation Plan approximately one mile southeast of the site indicates groundwater was encountered at a depth of approximately 411 feet below the

ground surface (LACSD, 2018). The offsite location is approximately 16 feet higher in elevation than the proposed Copart site. Groundwater levels may fluctuate seasonally, or in the future due to rainfall, irrigation, broken pipes, or changes in site drainage.

5. GEOLOGIC HAZARDS

5.1 FAULTING AND SURFACE FAULT RUPTURE

The site is located in a seismically active area. The estimated closest distance from the site to major nearby mapped active faults is presented in the table below.

Table 2. Faults in Site Vicinity

Fault	Distance (miles) (1)	Maximum Moment Magnitude (1)
San Andreas	7.7	8.2
San Gabriel	26.1	7.3
Sierra Madre	29.1	7.3
Northridge	29.8	6.9
Clamshell-Sawpit	31.1	6.7

[1]Measured from 2008 National Seismic Hazard Maps – Source Parameters Website - USGS (USGS, 2008).

As noted above, the closest known active fault is the San Andreas Fault, located approximately 7.7 miles southwest of the site. No active faults are known to underlie or project toward the site. Therefore, the probability of surface fault rupture at the site from a known active fault is considered low.

5.2 CALIFORNIA BUILDING CODE SEISMIC CRITERIA

A geologic hazard likely to affect the project is ground-shaking as a result of movement along an active fault zone in the vicinity of the subject site. The seismic parameters in accordance with the 2016 California Building Code (CBC) are presented below:

Table 3. 2016 CBC Seismic Parameters and Peak Ground Acceleration

Parameter	Value
Site Coordinates	Latitude : 34.654542° Longitude : -118.063119°
Mapped Spectral Acceleration Value at Short Period: S_s	1.5g
Mapped Spectral Acceleration Value at 1-Second Period: S_1	0.632g
Seismic Site Classification	D
Short Period Site Coefficient: F_a	1.0
1-Second Period Site Coefficient: F_v	1.5
Site Class Adjusted Acceleration Value at Short Period: S_{MS}	1.5g
Site Class Adjusted Acceleration Value at 1-Second Period: S_{M1}	0.949g
Design Spectral Response Acceleration at Short Periods: S_{DS}	1.0g
Design Spectral Response Acceleration at 1-Second Period: S_{D1}	0.632g
Peak Ground Acceleration adjusted for Site Class Effects: PGA_M	0.552g

ASCE 7-10 – Report generated through ASCE 7 Hazards Report website (ASCE, 2019) – accessed 2/22/19.

5.3 LIQUEFACTION AND DYNAMIC SETTLEMENT

Liquefaction is the transformation of a deposit of soil from a solid state to a liquefied state as a consequence of increased pore pressure and reduced effective stress. Often, this transformation results from the cyclic loading of an earthquake and the soil acquires "mobility" sufficient to permit both horizontal and vertical movements. Soils that are most susceptible to liquefaction are clean, loose, saturated (below groundwater), and uniformly graded sands. The vast majority of liquefaction hazards are associated with sandy soils in looser state and silty soils of low plasticity. Cohesive soils are generally not considered susceptible to soil liquefaction, although they can be subject to cyclic softening if they are soft enough, and if the seismic demand is relatively high.

The site is not located in a California Geological Survey Liquefaction Hazard Zone. This zone is defined as areas where historical occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation would be required.

The liquefaction potential was evaluated with the LiqSVs v1.1.1.12 computer program (Geologismiki, 2017) using the SPT data from soil boring B1. Liquefaction triggering methods developed by Idriss and Boulanger (2014) were used in our liquefaction evaluation. Our evaluation was based on the site class adjusted peak ground acceleration (PGA_M) of 0.552g, as presented in Table 2, and an earthquake magnitude of 7.9 which is the modal earthquake magnitude from the 2008 USGS deaggregation website. The groundwater depth of 411 feet (LACSD, 2018) was used to evaluate the cyclic stress ratio for the design earthquake, and the estimated insitu groundwater depth of 411 feet was used to evaluate the cyclic resistance ratio for the on-site soils.

Loose to dense granular soil is generally present from the ground surface to a depth of at least 51.5 feet at the site. Based on the density and location of groundwater table, most of this granular soil in the top 50 feet is generally not susceptible to seismically induced settlement. However, some of the unsaturated, loose to medium dense sand in the upper 50 feet may densify as a result of earthquake shaking, causing ground surface settlement. Ground surface total settlements due to compression in the unsaturated zone are estimated to be on the order of ¾ inch. Differential settlement over a span of approximately 30 feet is estimated to be approximately 0.4 inch.

5.4 LIQUEFACTION INDUCED LATERAL SPREADING

Liquefaction induced lateral spreading can occur in areas of sloping ground, or towards a free face. Given the depth to groundwater, and since the topography at the site is relatively flat, the potential for liquefaction induced lateral spreading is considered low.

5.5 FLOODING, TSUNAMIS AND SEICHES

The site is not located within a FEMA flood zone, therefore, damage due to flooding is considered low.

The site is not located within a Tsunami Inundation Area; therefore, damage due to tsunamis is considered low.

5.6 EXPANSIVE SOILS

The near-surface soils (upper approximate 10 feet) have a low expansion potential. Our soil classifications and laboratory test results show that the near surface (upper 10 feet) samples tested are granular with low-plasticity fines. Accordingly, mitigation for expansive soils is not considered necessary for onsite soils at this site.

If imported soils are used for earthwork, Stantec recommends that the proposed soils be tested for expansion potential prior to import. Imported soils should be approved by the Geotechnical Engineer before being imported.

6. CONCLUSIONS

Based on our field exploration, laboratory testing and engineering and geologic analyses, it is our opinion that the subject property is suitable for construction of the proposed vehicle storage facility improvements from a geotechnical engineering and engineering geology viewpoint; however, there are existing geotechnical conditions associated with the site that warrant mitigation and/or consideration during the planning stages. The main geotechnical conclusions for the project are presented in the following paragraphs.

- The site is underlain by Quaternary Alluvial deposits from the ground surface in all soil borings and extends to depths of at least 51.5 feet bgs. The alluvial deposits encountered at this location primarily consist of sand with variable amounts of clay and silt (SW, SP-SM, SW-SM, SM, and SC USCS soil type) and sandy silt (ML USCS soil type). The sandy deposits encountered were loose to medium dense and generally dry with increasing density below 30 feet. The fine-grained deposits were moist.

- Groundwater was not encountered during this investigation. Groundwater monitoring data at the Palmdale Water Reclamation Plan approximately one mile southeast of the site indicates groundwater was encountered at a depth of approximately 411 feet below the ground surface (LACSD, 2018). The offsite location is approximately 16 feet higher in elevation than the proposed Copart site. Groundwater levels may fluctuate seasonally, or in the future due to rainfall, irrigation, broken pipes, or changes in site drainage.

- Loose to dense alluvial deposits primarily consisting of granular soil is generally present from the ground surface to a depth of at least 51.5 feet at the site. Based on the depth of the groundwater table and soil density, most of this granular soil in the top 50 feet is generally not susceptible to seismically induced settlement. However, some of the unsaturated, loose to medium dense sand in the upper 50 feet may densify as a result of earthquake shaking, causing ground surface settlement. Ground surface total settlements due to compression in the unsaturated zone are estimated to be on the order of 0.8 inches. Differential settlement over a span of approximately 30 feet is estimated to be approximately 0.4 inches.

- Based on the relatively low estimated liquefaction induced settlement, conventional shallow foundations appear to be a suitable option for support of the proposed building.

- No active faults are known to underlie or project toward the site. Therefore, the probability of surface fault rupture occurring at the site from a known active fault is considered low.

7. RECOMMENDATIONS

7.1 EARTHWORK

The following recommendations are provided regarding specific aspects of the proposed earthwork construction. These recommendations should be considered subject to revision based on additional geotechnical evaluation of the conditions observed by the Geotechnical Engineer during grading operations.

7.1.1 Site Preparation

Site preparation should begin with the removal of existing buried slabs and foundations, vegetation, highly organic soil, leach lines, septic tanks, and any other unsuitable materials, as applicable. Existing underground utilities within the proposed construction areas should be completely removed and/or rerouted. Grading should conform to the guidelines presented in the 2016 California Building Code (CBC, 2016), as well as the pertinent requirements of the City of Palmdale and Los Angeles County.

7.1.2 Remedial Grading

Building Foundation Areas:

To provide uniform support for the proposed building, removal of the existing soils to a minimum depth of 2 feet below the bottom of the footings is recommended. Removal, replacement, and compaction should be completed laterally at least five feet beyond the outside edge of the footings unless constrained by existing structures. The bottom of the over excavation should be scarified to a depth of 8-inches, moisture conditioned to within 2 percentage points of the optimum moisture content and compacted to at least 90% relative compaction based on the ASTM D1557 laboratory test procedure. All references to optimum moisture content and relative compaction in this report are based on this test method.

Concrete Pavement and Hardscape:

Remedial grading for pavement and hardscape areas should include removal of the existing soils to a depth of at least 12 inches below the existing ground surface or subgrade elevation, whichever is deeper. Subgrade elevation is defined as the top of soil elevation provided in the grading plan. The soil exposed at the base of the excavation should be scarified to a depth of 8 inches, and moisture conditioned to within 2 percentage points of the optimum moisture content. Hardscape subgrade should be compacted to at least 90% relative compaction. Pavement subgrade should be compacted to at least 90% relative compaction.

Field Observations:

The Geotechnical Engineer should check the bottom of excavations. If soft, loose, or otherwise unsuitable soils are encountered, the depth of removal may need to be extended.

7.1.3 Fill Placement and Compaction

Excavated materials determined by the Geotechnical Engineer to be satisfactory can be reused as compacted fill. We anticipate that the majority of the excavated materials can be re-used as compacted fill soils. The Geotechnical Engineer should approve the fill material before placement.

Where large compaction equipment, such as sheep's foot or smooth drum compactors, are used, fill should be placed in 6- to 8-inch thick loose, horizontal lifts, moisture conditioned to within 2 percentage points of the optimum moisture content and compacted to at least 90% relative compaction. Thinner lifts will be required for smaller compaction equipment. The maximum dry density and optimum moisture content for the evaluation of relative compaction should be determined in accordance with ASTM D1557.

7.1.4 Yielding Subgrade Conditions

The soil encountered at the bottom of the remedial grading excavations can exhibit "pumping" or yielding if they become saturated in response to periods of significant precipitation, such as during the winter rainy season. If this occurs, corrective measures should be performed with oversight from the Geotechnical Engineer.

In order to help stabilize the yielding subgrade soils within the bottom of the removal areas, the contractor can consider the placement of stabilization fabric or geo-grid over the yielding areas, depending on the relative severity of the yielding.

Mirafi 600X (or approved equivalent) stabilization fabric may be used for areas with low to moderate yielding conditions. Geo-grid such as Tensar TX-5 may be used for areas with moderate to severe yielding conditions. Uniform sized, ¾- to 2-inch crushed rock should be placed over the stabilization fabric or geo-grid. A 6- to 12-inch thick section of crushed rock will typically be necessary to stabilize yielding ground.

If significant voids are present in the crushed gravel, a filter fabric should be placed over the crushed gravel to prevent migration of fines into the gravel and thus potential settlement of the overlying fill. Fill soils, which should be placed and compacted in accordance with the recommendations presented herein, should then be placed over the fabric or geo-grid until design grades are reached. The crushed gravel and stabilization fabric or geo-grid should extend at least 5 feet laterally beyond the limits of the yielding areas.

7.1.5 Dewatering

Groundwater was not encountered during our investigation to a maximum depth of 51.5 feet bgs. Accordingly, we do not anticipate that groundwater will be a significant consideration for this project.

7.1.6 Expansive Soil

The near-surface soils (upper approximate 10 feet) have a low expansion potential. Our soil classifications and laboratory test results show that the near surface (upper 10 feet) samples tested are granular with low-plasticity fines. Accordingly, mitigation for expansive soils is not considered necessary at this site. The grading and foundation recommendations presented in this report reflect a low expansion potential.

7.1.7 Imported Material

Imported materials, if used for fill, should be predominately granular, contain no rocks or lumps greater than 3 inches in maximum dimension, and have an Expansion Index less than 20, and a Plasticity Index less than 15. Imported materials should be reviewed and approved by the Geotechnical Engineer before being brought to the site.

7.1.8 Site Excavation Characteristics

During the recent geotechnical investigation, the soil boreholes were drilled using a truck-mounted, hollow stem auger drill rig. As the drilling was completed with moderate effort, conventional earth moving equipment should be capable of performing the excavations required for site development.

7.1.9 Oversized Material

Excavations may generate oversized material. Oversized material is defined as rocks or cemented clasts greater than 3 inches in largest dimension. Oversized material should be broken down to no greater than 3 inches in largest dimension for use in fill or be removed from the site.

7.1.10 Temporary Excavations

The existing native soils can be considered Type B for excavation in accordance with OSHA and Cal-OSHA requirements. Temporary excavations should be shored or excavated with a slope not steeper than 1:1 (horizontal to vertical) in accordance with OSHA and Cal-OSHA requirements.

The excavations should be inspected daily by the contractor's Competent Person before personnel are allowed to enter the excavation. Any zones of potential instability, sloughing or raveling should be brought to the attention of the Geotechnical Engineer and corrective action

implemented before personnel begin working in the excavation. Excavated soils should not be stockpiled behind temporary excavations within a distance equal to the depth of the excavation.

The project geotechnical engineer should be notified if other surcharge loads are anticipated so that lateral load criteria can be developed for the specific situation. If temporary slopes are to be maintained during the rainy season, berms are recommended near the tops of slopes to prevent runoff water from entering the excavation and eroding the slope faces.

7.1.11 Pipelines

Typical pipe bedding as specified in the Standard Specifications for Public Works Construction (GREENBOOK) may be used. As a minimum, it is recommended that pipe be supported on at least 4 inches of granular bedding material, such as 3/4-inch rock or clean coarse sand with less than 5 percent fines and a sand equivalent of 40 or more as evaluated by ASTM D2419.

The bedding should extend from the bottom of the trench to at least 1 foot above the top of the pipe. Sand bedding should be mechanically compacted to at least 90 percent relative compaction. Jetting of sand bedding should not be permitted.

Onsite material, imported select material, or 2-sack cement/sand slurry may be used as backfill in trenches above the pipe bedding. The material selected should match the engineering characteristics of the soils adjacent to the trench. Utility trench backfill beneath structures and hardscape should be compacted to at least 90% relative compaction.

The modulus of soil reaction (E') is used to characterize the stiffness of soil backfill placed along the sides of buried flexible pipelines. For the purpose of evaluating deflection due to the load associated with trench backfill over the pipe, a value of 1,500 pounds per square inch (lbs/in2) is recommended for the general site conditions assuming granular bedding material (sand or gravel) is placed around the pipe.

7.1.12 Surface Drainage

Final surface grades around structures should be designed to collect and direct surface water away from the structure and toward appropriate drainage facilities. The ground around the structure should be graded so that surface water flows rapidly away from the structure without ponding. In general, we recommend that the ground adjacent to the structure slope away at a gradient of at least 2%. Densely vegetated areas where runoff can be impaired should have a minimum gradient of at least 5% within the first 5 feet from the structure. Roof gutters with downspouts that discharge directly into a closed drainage system are recommended on structures. Drainage patterns established at the time of fine grading should be maintained throughout the life of the proposed structures. Site irrigation should be limited to the minimum necessary to sustain landscape growth. Should excessive irrigation, impaired drainage, or

unusually high rainfall occur, saturated zones of perched groundwater can develop. Saturated soil zones may result in increased maintenance and could impact structure stability.

7.1.13 Grading Plan Review

Stantec should review the grading plans and earthwork specifications to ascertain whether the intent of the recommendations contained in this report have been implemented, and that no revised recommendations are needed due to changes in the development scheme.

7.2 FOUNDATIONS

7.2.1 Shallow Foundations

Conventional shallow foundations (spread footings/strip footings) are considered suitable for support of the proposed building provided the recommendations in this report are incorporated into the design.

The following foundation recommendations are minimum criteria based on geotechnical considerations. They should not be considered a structural design, nor should they be considered to preclude more restrictive criteria by governing agencies or the structural engineer. The design of the foundation system should be performed by the project structural engineer.

Conventional Shallow Foundations:

An allowable bearing pressure of 2,500 pounds per square foot (psf) may be used for conventional square or rectangular shallow foundations founded in properly compacted fill prepared in accordance with the recommendations of this report. The bearing capacity can be increased by one third for transient loading conditions such as earthquake and wind.

Additional parameters for shallow foundations are provided below.

Minimum Footing Width: 18 inches for continuous footings
24 inches for square/rectangular footings

Minimum Footing Depth: 18 inches below lowest adjacent soil grade

Minimum Reinforcement: Two No. 5 bars at both top and bottom in continuous footings.

7.2.2 Foundation Settlement

The following static and seismic foundation settlements are estimated.

Static Settlement: Less than 1-inch total settlement

½ inch differential settlement over 30 feet

Seismic Settlement: Less than 0.8 inches total settlement
0.4 inches differential settlement over 30 feet

7.2.3 Lateral Resistance

Lateral loads will be resisted by friction between the bottoms of footings and passive pressure on the faces of footings and other structural elements below grade. An allowable coefficient of friction of 0.3 can be used.

