ABI Properties BESS

Geotechnical Engineering Report

February 7, 2025 | Terracon Project No. LA245225

Prepared for:

AYPA Power Development, LLC
11801 Domain Development, Suite 450
Austin, Texas 78758

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February 7, 2025

AYPA Power Development, LLC
11801 Domain Development, Suite 450
Austin, Texas 78758

Attn: Mr. Matthew McCaffrey, Senior Director of Development
P: (415) 990-6611
E: mmccaffrey@aypa.com

Re: Geotechnical Engineering Report
ABI Properties BESS
Gale Ave and Ward Way
City of Industry, Los Angeles County, California 91745
Terracon Project No. LA245225

Dear Mr. McCaffrey:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. PLA245225 dated October 23, 2024, revised November 8, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of access roads and foundations for the proposed Battery Energy Storage Systems (BESS).

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

Toni Aguilar

JOSHUA R. MORGAN
C 86032

Toni Aguilar
Field Engineer

Joshua R. Morgan, P.E.
Regional Geotechnical Manager

APR Review by John Mancini, P.E. (UT)

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Attachments

Note: This report was originally delivered in a web-based format. **Blue 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 Terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed Battery Energy Storage System (BESS) to be located at Gale Ave and Ward Way, City of Industry, Los Angeles County, California 91745. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic Site Class per CBC
- Site preparation and earthwork
- Foundation design and construction
- Lateral earth pressure
- Roadway Design and construction

The geotechnical engineering Scope of Services for this project included the advancement of seven (7) test borings, field electrical resistivity testing, laboratory testing, engineering analysis, and preparation of this report. The geotechnical engineering Scope of Services for our current scope of work included the following:

- Three (3) soil test borings to approximately 26.5 feet below ground surface (bgs) in the proposed BESS areas
- One (1) soil test boring to approximately 51.5 feet bgs in the proposed BESS areas
- Three (3) percolation test borings to approximately 5 and 10 feet bgs in the proposed BESS areas
- Corrosion testing on soil samples obtained from one (1) location
- Lab thermal resistivity testing on soil samples obtained from one (1) location
- Field electrical resistivity testing at two (2) locations

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

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	A site plan of the proposed structures was provided by Aypa during the proposal stage. Terracon previously provided a geotechnical engineering report for the proposed site titled, "City of Industry BESS," dated December 5, 2023, Terracon Project No. LA235125. The report was prepared for the site address of 16253 Gale Ave., City of Industry, CA.
Project Description	The project consists of a proposed Battery Energy Storage System (BESS) facility. The project facility will encompass an approximate footprint of 9 acres, however, this current scope only includes the western 2.6-acre area not part of the original geotechnical engineering report.
Proposed Structure	We anticipate the proposed battery storage units will be supported by mat foundations or drilled shafts. Other appurtenant electrical equipment may also be supported on mat or drilled shaft foundations.
Maximum Loads	Structural loads were not provided, but have been estimated based on our experience ▪ BESS enclosure pads: 1,000 to 1,200 psf contact pressure ▪ BESS Axial Load: 75 kips ▪ BESS Shear Load: 5 kips ▪ Transformers: 500 – 1,000 psf contact pressure
Grading/Slopes	We assume that the field grade will follow the existing site grades with minimum grading required to bring the site to finish grade.
Access Roadways	We understand that new pavements will be required for construction of the project. We anticipate a maximum vehicle load of 10,000 lbs. and will travel the paved areas once a week.
Infiltration Systems	As requested by the client, stormwater management systems will be required as part of this development. We have included shallow percolation testing as part of the scope.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

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 at 16233 and 16253 Gale Ave, and 16209 Ward Way, City of Industry, Los Angeles County, California 91745. The project site encompasses a total area of approximately 2.6 acres. The coordinates of the approximate center of the site are 34.0084°N, 117.9526°W. See **Site Location**
Existing Improvements	The site includes a commercial building used for multiple businesses with associated landscaping, parking, and drive areas.
Current Ground Cover	The majority of the site is covered with existing buildings and asphalt concrete pavements.
Existing Topography	The project site is generally flat with south to north elevations ranging from 346 to 353 feet.

Geotechnical Characterization

Subsurface Conditions

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** and the GeoModel can be found in the **Figures** attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	Consistency/Density
1	**Lean Clay with Sand/Sany Lean Clay**	Very stiff to hard
2	**Sandy Silt/Silt with Sand**	Very stiff to hard
3	**Silty Sand**	Medium dense to very dense
4	**Poorly Graded Sand with Silt**	Medium dense to very dense

The geotechnical characterization forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. As noted in **General Comments**, the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Lab Results

Laboratory tests were conducted on selected soil samples and the test results are presented in the **Exploration Results** section and on the boring logs. Atterberg limit test results indicate that the on-site soils generally have very low to medium plasticity. A consolidation test indicated that the clayey soils encountered at an approximate depth of 2.5 feet bgs have a negligible swell potential when saturated under normal footing loads of 2,000 psf. Direct shear testing on clayey soils encountered at 2.5 feet indicate soils have an effective friction angle of approximately 27 degrees with apparent cohesion value of 780 psf. Maximum density/optimum moisture content testing conducted in accordance with ASTM D1557 (Modified Proctor) indicate that near surface soils tested have maximum dry densities of 114.0 pounds per cubic feet (pcf) and optimum water contents of 16.5 percent.

Groundwater

Groundwater was observed in boring B-2, B-3 and B-4 at approximate depths of 23 to 27 feet bgs. In clayey soils with low permeability, the accurate determination of groundwater level may not be possible without long term observation. Long term observation after drilling could not be performed as borings were backfilled immediately upon completion due to safety concerns. Groundwater conditions may be different at the time of construction. Groundwater levels can best be determined by implementation of a groundwater monitoring plan.

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. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

According to data collected from the Los Angeles County Public Works Water Data Library for the State of California from a nearby well 3048E, located approximately 2,200 feet northwest of the site, historic groundwater elevation level on May 30, 2023 were recorded at approximately 12 feet below ground surface.[1]

Based on our review of available historical topographic and aerial maps, the San Jose Creek Diversion Channel is located approximately 450 feet north of the project site. The approximate depth of the channel estimated based on Google Earth Imagery is approximately 10 to 15 feet.[2]

Seismic Site Class

The 2022 California Building Code (CBC) Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool. This web-based software application calculates seismic design parameters in accordance with ASCE 7-16, and 2022 CBC. The 2022 CBC requires that a site-specific ground motion study be performed in accordance with Section 11.4.8 of ASCE 7-16 for Site Class D sites with a mapped S_s value greater than or equal 0.2.

An exception to this requirement is included in Supplement 3 to ASCE 7-16 that states: "A ground motion hazard analysis is not required where the value of the parameter S_{M1} determined by Eq. (11.4-2) is increased by 50% for all applications of S_{M1} in this standard. The resulting value of the parameter S_{D1} determined by Eq. (11.4-4) shall be used for all applications of S_{D1} in the Standard." **The structural engineer should verify the applicability of this exception and apply the modifications to the applied values of S_{M1} and S_{D1} as per Supplement No. *3,* if warranted.**

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[1] Los Angeles Public Works**.** https://dpw.lacounty.gov/general/wells/#

[2] Historical Aerials. https://www.historicaerials.com/viewer

Based on this exception, the spectral response accelerations presented below were determined using the site coefficients (Fa and Fv) from Tables 1613.2.3(1) and 1613.2.3(2) presented in Section 16.4.4 of the 2022 CBC.

Description	Value
2022 California Building Code Site Classification (CBC)[1]	D[2]
Site Latitude (°N)	34.0084
Site Longitude (°W)	117.9526
S_s Spectral Acceleration for a 0.2-Second Period	1.804
S_1 Spectral Acceleration for a 1-Second Period	0.64
F_a Site Coefficient for a 0.2-Second Period	1.0
F_v Site Coefficient for a 1-Second Period	1.7

1. Seismic site classification in general accordance with the *2022 California Building Code*.
2. The 2022 California Building Code (CBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the 100-foot soil profile determination. Borings were extended to a maximum depth of 51½ feet, and this seismic site class definition considers that similar or denser soils continue below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration.

A site-specific ground motion study may generate less conservative coefficients and acceleration values which may reduce construction costs. We recommend consulting with a structural engineer to evaluate the need for such study and its potential impact on construction costs. Terracon should be contacted if a site-specific ground motion study is desired.

Faulting and Estimated Ground Motions

The site is located in the southern California, 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. As calculated using the USGS Unified Hazard Tool, the Whittier Alt, which is considered to have the most significant effect at the site from a design standpoint, has a maximum credible earthquake magnitude of 6.56 and is located approximately 3 miles (4.83 kilometers) from the site.

Based on the USGS Design Maps Summary Report, using the American Society of Civil Engineers (ASCE 7-16) standard, the peak ground acceleration (PGA_M) at the project site is expected to be 0.854g. Furthermore, the site is not located within an Alquist-Priolo Earthquake Fault Zone based on our review of the State Fault Hazard Maps.[3]

Storm Water Management

Three in-situ percolation tests (falling-head borehole permeability) at boring locations P-1 through P-3, were performed at approximate depths between 5 and 10 feet bgs (see table below for depths).

The objective of the testing is to provide infiltration rates to support design of stormwater infiltration systems. Test was performed in by placing a 2-inch thick layer of 3/4-inch gravel in the bottom of each boring after completion of drilling. Three-inch diameter perforated pipes were installed on top of the gravel layer and 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.

Test Location	Boring Depth (ft.)[1]	Test Depth Range (ft.) [1]	Soil Type	Percolation Rate (in./hr.)	Infiltration Rate (in./hr.) [2]
P-1	10	5 to 10	CL/ML[3]	1.0	0.1
P-2	5	0 to 5	CL	0.7	<0.1
P-3	10	5 to 10	CL	2.3	0.1

1. Below existing ground surface.

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[3] California Geological Survey. https://maps.conservation.ca.gov/cgs/informationwarehouse.

Test Location	Boring Depth (ft.)[1]	Test Depth Range (ft.) [1]	Soil Type	Percolation Rate (in./hr.)	Infiltration Rate (in./hr.) [2]

2. If the proposed infiltration system will mainly rely on vertical downward seepage, the calculated infiltration rates should be used. Calculation was based on the Los Angeles County methods.
3. Material transition at the depth tested, see boring logs.

The above infiltration rates determined by the percolation test method are based on field test results utilizing clear water. Infiltration rates can be affected by silt buildup, debris, degree of soil saturation, site variability and other factors. The rate obtained at specific location and depth is representative of the location and depth tested and may not be representative of the entire site. 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 field test results are not intended to be design rates. They represent the result of our tests at the depths and locations indicated. The design rate should be determined by the designer by applying an appropriate factor of safety. Based on the County of Los Angeles Department of Public Works GS200.1 document, the following reduction factors are recommended:

LA County Reduction Factor	Value
RF_t	1
RF_v	1
RF_s	2[1]
RF, Total Reduction Factor $RF=RF_t + RF_v + RF_s$	4

1. This factor may be used if stormwater will be clear and filtered of silts and sediments prior to infiltration. We recommend the designer confirm this Reduction Factor.

Percolation and infiltration rates can be affected by silt buildup, debris, degree of soil saturation, site variability and other factors. The rate obtained at specific location and depth is representative of the location and depth tested and may not be representative of the entire site. 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.

With time, the bottoms of infiltration systems tend to plug with organics, sediments, and other debris. Satisfactory long-term performance of an infiltration facility will require some degree of maintenance to remove these deleterious materials to help reduce decreases in actual percolation rates. Accumulations of sediment, organic materials, or other material that serve to reduce their permeability of the receptor soils should be removed from the filtration system on a regular basis so as not to enter the retention system. The filtration system shall have a rigorous maintenance program, debris from the filtration maintenance should be disposed of at an approved facility in accordance with applicable regulations.

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 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 stormwater capture system. The design of the stormwater capture system should account for the presence of these materials and should incorporate structures/devices to remove these deleterious materials.

Infiltration testing should be performed after construction of the stormwater capture 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.

Operation of heavy equipment during construction may densify the receptor soils below the infiltration facility. The soils exposed in the bottom of the infiltration facility should not be compacted and should remain in their native condition. This may require scarification of the soils prior to construction.

Liquefaction

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. Liquefaction is typically a hazard where loose sandy soils exist below groundwater. The California Geological Survey (CGS) has designated certain areas as potential liquefaction hazard zones. These are areas considered at a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of a relatively shallow water table. The project site has been mapped and is located within a liquefaction hazard zone as designated by the California Geological Survey (CGS).

Seismic Settlement

Our explorations indicate the native soils encountered in exploratory borings generally consisted of very stiff to hard lean clay with sand, very stiff to hard sandy silt, and medium dense to dense silty sand at a maximum exploration depth of 51½ feet bgs.

To evaluate the presence of liquefiable soils and determine the amount of settlement of saturated/unsaturated soils during seismic shaking, we performed liquefaction analysis in accordance with the Los Angeles County guidelines.

Groundwater was encountered in borings B-2, B-3, and B-4 at depths ranging from 23 to 27 feet bgs while drilling. Historic high groundwater levels were recorded at approximately 12 feet bgs.

We utilized the software "LiquefyPro" by CivilTech Software, using soil dated from boring B-2. A Peak Ground Acceleration (PGA_M) of 0.854g and assumed a magnitude of 6.77 for the 2% chance of exceedance over 50 years for the project site were used. Settlement analysis used the Tokimatsu, M-correction method. The fines percentage were corrected for liquefaction using the Modify Stark/Olson method. For this analysis a groundwater depth of 12 feet has been utilized.

Based on the calculation results from B-2, the seismically induced settlement is estimated to be approximately 1 inch.

Results and calculations for the liquefaction analysis are included in the **Supporting Documents** section of this report.

Corrosivity

The table below lists the results of laboratory soluble sulfate, soluble chloride, electrical resistivity, and pH testing. The 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.

Corrosivity Test Results Summary

Boring	Sample Depth (feet)	Soluble Sulfate (%)	Sulfides (ppm)	Chloride (%)	Red-Ox Potential (mV)	Electrical Resistivity (Ω-cm)	Total Salts (ppm)	pH
B-3	1-5	0.0003	<0.001	0.0001	+122	2,300	188	7.26

Results of soluble sulfate testing indicate samples of the on-site soils tested possess negligible sulfate concentrations when classified in accordance with Table 19.3.1.1 of the ACI Design Manual. Concrete should be designed in accordance with the exposure class S0 provisions of the ACI Design Manual, Section 318, Chapter 19.

Electrical Resistivity Testing

Terracon performed field measurements of soil electrical resistivity for the support of grounding design. Soil resistivity data was obtained from two test arrays at two (2) locations in the proposed project site. The approximate location of the tests are shown in the **Exploration Plan**. The testing was performed in general accordance with Wenner Array (4-pin) method per ASTM G57. This method was performed in with IEEE Standard 81, IEEE Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Ground System. The tests in the proposed locations included perpendicular arrays with "a" spacings 1, 2, 3, 6, 10, 18, 30, 40, 50, 70 and 100, 150 feet. However, multiple spacings were omitted due to site constraints from nearby buildings and walls and overhead transmission lines interfering with tests. The "a" spacing is generally considered to be the depth of influence of the test. The electrical resistivity test results are presented in **Exploration Results**.

Thermal Resistivity Testing

Terracon subcontracted Geotherm USA to perform laboratory thermal resistivity testing. Testing was conducted on one (1) bulk sample at the project site from a depth of 0.5 to 5 feet bgs within the proposed BESS area. The tests were conducted on soil samples remolded to 85% and 95% (as determined by ASTM D1557) of the material's maximum dry density for a total of two (2) tests. Dry out curves targeted the higher of either the in-situ moisture content of the optimum moisture content as determined by ASTM D1557, totally dry condition, and two intermediate points. The results are in the **Exploration Results** section of this report.

Geotechnical Overview

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

The subsurface materials generally consisted of very stiff to hard clay and silts with varying amounts of sand, and medium dense to dense sand with varying amounts of silt extending to the maximum depth of the borings. Groundwater was encountered in borings B-2, B-3 and B-4 at approximately 23 to 27 feet bgs.

The proposed battery energy storage system (BESS) units and other appurtenant electrical equipment can be supported by **Shallow Foundations** (spread footings or mats) bearing on prepared native soils. Alternatively, **Deep Foundations** consisting of drilled shafts can also be used for foundations.

Geotechnical engineering recommendations for foundation systems and other earth connected phases of the project are outlined below. The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

The following presents recommendations for site preparation, excavation, subgrade preparation, and placement of engineered fills on the project. The recommendations presented for the design and construction of foundations are contingent upon following the recommendations outlined in this section.

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 of bearing soils, and other geotechnical conditions exposed during construction of the project.

Site Preparation

Demolition of the existing building should include complete removal of all foundation systems, floor slabs 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.

Prior to placing fill, existing pavement, debris, and other deleterious materials should be removed from proposed foundation and roadway areas. Exposed surfaces within these areas 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 structures.

In the event the contractor desires to crush on-site pavements and concrete and use these materials as engineered fill, the crushed materials should be evaluated and tested for compliance with the requirements and specifications of the State of California Department of Transportation, or other approved local governing specifications.

Although no evidence of fills, utilities, or underground facilities such as septic tanks, cesspools, basements, and utilities was observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills, utilities, 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 proposed structures may be supported by a shallow foundations (spread footings or mats) or on drilled shafts.

Where shallow foundations are used, following excavation to footing depth the exposed subgrades should be scarified to a minimum depth of 12 inches, moisture conditioned, and compacted. The moisture content and compaction of subgrade soils should be maintained until foundation construction.

Where deep foundations are used, no additional site preparation in necessary.

All exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 12 inches, moisture conditioned as necessary, and compacted per the compaction requirements in this report. Compacted structural fill soils should then be placed to the proposed design grade and the moisture content and compaction of subgrade soils should be maintained until foundation or pavement construction.

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

We anticipate 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.

Prior to the construction phase of the project, additional evaluation of groundwater and fluctuations in groundwater levels should be performed. Depending upon the depth of excavation and seasonal conditions, groundwater may be encountered within the excavations planned on the site.

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 and Placement

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

Onsite soils are suitable for reuse as engineered fill beneath proposed mat foundations and pavements.

Imported soils for use as fill material within proposed structure areas should conform to low volume change materials as indicated in the following specifications:

Percent Finer by Weight

Gradation	**(ASTM C 136)**
3″	100
No. 4 Sieve	50-100
No. 200 Sieve	40(max)

- Liquid Limit .... 30 (max)
- Plasticity Index .... 10 (max)
- Maximum Expansion Index* .... 20 (max)

*ASTM D4829

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.

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**
Approved on-site or imported fill soils:			
Beneath foundations:	90%	0%	+4%
Utility trenches (pavement and structural areas)[1]:	90%	0%	+4%
Fill greater than 5 feet in depth:	95%	0%	+4%
Exterior Slabs:	90%	0%	+4%
Miscellaneous backfill:	90%	0%	+4%
Aggregate base:	95%	0%	+4%

1. Upper 12 inches should be compacted to 95% within pavement and structural areas. Low-volume change imported soils should be used in lightly loaded equipment areas.

Utility Trench Backfill

We anticipate 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.

Trench excavation should not be conducted below a downward 1:1 projection from existing foundations without engineering review of shoring requirements and geotechnical observation during construction.

A non-expansive granular material with a sand equivalent greater than 30 should be used for bedding and shading of utilities, unless allowed or specified otherwise by the utility manufacturer.

On-site materials are considered suitable for backfill of utility and pipe trenches from 1 foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances. Imported low volume change soils should be used for trench backfill in structural areas.

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 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

All grades must provide effective drainage away from the proposed structure during and after construction and should be maintained throughout the life of the structure. Water retained next to the structures result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential foundation movements, cracked slabs and walls.

Backfill against footings and in utility trenches should be well compacted and structure 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 structure and the high-water elevation of the nearest storm-water retention basin.

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:

- exterior slabs should be supported directly on subgrade fill (not ABC) with no, or very low expansion potential;
- strict moisture-density control during placement of subgrade fills;
- maintain proper subgrade moisture until placement of slabs;

- placement of effective control joints on relatively close centers and isolation joints between slabs and other structural elements;
- provision for adequate drainage in areas adjoining the slabs;
- use of designs which allow vertical movement between the exterior slabs and adjoining structural elements.

Earthwork Construction Considerations

Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of roadways. Construction traffic over the completed subgrades 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. Water collecting over or adjacent to construction areas should be removed. If the subgrade desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to roadway construction.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

On-site clay soils may 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 will 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.

The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. Excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current Occupational Safety and Health Administration (OSHA) excavation and trench safety standards.

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, as recommended 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 structure areas and 5,000 square feet in surrounding pavement areas. Where not specified by local ordinance, one density and water content test should be performed for every 50 linear feet of compacted utility trench backfill. This testing frequency criteria may be adjusted during construction as specified by the geotechnical engineer of record.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, 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

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

Shallow Foundation Design Recommendations

Item	Description
Foundation System	Spread footings, mat foundations

Item	Description
Maximum Net Allowable Bearing Pressure [1, 2]	Spread Footings: 3,000 psf Mat Foundations: 2,000 psf
Required Bearing Stratum [3]	Properly prepared native subgrades
Minimum Embedment Below Finished Grade	18 inches
Minimum Dimensions	Square footings and mats: 24 inches Strip footings: 18 inches
Maximum Dimensions [3]	Square footings: 15 feet Mat foundations 12 feet wide by 40 feet long
Estimated Total Settlement from Structural Loads [3]	About 1 inch
Estimated Differential Settlement	About 1/2 of total settlement over a horizontal distance of 40 feet

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. These bearing pressures can be increased by 1/3 for transient loads unless those loads have been factored to account for transient conditions.
2. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in **Earthwork**.
3. Maximum footing/mat dimensions controlled by settlement of 1 inch or less; larger foundations can be used but will have higher settlements.

