November 19, 2020

BRE Space Mira Loma LLC
3401 Etiwanda Avenue
Jurupa Valley, California 91752

Attn: Mr. Tom Cruikshank – Sr. Vice President, Development
P: (909) 223-9035
E: tcruikshank@liprop.com

Re: Geotechnical Engineering Report
Proposed Logistics Facility Project
Manitou Court and "C" Street
Jurupa Valley, California
Terracon Project No. CB205119

Dear Mr. Cruikshank:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PCB205119 dated August 14, 2020. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork, the design and construction of foundations and floor slabs, and stormwater infiltration results for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

John S. McKeown, EG
Senior Geologist

PROFESSIONAL GEOLOGIST
JOHN S. McKEOWN
No. EG2396
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Keith P. Askew, PE, GE
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REGISTERED PROFESSIONAL ENGINEER
KEITH P. ASKEW
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REPORT TOPICS

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

Proposed Logistics Facility Project
Manitou Court and "C" Street
Jurupa Valley, California

Terracon Project No. CB205119
November 19, 2020

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Logistics Facility to be located at Manitou Court and "C" Street in Jurupa Valley, California. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Demolition considerations
- Excavation considerations
- Storm water infiltration considerations
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification and site-specific design parameters per 2019 CBC
- Lateral earth pressures
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of 34 test borings to depths ranging from approximately 6.5 to 101 feet below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan A** and **Exploration Plan B** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located west of Space Center Court between 7th and 10th Streets in Jurupa Valley, California. Manitou Ct. and "C" Street extend north and south within the eastern portion of the project. The property is approximately 105 acres. Latitude 34.0257°N/Longitude 117.5317°W (approximate) (See Exhibit D) See **Site Location**
Existing Improvements	The site is industrial property developed with ten large warehouse buildings, and associated pavements, drive areas and roads. Four industrial rail spurs exist on the site.
Current Ground Cover	Paved drive and parking areas, and isolated landscape areas.
Existing Topography	Existing site elevations range from about 818 feet to 805 feet, with a gentle downward gradient from north to south.
Geology	The site is underlain by previously placed fill soils, and alluvial plain sediments with younger alluvium (Qal) near the surface and older (Qoa) deposits at depths between 30 to 35 feet below ground surface (bgs).

Historical Aerial Photo Examination and Prior Investigations

Historical imagery dating from 1938 was examined for past site usage. In 1938 the site appears devoid of structures and developed as agricultural land. In 1948 nine redwood buildings and associated rail spurs are visible. The rail spurs are evident in the area west of the nine buildings between 1948 and 1967. In 2002 this area appears to be used for materials storage.

A report by NorCal Engineering dated August 28, 2008 (NorCal 2008) included test pit explorations in the area west of the nine buildings. NorCal (NorCal 2008) reported fill soils to depths ranging from 1 to 5 feet bgs in this area with local refusal on concrete debris. CHJ Incorporated (CHJ) performed a limited geotechnical investigation in the open area west of the nine buildings (CHJ 2010). The CHJ boring logs indicate fill soils and debris ranging in thickness from 0 to 17 feet bgs reported in Borings 1 and 2 located near the western margin of the site. The locations of the CHJ borings are shown on the **Exploration Plan** and the prior borings logs are included in **Exploration Results**. It is our understanding that debris in fill materials identified during the CHJ study were removed and replaced with fill soil.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	Conceptual Grading Plan prepared by KCT Consultants (two sheets), dated January 7, 2020. The locations of proposed chamber infiltration systems were appended to these sheets.
Project Description	The existing industrial site will be redeveloped into three separate parcels as follows: Parcels 1 and 2: Existing warehouse buildings (nine buildings) and infrastructure will be demolished and new logistics facilities will be constructed, along with associated drive areas, docks and parking. Parcels 1 and 2 are the subject of this report. Manitou Ct. and "C" Street separate Parcels 1 and 2. Parcel 3: Parcel is located just north of Parcel 2 and contains an existing building which will remain. The geotechnical evaluation of Parcel 3 is not a part of this report. Construction on Parcels 1 and 2 will require demolition of nine existing redwood industrial buildings, along with existing foundations, infrastructure, pavements, and other improvements. Three industrial rail spurs that traverse the site east-west will be removed. One spur outside the proposed construction area in the southwest portion of the site will remain.
Proposed Structures	Parcel 1: New 1,379,490 square foot logistics facility. Parcel 2: New 560,330 square foot logistics facility.
Building Construction	Both structures will be concrete tilt-up construction using concrete slabs on grade with conventional footings.
Finished Floor Elevation	Variable, elevation 814 to 819 feet.
Maximum Loads	■ Columns: 50 to 250 kips ■ Walls: 2 to 5 kips per linear foot (klf) ■ Slabs: 150 pounds per square foot (psf). This loading is for conventional live loads and does not include storage racks loads or forklift vehicular loads.
Grading/Slopes	The Conceptual Grading Plan depicts maximum cut and fill on the order of 5 feet thick to achieve the proposed grades excluding remedial grading requirements. Grading will accommodate loading docks with a proposed height on the order of 4 feet. Cut and fill slopes are anticipated to be less than 5 feet in height and flatter than 2:1 (horizontal:vertical).
Below-Grade Structures	Not anticipated. Terracon should be notified if any basements, vaults, or underground storage tanks are planned for this site.
Infiltration Systems	Four infiltration systems of the Contech storm chamber type are proposed, two near each proposed building.
Free-Standing Retaining Walls	Retaining walls are not expected to be constructed as part of site development to achieve final grades.

Item	Description
Pavements	New pavements will be constructed as parking areas and travel lanes and are included in this project. Assumed traffic indices (TIs) are as follows: ■ Auto Parking Areas: TI=5.0 ■ Auto Roads: TI=5.5 ■ Truck Roads: TI=7.0 ■ Truck loading areas: TI=8.0 ■ Pavement design period: 20 years It is our experience from previous similar projects that pavements may experience high traffic loading, especially from loading and unloading activities for semi-trucks. We have assumed a range of TIs as indicated that should be confirmed by the project design team.
Estimated Start of Construction	Unknown.

GEOTECHNICAL CHARACTERIZATION

Subsurface Profile

We have developed the general characterization of the subsurface soil and groundwater conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the planned construction. In general, the site is underlain with silty sand and sandy silt with varying amounts of gravel, and well-graded and poorly-graded sand with varying amounts of silt and gravel. Isolated and discontinuous lenses of lean clay with varying amounts of silt and sand are also present at relatively deep depths on the order of 30 feet bgs. In general, the subsurface soils are considered medium dense to very dense. Fill soils associated with the existing development were encountered to depths ranging from 1 to 6½ feet below the existing grades, with isolated areas up to 12 feet deep.

The geotechnical characterization forms the basis of our geotechnical calculations and evaluation of site preparation, foundation options and pavement options. As noted in **General Comments**, the characterization is based upon widely spaced exploration points across the site, and variations are likely. Conditions encountered at each boring location are indicated on the individual boring logs shown in the **Exploration Results** section and are attached to this report. Stratification boundaries on the boring logs represent the approximate location of changes in native soil types; in situ, the transition between materials may be gradual.

Groundwater Conditions

The borings were advanced using continuous flight auger drilling techniques that allow short-term groundwater observations to be made while drilling. Groundwater seepage was not observed within the borings during or at the completion of drilling to the depths drilled. Sources for groundwater data as described below indicate groundwater beneath the site is greater than 150 feet bgs. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed.

The site is located in the Chino Basin groundwater management area. The historical-high groundwater depth beneath the site is approximately 175 feet bgs based on a groundwater contour map compiled by Carson and Matti (1985). Additional depth-to-groundwater data in the vicinity of the site include data for well no. 02S06W04M002S located approximately ¼ miles east of the site (DWR 2020). Data for this well indicate groundwater depths at approximately 200 feet bgs for the time period from 1995 to 2020. The 2018 State of Basin Report for the Chino Basin includes groundwater contour maps that indicate ground water depths between 183 feet bgs and 208 feet bgs for the time period from 2000 to 2018.

Hydro-consolidation

The site is mapped by the County of Riverside as being in a zone as having the potential for subsidence. Several sources can contribute subsidence including hydro-collapse of subsurface soils. To evaluate the potential deformation that may be caused by the addition of water to the subsurface soils, hydroconsolidation testing was performed on selected, relatively undisturbed samples. The results are presented in the Exploration Results section and indicate collapse potentials are less than 1% on samples retrieved at depths between 5 and 11.5 feet bgs. The samples were saturated under a confining pressure of 2,000 psf.

Hydro-collapse tests that result in a collapse potential of less than 2% are typically considered a low hazard. Based on our experience and the proposed remedial grading recommendations for the site, the hydro-collapse potential for the site is considered a low hazard for the proposed development.

GEOLOGIC HAZARDS

Geologic Setting

The site is situated within the Peninsular Ranges Geomorphic Province in Southern California. Geologic structures within this Province trend mostly northwest, in contrast to the prevailing east-west trend in the neighboring Transverse Ranges Geomorphic Province to the north. The Peninsular Range Province extends into lower California and is bounded by the Colorado Desert to the east, the Pacific Ocean to the west, and the San Gabriel and San Bernardino mountains to

the north.

Based on geologic mapping by Morton and Miller (2006), the native geologic materials beneath the site consist of young alluvial-fan deposits of Holocene age with a mantle of eolian silts and sands in the western portion of the site. Artificial fill is shown by Morton and Miller to mantle the native sediments. As encountered in our explorations, the site is mantled by fill to depths of 1 to 5 feet bgs. The fill is underlain by native younger alluvium to depths between 30 and 36 ½ feet bgs where older alluvial sediments with a layer of red-brown pedogenic clayey sediments was encountered.

Faulting

The site is located in the southern California region which is a seismically active area. The type and magnitude of seismic hazards affecting the site are dependent on the distance to causative faults, the intensity, and the magnitude of the seismic event. The Cucamonga fault, a reverse fault forming the southern boundary of the San Gabriel Mountains, is located approximately 15 ½ kilometers north of the site. The Chino fault of the Elsinore fault zone, San Jacinto fault and San Bernardino strand of the San Andreas fault are located approximately 16 kilometers southwest, 19 ½ kilometers northeast and 26 kilometers northeast of the site, respectively. The San Jacinto and San Andreas fault dominate the seismic shaking hazard at the site for design level earthquakes.

The site is not located within a State-designated Alquist-Priolo Earthquake fault zone. The hazard of fault surface rupture is considered very low.

Landslide Potential

The site is located on a gently sloping alluvial plain with relatively flat-lying topography. According to the City of Jurupa Valley General Plan (2017) and County of Riverside General Plan (2015), the site is not located in an area with potential for landslides. The flat-lying site topography of the site precludes a potential for landslides. As such, landslides are not considered a hazard to the site.

Tsunamis, Inundation, Seiche, and Flooding Potential

The site is not located in a coastal area; therefore, tsunamis are not considered a hazard at the site. Reservoirs are not located up gradient from or in close proximity to the site; therefore, inundation or seiches are not considered hazards at the site.

The site is not included in a FEMA flood hazard zone (FEMA 2008). Therefore, flooding is not considered a significant hazard to the site.

EARTHWORK

The following recommendations include site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The recommendations presented for design and construction of earth supported elements including foundations, slabs, and pavements are contingent upon following the recommendations outlined in this section.

Support of floor slabs and pavements on or above existing fill materials is discussed in this report. However, even with the recommended construction procedures, there is inherent risk for the owner that compressible fill or unsuitable material, within or buried by the fill, will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but it can be reduced by following the recommendations contained in this report. To take advantage of the cost benefit of not removing the entire amount of undocumented fill, the owner must be willing to accept the risk associated with building over the undocumented fills following the recommended reworking of the material.

Earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project. The **General Comments** section provides an understanding of the report limitations.

Site Preparation

Strip and remove existing vegetation, debris, pavements, and other deleterious materials from proposed building and pavement areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction. The site should be initially graded to create a relatively level surface to receive fill and provide for a relatively uniform thickness of fill beneath proposed building structures.

Demolition of the existing buildings should include complete removal of all foundation systems and remaining underground utilities within the proposed construction area. This should include removal of any loose backfill found adjacent to existing foundations. All materials derived from the demolition of existing structures and pavements should be removed from the site and not be allowed for use as on-site fill, unless processed in accordance with the fill requirements included in this report.

Our explorations indicate that fill soils are present to depths ranging from 1 to 6 ½ feet bgs at the locations drilled throughout the majority of the site, and up to 12 feet bgs in the existing storage lot area west of the buildings. The fill soils consisted of locally derived silty sand with varying amounts of gravel. We recommend that all fill soils be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction. If unexpected fills or underground facilities

are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

The Conceptual Grading Plans depict cuts and fills on the order of 5 feet to achieve the proposed grades. Subsequent to demolition of the existing development, the site should be initially graded to create a relatively level surface to receive fill and provide for a relatively uniform thickness of fill beneath proposed building structures.

Due to the presence of relatively loose previously placed fill soils in the upper zones of the on-site soils, we recommend that the existing soils within the footprint of the proposed structures be removed to a minimum depth of 5 feet below existing grade, or to a minimum depth of 3 feet below the bottom of proposed foundations, whichever is greater. The engineered compacted fill should be placed beneath the entire footprint of the structures and should extend horizontally a minimum distance of 8 feet beyond the outside edge of perimeter footings. All loose materials resulting from the demolition activities of the existing structures should be removed and replaced with properly compacted engineered fill.

Support of pavements on or above existing fill materials is discussed in this report. However, even with the recommended construction testing services, there is an inherent risk for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by performing additional testing and evaluation.

Subgrade soils beneath proposed new exterior slabs and pavements should be removed to a depth of 18 inches below the existing or proposed grade, whichever is deeper, and replaced with compacted engineered fill.

All exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 10 inches, moisture conditioned as necessary, and compacted per the compaction requirements in this report. Compacted fill soils should then be placed to the design grades, and the moisture content and compaction of soils should be maintained until slab, pavement, or proposed improvements are constructed.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively workable. However, the workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and drying.

Excavation

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment.

The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

Onsite soils consist of cohesionless sandy soils. Such soils have the tendency to cave and slough during excavations. Therefore, formwork may be needed for foundation excavations. The walls of the proposed excavation should be shored or sloped in conformance with OSHA excavation and trench safety standards. If any excavation is extended to a depth of more than 20 feet, it will be necessary to have the side slopes designed by a professional engineer.

Soils from the excavation should not be stockpiled higher than six 6 feet or within ten 10 feet of the edge of an open trench. Construction of open cuts adjacent to existing structures, including underground pipes, is not recommended within a 1½ H:1V plane extending beyond and down from the perimeter of the structure. Cuts that are proposed within five 5 feet of light standards, other utilities, underground structures, and pavement should be provided with temporary shoring.

It may be necessary for the contractor to retain a geotechnical engineer to monitor the soils exposed in all excavations and provide engineering services for slopes. This will provide an opportunity to monitor the soils encountered and to modify the excavation slopes as necessary. It also offers an opportunity to verify the stability of the excavation slopes during construction.

Individual contractors are responsible for designing and constructing stable, temporary excavations. Excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

Fill Material Types

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than three inches in size. Pea gravel or other similar non-cementitious, poorly-graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer.

Clean on-site soils or approved imported materials may be used as fill material for the following:

- general site grading
- foundation areas
- interior floor slab areas
- foundation backfill
- pavement areas
- exterior slab areas

If imported soils are used as fill materials to raise grades, these soils should conform to low volume change materials and should conform to the following requirements:

Gradation	Percent Finer by Weight (ASTM C 136)
3”	100
No. 4 Sieve	50 - 100
No. 200 Sieve	20 - 50

- Liquid Limit ..... 30 (max)
- Plasticity Index ..... 15 (max)
- Maximum Expansive Index* ..... 20 (max)

*ASTM D 4829

The contractor shall notify the Geotechnical Engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" (Class S0) potential for sulfate attack based upon current ACI criteria and is "mildly corrosive" to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed 10 inches loose thickness.

Utility Trenches

It is anticipated that the on-site soils will provide suitable support for underground utilities and piping that may be installed. Any soft and/or unsuitable material encountered at the bottom of excavations should be removed and be replaced with an adequate bedding material. A non-expansive granular material with a sand equivalent greater than 30 is recommended for bedding and shading of utilities, unless otherwise allowed by the utility manufacturer.

On-site materials are considered suitable for backfill of utility and pipe trenches from one foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the

gradation and expansion index requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the development. Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 5 percent for at least 10 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration.

We recommend a minimum horizontal setback distance of 10 feet from the perimeter of any building and the high-water elevation of the nearest storm-water retention basin.

Roof drainage should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems and landscaped irrigation should not be installed within 5 feet of foundation walls.

Exterior Slab Design and Construction

Exterior slabs-on-grade, exterior architectural features, and utilities founded on, or in backfill may experience some movement due to the volume change of the backfill. To reduce the potential for damage caused by movement, we recommend:

- minimizing moisture increases in the backfill;
- controlling moisture-density during placement of backfill;
- using designs which allow vertical movement between the exterior features and adjoining structural elements;
- placing effective control joints on relatively close centers.

Slopes

Permanent slopes should be constructed with inclinations no steeper than 2:1 (horizontal:vertical) and with a maximum vertical height no greater than 5 feet. We expect slopes with this configuration to be relatively resistant to erosion and stable against circular failure. The face of all slopes should be compacted to the minimum specification for fill embankments. Alternately, fill slopes can be over-built with compacted material and trimmed to final configurations.

Construction Considerations

Upon completion of filling and grading, care should be taken to maintain the subgrade moisture content prior to construction of improvements including foundations, floor slabs and pavements. Construction traffic over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade should become desiccated, saturated, or disturbed, the affected material should be removed or these materials should be scarified, moisture conditioned, and recompacted prior to floor slab and pavement construction.

Although not anticipated for this site, on-site silt soils can pump and unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. The use of light construction equipment would aid in reducing subgrade disturbance. The use of remotely operated equipment, such as a backhoe, would be beneficial to perform cuts and reduce subgrade disturbance.

Should unstable subgrade conditions develop stabilization measures may need to be employed. Stabilization measures may include placement of aggregate base and multi-axial geogrid. Use of lime, fly ash, kiln dust or cement could also be considered as a stabilization technique. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction.

We recommend that the earthwork portion of this project be completed during extended periods of dry weather if possible. If earthwork is completed during the wet season (typically November through April) it may be necessary to take extra precautionary measures to protect subgrade soils. Wet season earthwork operations may require additional mitigative measures beyond that which would be expected during the drier summer and fall months. This could include diversion of surface runoff around exposed soils and draining of ponded water on the site. Once subgrades are established, it may be necessary to protect the exposed subgrade soils from construction traffic.

Based on our understanding of the project, we anticipate that excavations greater than 5 feet below existing grade may be required for this project. The sides of below grade structure excavations may either be sloped or formed with vertical cuts. For vertical sided excavations greater than 5 feet in depth, the excavations will require the use of shoring, bracing or some form of retention to prevent sloughing and caving of the soil into the excavation.

As a safety measure, no equipment should be operated within 5 feet of the edge of the excavation and no materials should be stockpiled within 10 feet of the excavation. Excavations should not approach closer than a distance equal to the depth of excavation from existing structures/facilities without some form of protection for the facilities. Proper berming or ditching should be performed to divert any surface runoff away from the excavation.

Fill Compaction Requirements

Recommended compaction and moisture content criteria for engineered fill materials are as follows:

Material Type and Location	Per the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction Above Optimum	
		Minimum	Maximum
On-site soils and/or low volume change imported fill: Beneath foundations:	90	0%	+3%
Beneath interior slabs:	90	0%	+3%
Miscellaneous backfill and behind retained walls:	90	0%	+3%
Beneath pavements:	95	0%	+3%
Utility Trenches*:	90	0%	+3%
Bottom of excavation receiving fill:	90	0%	+3%
Aggregate base (beneath pavements):	95	0%	+3%

* Upper 12 inches should be compacted to 95% within pavement and structural areas.

Construction Observation and Testing

The geotechnical engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation, proof-rolling, placement and compaction of controlled compacted fills, backfilling of excavations to the completed subgrade.

The exposed subgrade and each lift of compacted fill should be tested, evaluated, and reworked as necessary until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. One density and water content test for every 50 linear feet of compacted utility trench backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. In the event that unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

Provided the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Design Parameters – Compressive Loads

Item	Description
Net Allowable Bearing pressure [1, 2]	2,500 psf (foundations bearing within structural fill)
Required Bearing Stratum [3]	Minimum of 3 feet of compacted fill soil beneath bottom of footings
Minimum Foundation Dimensions	Columns: 36 inches Continuous: 18 inches
Minimum Footing Depth	24 inches below finish grade
Increments of Net Allowable Bearing Pressure	300 psf for each additional foot of width 800 psf for each additional foot of depth
Maximum Net Allowable Bearing Pressure [2]	5,000 psf
Ultimate Passive Resistance [4] **(equivalent fluid pressures)**	350 pcf (granular backfill)
Ultimate Coefficient of Sliding Friction [5]	0.32 (granular material)
Estimated Total Settlement from Structural Loads [2]	Less than about 1 inch
Estimated Differential Settlement [2, 7]	About 1/2 of total settlement

Item	Description
1.	The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. Values assume that exterior grades are no steeper than 20% within 10 feet of structure.
2.	Values provided are for maximum loads noted in **Project Description**.
3.	Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the **Earthwork**.
4.	Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face.
5.	Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions.
6.	Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
7.	Differential settlements are as measured over a span of 50 feet.

Foundation Construction Considerations

As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

If unsuitable bearing soils are encountered at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations.

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the California Building Code (CBC). Based on the averaged results of two shear wave velocity surveys within the proposed project footprint, the shear wave velocity in the upper 100 feet is 1,235 feet/second (377 meters/second). The **Seismic Site Classification is C** according to ASCE 7-16. The locations of the shear wave velocity survey lines is shown on **Exploration Plan A** and **Exploration Plan B**. The Seismic Shear-Wave Survey Report is attached.

Summary of Site-Specific Ground Motions

A site-specific ground motion study for the project was requested by the project team and consisted of a ground motion hazard analysis. We performed this analysis in general conformance with Chapter 21 of ASCE 7-16. Regional seismic sources considered in our analysis included faults modeled in the USGS Unified Hazard Tool and nearby mapped fault zones.

The procedures outlined in ASCE 7-16 Chapters 11, 20 and 21 were utilized for preparation of site-specific spectra for the proposed project. The site is approximately 15 ½ kilometers from the surface trace of the Cucamonga fault zone, 16 kilometers from the Chino fault of the Elsinore fault zone, 19 kilometers from the San Jacinto fault zone and 26 kilometers from the San Andreas fault zone. A Class C soil profile condition was utilized in the analysis. We prepared deterministic and probabilistic spectra and associated limiting spectra. The site-specific response spectra in tabular and graphic forms and a discussion of methodology are included in this report.

A deterministic MCE spectrum was based on scenario M7.9 and M8.3 events on the San Jacinto and San Andreas faults, respectively. The Next Generation West 2 (NGA-West 2) attenuation relations (GMPEs) used for the 2014 USGS seismic source model were applied. The equally-weighted spectral values from the attenuation relations of Abrahamson and others (ASK 2014), Boore and others (BSSA 2014), Campbell and Borzognia (CB 2014) and Chiou and Youngs (CY 2014) were used for the deterministic MCE spectrum. The MCE spectrum represents 84th-percentile, 5-percent-damped spectral response acceleration in the direction of maximum horizontal response (maximum rotated) for each period. Maximum rotated values were obtained using the scaling factors of ASCE 7-16 Section 21.2. Adjustment to the deterministic limit spectrum is applied if necessary. The Site Class 'C' condition was modeled using $V_{S100} \approx 377$ meters/second. The deterministic spectrum is derived from San Jacinto fault values for periods from 0.0 (PGA) to 1.5 seconds and from San Andreas fault values for periods from 2 to 5 seconds.

The probabilistic MCE spectrum was developed using spectral values obtained from the Unified Hazard Tool application (v4.2.0) hosted by USGS at https://earthquake.usgs.gov/hazards/interactive. The values so obtained were scaled to maximum rotated values using the factors of ASCE 7-16 Section 21.2. The probabilistic MCE spectrum was converted to risk-targeted spectra (MCE_R) using the risk coefficients of $C_{RS} = 0.941$ and $C_{R1} = 0.916$.

The lesser of the values at any site period from the deterministic MCE_R and MCE_R probabilistic spectra form the site-specific MCE_R spectrum.

A design response spectrum was determined according to the procedure outlined in ASCE 7-16, Section 21.3, and is equal to two-thirds of the response spectral accelerations of the site-specific MCE_R. The design spectrum is limited by a "floor" at 80 percent of spectral acceleration determined according to ASCE 7-16, Section 11.4.6. The recommended site-specific design

response spectrum is attached in tabular and graphic forms and includes adjustment to the 'floor' values for periods from 0.03 and 0.10 second.

Peak Ground Acceleration (PGA)

According to ASCE 7-16, Section 11.4.8, the site-specific geometric mean (MCE_G) PGA used for evaluation of soil effects is based on the lesser of the site-specific deterministic and probabilistic PGA values. The deterministic geometric mean PGA was based on a magnitude 7.3 event on the Sierra Madre Fault zone located 2.0 kilometers from the site. The following table summarizes the PGA values considered for the project.

Site-Specific PGA Values	
Code-Based Geometric Mean PGA	0.819g
80 Percent of Code-Based PGA	0.655g
Probabilistic Geometric Mean PGA	0.797g
Deterministic Geometric Mean PGA	0.480g
Recommended Site-Specific PGA	0.655g

For the site-specific (MCE_G) PGA, the deterministic value is the lesser of the probabilistic and deterministic values but is less than 80 percent of the code-based geometric mean PGA value. Therefore, we recommended a site-specific PGA value of 0.655g for evaluation of soil effects such as liquefaction or seismic settlement.

Seismic Design Parameters

The seismic design parameters, according to the 2016 California Building Code (CBC) and based on the site-specific analysis of ground motion are provided in the following table.

Description	Value
2019 California Building Code Site Classification (CBC) [1]	C [2]
Site Latitude	34.0257
Site Longitude	-117.5317
Mapped Spectral Acceleration Parameters [4]	S_S = 1.629 and S_1 = 0.596
Site Coefficients [4]	F_A = 1.2 and F_V = 1.404

Description	Value
Adjusted Maximum Considered Earthquake Spectral Response Parameters Design Spectral Acceleration Parameters [3]	SM_S = 1.955 and SM_1 = 0.837
Design Spectral Acceleration Parameters [3]	SD_S = 1.303 and SD_1 = 0.558
Geometric Mean Peak Ground Acceleration [3]	0.66g
De-aggregated Magnitude	6.6

1. Seismic site classification in general accordance with the 2019 California Building Code, which refers to ASCE 7-16.
2. The 2019 California Building Code (CBC) uses a site profile extending to a depth of 100 feet for seismic site classification. Shear wave geophysical surveys were performed at two locations within the project footprint.
3. Derived from the site-specific ground motion evaluation.
4. These values were obtained using online seismic design maps and tools provided by the USGS https://earthquake.usgs.gov/hazards/interactive.

LIQUEFACTION AND SEISMIC SETTLEMENT

Liquefaction Potential

Liquefaction is a mode of ground failure that results from the generation of high pore water pressures during earthquake ground shaking, causing loss of shear strength in foundation soils. Liquefaction is typically a hazard where loose sandy soils exist below groundwater.

According to the City of Jurupa Valley General Plan (2017) and County of Riverside General Plan 2015), the site is located within an area identified as having a 'moderate' potential for liquefaction based on the presence of susceptible sediments but deep groundwater. Historic-high and modern groundwater levels are greater than 150 feet bgs at the site; therefore, liquefaction hazard is considered to be very low at the site.

Seismic Settlement

The underlying native soils are comprised predominantly of granular soils with SPT blowcounts generally loose to very dense to the maximum depths drilled. Due to the seismic activity for this site and the potential for zones of relatively loose sands, we evaluated the potential settlement due to seismic shaking.

Seismic "dry" sand settlement was estimated using soil profile generalized from exploratory borings B-15, B-21, and B-25. The site-specific peak ground acceleration (PGA) of 0.66g and a deaggregated earthquake magnitude (Mw) of 6.6 were utilized. Our analysis indicates that

seismic settlement of the dry sands would be less than 1 inch for the soil profiles evaluated and the given seismic parameters.

FLOOR SLABS

To provide adequate support, floor slabs (or concrete slabs-on-grade) should bear on a minimum of 36 inches of compacted soil. The required overexcavation removal of 5 feet in the building pad area will satisfy this requirement. Concrete slabs-on-grade should be a minimum of 5 inches in thickness. The top 12 inches of soil should be compacted to 95 percent relative compaction if possible. The final pad surfaces should be rolled to provide smooth, dense surfaces.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor retarder/barrier. We recommend that a vapor retarder/barrier be designed and constructed according to the American Concrete Institute 302.1R, Concrete Floor and Slab Construction, which addresses moisture vapor retarder/barrier construction. At a minimum, the vapor retarder/barrier should comply with ASTM E 1745 and have a nominal thickness of at least 10 mils. The vapor retarder/barrier should be properly sealed, per the manufacturer's recommendations, and protected from punctures and other damage. Per the Portland Cement Association, for slabs with vapor-sensitive coverings, a layer of dry, granular material (sand), a minimum of 4 inches thick, should be placed under the vapor retarder/barrier. For slabs in humidity-controlled areas, a layer of dry, granular material (sand), a minimum of 4 inches thick, should be placed above the vapor retarder/barrier.

For the subject project, it is also acceptable to place the vapor barrier directly on the compacted soil and then place a layer of dry sand, a minimum of 4 inches thick, on top of the vapor barrier.

A modulus of vertical subgrade reaction of 200 ksf/ft can be utilized in the design of slabs-on-grade for the proposed structure.

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should

be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Settlement of floor slabs supported on fill materials cannot be accurately predicted, but could be larger than normal and result in some cracking. Mitigation measures, as noted in **Existing Fill** within **Earthwork**, are critical to the performance of floor slabs. In addition to the mitigation measures, the floor slab can be stiffened by adding steel reinforcement, grade beams and/or post-tensioned elements.

Floor Slab Construction Considerations

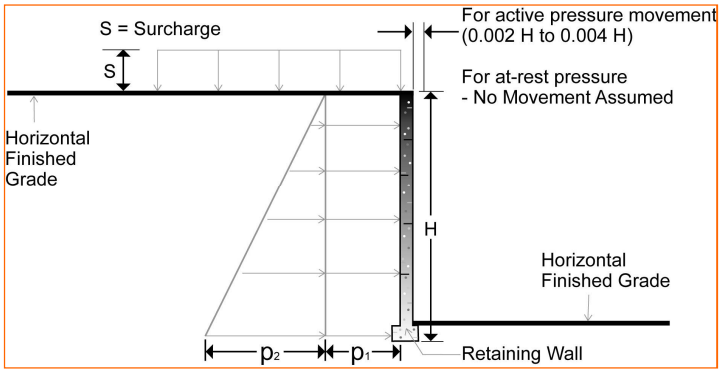
Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

LATERAL EARTH PRESSURES

Design Parameters

Structures with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to values indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown in the diagram below. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The “at-rest” condition assumes no wall movement and is commonly used for basement walls, loading dock walls, or other walls restrained at the top. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls (unless stated).



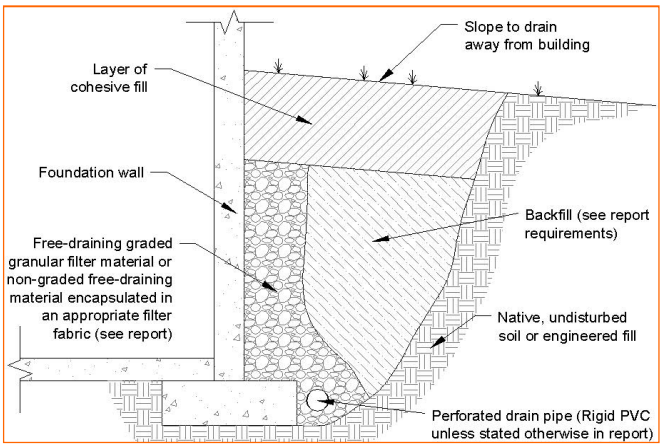
Lateral Earth Pressure Design Parameters			
Earth Pressure Condition [1]	**Lateral Earth Pressure Coeficients**[2]	**Surcharge Pressure p_1 (psf)** [3, 4, 5]	**Effective Fluid Pressures (psf)** [2, 4, 5]
			Unsaturated [6]
Active (Ka)	Granular - 0.33	(0.33)S	40 psf/ft
At-Rest (Ko)	Granular - 0.5	(0.5)S	55 psf/ft
Passive (Kp)	Granular - 3	(3)S	360 psf/ft

1. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure, wall must move horizontally to mobilize resistance.
2. Uniform, horizontal backfill, compacted to at least 90% of the ASTM D 1557 maximum dry density, rendering a maximum unit weight of 130 pcf.
3. Uniform surcharge, where S is surcharge pressure.
4. Loading from heavy compaction equipment is not included.
5. No safety factor is included in these values.
6. To achieve "Unsaturated" conditions, follow guidelines in **Subsurface Drainage for Below-Grade Walls** below.