Passive pressure can be computed using an allowable equivalent fluid pressure of 200 lbs/ft^3 for level ground conditions. Reductions for sloping ground should be made. The upper 1 foot of soil should not be relied on for passive support unless the ground is covered with pavements or slabs.

7.2.4 Foundation Plan Review

Stantec should review the foundation plans to ascertain that the intent of the recommendations in this report has been implemented and that revised recommendations are not necessary as a result of changes after this report was completed.

7.2.5 Foundation Excavation Observations

A representative working under direct supervision of the Geotechnical Engineer should observe the foundation excavations prior to forming or placing reinforcing steel.

7.3 SLABS-ON-GRADE

7.3.1 Exterior Slabs on Grade (Sidewalks)

Exterior slabs not subject to vehicular traffic should have a minimum thickness of 4 inches and be reinforced with at least No. 3 bars at 18 inches on center each way. Slabs should be provided with crack control joints placed in accordance with the American Concrete Institute (ACI) guidelines. The project architect or civil engineer should select the final joint patterns.

7.4 CORROSIVITY

One sample (B1-Bulk collected in the upper 5 feet) of the onsite soils was tested to provide a preliminary indication of the corrosion potential of the onsite soils. The test results are presented in Appendix B. A brief discussion of the corrosion test results is provided in the following text.

- The sample tested had a soluble sulfate concentration of 40 parts per million (ppm), which indicates the sample has a low sulfate corrosion potential relative to concrete.

It should be noted that soluble sulfate in the irrigation water supply, and/or the use of fertilizer may cause the sulfate content in the surficial soils to increase with time. This may result in a higher sulfate exposure than that indicated by the test results reported herein. Studies have shown that the use of improved cements in the concrete, and a low water-cement ratio will improve the resistance of the concrete to sulfate exposure.

- The sample tested had a chloride concentration of 99 ppm, which indicates the sample has a negligible chloride corrosion potential relative to metal.
- The sample tested had a minimum resistivity of 4,853 ohm-cm, which indicates the sample is moderately corrosive.
- The sample tested had a pH of 7.2 which indicates the sample is slightly alkaline.

Caltrans currently considers a site to be corrosive to foundation elements if one or more of the following conditions exist: Chloride concentration is greater than or equal to 500 ppm, sulfate concentration is greater than or equal to 1,500 ppm, or the pH is 5.5 or less (Caltrans, 2012).

Based on Caltrans criteria, the test results indicate the site is not considered to be a corrosive environment for structures. However, other samples at the site could yield significantly different concentrations to those described above. Therefore, additional testing may be performed to further evaluate corrosion during the planning or construction stages and to evaluate the as-graded corrosion potential of the onsite soils after site grading. We recommend evaluation by a corrosion engineer should be performed.

7.5 PAVEMENT

7.5.1 Asphalt Concrete Pavement

An R-Value of 20 has been assumed for preliminary design of pavement sections based on laboratory test results and visual observation of the on-site material in the upper 5 feet. The actual R-value of the subgrade soils should be determined after grading to provide final pavement design. Flexible pavement sections have been calculated in general conformance with Caltrans guidelines. Site development plans call for the Site to be used as a vehicle storage lot. In consideration of the property use, the owner has asked for different pavement options and levels of maintenance. The project engineer, in consultation with the owner, may select a pavement design with the understanding that they represent different levels of maintenance. The project civil engineer and owner should review the pavement designations to determine appropriate locations for pavement thickness. Based on an assumed R-value of 20, the following pavement structural sections have been calculated and presented in Table 4.

Table 4. Flexible Pavement Sections

Traffic Type	Traffic Index	Asphalt Concrete (inches)	Aggregate Base (2) (inches)	Chip Seal (inches)	Cement Treated Base (CTB) (inches)	Cement Treated Soil (CTS) (inches)
Vehicle Parking Area	5	3 (1)	8.5 (1)	--	--	--
Heavy Equipment Traffic Areas	12.5	8 (1)	20 (1)	--	--	--
Vehicle Parking and Heavy Equipment Traffic	--	--	--	3	12	12

Notes: (1) Designed using Caltrans Highway Design Method
(2) Aggregate Base should conform to Class 2 Aggregate Base in accordance with the Caltrans Standard Specifications or Crushed Miscellaneous Base in accordance with the Standard Specifications for Public Works Construction.

Prior to placing base materials, the upper 12 inches of the subgrade soil should be scarified, moisture conditioned to slightly above the optimum moisture content, and recompacted to a dry density of at least 90% of the laboratory maximum. The base material should also be compacted to slightly above the optimum moisture content and a dry density of at least 95% of the laboratory maximum.

Rigid concrete pavement (described below) should be placed in driveway entrance aprons and trash bin loading/storage areas. Concrete pavement design is provided in the following section.

7.5.2 Concrete Pavement

Concrete pavements have been calculated in general conformance with the procedure recommended by the American Concrete Institute (ACI 330R-08) using the parameters presented in Table 5. These recommendations do not apply to areas where heavy equipment will be used.

Table 5. Concrete Pavement Parameters

Design Parameter	Value
Modulus of Subgrade Reaction (k)	150 pci
Modulus of Concrete Rupture (M_R)	550 psi
Concrete Compressive Strength	3,700 psi
Traffic Categories (TC)	A and C
Average Daily Truck Traffic (ADTT)	10 and 100

Based on the parameters above, we recommend the following minimum concrete pavement thickness (Table 6).

Table 6. Recommended Concrete Pavement Sections

Traffic Type	Pavement Thickness (inches)	Aggregate Base (inches)
Automobile Parking and Driveways (TC = A)	6	6
Heavy Truck Traffic and Fire Lane Areas (TC = C)	8	6

The project civil engineer should confirm whether the assumed ADTT is appropriate for the anticipated traffic level. Concrete compressive strength for pavement should be at least 3,700 psi. Minimum reinforcement should consist of #3 bars on 24-inch centers. Crack control joints should be placed in accordance with the American Concrete Institute (ACI) guidelines.

Prior to placing concrete, the upper 12 inches of the subgrade soil should be scarified, moisture conditioned to slightly above the optimum moisture content, and recompacted to a dry density of at least 90% of the laboratory maximum.

7.6 PERCOLATION TESTING

Percolation testing was performed in four borings (P1 through P4) in general accordance with the guidelines described in Los Angeles County Administrative Manual (LACAM) (LA,2014).

Based on the laboratory sieve test results, the natural soils located at the bottom of the percolation well soil borings consist of sand (USCS: SP-SM, SW-SM and SP) with variable amounts of silt. The sands were brown, dry to moist, and loose to medium dense.

The percolation tests were performed in an eight-inch diameter, five to six-foot deep boring. Pre-soaking was performed the day prior to percolation testing. The stabilized percolation rate from the final tests was measured as 37.5 to 215 inches per hour or 0.3 to 1.6 minutes per inch which corresponds to a moderate percolation rate (un-factored).

Los Angeles County requirements for infiltration include converting the percolation rate to an infiltration rate (I_f) and applying a safety factor. Once the infiltration rate was calculated and a factor of safety of 3 is applied, the design infiltration rate is 1.3 inches per hour. Note that this infiltration rate is applicable at the location tested. Different locations may have different rates and soil compaction will reduce the infiltration rate. An appropriate factor of safety, if necessary, should be applied to the overall system design in accordance with the LA County Administrative Manual (LADPW, 2014).

Soil percolation rates from in situ tests can vary significantly from one location to another due to heterogeneous characteristics of subsurface conditions. The test results from these borings should be considered a screening level value and additional testing should be performed if an on-site disposal system is to be constructed for the project. Soil compaction can decrease infiltration rates

significantly. Final percolation testing should be performed in as graded conditions so that effects from soil compaction are incorporated in the test results.

7.7 POST INVESTIGATION SERVICES

Post investigation services are an important and necessary continuation of this investigation, and it is recommended that Stantec be retained as the Geotechnical Engineer to perform such services. Final project grading and foundation plans, foundation details and specifications should be reviewed by Stantec prior to construction to check that the intent of the recommendations presented herein have been applied to the design. Following review of plans and specifications, observation during construction should be performed to correlate the findings of this exploration with the actual subsurface conditions exposed.

8. CLOSURE

Our conclusions, recommendations, and discussions presented herein are based upon an evaluation and interpretation of the findings from the field and laboratory programs, with interpolation and extrapolation of subsurface conditions between and beyond the exploration locations. This report contains information that is valid as of the report's date and to the extent directly known to Stantec. However, conditions can change with the passage of time or construction subsequent to this report's preparation that may invalidate, either partially or wholly, the conclusions and recommendations presented herein.

Inherent in most projects performed in the heterogeneous subsurface environment, continuing subsurface explorations and analyses may reveal conditions that are different than those described in this report. The findings and recommendations contained in this report were developed in accordance with generally accepted, current professional principles and practice ordinarily exercised, under similar circumstances, by geotechnical engineers and engineering geologists practicing in this locality. No other warranty, express or implied, is made.

9. REFERENCES

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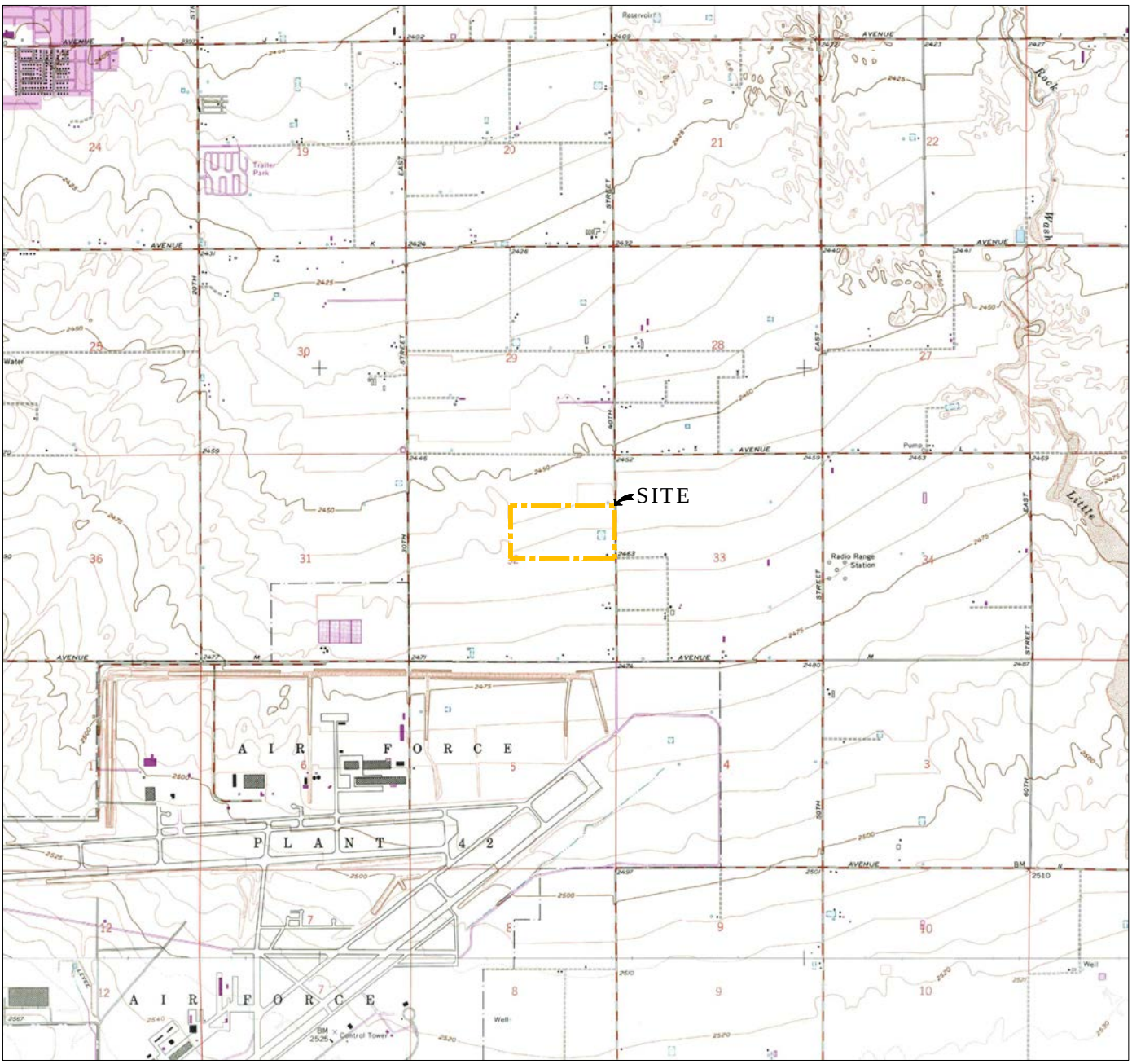
FIGURES



2 1 0 2

SCALE IN MILE

2000 0 2000 4000 6000 8000 10000 12000 14000

SCALE IN FEET

REFERENCE: USGS 7.5 X 15 MINUTE QUADRANGLE; LANCASTER EAST; 1974

Stantec	FOR: COPART PALMDALE NORTHWEST CORNER 40TH STREET EAST AND AVENUE L8 PALMDALE, CALIFORNIA		SITE LOCATION MAP		FIGURE: 1
735 EAST CARNEGIE DRIVE, SUITE 280 SAN BERNARDINO, CA 92408 PHONE:(909) 335-6116 FAX:(909) 335-6120	JOB NUMBER: 2042546200	DRAWN BY: JEF	CHECKED BY: JEF	APPROVED BY: JEF	DATE: 2/20/19

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LEGEND

APPROXIMATE LIMITS OF PROPERTY

N

0 300 600

SCALE (FEET)

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SAN BERNARDINO, CA 92408
PHONE:(909) 335-6116 FAX:(909) 335-6120

FOR:			FIGURE:
COPART PALMDALE NORTHWEST CORNER 40TH STREET EAST AND AVENUE L8 PALMDALE, CALIFORNIA		SITE VICINITY MAP	2
JOB NUMBER: 2042546200	DRAWN BY: JEF	CHECKED BY: JEF / APPROVED BY: JEF	DATE: 2/20/19

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ZONING: M-1 (LIGHT INDUSTRIAL)
GENERAL PLAN: IND (INDUSTRIAL)
APN: 3170-015-006

EXISTING SITE BOUNDARY AND AVENUE "L4" CENTERLINE

PROPOSED FENCE PER DETAILS ON SHEET 2.

PROPOSED R/W

N 89°47'05" W 2685.04'

AVENUE "L4"

PROPOSED INTERCEPTOR AND DISSIPATOR CHANNEL

EXISTING SITE BOUNDARY AND AVENUE 35th ST. CENTERLINE

PROPOSED FENCE PER DETAILS ON SHEET 2.

ZONING: M-2 (GENERAL INDUSTRIAL)
GENERAL PLAN: IND (INDUSTRIAL)
APN: 3170-015-017

35TH ST.

N 00°22'06" W 1331.84'

PROPOSED INTERCEPTOR AND DISSIPATOR CHANNEL

PROPOSED R/W

P1 P2 P3 P4

B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12

SEE DETAIL ON SHEET 2

SEE DETAIL ON SHEET 2

PROPOSED FENCE PER DETAILS ON SHEET 2.

PROPOSED LOADING/UNLOADING AREA

PROPOSED OFFICE BUILDING

PROPOSED R/W

40TH ST.

N 00°17'52" W 1329.04'

PROPOSED CURB & GUTTER

EXIST. EDGE OF PAVEMENT

EXIST. RIGHT OF WAY

STREET CENTERLINE

PROPOSED WATER TANK

EXIST. OVERHEAD ELECTRICAL LINE TO BE PROTECTED IN PLACE.

ZONING: M-2 (GENERAL INDUSTRIAL)
GENERAL PLAN: IND (INDUSTRIAL)
APN: 3170-015-014
LAND USE: VACANT

AVENUE "L8"

N 89°50'39" W 2683.37'

PROPOSED FENCE PER DETAILS ON SHEET 2.

EXISTING SITE BOUNDARY AND AVENUE "L8" CENTERLINE

EXISTING WATER WELL TO BE CAPPED AND ABANDONED.

PROPOSED R/W

EXISTING POWER POLES AND ELECTRICAL LINE TO BE REMOVED PRIOR TO CONSTRUCTION OF STREET IMPROVEMENTS.