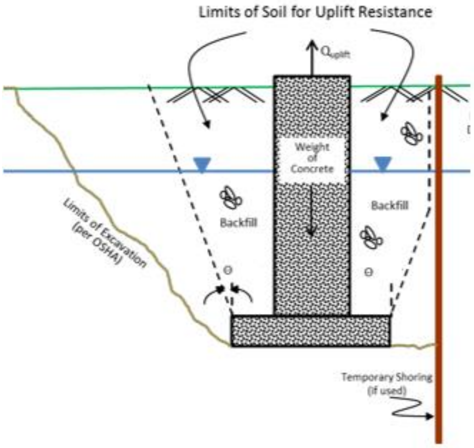
Finished grade is defined as the lowest adjacent grade within five feet of the foundation for perimeter (or exterior) footings.

The allowable foundation bearing pressure applies to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions. The weight of foundation concrete below grade may be neglected in dead load computations.

Foundation should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. Foundation excavations should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendation will be required.

Design Parameters – Overturning and Uplift Loads

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils. As illustrated on the subsequent figure, the effective weight of the soil prism defined by diagonal planes extending up from the top of the perimeter of the foundation to the ground surface at an angle, θ, of 20 degrees from the vertical can be included in uplift resistance. The maximum allowable uplift capacity should be taken as a sum of the effective weight of soil plus the dead weight of the foundation, divided by an appropriate factor of safety. A maximum total unit weight of 120 pcf should be used for the backfill.



Foundations subject to overturning loads should be sized to maintain the entire foundation area in contact with the bearing surface during the load event. This condition requires that the load eccentricity be maintained in the central third of the foundation (e.g., e < b/6), and may require foundation widening or additional foundation weight beyond that provided by proportioning for uplift alone.

Foundation Construction Considerations

Finished grade is defined as the lowest adjacent grade within five feet of the foundation for perimeter (or exterior) footings.

The allowable foundation bearing pressure applies to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Foundations should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. Foundation excavations should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

Lateral Earth Pressures

Design Parameters

For engineered fill comprised of on-site soils or imported low volume change materials above any free water surface, recommended equivalent fluid pressure of unrestrained foundation elements are:

Item	Recommended Value
Active Case	45 psf/ft
Passive Case	330 psf/ft
At-Rest Case	65 psf/ft
Ultimate Coefficient of Sliding Friction	0.30

1. The values are based on onsite soils used as backfill.
2. Uniform, horizontal backfill, compacted to at least 90% of the ASTM D 1557 maximum dry density, rendering a maximum
3. Use of passive earth pressures require the sides of the excavation for the foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the foundation forms be removed and compacted engineered fill be placed against the vertical foundation face
4. 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.
5. Passive pressure and sliding friction may be combined to resist sliding provided that either the passive pressure or frictional resistance is reduced by 50 percent.

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if such conditions are to be included in the design.

Fill against foundation walls should be compacted to densities specified in the Earthwork section of this report. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers of other lightweight compactors.

Deep Foundations

Drilled Shaft Design Recommendations

Proposed structures may be supported on drilled shafts. Total required embedment of the drilled shaft should be determined by the structural engineer based on structural loading and parameters provided in this report.

Drilled Shaft Axial Loading

Due to the presence of liquefiable soils between depths of about 35 feet and 45 feet below existing ground surface, drilled piers should not extend below a depth of 30 feet bgs

Allowable skin friction and total capacity charts are attached to our **Supporting Information** section at the end of this report. The values presented for allowable side friction and end bearing include a factor of safety of 2.5.

Drilled piers should have a minimum (center-to-center) spacing of three diameters. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of individual piers in a group versus the capacity calculated using the perimeter and base of the pier group acting as a unit. The lesser of the two capacities should be used in design.

The allowable uplift capacities should only be based on the side friction of the shaft; however, the weight of the foundation should be added to these values to obtain the actual allowable uplift capacities for drilled shafts. Tensile reinforcement should extend to the bottom of shafts subjected to uplift loading.

Drilled Shaft Lateral Loading

Based on our review of the subsurface conditions in the area of the BESS, our laboratory testing, and the Standard Penetration Test (SPT) results, engineering properties have been estimated for the soils conditions as shown in the following table. Due to potential for disturbance within the upper soils around the shaft, lateral and axial capacity of soils within the upper 2 feet should be neglected.

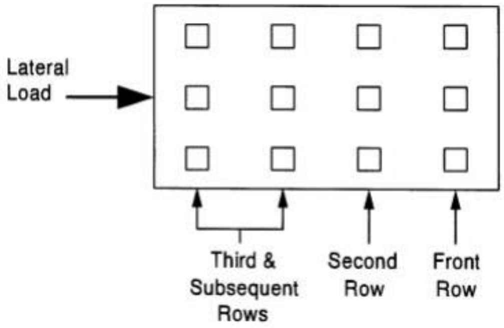
Recommended geotechnical parameters for lateral load analyses by others of drilled shaft foundations have been developed for use in the LPILE computer program. The following table summarizes input values for use in LPILE analyses. LPILE estimated values of k_h may be used. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

Stratigraphy[1]		L-Pile Soil Model	ϕ[2]	Cohesion (psf)	γ′ (pcf)[2]
Layer	Depth Below Finished Grade (feet)				
1	2 5	Stiff Clay w/o Water	--	4,000	125
2	5 10	Stiff Clay w/o Water	--	3,100	125
3	10 25	Stiff Clay w/o Water	--	3,800	125
4	25 30	Sand	34	--	58
5	30 35	Stiff Clay w/o Water	--	4,200	58

1. See Subsurface Profile in **Geotechnical Characterization** for more details on Stratigraphy.
2. Definition of Terms:
   ϕ: Internal friction angle
   γ′: Effective unit weight
3. Default K and E_{50} values may be utilized.
4. Design groundwater table at 26.4 feet

The load capacities provided herein are based on the stresses induced in the supporting soil strata. The structural capacity of the shafts/piles should be checked to assure they can safely accommodate the combined stresses induced by axial and lateral forces. Lateral deflections of shafts/piles should be evaluated using an appropriate analysis method, and will depend upon the pile's diameter, length, configuration, stiffness and "fixed head" or "free head" condition. We can provide additional analyses and estimates of lateral deflections for specific loading conditions upon request. The load-carrying capacity of shafts/piles may be increased by increasing the diameter and/or length.

When piers are used in groups, the lateral capacities of the piers in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent pier. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pier foundations within a pier group are as follows:



1. Front row: Pm = 0.8
2. Second row: Pm = 0.4
3. Third and subsequent row: Pm= 0.3

For the case of a single row of piers supporting a laterally loaded grade beam, group action for lateral resistance of piers would need to be considered when spacing is less than five pier diameters (measured center-to-center). However, spacing closer than 3D (where D is the diameter of the pier) is not recommended due to the potential for the installation of a new pier disturbing an adjacent installed pier, likely resulting in axial capacity reduction.

Drilled Shaft Construction Considerations

Drilling to design depths should be possible with conventional single flight power augers. Due to sandy lean clay soils, temporary casing is not anticipated to be required during shaft excavation to approximate depth of 10 feet bgs. Temporary steel casing will likely be required to depths greater than 10 feet extending into silt soils to properly drill and clean shafts prior to concrete placement. If shafts extend below the depth of groundwater, a tremie should be used for concrete placement.

Drilled shaft foundation concrete should be placed immediately after completion of drilling and cleaning. Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes.

In the event drilled hole walls slough during drilling, temporary steel casing may be required to properly drilled shafts prior to concrete placement. We recommend the use of slurry drilling methods with polymers method to keep the solids in suspension during the drilling. Drilled shaft foundation concrete should be placed within 6 inches of the shaft base of the slurry-filled excavation immediately after completion of drilling and cleaning. The tremie should remain inserted several feet into the fresh concrete as it displaces the slurry upward and until placement is complete. The slurry should have a sand content no greater than 1% at the time concrete placement commences. The maximum unit weight of the slurry should be established in consultation with Terracon.

If casing is used for drilled shaft construction, it should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or the creation of voids in shaft concrete. Shaft concrete should have a relatively high fluidity when placed in cased shaft holes or through a tremie. Shaft concrete with slump in the range of 6 to 8 inches is recommended.

Foundation concrete should be placed immediately after completion of drilling and cleaning. Closely spaced shafts should be drilled and filled alternatively, allowing the concrete to set at least eight hours before drilling the adjacent shaft. All excavations should be filled with concrete as soon after drilling as possible. In no event should shaft holes be left open overnight.

Formation of mushrooms or enlargements at the tops of shafts should be avoided during shaft drilling. If mushrooms develop at the tops of the shafts during drilling, sono-tubes should be placed at the shaft tops to help isolate the shafts.

Free-fall concrete placement in drilled piers will only be acceptable if provisions are taken to avoid striking the concrete on the sides of the hole or reinforcing steel. The use of a bottom-dump hopper, or an “elephant's trunk” discharging near the bottom of the hole where concrete segregation will be minimized, is recommended.

We recommend that all drilled shaft installations be observed on a full-time basis by an experienced geotechnical engineer in order to evaluate that the soils encountered are consistent with the recommended design parameters. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required. The Geotechnical Engineer should observe the installation of drilled piers to verify the soil conditions and the diameter and depth of piers. Drilled piers should be constructed true and plumb.

Drilled pier end bearing surfaces must be thoroughly cleaned prior to concrete placement. A representative of the Geotechnical Engineer should inspect the bearing surface and foundation pier configuration. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

Gravel-Surfaced Drives and Parking

Roadway designs are provided for the traffic conditions and pavement life conditions as noted in the **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Roadway sections noted in this section are contingent upon the site being adequately prepared. Additionally, our recommendations are based on Chapter 4 Low-Volume Road Design found in AASHTO 1993.

Roadway Subgrades

For this analysis, an assumed CBR value of 3 for sandy lean clay was used.

Design Parameters

We understand unpaved access roads are planned throughout the site. The unpaved road sections for post-construction use have been developed under the following assumptions:

Aggregate Roadway Design Parameters

Parameter	Design Value	Comments
Traffic Loading	5,000 ESALs [1]	Assumed
Design Life	30 years	Assumed
Design CBR	3	Assumed
Resilient Modulus	5,100 psi (all-weather)	Based on CBR of 3
Aggregate Base Elastic Modulus	36,000 psi	Assumed
Allowable Rut Depth	2.0 inches	Assumed
Design Serviceability Loss	2.5	Assumed
Vehicle Tire Pressure	80 psi	Assumed

1. ESAL = 18 kips Equivalent Single Axle Load

Access Road Sections

As a minimum, we recommend the following options for unpaved access roads:

Typical Unpaved Road Section – Post Construction Traffic	
Base Course Thickness (inches)	**Traffic (ESALs)**
5[1, 2]	5,000

1. Minimum section thickness is anticipated to support fire trucks and pick-up trucks associated with on-going maintenance. Trucks containing heavy equipment may require localized repairs.
2. Base materials shall consist of Class II Base meeting requirements of the Caltrans Standard Specifications.

Roadway section should be constructed over a minimum of 12 inches of scarified, moisture conditioned, and compacted native soils to 95% of the maximum dry density using ASTM D1557. The recommended thicknesses should be measured after full compaction. The width of the roadway should extend a minimum distance of 1 foot on each side of the desired surface width.

Aggregate materials should conform to the specifications of Class II aggregate base in accordance with the requirements and specifications of the State of California Department of Transportation (Caltrans), or other approved local governing specifications.

Positive drainage should be provided during construction and maintained throughout the life of the roadways. Proposed roadway design should maintain the integrity of the road and eliminate ponding.

Roadway Design and Construction Considerations

Regardless of the design, un-surfaced roadways will display varying levels of wear and deterioration. We recommend an implementation of a site inspection program at a frequency of at least once per year to verify the adequacy of the roadways. Preventative measures should be applied as needed for erosion control and re-grading. An initial site inspection should be completed approximately three months following construction.

Preventative maintenance should be planned and provided for through an on-going management program to enhance future roadway performance. Preventative maintenance activities are intended to slow the rate of deterioration, and to preserve the roadway investment.

Surfacing materials should not be placed when the surface is wet. Surface drainage should be provided away from the edge of roadways to reduce lateral moisture transmission into the subgrade.

If rut depths become excessive as construction work progresses, re-grading and re-compaction should be performed as necessary. Care should be taken to reduce or eliminate trafficking of the unpaved access road when the subgrade is wet as this will result in accelerated rutting conditions. Scarification, moisture treatment as necessary, and re-compaction of the roadways will likely be necessary as the roadways deteriorate.

Materials and construction of roadways for the project should be in accordance with the requirements and specifications of the California Department of Transportation or the applicable local governing body.

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. 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 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 effect 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. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. 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.

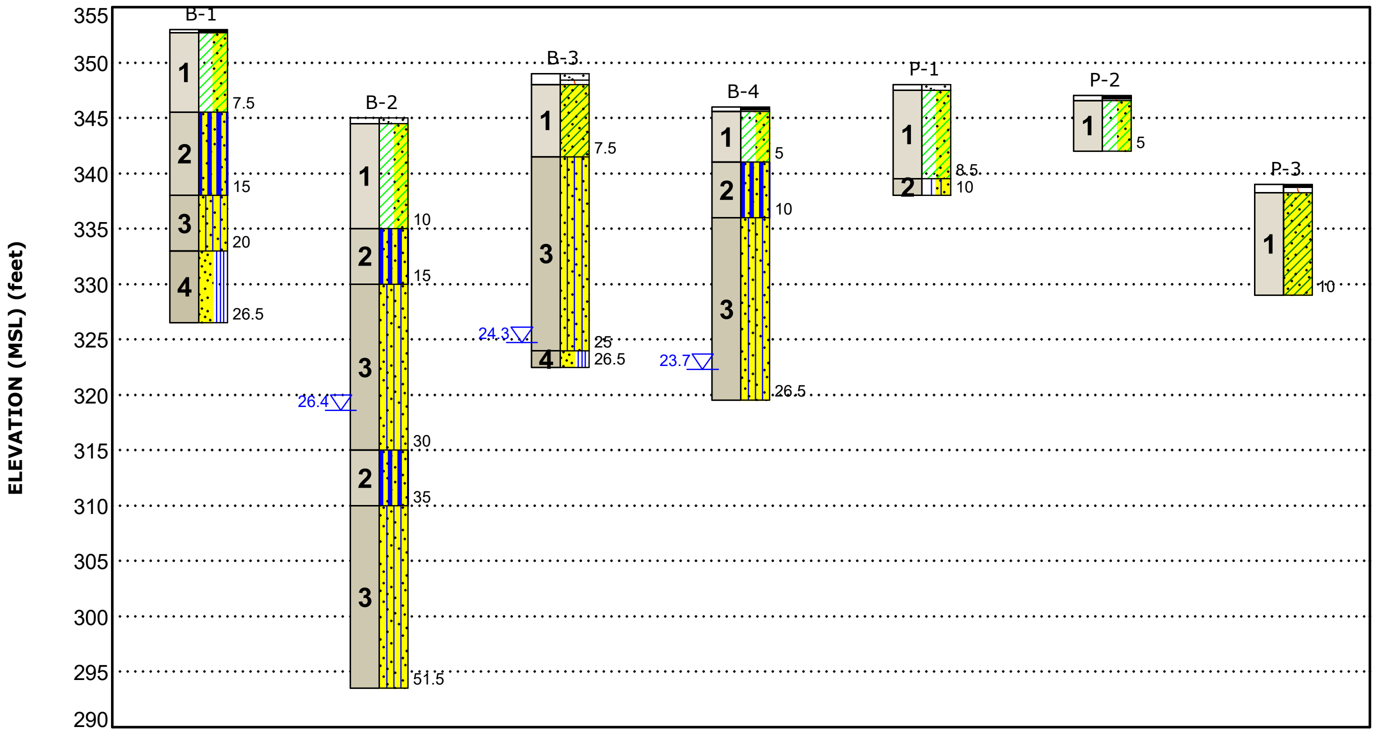
Figures

Contents:

ABI Properties BESS
Gale Ave and Ward Way | City of Industry, CA
Terracon Project No. LA245225

145 W Walnut St
Carson, CA

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	LEAN CLAY WITH SAND/SANDY LEAN CLAY	Very stiff to hard clay with varying amounts of sand
2	SANDY SILT/SILT WITH SAND	Very stiff to hard silt with varying amounts of sand
3	SILTY SAND	Medium dense to very dense sand with varying amounts of sand
4	POORLY GRADED SAND WITH SILT	Medium dense to very dense sand with varying amounts of silt

Legend

- ■ Asphalt
- ▨ Sandy Silt
- ▨ Poorly-graded Sand with Silt
- ▨ Aggregate Base Course
- ▨ Silt with Sand
- ▨ Lean Clay with Sand
- ▨ Silty Sand
- ▨ Concrete
- ▨ Sandy Lean Clay

▽ First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
3	26.5	Proposed BESS Area
1	51.5	Proposed BESS Area
3	5 to 10	Proposed BESS Area

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were estimated using Google Earth. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a truck-mounted drill rig using continuous hollow stem flight. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. Test samples were collected during drilling in general accordance with the appropriate ASTM methods using Standard Penetration Testing (SPT) and sampling using either standard split-spoon or Modified California samplers. A sampling spoon was driven into the ground by a 140 pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18 inch penetration was recorded as the Standard Penetration Test (SPT) resistance value, also referred to as N-values. The N-values are indicated on the boring logs at the test depths. The samples were placed in appropriate containers, taken to our soil laboratory for testing, and classified by a geotechnical engineer.

For safety purposes, all borings were backfilled with auger cuttings and grout after their completion.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was encountered in borings B-2, B-3 and B-4.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were 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.

Electrical Resistivity Testing: Soil electrical resistivity data was be obtained in accordance with ASTM G57 Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method. At the test locations, two near perpendicular lines was tested. The tests in the proposed locations included perpendicular arrays with "a" spacings 1, 2, 3, 6, 10, 18, 30, 40, 50, 70 and 100, 150 feet. Spacings 18, 30, 40, 50, 70, 100, and 150 feet were also proposed on the second test (ER-2). However, these spacings were omitted due to site constraints from nearby buildings and walls. Electrode "a" spacings are summarized in the following table. Electrode spacing was adjusted to conform to site conditions.

No. of Test Locations	Electrode "a" Spacing (feet) [1]	Planned Location
2	1, 2, 3, 6, 10, 18, 30, 40, 50, 70 and 100 feet	Proposed BESS Areas

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Dry Unit Weight
- Atterberg Limits
- Modified Proctor
- Swell Consolidation Test
- Direct Shear
- Corrosivity
- Thermal Resistivity

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Note: All attachments are one page unless noted above.