Backfill placed against structures should consist of granular soils or low plasticity cohesive soils. For the granular values to be valid, the granular backfill must extend out and up from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively.

Subsurface Drainage for Below-Grade Walls

A perforated rigid plastic drain line installed behind the base of walls and extends below adjacent grade is recommended to prevent hydrostatic loading on the walls. The invert of a drain line around a below-grade building area or exterior retaining wall should be placed near foundation bearing level. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material having less than 5% passing the No. 200 sieve. . The free-draining aggregate should be encapsulated in a filter fabric. The granular fill should extend to within 2 feet of final grade, where it should be capped with compacted cohesive fill to reduce infiltration of surface water into the drain system.



As an alternative to free-draining granular fill, a pre-fabricated drainage structure may be used. A pre-fabricated drainage structure is a plastic drainage core or mesh which is covered with filter fabric to prevent soil intrusion, and is fastened to the wall prior to placing backfill.

Subsurface Drainage for Below Grade Walls

Backfill behind retaining walls should consist of a soil of granularity sufficient that the backfill will properly drain. The granular soil should be classified per the USCS as GW, GP, SW, SP, SW-SM or SP-SM. Surface drainage should be provided to prevent ponding of water behind walls. A drainage system consisting of either or both of the following should be installed behind all retaining walls:

- A 4-inch-diameter perforated PVC (Schedule 40) pipe or equivalent at the base of the stem encased in 2 cubic feet of granular drain material per linear foot of pipe or
- Synthetic drains such as Enkadrain, Miradrain, Hydraway 300 or equivalent.

Perforations in the PVC pipe should be 3/8 inch in diameter and should be placed facing down. Granular drain material should be wrapped with filter cloth such as Mirafi 140 or equivalent to

prevent clogging of the drains with fines. Walls should be waterproofed to prevent nuisance seepage and damage. Water should outlet to an approved drain.

PAVEMENTS

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Pavement Design Parameters

Design of asphalt concrete (AC) pavements is based on the procedures outlined in the Caltrans "Highway Design Manual for Safety Roadside Rest Areas" (Caltrans, 2016). Design of Portland cement concrete (PCC) pavements are based upon American Concrete Institute (ACI) 330R-08; "Guide for Design and Construction of Concrete Parking Lots."

Laboratory R-value tests were performed on two samples retrieved from the exploratory borings. The tests resulted in R-values of 59 and 71. Per the design manual, a maximum R-value of 50 was used for the design of pavement sections. A modulus of rupture of 600 psi was used for pavement concrete. The structural sections are predicated upon proper compaction of the utility trench backfills and the subgrade soils as prescribed by in **Earthwork**, with the upper 12 inches of subgrade soils and all aggregate base material brought to a minimum relative compaction of 95 percent in accordance with ASTM D 1557 prior to paving. The aggregate base should meet Caltrans requirements for Class 2 base.

The pavement designs were based upon the results of preliminary sampling and testing and should be verified by additional sampling and testing during construction when the actual subgrade soils are exposed.

Pavement Section Thicknesses

The following table provides options for AC and PCC Sections:

Asphalt Concrete Design		
Usage	**Assumed Traffic Index**	**Recommended Structural Section**
Auto Parking Areas	5	3" HMA[1]/4" Class 2 AB[2]
Auto Roads	5.5	4" HMA[1]/4" Class 2 AB[2]
Truck Roads	7	4.5" HMA[1]/5" Class 2 AB[2]
Truck Loading Areas	8	5" HMA[1]/6" Class 2 AB[2]

1. HMA = hot mix asphalt
2. AB = aggregate base

Portland Cement Concrete Design			
Layer	**Thickness (inches)**		
	Light Duty[1]	**Medium Duty[2]**	**Heavy Duty[3]**
PCC	5.0	6.0	7.0
Aggregate Base [4]	--	--	--

1. Car Parking and Access Lanes, Average Daily Truck Traffic (ADTT) = 1 (Category A).
2. Truck Parking Areas, Multiple Units, ADTT = 25 (Category B)
3. In areas of anticipated heavy traffic, fire trucks, delivery trucks, or concentrated loads (e.g., dumpster pads), and areas with repeated turning or maneuvering of heavy vehicles, ADTT = 700 (Category C).
4. Aggregate base is not required. Compacted on-site material is considered competent.

Recommended structural sections were calculated based on assumed TIs and our preliminary sampling and testing.

Terracon does not practice traffic engineering. We recommend that the project civil engineer or traffic engineer verify that the TIs and ADTT traffic indices used are appropriate for this project.

Areas for parking of heavy vehicles, concentrated turn areas, and start/stop maneuvers could require thicker pavement sections. Edge restraints (i.e. concrete curbs or aggregate shoulders) should be planned along curves and areas of maneuvering vehicles. A maintenance program including surface sealing, joint cleaning and sealing, and timely repair of cracks and deteriorated

areas will increase the pavement's service life. As an option, thicker sections could be constructed to decrease future maintenance.

Concrete for rigid pavements should have a minimum 28-day compressive strength of 4,000 psi, and be placed with a maximum slump of 4 inches. Although not required for structural support, a minimum 4-inchthick base course layer is recommended to help reduce potential for slab curl, shrinkage cracking, and subgrade pumping through joints. Proper joint spacing will also be required to prevent excessive slab curling and shrinkage cracking. Joints should be sealed to prevent entry of foreign material and doweled where necessary for load transfer.

Where practical, we recommend early-entry cutting of crack-control joints in PCC pavements. Cutting of the concrete in its "green" state typically reduces the potential for micro-cracking of the pavements prior to the crack control joints being formed, compared to cutting the joints after the concrete has fully set. Micro-cracking of pavements may lead to crack formation in locations other than the sawed joints, and/or reduction of fatigue life of the pavement.

Openings in pavements, such as decorative landscaped areas, are sources for water infiltration into surrounding pavement systems. Water can collect in the islands and migrate into the surrounding subgrade soils thereby degrading support of the pavement. This is especially applicable for islands with raised concrete curbs, irrigated foliage, and low permeability near-surface soils. The civil design for the pavements with these conditions should include features to restrict or collect and discharge excess water from the islands. Examples of features are edge drains connected to the storm water collection system, longitudinal subdrains, or other suitable outlets and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

Dishing in parking lots surfaced with ACC is usually observed in frequently-used parking stalls (such as near the front of buildings), and occurs under the wheel footprint in these stalls. The use of higher-grade asphaltic cement, or surfacing these areas with PCC, should be considered. The dishing is exacerbated by factors such as irrigated islands or planter areas, sheet surface drainage to the front of structures, and placing the ACC directly on a compacted clay subgrade.

PCC pavement details for joint spacing, joint reinforcement, and joint sealing should be prepared in accordance with ACI 330 and ACI 325. PCC pavements should be provided with mechanically reinforced joints (doweled or keyed) in accordance with ACI 330.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Based on the possibility of shallow and/or perched groundwater, we recommend installing a pavement subdrain system to control groundwater, improve stability, and improve long-term pavement performance.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2 percent.
- Subgrade and pavement surfaces should have a minimum 2 percent slope to promote proper surface drainage.
- Install below pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

STORM WATER MANAGEMENT

Twelve (12) in-situ percolation tests (falling head borehole permeability) were performed in borings drilled to depths ranging from approximately 16 to 21½ feet bgs. The objective of the testing is to provide infiltration rates for designing the proposed storm water infiltration system.

A 2-inch thick, 3/8-inch gravel layer was placed in the bottom of each boring after the borings were drilled to investigate the soil profile. Three-inch diameter perforated pipes were installed on

top of the gravel layer. Gravel was used to backfill between the perforated pipes and the boring sidewall. The borings were then filled with water for a pre-soak period.

At the beginning of each test, the pipes were refilled with water and readings were taken at periodic time intervals as the water level dropped. The soil at the percolation test locations was classified in the field using a visual/manual procedure. The infiltration velocity is presented as the infiltration rate and is summarized in the following table. The infiltration rates provided do not include safety factors.

Basin Area	Boring No.	Boring Depth (ft.) [1]	Approximate Test Depth Range (ft.) [1]	Soil Type	Percolation Rate Average (in./hr.)	Correlated Infiltration Rate Average (in./hr.) [2]
NW	B-5	20-1/2	15 to 20	SM	444	7.8
	B-6	16	11 to 16	SM	586	13.1
	B-17	21-1/2	15 to 21	SM	260	7.1
NE	B-8	16	11 to 16	SM	316	9.6
	B-9	16	11 to 16	SP-SM	478	11.3
	B-12	20	15 to 20	SP-SM	136	9.8
SW	B-34	16-1/2	11 to 16	SP-SM	248	15.4
	B-35	21-1/2	15 to 21	SW-SM	228	5.6
	B-36	16-1/2	11 to 16	SW-SM	214	4.3
SE	B-28	16-1/2	11 to 16	SP-SM	171	4.8
	B-29	16-1/2	11 to 16	SP-SM	213	9.6
	B-30	21-1/2	15 to 21	ML	30	0.6

1. Below existing ground surface.
2. If proposed infiltration system will mainly rely on vertical downward seepage, the correlated infiltration rates should be used. The correlated infiltration rates were calculated using the Porchet method.

The rate obtained at specific location and depth is representative of the location and depth tested. If these rates are used for infiltration designed structures, an application of an appropriate safety factor is prudent to account for subsoil inconsistencies, possible compaction related to site grading, and potential silting of the percolating soils, depending on the application.

The design engineer should also check with the local agency for the limitation of the infiltration rate allowed in the design. If the maximum allowable design infiltration rate is lower than the above recommended rate, the maximum allowable design infiltration rate should be used. The designer of the basins should also consider other possible site variability in the design.

The percolation tests were performed with clear water, whereas the storm water will likely not be clear, but may contain organics, fines, and grease/oil. The presence of these deleterious materials will tend to decrease the rate that water percolates from the infiltration systems. Design of any storm water infiltration systems should account for the presence of these materials and should incorporate structures/devices to remove these deleterious materials

Based on the soils encountered in our borings, we expect the percolation rates of the soils could be different than measured in the field due to variations in the fines content of the subsurface soils encountered. The design elevation and size of the proposed infiltration system (if used) should account for this expected variability in infiltration rates.

If infiltration type structures for storm water management are used on the site, infiltration testing may be performed after construction of the infiltration system to verify the design infiltration rates. It should be noted that siltation and vegetation growth along with other factors may affect the infiltration rates of the infiltration areas. The actual infiltration rate may vary from the values reported here. Infiltration systems should be located at least 10 feet from any existing or proposed foundation system. Infiltration rates can be affected by silt buildup, debris, degree of soil saturation, site variability and other factors.

The following table lists the laboratory electrical resistivity (standard and as-received), chlorides, soluble sulfates, and pH testing results. These values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Boring	Depth (feet)	Soluble Sulfate (mg/kg)	Soluble Chloride (mg/kg)	Total Salts (mg/kg)	pH	Resistivity (as-received) (Ohm-cm)	Resistivity (saturated) (Ohm-cm)
B-14	0 - 2.5	16	47	424	7.67	63,050	9,118
B-22	0 - 5	49	80	389	7.72	43,165	10,040

Results of soluble sulfate testing indicate the samples tested possess negligible sulfate concentrations when classified in accordance with Table 4.3.1 of the ACI Design Manual. Concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

Resistivity results indicate the soil samples tested have mild corrosion potential to buried ferrous metal pipes**.** Evaluation of the resistivity test results follows the guidelines of J.F. Palmer, “Soil Resistivity Measurements and Analysis”, Materials Performance, Volume 13, January 1974. The table that follows outlines the guidelines for soil resistivity versus corrosion potential.

For protection against corrosion to buried metals, Terracon recommends that an experienced corrosion engineer be retained to design a suitable corrosion protection system for underground metal structures or components.

Corrosion Potential of Soil on Steel

Soil Resistivity (ohm-cm)	Corrosion Potential
0 to 1,000	Very High
1,000 to 2,000	High
2,000 to 5,000	Moderate
> 5,000	Mild

If corrosion of buried metal is critical, it should be protected using a non-corrosive backfill, wrapping, coating, sacrificial anodes, or a combination of these methods, as designed by a qualified corrosion engineer.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for

third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

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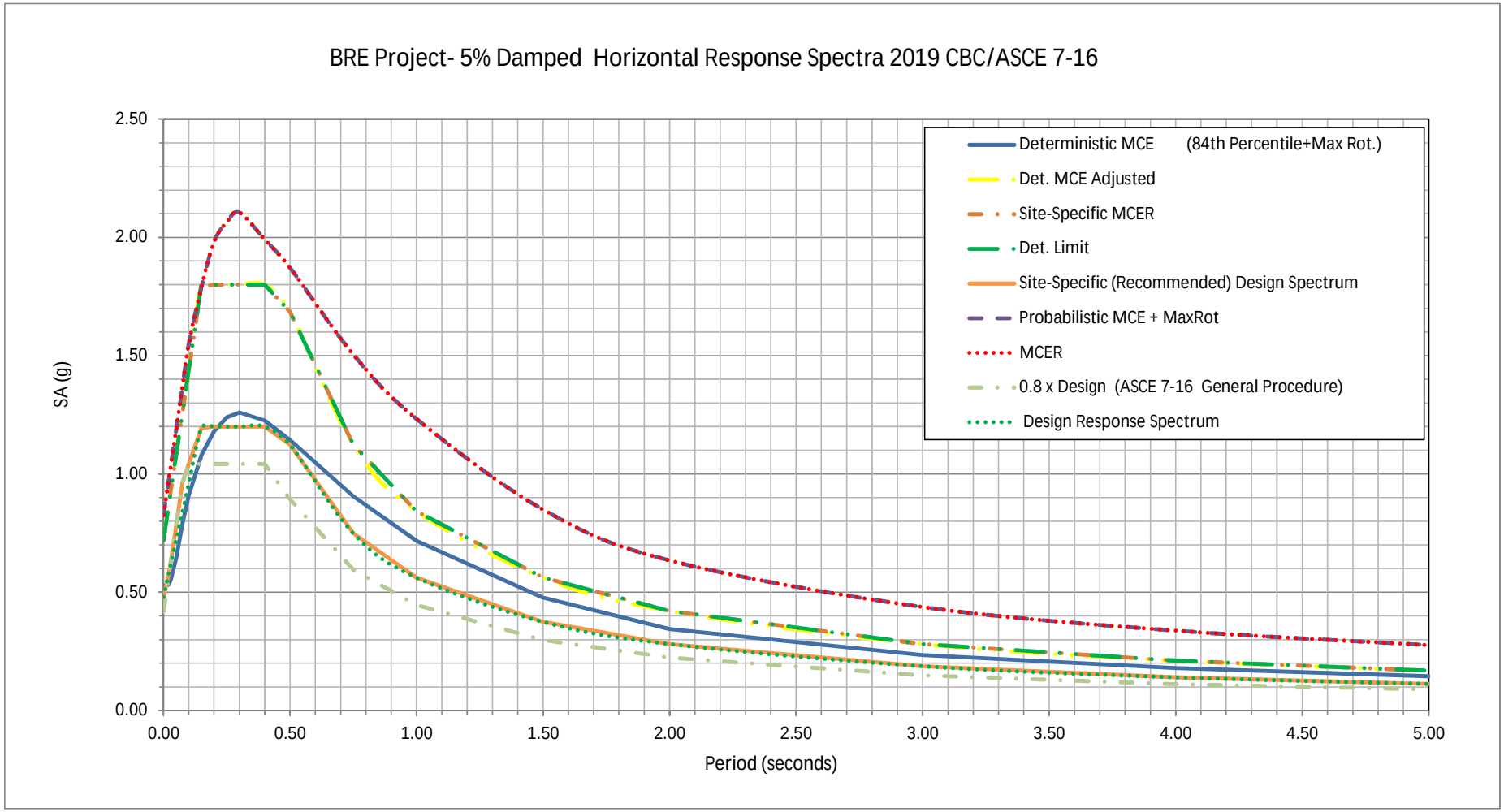
ATTACHMENTS

Ground Motion Results – Table

Ground Motion Results - Graph

BRE Project -Site-Specific Response Spectra 2019 CBC/ASCE 7-16										
Period (sec)	**Deterministic MCE (84th Percentile+Max Rot.)**	**Det. Limit**	**Det. MCE Adjusted**	**Probabilistic MCE + MaxRot**	**MCE_R**	**Site-Specific MCE_R**	**0.8 x Design (ASCE 7-16 General Procedure)**	**Design Response Spectrum**	**Site-Specific (Recommended) Design Spectrum**	**CBC2019 'Code' Spectrum**
0.000	0.528	0.720	0.720	0.877	0.825	0.720	0.417	0.480	0.480	0.521
0.010	0.530	0.792	0.792	0.954	0.898	0.792	0.490	0.528	0.528	0.612
0.020	0.532	0.864	0.864	1.031	0.970	0.864	0.563	0.576	0.576	0.704
0.030	0.556	0.936	0.936	1.108	1.043	0.936	0.636	0.624	0.636	0.795
0.050	0.644	1.080	1.080	1.262	1.188	1.080	0.782	0.720	0.782	0.978
0.075	0.790	1.260	1.260	1.455	1.369	1.260	0.965	0.840	0.965	1.206
0.100	0.909	1.440	1.440	1.647	1.550	1.440	1.042	0.960	1.042	1.303
0.150	1.079	1.800	1.800	1.903	1.791	1.791	1.042	1.194	1.194	1.303
0.200	1.180	1.800	1.800	2.106	1.982	1.800	1.042	1.200	1.200	1.303
0.250	1.239	1.800	1.800	2.197	2.064	1.800	1.042	1.200	1.200	1.303
0.300	1.260	1.800	1.800	2.244	2.105	1.800	1.042	1.200	1.200	1.303
0.400	1.226	1.800	1.800	2.130	1.991	1.800	1.042	1.200	1.200	1.303
0.500	1.143	1.685	1.685	2.009	1.871	1.685	0.893	1.123	1.123	1.116
0.750	0.905	1.123	1.123	1.629	1.505	1.123	0.595	0.749	0.749	0.744
1.000	0.718	0.842	0.842	1.346	1.233	0.842	0.446	0.562	0.562	0.558
1.500	0.477	0.562	0.562	0.928	0.850	0.562	0.298	0.374	0.374	0.372
2.000	0.344	0.421	0.421	0.692	0.634	0.421	0.223	0.281	0.281	0.279
3.000	0.234	0.281	0.281	0.478	0.438	0.281	0.149	0.187	0.187	0.186
4.000	0.179	0.211	0.211	0.369	0.338	0.211	0.112	0.140	0.140	0.140
5.000	0.145	0.168	0.168	0.302	0.276	0.168	0.089	0.112	0.112	0.112


BRE Project- 5% Damped Horizontal Response Spectra 2019 CBC/ASCE 7-16
SA (g)
Period (seconds)
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
Deterministic MCE (84th Percentile+Max Rot.)
Det. MCE Adjusted
Site-Specific MCER
Det. Limit
Site-Specific (Recommended) Design Spectrum
Probabilistic MCE + MaxRot
MCER
0.8 x Design (ASCE 7-16 General Procedure)
Design Response Spectrum

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Terracon conducted 34 soil-testing borings as shown on the Exploration Plan. The borings are numbered consecutively as B-1 through B-37; however, B-4, B-18, and B-24 were not performed and are not depicted on the plan.

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±10 feet) and approximate elevations were obtained by interpolation from the Google Earth. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

Subsurface Exploration Procedures: We advance the borings with a truck-mounted drill rig using hollow-stem augers. Both a standard penetration test (SPT) sampler (2-inch outer diameter and 1-3/8-inch inner diameter) and a modified California ring-lined sampler (3-inch outer diameter and 2-3/8-inch inner diameter) are utilized in our investigation. The penetration resistance is recorded on the boring logs as the number of hammer blows used to advance the sampler in 6-inch increments (or less if noted). The samplers are driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, samplers are advanced up to 18 inches, providing up to three sets of blowcounts at each sampling interval. The sampling depths, penetration distances, and other sampling information are recorded on the field boring logs. The recorded blows are raw numbers without any corrections for hammer type (automatic vs. manual cathead) or sampler size (ring sampler vs. SPT sampler). Relatively undisturbed and bulk samples of the soils encountered are placed in sealed containers and returned to the laboratory for testing and evaluation.

We observe and record groundwater levels during drilling and sampling. For safety purposes, all borings are backfilled with auger cuttings after their completion.

Our exploration team prepares field boring logs as part of the drilling operations. These field logs include visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs are prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural

standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- Water (Moisture) Content of Soil by Mass
- Laboratory Determination of Density (Unit Weight) of Soil Specimens
- Modified Proctor test
- Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
- Atterberg Limits
- Direct Shear Strength
- Consolidation/Hydrocollapse
- R-value
- Corrosion suite

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan
Exploration Plan A
Exploration Plan B

Note: All attachments are one page unless noted above.

SITE LOCATION

Proposed Logistics Facility Project ■ Jurupa Valley, California
November 19, 2020 ■ Terracon Project No. CB205119

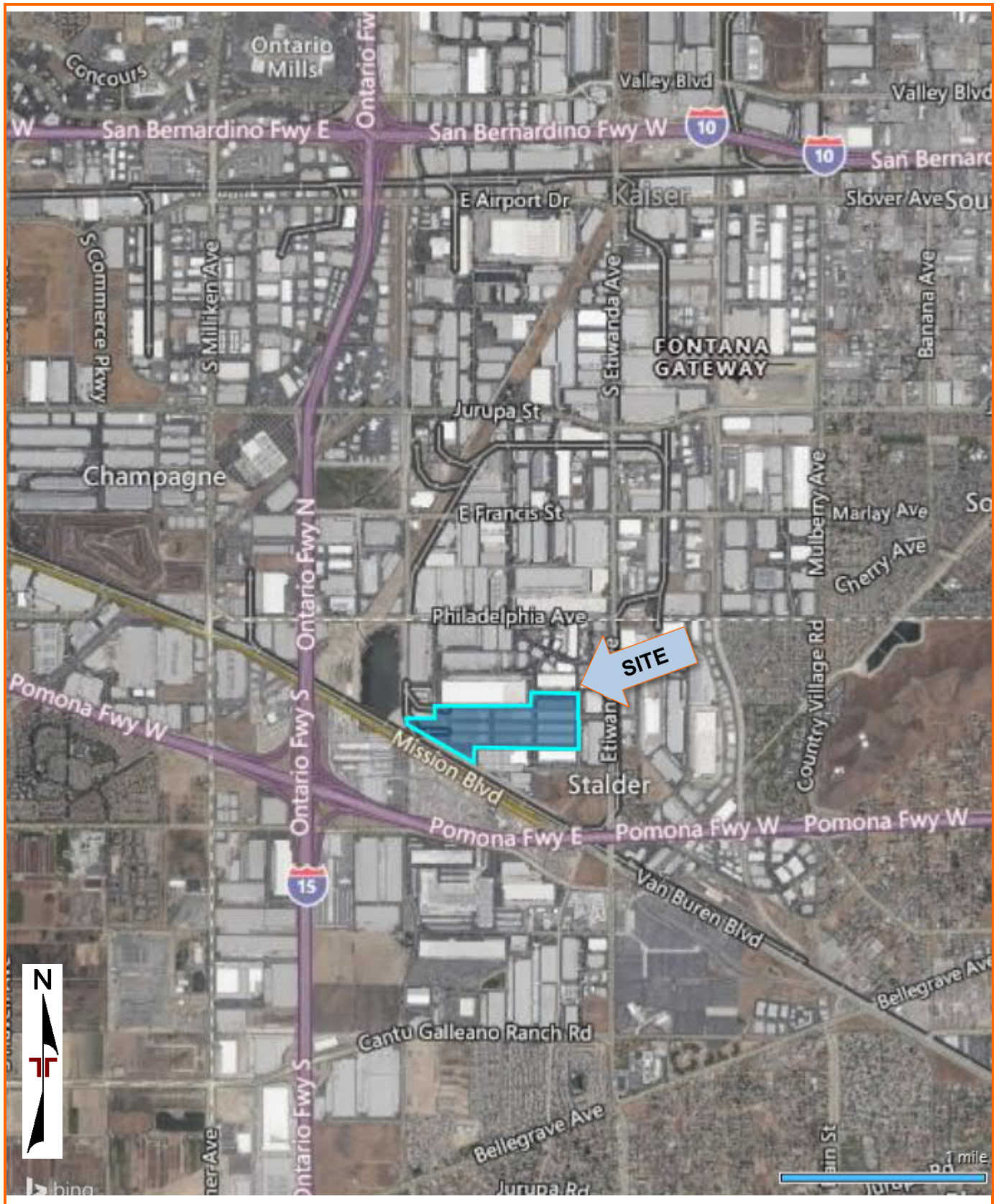


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

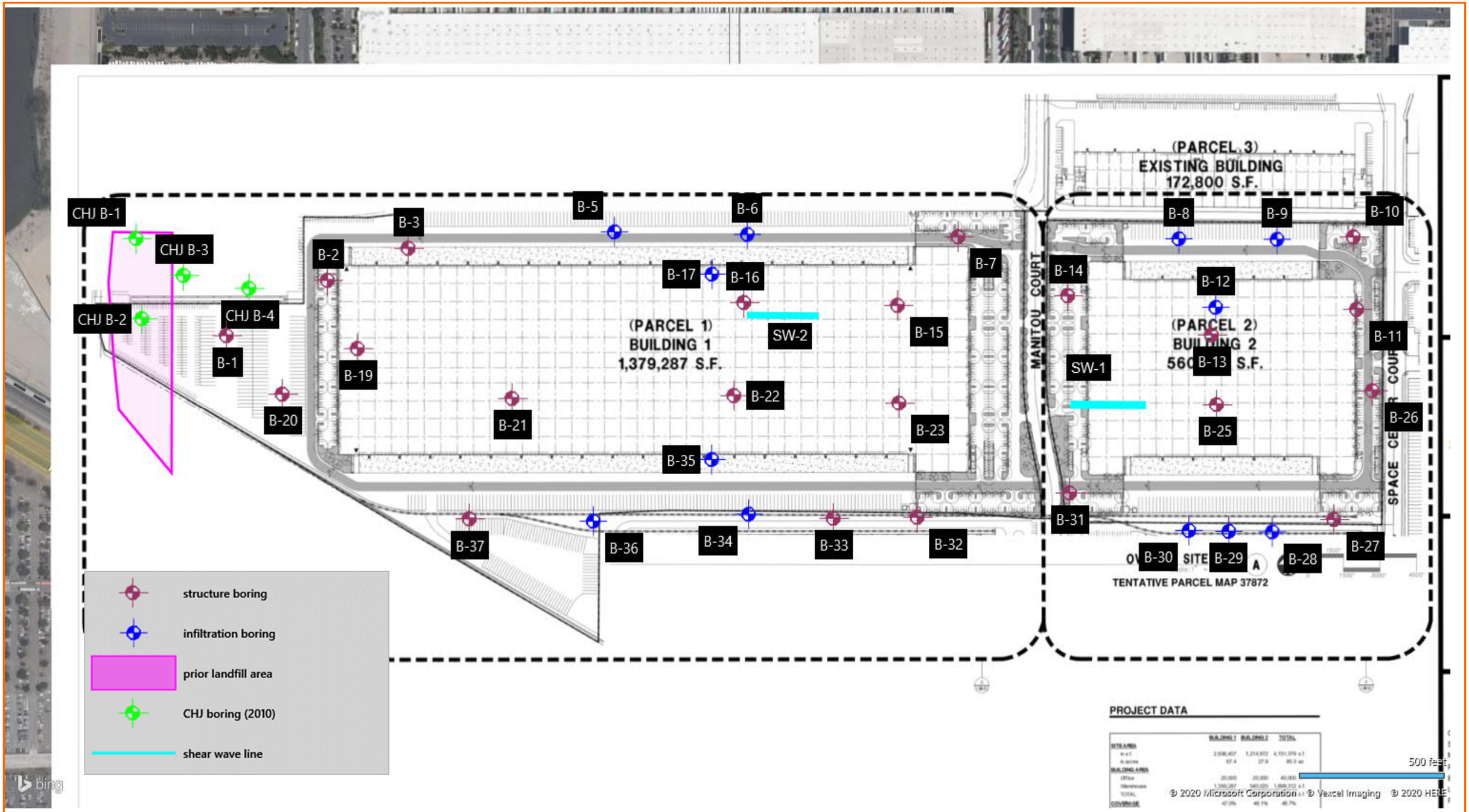


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

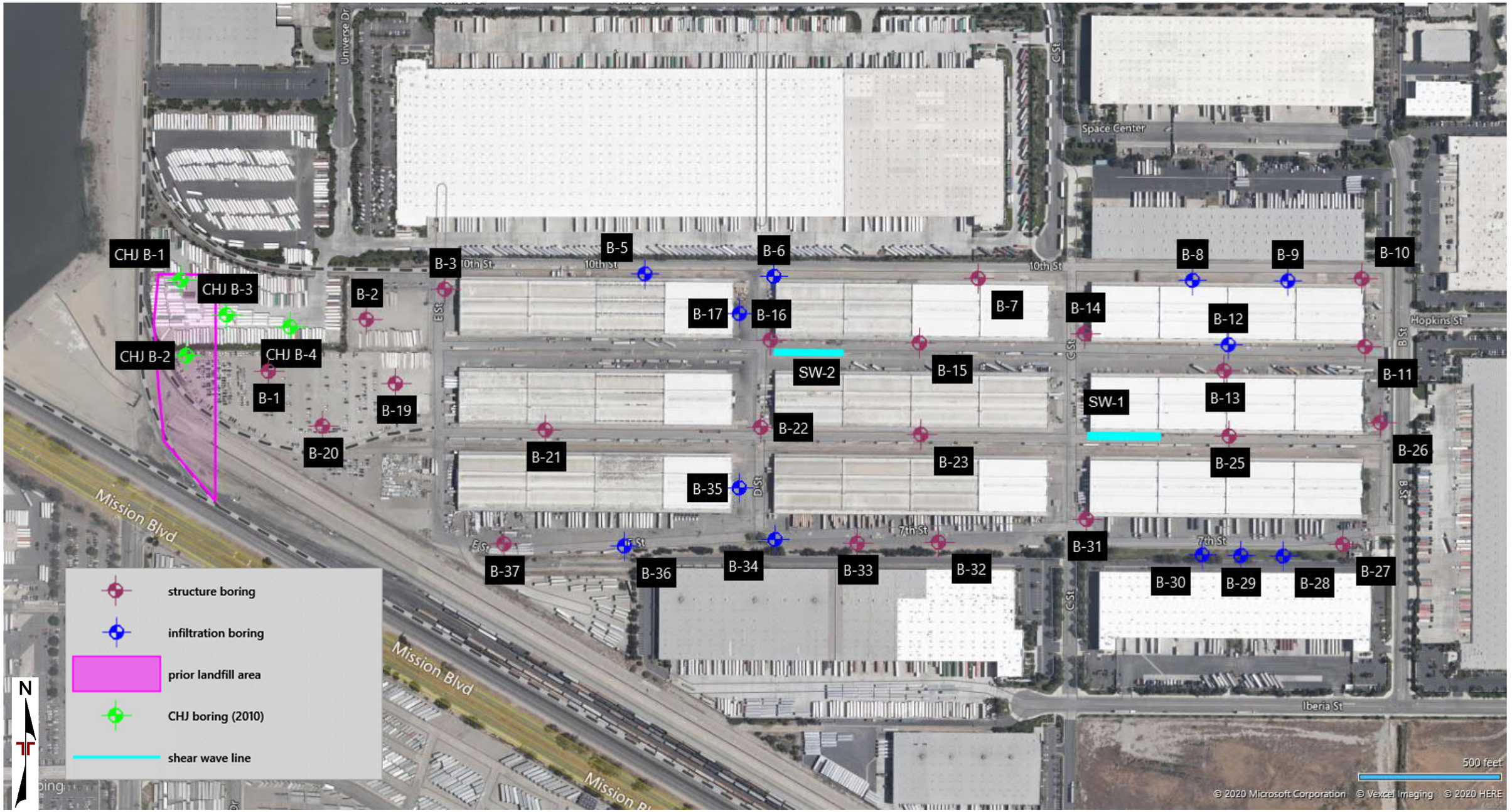


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

BORING LOG NO. B-1

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0262° Longitude: 117.54°

Surface Elev.: 814 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.5	813.5	**AGGREGATE BASE COURSE**, 6" thick
		FILL - SILTY SAND (SM), fine to coarse grained, gray brown, gravel to 1"
3.0	811	**SILTY SAND (SM)**, fine to coarse grained, gray brown, dense, gravel to 1"
		brown gray, gravel to 2"
11.5	802.5	***Boring Terminated at 11.5 Feet***

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
5		35-40-49		
		7-16-29	0	120
		16-32-38		
10		25-35-37		

ATTERBERG LIMITS: LL-PL-PI

PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-2

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0267° Longitude: 117.5391°

Surface Elev.: 815 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.5	814.5	**AGGREGATE BASE COURSE**, 6" thick
		FILL - SILTY SAND (SM), fine to coarse grained, gray, gravel to 1"
3.0	812	**WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)**, fine to coarse grained, gray, dense, gravel to 1"
10.0	805	**SILTY SAND (SM)**, fine to coarse grained, gray, dry, dense, gravel to 2"
15.0	800	**WELL GRADED GRAVEL WITH SILT AND SAND (GW-GM)**, dense
		auger chatter
20.0	795	**SILTY SAND WITH GRAVEL (SM)**, fine to coarse grained, gray, dry, very dense, gravel to 3"
		auger chatter

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		11-16-21 N=37		
		15-21-26 N=47	NP	8
10		18-21-25 N=46		
15		27-21-25 N=46	NP	7
20		50/5"		
25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-2

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0267° Longitude: 117.5391°

Surface Elev.: 815 (Ft.)