PROPOSED INTERCEPTOR AND DISSIPATOR CHANNEL

EXISTING TREE TO BE PROTECTED IN PLACE

APN: 3170-015-018

LEGEND

B12 — APPROXIMATE LOCATION OF SOIL BORING

P2 — APPROXIMATE LOCATION OF PERCOLATION TEST

APPROXIMATE LIMITS OF PROPERTY

N

0 200 400

SCALE (FEET)

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FOR:			FIGURE:
COPART PALMDALE NORTHWEST CORNER 40TH STREET EAST AND AVENUE L8 PALMDALE, CALIFORNIA		SUBSURFACE EXPLORATION MAP	3
JOB NUMBER: 2042546200	DRAWN BY: JEF	CHECKED BY: JEF / APPROVED BY: JEF	DATE: 2/20/19

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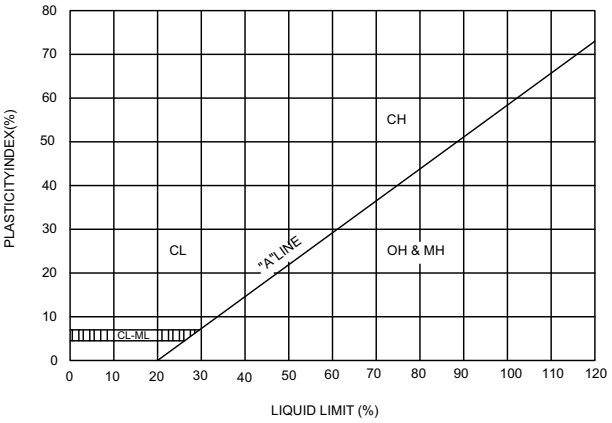
APPENDIX A
BORING LOGS

UNIFIED SOIL CLASSIFICATION (ASTM D-2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	*CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		*GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	*CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		*SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY
			PI>4 AND PLOTS<"A" LINE	ML	SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
			PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

* Dual symbols required for fines content between 5% and 12%

PLASTICITY CHART



SAMPLER TYPES

- SPT
- Shelby Tube
- Modified California (2.5" I.D.)
- No Recovery
- Rock Core
- Grab Sample

ADDITIONAL TESTS

COR	-	CHEMICAL ANALYSIS (CORROSIVITY)	PI	-	PLASTICITY INDEX
CD	-	CONSOLIDATED DRAINED TRIAXIAL	EI	-	EXPANSION INDEX
CN	-	CONSOLIDATION	TC	-	CYCLIC TRIAXIAL
CU	-	CONSOLIDATED UNDRAINED TRIAXIAL	TV	-	TORVANE SHEAR
DS	-	DIRECT SHEAR	UC	-	UNCONFINED COMPRESSION
PP	-	POCKET PENETROMETER (TSF)	(1.5)	-	(WITH SHEAR STRENGTH IN KSF)
#200	-	Percent Passing #200 SIEVE			
RV	-	R-VALUE	UU	-	UNCONSOLIDATED UNDRAINED TRIAXIAL
SA	-	SIEVE ANALYSIS: % PASSING			
▼	-	WATER LEVEL			

PENETRATION RESISTANCE (RECORDED AS BLOWS / FOOT)

SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.5
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.5-1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

* * UNDRAINED SHEAR STRENGTH IN KIPS/SQ. FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.

LEGEND TO BORING LOGS AND SOIL DESCRIPTIONS

Stantec

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/28/19** COMPLETED: **1/28/19**
INSTALLATION: STARTED **1/28/19** COMPLETED: **1/28/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO: **B1** PAGE 1 OF 3

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **34° 39' 17.24"** LONGITUDE: **118° 3' 34.59"**
GROUND ELEV (ft): **2464** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **51.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **JS** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)	Borehole Backfill
			QUATERNARY ALLUVIAL DEPOSITS (Qa)			MDD, CORR				
		SM	**SILTY SAND** ; SM; (10Y/R 4/4) dark yellowish brown; 74% very fine to coarse grained sand; 26% fines; dry; no staining for odor		0745 B1-2'	SA				
5			78% very fine to coarse grained sand; 22% fines; medium dense below 5 feet		0807 B1-5'	SA, DS	4 11 17		5	
			(2.5Y/R 6/4) light yellowish brown; 80% very fine to fine grained sand; 20% fines below 7 feet		B1-7'		4 7 8			
10			Loose below 10 feet		B1-10'	MD	1 5 10		10	
15			85% very fine to fine grained sand; 15% fines; moist; medium dense below 15 feet		B1-15'		10 14 14		15	
20		SW	**WELL GRADED SAND** ; SW; (10Y/R 5/3) brown; 95% fine to coarse grained sand; 5% fines; moist; medium dense; no staining or odor		B1-20'	MD	10 15 24		20	

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/28/19** COMPLETED: **1/28/19**
INSTALLATION: STARTED **1/28/19** COMPLETED: **1/28/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B1 PAGE 2 OF 3

Stantec

NORTHING (ft):
LATITUDE: **34° 39' 17.24"**
GROUND ELEV (ft): **2464**
INITIAL DTW (ft): **NE**
STATIC DTW (ft): **NE**
WELL CASING DIAMETER (in): **---**
LOGGED BY: **JS**

EASTING (ft):
LONGITUDE: **118° 3' 34.59"**
TOC ELEV (ft):
BOREHOLE DEPTH (ft): **51.5**
WELL DEPTH (ft): **---**
BOREHOLE DIAMETER (in): **8**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)	Borehole Backfill
		SM	**SILTY SAND** ; SM; (10Y/R 3/3) dark brown; 60% very fine to fine sand; 40% fines; moist; loose; no staining or odor		B1-25'		5 8 8			
30			(10 Y/R 5/3) brown; 10% fine gravel; 75% very fine to coarse sand; 15% fines; dense		B1-30'		9 18 13		30	
35		SW	**WELL GRADED SAND** ; SW; (10 Y/R 5/3) brown; 95% fine to coarse sand; 5% fines; moist; dense; no staining or odor		B1-35'		19 21 26		35	
40					B1-40'		10 20 24		40	
45		SC	**CLAYEY SAND** ; SC; (10 Y/R 3/3) dark brown; 60% very fine to coarse sand; 40% high plastic fines; moist; medium dense; no staining or odor		B1-45'		4 7 10		45	

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/28/19** COMPLETED: **1/28/19**
INSTALLATION: STARTED **1/28/19** COMPLETED: **1/28/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO: **B1** PAGE 3 OF 3

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 17.24"**
LONGITUDE: **118° 3' 34.59"**
GROUND ELEV (ft): **2464**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **51.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **JS**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)	Borehole Backfill
					0930 B1-50'		7 5 4			
			Hole terminated at 51.5 feet.							
55									55	
60									60	
65									65	
70									70	

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B10 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 13.36"**
LONGITUDE: **118° 3' 53.16"**
GROUND ELEV (ft): **2463**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **8.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		SM	**SILTY SAND** ; SM; (10 Y/R 5/3) brown; 57% very fine to coarse sand; 43% fines; dry; no staining or odor		B10-2'	SA			
5			Medium dense below 5 feet		B10-5'		3 5 9		5
					B10-7'	MD			
			Hole terminated at 8.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B11 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 21.29"**
LONGITUDE: **118° 3' 58.58"**
GROUND ELEV (ft): **2459**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **6.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		SM	**SILTY SAND** ; SM; (10 Y/R 5/4) brown; 62% fine to coarse sand; 38% fines; dry; no staining or odor		B11-2'	SA		0	
5			Medium dense; moist below 5 feet		B11-5'		4 8 14	0	5
			Hole terminated at 6.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B12 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 16.18"**
LONGITUDE: **118° 3' 58.68"**
GROUND ELEV (ft): **2461**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **8.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)			MDD			
		SM	**SILTY SAND** ; SM; (10 Y/R 5/3) brown; 58% very fine to medium grained sand; 42% fines; dry; no staining or odor		B12-2'	SA			
5			Medium dense below 5 feet		B12-5'		2 7 9		5
			(10 Y/R 7/4) pale brown below 7 feet		B12-7'	MD	3 8 10		
			Hole terminated at 8.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/28/19** COMPLETED: **1/28/19**
INSTALLATION: STARTED **1/28/19** COMPLETED: **1/28/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B2 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 16.29"**
LONGITUDE: **118° 3' 34.79"**
GROUND ELEV (ft): **2464**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **21.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		SM	**SILTY SAND** ; SM; (10 Y/R 5/6) yellowish brown; 86% fine to coarse grained sand; 14% fines; dry; medium dense; no staining or odor		1010 B2-2'	SA			
5			Light gray; (10 Y/R 7/2) light gray below 5 feet		B2-5'		2 5 6		5
					B2-7'	DS	2 6 15		
10			Dark yellowish brown; (10 Y/R 4/6) dark yellowish brown; 68% fine to coarse grained sand; 32% fines		B2-10'		3 5 7		10
15		SW-SM	**WELL GRADED SAND WITH SILT** ; SW-SM; (10 Y/R 6/4) light yellowish brown; 90% very fine to fine sand; 10% fines; dry; medium dense; no staining or odor		B2-15'	MD	2 9 18		15
20		SW	**WELL GRADED SAND** ; SW; (10 Y/R 4/6) dark yellowish brown; 95% fine to coarse sand; 5% fines; moist; medium dense; no staining or odor		1045 B2-20'		4 10 12		20
			Hole terminated at 21.5 feet.						

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B3 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 23.76"**
LONGITUDE: **118° 3' 40.65"**
GROUND ELEV (ft): **2459**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **6.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		SM	**SILTY SAND** ; SM; (10 Y/R 5/3) brown; 53% fine to medium grained sand; 47% fines; dry; no staining or odor		B3-2'	SA			
5			65% very fine to fine sand; 35% fines; dry; loose below 5 feet		B3-5'	MD	2 4 8		5
			Hole terminated at 6.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B4 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 18.69"**
LONGITUDE: **118° 3' 40.74"**
GROUND ELEV (ft): **2463**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **8.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		SM	**SILTY SAND** ; SM; (10 Y/R 3/4) dark yellowish brown; 67% fine to coarse grained sand; 33% fines; dry; no staining or odor		B4-2'	SA			
5			Pale brown; (10 Y/R 6/3) pale brown; loose below 5 feet		B4-5'		2 3 4		5
					B4-7'	MD	6 7 8		
			Hole terminated at 8.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B5 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 13.46"**
LONGITUDE: **118° 3' 40.67"**
GROUND ELEV (ft): **2464**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **6.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		SM	**SILTY SAND** ; SM; (10 Y/R 5/6) yellowish brown; 58% fine to very fine grained sand; 42% fines; dry; no staining or odor		B5-2'	SA			
5			(10 Y/R 6/6) brownish yellow; loose below 5 feet		B5-5'	MD	4 8 7		5
			Hole terminated at 6.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B6 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 21.13"**
LONGITUDE: **118° 3' 47.25"**
GROUND ELEV (ft): **2460**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **8.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)			R-VAL			
		SM	**SILTY SAND** ; SM; (10 Y/R 5/6) yellowish brown; 80% very fine to fine grained sand; 20% fines; dry; no staining or odor		B6-2'	SA			
5			Loose below 5 feet		B6-5'		3 3 4		5
			Medium dense below 7 feet		B6-7'	MD	8 14 15		
			Hole terminated at 8.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO: **B7** PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 16.35"**
LONGITUDE: **118° 3' 47.23"**
GROUND ELEV (ft): **2462**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **6.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		ML	**SANDY SILT** ; ML; (10 Y/R 6/4) light yellowish brown; 47% very fine to medium grained sand; 53% fines; dry; no staining or odor		B7-2'	SA			
5		SM	**SILTY SAND** ; SM; (10 Y/R 6/4) light yellowish brown; 75% very fine to medium grained sand; 25% fines; dry; no staining or odor		B7-5'	MD			5
			Hole terminated at 6.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
B8 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 23.66"**
LONGITUDE: **118° 3' 53.53"**
GROUND ELEV (ft): **2459**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **8.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		SM	**SILTY SAND** ; SM; (10 Y/R 6/4) light yellowish brown; 85% very fine to fine sand; 15% fines; dry; no staining or odor		B8-2'	SA			
5			(10 Y/R 6/3) pale brown; medium dense below 5 feet		B8-5'		3 5 5		5
			Loose below 7 feet		B8-7'	MD	1 5 6		
			Hole terminated at 8.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/29/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/29/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO: **B9** PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 18.71"**
LONGITUDE: **118° 3' 53.33"**
GROUND ELEV (ft): **2461**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **6.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY ALLUVIAL DEPOSITS (Qa)						
		SM	**SILTY SAND** ; SM; (10 Y/R 5/3) brown; 54% very fine to coarse sand; 46% fines; dry; no staining or odor		B9-2'	SA			
5			Medium dense below 5 feet		B9-5'	MD	4 8 12		5
			Hole terminated at 6.5 feet.						
10									10
15									15
20									20

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/28/19** COMPLETED: **1/29/19**
INSTALLATION: STARTED **1/28/19** COMPLETED: **1/29/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO: **P1** PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 24.61"**
LONGITUDE: **118° 3' 33.69"**
GROUND ELEV (ft): **2460**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **6.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **6.5**
WELL CASING DIAMETER (in): **2**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)	Well Construction
			QUATERNARY ALLUVIAL DEPOSITS (Qa)							
		SP-SM	**POORLY GRADED SAND WITH SILT** ; SP-SM; (10 Y/R 4/3) brown; 90% fine to coarse grained sand; 10% fines; dry; no staining or odor		0820 P1-2'					Backfilled with #3 Lone Star Sand
5			(10 Y/R 6/2) light brownish gray; 2% fine gravel; 89% very fine to coarse grained sand; 9% fines; medium dense below 5 feet		0845 P1-5'	SA, MD	8 9 13		5	
			Hole terminated at 6.5 feet.							
10									10	
15									15	
20									20	

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/28/19** COMPLETED: **1/28/19**
INSTALLATION: STARTED **1/28/19** COMPLETED: **1/28/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
P2 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 24.67"**
LONGITUDE: **118° 4' 2.97"**
GROUND ELEV (ft): **2457**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **6.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **6.5**
WELL CASING DIAMETER (in): **2**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **JS**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)	Well Construction
			QUATERNARY ALLUVIAL DEPOSITS (Qa)							
		SM	**SILTY SAND** ; SM; (2.5 Y/R 7/3) pale brown; 65% very fine to fine sand; 35% fines; dry; no staining or odor		P2-2'					Backfilled with #3 Lone Star Sand
5			Light olive brown; (2.5 Y/R 5/4) light olive brown; 77% very fine to coarse grained sand; 23% fines; loose below 5 feet		P2-5'	SA	3 4 4		5	
			Hole terminated at 6.5 feet.							
10									10	
15									15	
20									20	

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/28/19** COMPLETED: **1/28/19**
INSTALLATION: STARTED **1/28/19** COMPLETED: **1/28/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
P3 PAGE 1 OF 1

Stantec

NORTHING (ft):
EASTING (ft):
LATITUDE: **34° 39' 12.47"**
LONGITUDE: **118° 4' 3.04"**
GROUND ELEV (ft): **2464**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **6.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **6.5**
WELL CASING DIAMETER (in): **2**
BOREHOLE DIAMETER (in): **8**
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)	Well Construction
			QUATERNARY ALLUVIAL DEPOSITS (Qa)							
		SM	**SILTY SAND** ; SM; (10 Y/R 4/6) dark yellowish brown; 85% very fine to fine grained sand; 15% fines; dry; no staining or odor		P3-2'					Backfilled with #3 Lone Star Sand
5			(10 Y/R 3/6) dark yellowish brown; 74% fine to medium grained sand; 26% fines; medium dense below 5 feet		P3-5'	SA, MD	2 8 10		5	
			Hole terminated at 6.5 feet.							
10									10	
15									15	
20									20	

PROJECT: **Copart Palmdale**
LOCATION: **NWC 40th St E and Ave L8 (Future), Palmdale, CA**
PROJECT NUMBER: **2042546200**
DRILLING: STARTED **1/28/19** COMPLETED: **1/28/19**
INSTALLATION: STARTED **1/28/19** COMPLETED: **1/28/19**
DRILLING COMPANY: **ABC Liovin Drilling**
DRILLING EQUIPMENT: **CME85**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING EQUIPMENT: **Split Spoon**

WELL / TEST PIT / BOREHOLE NO:
P4 PAGE 1 OF 1

Stantec

NORTHING (ft):
LATITUDE: **34° 39' 12.31"**
GROUND ELEV (ft): **2465**
INITIAL DTW (ft): **NE**
STATIC DTW (ft): **NE**
WELL CASING DIAMETER (in): **2**
LOGGED BY: **JS**

EASTING (ft):
LONGITUDE: **118° 3' 33.29"**
TOC ELEV (ft):
BOREHOLE DEPTH (ft): **6.5**
WELL DEPTH (ft): **6.5**
BOREHOLE DIAMETER (in): **8**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)	Well Construction
			QUATERNARY ALLUVIAL DEPOSITS (Qa)							
		SW-SM	**WELL GRADED SAND WITH SILT** ; SW-SM; (10 Y/R 5/6) yellowish brown; 95% very fine to fine sand; 5% fines; dry; no staining or odor		P4-2'					Backfilled with #3 Lone Star Sand
5			(10 Y/R 3/3) dark brown; 5% fine gravel; 84% fine to coarse sand; 11% fines; medium dense below 5 feet		P4-5'	SA	5 7 8		5	
			Hole terminated at 6.5 feet.							
10									10	
15									15	
20									20	