Site Location

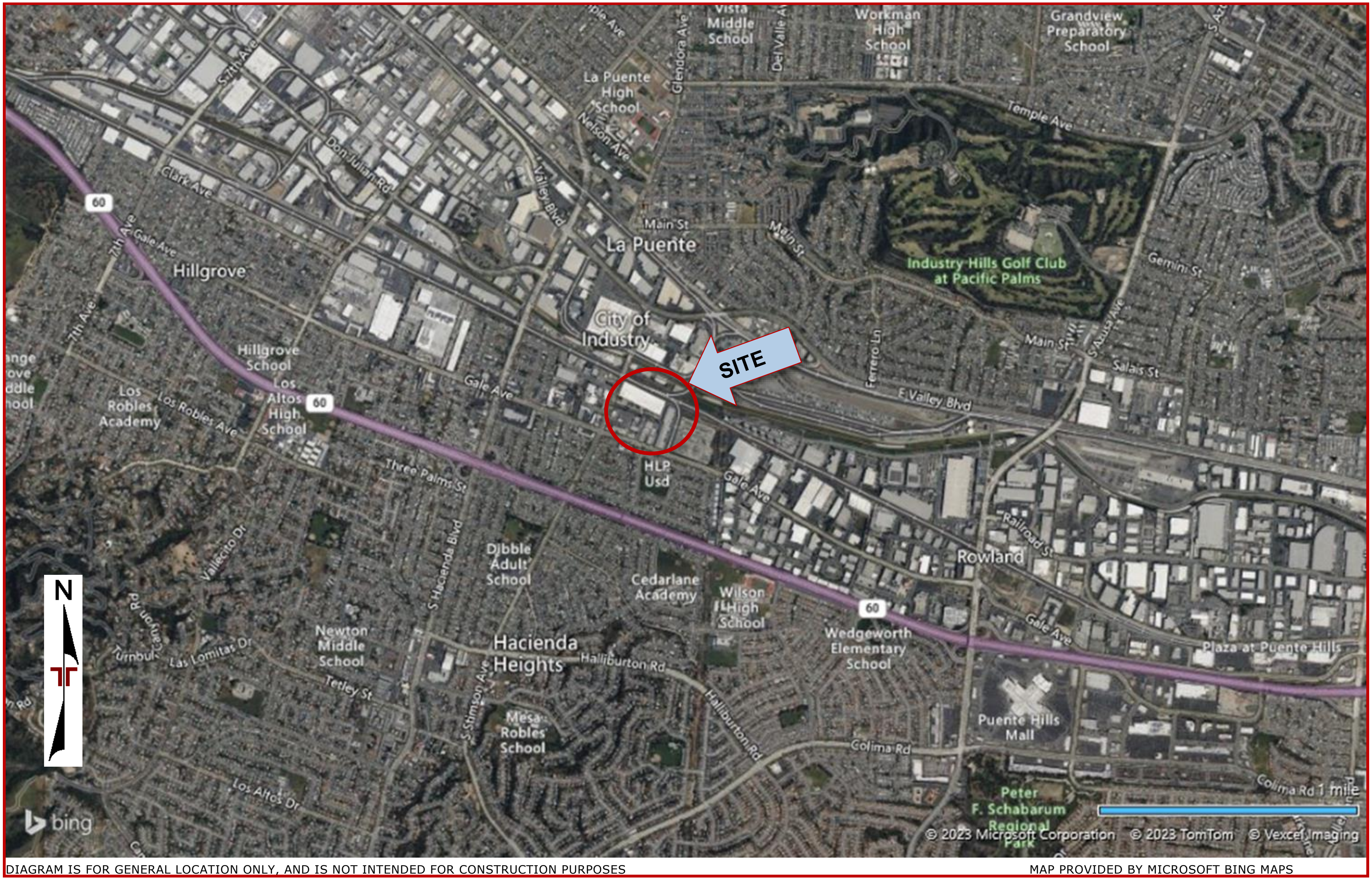


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

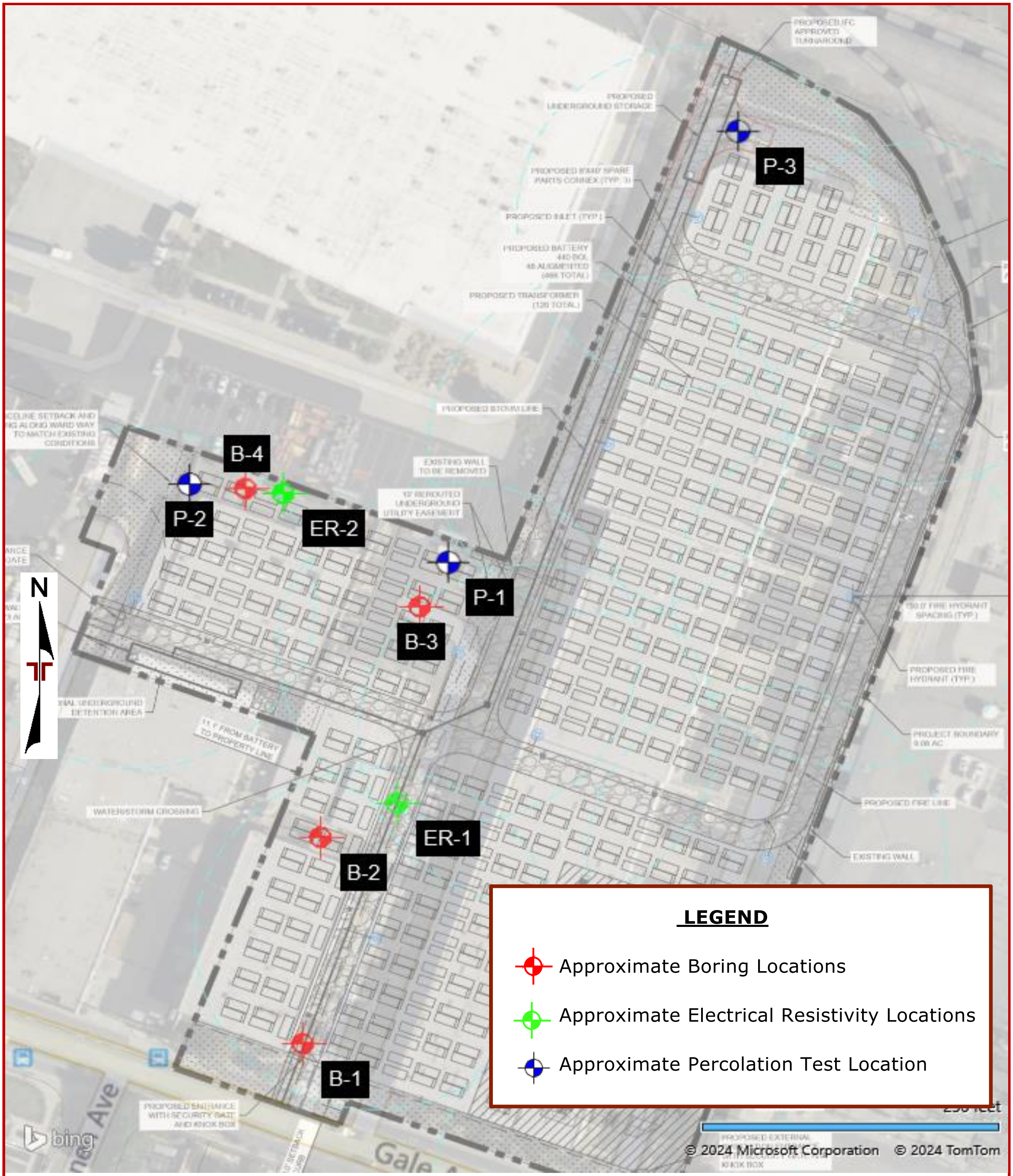


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (B-1 through B-4 and P-1 through P-3)
Atterberg Limits
Compaction Graph
Swell Consolidation Test Graph
Direct Shear Graph
Electrical Resistivity Results

Note: All attachments are one page unless noted above.

Terracon
145 W Walnut St
Carson, CA

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 34.0079° Longitude: -117.9527°

Model Layer	Graphic Log	Depth (Ft.)	Description	Elevation: 353 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test: Test Type	Strength Test: Compressive Strength (tsf)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		0.3	**ASPHALT CONCRETE**, 3.5" thickness	352.7											
1			**LEAN CLAY WITH SAND (CL)**, dark brown											37-18-19	83
			very stiff					11-18-24				15.3	110		
			hard		5			14-23-20				12.7	117		
		7.5		345.5											
2			**SANDY SILT (ML)**, brown, hard					13-27-23				14.2	115	NP	69
					10			18-39-50/5"				13.5	119		
		15.0		338											
3			**SILTY SAND (SM)**, yellowish tan, medium dense		15			7-9-11 N=20							
		20.0		333											
4			**POORLY GRADED SAND WITH SILT (SP-SM)**, reddish gray, medium dense		20			20-26-32				3.9			
					25			13-12-12				4.4			
		26.5		326.5											
			Boring Terminated at 26.5 Feet												

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.

Elevation Reference: Elevations were determined using Google Earth Pro

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
8" Hollow Stem Auger

Abandonment Method
Boring backfilled with Grout
Surface capped with asphalt

Drill Rig
CME 75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
12-26-2024

Boring Completed
12-26-2024

ABI Properties BESS
Gale Ave and Ward Way | City of Industry, CA
Terracon Project No. LA245225

Terracon
145 W Walnut St
Carson, CA

Boring Log No. B-2

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.0084° Longitude: -117.9526° Depth (Ft.) Elevation: 345 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test			Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	Percent Fines
							Test Type	Compressive Strength (tsf)	Strain (%)			LL-PL-PI	
		0.5 **CONCRETE**, 6" thickness 344.5											
1		**LEAN CLAY WITH SAND (CL)**, brown											
		very stiff				10-18-20				16.4	113	39-21-18	80
			5			8-11-18				14.9	115		
		hard				13-19-26				17.2	111		
		10.0 335	10										
2		**SILT WITH SAND (ML)**, brown, very stiff				14-17-19				16.2	108		71
		15.0 330	15										
		SANDY SILT (ML), brown, very stiff				12-14-16 N=30							
			20			9-9-14 N=23							
		25.0 320	25										
3		**SILTY SAND (SM)**, trace gravel, medium dense		∇		10-11-17 N=28							
		30.0 315	30										

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.

Elevation Reference: Elevations were determined using Google Earth Pro

Water Level Observations
∇ While drilling

Drill Rig
CME 75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
12-30-2024

Boring Completed
12-30-2024

Notes

Advancement Method
8" Hollow Stem Auger

Abandonment Method
Boring backfilled with Grout
Surface capped with concrete

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 34.0084° Longitude: -117.9526°

Model Layer	Graphic Log	Depth (Ft.) / Elevation: 345 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test: Test Type	Strength Test: Compressive Strength (tsf)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2	▨	**SANDY SILT (ML)**, olive brown, hard			☒	6-12-22 N=34						NP	66
		35.0 — 310	35										
4	▨	**POORLY GRADED SAND WITH SILT (SP-SM)**, gray, dense			☒	7-14-18 N=32							6
		medium dense	40		☒	7-8-11 N=19							
			45		☒	6-7-11 N=18							10
		47.0 — 298											
1	▨	**SANDY LEAN CLAY (CL)**, olive											
		very stiff	50		☒	7-8-11 N=19							
		51.5 — 293.5											
		Boring Terminated at 51.5 Feet											

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.

Elevation Reference: Elevations were determined using Google Earth Pro

Notes

Water Level Observations
∇ While drilling

Advancement Method
8" Hollow Stem Auger

Abandonment Method
Boring backfilled with Grout
Surface capped with concrete

Drill Rig
CME 75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
12-30-2024

Boring Completed
12-30-2024

ABI Properties BESS
Gale Ave and Ward Way | City of Industry, CA
Terracon Project No. LA245225

Terracon
145 W Walnut St
Carson, CA

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 34.0090° Longitude: -117.9523°

Elevation: 349 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Description	Elevation	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test Test Type	Compressive Strength (tsf)	Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		0.6	**CONCRETE**, 7" thickness	348.42											
		1.0	**AGGREGATE BASE COURSE**, 5" thickness	348											
1			**SANDY LEAN CLAY (CL)**, brown												
			stiff				⧗	4-7-11				14.8	115		53
			very stiff		5		⧗	4-9-11				12.7	115	36-20-16	61
		7.5		341.5											
3			**SILTY SAND (SM)**, brown, medium dense				⧗	7-13-22				15.5	109		
					10		⧗	7-14-16				11.2	107		
			dense		15		☒	7-15-15 N=30							
					20		☒	18-20-16 N=36							
						▽									
		25.0		324											
4			**POORLY GRADED SAND WITH SILT (SP-SM)**, brownish gray, very dense		25		☒	23-26-29 N=55							
		26.5		322.5											
			Boring Terminated at 26.5 Feet												

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.

Elevation Reference: Elevations were determined using Google Earth Pro

Water Level Observations
▽ While drilling

Drill Rig
CME75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
12-27-2024

Boring Completed
12-27-2024

Notes

Advancement Method
8" Hollow Stem Auger

Abandonment Method
Boring backfilled with Grout
Surface capped with concrete

Terracon
145 W Walnut St
Carson, CA

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 34.0093° Longitude: -117.9528°

Depth (Ft.) Elevation: 346 (Ft.)

Model Layer	Depth (Ft.)	Material Description	Elevation (Ft.)	Depth (Ft.)	Water Level Observations	Field Test Results	Test Type	Compressive Strength (tsf)	Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	0.3	**ASPHALT CONCRETE**, 3" thickness	345.75										
	0.4	**AGGREGATE BASE COURSE**, 2" thickness	345.58										
1		**LEAN CLAY WITH SAND (CL)**, dark brown very stiff				5-8-15				17.8	107	33-17-16	82
	5.0		341	5									
2		**SANDY SILT (ML)**, brown, very stiff				6-10-15				14.1	117	25-22-3	63
						6-11-15				13.9	110		
	10.0		336	10									
3		**SILTY SAND (SM)**, brown, medium dense				13-19-22				8.0	99		
		dense		15		7-8-26 N=34							
		brown, medium dense		20		8-9-32				5.2			
					▽								
		brownish gray		25		8-15-20				10.6			
	26.5		319.5										
		Boring Terminated at 26.5 Feet											

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.

Elevation Reference: Elevations were determined using Google Earth Pro

Notes

Water Level Observations
▽ While drilling

Advancement Method
8" Hollow Stem Auger

Abandonment Method
Boring backfilled with Grout
Surface capped with asphalt

Drill Rig
GT-8

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
12-26-2024

Boring Completed
12-26-2024

Boring Log No. P-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.0091° Longitude: -117.9523° Depth (Ft.) Elevation: 348 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test			Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	Percent Fines
							Test Type	Compressive Strength (tsf)	Strain (%)			LL-PL-PI	
		0.5 **CONCRETE**, 6" thickness 347.5											
1		**LEAN CLAY WITH SAND (CL)**, brown 8.5 339.5	5										
2		**SANDY SILT (ML)**, brown, very stiff 10.0 338	10			11-15-15				16.6	108	31-23-8	70
		Boring Terminated at 10 Feet											

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.

Elevation Reference: Elevations were determined using Google Earth Pro

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
8" Hollow Stem Auger

Abandonment Method
Boring backfilled with Grout
Surface capped with asphalt

Drill Rig
CME 75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
12-26-2024

Boring Completed
12-26-2024

Boring Log No. P-2

Location: See Exploration Plan

Latitude: 34.0093° Longitude: -117.9530°

Model Layer	Graphic Log	Depth (Ft.)		Elevation: 347 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test Test Type	 Compressive Strength (tsf)	 Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		0.3	**ASPHALT CONCRETE**, 3" thickness	346.75											
		0.4	**AGGREGATE BASE COURSE**, 2" thickness	346.58											
1			**LEAN CLAY WITH SAND (CL)**, black											33-18-15	73
		5.0	very stiff	342	5			4-11-13				16.7	112		
			Boring Terminated at 5 Feet												

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.

Elevation Reference: Elevations were determined using Google Earth Pro

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8" Hollow Stem Auger

Abandonment Method
Boring backfilled with Grout
Surface capped with asphalt

Drill Rig
CME 75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
12-26-2024

Boring Completed
12-26-2024

Boring Log No. P-3

Location: See Exploration Plan

Latitude: 34.0102° Longitude: -117.9515°

Model Layer	Graphic Log	Depth (Ft.)	Description	Elevation: 339 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test Test Type	Strength Test Compressive Strength (tsf)	Strength Test Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.3	**ASPHALT CONCRETE**, 3" thickness	338.75											
		0.8	**AGGREGATE BASE COURSE**, 6" thickness	338.25											
			SANDY LEAN CLAY (CL), black												
					5									31-17-14	67.2
			brown, stiff					6-8-12				16.2	104		
		10.0		329	10										
			Boring Terminated at 10 Feet												

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.

Elevation Reference: Elevations were determined using Google Earth Pro

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8" Hollow Stem Auger

Abandonment Method
Boring backfilled with Grout
Surface capped with concrete

Drill Rig
CME 75

Hammer Type
Automatic

Driller
2R Drilling

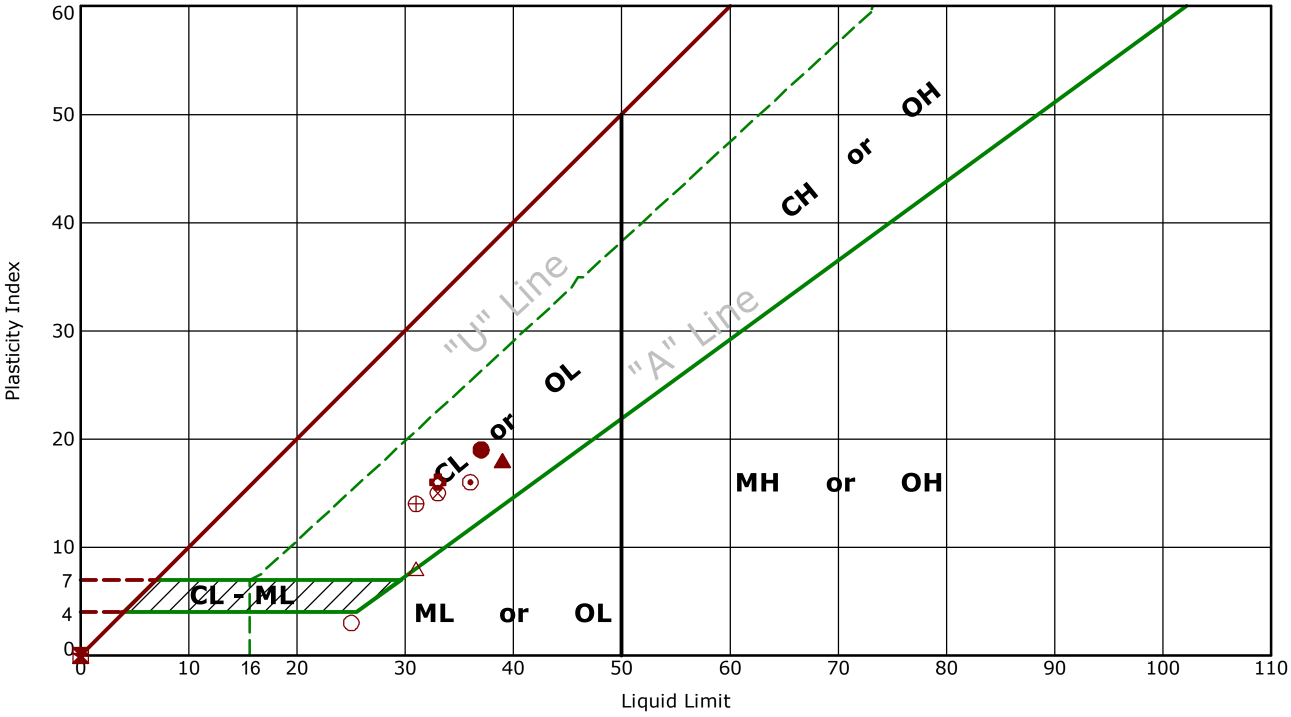
Logged by
GA

Boring Started
12-26-2024

Boring Completed
12-26-2024

Atterberg Limit Results

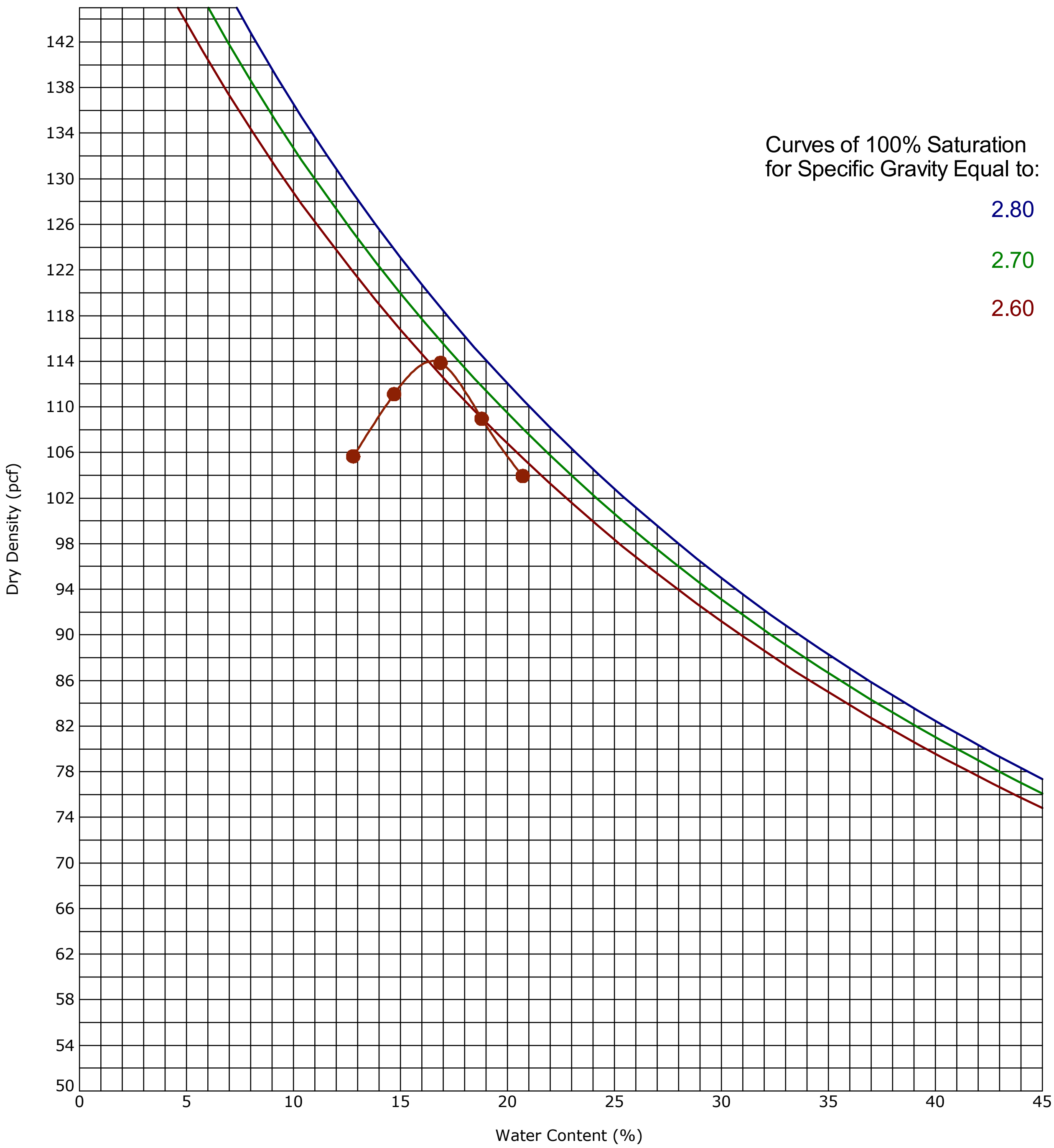
ASTM D4318



	Boring ID	Depth (Ft)	LL	PL	PI	Fines	USCS	Description
●	B-1	0.3 - 5	37	18	19	83.0	CL	LEAN CLAY with SAND
⊠	B-1	7.5 - 9	NP	NP	NP	69.8	ML	SANDY SILT
▲	B-2	2.5 - 4	39	21	18	80.9	CL	LEAN CLAY with SAND
★	B-2	30 - 31.5	NP	NP	NP	66.5	ML	SANDY SILT
⊙	B-3	5 - 6.5	36	20	16	61.6	CL	SANDY LEAN CLAY
✚	B-4	0.4 - 5	33	17	16	82.3	CL	LEAN CLAY with SAND
○	B-4	5 - 6.5	25	22	3	63.2	ML	SANDY SILT
△	P-1	8.5 - 10	31	23	8	70.3	ML	SANDY SILT
⊗	P-2	0.4 - 5	33	18	15	73.2	CL	LEAN CLAY with SAND
⊕	P-3	5 - 10	31	17	14	67.2	CL	SANDY LEAN CLAY