DEPTH	ELEVATION (Ft.)	
31.5	783.5	**SILTY SAND WITH GRAVEL (SM)**, fine to coarse grained, gray, dry, very dense, gravel to 3" *(continued)*
40.0	775	**CLAYEY SAND (SC)**, fine to medium grained, strong brown, moist, medium dense
		SILTY SAND (SM), with clay, fine grained, yellow brown, dense

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS
		18-36-50/5"
30		29-50/5"
35		7-9-15 N=24
40		8-10-12 N=22
45		12-18-20 N=38
50		

GRAPHIC LOG | WATER LEVEL OBSERVATIONS | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI | PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-2

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 34.0267° Longitude: 117.5391° Surface Elev.: 815 (Ft.) DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SILTY SAND (SM), with clay, fine grained, yellow brown, dense *(continued)* 51.5 medium dense 763.5			X	7-9-14 N=23				
	Boring Terminated at 51.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-3

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0267° Longitude: 117.5391°

Surface Elev.: 815 (Ft.)

DEPTH	ELEVATION (Ft.)	
0	815	**FILL - SILTY SAND (SM)**, fine grained, light brown, dry
2.0	813	**SILTY SAND (SM)**, fine grained, light brown, dry, medium dense
7.5	807.5	**SANDY SILT (ML)**, fine grained, gray brown mottle, dry, medium dense
15.0	800	**SILTY SAND (SM)**, fine grained, mottle gray brown, dry, medium dense
21.5	793.5	***Boring Terminated at 21.5 Feet***

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		12-14-20	5	107		
		7-14-16	14	115		
10		5-11-15				
15		11-18-21				
20		11-15-18				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-24-2020 | Boring Completed: 09-24-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-4

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 34.027° Longitude: 117.5382° Surface Elev.: 818 (Ft.) DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:	Boring Completed:
Drill Rig: CME 75	Driller: 2R Drilling Inc.
Project No.: CB205119	

BORING LOG NO. B-5

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0272° Longitude: 117.5359°

Surface Elev.: 820 (Ft.)

DEPTH	ELEVATION (Ft.)	
0.0	820	**FILL - SILTY SAND (SM)**, fine to medium grained, olive brown, moist, gravel to 1"
5.0	815	**SILTY SAND WITH GRAVEL (SM)**, fine to medium grained, moist, medium dense, gravel to 1"
		dense
		very dense
21.5	798.5	***Boring Terminated at 21.5 Feet***

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS
5		5-8-10 N=18
		7-7-8 N=15
		10-13-15 N=28
10		12-13-23 N=36
15		16-16-19 N=35
20		24-23-28 N=51

GRAPHIC LOG | WATER LEVEL OBSERVATIONS | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI | PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-6

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.027° Longitude: 117.5345°

Surface Elev.: 818 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	2.0	816								
	10.0	808	5			8-11-15				
						16-36-40	1			
						9-11-18			NP	18
	16.5	801.5	10			40-50/6"				
			15			23-39-47 N=86				

FILL - SILTY SAND (SM), fine to medium grained, brown, moist, gravel to 1"

SILTY SAND (SM), fine to medium grained, brown, moist, medium dense, gravel to 1"

fine to coarse grained, gray brown, dense, gravel to 1"

SILTY SAND WITH GRAVEL (SM), fine to coarse grained, brown, moist, very dense, gravel to 3"

Boring Terminated at 16.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-7

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0271° Longitude: 117.5322°

Surface Elev.: 820 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.0	820	**FILL - SILTY SAND (SM)**, fine to coarse grained, gravel to 1"
2.5	817.5	**SILTY SAND (SM)**, fine grained, brown, medium dense
5.0	815	**SILTY SAND WITH GRAVEL (SM)**, fine to coarse grained, brown gray, medium dense, gravel to 2"
		dense
25.0	795	

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		2-4-6 N=10		
		5-9-10 N=19		
		5-10-12 N=22		
10		12-12-14 N=26		
15		9-9-16 N=25	NP	17
20		6-12-29 N=41		
25				

WATER LEVEL OBSERVATIONS; WATER CONTENT (%); DRY UNIT WEIGHT (pcf)

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-7

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0271° Longitude: 117.5322°

Surface Elev.: 820 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), fine to medium grained, light brown, dense			7-8-32 N=40		
30.0	790		30				
		SILTY SAND (SM), fine to medium grained, olive with orange mottle, medium dense			11-12-16 N=28		
33.0	787						
		SANDY LEAN CLAY (CL), fine grained, red brown, very stiff	35		8-11-15 N=26		
40.0	780		40		7-10-11 N=21	NP	42
		SILTY SAND (SM), light brown, medium dense dense, few gravel to 1"	45		11-16-19 N=35		
50.0	770		50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-7

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 34.0271° Longitude: 117.5322° Surface Elev.: 820 (Ft.) DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SILTY SAND (SM), with clay, fine to medium grained, light brown, medium dense 51.5 / 768.5				6-9-12 N=21				
	Boring Terminated at 51.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-8

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0271° Longitude: 117.5294°

Surface Elev.: 819 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.0	819	**FILL - SILTY SAND (SM)**, fine to medium grained, dark brown, moist
2.5	816.5	**SILTY SAND (SM)**, fine to medium grained, dark brown, moist, loose
7.0	812	**POORLY GRADED SAND WITH GRAVEL (SP)**, medium to coarse grained, brown some gray, moist, medium dense, with gravel to 1"
10.0	809	**SILTY SAND (SM)**, medium to coarse grained, brown gray, dense, with gravel to 1"
16.0	803	***Boring Terminated at 16 Feet***

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		5-9-9				
		9-18-21	2	116		
10		16-21-22	2	119	NP	3
		25-35-43				
15						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-9

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0271° Longitude: 117.5285°

Surface Elev.: 820 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
2.0	818	**FILL - SILTY SAND (SM)**, fine to medium grained, brown, moist					
		SILTY SAND (SM), fine to medium grained, brown, moist, medium dense			3-3-9 N=12		
		fine to coarse grained, gray brown, gravel to 1/2"	5		9-10-14 N=24		
7.5	812.5						
		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), fine to medium grained, gray brown, moist, medium dense, few gravel to 1"			11-8-9 N=17	NP	12
			10		7-8-16 N=24		
15.0	805						
		SILTY SAND WITH GRAVEL (SM), medium to coarse grained, gray brown, dry, very dense, gravel to 2 1/2"	15		16-33-42 N=75		
16.5	803.5						
		Boring Terminated at 16.5 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-10

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.027° Longitude: 117.5275°

Surface Elev.: 821 (Ft.)

DEPTH	ELEVATION (Ft.)	
0.1	821	**ASPHALT**, 1" thick
1.0	820	**FILL - SILTY SAND (SM)**, brown, few gravel to 1/2"
		SILTY SAND (SM), brown, medium dense, few gravel to 1/2"
		fine grained, gray brown, gravel to 1/2"
10.0	811	
		SANDY SILT (ML), fine grained, olive gray, very stiff
15.0	806	
		SILTY SAND (SM), medium to coarse grained, gray brown, very dense, gravel to 1/2"
25.0	796	

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)
5		5-9-26	
		13-25-30	
		15-10-9	1
10		6-8-11	
15		34-50/6"	
20		15-18-32 N=50	
25			

WATER LEVEL OBSERVATIONS, DRY UNIT WEIGHT (pcf), ATTERBERG LIMITS (LL-PL-PI), PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-10

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.027° Longitude: 117.5275°

Surface Elev.: 821 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND WITH GRAVEL (SM), medium to coarse grained, strong brown, very dense, gravel to 1"			50/6"		
31.5	789.5		30		28-31-26 N=57		
		SANDY LEAN CLAY (CL), fine to medium grained, red brown, stiff					
35.0	786		35		9-13-17 N=30	22-15-7	44
		SILTY CLAYEY SAND (SC-SM), fine to medium grained, red brown with olive mottle, dense					
40.5	780.5		40		13-20-33 N=53		
		SILTY SAND (SM), fine to medium grained, strong brown, dry, very dense, gravel to 1/2"					
45.0	776		45		17-18-34 N=52	32-20-12	72
		LEAN CLAY WITH SAND (CL), fine to coarse grained, red brown, hard					
50.0	771		50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-10

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 34.027° Longitude: 117.5275° Surface Elev.: 821 (Ft.) DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SANDY SILT (ML), fine grained, strong brown, very stiff				10-11-16 N=27				
	hard				20-29-47 N=76				
	53.5 / 767.5								
	Boring Terminated at 53.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-11

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0264° Longitude: 117.5275°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY SAND (SM), fine grained, brown							
2.0	815								
		SILTY SAND (SM), fine grained, brown, medium dense							
					19-12-11	7	118		
		fine to medium grained, gray brown, gravel to 3/4"	5		8-10-12				
					6-15-27				
		dense	10		25-25-34				
15.0	802								
		SILTY SAND WITH GRAVEL (SM), fine to coarse grained, gray brown, very dense, gravel to 2"	15		50/4"				
		dense	20		9-16-17 N=33				
21.5	795.5								
		Boring Terminated at 21.5 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-12

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0264° Longitude: 117.5291°

Surface Elev.: 819 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	0.3	818.5	**ASPHALT**, 4" thick								
	2.0	817	**FILL - SILTY SAND (SM)**, fine to medium grained, brown, moist, few gravel to 1 1/2"								
	15.0	804	**SILTY SAND (SM)**, fine to medium grained, brown, moist, few gravel to 1 1/2" fine to coarse grained, gravel to 1"	5 10							
	20.0	799	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, medium to coarse grained, brown to gray brown, moist, with gravel to 1 1/2"	15						NP	6
			Boring Terminated at 20 Feet	20							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-13

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0262° Longitude: 117.529°

Surface Elev.: 819 (Ft.)

DEPTH	ELEVATION (Ft.)	
0.4	818.5	**ASPHALT**, 5" thick
		FILL - SILTY SAND (SM), fine to coarse grained, light brown, few gravel to 1"
2.0	817	
		SILTY SAND (SM), fine to coarse grained, light brown, medium dense, few gravel to 1"
		gray brown, few gravel to 3/4"
8.0	811	
		SILTY SAND WITH GRAVEL (SM), fine to coarse grained, gray brown, medium dense, gravel to 1 1/2"
		dense
16.0	803	
		SILT (ML), fine grained, olive, very stiff
20.0	799	
		SAND (SP), fine grained, strong brown, very dense
21.0	798	
		SILTY SAND (SM), fine to coarse grained, gray brown, very dense, gravel to 1"
25.0	794	

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		3-4-6 N=10				
		8-11-12 N=23				
		7-11-15 N=26				
10		11-13-23 N=36				
15		17-8-7 N=15				
20		10-21-38 N=59				
25						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:	Boring Completed:
Drill Rig: CME 75	Driller: 2R Drilling Inc.
Project No.: CB205119	

BORING LOG NO. B-13

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0262° Longitude: 117.529°

Surface Elev.: 819 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse grained, gray brown, very dense, gravel to 2-1/2"			32-50/6"	NP	7
30.0	789	**LEAN CLAY WITH SILT (CL)**, fine grained, olive with brown mottle, hard	30		11-11-20 N=31		
32.0	787	**SANDY SILT (ML)**, fine grained, brown with orange mottle					
35.0	784	**SANDY LEAN CLAY (CL)**, fine to medium grained, red brown, hard	35		10-12-26 N=38		
			40		14-10-12 N=22		
			45		11-18-30 N=48		
50.0	769		50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-13

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0262° Longitude: 117.529°

Surface Elev.: 819 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SANDY SILT (ML), fine grained, yellow brown, hard				X	7-9-16 N=25			NP	68
	51.5	767.5								
	Boring Terminated at 51.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-14

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0264° Longitude: 117.5309°

Surface Elev.: 815 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.5	814.5	**ASPHALT**, 6" thick					
		FILL - SILTY SAND (SM), fine grained, brown					
3.0	812	**SILTY SAND (SM)**, fine to medium grained, brown, loose			4-4-4 N=8		
			5		1-2-3 N=5	NP	21
		medium dense			3-5-8 N=13		
10.0	805	**SILTY SAND WITH GRAVEL (SM)**, fine to coarse grained, brown, medium dense, gravel to 1"	10		4-6-10 N=16		
		very dense	15		18-23-49 N=72		
		medium dense	20		10-11-13 N=24		
21.5	793.5	***Boring Terminated at 21.5 Feet***					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-15

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0265° Longitude: 117.5327°

Surface Elev.: 819 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.5	818.5	**ASPHALT**, 6" thick
		FILL - SILTY SAND (SM), fine grained, brown
2.0	817	**SILTY SAND (SM)**, fine grained, brown, loose
		fine to coarse grained, brown gray, medium dense, gravel to 1.5"
15.0	804	**SILTY SAND WITH GRAVEL (SM)**, fine to coarse grained, brown gray, dense, gravel to 2.5"
20.0	799	**SILTY SAND (SM)**, fine grained, light brown, medium dense

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		5-6-12		
		4-5-7		
		5-5-6		
10		9-12-12		
15		13-18-23 N=41		
20		6-5-8 N=13	NP	36
25				

WATER LEVEL OBSERVATIONS, WATER CONTENT (%), DRY UNIT WEIGHT (pcf)

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-15

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0265° Longitude: 117.5327°

Surface Elev.: 819 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), fine grained, light brown, medium dense *(continued)*				6-9-11 N=20				
	30.0	789	30							
		SANDY SILT (ML), fine grained, light brown, very stiff				4-7-10 N=17			NP	51
	35.0	784	35							
		SILTY SAND (SM), fine to medium grained, red brown, medium dense				7-9-13 N=22			NP	43
	40.0	779	40							
		CLAYEY SAND (SC), with silt, fine to medium grained, red brown, medium dense				10-11-16 N=27				
	45.0	774	45							
		SILTY SAND (SM), with clay, red brown, medium dense				10-12-15 N=27				
	50.0	769	50							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-15

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0265° Longitude: 117.5327°

Surface Elev.: 819 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SILTY SAND (SM), fine to coarse grained, brown gray, dense, few gravel to 1"				X	14-18-22 N=40				
	51.5	767.5								
	Boring Terminated at 51.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-16

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0264° Longitude: 117.5344°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.0	817	**FILL - SILTY SAND (SM)**, fine grained, brown, moist, (disturbed native)
2.0	815	**SILT (ML)**, with fine sand, moist, soft
5.5	811.5	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, fine to coarse grained, gray brown, moist, medium dense, few gravel to 1"
10.0	807	**SILTY SAND (SM)**, fine to medium grained, brown, moist, loose, few gravel to 1/2"
15.0	802	**WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)**, fine to coarse grained, gray brown, very dense, gravel to 1-1/2"
25.0	792	

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		1-1-1 N=2		
		3-5-7 N=12	NP	10
		8-12-13 N=25		
10		5-3-3 N=6		
15		16-23-38 N=61	NP	11
20		16-23-37 N=60		
25				

WATER LEVEL OBSERVATIONS

WATER CONTENT (%)

DRY UNIT WEIGHT (pcf)

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB205119 MANITOU CT C ST.GPJ TERRACON_DATATEMPLATE.GDT 11/17/20

BORING LOG NO. B-16

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0264° Longitude: 117.5344°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), fine to coarse grained, gray brown, very dense, gravel to 2-1/2", few cobbles			37-40-43 N=83		
30.0	787	**SILTY SAND WITH GRAVEL (SM)**, fine to coarse grained, gray brown, dense, gravel to 2-1/2", few cobbles	30		22-24-22 N=46		
35.0	782	**SANDY SILT (ML)**, fine grained, brown, moist, very stiff	35		8-9-14 N=23		
40.0	777	**SANDY SILTY CLAY (CL-ML)**, fine grained, brown, moist, very stiff	40		4-7-9 N=16	24-17-7	65
45.0	772	**SILTY SAND (SM)**, fine grained, brown, very dense	45		37-50/5"		
			50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-16

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0264° Longitude: 117.5344°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS
SILTY SAND (SM), fine grained, brown, very dense *(continued)* fine to medium grained, light brown, dense, few gravel to 1/2"				17-22-23 N=45
fine grained, brown, very dense		55		15-23-33 N=56
60.0	757	60		7-9-15 N=24
SANDY SILT (ML), fine grained, brown, very stiff				
65.0	752	65		12-23-30 N=53
SILTY SAND (SM), fine grained, light brown, very dense				
fine to medium grained		70		17-23-27 N=50
75.0	742	75		

WATER LEVEL OBSERVATIONS | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI | PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-16

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0264° Longitude: 117.5344°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	FIELD TEST RESULTS
		SANDY SILT (ML), with clay, fine grained, strong brown, hard		14-22-32 N=54
80.0	737	**SILTY SAND (SM)**, fine grained, light brown, very dense	80	27-50/6"
85.0	732	**SILTY SAND (SM)**, fine to coarse grained, gray brown, very dense, gravel to 1"	85	30-50/3"
		brown gray, gravel to 1/2"	90	37-50/6"
			95	42-50/6"
			100	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-16

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 34.0264° Longitude: 117.5344° Surface Elev.: 817 (Ft.) DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	101.0 / 716			X	29-50/6"				
	Boring Terminated at 101 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-17

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0266° Longitude: 117.5345°

Surface Elev.: 818 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
1.0	817	**FILL - SILTY SAND (SM)**, fine to medium grained, brown
2.0	816	**SANDY SILT (ML)**, fine grained, brown, moist
		SILTY SAND (SM), fine to coarse grained, gray brown, loose, gravel to 2"
		medium dense
10.0	808	
11.5	806.5	**WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)**, fine to coarse grained, gray brown, dense, gravel to 2"
		SILTY SAND (SM), fine to coarse grained, gray brown, very dense, gravel to 2"
21.0	797	
		Boring Terminated at 21 Feet

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		1-1-4 N=5		
		7-10-15 N=25		
		9-8-14 N=22		
10		15-18-19 N=37	NP	10
15		35-35-36 N=71		
20		38-50/6"		

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-18

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 34.0263° Longitude: 117.5396° Surface Elev.: 815 (Ft.) DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-19

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.026° Longitude: 117.5385°

Surface Elev.: 813 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.5	812.5	**AGGREGATE BASE COURSE**, 6" thick
		FILL - SILTY SAND (SM), fine to coarse grained, light brown
2.5	810.5	**SILTY SAND (SM)**, fine to medium grained, light gray brown, medium dense
		fine to coarse grained, gray, dense, gravel to 2"
8.5	804.5	**SILT (ML)**, brown, dry, very stiff
10.0	803	**SANDY SILT (ML)**, fine grained, brown, dry, very stiff
15.0	798	**SILTY SAND (SM)**, fine grained, light brown, dry, medium dense
		very dense
20.9	792	***Boring Terminated at 20.92 Feet***

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	LL-PL-PI	PERCENT FINES
5		11-15-19				
		19-29-30				
		12-13-16	7	111		
10		5-10-14	6	107		
15		9-15-21				
20		40-50/5"				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-20

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0255° Longitude: 117.5397°

Surface Elev.: 812 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	0.5	811.5								
		AGGREGATE BASE COURSE, 6" thick								
		FILL - SILTY SAND (SM), fine to coarse grained, brown gray, gravel to 2"				13-23-13	3			
	5.0	807	5							
		SILTY SAND (SM), fine to coarse grained, brown gray, very dense, gravel to 2"				19-13-50/5"				
						24-33-50/5"				
	11.0	801	10							
	11.5	800.5				27-30-18				
		SILTY SAND (SM), fine grained, medium dense								
		Boring Terminated at 11.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-21

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0255° Longitude: 117.537°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY SAND (SM), fine grained, brown					
					2-3-4 N=7		
5.0	812		5				
		SILTY SAND (SM), fine to medium grained, brown, loose, few gravel to 1/2"			3-3-4 N=7		
		medium dense			3-6-5 N=11		
		loose	10		3-4-5 N=9	NP	39
15.0	802		15		9-12-31 N=43		
		SILTY SAND WITH GRAVEL (SM), fine to coarse grained, dense, gravel to 2.5"					
		medium dense	20		9-7-7 N=14	NP	26
			25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-21

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0255° Longitude: 117.537°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)		DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND WITH GRAVEL (SM), fine to coarse grained, dense, gravel to 2.5" *(continued)* dense					
					9-30-18 N=48		
30.0	787		30				
		SILTY SAND (SM), fine to medium grained, gray brown, dense, with gravel to 1"			9-21-23 N=44		
33.0	784						
		CLAYEY SAND (SC), fine grained, strong brown, medium dense, with interbedded layers of Silty Sand (SM)	35		10-11-11 N=22		
40.0	777		40		4-5-10 N=15	38-18-20	69
		SANDY LEAN CLAY (CL), fine to medium grained, strong brown, very stiff	45		4-7-12 N=19		
50.0	767		50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-21

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0255° Longitude: 117.537°

Surface Elev.: 817 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SILTY SAND (SM), fine to medium grained, brown, medium dense, few gravel to 1/4"				X	6-9-11 N=20				
	51.5	765.5								
	Boring Terminated at 51.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-22

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0256° Longitude: 117.5346°

Surface Elev.: 813 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.4	812.5	**ASPHALT**, 5" thick
		FILL - SILTY SAND (SM), fine grained, brown
3.0	810	**SILTY SAND (SM)**, fine grained, brown, medium dense
		fine to medium grained, loose
		fine to coarse grained, brown gray, medium dense, gravel to 2"
		gravel to 3.5"
		very dense
20.4	792.5	***Boring Terminated at 20.4 Feet***

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)
5		4-10-14	
		6-5-7	
		5-18-21	2
10		10-12-30	
15		15-28-50/5"	
20		50/5"	

GRAPHIC LOG | WATER LEVEL OBSERVATIONS | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI | PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-23

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0255° Longitude: 117.5327°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY SAND (SM), fine to medium grained, brown, moist					
2.0	815						
		SILTY SAND (SM), fine grained, brown, loose					
					1-2-3 N=5		
			5		2-3-4 N=7		
		fine to coarse grained, gray brown, medium dense			4-5-7 N=12		
10.0	807		10		7-12-12 N=24	NP	8
		WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM), fine to coarse grained, gray brown, medium dense, gravel to 1"					
		dense	15		12-20-14 N=34		
		medium dense	20		12-13-13 N=26		
25.0	792		25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-23

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0255° Longitude: 117.5327°

Surface Elev.: 817 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND WITH GRAVEL (SM), fine to coarse grained, gray, very dense, gravel to 2"			23-42-21 N=63		
31.5	785.5		30		12-16-19 N=35		
		CLAYEY SAND (SC), fine grained, red brown, medium dense	35		9-15-11 N=26		
40.0	777		40		4-7-15 N=22	NP	59
45.0	772	**SILTY SAND (SM)**, fine to medium grained, gray brown, medium dense	45		7-13-13 N=26		
			50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-23

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0255° Longitude: 117.5327°

Surface Elev.: 817 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), fine to medium grained, gray brown, medium dense *(continued)*								
	51.5	dense 765.5				10-17-22 N=39				
		Boring Terminated at 51.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-24

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 34.0255° Longitude: 117.5311° Surface Elev.: 812 (Ft.) DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:	Boring Completed:
Drill Rig: CME 75	Driller: 2R Drilling Inc.
Project No.: CB205119	

BORING LOG NO. B-25

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0253° Longitude: 117.5291°

Surface Elev.: 816 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS
		FILL - SILTY SAND (SM), fine grained, brown			
3.0	813				
		SILTY SAND (SM), fine grained, brown, loose			4-4-3 N=7
		fine to medium grained, medium dense	5		2-4-6 N=10
		fine to coarse grained, gray brown, dense, gravel to 2"			5-7-9 N=16
			10		5-7-13 N=20
15.0	801				
		SILTY SAND WITH GRAVEL (SM), fine to coarse grained, brown gray, dense, gravel to 2.5"	15		11-27-17 N=44
20.0	796				
		SANDY SILT (ML), fine grained, mottled orange to olive brown, moist, very stiff	20		3-6-9 N=15
25.0	791		25		

WATER LEVEL OBSERVATIONS | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI | PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-25

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0253° Longitude: 117.5291°

Surface Elev.: 816 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND WITH GRAVEL (SM), fine to coarse grained, brown gray, very dense, gravel to 2.5"			17-32-37 N=69		
30.0	786		30				
		SILTY CLAYEY SAND (SC-SM), fine grained, olive brown to brown mottle, moist, medium dense			5-9-12 N=21	23-17-6	46
34.0	782						
		SANDY LEAN CLAY (CL), red brown, medium dense	35		5-8-13 N=21		
40.0	776		40				
		SILTY SAND (SM), with clay, fine to medium grained, red brown, medium dense			8-10-13 N=23	NP	21
45.0	771		45				
		SILTY CLAY (CL-ML), with sand, fine grained, red brown, hard			7-14-21 N=35		
50.0	766		50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-25

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0253° Longitude: 117.5291°

Surface Elev.: 816 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), with clay, fine grained, strong brown, medium dense			6-7-11 N=18		
55.0	761		55				
		SILTY CLAYEY SAND (SC-SM), fine to medium grained, strong brown, medium dense			5-7-10 N=17		
60.0	756		60				
		SANDY SILT (ML), strong brown, very stiff			5-7-11 N=18	NP	61
65.0	751		65				
		SILTY SAND (SM), with clay, fine to medium grained, strong brown, medium dense			11-10-15 N=25		
		fine to coarse grained, brown gray, very dense, gravel to 3/4"	70		22-40-43 N=83		
			75				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-25

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0253° Longitude: 117.5291°

Surface Elev.: 816 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), with clay, fine to medium grained, strong brown, medium dense *(continued)*								
	76.5	739.5				18-25-50/5"				
		Boring Terminated at 76.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-02-2020 | Boring Completed: 10-02-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-26

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0256° Longitude: 117.5273°

Surface Elev.: 816 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	0.3	815.5								
ASPHALT, 3.5" thick **FILL - SILTY SAND (SM)**, fine to medium grained, light brown, trace gravel to 1/2"						5-6-6				
			5			12-22-23	1			
fine to coarse grained, grayish brown, medium dense, with gravel to 1"	6.5	809.5								
Boring Terminated at 6.5 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-22-2020 | Boring Completed: 09-22-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-27

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0254° Longitude: 117.5277°

Surface Elev.: 814 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.4	813.5	**ASPHALT**, 5" thick
0.7	813.5	**AGGREGATE BASE COURSE**, 3" thick
		FILL - SILTY SAND (SM), fine to coarse grained, brown, loose, trace gravel to 1/2"
3.0	811	**SILTY SAND (SM)**, fine to coarse grained, brown, loose, trace gravel to 1/2"
9.0	805	**POORLY GRADED SAND (SP)**, fine to coarse grained, grayish brown, medium dense, with gravel to 1/2"
		very dense, 2" gravel in auger cuttings
20.0	794	**WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)**, fine to coarse grained, grayish brown, very dense, with gravel to 3" auger chatter

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		5-5-4				
5		3-5-8				
		8-11-7	2	108		
10		12-14-19			NP	5
15		35-50/6"				
20		45-25-26 N=51			NP	8
25						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-27

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0254° Longitude: 117.5277°

Surface Elev.: 814 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM), fine to coarse grained, grayish brown, very dense, with gravel to 3" *(continued)* light brown to grayish brown			12-27-28 N=55		
31.0	783		30		34-50/4"		
		SILTY SAND (SM), fine grained, reddish brown, very dense					
35.0	779		35		7-10-14 N=24	NP	59
		SANDY SILT (ML), fine grained, reddish brown, very stiff					
40.0	774		40		9-14-16 N=30		
		SILTY SAND (SM), trace clay, fine to medium grained, reddish brown, dense, trace gravel to 1/2"					
		medium dense	45		7-9-14 N=23	NP	47
			50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-27

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0254° Longitude: 117.5277°

Surface Elev.: 814 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), trace clay, fine to medium grained, reddish brown, dense, trace gravel to 1/2" *(continued)*								
	51.5	dense	762.5			6-13-17 N=30				
		Boring Terminated at 51.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-28

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0244° Longitude: 117.5286°

Surface Elev.: 808 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY SAND (SM), fine to medium grained, brown								
6.0	802									
		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse grained, grayish brown, medium dense, trace gravel to 1/2"	5			4-4-7 N=11				
		with gravel to 1"	10			9-12-15 N=27			NP	8
		dense	15			22-20-23 N=43				
16.5	791.5									
		Boring Terminated at 16.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-29

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0244° Longitude: 117.5289°

Surface Elev.: 808 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY SAND (SM), fine to medium grained, brown					
5.5	802.5		5		8-8-8 N=16		12
		POORLY GRADED SAND WITH SILT (SP-SM), fine to coarse grained, light brown, medium dense					
		grayish brown	10		8-14-15 N=29	NP	
		very dense, gravel to 1"	15		8-32-34 N=66		
16.5	791.5	***Boring Terminated at 16.5 Feet***					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-30

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0244° Longitude: 117.5293°

Surface Elev.: 808 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0	808	**FILL - SILTY SAND (SM)**, fine to medium grained, light brown, trace gravel to 1"
6.0	802	**SILTY SAND (SM)**, fine to medium grained, light brown, medium dense, trace gravel to 1"
		fine to coarse grained, grayish brown, dense, with gravel to 1"
		gravel layer
15.0	793	**SILT WITH SAND (ML)**, fine grained, grayish brown, very stiff
21.5	786.5	***Boring Terminated at 21.5 Feet***

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		6-10-14				
10		11-30-33	1	133		
15		17-11-20			NP	75
20		20-33-37				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-31

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0247° Longitude: 117.5301°

Surface Elev.: 812 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.5	811.5	**ASPHALT**, 6" thick			
		FILL - SILTY SAND (SM), fine grained, light brown			
2.0	810	**SILTY SAND (SM)**, trace clay, fine to medium grained, brown, loose, trace gravel to 1/2"	4-4-4 N=8		
			2-2-1 N=3		
			3-4-5 N=9	NP	35
10.0	802	**POORLY GRADED SAND (SP)**, fine to coarse grained, light grayish brown, medium dense, with gravel to 1/2"	4-5-9 N=14	NP	5
		very dense, with gravel to 1"	14-23-32 N=55		
20.0	792	**SILTY SAND (SM)**, fine grained, orangish brown, medium dense	16-11-9 N=20	NP	49
22.5	789.5	**POORLY GRADED SAND WITH SILT (SP-SM)**, fine to coarse grained, orangish brown to grayish brown, very dense, with gravel to 2"			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-31

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0247° Longitude: 117.5301°

Surface Elev.: 812 (Ft.)