GEO FORM 304 COPART_PALMDALE_20190208.GPJ SECOR INTL.GDT 2/24/19

APPENDIX B
LABORATORY TEST RESULTS

SUMMARY OF SOIL DENSITY TEST RESULTS
ASTM D 2216

Boring Location	Sample Depth (ft)	Wet Density (lb/ft^3)	Dry Density (lb/ft^3)	Moisture Content (percent)
B1-10'	10	96.1	92.4	4.0
B1-20'	20	109.3	107.8	1.4
B2-15'	15	117.6	115.8	1.5
B3-5'	5	105.5	104.5	0.9
B4-7'	7	103.7	102.1	1.6
B5-5'	5	109.2	108.5	0.6
B6-7'	7	108.0	104.9	2.9
B7-5'	5	103.4	100.8	2.6
B8-7'	7	103.9	102.3	1.6
B9-5'	5	105.1	103.7	1.3
B10-7'	7	101.4	99.6	1.9
B12-7'	7	95.6	91.4	4.5
P1-5'	5	101.9	101.2	0.7
P3-5'	5	109.1	104.4	4.5

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B1-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-04-2019
Particle Shape		Test Date	02-05-2019
Particle Hardness			
Sample Dry Mass (g)	359.50		
Moisture Content (%)	1.6		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 8	1.10	0.3	99.7
No. 16	5.80	1.6	98.1
No. 30	9.30	2.6	95.5
No. 50	29.00	8.1	87.4
No. 100	107.00	29.8	57.7
No. 200	114.50	31.8	25.8
Pan	92.80	25.8	---

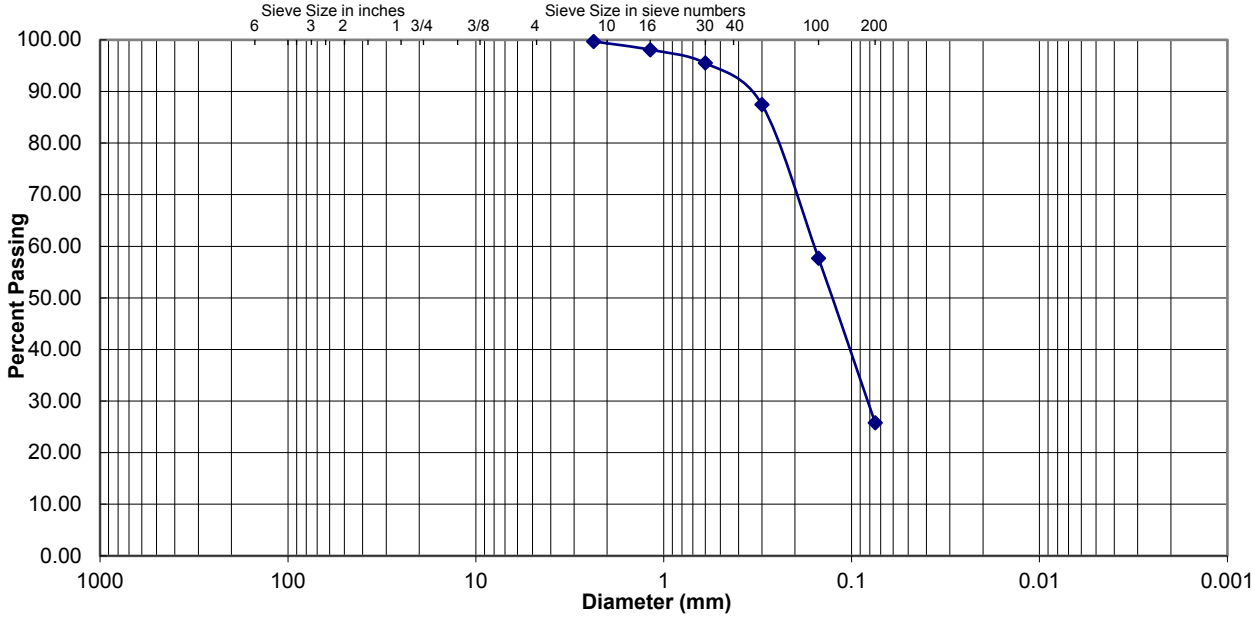
% Gravel	0.0
% Sand	74.2
% Fines	25.8
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

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Gradation Analysis

ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	CalMod	Lab ID	B1-5'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-04-2019
Particle Shape		Test Date	02-05-2019
Particle Hardness			
Sample Dry Mass (g)	312.10		
Moisture Content (%)	3.3		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 8	2.80	0.9	99.1
No. 16	8.80	2.8	96.3
No. 30	16.70	5.4	90.9
No. 50	42.40	13.6	77.3
No. 100	98.90	31.7	45.7
No. 200	73.50	23.6	22.1
Pan	69.00	22.1	---

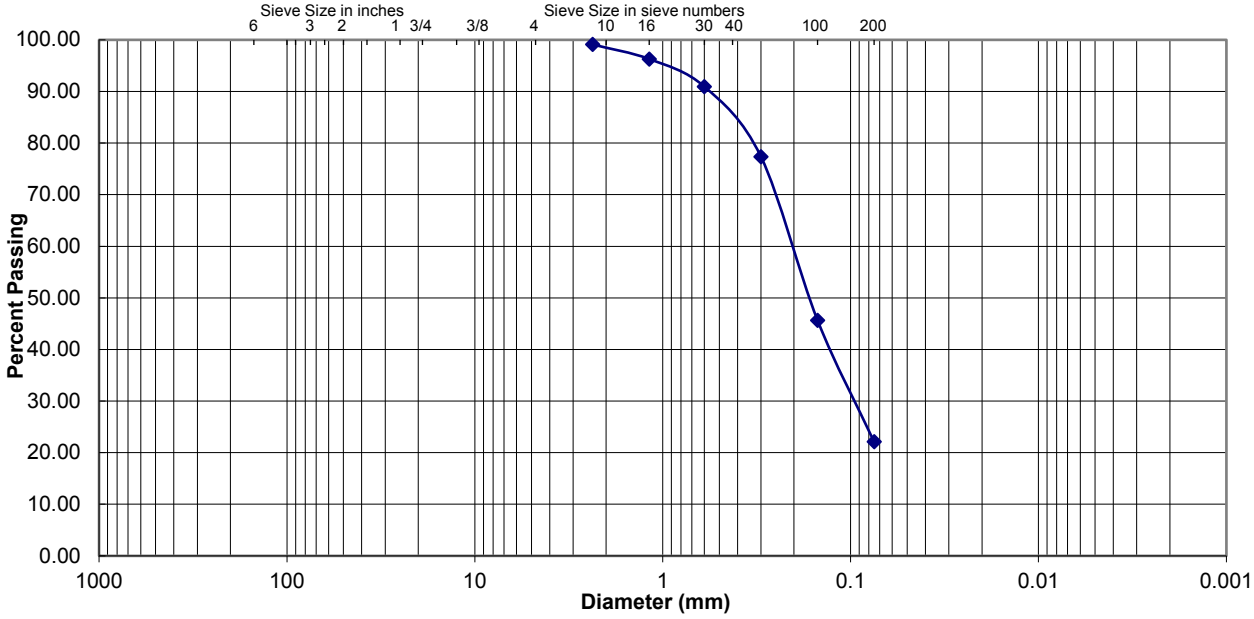
% Gravel	0.0
% Sand	77.9
% Fines	22.1
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

File: Copart_Palmdale_2042546200_B1-5_Sieve.xlsm Sheet: Report
Preparation Date: 1-2008
Revision Date: 4-2008

Stantec Consulting Services Inc.

Laboratory Document
Prepared By: JW
Approved By: TLK

Stantec

Gradation Analysis

ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B2-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-04-2019
Particle Shape		Test Date	02-05-2019
Particle Hardness			
Sample Dry Mass (g)	395.40		
Moisture Content (%)	1.3		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	1.20	0.3	99.7
No. 8	3.20	0.8	98.9
No. 16	10.20	2.6	96.3
No. 30	24.20	6.1	90.2
No. 50	84.70	21.4	68.8
No. 100	133.20	33.7	35.1
No. 200	81.60	20.6	14.4
Pan	57.10	14.4	---

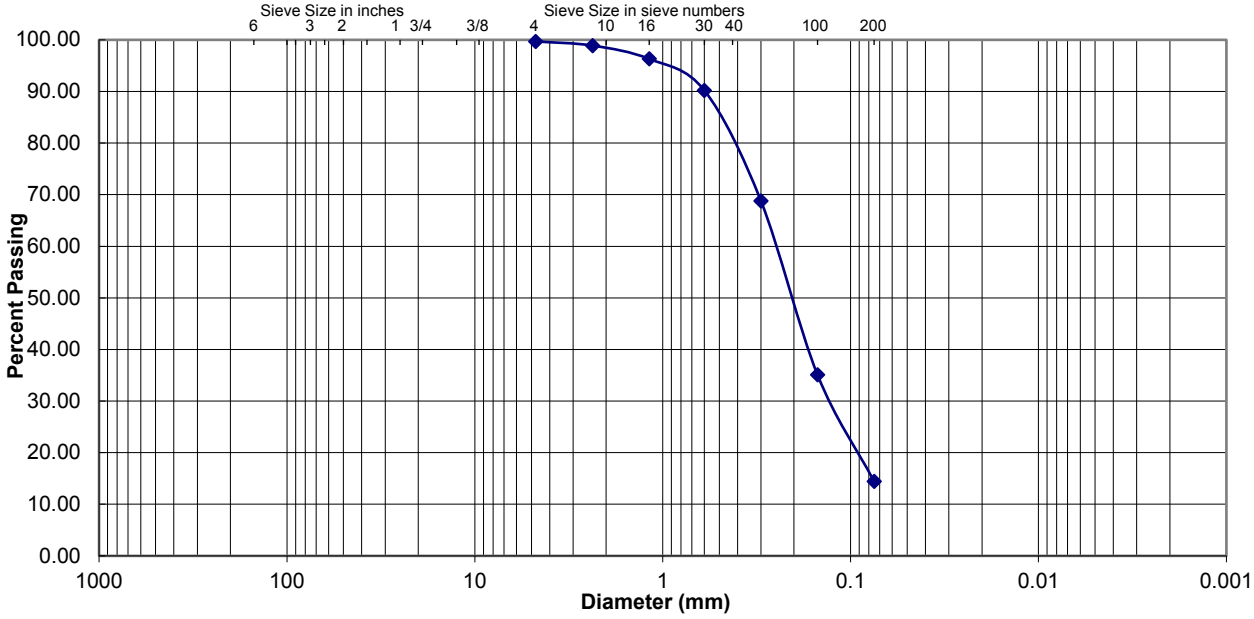
% Gravel	0.3
% Sand	85.3
% Fines	14.4
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

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Gradation Analysis

ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	SPT	Lab ID	B2-10'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	374.60	Analysis based on total sample.	
Moisture Content (%)	3.0		

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	1.20	0.3	99.7
No. 8	8.20	2.2	97.5
No. 16	20.40	5.4	92.0
No. 30	26.90	7.2	84.9
No. 50	34.00	9.1	75.8
No. 100	81.70	21.8	54.0
No. 200	83.60	22.3	31.7
Pan	118.60	31.7	---

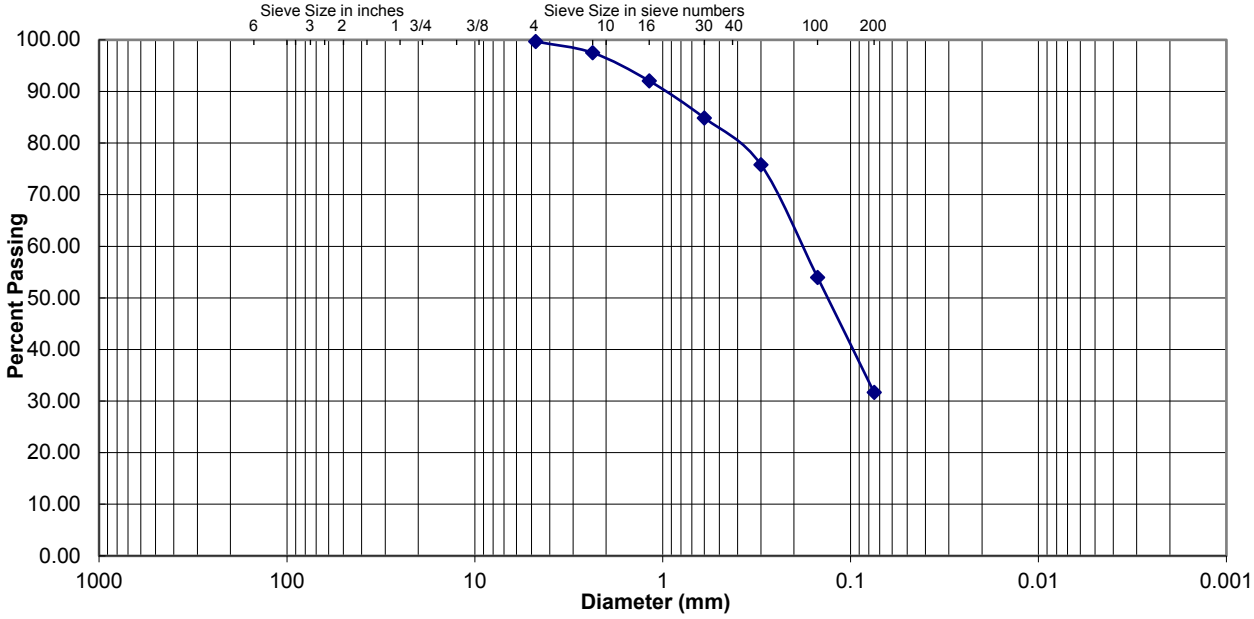
% Gravel	0.3
% Sand	68.0
% Fines	31.7
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

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Gradation Analysis

ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B3-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-04-2019
Particle Shape		Test Date	02-05-2019
Particle Hardness			
Sample Dry Mass (g)	455.00		
Moisture Content (%)	1.8		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 8	0.30	0.1	99.9
No. 16	2.10	0.5	99.5
No. 30	4.70	1.0	98.4
No. 50	28.80	6.3	92.1
No. 100	81.00	17.8	74.3
No. 200	123.30	27.1	47.2
Pan	214.80	47.2	---

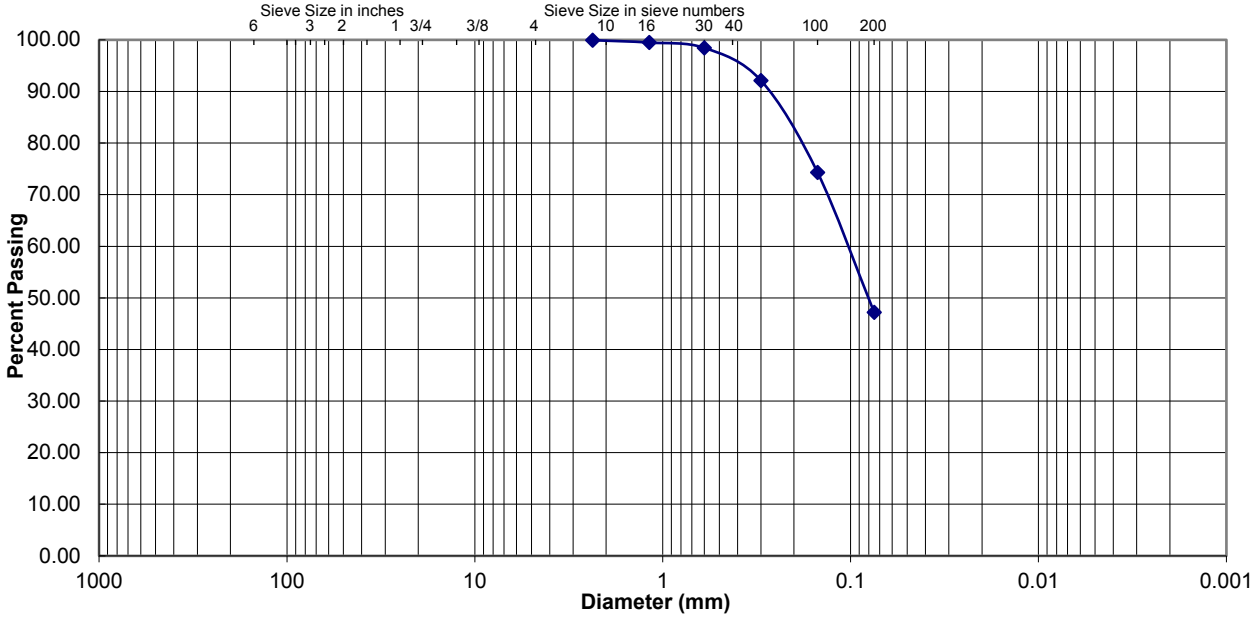
% Gravel	0.0
% Sand	52.8
% Fines	47.2
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

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Preparation Date: 1-2008
Revision Date: 4-2008

Stantec Consulting Services Inc.