Moisture-Density Relationship

ASTM D1557-Method B

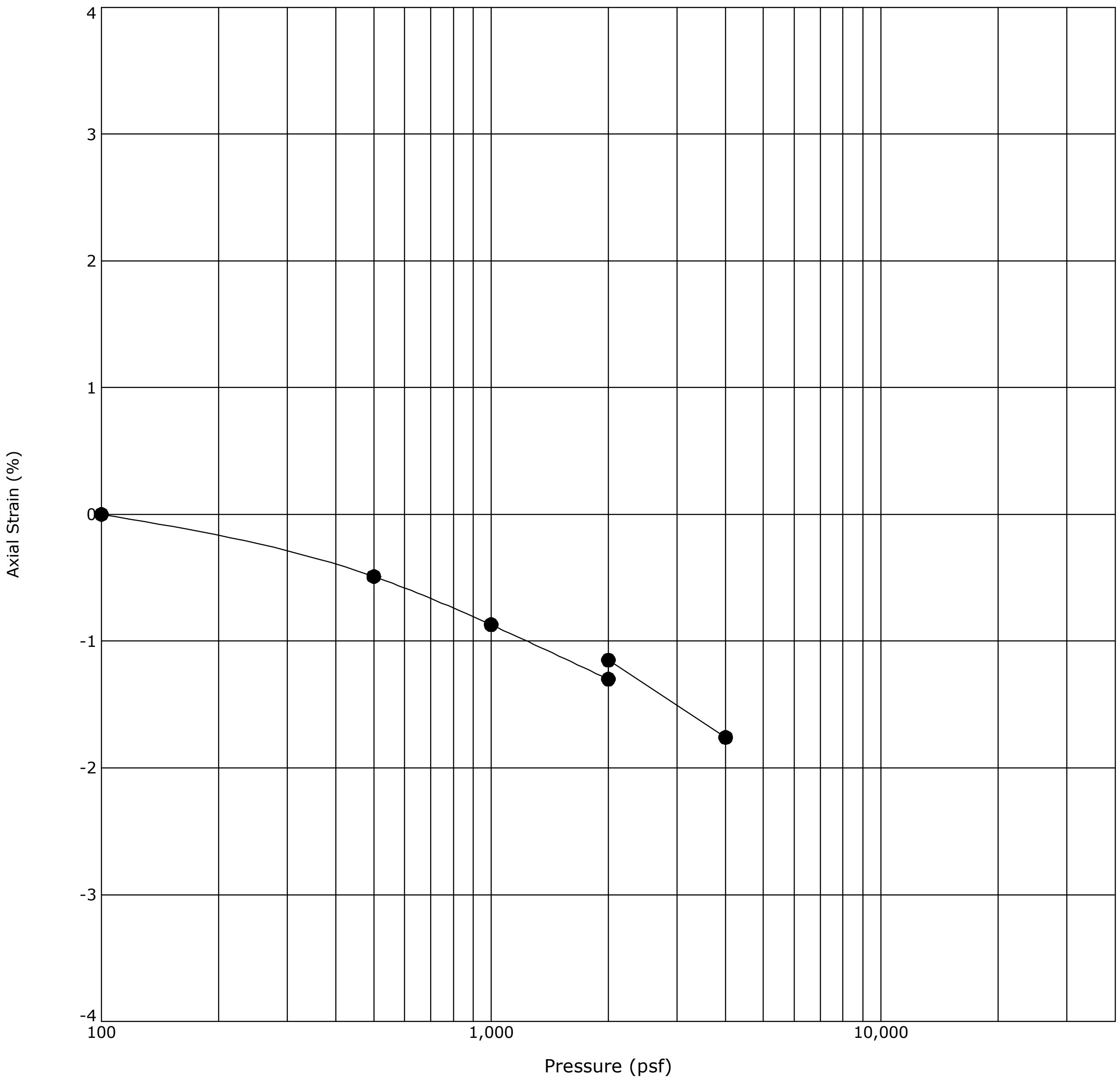


Boring ID	Depth (Ft)	Description of Materials
B-2	0.5 - 5	LEAN CLAY with SAND

Fines (%)	Fraction > mm size	LL	PL	PI	Test Method	Maximum Dry Density (pcf)	Optimum Water Content (%)
	--				ASTM D1557-Method B	114.0	16.5

One-Dimensional Swell or Collapse

ASTM D4546



	Boring ID	Depth (Ft)	Description	USCS	γ_d(pcf)	WC (%)
●	B-3	2.5 - 4	SANDY LEAN CLAY	CL	115	14.8

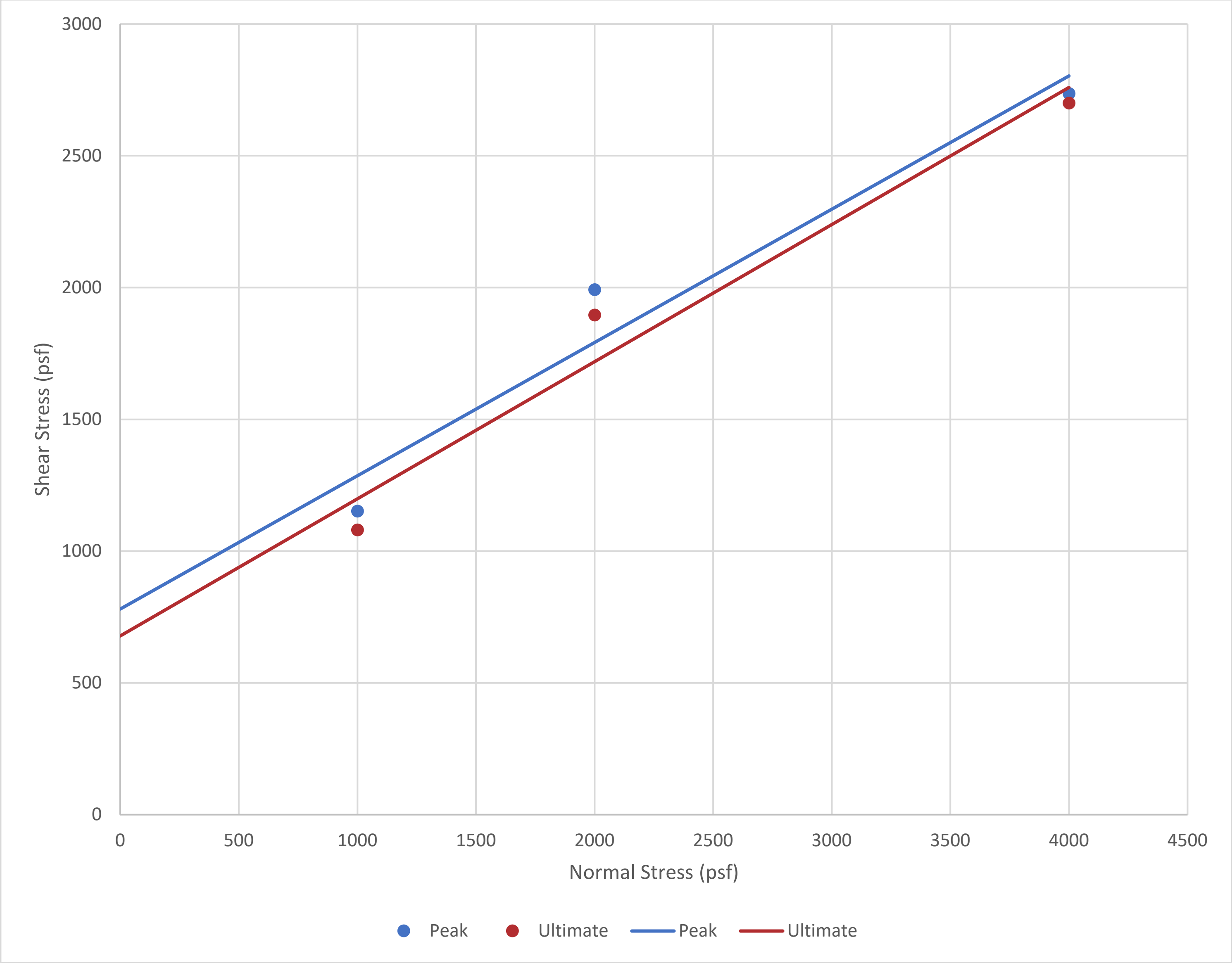
Notes: Water added at 2,000 psf

Direct Shear Test

ASTM D3080

Boring ID	Depth (ft)	Description	USCS	γ_d (pcf)	W(%)
B-4	2.5	Lean Clay with Sand	CL	107	17.8

Normal Stress (psf)	Peak Shear Stress (psf)	Ultimate Shear Stress (psf)	Peak		Ultimate	
			φ°	**C (psf)**	**φ°**	**C (psf)**
1000	1152	1080	**27.0**	**780**	**27.0**	**680**
2000	1992	1896				
4000	2736	2700				



902 Industrial Way
Lodi, California 95240
(209) 367-3701

Terracon
Explore with us

Client

Aypa Power Development LLC

Project

ABI Properties BESS

Sample Submitted By: LA

Date Tested: 1/23/2025

Project Number: LA245225

Results of Corrosion Analysis

Sample Type	Bulk
Sample Location	B-3
Sample Depth (ft.)	1-5
pH Analysis, ASTM G 51	7.26
Water Soluble Sulfate (SO4), ASTM D516 (%)	0.003
Sulfides, AWWA 4500-S^{2-} D, (mg/kg)	<0.001
Chlorides, AWWA 4500-CL^{-} E (%)	0.001
Red-Ox, ASTM G 200, (mV)	+122
Total Salts, AWWA 2520 B, (mg/kg)	188
Saturated Minimum Resistivity, ASTM G 57, (ohm-cm)	2,300

Reviewed By: Paula Arends

Paula Arends
Laboratory Manager

FIELD ELECTRICAL RESISTIVITY TEST DATA

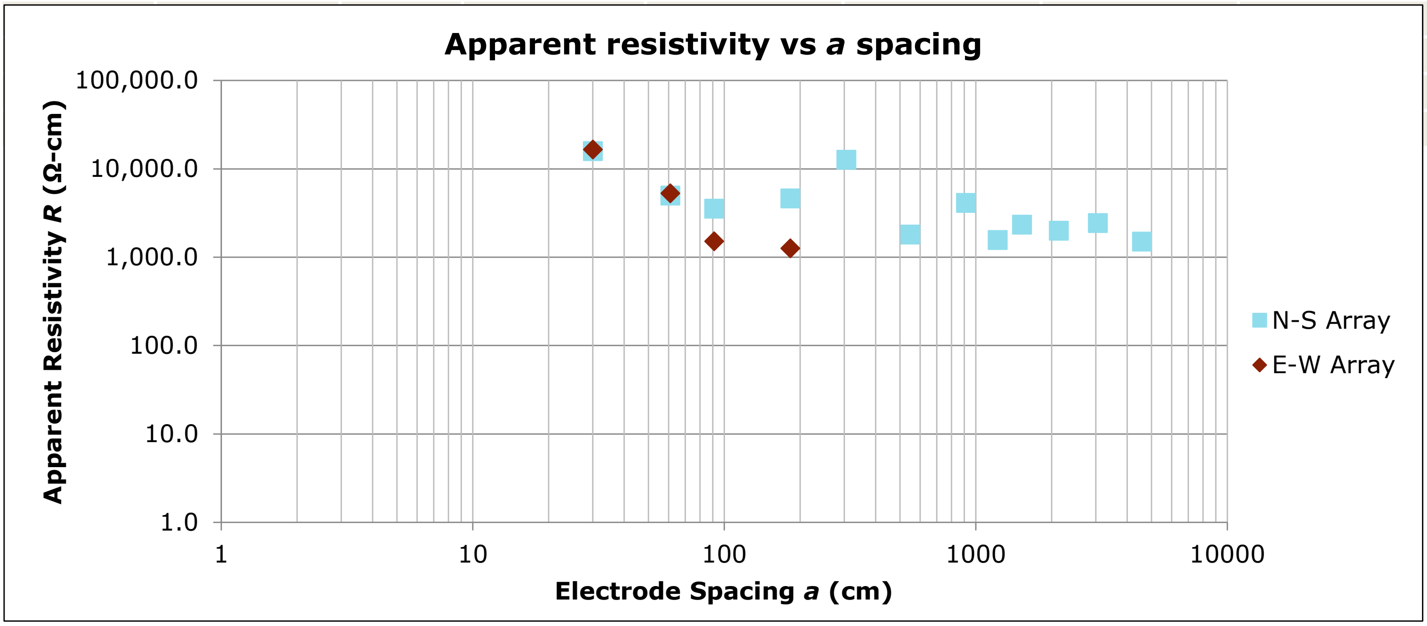
ABI Properties BESS | City of Industry, California
Terracon Project No. LA245225

Array Loc.	ER-1		
Instrument	Mini-Sting	**Weather**	Sunny
Serial #	SS0603179	**Ground Cond.**	Concrete and asphalt
Calib. Due	July 25, 2025	**Tested By**	AT/NP
Test Date	November 22, 2024	**Method**	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012)
Notes & Conflicts	Interference is observed on the N-S array due to overhead powerlines. Site limitation on the E-W Array due to nearby buildings and walls.		

Apparent resistivity ρ is calculated as :

$$\rho = \frac{4\pi aR}{1+\frac{2a}{\sqrt{a^2+4b^2}}-\frac{a}{\sqrt{a^2+b^2}}}$$

Electrode Spacing *a*		**Electrode Depth *b***		**N-S Test**		**E-W Test**	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance *R*	Apparent Resistivity *ρ*	Measured Resistance *R*	Apparent Resistivity *ρ*
				Ω	(Ω-cm)	Ω	(Ω-cm)
1	30	2	5	81	15,890	84	16,600
2	61	2	5	13	4,980	14	5,270
3	91	2	5	6.2	3,540	2.6	1,520
6	183	2	5	4.0	4,620	1.1	1,260
10	305	2	5	6.6	12,650		
18	549	2	5	0.52	1,810		
30	914	3	8	0.72	4,120		
40	1219	3	8	0.20	1,570		
50	1524	3	8	0.24	2,330		
70	2134	6	15	0.15	1,990		
100	3048	6	15	0.13	2,440		
150	4572	6	15	0.052	1,500		



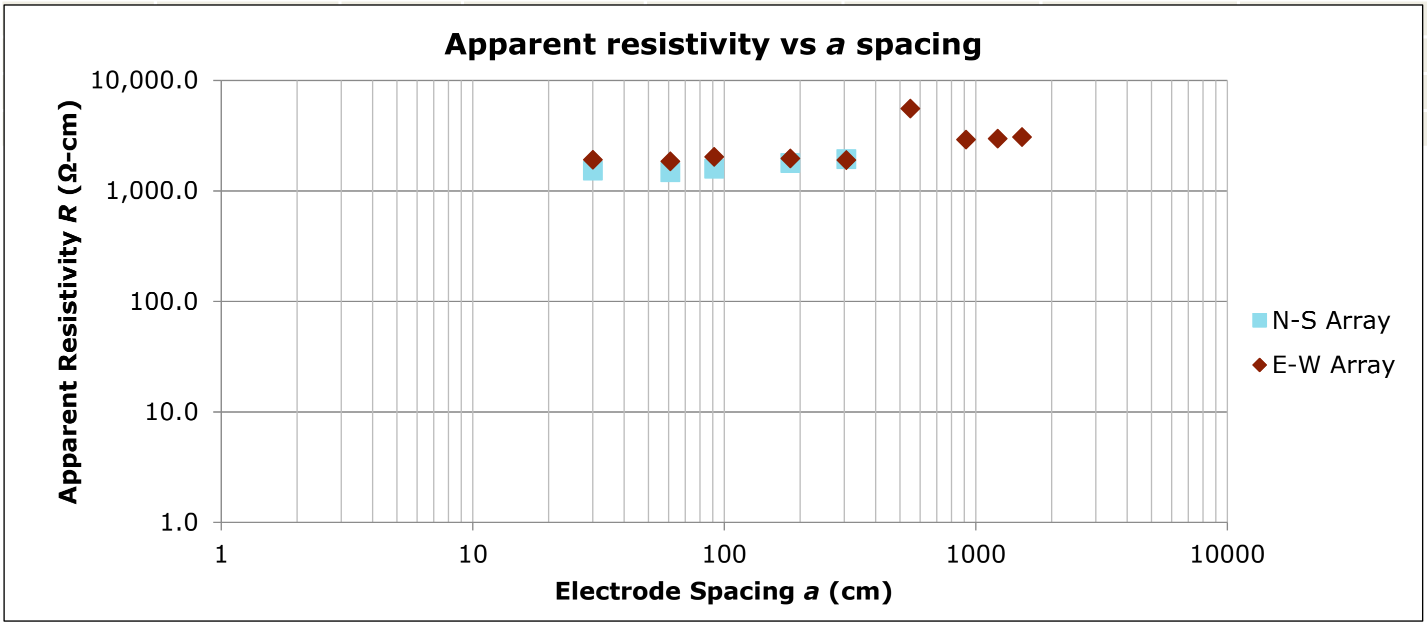
FIELD ELECTRICAL RESISTIVITY TEST DATA
ABI Properties BESS | City of Industry, California
Terracon Project No. LA245225

Array Loc.	ER-2		
Instrument	Mini-Sting	**Weather**	Sunny
Serial #	SS0603179	**Ground Cond.**	Concrete and asphalt
Calib. Due	July 25, 2025	**Tested By**	AT/NP
Test Date	November 22, 2024	**Method**	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012)
Notes & Conflicts	Interference is observed on the E-W array due to overhead powerlines. Site limitation on both Arrays due to nearby buildings and walls.		