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		POORLY GRADED SAND WITH SILT (SP-SM), fine to coarse grained, orangish brown to grayish brown, very dense, with gravel to 2" *(continued)*								
						12-15-35 N=50				
		dense	30			18-22-25 N=47				
			35			12-20-17 N=37				
36.5	775.5	**SILTY SAND (SM)**, trace clay, fine to medium grained, orangish brown, medium dense, trace gravel to 1/2"								
			40			7-10-12 N=22				
			45			5-8-6 N=14				
			50							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-31

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0247° Longitude: 117.5301°

Surface Elev.: 812 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), trace clay, fine to medium grained, orangish brown, medium dense, trace gravel to 1/2" *(continued)*				11-15-24 N=39				
	51.5	dense 760.5								
		Boring Terminated at 51.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-32

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0244° Longitude: 117.5325°

Surface Elev.: 810 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	0.3	809.5								
						5-8-10				
			5							
						5-8-10	2	106		
	6.5	803.5								

ASPHALT, 4" thick

FILL - SILTY SAND (SM), fine to medium grained, light brown, trace gravel to 1/2"

Boring Terminated at 6.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-33

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0245° Longitude: 117.5335°

Surface Elev.: 809 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.3	809	**ASPHALT**, 3" thick							
		FILL - SILTY SAND (SM), fine to medium grained, brown, trace gravel to 1/2"							
					9-9-10	6	109		
			5		5-7-6				
6.0	803	**POORLY GRADED SAND WITH SILT (SP-SM)**, fine to coarse grained, light brown, loose, trace gravel to 1"							
		medium dense			16-20-22			NP	6
			10		15-20-20				
		grayish brown, very dense	15		15-22-45 N=67				
20.5	788.5		20		50/6"				
		Boring Terminated at 20.5 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-21-2020 | Boring Completed: 09-21-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-34

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0246° Longitude: 117.5345°

Surface Elev.: 810 (Ft.)

DEPTH	ELEVATION (Ft.)	
0	810	**FILL - SILTY SAND (SM)**, fine to medium grained, brown
3.5	806.5	**SILTY SAND (SM)**, fine to medium grained, gray brown, medium dense, gravel to 1"
		fine grained, light brown, loose
7.0	803	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, fine to medium grained, brown, dense, gravel to 1"
		medium dense
		dense
16.0	794	
		Boring Terminated at 16.5 Feet

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		6-12-13 N=25		
		4-4-4 N=8		
10		9-16-19 N=35		
		6-7-9 N=16		
15		17-21-26 N=47	NP	8

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-35

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0251° Longitude: 117.5348°

Surface Elev.: 812 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY SAND (SM), fine to medium grained, brown, gravel to 1"					
3.0	809	**SILTY SAND (SM)**, fine to medium grained, brown, medium dense, gravel to 1"			7-7-5 N=12		
5.0	807	**SANDY SILT (ML)**, fine to medium grained, brown, medium dense	5		2-4-6 N=10		
7.5	804.5	**WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)**, fine grained, brown, medium dense			5-6-8 N=14		
			10		5-8-11 N=19	NP	8
		very dense	15		14-25-27 N=52		
20.0	792	**SILTY SAND (SM)**, fine grained, brown, medium dense	20		7-8-12 N=20		
21.5	790.5	***Boring Terminated at 21.5 Feet***					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 09-23-2020 | Boring Completed: 09-23-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-36

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0245° Longitude: 117.5364°

Surface Elev.: 813 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		FILL - SILTY SAND (SM), fine grained, brown								
3.0	810					3-6-9				
		WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM), fine to coarse grained, gray brown, loose, gravel to 1"								
		medium dense	5			13-17-24	2			
		dense				13-28-32			NP	6
		very dense	10			23-40-50				
15.0	798									
		SANDY SILT (ML), fine grained, light brown with orange mottle, very stiff	15			12-12-18				
16.5	796.5									
		Boring Terminated at 16.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started:

Boring Completed:

Drill Rig: CME 75

Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-37

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0245° Longitude: 117.5376°

Surface Elev.: 815 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.4	814.5	**ASPHALT**, 5" thick
		FILL - SILTY SAND (SM), fine grained, brown
		fine to medium grained, mottled gray brown, few gravel to 1/2"
12.0	803	
		SILTY SAND (SM), fine to medium grained, mottled gray brown, few gravel to 1/2"
15.0	800	
		SANDY SILT (ML), fine grained, brown, stiff

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS
5		2-4-6 N=10
		3-4-6 N=10
		5-6-8 N=14
10		8-10-4 N=14
15		3-5-5 N=10
20		3-3-6 N=9
25		

GRAPHIC LOG | WATER LEVEL OBSERVATIONS | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI | PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-37

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0245° Longitude: 117.5376°

Surface Elev.: 815 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SANDY SILT (ML), fine grained, brown, stiff *(continued)*			3-5-7 N=12		
30.0	785		30				
		SILTY SAND (SM), fine to coarse grained, gray brown, dry, very dense, gravel to 1"			21-44-50/5"		
35.0	780		35				
36.0	779	**SANDY LEAN CLAY (CL)**, fine to medium grained, red brown, very stiff			9-11-14 N=25		
		CLAYEY SAND (SC), fine to medium grained, strong brown, medium dense					
40.0	775		40				
		SILTY SAND (SM), red brown, dense			8-12-18 N=30	NP	49
		fine to coarse grained, light red brown, medium dense	45		8-10-19 N=29		
			50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

BORING LOG NO. B-37

PROJECT: Manitou Ct./C St. Redevelopment

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

LOCATION See Exploration Plan

Latitude: 34.0245° Longitude: 117.5376°

Surface Elev.: 815 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), red brown, dense *(continued)*								
	51.5	763.5				11-12-7 N=19				
		Boring Terminated at 51.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 10-01-2020 | Boring Completed: 10-01-2020

Drill Rig: CME 75 | Driller: 2R Drilling Inc.

Project No.: CB205119

TERRA GEOSCIENCES

SEISMIC SHEAR-WAVE SURVEY

EXISTING WAREHOUSE PROJECT

11200 IBERIA STREET

JURUPA VALLEY, CALIFORNIA

Project No. 203524-1

November 2, 2020

Prepared for:

Terracon
1355 E. Cooley Drive
Colton, CA 92324

Consulting Engineering Geology & Geophysics

P.O. Box 1090, Loma Linda, CA 92354 • 909 796-4667

Terracon
1355 E. Cooley Drive
Colton, CA 92324

Attention: Mr. John Mckeown

Regarding: Seismic Shear-Wave Survey
Existing Warehouse Project
11200 Iberia Street
Jurupa Valley, California
Terracon Project No. CB205154

INTRODUCTION

As requested, this firm has performed a seismic shear-wave survey along two selected locations for the above referenced subject site, using the multi-channel analysis of surface waves (MASW) and microtremor array measurements (MAM) methods. The purpose of this survey was to assess the one-dimensional average shear-wave velocity structure beneath the subject survey areas to a depth of at least 100 feet. Geologic mapping of the local area by Morton and Miller (2006) indicates that the site is mantled by recent artificial fill, which is underlain by late Holocene age alluvial fan deposits, generally comprised of unconsolidated to slightly consolidated coarse-grained sand to bouldery alluvium, with progressively older and more consolidated alluvium at depth.

The locations of the seismic traverses have been approximated on a captured Google™ Earth image (Google™ Earth, 2020) and a copy of the provided 200-scale Site Plan, which are presented on Plates 1 and 2, for reference. Additionally, photographic views of the survey lines are presented on Plates 3 and 4 for visual and reference purposes. As authorized by you, the following services were performed during this study:

- ***Review of available pertinent published and unpublished geologic and geophysical data in our files pertaining to the site.***
- ***Performing a seismic surface-wave survey by a licensed State of California Professional Geophysicist that included two traverses for shear-wave velocity analysis purposes.***
- ***Preparation of this report, presenting the results of our findings with respect to the shear-wave velocities of the subsurface earth materials.***

Accompanying Maps, Illustrations, and Appendices

Plate 1 - Google™ Earth Imagery Map
Plate 2 - Seismic Line Location Map
Plates 3 & 4 - Site Photographs
Appendix A - Shear-Wave Models and Data
Appendix B - References

SUMMARY OF SHEAR-WAVE SURVEY

Methodology

The fundamental premise of this survey uses the fact that the Earth is always in motion at various seismic frequencies. These relatively constant vibrations of the Earth's surface are called microtremors, which are very small with respect to amplitude and are generally referred to as background "noise" that contain abundant surface waves. These microtremors are caused by both human activity (i.e., cultural noise, traffic, factories, etc.) and natural phenomenon (i.e., wind, wave motion, rain, atmospheric pressure, etc.) which have now become regarded as useful signal information. Although these signals are generally very weak, the recording, amplification, and processing of these surface waves has greatly improved by the use of technologically improved seismic recording instrumentation and recently developed computer software. For this application, we are mainly concerned with the Rayleigh wave portion of the seismic signals, which is also referred to as "ground roll" since the Rayleigh wave is the dominant component of ground roll.

For the purposes of this study, there are two ways that the surface waves were recorded, one being "active" and the other being "passive." Active means that seismic energy is intentionally generated at a specific location relative to the survey spread and recording begins when the source energy is imparted into the ground (i.e., MASW survey technique). Passive surveying, also called "microtremor surveying," is where the seismograph records ambient background vibrations (i.e., MAM survey technique), with the ideal vibration sources being at a constant level. Longer wavelength surface waves (longer-period and lower-frequency) travel deeper and thus contain more information about deeper velocity structure and are generally obtained with passive survey information. Shorter wavelength (shorter-period and higher-frequency) surface waves travel shallower and thus contain more information about shallower velocity structure and are generally collected with the use of active sources. For the most part, higher frequency active source surface waves will resolve the shallower velocity structure and lower frequency passive source surface waves will better resolve the deeper velocity structure. Therefore, the combination of both of these surveying techniques provides a more accurate depiction of the subsurface velocity structure.

The assemblage of the data that is gathered from these surface wave surveys results in development of a dispersion curve. Dispersion, or the change in phase velocity of the seismic waves with frequency, is the fundamental property utilized in the analysis of surface wave methods. The fundamental assumption of these survey methods is that the signal wavefront is planar, stable, and isotropic (coming from all directions) making it independent of source locations and for analytical purposes uses the spatial autocorrelation method (SPAC). The SPAC method is based on theories that are able to detect "signals" from background "noise" (Okada, 2003). The shear wave velocity (V_S) can then be calculated by mathematical inversion of the dispersive phase velocity of the surface waves which can be significant in the presence of velocity layering, which is common in the near-surface environment.

Field Procedures

Two seismic shear-wave survey traverses (Seismic Line SW-1 and SW-2) were performed along selected portions of the subject site, as directed by you, which are approximated on Plates 1 and 2, for reference. The traverses were located in the field by use of Google™ Earth imagery (2020) and GPS coordinates. For data collection, the field survey employed a twenty-four channel Geometrics StrataVisor™ NZXP model signal-enhancement refraction seismograph. This survey employed both active (MASW) and passive (MAM) source methods to ensure that both quality shallow and deeper shear-wave velocity information was recorded (Park et al., 2005). Both the MASW and MAM surveys used the same linear geometry array that consisted of a 184-foot long spread using a series of twenty-four 4.5-Hz geophones that were spaced at regular eight-foot intervals. For the MASW survey, the ground vibrations were recorded using a one second record length at a sampling rate of 0.5-milliseconds. For each traverse, two seismic records were obtained using a 30-foot offset from the beginning and end of the survey line, utilizing a 16-pound sledge-hammer as the energy source to produce the seismic waves. Each of these shot points used multiple hammer impacts (stacking) to improve the signal to noise ratio of the data.

The MAM survey did not require the introduction of any artificial seismic sources and only background ambient noise was recorded for each seismic traverse. The ambient ground vibrations were recorded using a thirty-two second record length at a two-millisecond sampling rate with 20 separate seismic records being obtained for quality control purposes. The seismic-wave forms and associated frequency spectrum that were displayed on the seismograph screen were used to assess the recorded seismic wave data for quality control purposes in the field. The acceptable records were digitally recorded on the in-board seismograph computer and subsequently transferred to a flash drive so that they could be subsequently transferred to our office computer for analysis.

Data Reduction

For analysis and presentation of the shear-wave profiles and supportive illustrations, this study used the SeisImager/SW™ computer software program developed by Geometrics, Inc. (2009 & 2016). Both the active (MASW) and passive (MAM) survey results were combined for this analysis (Park et al., 2005). The combined results maximize the resolution and overall depth range in order to obtain one high resolution V_S curve over the entire sampled depth range. These methods economically and efficiently estimate one-dimensional subsurface shear-wave velocities using data collected from standard primary-wave (P-wave) refraction surveys, however, it should be noted that surface waves by their physical nature cannot resolve relatively abrupt or small-scale velocity anomalies. Processing of the data proceeded by calculating the dispersion curve from the input data which subsequently created an initial shear-wave model based on the observed data. The initial models were then inverted in order to converge on the best fit of the initial model and the observed data, creating the final shear-wave models (Seismic Line SW-1 and SW-2) as presented within Appendix A.

Data Analysis

Data acquisition went very smoothly and the quality was considered to be good. The seismic model data indicates that the average shear-wave velocity beneath the survey traverses has several velocity layers that generally increase with depth, with a minor velocity reversal occurring at depth locally beneath Seismic Line SW-2 (below a depth of 100 feet), of which did not affect the calculations of the average V_{100} shear-wave velocity. Analysis revealed that the average shear-wave velocity ("weighted average") in the upper 100 feet of the subject survey area for Seismic Line SW-1 is **1,254.3** feet per second, with Seismic Line SW-2 being **1,316.8** feet per second. These average velocities classify the underlying soils to that of Site Class "***Sc***" (Very Stiff/Very Dense Soil and Soft Rock), which has a velocity range from 1,200 to 2,500 feet/second (ASCE, 2017; Standard 7-16; Table 20.3-1).

The "weighted average" velocity is computed from a formula that is used by the ASCE (Standard 7-16, Section 20.4, Equation 20.4-1) to determine the average shear-wave velocity for the upper 100 feet of the subsurface (V100). This formula is as follows:

$$V100' = 100/[(T1/V1) + (T2/V2) + ...+ (TN/VN)]$$

Where t1, t2, t3,...,tn, are the thicknesses for layers 1, 2, 3,...n, up to 100 feet, and v1, v2, v3,...,vn, are the seismic velocities (feet/second) for layers 1, 2, 3,...n. The shear-wave model displays these calculated layers and associated velocities (feet/second) to the maximum depth, where locally sampled. The constrained data is represented by the dark-gray shading on each the shear-wave models. The associated Dispersion Curves (for both the active and passive methods) which show the data quality and picks, along with the resultant combined dispersion curve model for each traverse, are also included within Appendix A for reference purposes. It should be noted that when compared with traditional borehole shear-wave surveys, which use vertical body waves, the sources of error (if present) using horizontal surface waves for this project are not believed to be greater than 15 percent.

CLOSURE

The field survey was performed by the undersigned on October 30, 2020, using "state of the art" geophysical equipment and techniques along the selected portion of the subject study area as directed by you. It is important to note that the fundamental limitation for seismic surveys is known as nonuniqueness, wherein a specific seismic data set does not provide sufficient information to determine a single "true" earth model. Therefore, the interpretation of any seismic data set uses "best-fit" approximations along with the geologic models that appear to be most reasonable for the local area being surveyed. Client should also understand that when using the theoretical geophysical principles and techniques discussed in this report, sources of error are possible in both the data obtained and, in the interpretation, and that the results of this survey may not represent actual subsurface conditions.

These are all factors beyond **Terra Geosciences** control and no guarantees as to the results of this survey can be made. We make no warranty, either expressed or implied. If the client does not understand the limitations of this geophysical survey, additional input should be sought from the consultant.

Respectfully submitted,
TERRA GEOSCIENCES

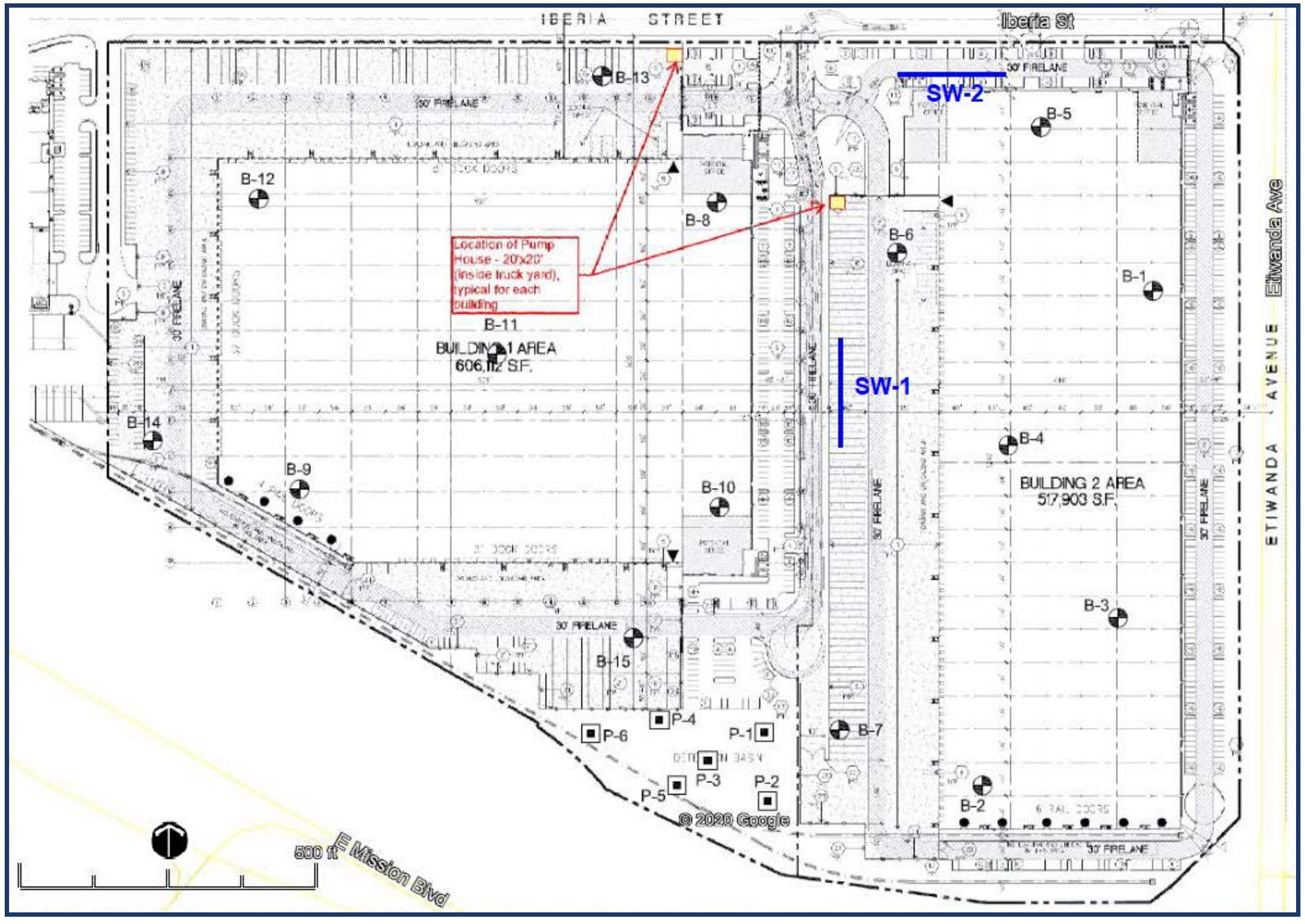
Donn C. Schwartzkopf
Principal Geophysicist
PGP 1002

GOOGLE™ EARTH IMAGERY MAP

Base Map: Google™ Earth (2020); Seismic shear-wave traverses SW-1 and SW-2 shown as blue lines.

PROJECT NO. 203524-1 **PLATE 1**

SEISMIC LINE LOCATION MAP



Base Map: Provided Site Plan (dated July 2015); Seismic shear-wave traverses SW-1 and SW-2 shown as blue lines.

SITE PHOTOGRAPHS

View looking south along Seismic Line SW-1.

View looking north along Seismic Line SW-1.

SITE PHOTOGRAPHS

View looking west along Seismic Line SW-2.

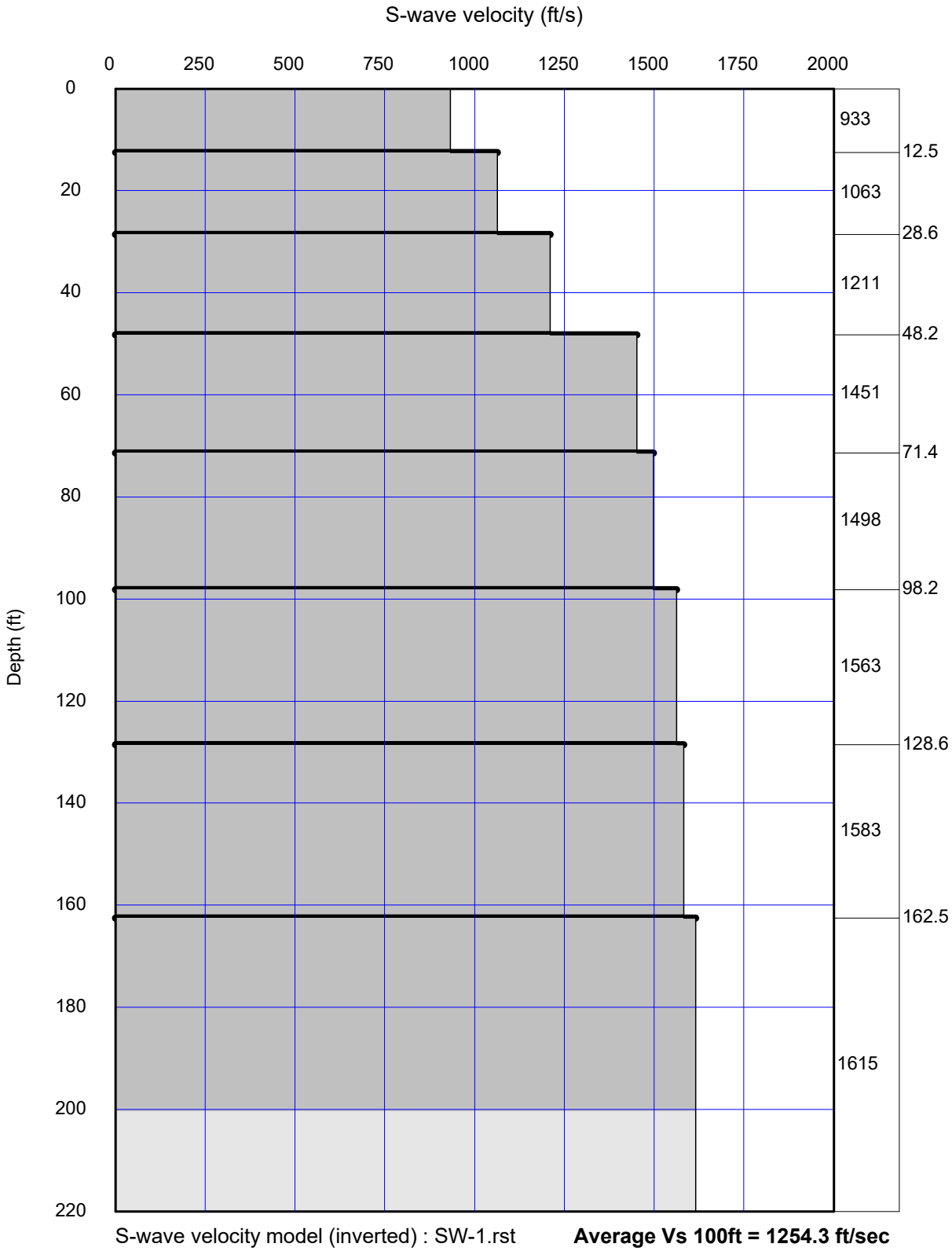
View looking east along Seismic Line SW-2.