Laboratory Document
Prepared By: JW
Approved By: TLK

Stantec

Gradation Analysis

ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B4-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-04-2019
Particle Shape		Test Date	02-05-2019
Particle Hardness			
Sample Dry Mass (g)	426.70		
Moisture Content (%)	2.8		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	1.30	0.3	99.7
No. 8	3.10	0.7	99.0
No. 16	8.00	1.9	97.1
No. 30	14.00	3.3	93.8
No. 50	61.10	14.3	79.5
No. 100	115.50	27.1	52.4
No. 200	85.10	19.9	32.5
Pan	138.60	32.5	---

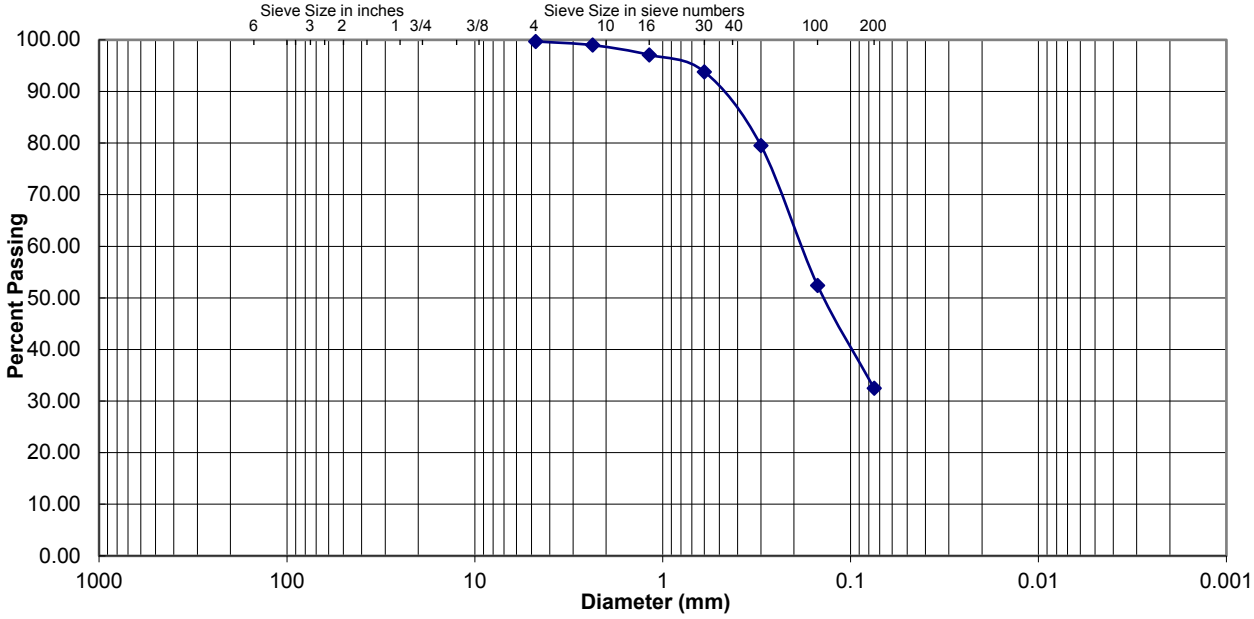
% Gravel	0.3
% Sand	67.2
% Fines	32.5
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

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Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B5-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	455.20		
Moisture Content (%)	2.6		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 8	1.40	0.3	99.7
No. 16	6.80	1.5	98.2
No. 30	11.40	2.5	95.7
No. 50	27.90	6.1	89.6
No. 100	92.20	20.3	69.3
No. 200	121.90	26.8	42.5
Pan	193.60	42.5	---

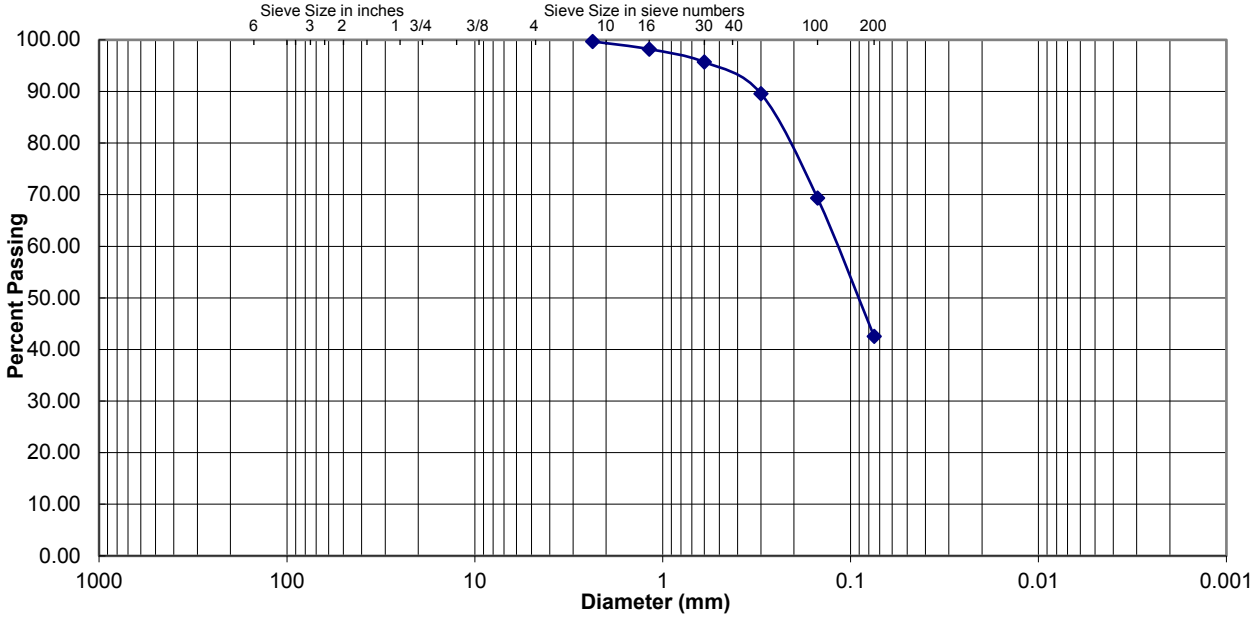
% Gravel	0.0
% Sand	57.5
% Fines	42.5
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

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Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B6-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	471.60		
Moisture Content (%)	2.1		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	2.00	0.4	99.6
No. 8	6.40	1.4	98.2
No. 16	9.90	2.1	96.1
No. 30	16.90	3.6	92.5
No. 50	95.00	20.1	72.4
No. 100	157.40	33.4	39.0
No. 200	91.50	19.4	19.6
Pan	92.50	19.6	---

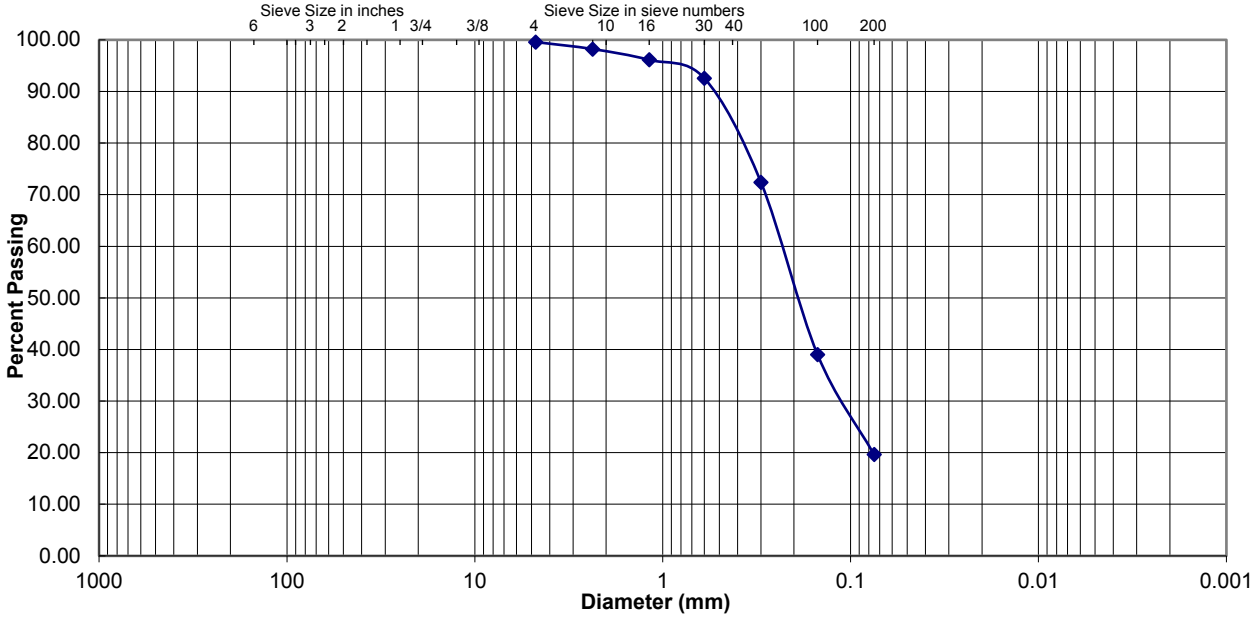
% Gravel	0.4
% Sand	80.0
% Fines	19.6
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

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Gradation Analysis

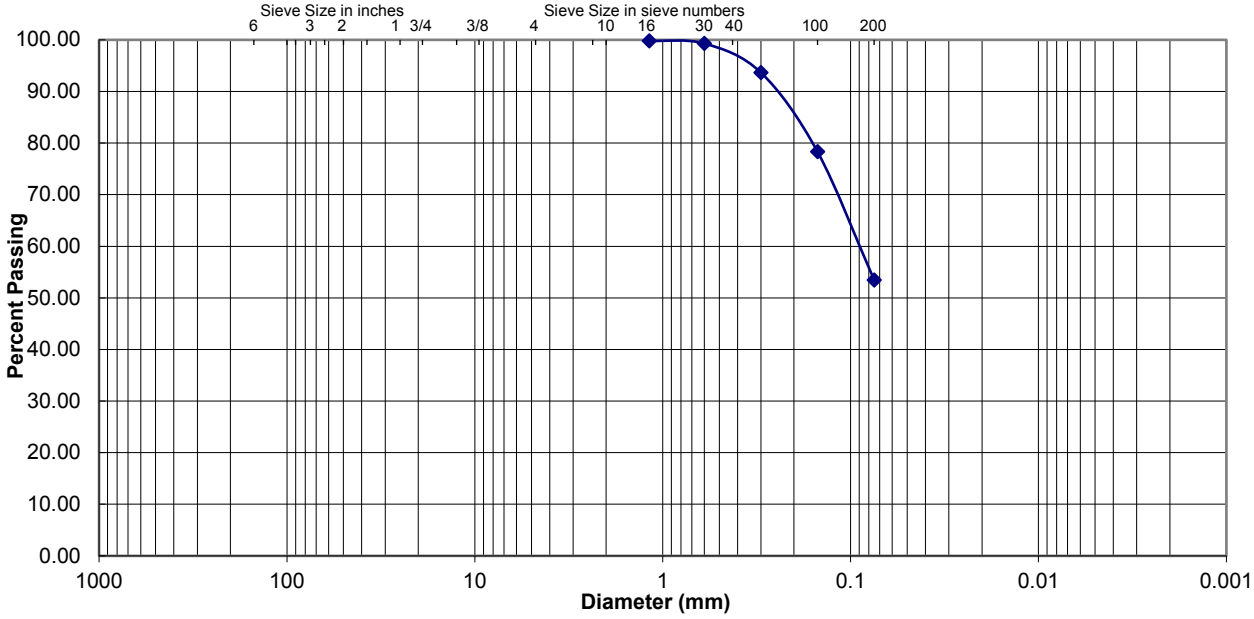
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B7-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	294.10	Analysis based on total sample.	
Moisture Content (%)	3.1		

Sieve Size	Grams Retained	% Retained	% Passing
No. 16	0.50	0.2	99.8
No. 30	1.60	0.5	99.3
No. 50	16.60	5.6	93.6
No. 100	45.10	15.3	78.3
No. 200	73.00	24.8	53.5
Pan	157.30	53.5	---

% Gravel	0.0
% Sand	46.5
% Fines	53.5
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B8-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	416.70		
Moisture Content (%)	1.4		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 8	0.90	0.2	99.8
No. 16	1.70	0.4	99.4
No. 30	12.10	2.9	96.5
No. 50	118.30	28.4	68.1
No. 100	157.90	37.9	30.2
No. 200	63.30	15.2	15.0
Pan	62.50	15.0	---

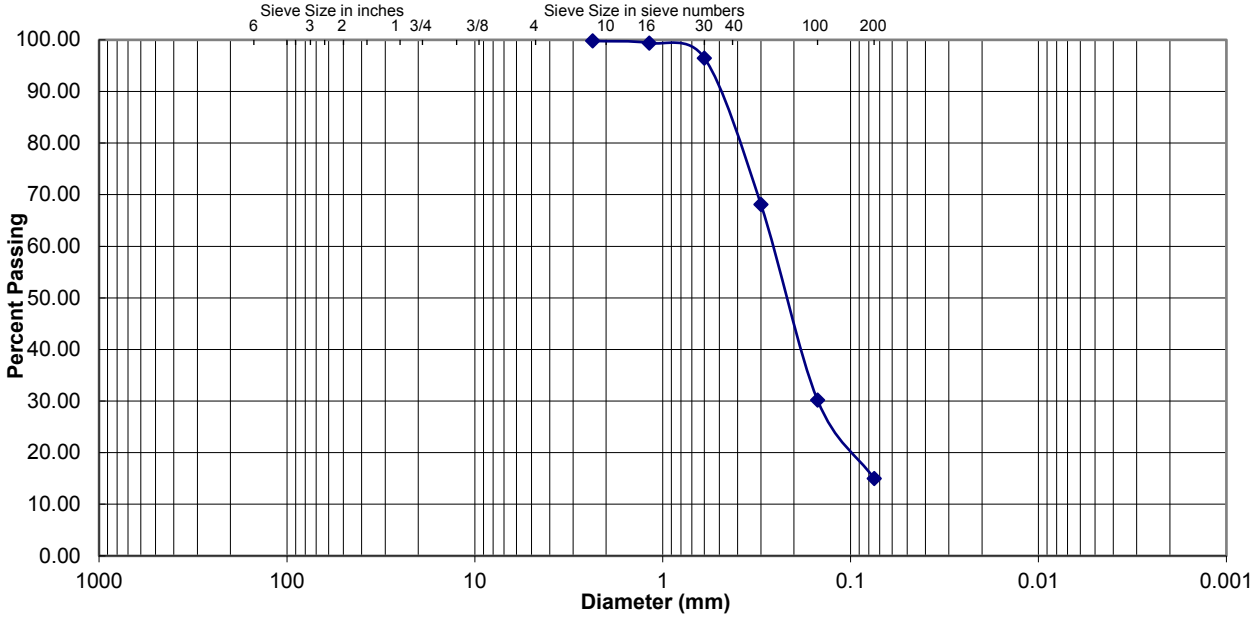
% Gravel	0.0
% Sand	85.0
% Fines	15.0
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

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Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B9-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	302.20		
Moisture Content (%)	4.9		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 8	0.50	0.2	99.8
No. 16	0.80	0.3	99.6
No. 30	3.80	1.3	98.3
No. 50	40.30	13.3	85.0
No. 100	64.00	21.2	63.8
No. 200	54.00	17.9	45.9
Pan	138.80	45.9	---

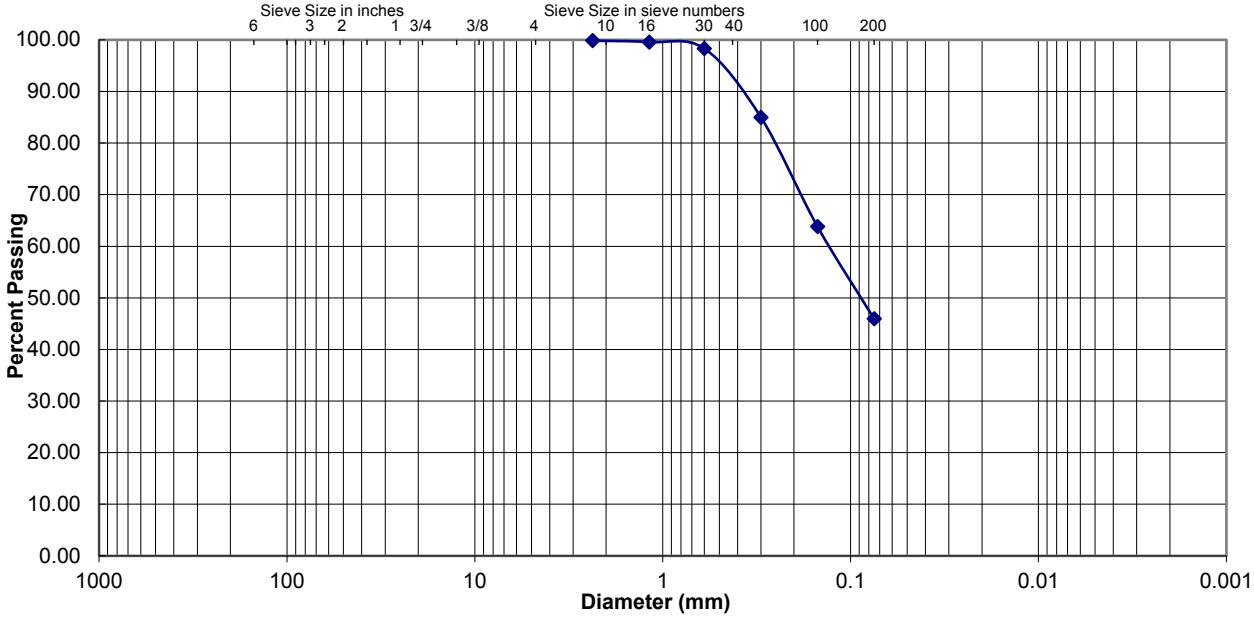
% Gravel	0.0
% Sand	54.1
% Fines	45.9
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B10-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	371.40		
Moisture Content (%)	5.8		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 8	0.30	0.1	99.9
No. 16	0.90	0.2	99.7
No. 30	3.40	0.9	98.8
No. 50	48.10	13.0	85.8
No. 100	94.10	25.3	60.5
No. 200	63.50	17.1	43.4
Pan	161.10	43.4	---