Apparent resistivity ρ is calculated as :

$$\rho = \frac{4\pi a R}{1+\frac{2a}{\sqrt{a^2+4b^2}}-\frac{a}{\sqrt{a^2+b^2}}}$$

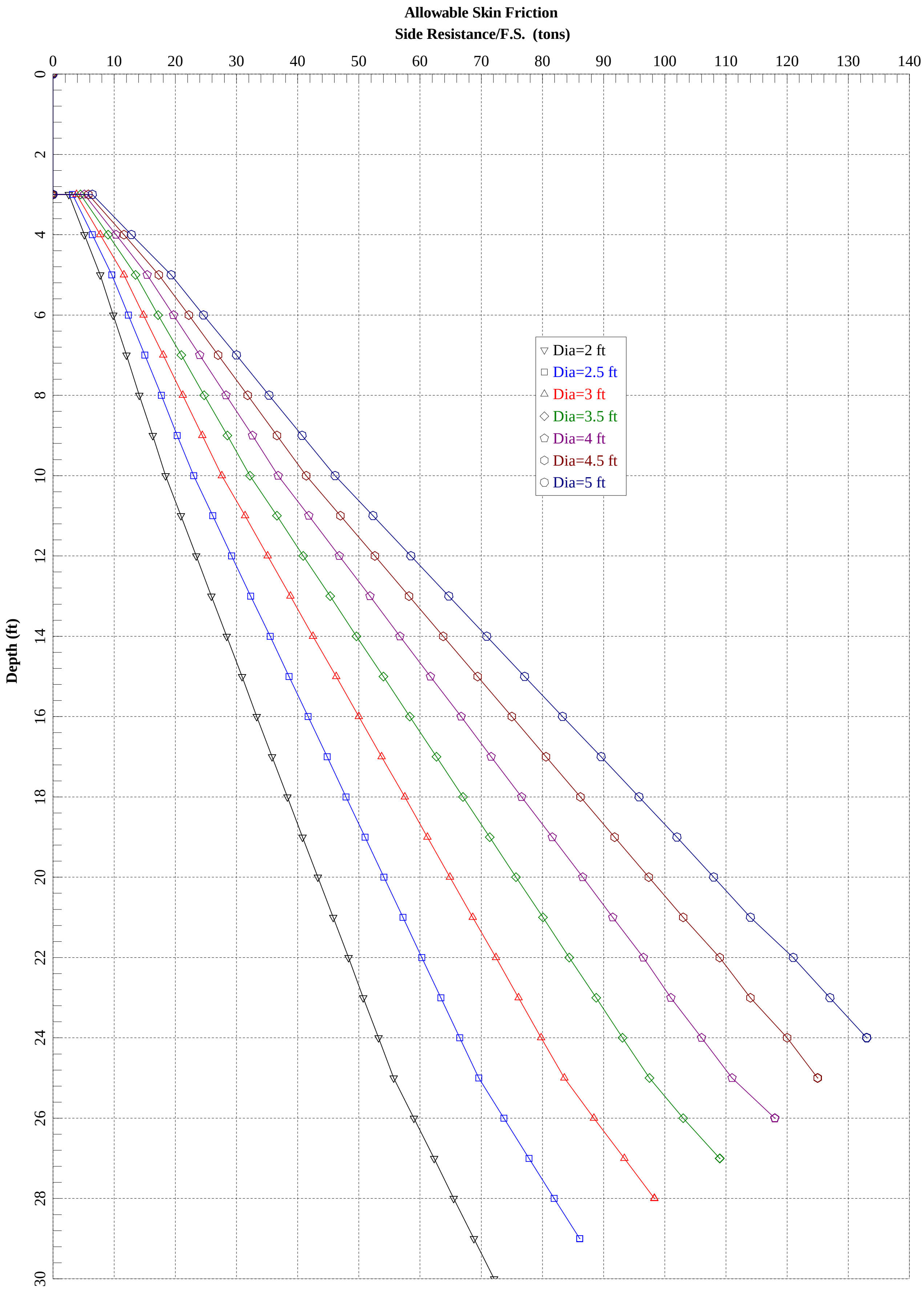
Electrode Spacing *a*		**Electrode Depth *b***		**N-S Test**		**E-W Test**	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance *R*	Apparent Resistivity *ρ*	Measured Resistance *R*	Apparent Resistivity *ρ*
				Ω	(Ω-cm)	Ω	(Ω-cm)
1	30	2	5	7.8	1,530	10	1,920
2	61	2	5	3.8	1,480	4.8	1,860
3	91	2	5	2.8	1,590	3.6	2,040
6	183	2	5	1.6	1,790	1.7	1,970
10	305	2	5	1.0	1,940	1.0	1,900
18	549	2	5			1.6	5,560
30	914	3	8			0.51	2,920
40	1219	3	8			0.39	2,980
50	1524	3	8			0.32	3,070
70	2134	6	15				
100	3048	6	15				
150	4572	6	15				

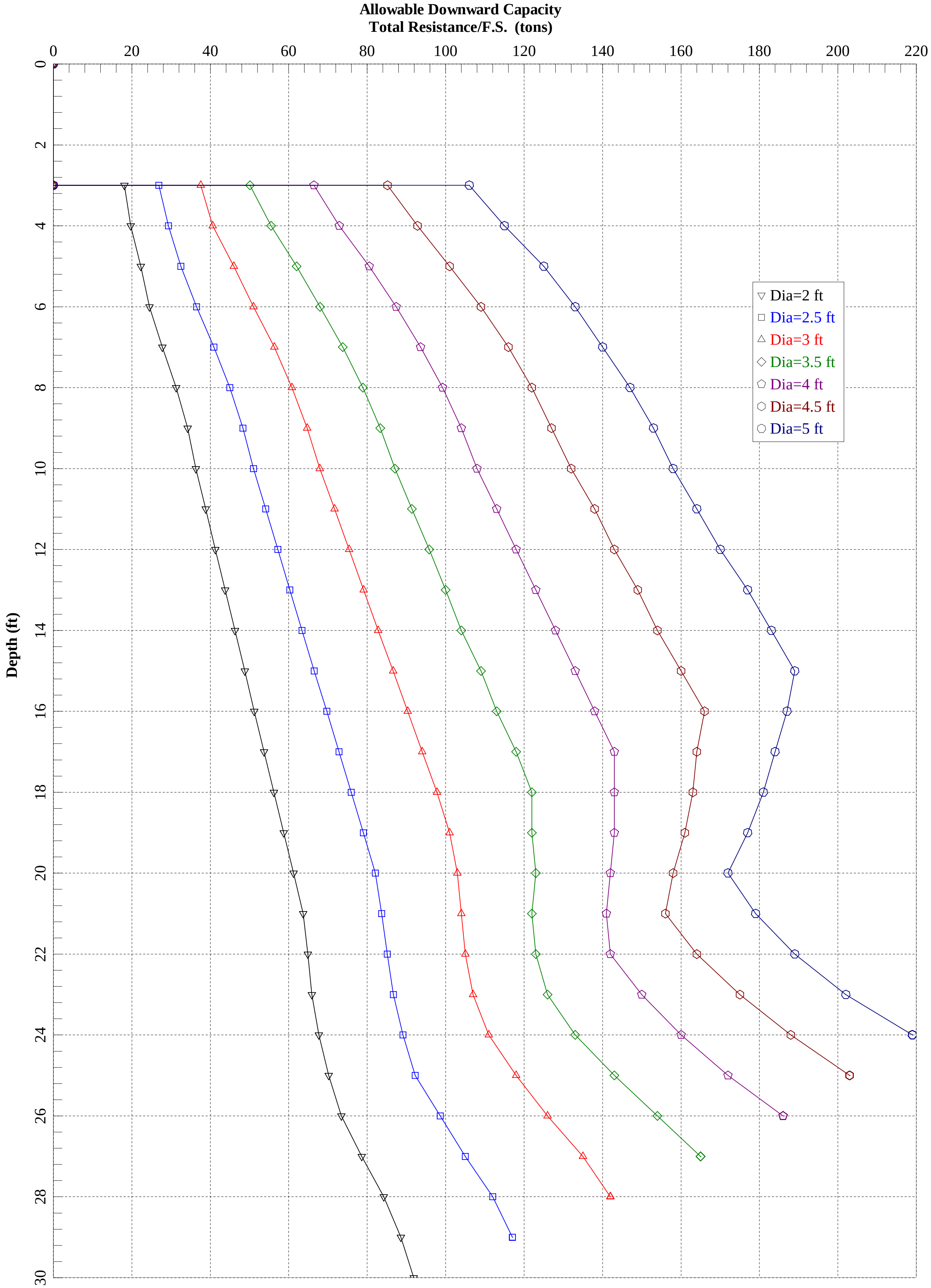


Supporting Information

Contents:

Note: All attachments are one page unless noted above.


Allowable Skin Friction
Side Resistance/F.S. (tons)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
▽ Dia=2 ft
□ Dia=2.5 ft
△ Dia=3 ft
◇ Dia=3.5 ft
⬠ Dia=4 ft
⬡ Dia=4.5 ft
○ Dia=5 ft


Allowable Downward Capacity
Total Resistance/F.S. (tons)
0
20
40
60
80
100
120
140
160
180
200
220
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
▽ Dia=2 ft
□ Dia=2.5 ft
△ Dia=3 ft
◇ Dia=3.5 ft
⬠ Dia=4 ft
⬡ Dia=4.5 ft
○ Dia=5 ft

```
************************************************************************************
*******************
                                          LIQUEFACTION ANALYSIS SUMMARY

                                         Copyright by CivilTech Software
                                               www.civiltech.com

************************************************************************************
*******************
        Font: Courier New, Regular, Size 8 is recommended for this report.
        Licensed to ,   2/7/2025        8:25:32 PM

        Input File Name: C:\Users\toaguilar\OneDrive - Terracon Consultants
Inc\Desktop\LA245225 ABI Properties BESS B-2.liq
        Title:  ABI Properties BESS
        Subtitle:

        Surface Elev.=345
        Hole No.=B-2
        Depth of Hole= 51.50 ft
        Water Table during Earthquake= 12.00 ft
        Water Table during In-Situ Testing= 12.00 ft
        Max. Acceleration= 0.85 g
        Earthquake Magnitude= 6.77

 Input Data:
        Surface Elev.=345
        Hole No.=B-2
        Depth of Hole=51.50 ft
        Water Table during Earthquake= 12.00 ft
        Water Table during In-Situ Testing= 12.00 ft
        Max. Acceleration=0.85 g
        Earthquake Magnitude=6.77
        No-Liquefiable Soils:   CL, OL are Non-Liq. Soil

        1. SPT or BPT Calculation.
        2. Settlement Analysis Method: Tokimatsu/Seed
        3. Fines Correction for Liquefaction: Modify Stark/Olson
        4. Fine Correction for Settlement: During Liquefaction*
        5. Settlement Calculation in: All zones*
        6. Hammer Energy Ratio,                                   Ce = 1.25
        7. Borehole Diameter,                                         Cb= 1.15
        8. Sampling Method,                                          Cs= 1.2
        9. User request factor of safety (apply to CSR) ,   User= 1.3
           Plot two CSR (fs1=1, fs2=User)
        10. Use Curve Smoothing: Yes*
        * Recommended Options

        In-Situ Test Data:
```

```
        Depth   SPT     gamma   Fines
        ft              pcf     %
        ____________________________________
        2.50    32.00   125.00  NoLiq
        5.00    25.00   125.00  NoLiq
        7.50    39.00   125.00  NoLiq
        10.00   31.00   125.00  NoLiq
        15.00   30.00   120.00  NoLiq
        20.00   23.00   120.00  NoLiq
        24.00   28.00   120.00  30.00
        30.00   34.00   120.00  NoLiq
        34.00   32.00   120.00  NoLiq
        40.00   19.00   120.00  6.00
        45.00   18.00   120.00  10.00
        50.00   19.00   120.00  NoLiq
        ____________________________________

Output Results:
        Settlement of Saturated Sands=0.91 in.
        Settlement of Unsaturated Sands=0.00 in.
        Total Settlement of Saturated and Unsaturated Sands=0.91 in.
        Differential Settlement=0.457 to 0.604 in.

        Depth   CRRm    CSRfs   F.S.    S_sat.  S_dry   S_all
        ft                              in.     in.     in.
        _______________________________________________________
        2.50    2.00    0.55    5.00    0.91    0.00    0.91
        2.55    2.00    0.55    5.00    0.91    0.00    0.91
        2.60    2.00    0.55    5.00    0.91    0.00    0.91
        2.65    2.00    0.55    5.00    0.91    0.00    0.91
        2.70    2.00    0.55    5.00    0.91    0.00    0.91
        2.75    2.00    0.55    5.00    0.91    0.00    0.91
        2.80    2.00    0.55    5.00    0.91    0.00    0.91
        2.85    2.00    0.55    5.00    0.91    0.00    0.91
        2.90    2.00    0.55    5.00    0.91    0.00    0.91
        2.95    2.00    0.55    5.00    0.91    0.00    0.91
        3.00    2.00    0.55    5.00    0.91    0.00    0.91
        3.05    2.00    0.55    5.00    0.91    0.00    0.91
        3.10    2.00    0.55    5.00    0.91    0.00    0.91
        3.15    2.00    0.55    5.00    0.91    0.00    0.91
        3.20    2.00    0.55    5.00    0.91    0.00    0.91
        3.25    2.00    0.55    5.00    0.91    0.00    0.91
        3.30    2.00    0.55    5.00    0.91    0.00    0.91
        3.35    2.00    0.55    5.00    0.91    0.00    0.91
        3.40    2.00    0.55    5.00    0.91    0.00    0.91
        3.45    2.00    0.55    5.00    0.91    0.00    0.91
        3.50    2.00    0.55    5.00    0.91    0.00    0.91
        3.55    2.00    0.55    5.00    0.91    0.00    0.91
        3.60    2.00    0.55    5.00    0.91    0.00    0.91
        3.65    2.00    0.55    5.00    0.91    0.00    0.91
```

3.70	2.00	0.55	5.00	0.91	0.00	0.91
3.75	2.00	0.55	5.00	0.91	0.00	0.91
3.80	2.00	0.55	5.00	0.91	0.00	0.91
3.85	2.00	0.55	5.00	0.91	0.00	0.91
3.90	2.00	0.55	5.00	0.91	0.00	0.91
3.95	2.00	0.55	5.00	0.91	0.00	0.91
4.00	2.00	0.55	5.00	0.91	0.00	0.91
4.05	2.00	0.55	5.00	0.91	0.00	0.91
4.10	2.00	0.55	5.00	0.91	0.00	0.91
4.15	2.00	0.55	5.00	0.91	0.00	0.91
4.20	2.00	0.55	5.00	0.91	0.00	0.91
4.25	2.00	0.55	5.00	0.91	0.00	0.91
4.30	2.00	0.55	5.00	0.91	0.00	0.91
4.35	2.00	0.55	5.00	0.91	0.00	0.91
4.40	2.00	0.55	5.00	0.91	0.00	0.91
4.45	2.00	0.55	5.00	0.91	0.00	0.91
4.50	2.00	0.55	5.00	0.91	0.00	0.91
4.55	2.00	0.55	5.00	0.91	0.00	0.91
4.60	2.00	0.55	5.00	0.91	0.00	0.91
4.65	2.00	0.55	5.00	0.91	0.00	0.91
4.70	2.00	0.55	5.00	0.91	0.00	0.91
4.75	2.00	0.55	5.00	0.91	0.00	0.91
4.80	2.00	0.55	5.00	0.91	0.00	0.91
4.85	2.00	0.55	5.00	0.91	0.00	0.91
4.90	2.00	0.55	5.00	0.91	0.00	0.91
4.95	2.00	0.55	5.00	0.91	0.00	0.91
5.00	2.00	0.55	5.00	0.91	0.00	0.91
5.05	2.00	0.55	5.00	0.91	0.00	0.91
5.10	2.00	0.55	5.00	0.91	0.00	0.91
5.15	2.00	0.55	5.00	0.91	0.00	0.91
5.20	2.00	0.55	5.00	0.91	0.00	0.91
5.25	2.00	0.55	5.00	0.91	0.00	0.91
5.30	2.00	0.55	5.00	0.91	0.00	0.91
5.35	2.00	0.55	5.00	0.91	0.00	0.91
5.40	2.00	0.55	5.00	0.91	0.00	0.91
5.45	2.00	0.55	5.00	0.91	0.00	0.91
5.50	2.00	0.55	5.00	0.91	0.00	0.91
5.55	2.00	0.55	5.00	0.91	0.00	0.91
5.60	2.00	0.55	5.00	0.91	0.00	0.91
5.65	2.00	0.55	5.00	0.91	0.00	0.91
5.70	2.00	0.55	5.00	0.91	0.00	0.91
5.75	2.00	0.55	5.00	0.91	0.00	0.91
5.80	2.00	0.55	5.00	0.91	0.00	0.91
5.85	2.00	0.55	5.00	0.91	0.00	0.91
5.90	2.00	0.55	5.00	0.91	0.00	0.91
5.95	2.00	0.55	5.00	0.91	0.00	0.91
6.00	2.00	0.55	5.00	0.91	0.00	0.91
6.05	2.00	0.55	5.00	0.91	0.00	0.91
6.10	2.00	0.55	5.00	0.91	0.00	0.91
6.15	2.00	0.55	5.00	0.91	0.00	0.91

```
6.20    2.00    0.55    5.00    0.91    0.00    0.91
6.25    2.00    0.55    5.00    0.91    0.00    0.91
6.30    2.00    0.55    5.00    0.91    0.00    0.91
6.35    2.00    0.55    5.00    0.91    0.00    0.91
6.40    2.00    0.55    5.00    0.91    0.00    0.91
6.45    2.00    0.55    5.00    0.91    0.00    0.91
6.50    2.00    0.55    5.00    0.91    0.00    0.91
6.55    2.00    0.55    5.00    0.91    0.00    0.91
6.60    2.00    0.55    5.00    0.91    0.00    0.91
6.65    2.00    0.55    5.00    0.91    0.00    0.91
6.70    2.00    0.55    5.00    0.91    0.00    0.91
6.75    2.00    0.55    5.00    0.91    0.00    0.91
6.80    2.00    0.55    5.00    0.91    0.00    0.91
6.85    2.00    0.55    5.00    0.91    0.00    0.91
6.90    2.00    0.55    5.00    0.91    0.00    0.91
6.95    2.00    0.55    5.00    0.91    0.00    0.91
7.00    2.00    0.55    5.00    0.91    0.00    0.91
7.05    2.00    0.55    5.00    0.91    0.00    0.91
7.10    2.00    0.55    5.00    0.91    0.00    0.91
7.15    2.00    0.55    5.00    0.91    0.00    0.91
7.20    2.00    0.55    5.00    0.91    0.00    0.91
7.25    2.00    0.55    5.00    0.91    0.00    0.91
7.30    2.00    0.55    5.00    0.91    0.00    0.91
7.35    2.00    0.55    5.00    0.91    0.00    0.91
7.40    2.00    0.55    5.00    0.91    0.00    0.91
7.45    2.00    0.55    5.00    0.91    0.00    0.91
7.50    2.00    0.55    5.00    0.91    0.00    0.91
7.55    2.00    0.55    5.00    0.91    0.00    0.91
7.60    2.00    0.55    5.00    0.91    0.00    0.91
7.65    2.00    0.55    5.00    0.91    0.00    0.91
7.70    2.00    0.55    5.00    0.91    0.00    0.91
7.75    2.00    0.55    5.00    0.91    0.00    0.91
7.80    2.00    0.55    5.00    0.91    0.00    0.91
7.85    2.00    0.54    5.00    0.91    0.00    0.91
7.90    2.00    0.54    5.00    0.91    0.00    0.91
7.95    2.00    0.54    5.00    0.91    0.00    0.91
8.00    2.00    0.54    5.00    0.91    0.00    0.91
8.05    2.00    0.54    5.00    0.91    0.00    0.91
8.10    2.00    0.54    5.00    0.91    0.00    0.91
8.15    2.00    0.54    5.00    0.91    0.00    0.91
8.20    2.00    0.54    5.00    0.91    0.00    0.91
8.25    2.00    0.54    5.00    0.91    0.00    0.91
8.30    2.00    0.54    5.00    0.91    0.00    0.91
8.35    2.00    0.54    5.00    0.91    0.00    0.91
8.40    2.00    0.54    5.00    0.91    0.00    0.91
8.45    2.00    0.54    5.00    0.91    0.00    0.91
8.50    2.00    0.54    5.00    0.91    0.00    0.91
8.55    2.00    0.54    5.00    0.91    0.00    0.91
8.60    2.00    0.54    5.00    0.91    0.00    0.91
8.65    2.00    0.54    5.00    0.91    0.00    0.91
```

8.70	2.00	0.54	5.00	0.91	0.00	0.91
8.75	2.00	0.54	5.00	0.91	0.00	0.91
8.80	2.00	0.54	5.00	0.91	0.00	0.91
8.85	2.00	0.54	5.00	0.91	0.00	0.91
8.90	2.00	0.54	5.00	0.91	0.00	0.91
8.95	2.00	0.54	5.00	0.91	0.00	0.91
9.00	2.00	0.54	5.00	0.91	0.00	0.91
9.05	2.00	0.54	5.00	0.91	0.00	0.91
9.10	2.00	0.54	5.00	0.91	0.00	0.91
9.15	2.00	0.54	5.00	0.91	0.00	0.91
9.20	2.00	0.54	5.00	0.91	0.00	0.91
9.25	2.00	0.54	5.00	0.91	0.00	0.91
9.30	2.00	0.54	5.00	0.91	0.00	0.91
9.35	2.00	0.54	5.00	0.91	0.00	0.91
9.40	2.00	0.54	5.00	0.91	0.00	0.91
9.45	2.00	0.54	5.00	0.91	0.00	0.91
9.50	2.00	0.54	5.00	0.91	0.00	0.91
9.55	2.00	0.54	5.00	0.91	0.00	0.91
9.60	2.00	0.54	5.00	0.91	0.00	0.91
9.65	2.00	0.54	5.00	0.91	0.00	0.91
9.70	2.00	0.54	5.00	0.91	0.00	0.91
9.75	2.00	0.54	5.00	0.91	0.00	0.91
9.80	2.00	0.54	5.00	0.91	0.00	0.91
9.85	2.00	0.54	5.00	0.91	0.00	0.91
9.90	2.00	0.54	5.00	0.91	0.00	0.91
9.95	2.00	0.54	5.00	0.91	0.00	0.91
10.00	2.00	0.54	5.00	0.91	0.00	0.91
10.05	2.00	0.54	5.00	0.91	0.00	0.91
10.10	2.00	0.54	5.00	0.91	0.00	0.91
10.15	2.00	0.54	5.00	0.91	0.00	0.91
10.20	2.00	0.54	5.00	0.91	0.00	0.91
10.25	2.00	0.54	5.00	0.91	0.00	0.91
10.30	2.00	0.54	5.00	0.91	0.00	0.91
10.35	2.00	0.54	5.00	0.91	0.00	0.91
10.40	2.00	0.54	5.00	0.91	0.00	0.91
10.45	2.00	0.54	5.00	0.91	0.00	0.91
10.50	2.00	0.54	5.00	0.91	0.00	0.91
10.55	2.00	0.54	5.00	0.91	0.00	0.91
10.60	2.00	0.54	5.00	0.91	0.00	0.91
10.65	2.00	0.54	5.00	0.91	0.00	0.91
10.70	2.00	0.54	5.00	0.91	0.00	0.91
10.75	2.00	0.54	5.00	0.91	0.00	0.91
10.80	2.00	0.54	5.00	0.91	0.00	0.91
10.85	2.00	0.54	5.00	0.91	0.00	0.91
10.90	2.00	0.54	5.00	0.91	0.00	0.91
10.95	2.00	0.54	5.00	0.91	0.00	0.91
11.00	2.00	0.54	5.00	0.91	0.00	0.91
11.05	2.00	0.54	5.00	0.91	0.00	0.91
11.10	2.00	0.54	5.00	0.91	0.00	0.91
11.15	2.00	0.54	5.00	0.91	0.00	0.91