APPENDIX A

SHEAR-WAVE MODELS AND DATA

SEISMIC LINE SW-1

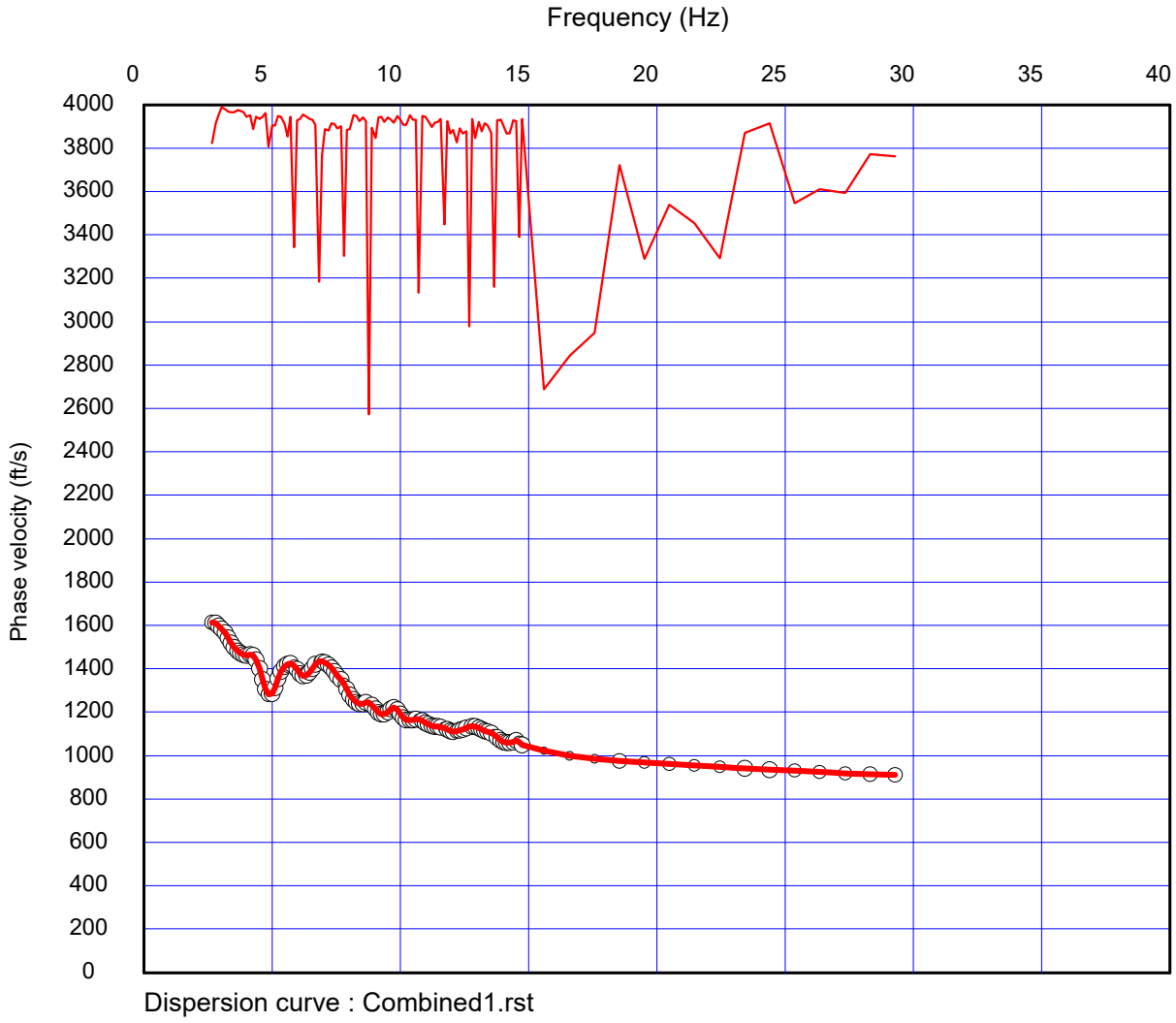
SHEAR-WAVE MODEL



S-wave velocity model (inverted) : SW-1.rst

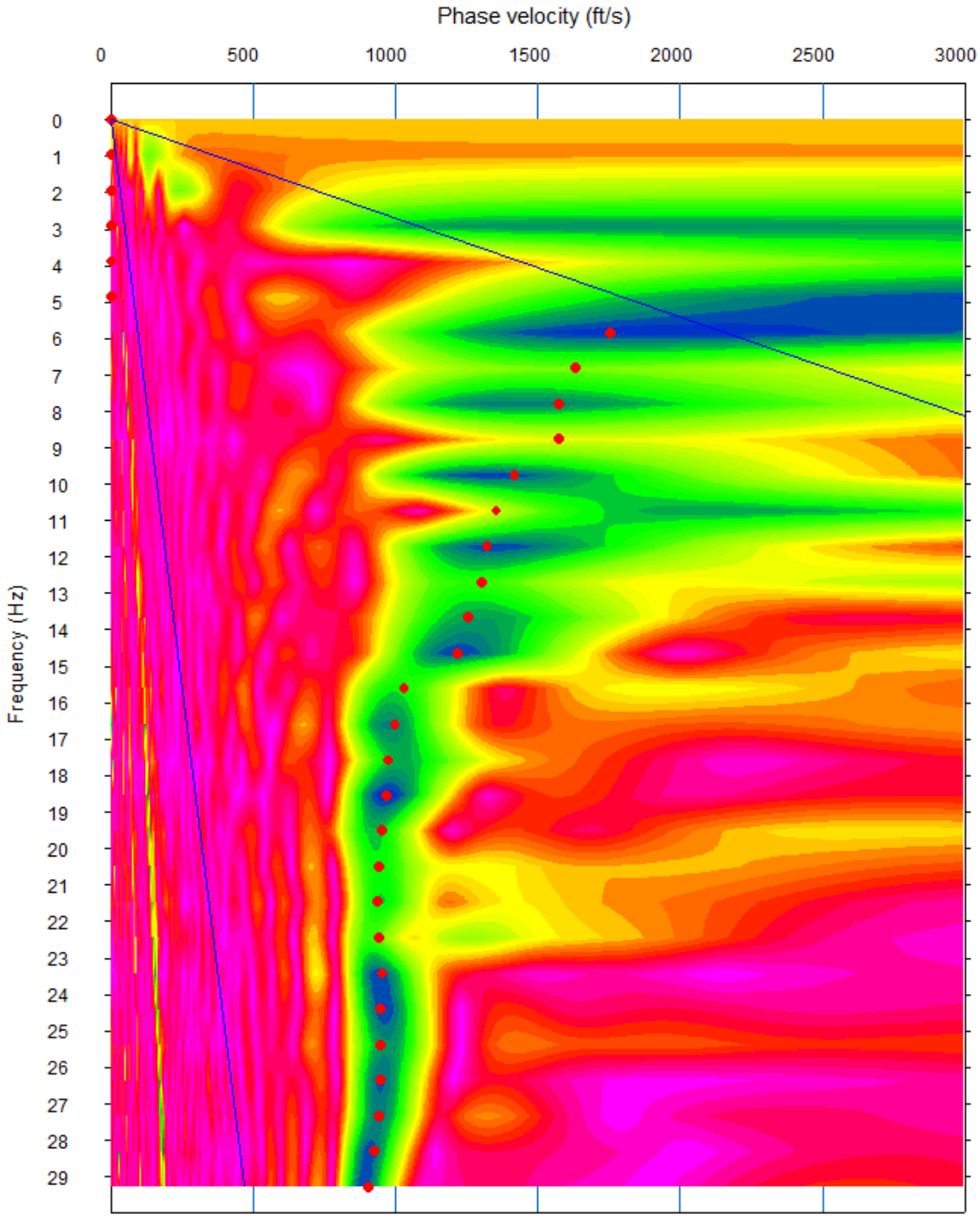
Average Vs 100ft = 1254.3 ft/sec

SHEAR-WAVE MODEL SW-1



COMBINED DISPERSION CURVE

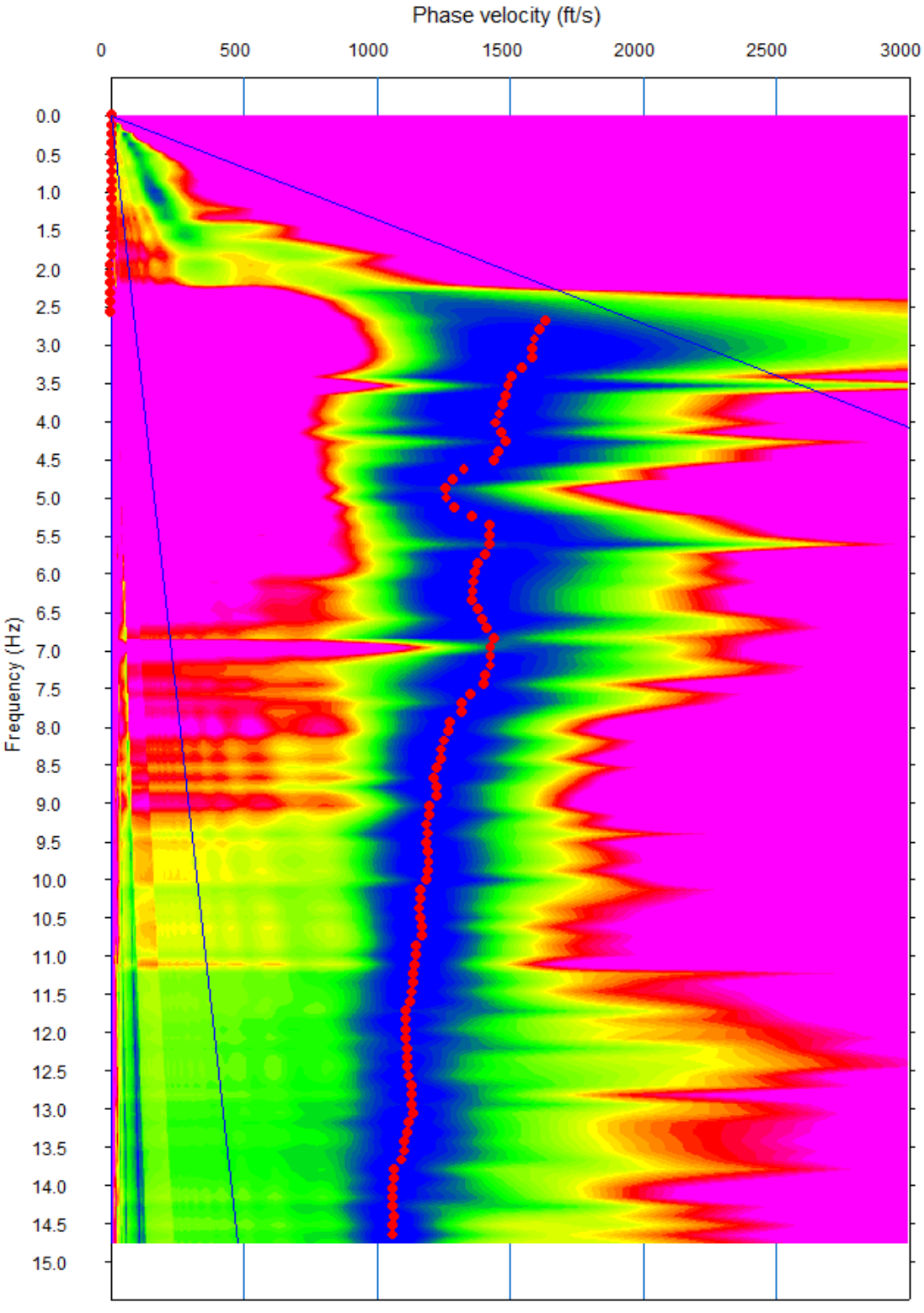
SEISMIC LINE SW-1



Dispersion Cure: Active1.dat

ACTIVE DISPERSION CURVE

SEISMIC LINE SW-1

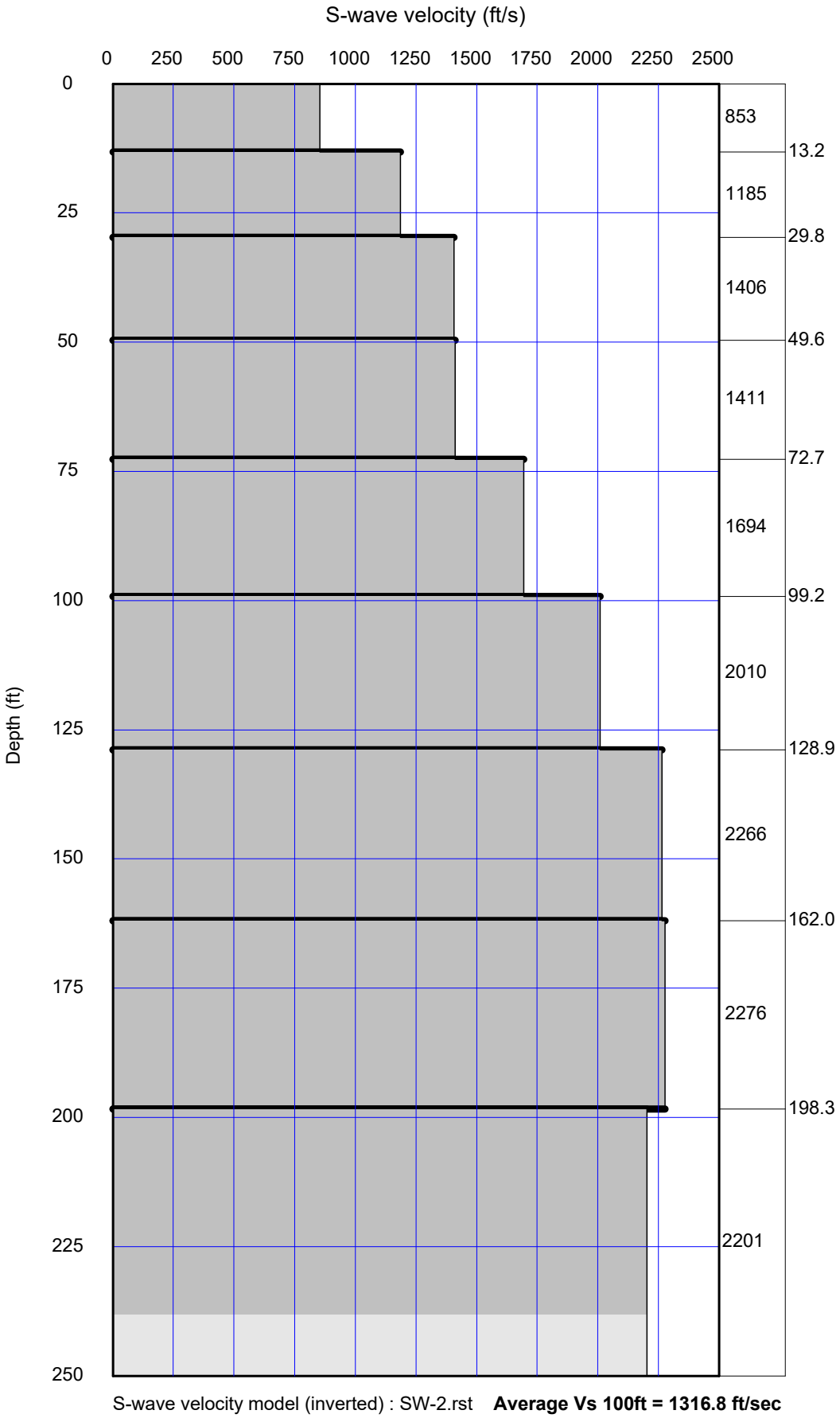


Dispersion Curve: Passive1.dat

PASSIVE DISPERSION CURVE

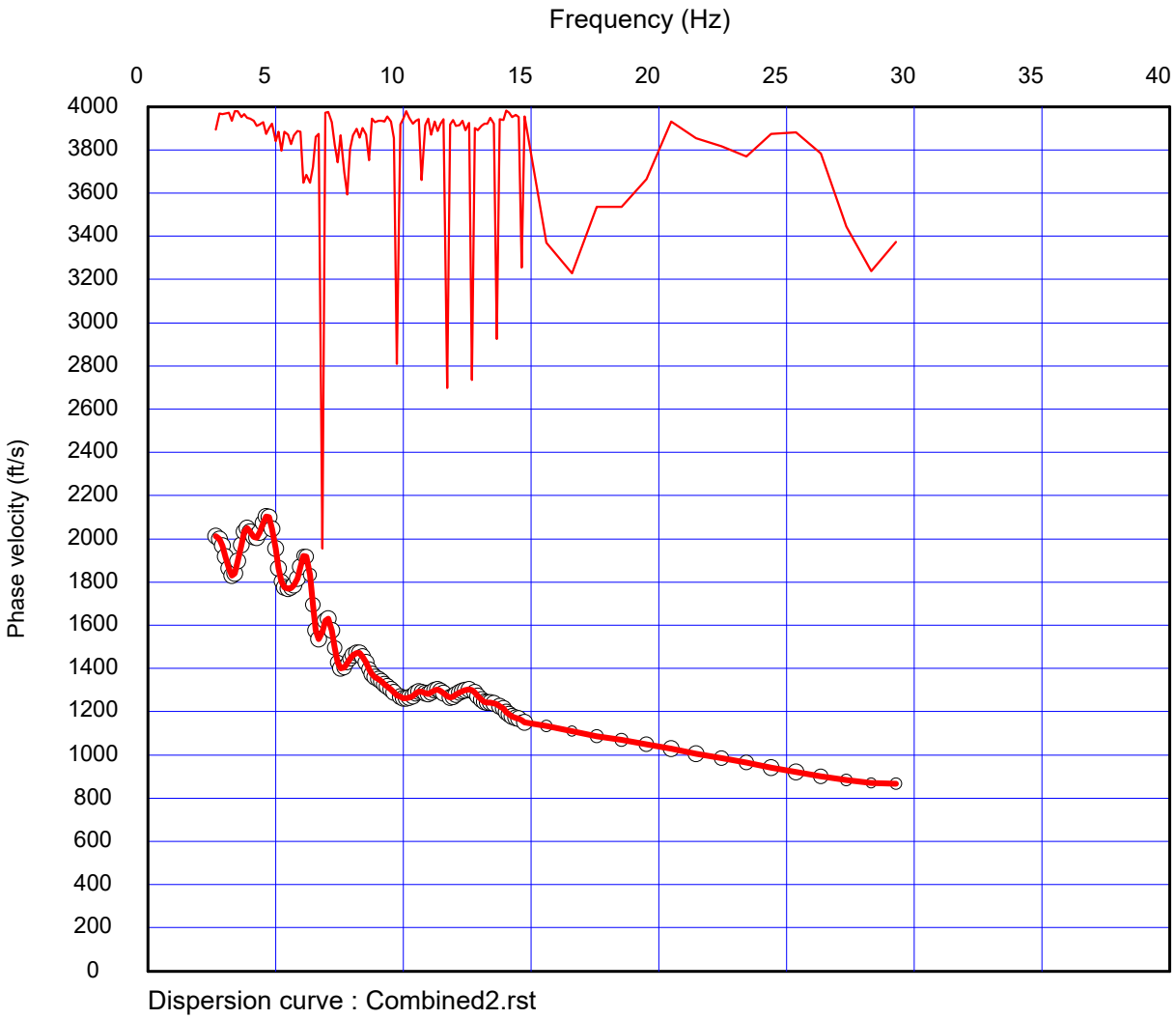
SEISMIC LINE SW-2

SHEAR-WAVE MODEL



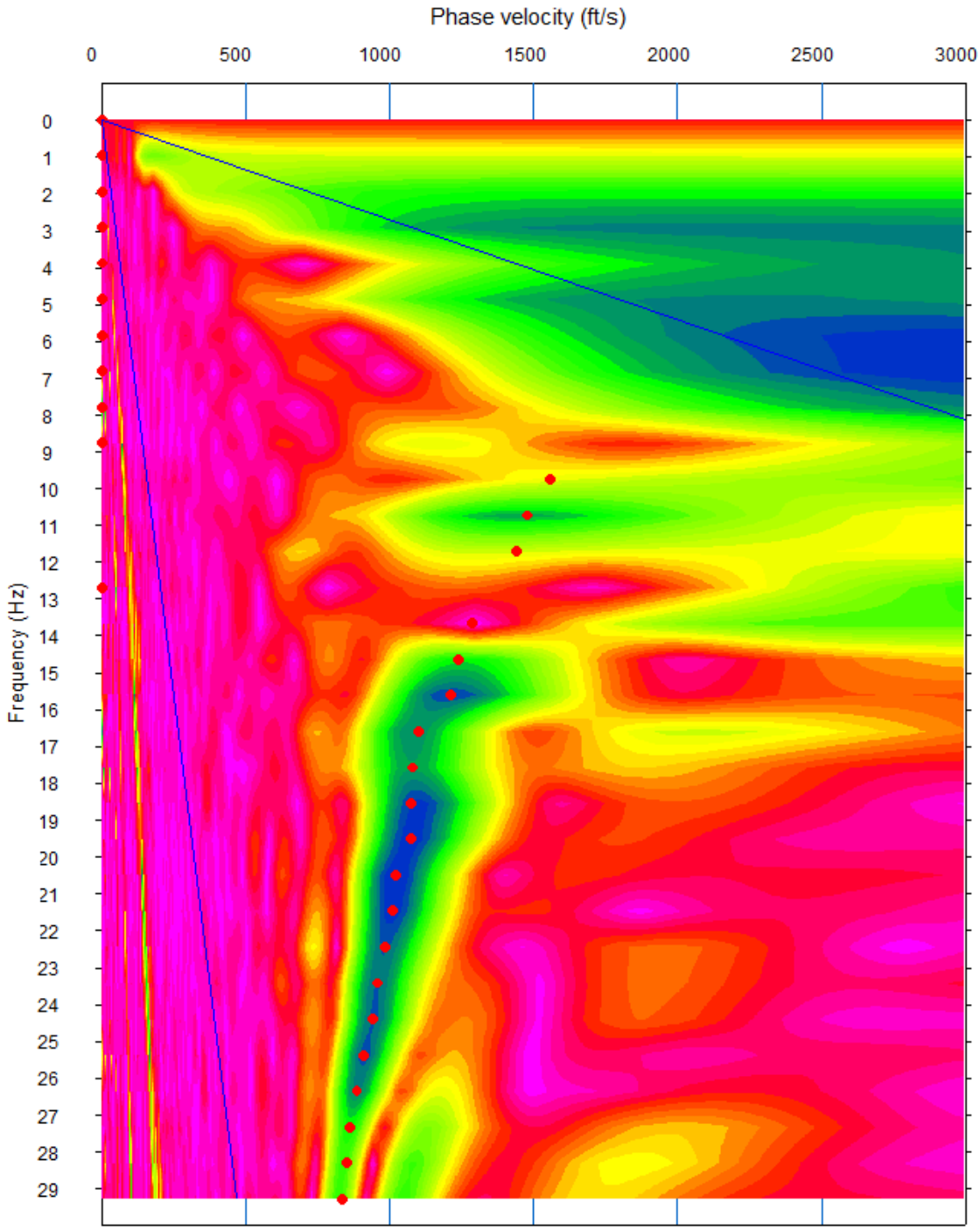
S-wave velocity model (inverted) : SW-2.rst **Average Vs 100ft = 1316.8 ft/sec**

SHEAR-WAVE MODEL SW-2



COMBINED DISPERSION CURVE

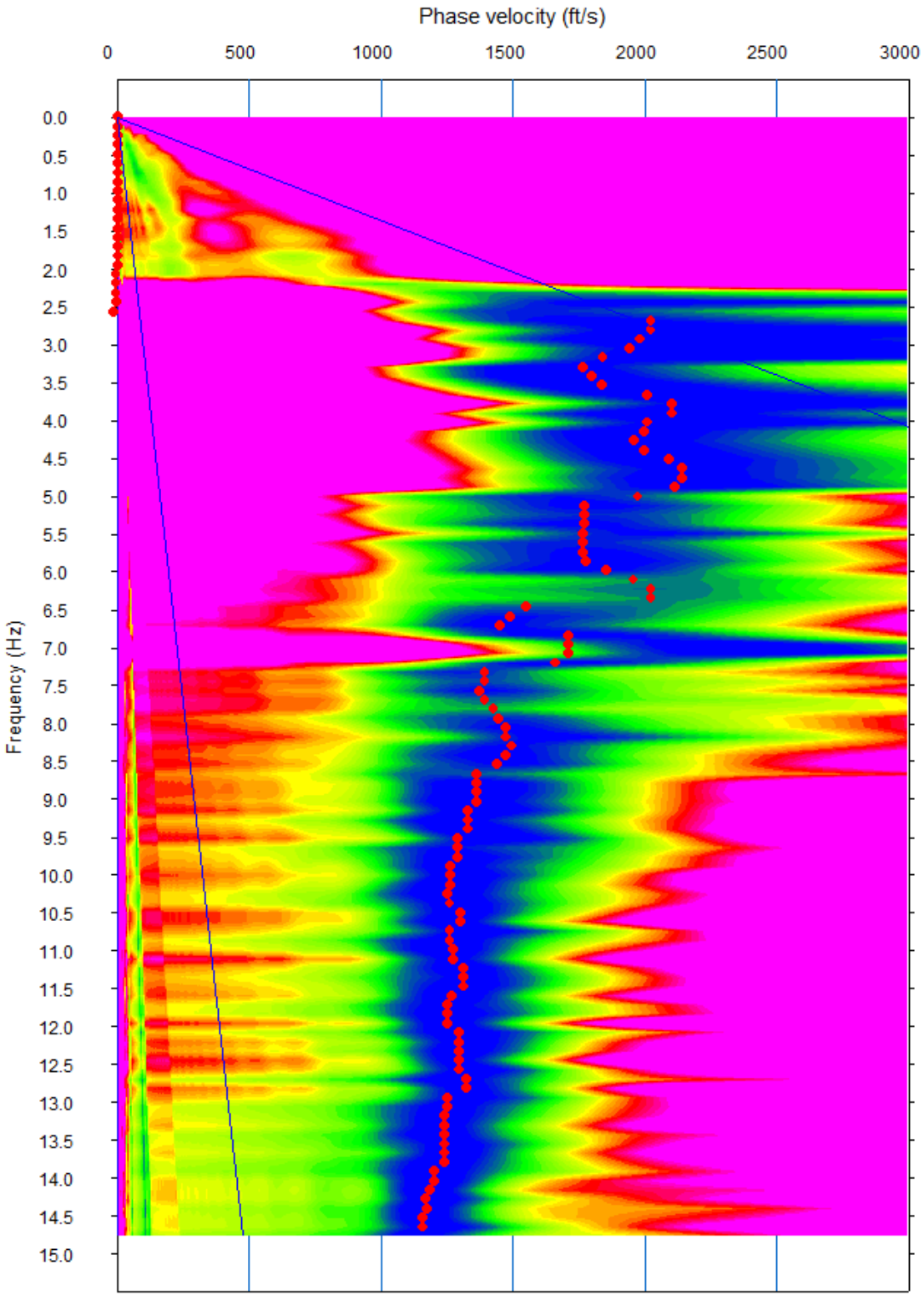
SEISMIC LINE SW-2



Dispersion Cure: Active2.dat

ACTIVE DISPERSION CURVE

SEISMIC LINE SW-2



Dispersion Curve: Passive2.dat

PASSIVE DISPERSION CURVE

APPENDIX B

REFERENCES

REFERENCES

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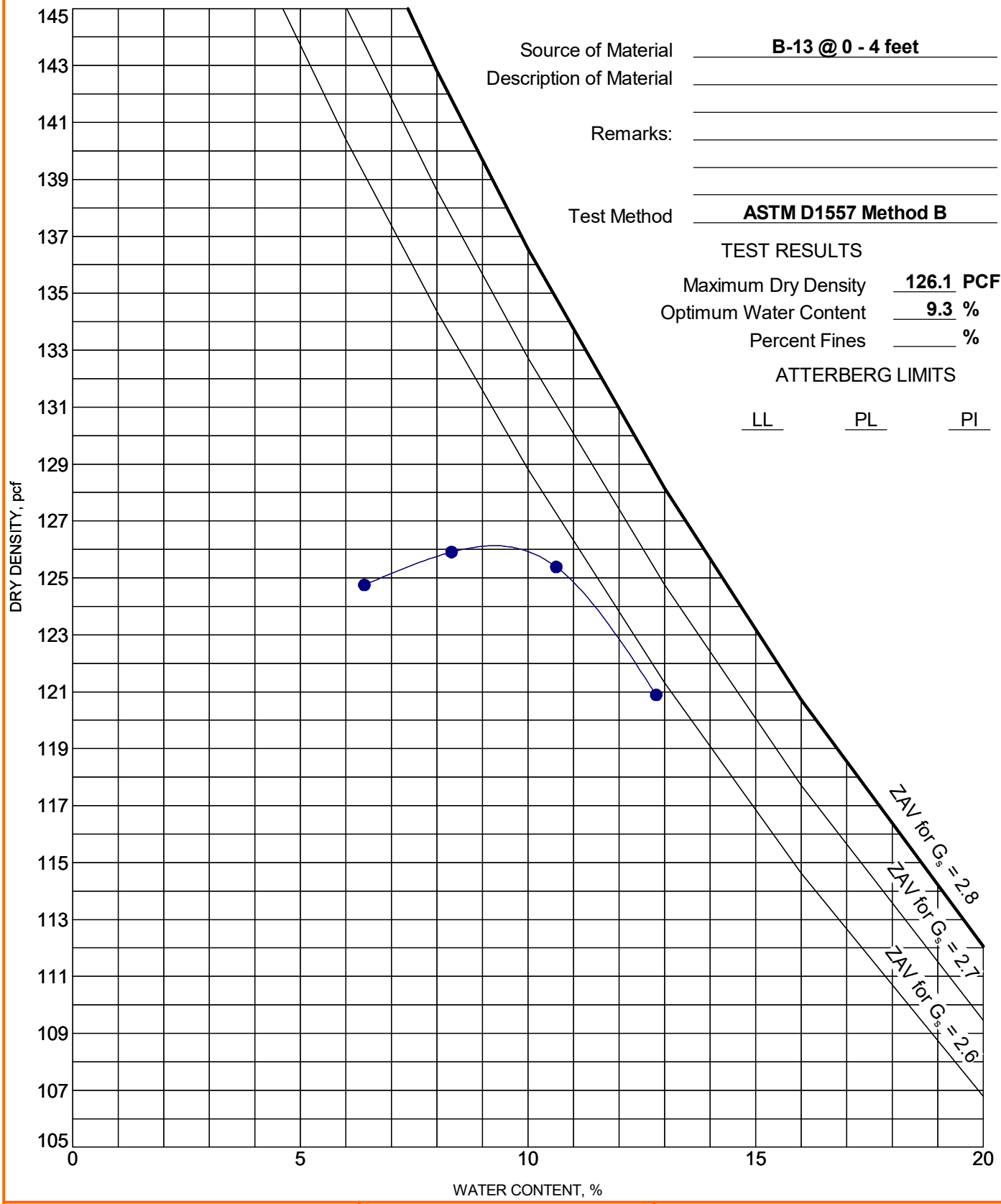
MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material: **B-13 @ 0 - 4 feet**

Description of Material:

Remarks:

Test Method: **ASTM D1557 Method B**

TEST RESULTS

Maximum Dry Density	**126.1**	**PCF**
Optimum Water Content	**9.3**	**%**
Percent Fines		**%**

ATTERBERG LIMITS

LL	PL	PI

PROJECT: Manitou Ct./C St. Redevelopment

PROJECT NUMBER: CB205119

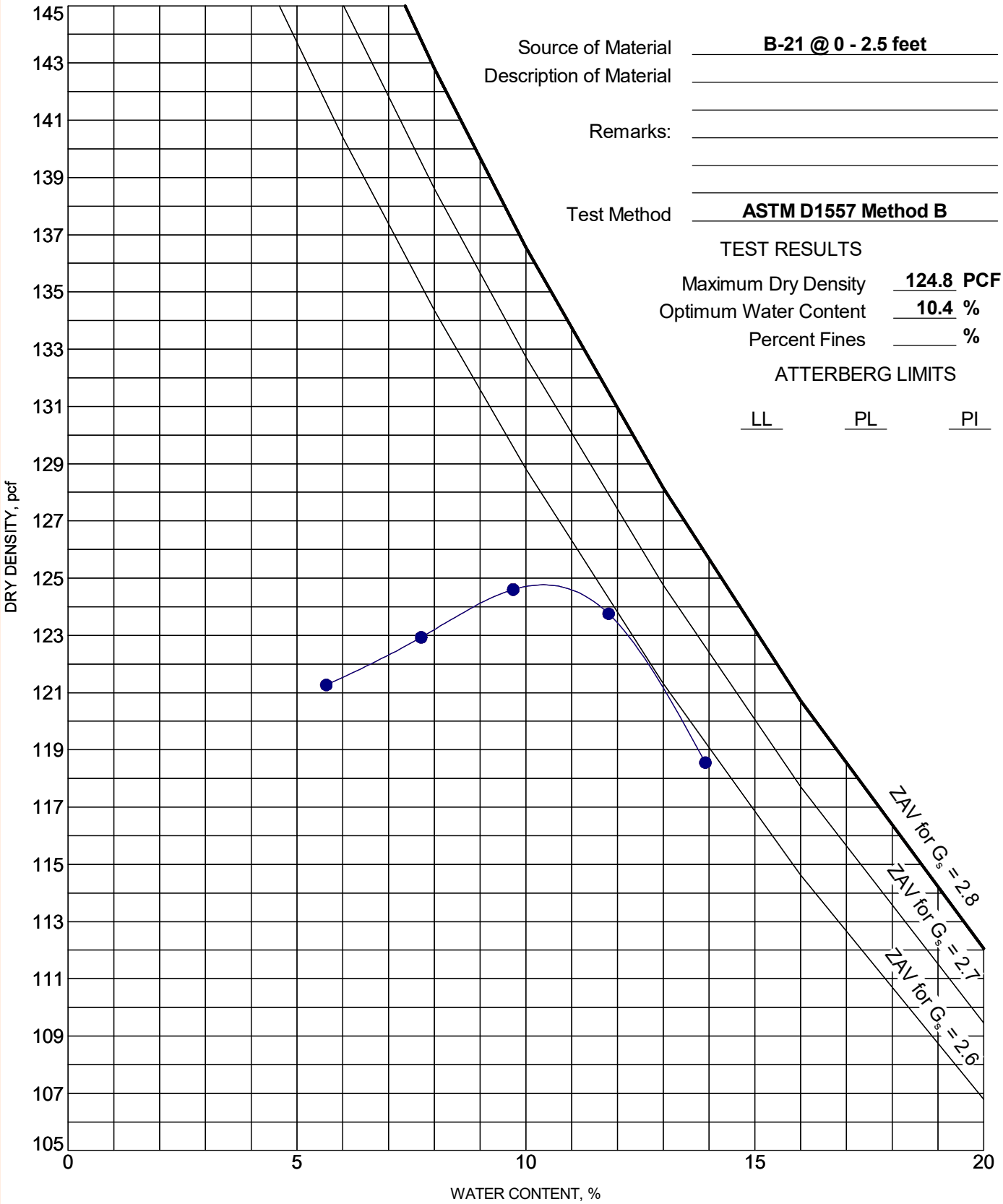
SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material: **B-21 @ 0 - 2.5 feet**

Description of Material:

Remarks:

Test Method: **ASTM D1557 Method B**

TEST RESULTS

Maximum Dry Density	**124.8**	**PCF**
Optimum Water Content	**10.4**	**%**
Percent Fines		**%**

ATTERBERG LIMITS

LL	PL	PI

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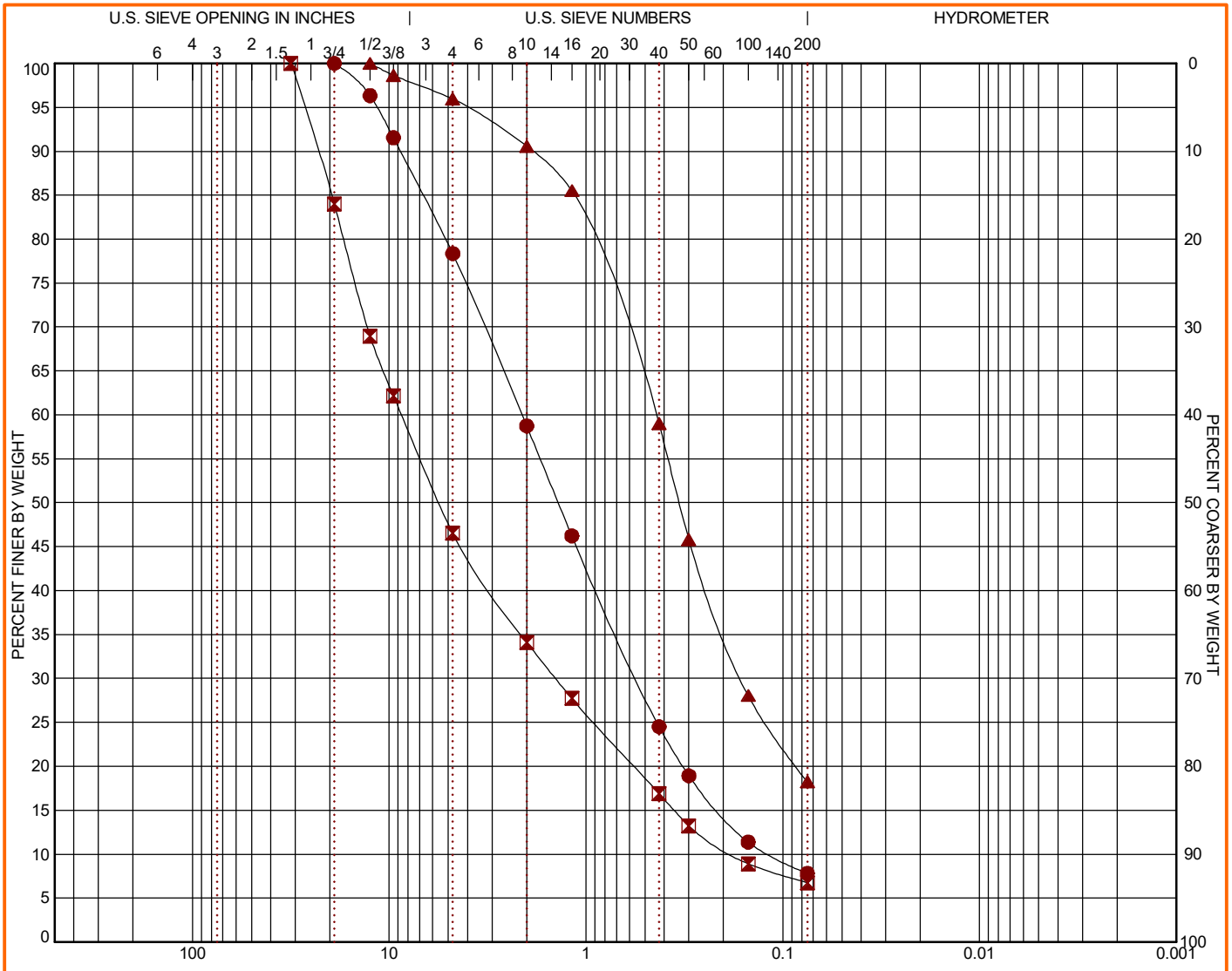
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-2	7.5 - 9	0.0	21.6	70.5		7.8		SW-SM
⊠	B-2	15 - 16.5	0.0	53.5	39.8		6.8		GW-GM
▲	B-6	7.5 - 9	0.0	4.0	77.7		18.2		SM

GRAIN SIZE	●	⊠	▲
D_{60}	2.114	8.632	0.442
D_{30}	0.55	1.425	0.162
D_{10}	0.115	0.179	

COEFFICIENTS	●	⊠	▲
C_C	1.25	1.32	
C_U	18.42	48.33	

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/4"	100.0	1 1/4"	100.0	1/2"	100.0
1/2"	96.33	3/4"	84.02	3/8"	98.65
3/8"	91.54	1/2"	68.96	#4	95.96
#4	78.36	3/8"	62.16	#10	90.59
#10	58.74	#4	46.53	#16	85.53
#16	46.23	#10	34.09	#40	58.99
#40	24.51	#16	27.72	#50	45.79
#50	18.92	#40	16.88	#100	28.06
#100	11.37	#50	13.24	#200	18.23
#200	7.82	#100	8.91		
		#200	6.76		

SOIL DESCRIPTION	
●	WELL-GRADED SAND with SILT and GRAVEL (SW-SM)
⊠	WELL-GRADED GRAVEL with SILT and SAND (GW-GM)
▲	SILTY SAND (SM)