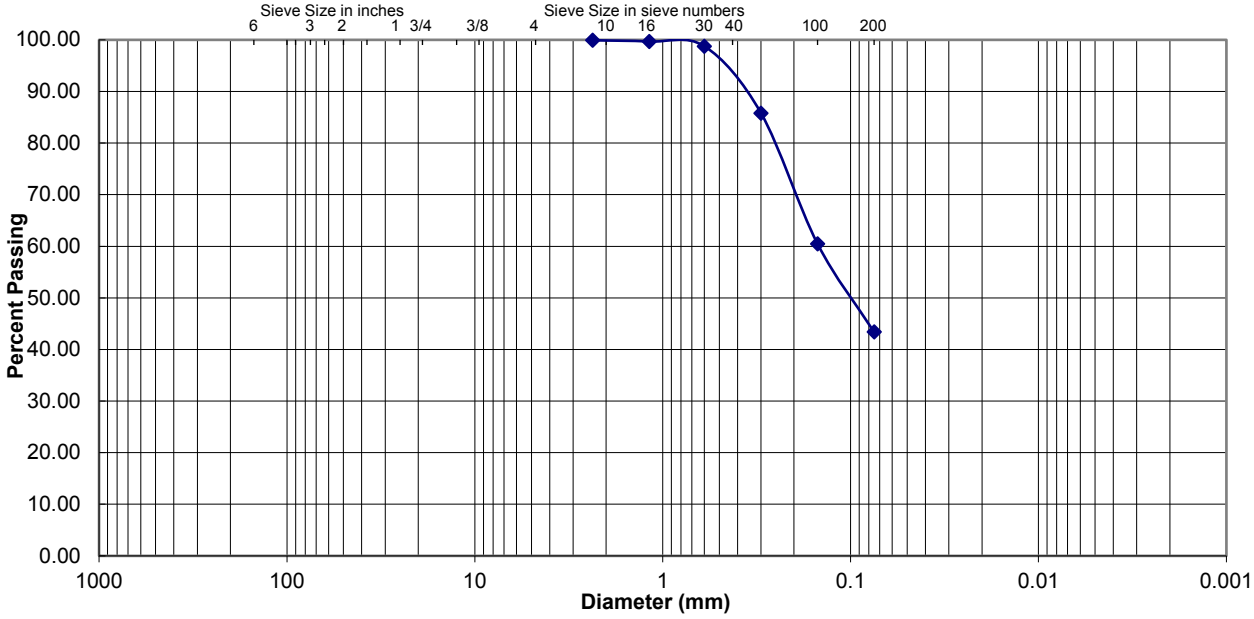
% Gravel	0.0
% Sand	56.6
% Fines	43.4
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B11-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	347.60		
Moisture Content (%)	3.9		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 16	0.90	0.3	99.7
No. 30	9.00	2.6	97.2
No. 50	61.50	17.7	79.5
No. 100	85.60	24.6	54.8
No. 200	58.00	16.7	38.1
Pan	132.60	38.1	---

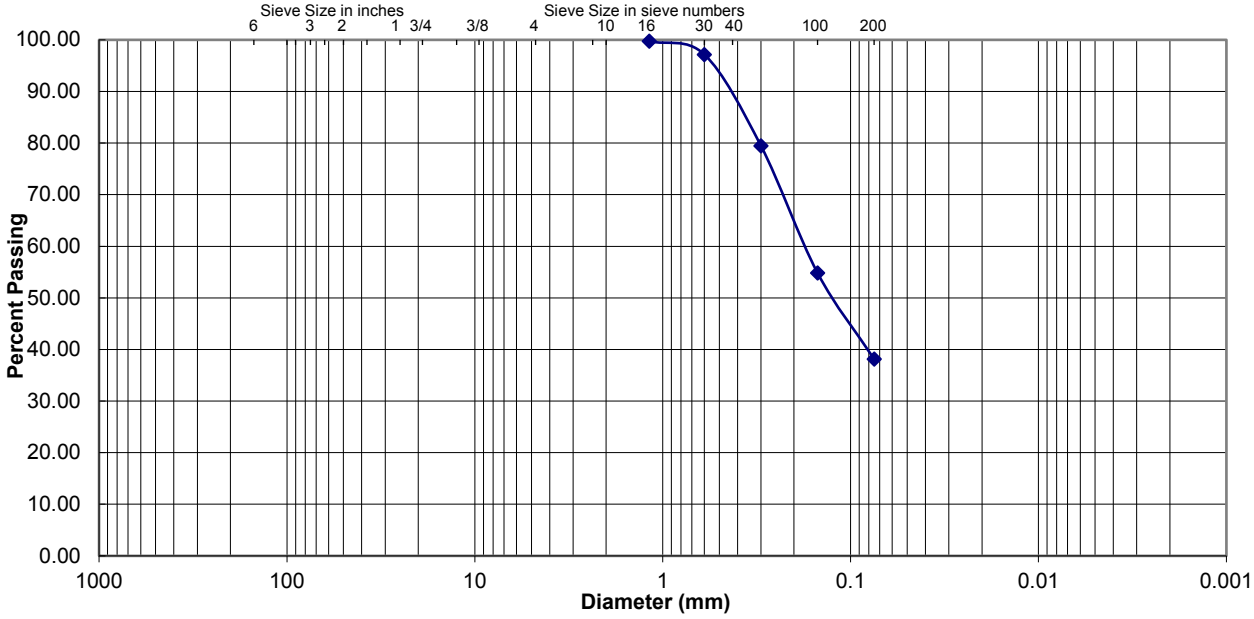
% Gravel	0.0
% Sand	61.9
% Fines	38.1
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart, Palmdale	Project Number	2042546200
Source	Grab	Lab ID	B12-2'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-04-2019
Particle Shape		Test Date	02-05-2019
Particle Hardness			
Sample Dry Mass (g)	359.50		
Moisture Content (%)	4.9		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 16	0.90	0.3	99.7
No. 30	6.30	1.8	98.0
No. 50	52.60	14.6	83.4
No. 100	89.70	25.0	58.4
No. 200	60.40	16.8	41.6
Pan	149.60	41.6	---

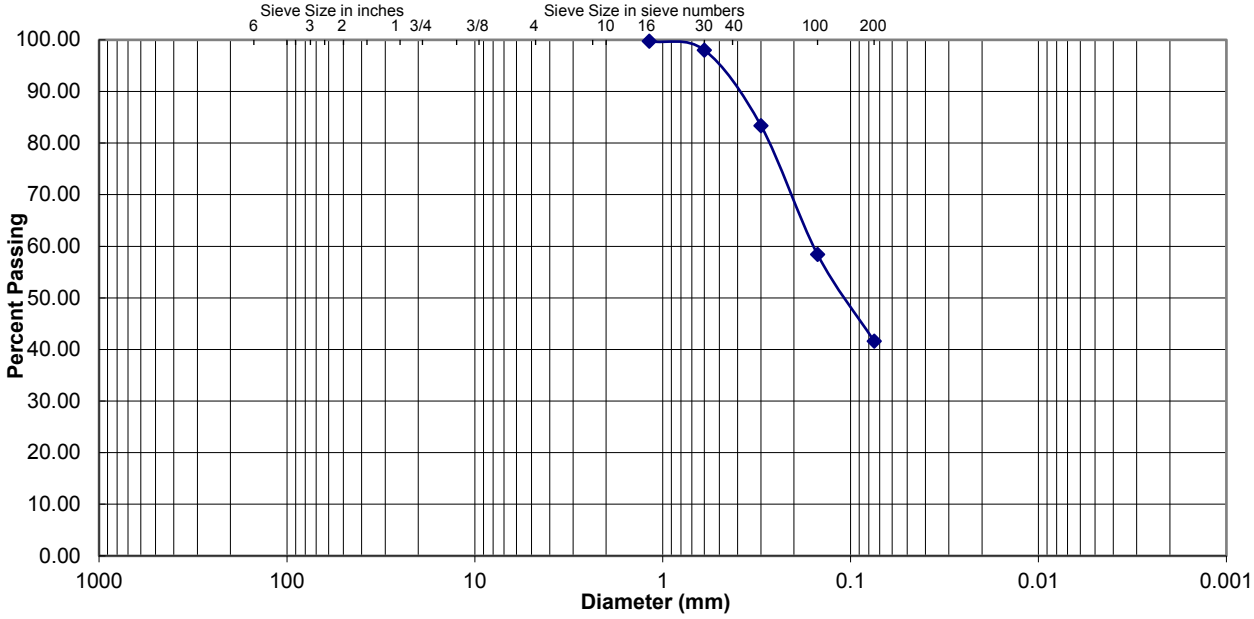
% Gravel	0.0
% Sand	58.4
% Fines	41.6
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	CM	Lab ID	P1-5'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	389.40		
Moisture Content (%)	1.0		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	7.50	1.9	98.1
No. 8	12.90	3.3	94.8
No. 16	28.90	7.4	87.3
No. 30	61.50	15.8	71.5
No. 50	118.60	30.5	41.1
No. 100	87.00	22.3	18.7
No. 200	38.50	9.9	8.9
Pan	34.50	8.9	---

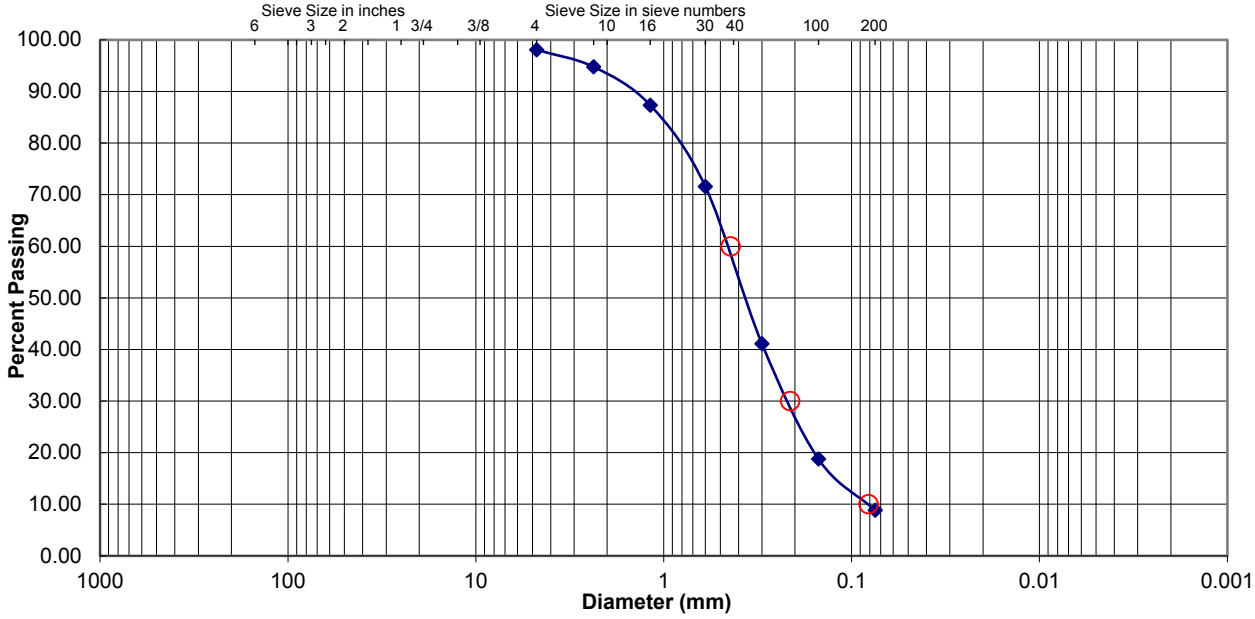
% Gravel	1.9
% Sand	89.2
% Fines	8.9
Fines Classification	ML
D_{10} (mm)	0.0812
D_{30} (mm)	0.2127
D_{60} (mm)	0.4414
Cu	5.43
Cc	1.26

Classification

Poorly Graded Sand (SP-SM) with Silt

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	SPT	Lab ID	P2-5'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	282.10		
Moisture Content (%)	1.3		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 8	5.00	1.8	98.2
No. 16	10.10	3.6	94.6
No. 30	17.50	6.2	88.4
No. 50	47.50	16.8	71.6
No. 100	83.60	29.6	42.0
No. 200	54.60	19.4	22.6
Pan	63.80	22.6	---

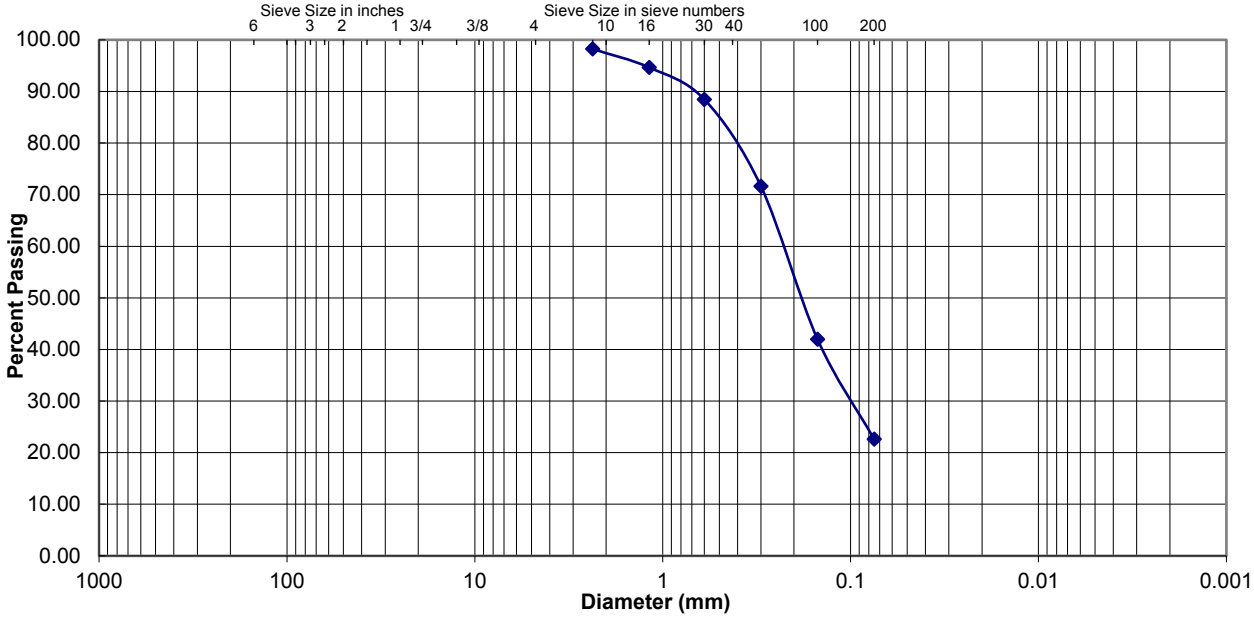
% Gravel	0.0
% Sand	77.4
% Fines	22.6
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	CM	Lab ID	P3-5'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	271.80		
Moisture Content (%)	4.2		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	2.30	0.8	99.2
No. 8	1.70	0.6	98.5
No. 16	2.80	1.0	97.5
No. 30	8.20	3.0	94.5
No. 50	60.00	22.1	72.4
No. 100	78.80	29.0	43.4
No. 200	48.60	17.9	25.5
Pan	69.40	25.5	---

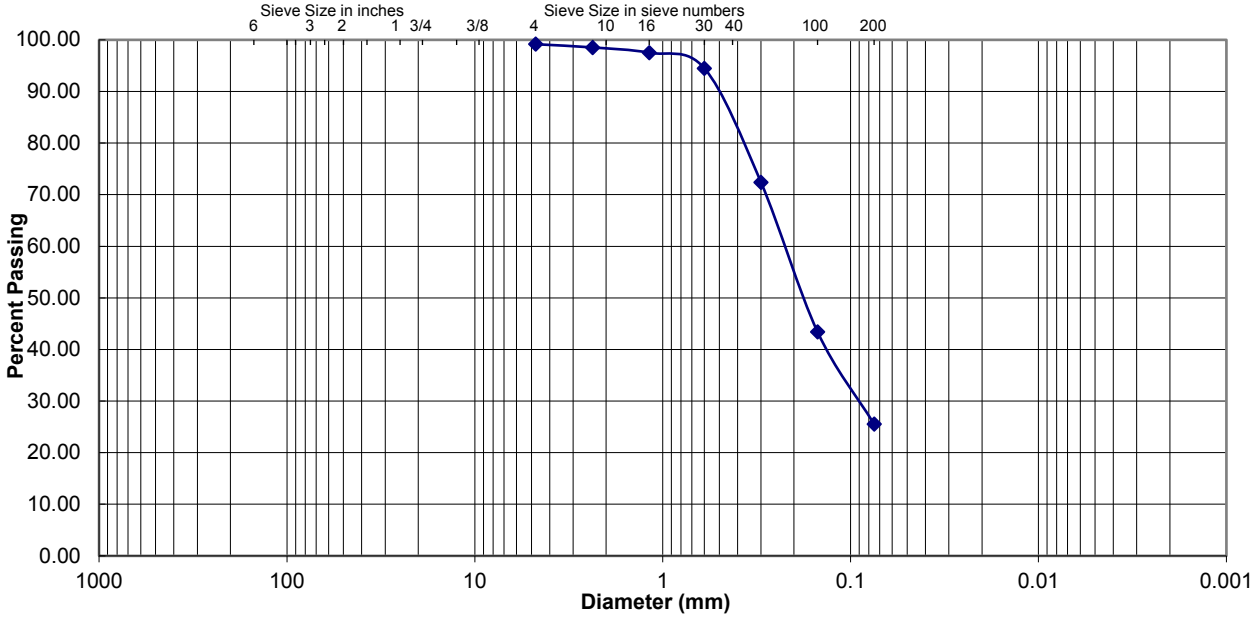
% Gravel	0.8
% Sand	73.6
% Fines	25.5
Fines Classification	ML
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Silty Sand (SM)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis
ASTM D 422