11.20	2.00	0.54	5.00	0.91	0.00	0.91
11.25	2.00	0.54	5.00	0.91	0.00	0.91
11.30	2.00	0.54	5.00	0.91	0.00	0.91
11.35	2.00	0.54	5.00	0.91	0.00	0.91
11.40	2.00	0.54	5.00	0.91	0.00	0.91
11.45	2.00	0.54	5.00	0.91	0.00	0.91
11.50	2.00	0.54	5.00	0.91	0.00	0.91
11.55	2.00	0.54	5.00	0.91	0.00	0.91
11.60	2.00	0.54	5.00	0.91	0.00	0.91
11.65	2.00	0.54	5.00	0.91	0.00	0.91
11.70	2.00	0.54	5.00	0.91	0.00	0.91
11.75	2.00	0.54	5.00	0.91	0.00	0.91
11.80	2.00	0.54	5.00	0.91	0.00	0.91
11.85	2.00	0.54	5.00	0.91	0.00	0.91
11.90	2.00	0.54	5.00	0.91	0.00	0.91
11.95	2.00	0.54	5.00	0.91	0.00	0.91
12.00	2.00	0.54	5.00	0.91	0.00	0.91
12.05	2.00	0.54	5.00	0.91	0.00	0.91
12.10	2.00	0.54	5.00	0.91	0.00	0.91
12.15	2.00	0.54	5.00	0.91	0.00	0.91
12.20	2.00	0.54	5.00	0.91	0.00	0.91
12.25	2.00	0.54	5.00	0.91	0.00	0.91
12.30	2.00	0.55	5.00	0.91	0.00	0.91
12.35	2.00	0.55	5.00	0.91	0.00	0.91
12.40	2.00	0.55	5.00	0.91	0.00	0.91
12.45	2.00	0.55	5.00	0.91	0.00	0.91
12.50	2.00	0.55	5.00	0.91	0.00	0.91
12.55	2.00	0.55	5.00	0.91	0.00	0.91
12.60	2.00	0.55	5.00	0.91	0.00	0.91
12.65	2.00	0.55	5.00	0.91	0.00	0.91
12.70	2.00	0.55	5.00	0.91	0.00	0.91
12.75	2.00	0.55	5.00	0.91	0.00	0.91
12.80	2.00	0.56	5.00	0.91	0.00	0.91
12.85	2.00	0.56	5.00	0.91	0.00	0.91
12.90	2.00	0.56	5.00	0.91	0.00	0.91
12.95	2.00	0.56	5.00	0.91	0.00	0.91
13.00	2.00	0.56	5.00	0.91	0.00	0.91
13.05	2.00	0.56	5.00	0.91	0.00	0.91
13.10	2.00	0.56	5.00	0.91	0.00	0.91
13.15	2.00	0.56	5.00	0.91	0.00	0.91
13.20	2.00	0.56	5.00	0.91	0.00	0.91
13.25	2.00	0.56	5.00	0.91	0.00	0.91
13.30	2.00	0.57	5.00	0.91	0.00	0.91
13.35	2.00	0.57	5.00	0.91	0.00	0.91
13.40	2.00	0.57	5.00	0.91	0.00	0.91
13.45	2.00	0.57	5.00	0.91	0.00	0.91
13.50	2.00	0.57	5.00	0.91	0.00	0.91
13.55	2.00	0.57	5.00	0.91	0.00	0.91
13.60	2.00	0.57	5.00	0.91	0.00	0.91
13.65	2.00	0.57	5.00	0.91	0.00	0.91

```
13.70   2.00    0.57    5.00    0.91    0.00    0.91
13.75   2.00    0.57    5.00    0.91    0.00    0.91
13.80   2.00    0.57    5.00    0.91    0.00    0.91
13.85   2.00    0.58    5.00    0.91    0.00    0.91
13.90   2.00    0.58    5.00    0.91    0.00    0.91
13.95   2.00    0.58    5.00    0.91    0.00    0.91
14.00   2.00    0.58    5.00    0.91    0.00    0.91
14.05   2.00    0.58    5.00    0.91    0.00    0.91
14.10   2.00    0.58    5.00    0.91    0.00    0.91
14.15   2.00    0.58    5.00    0.91    0.00    0.91
14.20   2.00    0.58    5.00    0.91    0.00    0.91
14.25   2.00    0.58    5.00    0.91    0.00    0.91
14.30   2.00    0.58    5.00    0.91    0.00    0.91
14.35   2.00    0.58    5.00    0.91    0.00    0.91
14.40   2.00    0.59    5.00    0.91    0.00    0.91
14.45   2.00    0.59    5.00    0.91    0.00    0.91
14.50   2.00    0.59    5.00    0.91    0.00    0.91
14.55   2.00    0.59    5.00    0.91    0.00    0.91
14.60   2.00    0.59    5.00    0.91    0.00    0.91
14.65   2.00    0.59    5.00    0.91    0.00    0.91
14.70   2.00    0.59    5.00    0.91    0.00    0.91
14.75   2.00    0.59    5.00    0.91    0.00    0.91
14.80   2.00    0.59    5.00    0.91    0.00    0.91
14.85   2.00    0.59    5.00    0.91    0.00    0.91
14.90   2.00    0.59    5.00    0.91    0.00    0.91
14.95   2.00    0.59    5.00    0.91    0.00    0.91
15.00   2.00    0.60    5.00    0.91    0.00    0.91
15.05   2.00    0.60    5.00    0.91    0.00    0.91
15.10   2.00    0.60    5.00    0.91    0.00    0.91
15.15   2.00    0.60    5.00    0.91    0.00    0.91
15.20   2.00    0.60    5.00    0.91    0.00    0.91
15.25   2.00    0.60    5.00    0.91    0.00    0.91
15.30   2.00    0.60    5.00    0.91    0.00    0.91
15.35   2.00    0.60    5.00    0.91    0.00    0.91
15.40   2.00    0.60    5.00    0.91    0.00    0.91
15.45   2.00    0.60    5.00    0.91    0.00    0.91
15.50   2.00    0.60    5.00    0.91    0.00    0.91
15.55   2.00    0.60    5.00    0.91    0.00    0.91
15.60   2.00    0.61    5.00    0.91    0.00    0.91
15.65   2.00    0.61    5.00    0.91    0.00    0.91
15.70   2.00    0.61    5.00    0.91    0.00    0.91
15.75   2.00    0.61    5.00    0.91    0.00    0.91
15.80   2.00    0.61    5.00    0.91    0.00    0.91
15.85   2.00    0.61    5.00    0.91    0.00    0.91
15.90   2.00    0.61    5.00    0.91    0.00    0.91
15.95   2.00    0.61    5.00    0.91    0.00    0.91
16.00   2.00    0.61    5.00    0.91    0.00    0.91
16.05   2.00    0.61    5.00    0.91    0.00    0.91
16.10   2.00    0.61    5.00    0.91    0.00    0.91
16.15   2.00    0.61    5.00    0.91    0.00    0.91
```

16.20	2.00	0.61	5.00	0.91	0.00	0.91
16.25	2.00	0.62	5.00	0.91	0.00	0.91
16.30	2.00	0.62	5.00	0.91	0.00	0.91
16.35	2.00	0.62	5.00	0.91	0.00	0.91
16.40	2.00	0.62	5.00	0.91	0.00	0.91
16.45	2.00	0.62	5.00	0.91	0.00	0.91
16.50	2.00	0.62	5.00	0.91	0.00	0.91
16.55	2.00	0.62	5.00	0.91	0.00	0.91
16.60	2.00	0.62	5.00	0.91	0.00	0.91
16.65	2.00	0.62	5.00	0.91	0.00	0.91
16.70	2.00	0.62	5.00	0.91	0.00	0.91
16.75	2.00	0.62	5.00	0.91	0.00	0.91
16.80	2.00	0.62	5.00	0.91	0.00	0.91
16.85	2.00	0.62	5.00	0.91	0.00	0.91
16.90	2.00	0.62	5.00	0.91	0.00	0.91
16.95	2.00	0.63	5.00	0.91	0.00	0.91
17.00	2.00	0.63	5.00	0.91	0.00	0.91
17.05	2.00	0.63	5.00	0.91	0.00	0.91
17.10	2.00	0.63	5.00	0.91	0.00	0.91
17.15	2.00	0.63	5.00	0.91	0.00	0.91
17.20	2.00	0.63	5.00	0.91	0.00	0.91
17.25	2.00	0.63	5.00	0.91	0.00	0.91
17.30	2.00	0.63	5.00	0.91	0.00	0.91
17.35	2.00	0.63	5.00	0.91	0.00	0.91
17.40	2.00	0.63	5.00	0.91	0.00	0.91
17.45	2.00	0.63	5.00	0.91	0.00	0.91
17.50	2.00	0.63	5.00	0.91	0.00	0.91
17.55	2.00	0.63	5.00	0.91	0.00	0.91
17.60	2.00	0.63	5.00	0.91	0.00	0.91
17.65	2.00	0.63	5.00	0.91	0.00	0.91
17.70	2.00	0.64	5.00	0.91	0.00	0.91
17.75	2.00	0.64	5.00	0.91	0.00	0.91
17.80	2.00	0.64	5.00	0.91	0.00	0.91
17.85	2.00	0.64	5.00	0.91	0.00	0.91
17.90	2.00	0.64	5.00	0.91	0.00	0.91
17.95	2.00	0.64	5.00	0.91	0.00	0.91
18.00	2.00	0.64	5.00	0.91	0.00	0.91
18.05	2.00	0.64	5.00	0.91	0.00	0.91
18.10	2.00	0.64	5.00	0.91	0.00	0.91
18.15	2.00	0.64	5.00	0.91	0.00	0.91
18.20	2.00	0.64	5.00	0.91	0.00	0.91
18.25	2.00	0.64	5.00	0.91	0.00	0.91
18.30	2.00	0.64	5.00	0.91	0.00	0.91
18.35	2.00	0.64	5.00	0.91	0.00	0.91
18.40	2.00	0.64	5.00	0.91	0.00	0.91
18.45	2.00	0.65	5.00	0.91	0.00	0.91
18.50	2.00	0.65	5.00	0.91	0.00	0.91
18.55	2.00	0.65	5.00	0.91	0.00	0.91
18.60	2.00	0.65	5.00	0.91	0.00	0.91
18.65	2.00	0.65	5.00	0.91	0.00	0.91

```
18.70   2.00    0.65    5.00    0.91    0.00    0.91
18.75   2.00    0.65    5.00    0.91    0.00    0.91
18.80   2.00    0.65    5.00    0.91    0.00    0.91
18.85   2.00    0.65    5.00    0.91    0.00    0.91
18.90   2.00    0.65    5.00    0.91    0.00    0.91
18.95   2.00    0.65    5.00    0.91    0.00    0.91
19.00   2.00    0.65    5.00    0.91    0.00    0.91
19.05   2.00    0.65    5.00    0.91    0.00    0.91
19.10   2.00    0.65    5.00    0.91    0.00    0.91
19.15   2.00    0.65    5.00    0.91    0.00    0.91
19.20   2.00    0.65    5.00    0.91    0.00    0.91
19.25   2.00    0.66    5.00    0.91    0.00    0.91
19.30   2.00    0.66    5.00    0.91    0.00    0.91
19.35   2.00    0.66    5.00    0.91    0.00    0.91
19.40   2.00    0.66    5.00    0.91    0.00    0.91
19.45   2.00    0.66    5.00    0.91    0.00    0.91
19.50   2.00    0.66    5.00    0.91    0.00    0.91
19.55   2.00    0.66    5.00    0.91    0.00    0.91
19.60   2.00    0.66    5.00    0.91    0.00    0.91
19.65   2.00    0.66    5.00    0.91    0.00    0.91
19.70   2.00    0.66    5.00    0.91    0.00    0.91
19.75   2.00    0.66    5.00    0.91    0.00    0.91
19.80   2.00    0.66    5.00    0.91    0.00    0.91
19.85   2.00    0.66    5.00    0.91    0.00    0.91
19.90   2.00    0.66    5.00    0.91    0.00    0.91
19.95   2.00    0.66    5.00    0.91    0.00    0.91
20.00   2.00    0.66    5.00    0.91    0.00    0.91
20.05   0.65    0.66    0.98*   0.91    0.00    0.91
20.10   0.65    0.66    0.98*   0.91    0.00    0.91
20.15   0.65    0.67    0.98*   0.91    0.00    0.91
20.20   0.65    0.67    0.98*   0.91    0.00    0.91
20.25   0.65    0.67    0.97*   0.91    0.00    0.91
20.30   0.65    0.67    0.97*   0.91    0.00    0.91
20.35   0.65    0.67    0.97*   0.91    0.00    0.91
20.40   0.65    0.67    0.97*   0.91    0.00    0.91
20.45   0.65    0.67    0.97*   0.91    0.00    0.91
20.50   0.65    0.67    0.97*   0.91    0.00    0.91
20.55   0.65    0.67    0.97*   0.91    0.00    0.91
20.60   0.65    0.67    0.97*   0.91    0.00    0.91
20.65   0.65    0.67    0.97*   0.91    0.00    0.91
20.70   0.65    0.67    0.97*   0.91    0.00    0.91
20.75   0.65    0.67    0.97*   0.91    0.00    0.91
20.80   0.65    0.67    0.97*   0.91    0.00    0.91
20.85   0.65    0.67    0.97*   0.91    0.00    0.91
20.90   0.65    0.67    0.96*   0.91    0.00    0.91
20.95   0.65    0.67    0.96*   0.91    0.00    0.91
21.00   0.65    0.67    0.96*   0.91    0.00    0.91
21.05   0.65    0.68    0.96*   0.91    0.00    0.91
21.10   0.65    0.68    0.96*   0.91    0.00    0.91
21.15   0.65    0.68    0.96*   0.91    0.00    0.91
```

21.20	0.65	0.68	0.96*	0.91	0.00	0.91
21.25	0.65	0.68	0.96*	0.91	0.00	0.91
21.30	0.65	0.68	0.96*	0.91	0.00	0.91
21.35	0.65	0.68	0.96*	0.91	0.00	0.91
21.40	0.65	0.68	0.96*	0.91	0.00	0.91
21.45	0.65	0.68	0.96*	0.91	0.00	0.91
21.50	0.65	0.68	0.96*	0.91	0.00	0.91
21.55	0.65	0.68	0.95*	0.91	0.00	0.91
21.60	0.65	0.68	0.95*	0.91	0.00	0.91
21.65	0.65	0.68	0.95*	0.91	0.00	0.91
21.70	0.65	0.68	0.95*	0.91	0.00	0.91
21.75	0.65	0.68	0.95*	0.91	0.00	0.91
21.80	0.65	0.68	0.95*	0.91	0.00	0.91
21.85	0.65	0.68	0.95*	0.91	0.00	0.91
21.90	0.65	0.68	0.95*	0.91	0.00	0.91
21.95	0.65	0.68	0.95*	0.91	0.00	0.91
22.00	0.65	0.68	0.95*	0.91	0.00	0.91
22.05	0.65	0.69	0.95*	0.91	0.00	0.91
22.10	0.65	0.69	0.95*	0.91	0.00	0.91
22.15	0.65	0.69	0.95*	0.91	0.00	0.91
22.20	0.65	0.69	0.95*	0.91	0.00	0.91
22.25	0.65	0.69	0.95*	0.91	0.00	0.91
22.30	0.65	0.69	0.94*	0.91	0.00	0.91
22.35	0.65	0.69	0.94*	0.91	0.00	0.91
22.40	0.65	0.69	0.94*	0.91	0.00	0.91
22.45	0.65	0.69	0.94*	0.91	0.00	0.91
22.50	0.65	0.69	0.94*	0.91	0.00	0.91
22.55	0.65	0.69	0.94*	0.91	0.00	0.91
22.60	0.65	0.69	0.94*	0.91	0.00	0.91
22.65	0.65	0.69	0.94*	0.91	0.00	0.91
22.70	0.65	0.69	0.94*	0.91	0.00	0.91
22.75	0.65	0.69	0.94*	0.91	0.00	0.91
22.80	0.65	0.69	0.94*	0.91	0.00	0.91
22.85	0.65	0.69	0.94*	0.91	0.00	0.91
22.90	0.65	0.69	0.94*	0.91	0.00	0.91
22.95	0.65	0.69	0.94*	0.91	0.00	0.91
23.00	0.65	0.69	0.94*	0.91	0.00	0.91
23.05	0.65	0.69	0.94*	0.91	0.00	0.91
23.10	0.65	0.70	0.93*	0.91	0.00	0.91
23.15	0.65	0.70	0.93*	0.91	0.00	0.91
23.20	0.65	0.70	0.93*	0.91	0.00	0.91
23.25	0.65	0.70	0.93*	0.91	0.00	0.91
23.30	0.65	0.70	0.93*	0.91	0.00	0.91
23.35	0.65	0.70	0.93*	0.91	0.00	0.91
23.40	0.65	0.70	0.93*	0.91	0.00	0.91
23.45	0.65	0.70	0.93*	0.91	0.00	0.91
23.50	0.65	0.70	0.93*	0.91	0.00	0.91
23.55	0.65	0.70	0.93*	0.91	0.00	0.91
23.60	0.65	0.70	0.93*	0.91	0.00	0.91
23.65	0.65	0.70	0.93*	0.91	0.00	0.91

23.70	0.65	0.70	0.93*	0.91	0.00	0.91
23.75	0.65	0.70	0.93*	0.91	0.00	0.91
23.80	0.65	0.70	0.93*	0.91	0.00	0.91
23.85	0.65	0.70	0.93*	0.91	0.00	0.91
23.90	0.65	0.70	0.93*	0.91	0.00	0.91
23.95	0.65	0.70	0.92*	0.91	0.00	0.91
24.00	0.65	0.70	0.92*	0.91	0.00	0.91
24.05	0.65	0.70	0.92*	0.91	0.00	0.91
24.10	0.65	0.70	0.92*	0.91	0.00	0.91
24.15	0.65	0.70	0.92*	0.91	0.00	0.91
24.20	0.65	0.70	0.92*	0.91	0.00	0.91
24.25	0.65	0.71	0.92*	0.91	0.00	0.91
24.30	0.65	0.71	0.92*	0.91	0.00	0.91
24.35	0.65	0.71	0.92*	0.91	0.00	0.91
24.40	0.65	0.71	0.92*	0.91	0.00	0.91
24.45	0.65	0.71	0.92*	0.91	0.00	0.91
24.50	0.65	0.71	0.92*	0.91	0.00	0.91
24.55	0.65	0.71	0.92*	0.91	0.00	0.91
24.60	0.65	0.71	0.92*	0.91	0.00	0.91
24.65	0.65	0.71	0.92*	0.91	0.00	0.91
24.70	0.65	0.71	0.92*	0.91	0.00	0.91
24.75	0.65	0.71	0.92*	0.91	0.00	0.91
24.80	0.65	0.71	0.92*	0.91	0.00	0.91
24.85	0.65	0.71	0.92*	0.91	0.00	0.91
24.90	0.65	0.71	0.91*	0.91	0.00	0.91
24.95	0.65	0.71	0.91*	0.91	0.00	0.91
25.00	0.65	0.71	0.91*	0.91	0.00	0.91
25.05	0.65	0.71	0.91*	0.91	0.00	0.91
25.10	0.65	0.71	0.91*	0.91	0.00	0.91
25.15	0.65	0.71	0.91*	0.91	0.00	0.91
25.20	0.65	0.71	0.91*	0.91	0.00	0.91
25.25	0.65	0.71	0.91*	0.91	0.00	0.91
25.30	0.65	0.71	0.91*	0.91	0.00	0.91
25.35	0.65	0.71	0.91*	0.91	0.00	0.91
25.40	0.65	0.71	0.91*	0.91	0.00	0.91
25.45	0.65	0.71	0.91*	0.91	0.00	0.91
25.50	0.65	0.71	0.91*	0.91	0.00	0.91
25.55	0.65	0.72	0.91*	0.91	0.00	0.91
25.60	0.65	0.72	0.91*	0.91	0.00	0.91
25.65	0.65	0.72	0.91*	0.91	0.00	0.91
25.70	0.65	0.72	0.91*	0.91	0.00	0.91
25.75	0.65	0.72	0.91*	0.91	0.00	0.91
25.80	0.65	0.72	0.91*	0.91	0.00	0.91
25.85	0.65	0.72	0.91*	0.91	0.00	0.91
25.90	0.65	0.72	0.90*	0.91	0.00	0.91
25.95	0.65	0.72	0.90*	0.91	0.00	0.91
26.00	0.65	0.72	0.90*	0.91	0.00	0.91
26.05	0.65	0.72	0.90*	0.91	0.00	0.91
26.10	0.65	0.72	0.90*	0.91	0.00	0.91
26.15	0.65	0.72	0.90*	0.91	0.00	0.91