REMARKS	
●	
⊠	
▲	

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Jurupa Valley, CA

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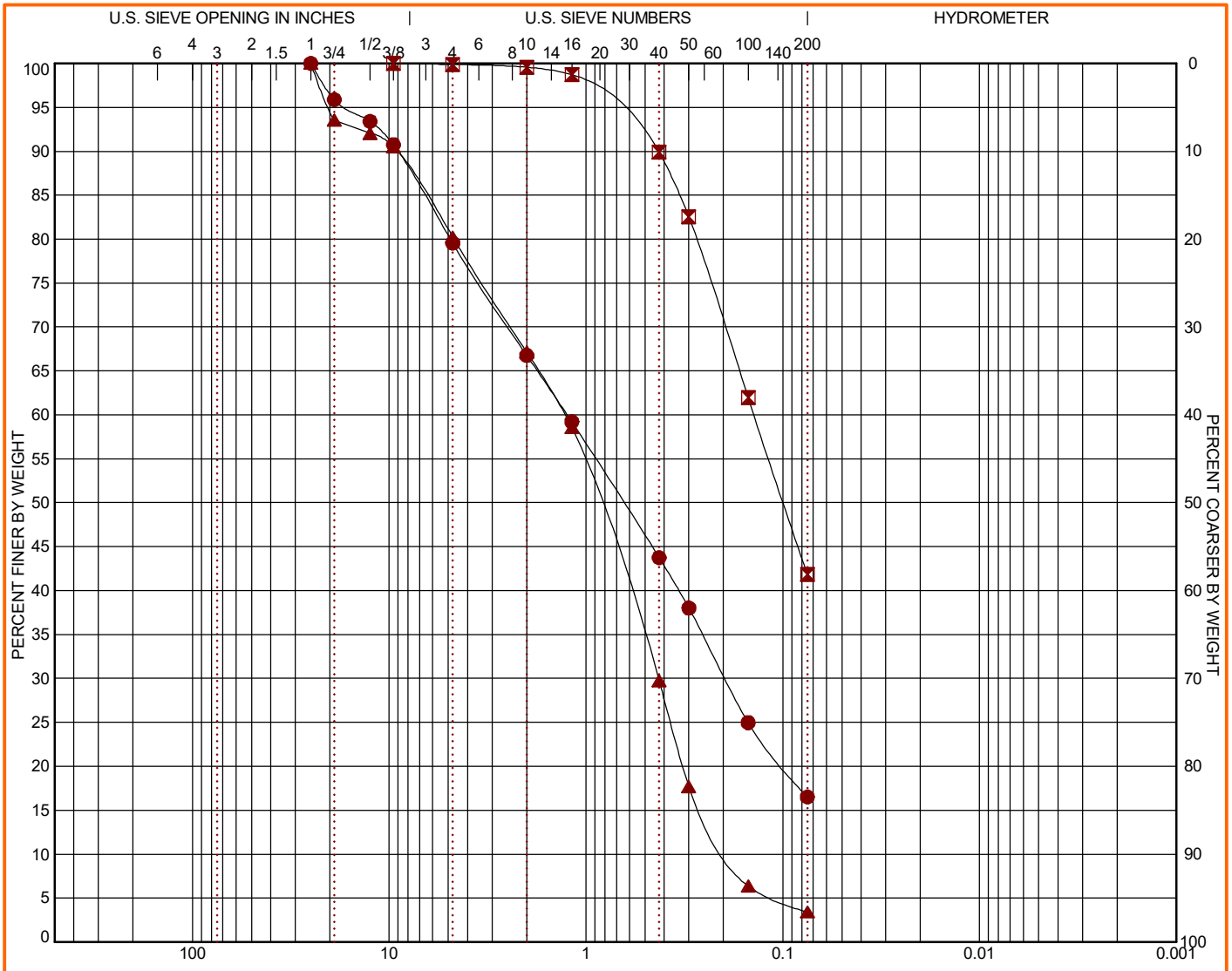
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-7	15 - 16.5	0.0	20.5	63.0		16.5		SM
⊠	B-7	40 - 41.5	0.0	0.1	58.0		41.9		SM
▲	B-8	7.5 - 9	0.0	19.7	76.8		3.4		SP

GRAIN SIZE	●	⊠	▲
D_{60}	1.247	0.14	1.289
D_{30}	0.196		0.428
D_{10}			0.187

COEFFICIENTS	●	⊠	▲
C_C			0.76
C_U			6.88

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1"	100.0	3/8"	100.0	1"	100.0
3/4"	95.87	#4	99.87	3/4"	93.54
1/2"	93.4	#10	99.56	1/2"	92.05
3/8"	90.75	#16	98.72	3/8"	90.52
#4	79.55	#40	89.91	#4	80.26
#10	66.76	#50	82.52	#10	67.14
#16	59.21	#100	61.98	#16	58.56
#40	43.75	#200	41.87	#40	29.77
#50	38.02			#50	17.66
#100	24.97			#100	6.38
#200	16.5			#200	3.42

SOIL DESCRIPTION	
●	SILTY SAND with GRAVEL (SM)
⊠	SILTY SAND (SM)
▲	POORLY GRADED SAND with GRAVEL (SP)

REMARKS	
●	
⊠	
▲	

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CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

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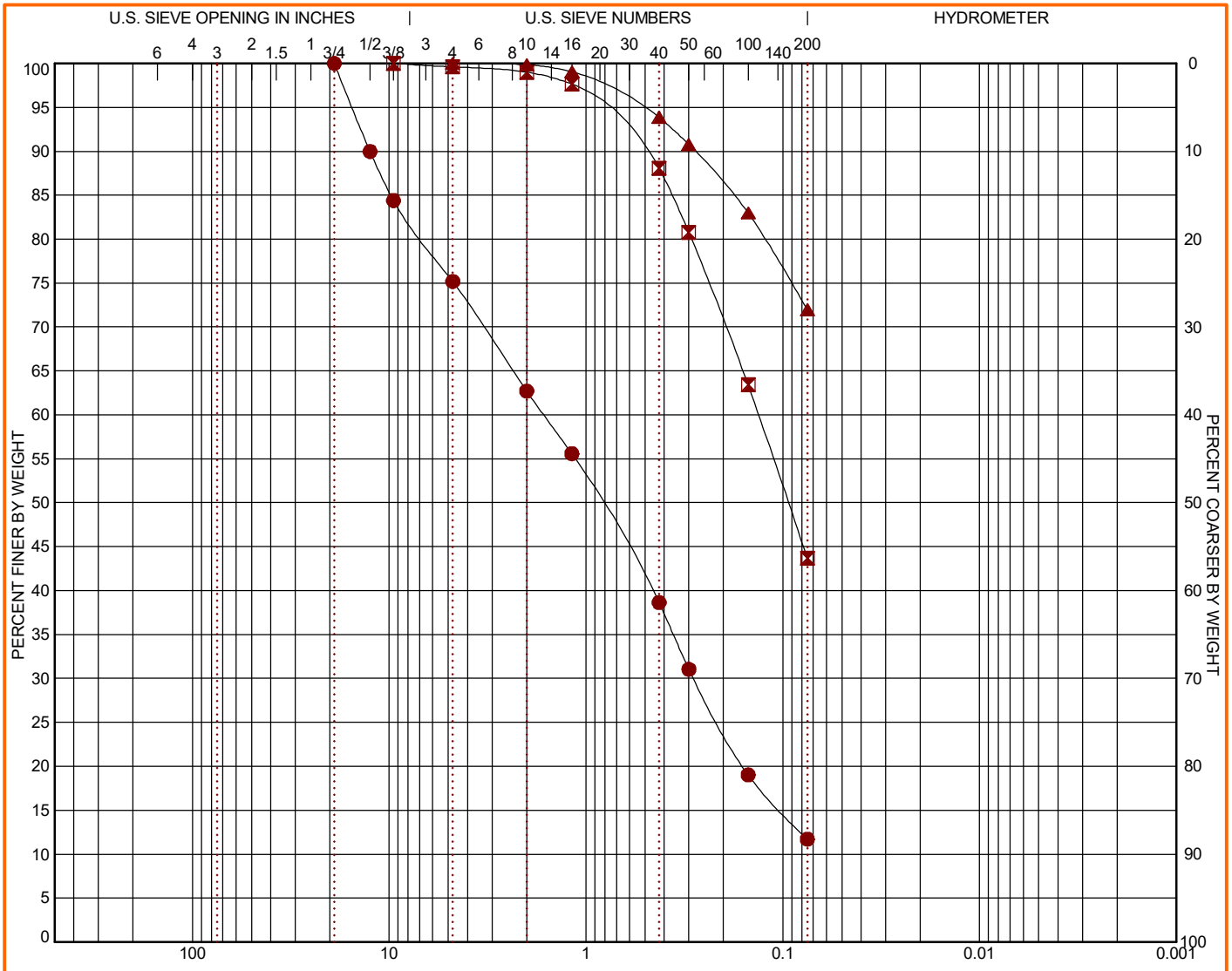
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-9	7.5 - 9	0.0	24.8	63.5		11.7		SP-SM
⊠	B-10	35 - 36.5	0.0	0.4	55.9		43.7		SC-SM
▲	B-10	45 - 46.5	0.0	0.0	28.0		72.0		CL

GRAIN SIZE	●	⊠	▲
D_{60}	1.637	0.133	
D_{30}	0.283		
D_{10}			

COEFFICIENTS	●	⊠	▲
C_C	0.76		
C_U	25.66		

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/4"	100.0	3/8"	100.0	#4	100.0
1/2"	89.98	#4	99.6	#10	99.86
3/8"	84.4	#10	99.0	#16	99.05
#4	75.18	#16	97.65	#40	93.86
#10	62.71	#40	88.06	#50	90.78
#16	55.59	#50	80.76	#100	82.99
#40	38.64	#100	63.4	#200	71.95
#50	31.04	#200	43.68		
#100	19.02				
#200	11.71				

SOIL DESCRIPTION	
●	POORLY GRADED SAND with SILT and GRAVEL (SP-SM)
⊠	SILTY CLAYEY SAND (SC-SM)
▲	LEAN CLAY with SAND (CL)

REMARKS	
●	
⊠	
▲	

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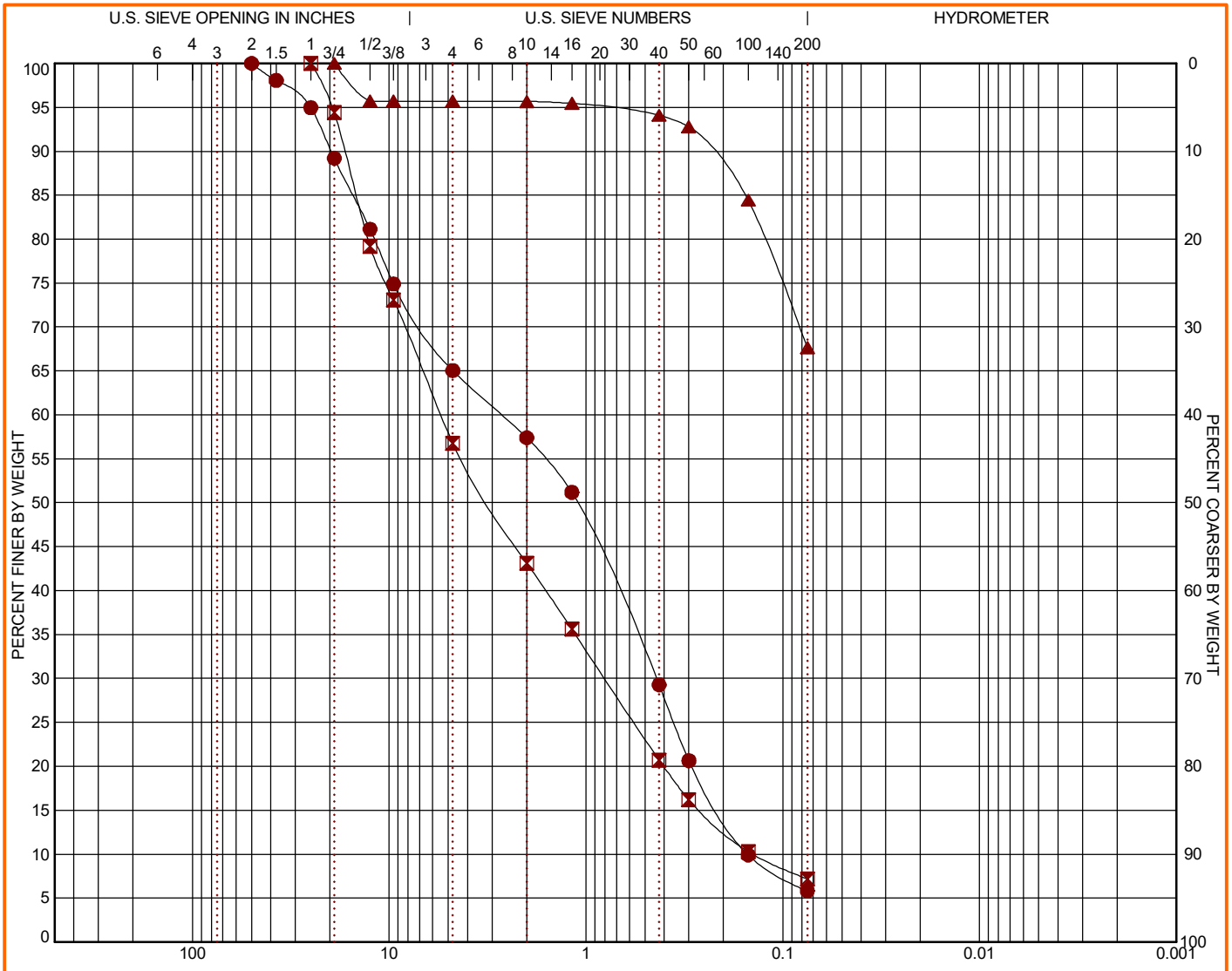
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-12	15 - 20	0.0	35.0	59.2		5.8		SP-SM
⊠	B-13	25 - 26	0.0	43.2	49.6		7.2		SP-SM
▲	B-13	50 - 51.5	0.0	4.3	28.1		67.6		ML

GRAIN SIZE	●	⊠	▲
D_{60}	2.685	5.451	
D_{30}	0.439	0.804	
D_{10}	0.151	0.141	

COEFFICIENTS	●	⊠	▲
C_C	0.48	0.84	
C_U	17.79	38.75	

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
2"	100.0	1"	100.0	3/4"	100.0
1 1/2"	98.07	3/4"	94.41	1/2"	95.69
1"	94.96	1/2"	79.19	3/8"	95.69
3/4"	89.2	3/8"	73.07	#4	95.69
1/2"	81.12	#4	56.76	#10	95.67
3/8"	74.89	#10	43.1	#16	95.46
#4	65.04	#16	35.6	#40	94.09
#10	57.4	#40	20.71	#50	92.77
#16	51.18	#50	16.19	#100	84.45
#40	29.29	#100	10.29	#200	67.63
#50	20.65	#200	7.17		
#100	9.9				
#200	5.82				

SOIL DESCRIPTION	
●	POORLY GRADED SAND with SILT and GRAVEL (SP-SM)
⊠	POORLY GRADED SAND with SILT and GRAVEL (SP-SM)
▲	SANDY SILT (ML)

REMARKS	
●	
⊠	
▲	

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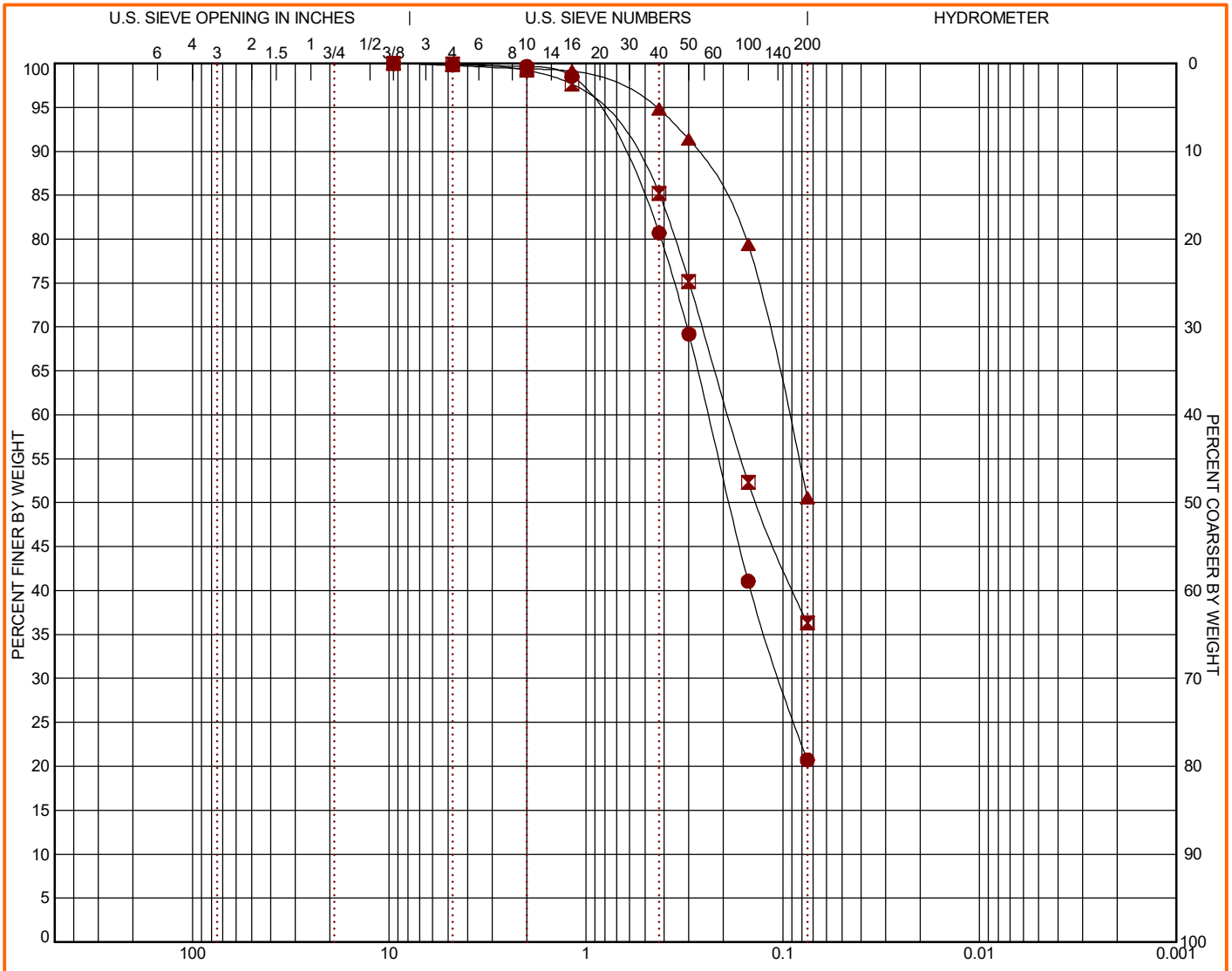
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-14	5 - 6.5	0.0	0.2	79.1		20.7		SM
⊠	B-15	20 - 21.5	0.0	0.1	63.6		36.3		SM
▲	B-15	30 - 31.5	0.0	0.2	49.2		50.6		ML

GRAIN SIZE	●	⊠	▲
D_{60}	0.239	0.189	0.094
D_{30}	0.103		
D_{10}			

COEFFICIENTS	●	⊠	▲
C_C			
C_U			

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/8"	100.0	3/8"	100.0	3/8"	100.0
#4	99.84	#4	99.92	#4	99.76
#10	99.66	#10	99.23	#10	99.38
#16	98.55	#16	97.67	#16	99.12
#40	80.7	#40	85.21	#40	94.82
#50	69.2	#50	75.18	#50	91.36
#100	41.06	#100	52.35	#100	79.42
#200	20.73	#200	36.32	#200	50.57

SOIL DESCRIPTION	
●	SILTY SAND (SM)
⊠	SILTY SAND (SM)
▲	SANDY SILT (ML)

REMARKS	
●	
⊠	
▲	

PROJECT: Manitou Ct./C St. Redevelopment

PROJECT NUMBER: CB205119

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

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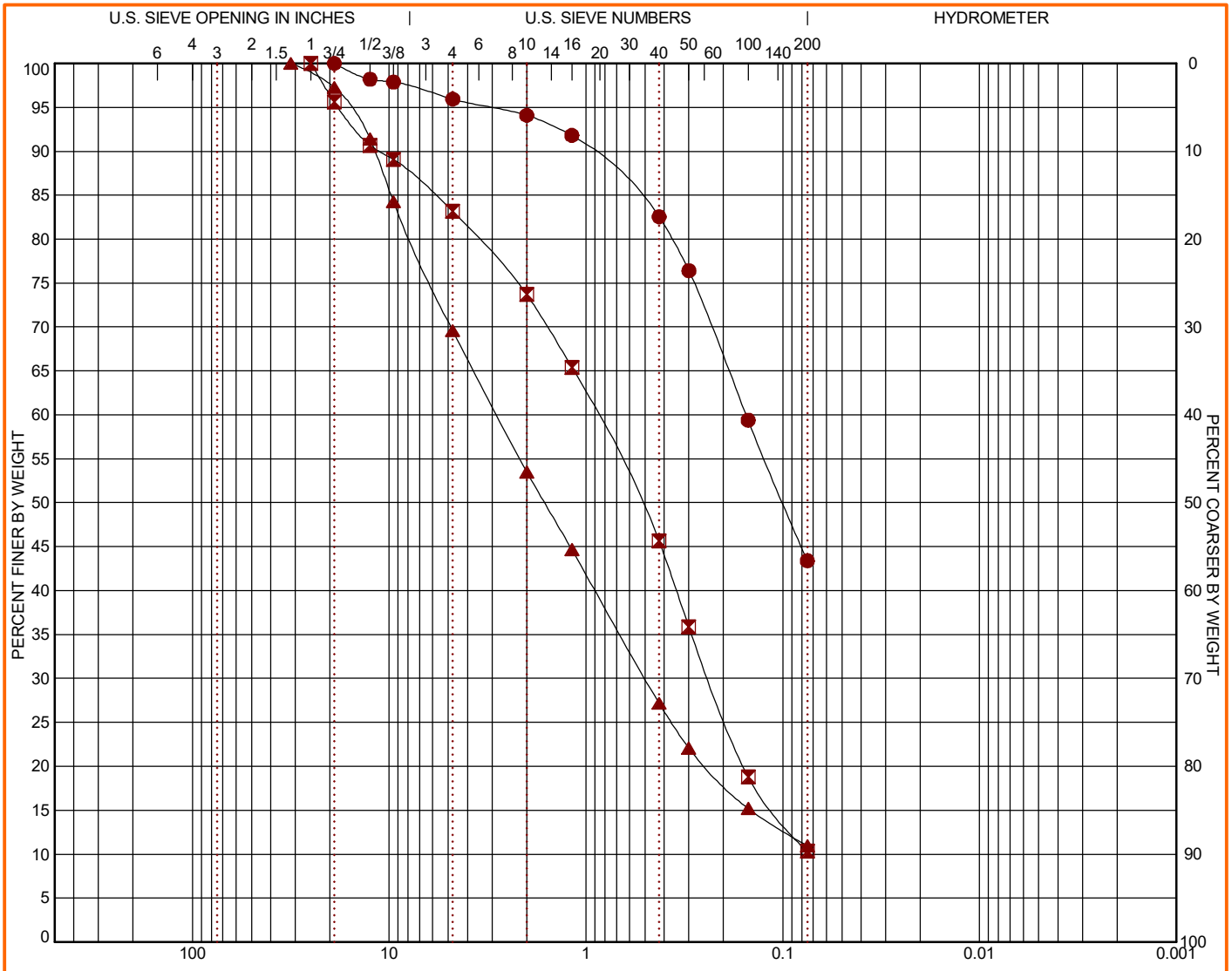
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-15	35 - 36.5	0.0	4.1	52.5		43.4		SM
⊠	B-16	5 - 6.5	0.0	16.8	72.8		10.3		SP-SM
▲	B-16	15 - 16.5	0.0	30.4	58.6		10.9		SW-SM

GRAIN SIZE	●	⊠	▲
D_{60}	0.154	0.892	2.835
D_{30}		0.236	0.501
D_{10}			

COEFFICIENTS	●	⊠	▲
C_C		0.86	1.38
C_U		12.22	44.09

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/4"	100.0	1"	100.0	1/2"	91.42
1/2"	98.2	3/4"	95.6	3/8"	84.25
3/8"	97.88	1/2"	90.67	#4	69.59
#4	95.93	3/8"	89.06	#10	53.51
#10	94.09	#4	83.16	#16	44.67
#16	91.81	#10	73.69	#40	27.18
#40	82.55	#16	65.43	#50	22.07
#50	76.4	#40	45.62	#100	15.21
#100	59.4	#50	35.86	#200	10.95
#200	43.39	#100	18.81	1 1/4"	100.0
		#200	10.33	3/4"	97.27

SOIL DESCRIPTION	
●	SILTY SAND (SM)
⊠	POORLY GRADED SAND with SILT and GRAVEL (SP-SM)
▲	WELL GRADED SAND with SILT and GRAVEL (SW-SM)

REMARKS	
●	
⊠	
▲	

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GRAIN SIZE DISTRIBUTION

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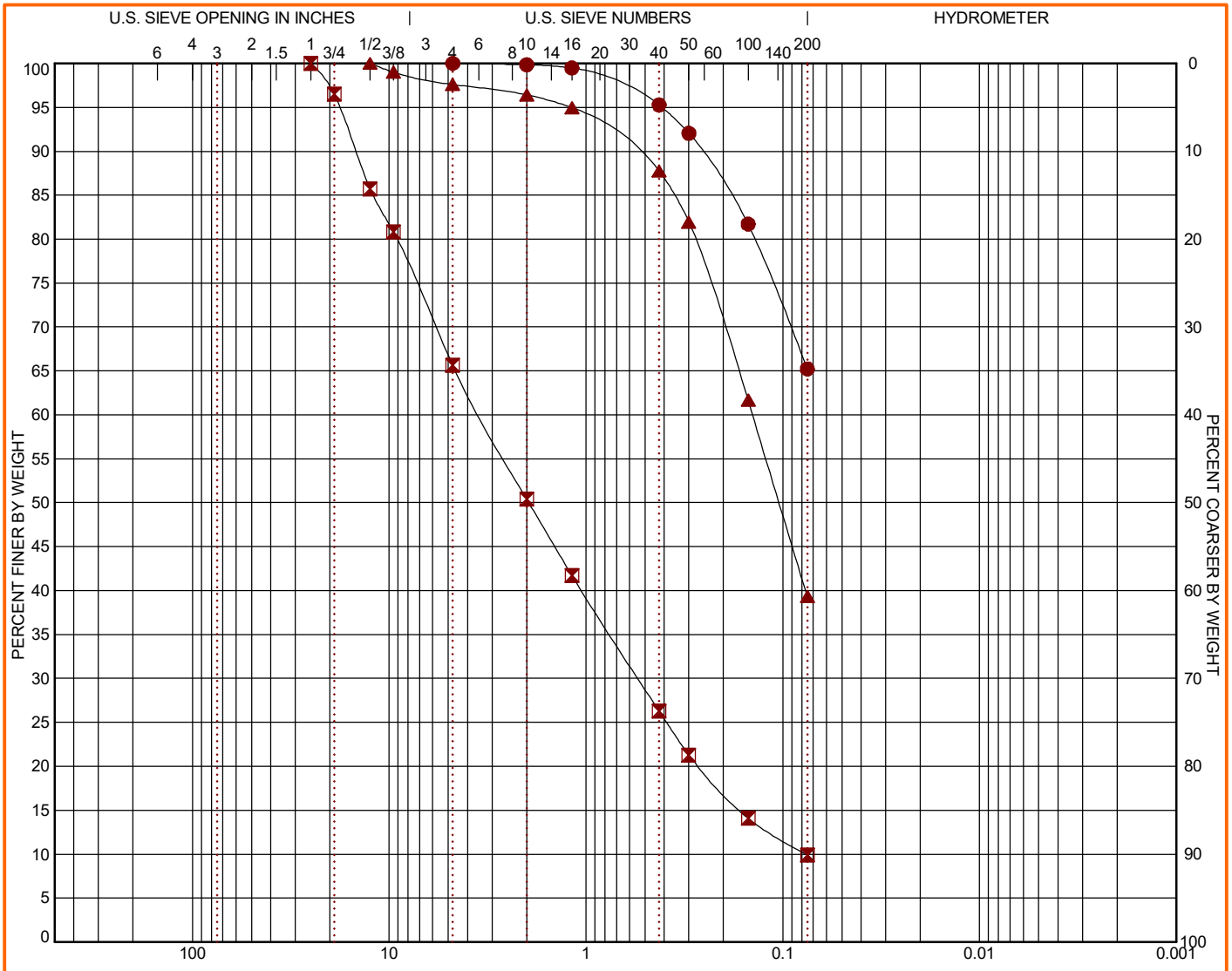

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-16	40 - 41.5	0.0	0.0	34.8		65.2		CL-ML
⊠	B-17	10 - 11.5	0.0	34.4	55.7		9.9		SW-SM
▲	B-21	10 - 11.5	0.0	2.4	58.3		39.3		SM

GRAIN SIZE	●	⊠	▲
D_{60}		3.452	0.142
D_{30}		0.544	
D_{10}		0.076	

COEFFICIENTS	●	⊠	▲
C_C		1.12	
C_U		45.19	

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#4	100.0	1"	100.0	1/2"	100.0
#10	99.84	3/4"	96.52	3/8"	99.0
#16	99.48	1/2"	85.73	#4	97.6
#40	95.28	3/8"	80.84	#10	96.42
#50	92.05	#4	65.62	#16	94.97
#100	81.71	#10	50.38	#40	87.75
#200	65.23	#16	41.73	#50	81.95
		#40	26.28	#100	61.68
		#50	21.3	#200	39.32
		#100	14.08		
		#200	9.89		

SOIL DESCRIPTION	
●	SANDY SILTY CLAY (CL-ML)
⊠	WELL-GRADED SAND with SILT and
▲	GRAVEL (SW-SM) SILTY SAND (SM)

REMARKS	
●	
⊠	
▲	

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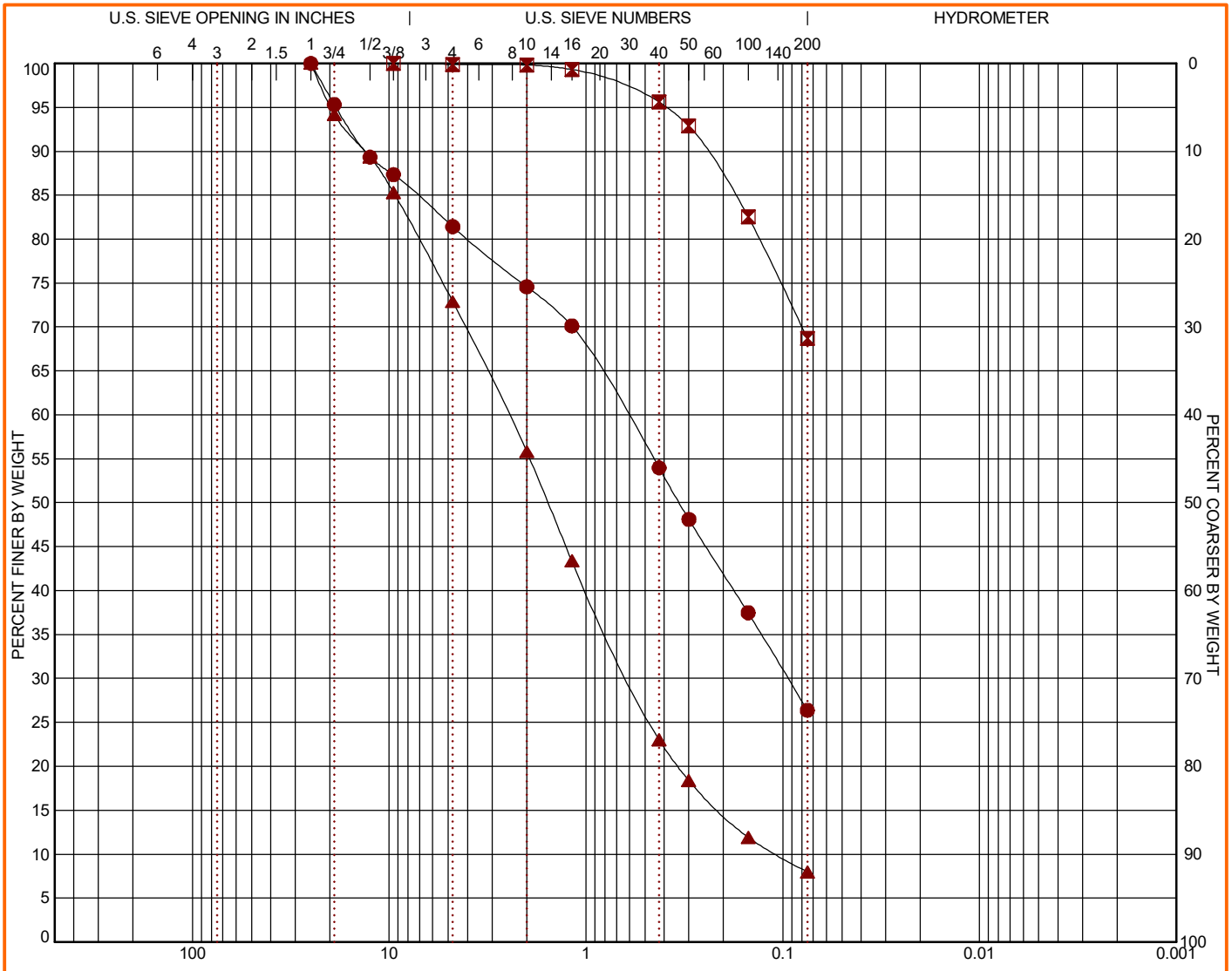

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-21	20 - 21.5	0.0	18.6	55.0		26.4		SM
⊠	B-21	40 - 41.5	0.0	0.1	31.2		68.7		CL
▲	B-23	10 - 11.5	0.0	27.1	64.9		8.0		SW-SM