Project Name	Copart Palmdale	Project Number	2042546200
Source	SPT	Lab ID	P4-5'
		Date Received	02-01-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	02-05-2019
Particle Shape		Test Date	02-06-2019
Particle Hardness			
Sample Dry Mass (g)	302.20		
Moisture Content (%)	2.0		

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	15.00	5.0	95.0
No. 8	26.60	8.8	86.2
No. 16	46.80	15.5	70.7
No. 30	67.40	22.3	48.4
No. 50	59.70	19.8	28.7
No. 100	36.20	12.0	16.7
No. 200	18.50	6.1	10.6
Pan	32.00	10.6	---

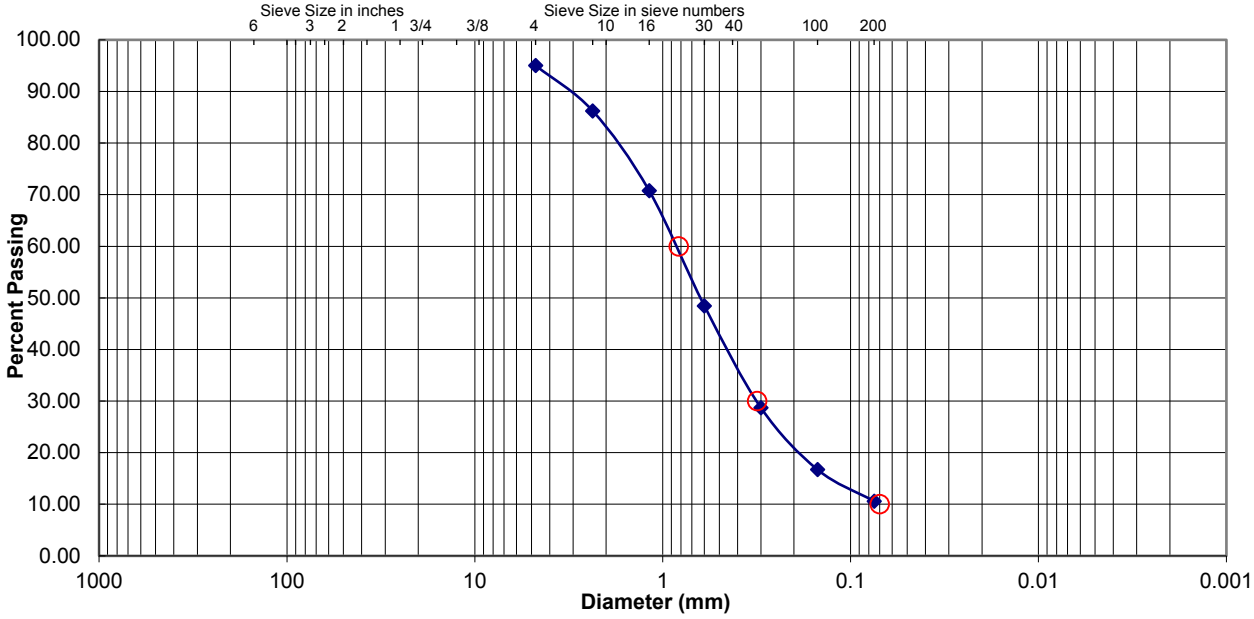
% Gravel	5.0
% Sand	84.4
% Fines	10.6
Fines Classification	ML
D_{10} (mm)	0.0702
D_{30} (mm)	0.3141
D_{60} (mm)	0.8218
Cu	11.71
Cc	1.71

Classification

Well Graded Sand (SW-SM) with Silt

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Compaction Characteristics of Soil Using Modified Effort

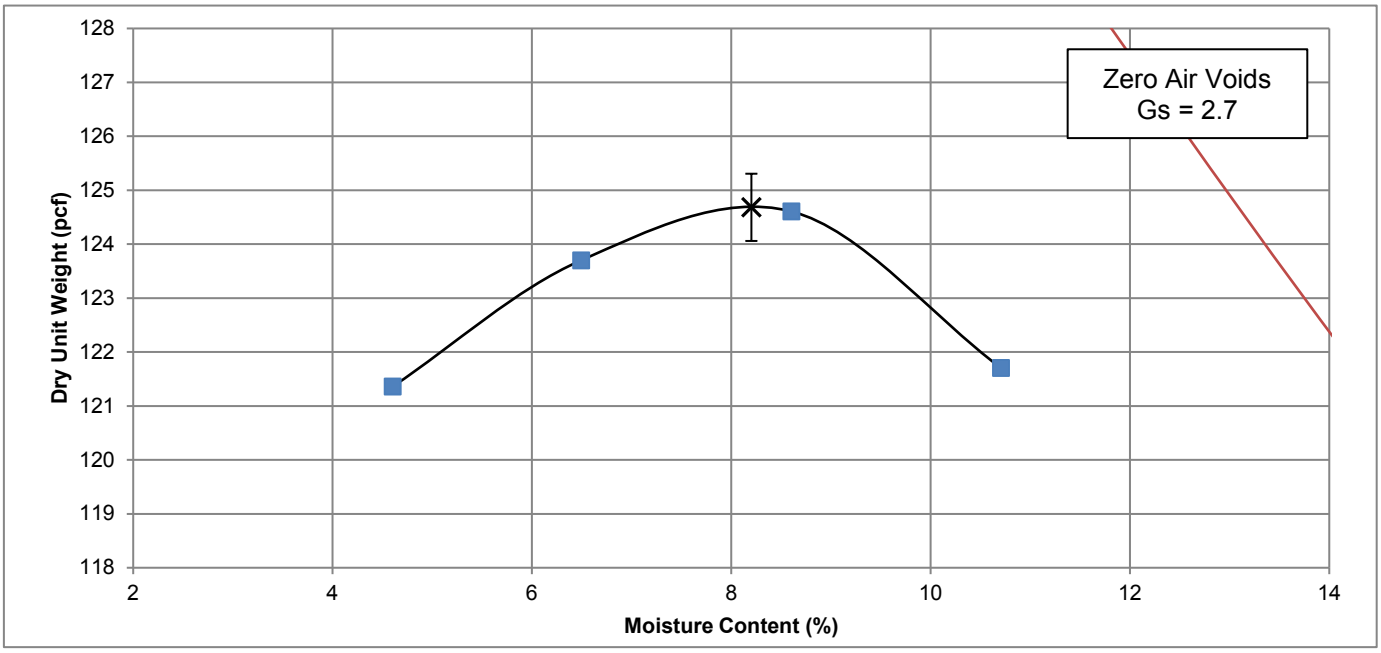
ASTM D 1557 - Method B

Project	Copart Palmdale	Project No.	2042546200
Source	Bulk Bag (0-5')	Sample ID	B1-Bulk
Description	Silty-Sand F-C (SM) Brown	Date Received	02/01/2019
Visual Notes		Date Tested	02/04/2019

Test Fraction (%)	0.0		Oversized Fraction (%)	0.0	
Gs of Test Fraction	2.7	Estimated	Gs of Oversized Fraction	0.0	ASTM C 127
Oversized Fraction Sieve	3/4"		MC of Oversized Fraction (%)	0.0	

Mold Weight (g)	4254.8	Preparation Method	Moist	Rammer Type	Manual

Wet Soil & Mold Weight (g)	Wet Soil Weight (g)	Moisture Content Determination: Wet Soil & Tare (g)	Dry Soil & Tare (g)	Tare (g)	Water Content (%)	Dry Unit Weight (pcf)
6178	1923	522.70	499.70	0.00	4.6	121.4
6251	1996	506.60	475.70	0.00	6.5	123.7
6305	2050	513.80	473.10	0.00	8.6	124.6
6296	2041	504.60	455.80	0.00	10.7	121.7



Maximun Dry Unit Weight (pcf)	**124.7**
Optimum Moisture Content (%)	**8.2**
Corrected Maximun Dry Unit Weight (pcf)	**N/A**
Corrected Optimum Moisture Content (%)	**N/A**

Comments

Reviewed By: JF

Stantec

Compaction Characteristics of Soil Using Modified Effort

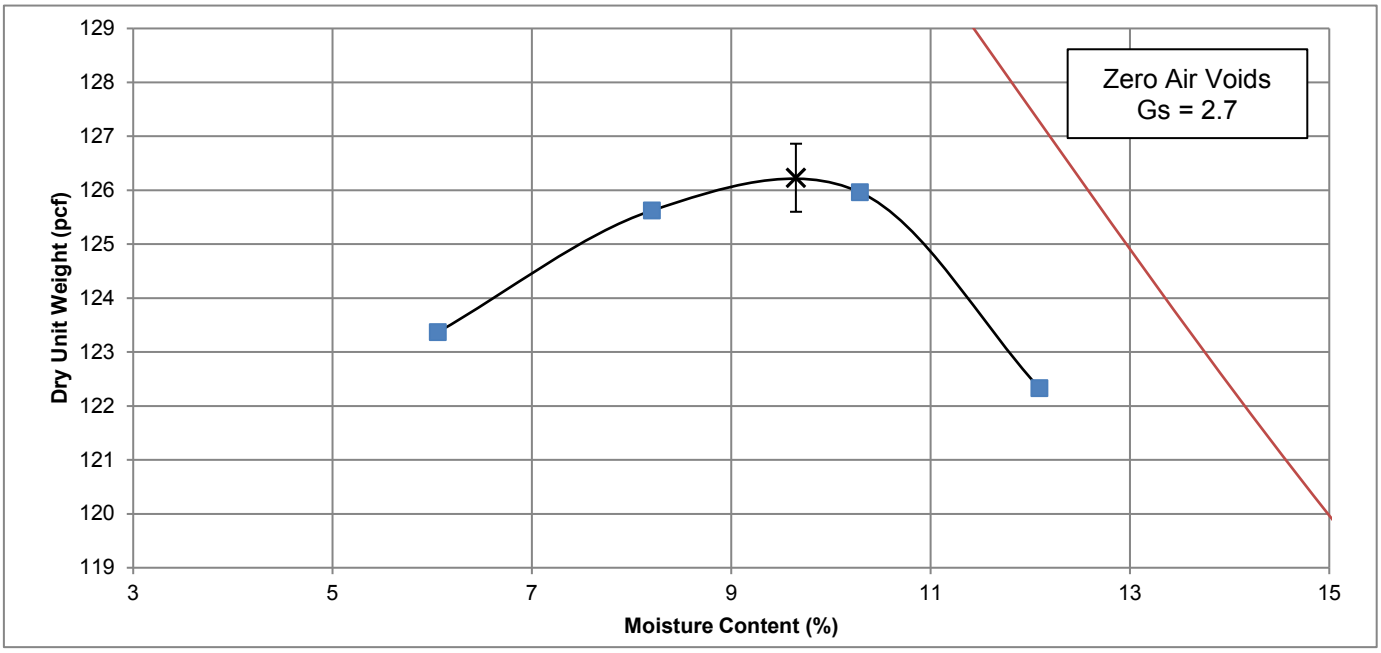
ASTM D 1557 - Method B

Project	Copart Palmdale	Project No.	2042546200
Source	Bulk Bag (0-5')	Sample ID	B12-Bulk
Description	Silty-Sand F-C (SM) Red-Brown	Date Received	02/01/2019
Visual Notes		Date Tested	02/04/2019

Test Fraction (%)	0.0		Oversized Fraction (%)	0.0	
Gs of Test Fraction	2.7	Estimated	Gs of Oversized Fraction	0.0	ASTM C 127
Oversized Fraction Sieve	3/4"		MC of Oversized Fraction (%)	0.0	

Mold Weight (g)	4254.8	Preparation Method	Moist	Rammer Type	Manual

Wet Soil & Mold Weight (g)	Wet Soil Weight (g)	Moisture Content Determination: Wet Soil & Tare (g)	Dry Soil & Tare (g)	Tare (g)	Water Content (%)	Dry Unit Weight (pcf)
6237	1982	488.60	460.70	0.00	6.1	123.4
6314	2059	513.10	474.20	0.00	8.2	125.6
6360	2105	504.80	457.70	0.00	10.3	126.0
6332	2077	516.40	460.70	0.00	12.1	122.3



Maximun Dry Unit Weight (pcf)	**126.2**
Optimum Moisture Content (%)	**9.7**
Corrected Maximun Dry Unit Weight (pcf)	**N/A**
Corrected Optimum Moisture Content (%)	**N/A**

Comments

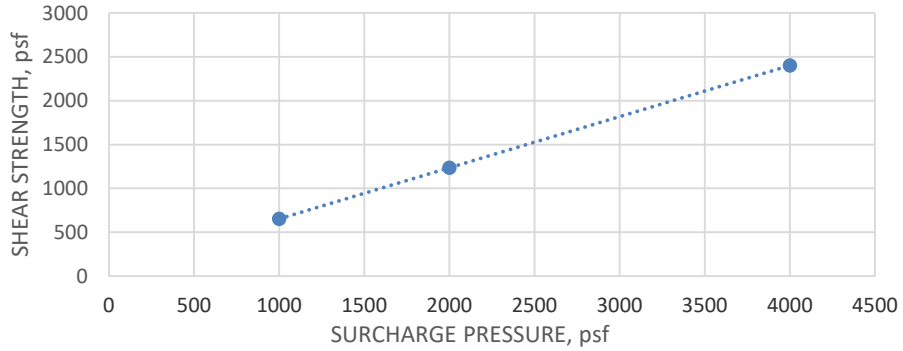
Reviewed By: JF

JD & S Testing

Direct Shear Moisture Content & Density

Project Name:	Copart. Palmdale	Project Number:	2042546200
Sampled By:	Client	Sample Date: 1/29/2019	Lab #:
Source/Location:	B1-5'	Tested By:	M.P.
Description:		Test Date:	2/4/2019

	Shearing Rate (in./min.)		0.040		
	Normal Pressure (psf)		1000	2000	4000
[A]	Initial Weight of Wet Soil + Ring (0.1g)		175.9	168.8	166.9
[B]	Weight of Ring (0.1g)		45.4	45.4	45.4
[C] = [A] - [B]	Initial Weight of Wet Soil (0.1g)		130.5	123.4	121.5
[D]	Initial Reading	Time	0.0000	0.0000	0.0000
		Time			
		Time			
		Time			
[E]	Final Reading	Time	0.0051	0.0007	0.0082
[F] = [E] - [D]	Height Change		0.0051	0.0007	0.0082
[G] = 1 - [F]	Final Height		0.9949	0.9993	0.9918
2400	1236		652	1236	2400
[H]	Final Weight of Wet Soil (0.1g)		149.7	143.1	143.6
[J]	Weight of Dry Soil (0.1g)		125.2	118.0	120.0
[K]	Specific Gravity		2.7		
[L]	Average Maximum Dry Density (0.1pcf)		100.7		
[M]	Initial Volume (0.01 cubic inch)		4.60	4.60	4.60
[P] = ([C] - [J]) / [J]	Initial Moisture Content (0.1%)		4.2%	4.6%	1.3%
[Q] = [C] / [M] * 3.81	Initial Wet Density (0.1pcf)		108.1	102.2	100.6
[R] = [Q] / (1 + [P])	Initial Dry Density (0.1pcf)		103.7	97.7	99.4
[S]=[P]x[K]x[R]/([K]x62.3)-[R]	Initial Saturation (0.1%)		19.2%	17.9%	4.9%
[T] = [R] / [L]	Initial Relative Compaction (0.1%)		103.0%	97.1%	98.7%
[U] = [M] X [G]	Final Volume (0.01 cubic inch)		4.58	4.60	4.56
[V] = ([H]-[J]) / [J]	Final Moisture Content (0.1%)		19.6%	21.3%	19.7%
[W] = [H] / [U] * 3.81	Final Wet Density (0.1pcf)		124.6	118.6	119.9
[X] = [W] / (1 + [V])	Final Dry Density (0.1pcf)		104.2	97.8	100.2
[Y]= [V]x[K]x[X]/([K]x62.3)-[X]	Final Saturation (0.1%)		86.1%	79.8%	78.3%
[Z] = [X] / [L]	Final Relative Compaction (0.1%)		103.5%	97.1%	99.5%



Cohesion (psf)	70
Friction Angle (degrees)	30

Remarks:

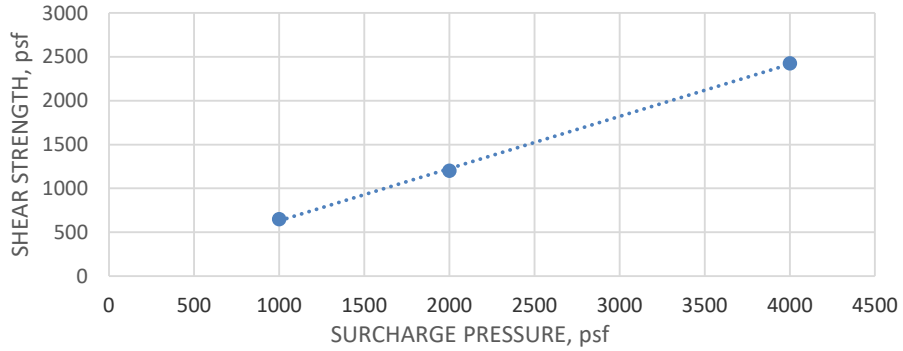
Reviewed by:

JD & S Testing

Direct Shear Moisture Content & Density

Project Name:	C0part. Palmdale	Project Number:	2042546200
Sampled By:	Client	Sample Date: 1/29/2019	Lab #:
Source/Location:	B2-7'	Tested By:	M.P.
Description:		Test Date:	2/4/2019

	Shearing Rate (in./min.)		0.040		
	Normal Pressure (psf)		1000	2000	4000
[A]	Initial Weight of Wet Soil + Ring (0.1g)		174.5	166.3	168.0
[B]	Weight of Ring (0.1g)		45.8	45.7	45.2
[C] = [A] - [B]	Initial Weight of Wet Soil (0.1g)		128.7	120.6	122.8
[D]	Initial Reading	Time	0.0000	0.0000	0.0000
		Time			
		Time			
		Time			
[E]	Final Reading	Time	0.0036	0.0076	0.0169
[F] = [E] - [D]	Height Change		0.0036	0.0076	0.0169
[G] = 1 - [F]	Final Height		0.9964	0.9924	0.9831
	Shear Strength (psf)		648	1200	2424
[H]	Final Weight of Wet Soil (0.1g)		146.4	139.0	142.7
[J]	Weight of Dry Soil (0.1g)		120.0	112.5	112.6
[K]	Specific Gravity		2.7		
[L]	Average Maximum Dry Density (0.1pcf)		95.7		
[M]	Initial Volume (0.01 cubic inch)		4.60	4.60	4.60
[P] = ([C] - [J]) / [J]	Initial Moisture Content (0.1%)		7.2%	7.2%	9.1%
[Q] = [C] / [M] * 3.81	Initial Wet Density (0.1pcf)		106.6	99.9	101.7
[R] = [Q] / (1 + [P])	Initial Dry Density (0.1pcf)		99.4	93.2	93.3
[S]=[P]x[K]x[R]/([K]x62.3)-[R]	Initial Saturation (0.1%)		30.3%	25.9%	33.2%
[T] = [R] / [L]	Initial Relative Compaction (0.1%)		103.9%	97.4%	97.5%
[U] = [M] X [G]	Final Volume (0.01 cubic inch)		4.58	4.57	4.52
[V] = ([H]-[J]) / [J]	Final Moisture Content (0.1%)		22.0%	23.6%	26.7%
[W] = [H] / [U] * 3.81	Final Wet Density (0.1pcf)		121.7	116.0	120.2
[X] = [W] / (1 + [V])	Final Dry Density (0.1pcf)		99.8	93.9	94.9
[Y]= [V]x[K]x[X]/([K]x62.3)-[X]	Final Saturation (0.1%)		86.5%	80.4%	93.4%
[Z] = [X] / [L]	Final Relative Compaction (0.1%)		104.3%	98.2%	99.2%



Cohesion (psf)	40
Friction Angle (degrees)	31

Remarks:

Reviewed by:

AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com

CORROSION TEST RESULTS

Client Name: Stantec
Project Name: Copart Palmdale
Project No.: 2042546200

AP Job No.: 19-0202
Date: 02/05/19

Boring No.	Sample Type	Depth (feet)	Soil Type	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
B1	Bulk	-	SM	4853	7.2	40	42

NOTES:
Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

AP Engineering and Testing, Inc.
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2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com

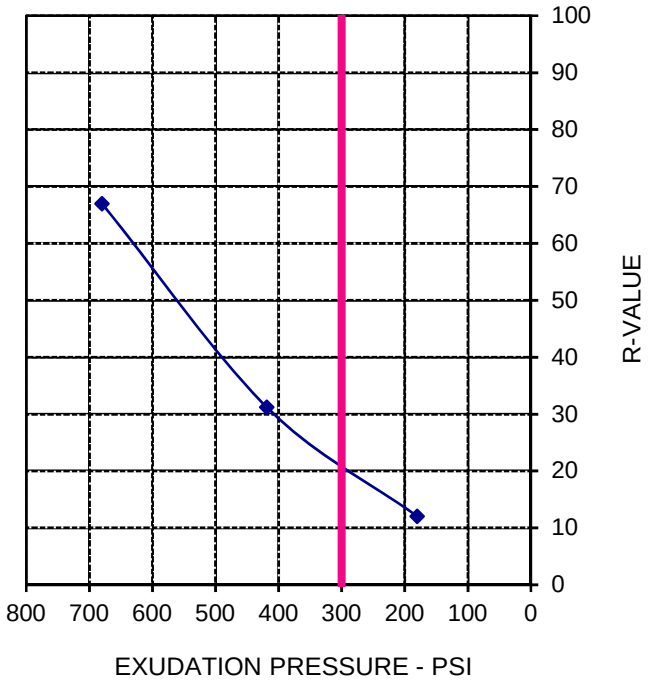
R-VALUE TEST DATA

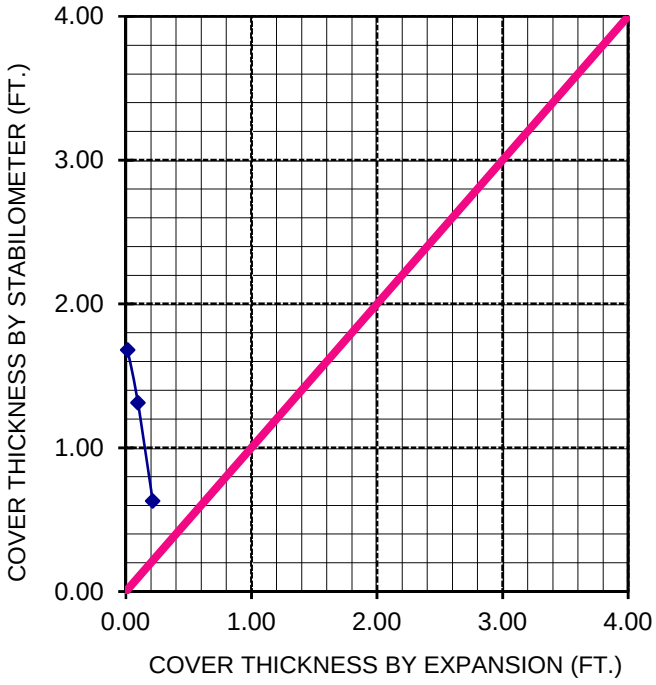
ASTM D2844

Project Name:	Copart Palmdale	Tested By:	ST	Date:	02/04/19
Project Number:	2042546200	Computed By:	KM	Date:	02/06/19
Boring No.:	B6	Checked By:	AP	Date:	02/08/19
Sample Type:	Bulk	Depth (ft.):	-		
Location:	N/A				
Soil Description:	Clayey Sand				

Mold Number	G	H	I	
Water Added, g	68	52	43	
Compact Moisture(%)	12.8	11.1	10.2	
Compaction Gage Pressure, psi	150	250	350	
Exudation Pressure, psi	180	419	680	
Sample Height, Inches	2.5	2.5	2.5	
Gross Weight Mold, g	2927	2932	2899	
Tare Weight Mold, g	1827	1836	1818	
Net Sample Weight, g	1100	1095	1081	
Expansion, inchesx10^{-4}	4	29	64	
Stability 2,000 (160 psi)	61/129	43/92	21/39	
Turns Displacement	4.38	4.07	3.82	
R-Value Uncorrected	12	31	67	
R-Value Corrected	12	31	67	
Dry Density, pcf	118.2	119.4	118.8	
Traffic Index	8.0	8.0	8.0	
G.E. by Stability	1.68	1.31	0.63	
G.E. by Expansion	0.01	0.10	0.21	

R-VALUE	By Exudation:	21
	By Expansion:	*N/A
	At Equilibrium: (by Exudation)	21
Remarks	Gf = 1.34, and 0.0 % Retained on the ¾" *Not Applicable	





APPENDIX C
PERCOLATION TEST RESULTS

PERCOLATION TEST DATA SHEET

Project:	Copart Palmdale	Project No.	2042546200	Date:	1/29/2019
Test Hole No.	P1	Tested By:	JS		
Depth of Test Hole, D_T:	72	USCS Soil Classification	SP		
Test Hole Dimensions (inches)		Length	Width		
Diameter (if round)	8	Sides (if rectangular)			

Sandy Soil Test Criteria*

Trial No.	Start Time	Stop Time	Time Interval, (min)	Initial Depth of Water (in)	Final Depth of Water (in)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:10	9:40	30	28.9	11.4	17.4	y
2	9:40	10:10	30	31.5	11.4	20.1	y

*If two consecutive measurements show that twelve inches of water seeps away in less than 30 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) for a minimum of four hours before running test. Obtain at least eight measurements per hole over at least four hours (approximately 30 minute intervals) with a precision of at least 1/8" until the last 3 consecutive readings are within 10% of each other.

Trial No.	Start Time	Stop Time	Δt, Time Interval, (min)	D_o, Initial Depth of Water (in)	D_f, Final Depth of Water (in)	ΔD, Change in Water Level (in.)	Percolation Rate (in/hr)
1	10:53	11:03	10	45.0	22.25	22.8	136.5
2	11:03	11:13	10	40.3	24.125	16.1	96.8
3	11:13	11:23	10	42.0	24.75	17.3	103.5
4	11:23	11:33	10	41.5	24.875	16.6	99.8
5	11:33	11:43	10	40.8	24.25	16.5	99.0
6	11:43	11:53	10	39.3	23	16.3	97.5
7							
8							
9							
10							
11							
12							
13							
14							
15							

Comments: Reduction Factor (R_f) = ((2d_1 - delta d) / DIA) + 1

d_1 = initial water depth (inches)

delta d = water level drop of the stabilized rate (inches)

DIA = diameter of the boring (inches)

Factor of Safety (FS) = 3.0

R_f = ((2*39.5)-16.3)/8)+1

R_f = 8.84

Infiltration rate (Ir) = perc rate / R_f = 97.5/8.84

Ir = 11.0 inches/hour

Ir_{all} = Ir / FS = 11 / 3.0 = 3.7 in/hr

PERCOLATION TEST DATA SHEET

Project:	Copart Palmdale	Project No.	2042546200	Date:	1/29/2019
Test Hole No.	P2	Tested By:	JS		
Depth of Test Hole, D_T:	62.75	USCS Soil Classification	SW-SM		
Test Hole Dimensions (inches)		Length	Width		
Diameter (if round)	8	Sides (if rectangular)			

Sandy Soil Test Criteria*

Trial No.	Start Time	Stop Time	Time Interval, (min)	Initial Depth of Water (in)	Final Depth of Water (in)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	10:30am	11:00am	30	12.0	0.0	12.0	y
2	11:00am	11:40am	30	12.0	0.0	12.0	y

*If two consecutive measurements show that twelve inches of water seeps away in less than 30 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) for a minimum of four hours before running test. Obtain at least eight measurements per hole over at least four hours (approximately 30 minute intervals) with a precision of at least 1/8" until the last 3 consecutive readings are within 10% of each other.

Trial No.	Start Time	Stop Time	Δt, Time Interval, (min)	D_o, Initial Depth of Water (in)	D_f, Final Depth of Water (in)	ΔD, Change in Water Level (in.)	Percolation Rate (in/hr)
1	12:10	12:20	10	30.8	0	30.8	184.5
2	12:20	12:30	10	34.4	0	34.4	206.3
3	12:30	12:40	10	36.3	0	36.3	217.5
4	12:40	12:50	10	35.3	0	35.3	211.5
5	12:50	13:00	10	35.8	0	35.8	214.5
6	13:00	13:10	10	35.9	0	35.9	215.3
7							
8							
9							
10							
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12							
13							
14							
15							

Comments: Reduction Factor (R_f) = ((2d_1 - delta d) / DIA) + 1

d_1 = initial water depth (inches)

delta d = water level drop of the stabilized rate (inches)

DIA = diameter of the boring (inches)

Factor of Safety (FS) = 3.0

R_f = ((2*35.9)-35.9)/8)+1

R_f = 5.5

Infiltration rate (Ir) = perc rate / R_f = 215/5.5

Ir = 39.3 inches/hour

Ir_{all} = Ir / FS = 39.3 / 3.0 = 13.1 in/hr

PERCOLATION TEST DATA SHEET

Project:	Copart Palmdale	Project No.	2042546200	Date:	1/29/2019
Test Hole No.	P3	Tested By:	JS		
Depth of Test Hole, D_T:	72	USCS Soil Classification	SP		
Test Hole Dimensions (inches)		Length	Width		
Diameter (if round)	8	Sides (if rectangular)			

Sandy Soil Test Criteria*

Trial No.	Start Time	Stop Time	Time Interval, (min)	Initial Depth of Water (in)	Final Depth of Water (in)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:10	9:40	30	47.0	62.6	15.6	y
2	9:40	10:10	30	46.0	62.6	16.6	y

*If two consecutive measurements show that twelve inches of water seeps away in less than 30 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) for a minimum of four hours before running test. Obtain at least eight measurements per hole over at least four hours (approximately 30 minute intervals) with a precision of at least 1/8" until the last 3 consecutive readings are within 10% of each other.

Trial No.	Start Time	Stop Time	Δt, Time Interval, (min)	D_o, Initial Depth of Water (in)	D_f, Final Depth of Water (in)	ΔD, Change in Water Level (in.)	Percolation Rate (in/hr)
1	8:18	8:28	10	39.0	28.5	10.5	63.0
2	8:28	8:38	10	39.5	33.25	6.3	37.5
3	8:38	8:48	10	38.3	32	6.3	37.5
4	8:48	8:58	10	36.0	31.75	4.3	25.5
5	8:58	9:08	10	42.3	34	8.3	49.5
6	9:08	9:18	10	37.0	30.75	6.3	37.5
7							
8							
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12							
13							
14							
15							

Comments: Reduction Factor (R_f) = ((2d_1 - delta d) / DIA) + 1

d_1 = initial water depth (inches)

delta d = water level drop of the stabilized rate (inches)

DIA = diameter of the boring (inches)

Factor of Safety (FS) = 3.0

R_f = ((2*37)-6.3)/8)+1

R_f = 9.46

Infiltration rate (Ir) = perc rate / R_f = 37.5/9.5

Ir = 3.95 inches/hour

Ir_{all} = Ir / FS = 3.95 / 3.0 = 1.3 in/hr

PERCOLATION TEST DATA SHEET

Project:	Copart Palmdale	Project No.	2042546200	Date:	1/29/2019
Test Hole No.	P4	Tested By:	JS		
Depth of Test Hole, D_T:	62.75	USCS Soil Classification	SW-SM		
Test Hole Dimensions (inches)		Length	Width		
Diameter (if round)	8	Sides (if rectangular)			

Sandy Soil Test Criteria*

Trial No.	Start Time	Stop Time	Time Interval, (min)	Initial Depth of Water (in)	Final Depth of Water (in)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	8:00	8:30	30	12.0	0.0	12.0	y
2	8:30am	9:00am	30	12.0	0.0	12.0	y

*If two consecutive measurements show that twelve inches of water seeps away in less than 30 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) for a minimum of four hours before running test. Obtain at least eight measurements per hole over at least four hours (approximately 30 minute intervals) with a precision of at least 1/8" until the last 3 consecutive readings are within 10% of each other.

Trial No.	Start Time	Stop Time	Δt, Time Interval, (min)	D_o, Initial Depth of Water (in)	D_f, Final Depth of Water (in)	ΔD, Change in Water Level (in.)	Percolation Rate (in/hr)
1	9:35	9:45	10	24.0	4	20.0	120.0
2	9:45	9:55	10	19.75	4.625	15.1	90.8
3	9:55	10:05	10	33.25	6	27.3	163.5
4	10:05	10:15	10	33.75	7.5	26.3	157.5
5	10:15	10:25	10	34.3	5.875	28.4	170.3
6	10:25	10:35	10	31.875	6.875	25.0	150.0
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10							
11							
12							
13							
14							
15							

Comments: Reduction Factor (R_f) = ((2d_1 - delta d) / DIA) + 1

d_1 = initial water depth (inches)

delta d = water level drop of the stabilized rate (inches)

DIA = diameter of the boring (inches)

Factor of Safety (FS) = 3.0

R_f = ((2*31.9)-25)/8)+1

R_f = 5.84

Infiltration rate (Ir) = perc rate / R_f = 150/5.84

Ir = 25.7 inches/hour

Ir_{all} = Ir / FS = 25.7 / 3.0 = 8.6 in/hr