26.20	0.65	0.72	0.90*	0.91	0.00	0.91
26.25	0.65	0.72	0.90*	0.91	0.00	0.91
26.30	0.65	0.72	0.90*	0.91	0.00	0.91
26.35	0.65	0.72	0.90*	0.91	0.00	0.91
26.40	0.65	0.72	0.90*	0.91	0.00	0.91
26.45	0.65	0.72	0.90*	0.91	0.00	0.91
26.50	0.65	0.72	0.90*	0.91	0.00	0.91
26.55	0.65	0.72	0.90*	0.91	0.00	0.91
26.60	0.65	0.72	0.90*	0.91	0.00	0.91
26.65	0.65	0.72	0.90*	0.91	0.00	0.91
26.70	0.65	0.72	0.90*	0.91	0.00	0.91
26.75	0.65	0.72	0.90*	0.91	0.00	0.91
26.80	0.65	0.72	0.90*	0.91	0.00	0.91
26.85	0.65	0.72	0.90*	0.91	0.00	0.91
26.90	0.65	0.73	0.90*	0.91	0.00	0.91
26.95	0.65	0.73	0.90*	0.91	0.00	0.91
27.00	0.65	0.73	0.89*	0.91	0.00	0.91
27.05	0.65	0.73	0.89*	0.91	0.00	0.91
27.10	0.65	0.73	0.89*	0.91	0.00	0.91
27.15	0.65	0.73	0.89*	0.91	0.00	0.91
27.20	0.65	0.73	0.89*	0.91	0.00	0.91
27.25	0.65	0.73	0.89*	0.91	0.00	0.91
27.30	0.65	0.73	0.89*	0.91	0.00	0.91
27.35	0.65	0.73	0.89*	0.91	0.00	0.91
27.40	0.65	0.73	0.89*	0.91	0.00	0.91
27.45	0.65	0.73	0.89*	0.91	0.00	0.91
27.50	0.65	0.73	0.89*	0.91	0.00	0.91
27.55	0.65	0.73	0.89*	0.91	0.00	0.91
27.60	0.65	0.73	0.89*	0.91	0.00	0.91
27.65	0.65	0.73	0.89*	0.91	0.00	0.91
27.70	0.65	0.73	0.89*	0.91	0.00	0.91
27.75	0.65	0.73	0.89*	0.91	0.00	0.91
27.80	0.65	0.73	0.89*	0.91	0.00	0.91
27.85	0.65	0.73	0.89*	0.91	0.00	0.91
27.90	0.65	0.73	0.89*	0.91	0.00	0.91
27.95	0.65	0.73	0.89*	0.91	0.00	0.91
28.00	0.65	0.73	0.89*	0.91	0.00	0.91
28.05	0.65	0.73	0.89*	0.91	0.00	0.91
28.10	0.65	0.73	0.89*	0.91	0.00	0.91
28.15	0.65	0.73	0.89*	0.91	0.00	0.91
28.20	0.65	0.73	0.89*	0.91	0.00	0.91
28.25	0.65	0.73	0.88*	0.91	0.00	0.91
28.30	0.65	0.73	0.88*	0.91	0.00	0.91
28.35	0.65	0.73	0.88*	0.91	0.00	0.91
28.40	0.65	0.74	0.88*	0.91	0.00	0.91
28.45	0.65	0.74	0.88*	0.91	0.00	0.91
28.50	0.65	0.74	0.88*	0.91	0.00	0.91
28.55	0.65	0.74	0.88*	0.91	0.00	0.91
28.60	0.65	0.74	0.88*	0.91	0.00	0.91
28.65	0.65	0.74	0.88*	0.91	0.00	0.91

```
28.70   0.65    0.74    0.88*   0.91    0.00    0.91
28.75   0.65    0.74    0.88*   0.91    0.00    0.91
28.80   0.65    0.74    0.88*   0.91    0.00    0.91
28.85   0.65    0.74    0.88*   0.91    0.00    0.91
28.90   0.65    0.74    0.88*   0.91    0.00    0.91
28.95   0.65    0.74    0.88*   0.91    0.00    0.91
29.00   0.65    0.74    0.88*   0.91    0.00    0.91
29.05   0.65    0.74    0.88*   0.91    0.00    0.91
29.10   0.65    0.74    0.88*   0.91    0.00    0.91
29.15   0.65    0.74    0.88*   0.91    0.00    0.91
29.20   0.65    0.74    0.88*   0.91    0.00    0.91
29.25   0.65    0.74    0.88*   0.91    0.00    0.91
29.30   0.65    0.74    0.88*   0.91    0.00    0.91
29.35   0.65    0.74    0.88*   0.91    0.00    0.91
29.40   0.65    0.74    0.88*   0.91    0.00    0.91
29.45   0.65    0.74    0.88*   0.91    0.00    0.91
29.50   0.65    0.74    0.88*   0.91    0.00    0.91
29.55   0.65    0.74    0.88*   0.91    0.00    0.91
29.60   0.65    0.74    0.88*   0.91    0.00    0.91
29.65   0.65    0.74    0.87*   0.91    0.00    0.91
29.70   0.65    0.74    0.87*   0.91    0.00    0.91
29.75   0.65    0.74    0.87*   0.91    0.00    0.91
29.80   0.65    0.74    0.87*   0.91    0.00    0.91
29.85   0.65    0.74    0.87*   0.91    0.00    0.91
29.90   0.65    0.74    0.87*   0.91    0.00    0.91
29.95   0.65    0.74    0.87*   0.91    0.00    0.91
30.00   0.65    0.74    0.87*   0.91    0.00    0.91
30.05   2.00    0.74    5.00    0.91    0.00    0.91
30.10   2.00    0.74    5.00    0.91    0.00    0.91
30.15   2.00    0.74    5.00    0.91    0.00    0.91
30.20   2.00    0.74    5.00    0.91    0.00    0.91
30.25   2.00    0.74    5.00    0.91    0.00    0.91
30.30   2.00    0.74    5.00    0.91    0.00    0.91
30.35   2.00    0.74    5.00    0.91    0.00    0.91
30.40   2.00    0.74    5.00    0.91    0.00    0.91
30.45   2.00    0.74    5.00    0.91    0.00    0.91
30.50   2.00    0.74    5.00    0.91    0.00    0.91
30.55   2.00    0.74    5.00    0.91    0.00    0.91
30.60   2.00    0.74    5.00    0.91    0.00    0.91
30.65   2.00    0.75    5.00    0.91    0.00    0.91
30.70   2.00    0.75    5.00    0.91    0.00    0.91
30.75   2.00    0.75    5.00    0.91    0.00    0.91
30.80   2.00    0.75    5.00    0.91    0.00    0.91
30.85   2.00    0.75    5.00    0.91    0.00    0.91
30.90   2.00    0.75    5.00    0.91    0.00    0.91
30.95   2.00    0.75    5.00    0.91    0.00    0.91
31.00   2.00    0.75    5.00    0.91    0.00    0.91
31.05   2.00    0.75    5.00    0.91    0.00    0.91
31.10   2.00    0.75    5.00    0.91    0.00    0.91
31.15   2.00    0.75    5.00    0.91    0.00    0.91
```

31.20	2.00	0.75	5.00	0.91	0.00	0.91
31.25	2.00	0.75	5.00	0.91	0.00	0.91
31.30	2.00	0.75	5.00	0.91	0.00	0.91
31.35	2.00	0.75	5.00	0.91	0.00	0.91
31.40	2.00	0.75	5.00	0.91	0.00	0.91
31.45	2.00	0.75	5.00	0.91	0.00	0.91
31.50	2.00	0.75	5.00	0.91	0.00	0.91
31.55	2.00	0.75	5.00	0.91	0.00	0.91
31.60	2.00	0.75	5.00	0.91	0.00	0.91
31.65	2.00	0.75	5.00	0.91	0.00	0.91
31.70	2.00	0.75	5.00	0.91	0.00	0.91
31.75	2.00	0.75	5.00	0.91	0.00	0.91
31.80	2.00	0.75	5.00	0.91	0.00	0.91
31.85	2.00	0.75	5.00	0.91	0.00	0.91
31.90	2.00	0.75	5.00	0.91	0.00	0.91
31.95	2.00	0.75	5.00	0.91	0.00	0.91
32.00	2.00	0.75	5.00	0.91	0.00	0.91
32.05	2.00	0.75	5.00	0.91	0.00	0.91
32.10	2.00	0.75	5.00	0.91	0.00	0.91
32.15	2.00	0.75	5.00	0.91	0.00	0.91
32.20	2.00	0.75	5.00	0.91	0.00	0.91
32.25	2.00	0.75	5.00	0.91	0.00	0.91
32.30	2.00	0.75	5.00	0.91	0.00	0.91
32.35	2.00	0.75	5.00	0.91	0.00	0.91
32.40	2.00	0.75	5.00	0.91	0.00	0.91
32.45	2.00	0.75	5.00	0.91	0.00	0.91
32.50	2.00	0.75	5.00	0.91	0.00	0.91
32.55	2.00	0.75	5.00	0.91	0.00	0.91
32.60	2.00	0.75	5.00	0.91	0.00	0.91
32.65	2.00	0.75	5.00	0.91	0.00	0.91
32.70	2.00	0.75	5.00	0.91	0.00	0.91
32.75	2.00	0.75	5.00	0.91	0.00	0.91
32.80	2.00	0.75	5.00	0.91	0.00	0.91
32.85	2.00	0.75	5.00	0.91	0.00	0.91
32.90	2.00	0.75	5.00	0.91	0.00	0.91
32.95	2.00	0.75	5.00	0.91	0.00	0.91
33.00	2.00	0.75	5.00	0.91	0.00	0.91
33.05	2.00	0.75	5.00	0.91	0.00	0.91
33.10	2.00	0.75	5.00	0.91	0.00	0.91
33.15	2.00	0.75	5.00	0.91	0.00	0.91
33.20	2.00	0.75	5.00	0.91	0.00	0.91
33.25	2.00	0.75	5.00	0.91	0.00	0.91
33.30	2.00	0.75	5.00	0.91	0.00	0.91
33.35	2.00	0.75	5.00	0.91	0.00	0.91
33.40	2.00	0.75	5.00	0.91	0.00	0.91
33.45	2.00	0.75	5.00	0.91	0.00	0.91
33.50	2.00	0.75	5.00	0.91	0.00	0.91
33.55	2.00	0.75	5.00	0.91	0.00	0.91
33.60	2.00	0.75	5.00	0.91	0.00	0.91
33.65	2.00	0.75	5.00	0.91	0.00	0.91

```
33.70   2.00    0.75    5.00    0.91    0.00    0.91
33.75   2.00    0.75    5.00    0.91    0.00    0.91
33.80   2.00    0.75    5.00    0.91    0.00    0.91
33.85   2.00    0.75    5.00    0.91    0.00    0.91
33.90   2.00    0.75    5.00    0.91    0.00    0.91
33.95   2.00    0.75    5.00    0.91    0.00    0.91
34.00   2.00    0.74    5.00    0.91    0.00    0.91
34.05   0.65    0.74    0.87*   0.91    0.00    0.91
34.10   0.65    0.74    0.87*   0.91    0.00    0.91
34.15   0.65    0.74    0.87*   0.91    0.00    0.91
34.20   0.65    0.74    0.87*   0.91    0.00    0.91
34.25   0.65    0.74    0.87*   0.91    0.00    0.91
34.30   0.65    0.74    0.87*   0.91    0.00    0.91
34.35   0.65    0.74    0.87*   0.91    0.00    0.91
34.40   0.65    0.74    0.87*   0.91    0.00    0.91
34.45   0.65    0.74    0.87*   0.91    0.00    0.91
34.50   0.65    0.74    0.87*   0.91    0.00    0.91
34.55   0.65    0.74    0.87*   0.91    0.00    0.91
34.60   0.65    0.74    0.87*   0.91    0.00    0.91
34.65   0.65    0.74    0.87*   0.91    0.00    0.91
34.70   0.65    0.74    0.87*   0.91    0.00    0.91
34.75   0.65    0.74    0.87*   0.91    0.00    0.91
34.80   0.65    0.74    0.87*   0.91    0.00    0.91
34.85   0.65    0.74    0.87*   0.91    0.00    0.91
34.90   0.65    0.74    0.87*   0.91    0.00    0.91
34.95   0.65    0.74    0.87*   0.91    0.00    0.91
35.00   0.65    0.74    0.87*   0.91    0.00    0.91
35.05   0.65    0.74    0.87*   0.91    0.00    0.91
35.10   0.65    0.74    0.87*   0.91    0.00    0.91
35.15   0.65    0.74    0.87*   0.91    0.00    0.91
35.20   0.65    0.74    0.87*   0.91    0.00    0.91
35.25   0.65    0.74    0.87*   0.91    0.00    0.91
35.30   0.65    0.74    0.87*   0.91    0.00    0.91
35.35   0.65    0.74    0.87*   0.91    0.00    0.91
35.40   0.65    0.74    0.87*   0.91    0.00    0.91
35.45   0.65    0.74    0.87*   0.91    0.00    0.91
35.50   0.65    0.74    0.87*   0.91    0.00    0.91
35.55   0.65    0.74    0.87*   0.91    0.00    0.91
35.60   0.65    0.74    0.87*   0.91    0.00    0.91
35.65   0.65    0.74    0.87*   0.91    0.00    0.91
35.70   0.65    0.74    0.87*   0.91    0.00    0.91
35.75   0.65    0.74    0.87*   0.91    0.00    0.91
35.80   0.65    0.74    0.87*   0.91    0.00    0.91
35.85   0.65    0.74    0.87*   0.91    0.00    0.91
35.90   0.65    0.74    0.87*   0.91    0.00    0.91
35.95   0.65    0.74    0.87*   0.91    0.00    0.91
36.00   0.65    0.74    0.87*   0.91    0.00    0.91
36.05   0.65    0.74    0.87*   0.91    0.00    0.91
36.10   0.65    0.74    0.87*   0.91    0.00    0.91
36.15   0.65    0.74    0.87*   0.91    0.00    0.91
```

36.20	0.65	0.74	0.87*	0.91	0.00	0.91
36.25	0.65	0.74	0.87*	0.91	0.00	0.91
36.30	0.65	0.74	0.87*	0.91	0.00	0.91
36.35	0.65	0.74	0.87*	0.91	0.00	0.91
36.40	0.65	0.74	0.88*	0.91	0.00	0.91
36.45	0.65	0.74	0.88*	0.91	0.00	0.91
36.50	0.65	0.74	0.88*	0.91	0.00	0.91
36.55	0.65	0.74	0.88*	0.91	0.00	0.91
36.60	0.65	0.74	0.88*	0.91	0.00	0.91
36.65	0.65	0.74	0.88*	0.91	0.00	0.91
36.70	0.65	0.74	0.88*	0.91	0.00	0.91
36.75	0.65	0.74	0.88*	0.91	0.00	0.91
36.80	0.65	0.74	0.88*	0.91	0.00	0.91
36.85	0.65	0.74	0.88*	0.91	0.00	0.91
36.90	0.65	0.74	0.88*	0.91	0.00	0.91
36.95	0.65	0.74	0.88*	0.91	0.00	0.91
37.00	0.65	0.74	0.88*	0.91	0.00	0.91
37.05	0.65	0.74	0.88*	0.91	0.00	0.91
37.10	0.65	0.74	0.88*	0.91	0.00	0.91
37.15	0.65	0.74	0.88*	0.91	0.00	0.91
37.20	0.65	0.74	0.88*	0.91	0.00	0.91
37.25	0.65	0.74	0.88*	0.91	0.00	0.91
37.30	0.65	0.74	0.88*	0.91	0.00	0.91
37.35	0.65	0.74	0.88*	0.91	0.00	0.91
37.40	0.65	0.74	0.88*	0.91	0.00	0.91
37.45	0.65	0.74	0.88*	0.91	0.00	0.91
37.50	0.65	0.74	0.88*	0.91	0.00	0.91
37.55	0.65	0.74	0.88*	0.91	0.00	0.91
37.60	0.65	0.74	0.88*	0.91	0.00	0.91
37.65	0.65	0.74	0.88*	0.91	0.00	0.91
37.70	0.65	0.74	0.88*	0.91	0.00	0.91
37.75	0.65	0.74	0.88*	0.91	0.00	0.91
37.80	0.65	0.74	0.88*	0.91	0.00	0.91
37.85	0.65	0.74	0.88*	0.91	0.00	0.91
37.90	0.65	0.74	0.88*	0.91	0.00	0.91
37.95	0.65	0.74	0.88*	0.91	0.00	0.91
38.00	0.65	0.74	0.88*	0.91	0.00	0.91
38.05	0.65	0.74	0.88*	0.91	0.00	0.91
38.10	0.65	0.74	0.88*	0.91	0.00	0.91
38.15	0.65	0.74	0.88*	0.91	0.00	0.91
38.20	0.65	0.74	0.88*	0.91	0.00	0.91
38.25	0.65	0.74	0.88*	0.91	0.00	0.91
38.30	0.65	0.74	0.88*	0.91	0.00	0.91
38.35	0.65	0.74	0.88*	0.91	0.00	0.91
38.40	0.65	0.74	0.88*	0.91	0.00	0.91
38.45	0.65	0.74	0.88*	0.91	0.00	0.91
38.50	0.65	0.74	0.88*	0.91	0.00	0.91
38.55	0.65	0.74	0.88*	0.91	0.00	0.91
38.60	0.65	0.74	0.88*	0.91	0.00	0.91
38.65	0.65	0.74	0.88*	0.91	0.00	0.91

```
38.70   0.65    0.74    0.88*   0.91    0.00    0.91
38.75   0.65    0.74    0.88*   0.91    0.00    0.91
38.80   0.65    0.74    0.88*   0.91    0.00    0.91
38.85   0.65    0.74    0.88*   0.91    0.00    0.91
38.90   0.65    0.74    0.88*   0.91    0.00    0.91
38.95   0.65    0.74    0.88*   0.91    0.00    0.91
39.00   0.65    0.74    0.88*   0.91    0.00    0.91
39.05   0.65    0.74    0.88*   0.91    0.00    0.91
39.10   0.65    0.74    0.88*   0.91    0.00    0.91
39.15   0.65    0.74    0.88*   0.91    0.00    0.91
39.20   0.65    0.74    0.88*   0.91    0.00    0.91
39.25   0.65    0.74    0.88*   0.90    0.00    0.90
39.30   0.65    0.74    0.88*   0.90    0.00    0.90
39.35   0.65    0.74    0.88*   0.90    0.00    0.90
39.40   0.65    0.74    0.88*   0.90    0.00    0.90
39.45   0.65    0.74    0.88*   0.89    0.00    0.89
39.50   0.65    0.74    0.88*   0.89    0.00    0.89
39.55   0.65    0.74    0.88*   0.88    0.00    0.88
39.60   0.64    0.74    0.87*   0.88    0.00    0.88
39.65   0.55    0.74    0.74*   0.88    0.00    0.88
39.70   0.51    0.74    0.70*   0.87    0.00    0.87
39.75   0.49    0.74    0.66*   0.87    0.00    0.87
39.80   0.47    0.74    0.64*   0.86    0.00    0.86
39.85   0.46    0.74    0.62*   0.86    0.00    0.86
39.90   0.44    0.74    0.60*   0.85    0.00    0.85
39.95   0.43    0.74    0.59*   0.84    0.00    0.84
40.00   0.42    0.74    0.57*   0.84    0.00    0.84
40.05   0.42    0.74    0.57*   0.83    0.00    0.83
40.10   0.42    0.73    0.57*   0.83    0.00    0.83
40.15   0.42    0.73    0.57*   0.82    0.00    0.82
40.20   0.42    0.73    0.57*   0.81    0.00    0.81
40.25   0.42    0.73    0.57*   0.81    0.00    0.81
40.30   0.42    0.73    0.57*   0.80    0.00    0.80
40.35   0.42    0.73    0.57*   0.79    0.00    0.79
40.40   0.42    0.73    0.57*   0.79    0.00    0.79
40.45   0.42    0.73    0.57*   0.78    0.00    0.78
40.50   0.42    0.73    0.57*   0.77    0.00    0.77
40.55   0.42    0.73    0.57*   0.77    0.00    0.77
40.60   0.42    0.73    0.57*   0.76    0.00    0.76
40.65   0.42    0.73    0.57*   0.76    0.00    0.76
40.70   0.42    0.73    0.57*   0.75    0.00    0.75
40.75   0.42    0.73    0.57*   0.74    0.00    0.74
40.80   0.41    0.73    0.57*   0.74    0.00    0.74
40.85   0.41    0.73    0.57*   0.73    0.00    0.73
40.90   0.41    0.73    0.56*   0.72    0.00    0.72
40.95   0.41    0.73    0.56*   0.72    0.00    0.72
41.00   0.41    0.73    0.56*   0.71    0.00    0.71
41.05   0.41    0.73    0.56*   0.70    0.00    0.70
41.10   0.41    0.73    0.56*   0.70    0.00    0.70
41.15   0.41    0.73    0.56*   0.69    0.00    0.69
```

```
41.20   0.41    0.73    0.56*   0.69    0.00    0.69
41.25   0.41    0.73    0.56*   0.68    0.00    0.68
41.30   0.41    0.73    0.56*   0.67    0.00    0.67
41.35   0.41    0.73    0.56*   0.67    0.00    0.67
41.40   0.41    0.73    0.56*   0.66    0.00    0.66
41.45   0.41    0.73    0.56*   0.65    0.00    0.65
41.50   0.41    0.73    0.56*   0.65    0.00    0.65
41.55   0.41    0.73    0.56*   0.64    0.00    0.64
41.60   0.41    0.73    0.56*   0.63    0.00    0.63
41.65   0.41    0.73    0.56*   0.63    0.00    0.63
41.70   0.41    0.73    0.56*   0.62    0.00    0.62
41.75   0.41    0.73    0.56*   0.61    0.00    0.61
41.80   0.41    0.73    0.56*   0.61    0.00    0.61
41.85   0.41    0.73    0.56*   0.60    0.00    0.60
41.90   0.41    0.73    0.55*   0.59    0.00    0.59
41.95   0.40    0.73    0.55*   0.59    0.00    0.59
42.00   0.40    0.73    0.55*   0.58    0.00    0.58
42.05   0.40    0.73    0.55*   0.57    0.00    0.57
42.10   0.40    0.73    0.55*   0.57    0.00    0.57
42.15   0.40    0.73    0.55*   0.56    0.00    0.56
42.20   0.40    0.73    0.55*   0.56    0.00    0.56
42.25   0.40    0.73    0.55*   0.55    0.00    0.55
42.30   0.40    0.73    0.55*   0.54    0.00    0.54
42.35   0.40    0.73    0.55*   0.54    0.00    0.54
42.40   0.40    0.73    0.55*   0.53    0.00    0.53
42.45   0.40    0.73    0.55*   0.52    0.00    0.52
42.50   0.40    0.73    0.55*   0.52    0.00    0.52
42.55   0.40    0.73    0.55*   0.51    0.00    0.51
42.60   0.40    0.73    0.55*   0.50    0.00    0.50
42.65   0.40    0.73    0.55*   0.50    0.00    0.50
42.70   0.40    0.73    0.55*   0.49    0.00    0.49
42.75   0.40    0.73    0.55*   0.48    0.00    0.48
42.80   0.40    0.73    0.55*   0.48    0.00    0.48
42.85   0.40    0.73    0.55*   0.47    0.00    0.47
42.90   0.40    0.73    0.55*   0.46    0.00    0.46
42.95   0.40    0.73    0.55*   0.46    0.00    0.46
43.00   0.40    0.73    0.55*   0.45    0.00    0.45
43.05   0.40    0.73    0.55*   0.44    0.00    0.44
43.10   0.40    0.73    0.55*   0.44    0.00    0.44
43.15   0.40    0.73    0.55*   0.43    0.00    0.43
43.20   0.40    0.73    0.55*   0.42    0.00    0.42
43.25   0.40    0.73    0.55*   0.42    0.00    0.42
43.30   0.40    0.73    0.55*   0.41    0.00    0.41
43.35   0.40    0.73    0.54*   0.40    0.00    0.40
43.40   0.39    0.73    0.54*   0.40    0.00    0.40
43.45   0.39    0.73    0.54*   0.39    0.00    0.39
43.50   0.39    0.72    0.54*   0.38    0.00    0.38
43.55   0.39    0.72    0.54*   0.38    0.00    0.38
43.60   0.39    0.72    0.54*   0.37    0.00    0.37
43.65   0.39    0.72    0.54*   0.36    0.00    0.36
```