GRAIN SIZE	●	⊠	▲
D_{60}	0.622		2.473
D_{30}	0.094		0.603
D_{10}			0.107

COEFFICIENTS	●	⊠	▲
C_C			1.38
C_U			23.13

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1"	100.0	3/8"	100.0	1"	100.0
3/4"	95.32	#4	99.9	3/4"	94.2
1/2"	89.34	#10	99.82	1/2"	89.38
3/8"	87.34	#16	99.31	3/8"	85.32
#4	81.42	#40	95.6	#4	72.89
#10	74.57	#50	92.86	#10	55.81
#16	70.12	#100	82.57	#16	43.37
#40	53.97	#200	68.68	#40	23.01
#50	48.1			#50	18.37
#100	37.48			#100	11.93
#200	26.37			#200	7.98

SOIL DESCRIPTION	
●	SILTY SAND with GRAVEL (SM)
⊠	SANDY LEAN CLAY (CL)
▲	WELL-GRADED SAND with SILT and GRAVEL (SW-SM)

REMARKS	
●	
⊠	
▲	

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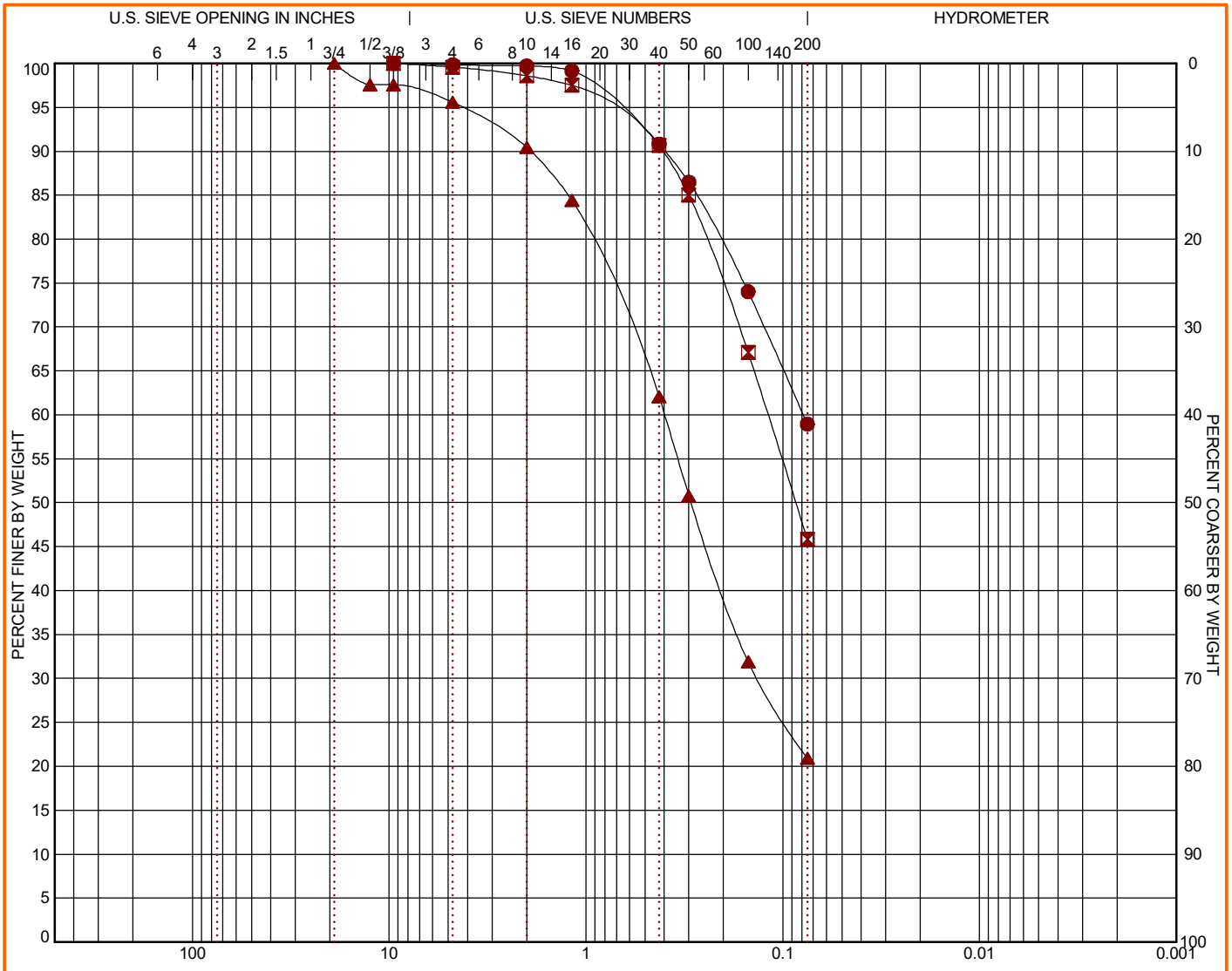

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-23	40 - 41.5	0.0	0.2	40.9		59.0		ML
⊠	B-25	30 - 31.5	0.0	0.4	53.7		45.9		SC-SM
▲	B-25	40 - 41.5	0.0	4.4	74.7		20.9		SM

GRAIN SIZE	●	⊠	▲
D_{60}	0.079	0.119	0.399
D_{30}			0.133
D_{10}			

COEFFICIENTS	●	⊠	▲
C_C			
C_U			

● Sieve	● % Finer	⊠ Sieve	⊠ % Finer	▲ Sieve	▲ % Finer
3/8"	100.0	3/8"	100.0	3/4"	100.0
#4	99.84	#4	99.58	1/2"	97.56
#10	99.72	#10	98.6	3/8"	97.56
#16	99.17	#16	97.49	#4	95.58
#40	90.82	#40	90.65	#10	90.44
#50	86.49	#50	85.0	#16	84.41
#100	74.01	#100	67.13	#40	62.07
#200	58.95	#200	45.87	#50	50.78
				#100	31.9
				#200	20.91

SOIL DESCRIPTION	
●	SANDY SILT (ML)
⊠	SILTY, CLAYEY SAND (SC-SM)
▲	SILTY SAND (SM)

REMARKS	
●	
⊠	
▲	

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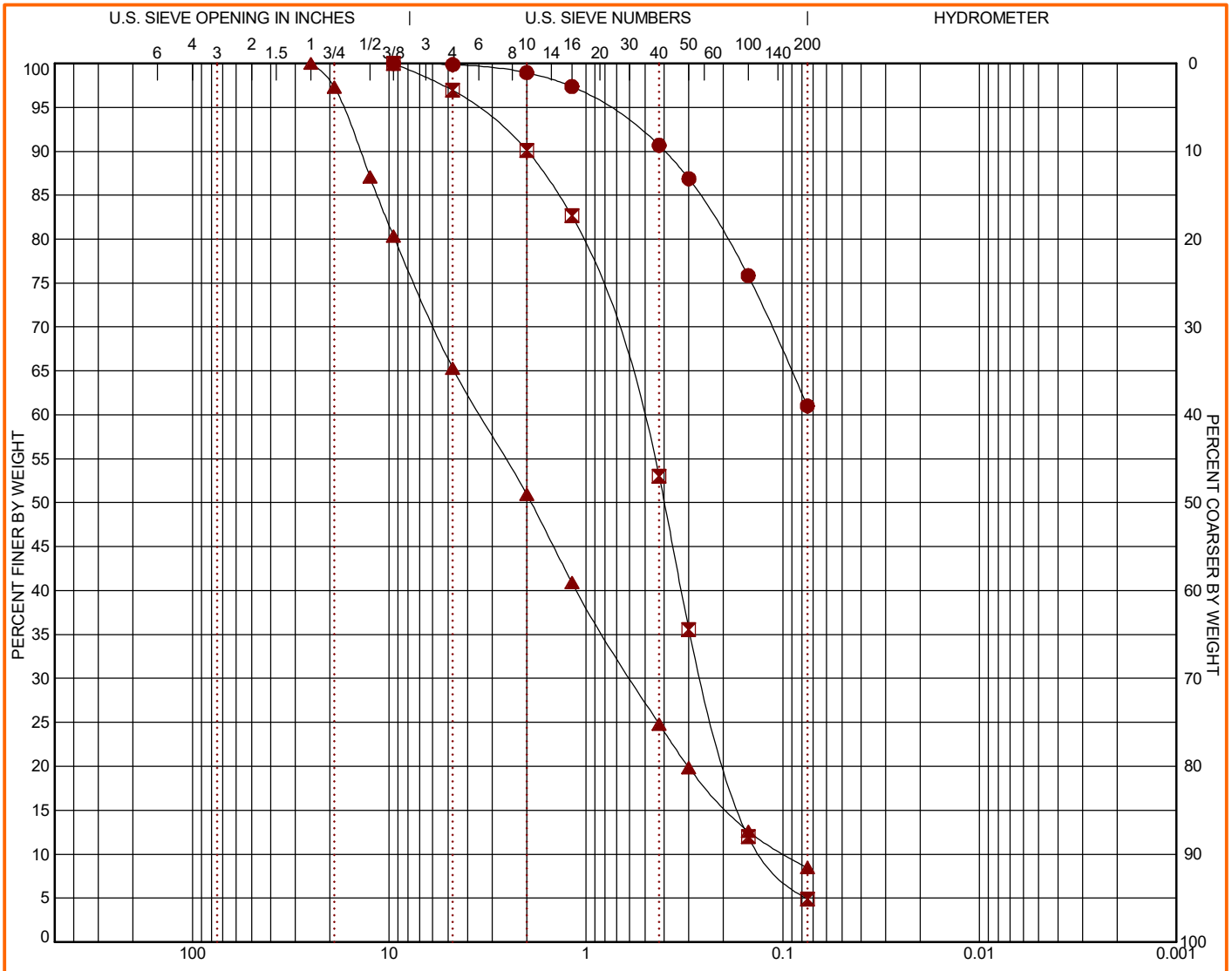

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-25	60 - 61.5	0.0	0.1	38.8		61.0		ML
⊠	B-27	10 - 11.5	0.0	3.1	92.0		4.9		SP
▲	B-27	20 - 21.5	0.0	34.7	56.9		8.5		SW-SM

GRAIN SIZE	●	⊠	▲
D_{60}		0.54	3.449
D_{30}		0.255	0.59
D_{10}		0.123	0.097

COEFFICIENTS	●	⊠	▲
C_C		0.97	1.04
C_U		4.38	35.54

● Sieve	● % Finer	⊠ Sieve	⊠ % Finer	▲ Sieve	▲ % Finer
3/8"	100.0	3/8"	100.0	1"	100.0
#4	99.86	#4	96.93	3/4"	97.32
#10	98.94	#10	90.1	1/2"	87.06
#16	97.37	#16	82.64	3/8"	80.35
#40	90.68	#40	53.04	#4	65.31
#50	86.87	#50	35.55	#10	50.95
#100	75.84	#100	11.99	#16	40.92
#200	61.02	#200	4.91	#40	24.82
				#50	19.84
				#100	12.61
				#200	8.45

SOIL DESCRIPTION	
●	SANDY SILT (ML)
⊠	POORLY GRADED SAND (SP)
▲	WELL-GRADED SAND with SILT and GRAVEL (SW-SM)

REMARKS	
●	
⊠	
▲	

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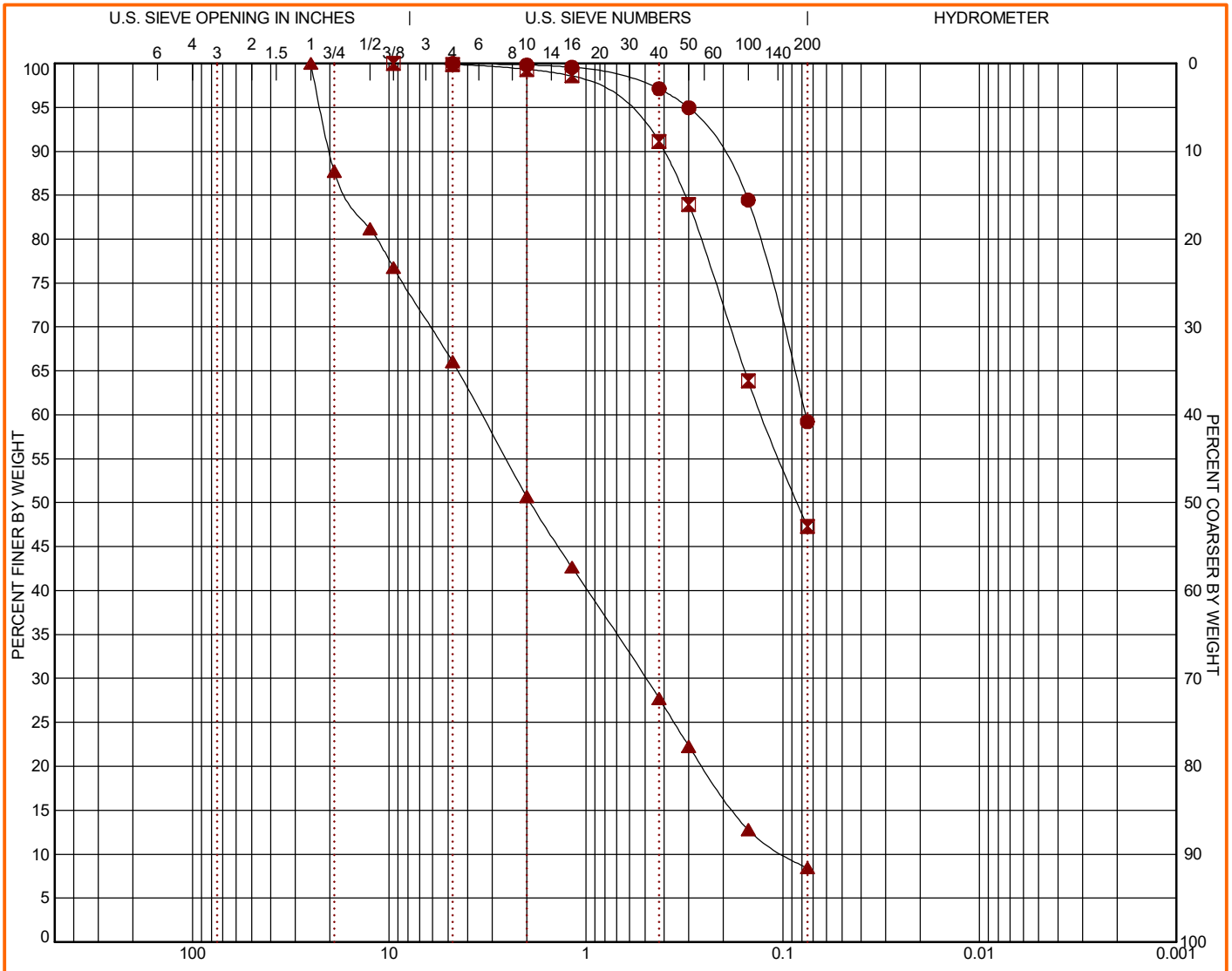

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-27	35 - 36.5	0.0	0.0	40.8		59.2		ML
⊠	B-27	45 - 46.5	0.0	0.1	52.6		47.3		SM
▲	B-28	10 - 11.5	0.0	34.0	57.6		8.4		SP-SM

GRAIN SIZE	●	⊠	▲
D_{60}	0.077	0.127	3.38
D_{30}			0.497
D_{10}			0.096

COEFFICIENTS	●	⊠	▲
C_C			0.76
C_U			35.15

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#4	100.0	3/8"	100.0	1"	100.0
#10	99.82	#4	99.88	3/4"	87.71
#16	99.56	#10	99.33	1/2"	81.17
#40	97.12	#16	98.58	3/8"	76.76
#50	94.95	#40	91.09	#4	66.04
#100	84.45	#50	83.96	#10	50.68
#200	59.22	#100	63.89	#16	42.67
		#200	47.32	#40	27.72
				#50	22.26
				#100	12.79
				#200	8.44

SOIL DESCRIPTION	
●	SANDY SILT (ML)
⊠	SILTY SAND (SM)
▲	POORLY GRADED SAND with SILT and GRAVEL (SP-SM)

REMARKS	
●	
⊠	
▲	

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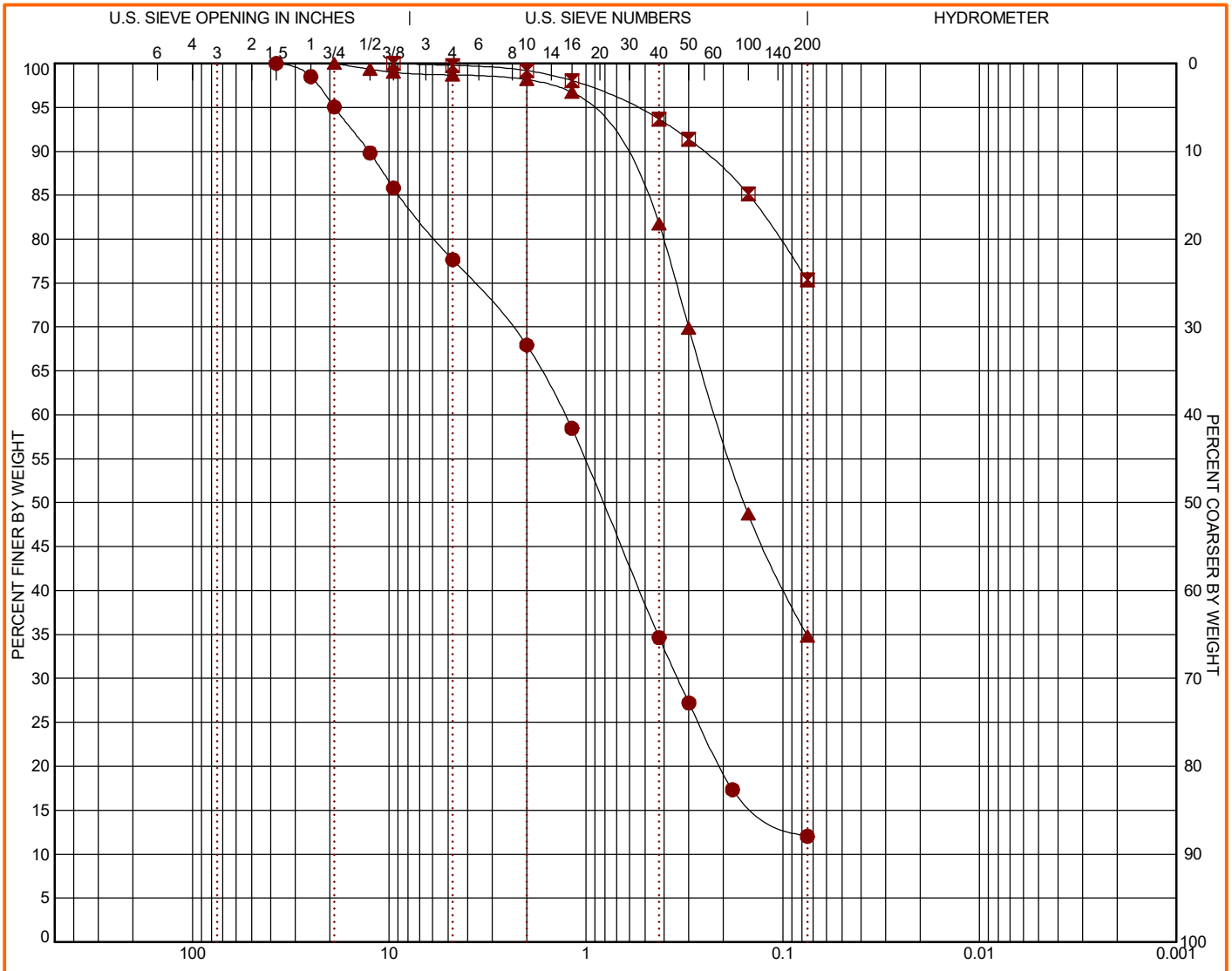

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-29	5 - 5.5	0.0	22.3	65.6		12.0		
⊠	B-30	15 - 16.5	0.0	0.2	24.4		75.3		ML
▲	B-31	7.5 - 9	0.0	1.3	63.9		34.8		SM

GRAIN SIZE	●	⊠	▲
D_{60}	1.285		0.217
D_{30}	0.342		
D_{10}			

COEFFICIENTS	●	⊠	▲
C_C	1.69		
C_U	23.94		

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1 1/2"	100.0	#200	75.34	3/4"	100.0
1"	98.5	3/8"	100.0	1/2"	99.33
3/4"	95.04	#4	99.78	3/8"	98.98
1/2"	89.8	#10	99.19	#4	98.69
3/8"	85.81	#16	98.06	#10	98.16
#4	77.66	#40	93.66	#16	96.72
#10	67.94	#50	91.36	#40	81.75
#16	58.47	#100	85.16	#50	69.86
#40	34.64			#100	48.72
#50	27.21			#200	34.81
#80	17.34				
#200	12.03				

SOIL DESCRIPTION	
●	
⊠	SILT with SAND (ML)
▲	SILTY SAND (SM)

REMARKS	
●	
⊠	
▲	

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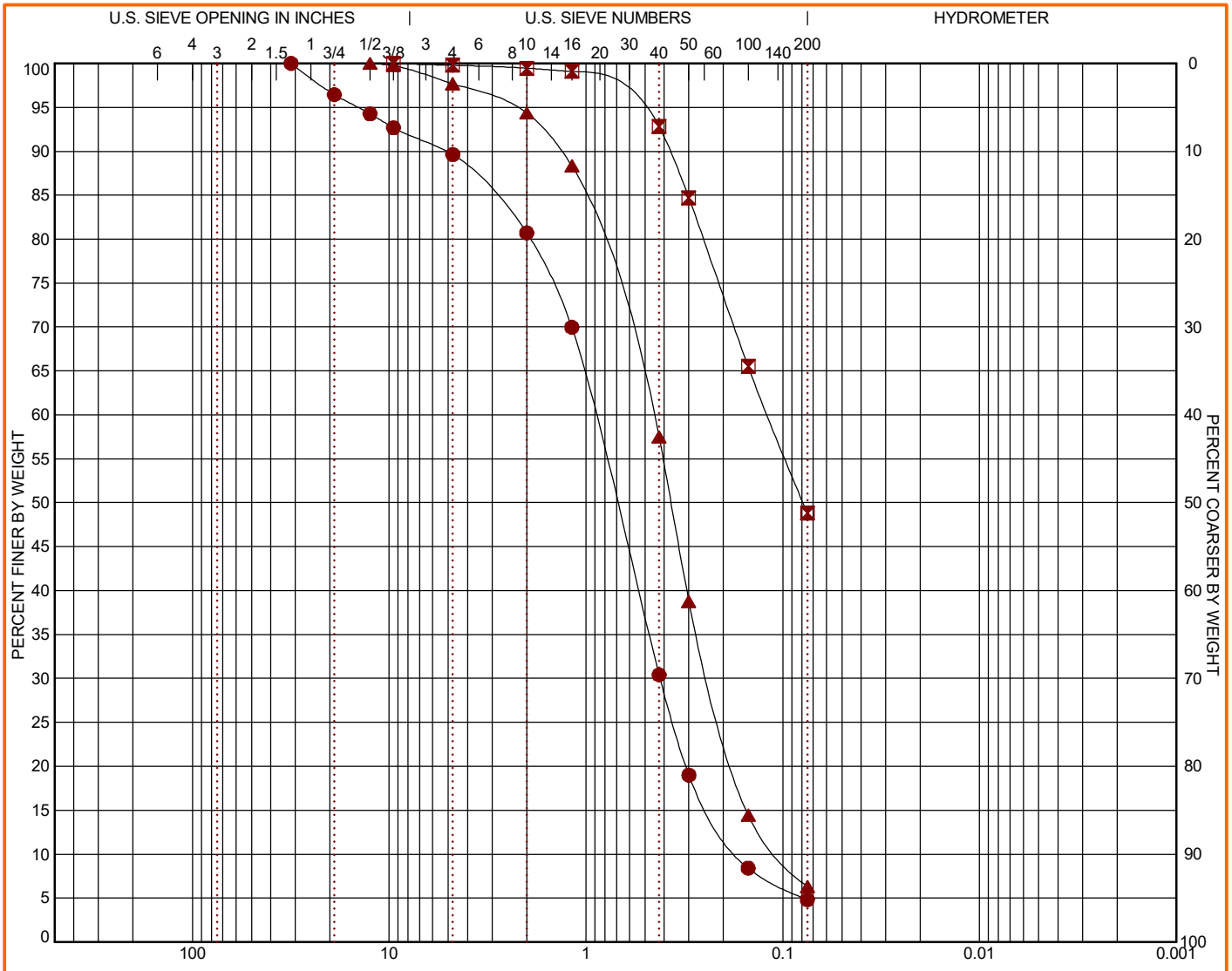

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-31	10 - 11.5	0.0	10.4	84.8		4.8		SP
⊠	B-31	20 - 21.5	0.0	0.2	51.0		48.8		SM
▲	B-33	7.5 - 9	0.0	2.3	91.4		6.3		SP-SM

GRAIN SIZE	●	⊠	▲
D_{60}	0.912	0.119	0.462
D_{30}	0.42		0.234
D_{10}	0.166		0.103

COEFFICIENTS	●	⊠	▲
C_C	1.16		1.15
C_U	5.48		4.50

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1 1/4"	100.0	3/8"	100.0	1/2"	100.0
3/4"	96.44	#4	99.78	3/8"	99.75
1/2"	94.26	#10	99.46	#4	97.68
3/8"	92.67	#16	99.1	#10	94.36
#4	89.63	#40	92.83	#16	88.34
#10	80.71	#50	84.7	#40	57.5
#16	69.97	#100	65.53	#50	38.77
#40	30.41	#200	48.83	#100	14.45
#50	18.99			#200	6.31
#100	8.41				
#200	4.81				

SOIL DESCRIPTION	
●	POORLY GRADED SAND (SP)
⊠	SILTY SAND (SM)
▲	POORLY GRADED SAND with SILT (SP-SM)

REMARKS	
●	
⊠	
▲	

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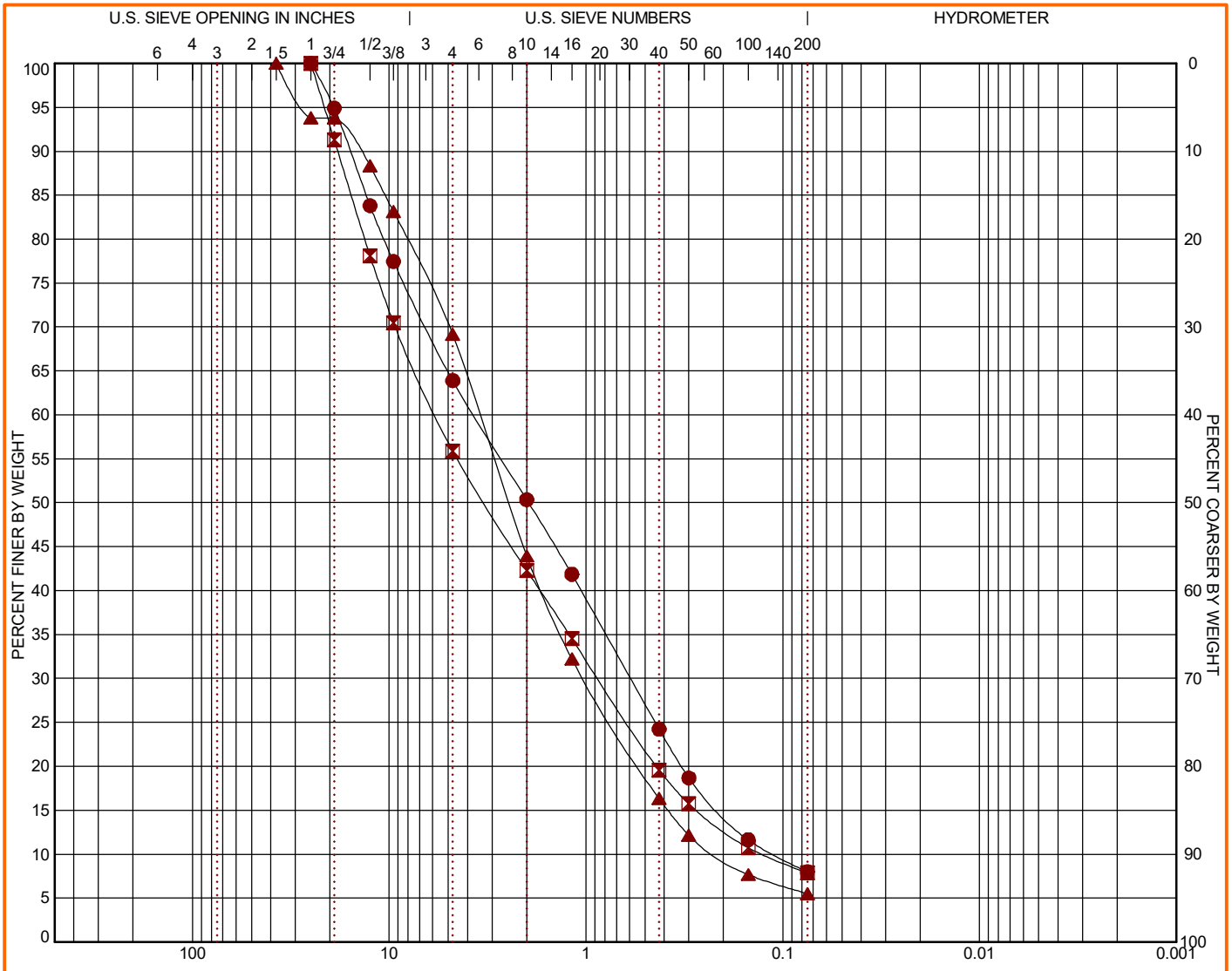


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-34	15 - 16.5	0.0	36.1	55.9		8.0		SP-SM
⊠	B-35	10 - 11.5	0.0	44.1	48.0		7.9		SW-SM
▲	B-36	7.5 - 9	0.0	30.8	63.6		5.5		SW-SM

GRAIN SIZE	●	⊠	▲
D_{60}	3.705	5.772	3.47
D_{30}	0.594	0.865	1.023
D_{10}	0.11	0.125	0.215

COEFFICIENTS	●	⊠	▲
C_C	0.87	1.03	1.40
C_U	33.76	46.00	16.12

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1"	100.0	1"	100.0	1 1/2"	100.0
3/4"	94.91	3/4"	91.32	1"	93.8
1/2"	83.81	1/2"	78.09	3/4"	93.8
3/8"	77.45	3/8"	70.49	1/2"	88.34
#4	63.89	#4	55.9	3/8"	83.14
#10	50.34	#10	42.27	#4	69.16
#16	41.86	#16	34.56	#10	43.93
#40	24.22	#40	19.55	#16	32.22
#50	18.67	#50	15.73	#40	16.33
#100	11.63	#100	10.74	#50	12.14
#200	8.01	#200	7.87	#100	7.68
				#200	5.52

SOIL DESCRIPTION	
●	POORLY GRADED SAND with SILT and GRAVEL (SP-SM)
⊠	WELL GRADED SAND with SILT and GRAVEL (SW-SM)
▲	WELL GRADED SAND with SILT and GRAVEL (SW-SM)

GRAVEL (SW-SM)