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43.70   0.39    0.72    0.54*   0.36    0.00    0.36
43.75   0.39    0.72    0.54*   0.35    0.00    0.35
43.80   0.39    0.72    0.54*   0.34    0.00    0.34
43.85   0.39    0.72    0.54*   0.34    0.00    0.34
43.90   0.39    0.72    0.54*   0.33    0.00    0.33
43.95   0.39    0.72    0.54*   0.32    0.00    0.32
44.00   0.39    0.72    0.54*   0.32    0.00    0.32
44.05   0.39    0.72    0.54*   0.31    0.00    0.31
44.10   0.39    0.72    0.54*   0.30    0.00    0.30
44.15   0.39    0.72    0.54*   0.29    0.00    0.29
44.20   0.39    0.72    0.54*   0.29    0.00    0.29
44.25   0.39    0.72    0.54*   0.28    0.00    0.28
44.30   0.39    0.72    0.54*   0.27    0.00    0.27
44.35   0.39    0.72    0.54*   0.27    0.00    0.27
44.40   0.39    0.72    0.54*   0.26    0.00    0.26
44.45   0.39    0.72    0.53*   0.25    0.00    0.25
44.50   0.39    0.72    0.53*   0.25    0.00    0.25
44.55   0.39    0.72    0.53*   0.24    0.00    0.24
44.60   0.38    0.72    0.53*   0.23    0.00    0.23
44.65   0.38    0.72    0.53*   0.23    0.00    0.23
44.70   0.38    0.72    0.53*   0.22    0.00    0.22
44.75   0.38    0.72    0.53*   0.21    0.00    0.21
44.80   0.38    0.72    0.53*   0.21    0.00    0.21
44.85   0.38    0.72    0.53*   0.20    0.00    0.20
44.90   0.38    0.72    0.53*   0.19    0.00    0.19
44.95   0.38    0.72    0.53*   0.19    0.00    0.19
45.00   0.38    0.72    0.53*   0.18    0.00    0.18
45.05   0.39    0.72    0.54*   0.17    0.00    0.17
45.10   0.39    0.72    0.55*   0.17    0.00    0.17
45.15   0.40    0.72    0.55*   0.16    0.00    0.16
45.20   0.40    0.72    0.56*   0.15    0.00    0.15
45.25   0.41    0.72    0.57*   0.15    0.00    0.15
45.30   0.41    0.72    0.58*   0.14    0.00    0.14
45.35   0.42    0.72    0.59*   0.13    0.00    0.13
45.40   0.43    0.72    0.59*   0.13    0.00    0.13
45.45   0.43    0.72    0.60*   0.12    0.00    0.12
45.50   0.44    0.72    0.61*   0.11    0.00    0.11
45.55   0.45    0.72    0.63*   0.11    0.00    0.11
45.60   0.46    0.72    0.64*   0.10    0.00    0.10
45.65   0.47    0.72    0.65*   0.10    0.00    0.10
45.70   0.48    0.72    0.66*   0.09    0.00    0.09
45.75   0.49    0.72    0.68*   0.08    0.00    0.08
45.80   0.50    0.72    0.70*   0.08    0.00    0.08
45.85   0.51    0.72    0.72*   0.07    0.00    0.07
45.90   0.54    0.72    0.75*   0.07    0.00    0.07
45.95   0.57    0.72    0.79*   0.06    0.00    0.06
46.00   0.64    0.72    0.89*   0.06    0.00    0.06
46.05   0.65    0.72    0.90*   0.06    0.00    0.06
46.10   0.65    0.72    0.90*   0.05    0.00    0.05
46.15   0.65    0.72    0.90*   0.05    0.00    0.05
```

```
46.20   0.65    0.72    0.90*   0.04    0.00    0.04
46.25   0.65    0.72    0.90*   0.04    0.00    0.04
46.30   0.65    0.71    0.90*   0.04    0.00    0.04
46.35   0.65    0.71    0.90*   0.03    0.00    0.03
46.40   0.65    0.71    0.90*   0.03    0.00    0.03
46.45   0.65    0.71    0.90*   0.03    0.00    0.03
46.50   0.65    0.71    0.91*   0.02    0.00    0.02
46.55   0.65    0.71    0.91*   0.02    0.00    0.02
46.60   0.65    0.71    0.91*   0.02    0.00    0.02
46.65   0.65    0.71    0.91*   0.02    0.00    0.02
46.70   0.65    0.71    0.91*   0.02    0.00    0.02
46.75   0.65    0.71    0.91*   0.01    0.00    0.01
46.80   0.65    0.71    0.91*   0.01    0.00    0.01
46.85   0.65    0.71    0.91*   0.01    0.00    0.01
46.90   0.65    0.71    0.91*   0.01    0.00    0.01
46.95   0.65    0.71    0.91*   0.01    0.00    0.01
47.00   0.65    0.71    0.91*   0.01    0.00    0.01
47.05   0.65    0.71    0.91*   0.01    0.00    0.01
47.10   0.65    0.71    0.91*   0.01    0.00    0.01
47.15   0.65    0.71    0.91*   0.01    0.00    0.01
47.20   0.65    0.71    0.91*   0.00    0.00    0.00
47.25   0.64    0.71    0.91*   0.00    0.00    0.00
47.30   0.64    0.71    0.91*   0.00    0.00    0.00
47.35   0.64    0.71    0.91*   0.00    0.00    0.00
47.40   0.64    0.71    0.91*   0.00    0.00    0.00
47.45   0.64    0.71    0.91*   0.00    0.00    0.00
47.50   0.64    0.71    0.91*   0.00    0.00    0.00
47.55   0.64    0.71    0.91*   0.00    0.00    0.00
47.60   0.64    0.71    0.91*   0.00    0.00    0.00
47.65   0.64    0.71    0.91*   0.00    0.00    0.00
47.70   0.64    0.71    0.91*   0.00    0.00    0.00
47.75   0.64    0.71    0.91*   0.00    0.00    0.00
47.80   0.64    0.71    0.91*   0.00    0.00    0.00
47.85   0.64    0.71    0.91*   0.00    0.00    0.00
47.90   0.64    0.71    0.91*   0.00    0.00    0.00
47.95   0.64    0.71    0.91*   0.00    0.00    0.00
48.00   0.64    0.71    0.91*   0.00    0.00    0.00
48.05   0.64    0.71    0.91*   0.00    0.00    0.00
48.10   0.64    0.71    0.91*   0.00    0.00    0.00
48.15   0.64    0.71    0.91*   0.00    0.00    0.00
48.20   0.64    0.71    0.91*   0.00    0.00    0.00
48.25   0.64    0.71    0.91*   0.00    0.00    0.00
48.30   0.64    0.71    0.91*   0.00    0.00    0.00
48.35   0.64    0.71    0.91*   0.00    0.00    0.00
48.40   0.64    0.71    0.91*   0.00    0.00    0.00
48.45   0.64    0.71    0.91*   0.00    0.00    0.00
48.50   0.64    0.71    0.91*   0.00    0.00    0.00
48.55   0.64    0.71    0.91*   0.00    0.00    0.00
48.60   0.64    0.71    0.91*   0.00    0.00    0.00
48.65   0.64    0.71    0.91*   0.00    0.00    0.00
```

```
48.70   0.64    0.71    0.91*   0.00    0.00    0.00
48.75   0.64    0.70    0.91*   0.00    0.00    0.00
48.80   0.64    0.70    0.91*   0.00    0.00    0.00
48.85   0.64    0.70    0.91*   0.00    0.00    0.00
48.90   0.64    0.70    0.91*   0.00    0.00    0.00
48.95   0.64    0.70    0.91*   0.00    0.00    0.00
49.00   0.64    0.70    0.91*   0.00    0.00    0.00
49.05   0.64    0.70    0.91*   0.00    0.00    0.00
49.10   0.64    0.70    0.91*   0.00    0.00    0.00
49.15   0.64    0.70    0.91*   0.00    0.00    0.00
49.20   0.64    0.70    0.91*   0.00    0.00    0.00
49.25   0.64    0.70    0.91*   0.00    0.00    0.00
49.30   0.64    0.70    0.91*   0.00    0.00    0.00
49.35   0.64    0.70    0.91*   0.00    0.00    0.00
49.40   0.64    0.70    0.91*   0.00    0.00    0.00
49.45   0.64    0.70    0.91*   0.00    0.00    0.00
49.50   0.64    0.70    0.91*   0.00    0.00    0.00
49.55   0.64    0.70    0.91*   0.00    0.00    0.00
49.60   0.64    0.70    0.91*   0.00    0.00    0.00
49.65   0.64    0.70    0.91*   0.00    0.00    0.00
49.70   0.64    0.70    0.91*   0.00    0.00    0.00
49.75   0.64    0.70    0.91*   0.00    0.00    0.00
49.80   0.64    0.70    0.91*   0.00    0.00    0.00
49.85   0.64    0.70    0.91*   0.00    0.00    0.00
49.90   0.64    0.70    0.91*   0.00    0.00    0.00
49.95   0.64    0.70    0.92*   0.00    0.00    0.00
50.00   0.64    0.70    0.92*   0.00    0.00    0.00
50.05   2.00    0.70    5.00    0.00    0.00    0.00
50.10   2.00    0.70    5.00    0.00    0.00    0.00
50.15   2.00    0.70    5.00    0.00    0.00    0.00
50.20   2.00    0.70    5.00    0.00    0.00    0.00
50.25   2.00    0.70    5.00    0.00    0.00    0.00
50.30   2.00    0.70    5.00    0.00    0.00    0.00
50.35   2.00    0.70    5.00    0.00    0.00    0.00
50.40   2.00    0.70    5.00    0.00    0.00    0.00
50.45   2.00    0.70    5.00    0.00    0.00    0.00
50.50   2.00    0.70    5.00    0.00    0.00    0.00
50.55   2.00    0.70    5.00    0.00    0.00    0.00
50.60   2.00    0.70    5.00    0.00    0.00    0.00
50.65   2.00    0.70    5.00    0.00    0.00    0.00
50.70   2.00    0.70    5.00    0.00    0.00    0.00
50.75   2.00    0.70    5.00    0.00    0.00    0.00
50.80   2.00    0.70    5.00    0.00    0.00    0.00
50.85   2.00    0.70    5.00    0.00    0.00    0.00
50.90   2.00    0.70    5.00    0.00    0.00    0.00
50.95   2.00    0.70    5.00    0.00    0.00    0.00
51.00   2.00    0.69    5.00    0.00    0.00    0.00
51.05   2.00    0.69    5.00    0.00    0.00    0.00
51.10   2.00    0.69    5.00    0.00    0.00    0.00
51.15   2.00    0.69    5.00    0.00    0.00    0.00
```

```
        51.20   2.00    0.69    5.00    0.00    0.00    0.00
        51.25   2.00    0.69    5.00    0.00    0.00    0.00
        51.30   2.00    0.69    5.00    0.00    0.00    0.00
        51.35   2.00    0.69    5.00    0.00    0.00    0.00
        51.40   2.00    0.69    5.00    0.00    0.00    0.00
        51.45   2.00    0.69    5.00    0.00    0.00    0.00
        51.50   2.00    0.69    5.00    0.00    0.00    0.00

        * F.S.<1, Liquefaction Potential Zone
        (F.S. is limited to 5,  CRR is limited to 2,    CSR is limited to 2)

        Units:  Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight =
pcf; Depth = ft; Settlement = in.


        1 atm (atmosphere) = 1 tsf (ton/ft2)
        CRRm            Cyclic resistance ratio from soils
        CSRsf           Cyclic stress ratio induced by a given earthquake (with user
request factor of safety)
        F.S.            Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
        S_sat           Settlement from saturated sands
        S_dry           Settlement from Unsaturated Sands
        S_all           Total Settlement from Saturated and Unsaturated Sands
        NoLiq           No-Liquefy Soils
```

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February 5, 2025

Terracon
145 West Walnut Street
Carson, CA 90248
Attn: Toni Aguilar

Thermal Resistivity Report
ABI Properties BESS – City of Industry, CA (Project No. LA245225)

The following is the report of thermal dryout characterization tests conducted on one (2) bulk sample of native soil from the referenced project sent to our laboratory.

Thermal Resistivity Tests: The sample was tested at either the ‘optimum’ or ‘as received’ moisture content, whichever was greater and at 85% and 95% of the standard Proctor dry density ***provided by Terracon***. The tests were conducted in accordance with the **IEEE standard 442-2017**. The results are tabulated below and the thermal dry out curve is presented in **Figure 1.**

Sample ID, Description, Thermal Resistivity, Moisture Content and Density

Sample ID	Depth (ft)	Effort (%)	Description (Terracon)	Thermal Resistivity (°C-cm/W)		Moisture Content (%)	Dry Density (lb/ft^3)
				Wet	Dry		
B-2	0.5 – 5.0	85	Lean Clay with Sand (CL)	55	186	17	97
B-2	0.5 – 5.0	95	Lean Clay with Sand (CL)	49	133	17	108

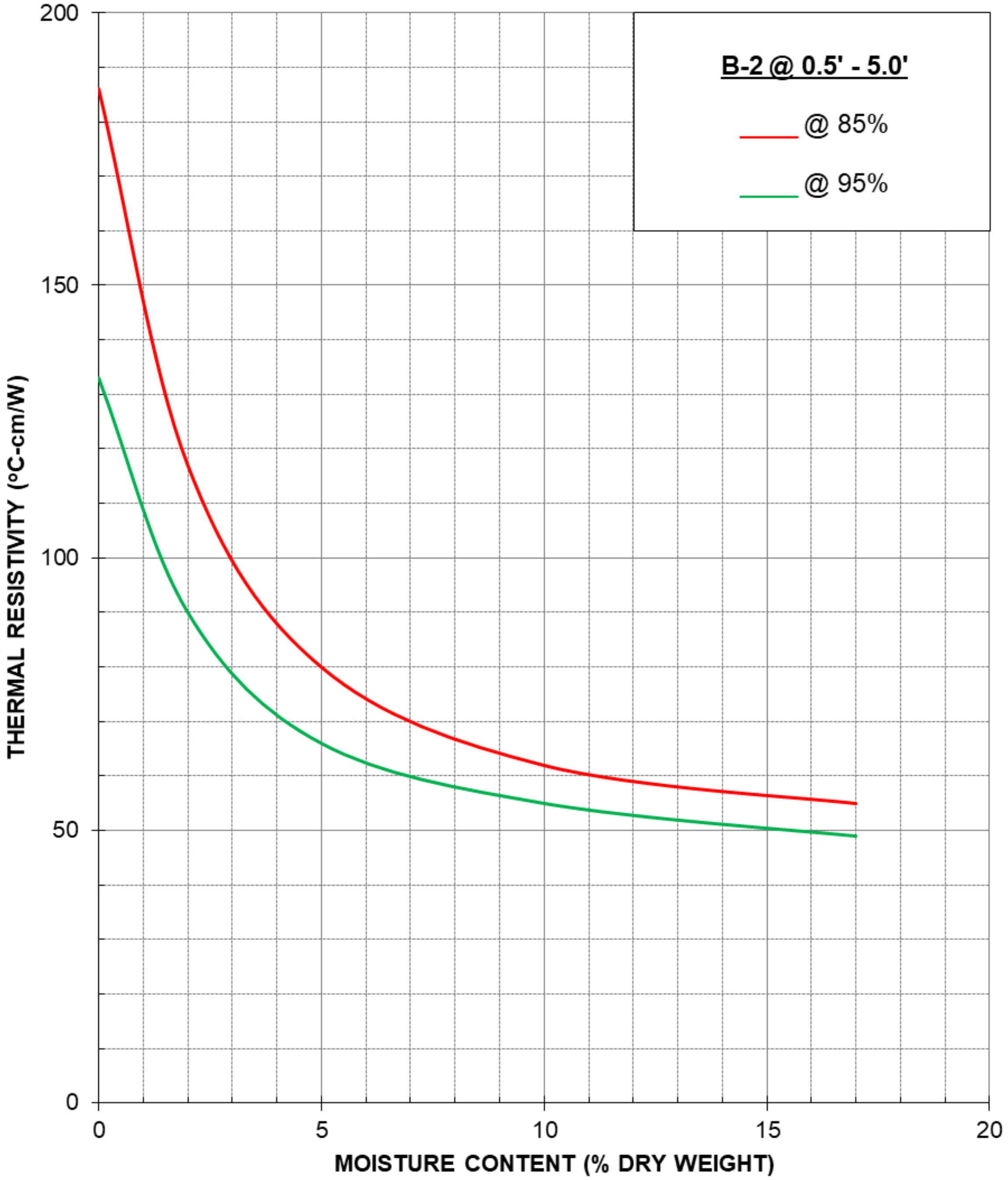
Comments: The thermal characteristic depicted in the dryout curves apply for the soils at their respective test dry density.

Please contact us if you have any questions or if we can be of further assistance.

Geotherm USA, LLC

Nimesh Patel

THERMAL DRYOUT CURVES



Terracon (Project No. LA245225)

ABI Properties BESS – City of Industry, CA

Thermal Resistivity Report

February 2025 **Figure 1**

General Notes

Sampling

- ▯ Auger Cuttings
- ⧗ Modified Dames & Moore Ring Sampler
- ✋ Grab Sample
- ☒ Standard Penetration Test

Water Level

- ▽ Water Initially Encountered
- ▽ Water Level After a Specified Period of Time
- ▼ Water Level After a Specified Period of Time
- ▨ Cave In Encountered

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

Field Tests

N	Standard Penetration Test Resistance (Blows/Ft.)
(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
UC	Unconfined Compressive Strength
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			**Consistency of Fine-Grained Soils** (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Relative Density	**Standard Penetration or N-Value (Blows/Ft.)**	**Ring Sampler (Blows/Ft.)**	**Consistency**	**Unconfined Compressive Strength Qu (tsf)**	**Standard Penetration or N-Value (Blows/Ft.)**	**Ring Sampler (Blows/Ft.)**
Very Loose	0 - 3	0 - 6	Very Soft	less than 0.25	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	0.25 to 0.50	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium Stiff	0.50 to 1.00	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	1.00 to 2.00	8 - 15	10 - 18
Very Dense	> 50	> 99	Very Stiff	2.00 to 4.00	15 - 30	19 - 42
			Hard	> 4.00	> 30	> 42

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

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≥4 and 1≤Cc≤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≥6 and 1≤Cc≤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 above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					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:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					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] $Cu = D_{60}/D_{10} \qquad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[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.