REMARKS	
●	
⊠	
▲	

PROJECT: Manitou Ct./C St. Redevelopment

SITE: Space Center Ct. & Hopkins St.
Jurupa Vallley, CA

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

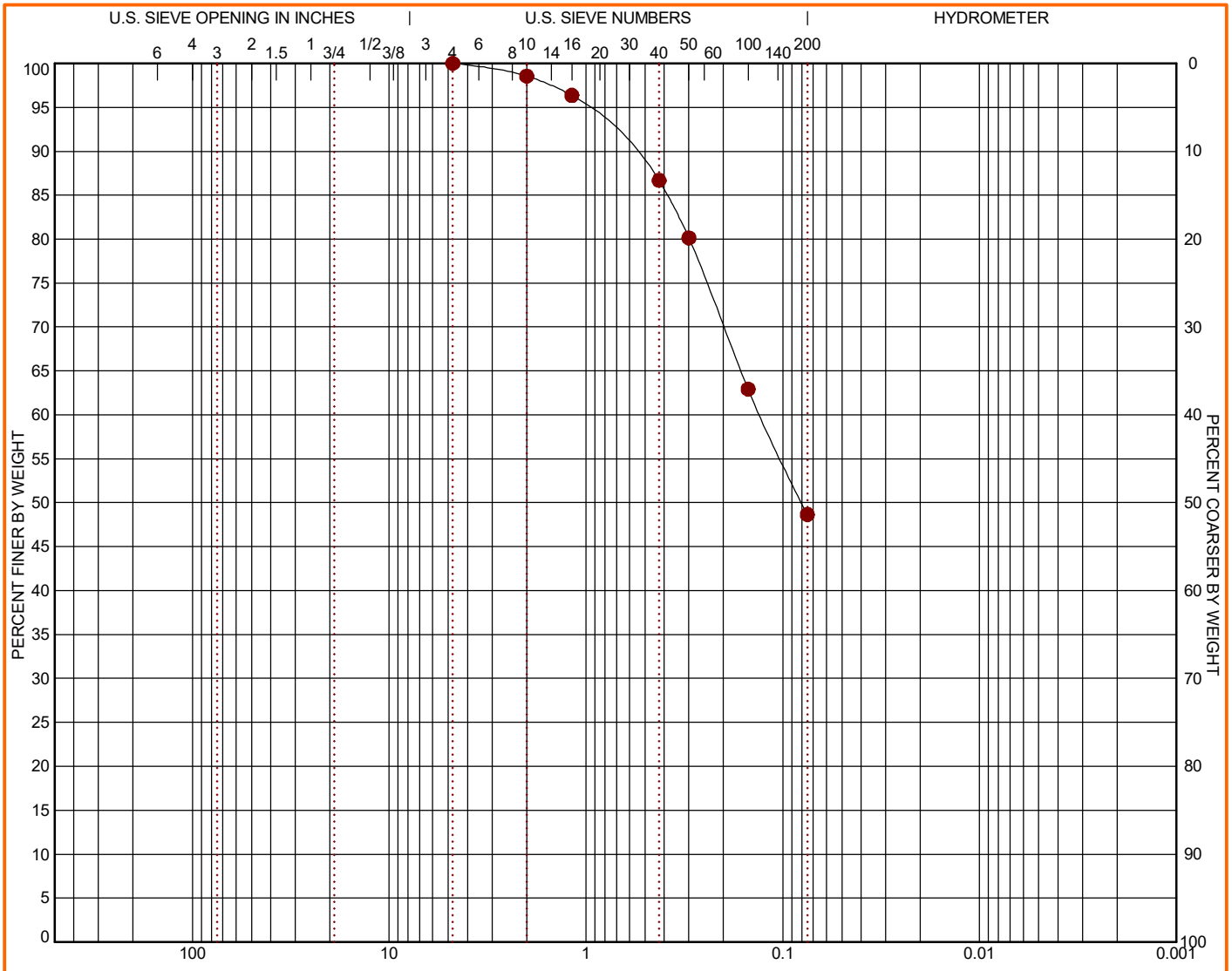
PROJECT NUMBER: CB205119

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 CB205119 MANITOU CT C ST.GPJ TERRACON_DATATEMPLATE.GDT 11/9/20

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-37	40 - 41.5	0.0	0.0	51.3		48.7		SM

GRAIN SIZE			
	●		
D_{60}	0.13		
D_{30}			
D_{10}			

COEFFICIENTS			
	●		
C_C			
C_U			

●						
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#4	100.0				
#10	98.55				
#16	96.36				
#40	86.69				
#50	80.14				
#100	62.93				
#200	48.65				

SOIL DESCRIPTION	
●	SILTY SAND (SM)

REMARKS	
●	

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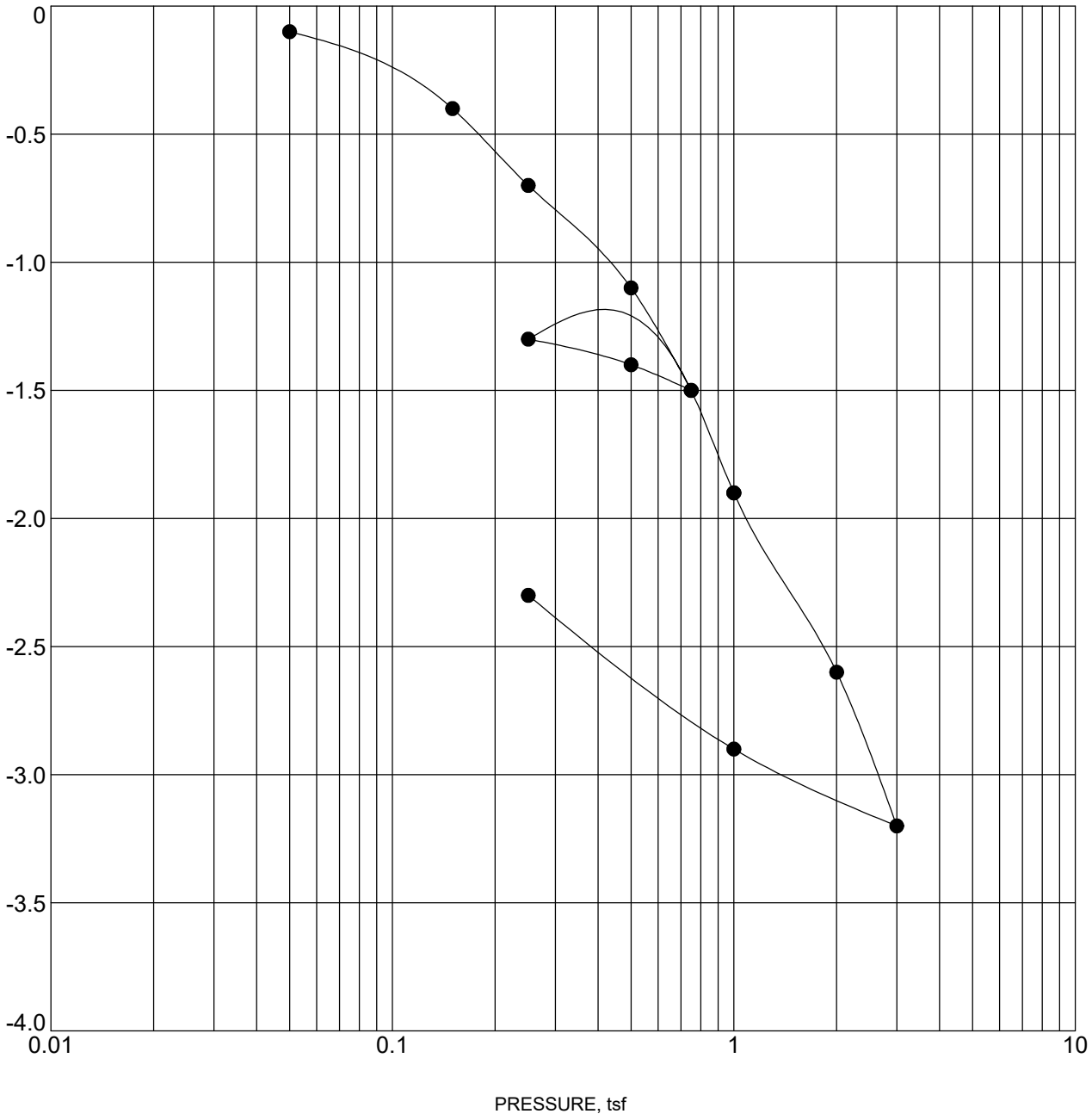
LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 CB205119 MANITOU CT C ST.GPJ TERRACON_DATATEMPLATE.GDT 11/9/20

SWELL CONSOLIDATION TEST

ASTM D4546



Specimen Identification		Classification	γ_d, pcf	WC, %
●	B-10 10 - 11.5 ft		104	15.2

NOTES:

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Colton, CA

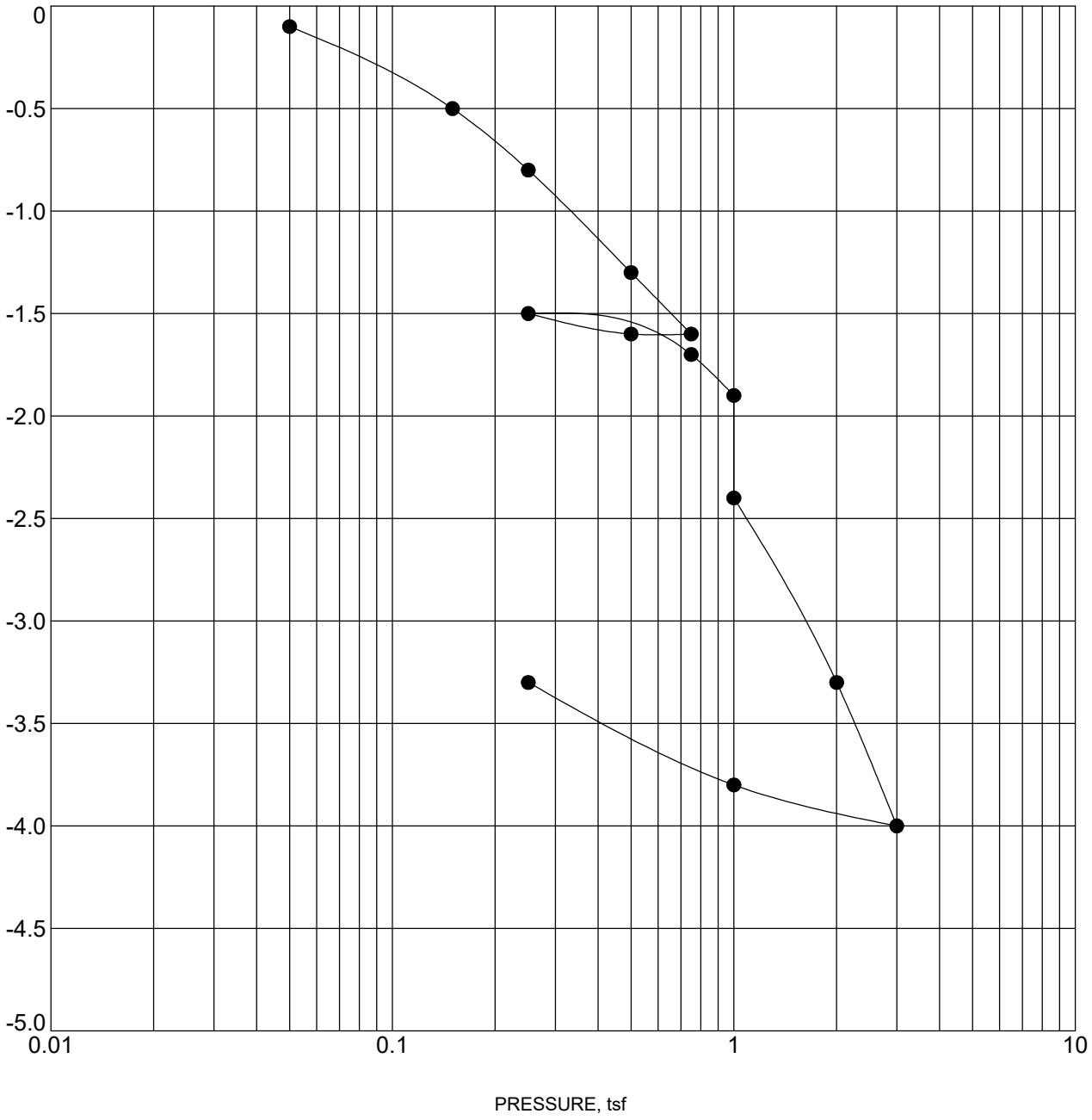
PROJECT NUMBER: CB205119

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

EXHIBIT: B-1

SWELL CONSOLIDATION TEST

ASTM D4546



Specimen Identification		Classification	γ_d, pcf	WC, %
●	B-15 7.5 - 9 ft		106	8.6

NOTES:

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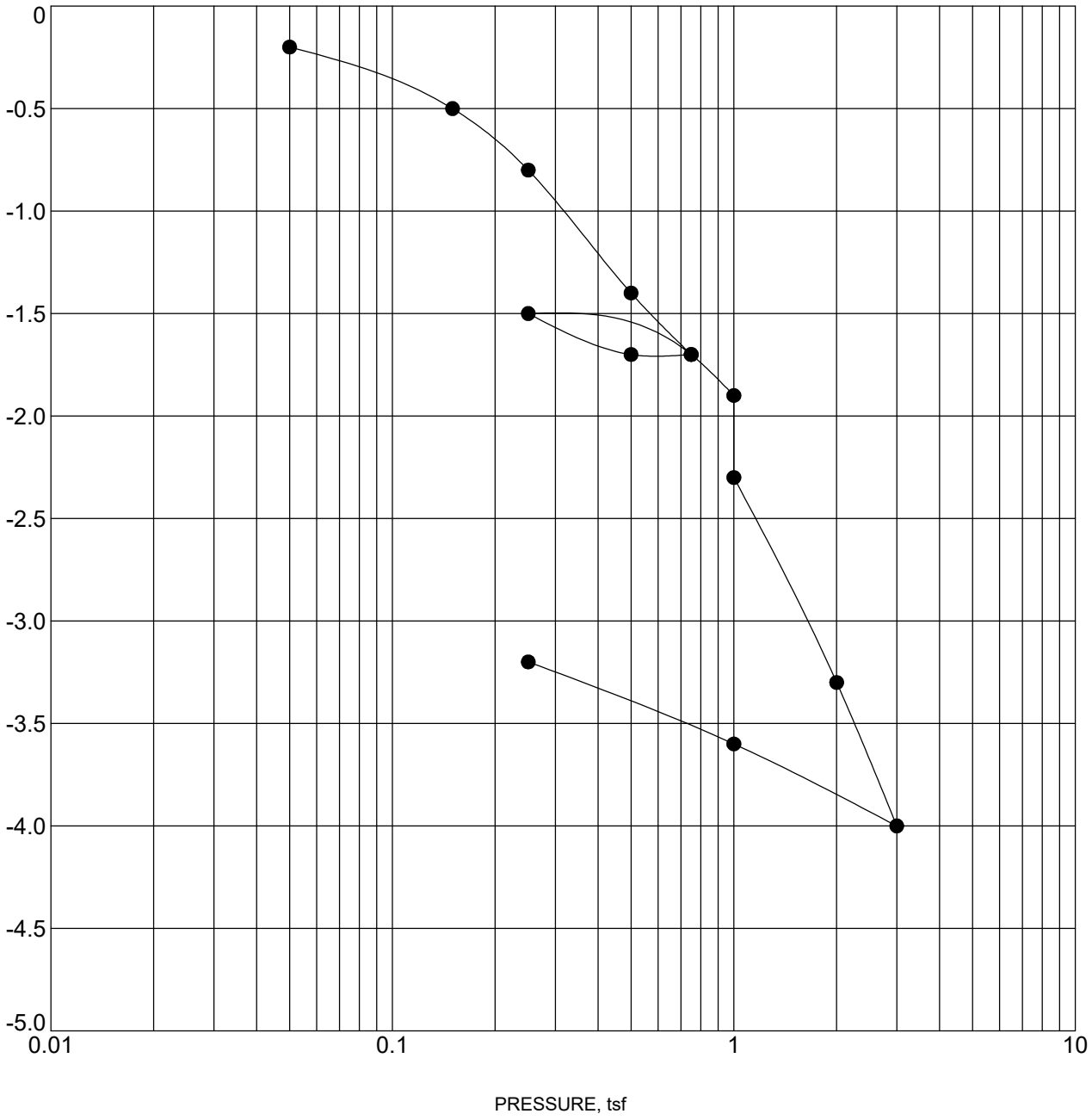
PROJECT NUMBER: CB205119

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

EXHIBIT: B-1

SWELL CONSOLIDATION TEST

ASTM D4546



Specimen Identification		Classification	γ_d, pcf	WC, %
● B-22 5 - 6.5 ft			95	8.5

NOTES:

PROJECT: Manitou Ct./C St. Redevelopment

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Colton, CA

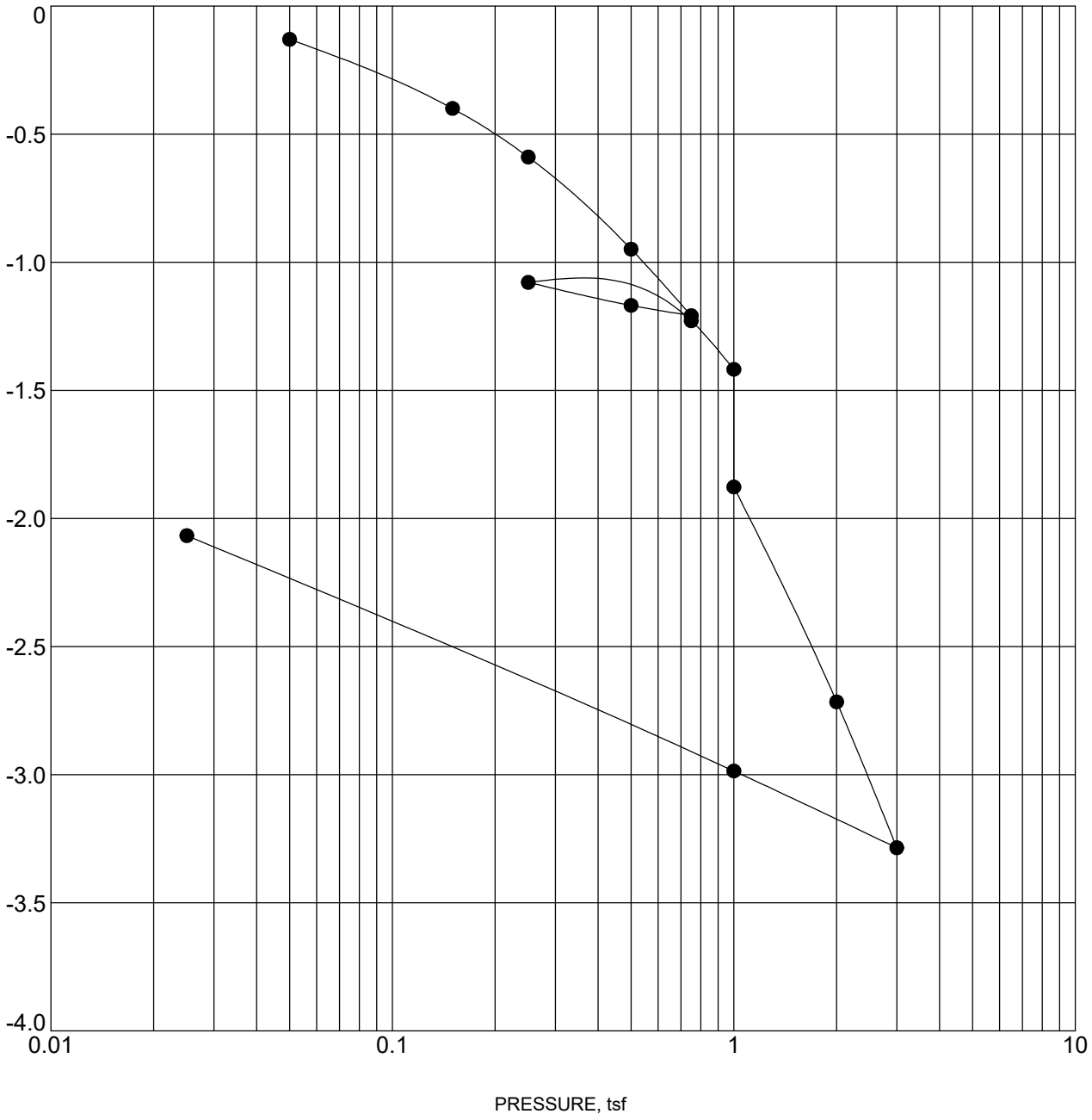
PROJECT NUMBER: CB205119

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

EXHIBIT: B-1

SWELL CONSOLIDATION TEST

ASTM D4546



Specimen Identification			Classification	γ_d, pcf	WC, %
●	B-27	5 - 6.5 ft		108	5.7

NOTES:

PROJECT: Manitou Ct./C St. Redevelopment

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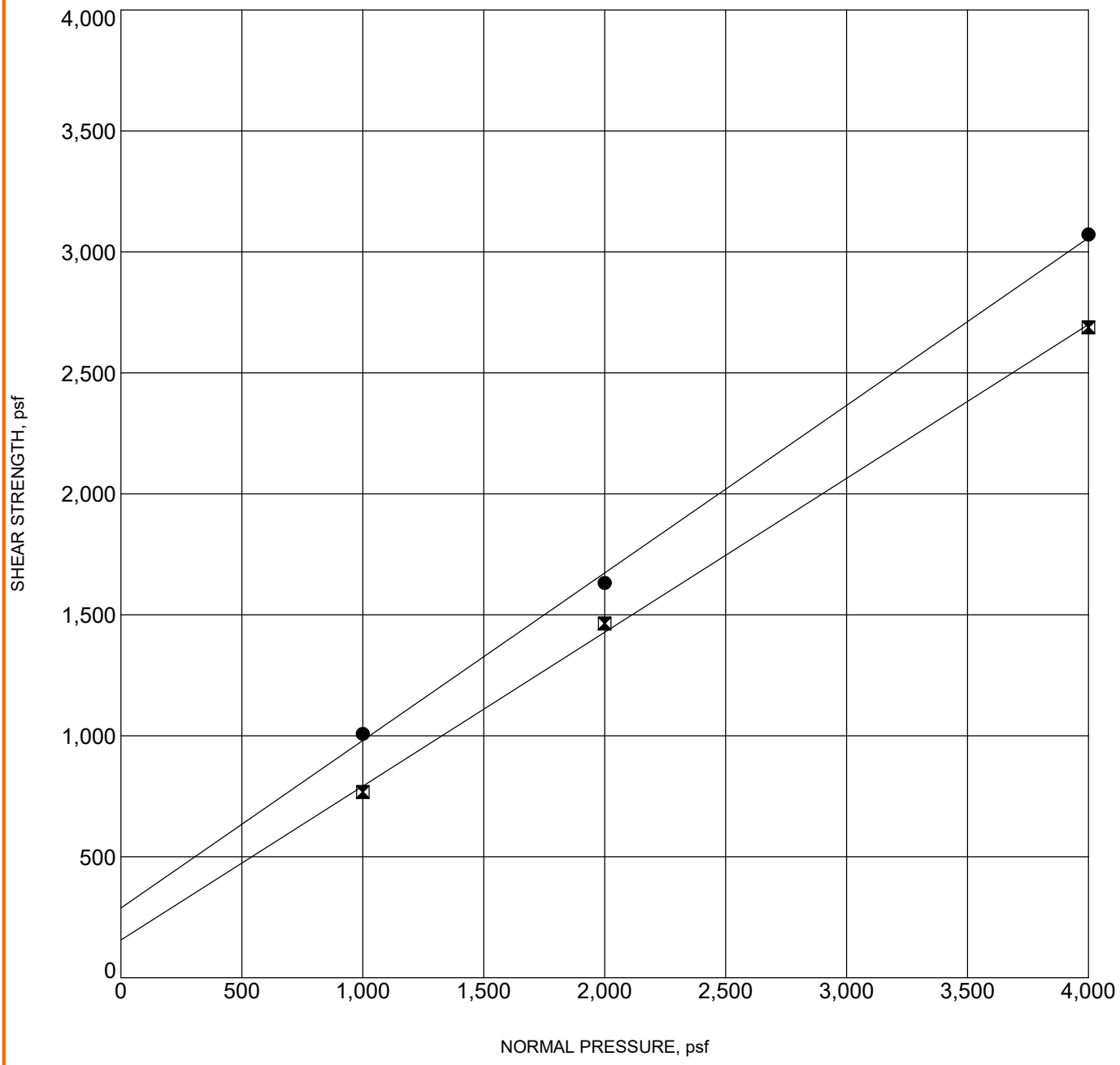
Colton, CA

PROJECT NUMBER: CB205119

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

EXHIBIT: B-1

DIRECT SHEAR TEST ASTM D3080



Specimen Identification		Classification	γ_d, pcf	WC,%	c, psf	$\phi°$
●	B-13 0 - 4'	Silty Sand	113	9	288	35
⊠	B-21 0 - 2.5'	Silty Sand	112	11	156	32

PROJECT: Manitou Ct./C St. Redevelopment

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Terracon
1355 E Cooley Dr, Ste C
Colton, CA

CLIENT: BRE Space Mira Loma LLC
Jurupa Valley, CA

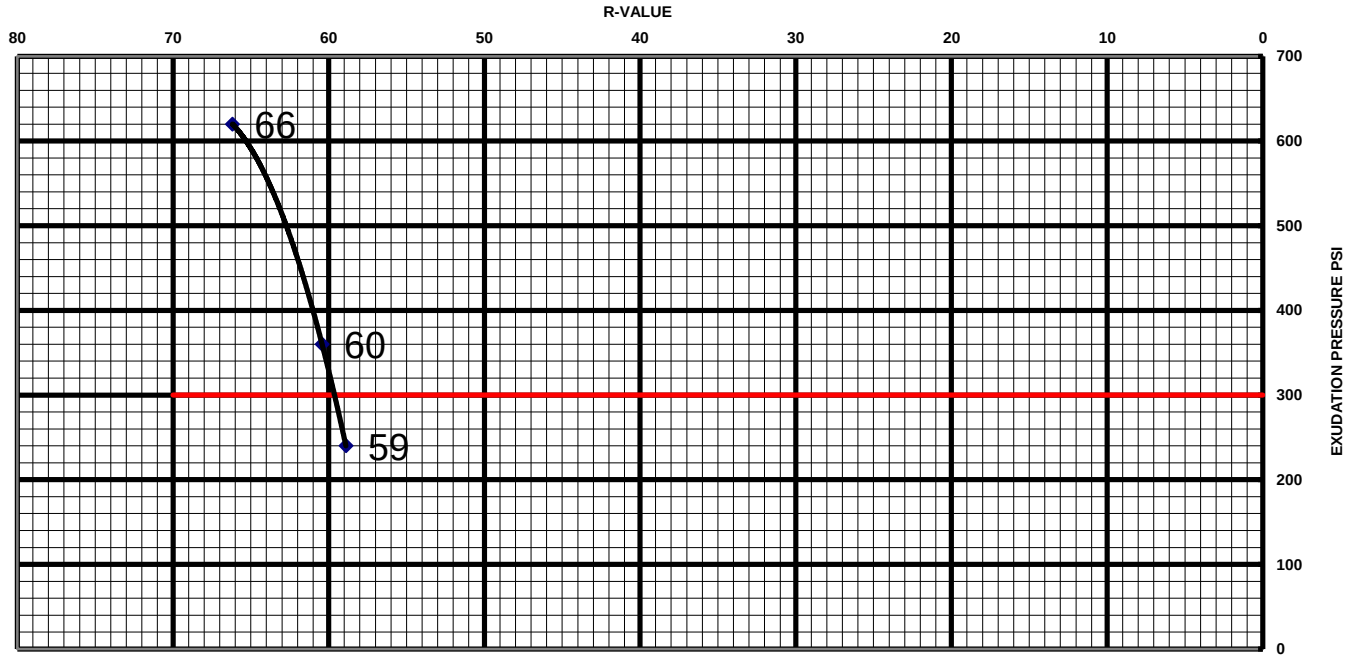
Job No. CB205119
Date. 11/6/2020

LAB0RATORY RECORD OF TESTS MADE ON BASE, SUBBASE, AND BASEMENT SOILS

CLIENT: **BRE Space Mira Loma**
PROJECT **Manitou Ct./ C St. Redevelopment**
LOCATION: **Jurupa Valley, CA**
R-VALUE # : **3A**
T.I. :

	A	B	C	D
COMPACTOR AIR PRESSURE P.S.I.	350	350	350	
INITIAL MOISTURE %	4.2	4.2	4.2	
WATER ADDED, ML	80	75	70	
WATER ADDED %	7.9	7.4	6.9	
MOISTURE AT COMPACTION %	12.1	11.6	11.1	
HEIGHT OF BRIQUETTE	2.48	2.48	2.47	
WET WEIGHT OF BRIQUETTE	1055	1053	1055	
DENSITY LB. PER CU.FT.	115.0	115.3	116.5	
STABILOMETER PH AT 1000 LBS.	26	24	22	
2000 LBS.	44	42	36	
DISPLACEMENT	4.60	4.60	4.40	
R-VALUE	59	60	66	
EXUDATION PRESSURE	240	360	620	
THICK. INDICATED BY STAB.	0.00	0.00	0.00	
EXPANSION PRESSURE	0	0	0	
THICK. INDICATED BY E.P.	0.00	0.00	0.00	

EXUDATION CHART



R-Value: **59**

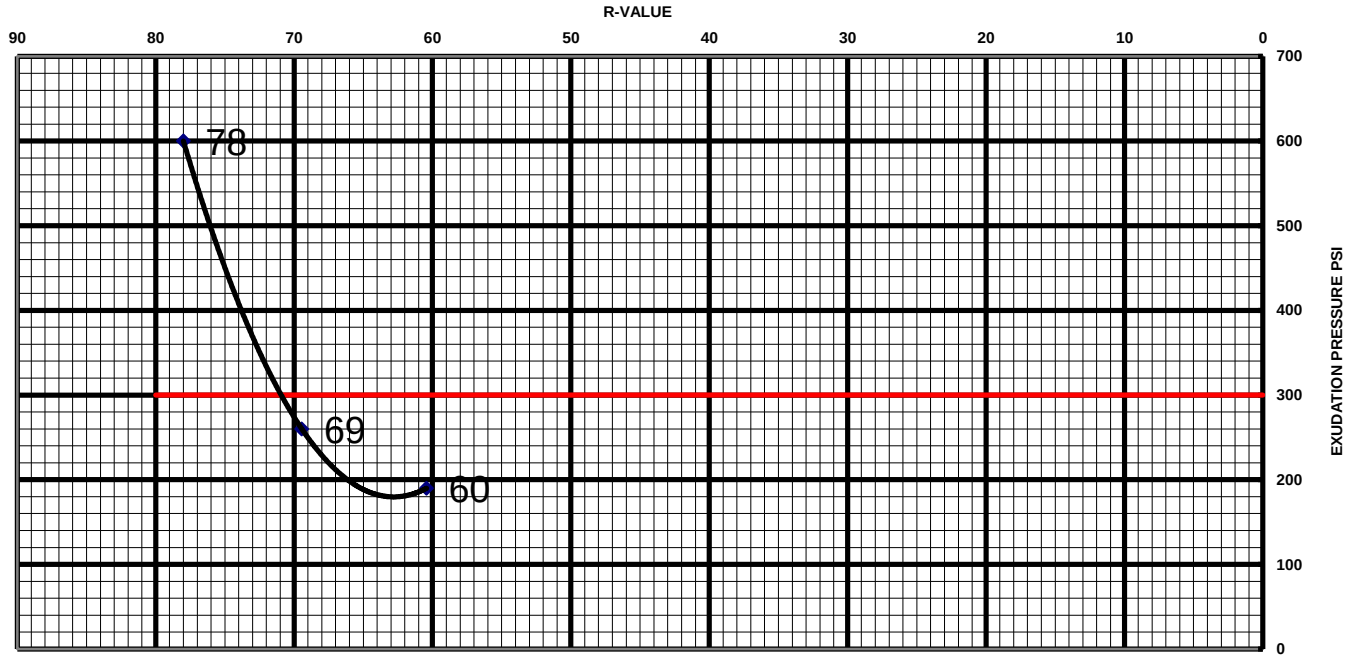
Job No. CB205119
Date. 11/6/2020

LAB0RATORY RECORD OF TESTS MADE ON BASE, SUBBASE, AND BASEMENT SOILS

CLIENT: **BRE Space Mira Loma**
PROJECT **Manitou Ct./ C St. Redevelopment**
LOCATION: **Jurupa Valley, CA**
R-VALUE # : **25A**
T.I. :

	A	B	C	D
COMPACTOR AIR PRESSURE P.S.I.	350	350	350	
INITIAL MOISTURE %	5.9	5.9	5.9	
WATER ADDED, ML	50	40	30	
WATER ADDED %	4.7	3.8	2.8	
MOISTURE AT COMPACTION %	10.6	9.7	8.7	
HEIGHT OF BRIQUETTE	2.50	2.48	2.48	
WET WEIGHT OF BRIQUETTE	1116	1118	1122	
DENSITY LB. PER CU.FT.	122.2	124.5	126.1	
STABILOMETER PH AT 1000 LBS.	25	20	16	
2000 LBS.	42	32	23	
DISPLACEMENT	4.60	4.40	4.20	
R-VALUE	60	69	78	
EXUDATION PRESSURE	190	260	600	
THICK. INDICATED BY STAB.	0.00	0.00	0.00	
EXPANSION PRESSURE	0	0	0	
THICK. INDICATED BY E.P.	0.00	0.00	0.00	

EXUDATION CHART



R-Value: **71**

750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client
BRE Space Mira Loma LLC
Jurupa Valley, CA

Project
Manitou Ct./C St. Redevelopment

Sample Submitted By: Terracon (CB) **Date Received:** 10/29/2020 **Lab No.: 20-1159**

Results of Corrosion Analysis

Sample Number	14A	22A
Sample Location	B-14	B-22
Sample Depth (ft.)	0.0-2.5	0.0-5.0
pH Analysis, ASTM G 51	7.67	7.72
Water Soluble Sulfate (SO4), ASTM C 1580 (mg/kg)	16	49
Chlorides, ASTM D 512, (mg/kg)	47	80
Total Salts, AWWA 2540, (mg/kg)	424	389
Resistivity (As-Received), ASTM G 57, (ohm-cm)	63050	43165
Resistivity (Saturated), ASTM G 57, (ohm-cm)	9118	10040

Analyzed By: Trisha Campo
Chemist

SUPPORTING INFORMATION

Contents:

Note: All attachments are one page unless noted above.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.