PRELIMINARY GEOTECHNICAL EVALUATION
RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PREPARED FOR:
BrightSource Energy
1999 Harrison Street, Suite 2150
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PREPARED BY:
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June 8, 2011
Project No. 303256001

June 8, 2011
Project No. 303256001

Dr. Michael Rojansky
BrightSource Energy
1999 Harrison Street, Suite 2150
Oakland, California 94612

Subject: Preliminary Geotechnical Evaluation
Rio Mesa Solar Facility
Bradshaw Trail and West Avenue
Riverside County, California

Dear Dr. Rojansky:

Transmitted herein are the results of Ninyo & Moore's preliminary geotechnical evaluation for the proposed Rio Mesa Solar Facility project to be located southwest of Bradshaw Trail and West Avenue near Palo Verde in Riverside County, California. The purpose of our preliminary evaluation was to assess geologic and geotechnically related considerations pertaining to the project site and to provide preliminary conclusions and recommendations. The conclusions and recommendations provided in this report are intended for planning purposes. A design-level geotechnical evaluation, including additional subsurface evaluation and laboratory testing, will need to be performed for the project in the future. We appreciate the opportunity to be of service to you on this project.

Respectfully submitted,
NINYO & MOORE

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Senior Project Engineer

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Chief Geotechnical Engineer

SLM/EDE/ltk

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1. INTRODUCTION

In accordance with your request, Ninyo & Moore has performed a preliminary geotechnical evaluation for the proposed Rio Mesa Solar Facility project to be located southwest of Bradshaw Trail and West Avenue near Palo Verde in Riverside County, California. The approximate location of the site is indicated on Figure 1. The purpose of our preliminary evaluation was to assess geologic and geotechnically related considerations pertaining to the project site and to provide preliminary conclusions and recommendations. This report presents the findings of our subsurface exploration, results of our laboratory testing, and preliminary conclusions regarding the subsurface soil and geologic conditions at the site. The conclusions and recommendations provided in this report are intended for planning purposes. A design-level geotechnical evaluation, including additional subsurface evaluation and laboratory testing, will need to be performed for the project in the future.

2. SCOPE OF SERVICES

The scope of our services included the following:

- Review of pertinent background data listed in the References section of this report. The data reviewed included in-house geotechnical data, and published soils and geologic maps and literature.
- Coordination and mobilization for subsurface exploration. Marking of existing utilities was conducted through Underground Service Alert (USA).
- Performance of a geologic reconnaissance at the subject site to evaluate the possible presence of faults, ground fissures, and other potential geologic hazards that could affect design and construction of the project.
- Drilling, logging, and sampling of 16 exploratory borings to depths up to approximately 20 feet. The purposes of the soil borings were to evaluate the subsurface soil profile and groundwater conditions, and to obtain soil samples for laboratory testing.
- Performance of 16 cone penetration tests (CPTs) to depths up to approximately 25 feet adjacent to each of the boring locations.
- Excavation, logging, and sampling of 15 exploratory test pits to depths up to approximately 10 feet to evaluate subsurface conditions and to obtain soil samples for laboratory testing.

- Performance of laboratory tests on selected soil samples obtained from the exploratory excavations to evaluate in-place moisture content and dry density, gradation, plasticity, consolidation characteristics, shear strength, maximum dry density and optimum moisture content, chloride content, pH, reduction-oxidation potential, sodium content, sulfate content, sodium sulfate content, solubility potential (total salts), and resistivity.

- Compilation and analysis of the accumulated data.

- Preparation of this geotechnical evaluation report presenting our preliminary findings, conclusions, and recommendations regarding the subject project.

3. PROJECT DESCRIPTION

Based on our discussions with BrightSource Energy personnel, it is our understanding that the project will include design and construction of a concentrated thermal solar facility located on a site encompassing portions of Sections 16, 20, 21, 22, 23, 26, 27, 28, 29, 33, 34, and 35 within Township 8S and Range 21E in Riverside County, California. It is also our understanding that in the future the site will be expanded to include approximately 1,600 acres adjacent to and north of the initial Rio Mesa Solar site that is covered in this report. An additional geotechnical evaluation addressing these Augmentation Lands, which are located within the jurisdiction of the Bureau of Land Management, will be performed in the future. A separate geotechnical report covering the Augmentation Lands will also be provided in the future.

It is our understanding that the project is currently in the conceptual stages of design. Accordingly, site plans and/or proposed layouts were not available for our review prior to preparation of this report. However, we understand that the proposed project will generally include arrays of mirrored heliostats that will concentrate and reflect the sun's energy towards boilers situated on top of central receiving towers. It is our understanding that driven pylon foundations consisting of 6-inch diameter pipe piles with fins will be used to supports the heliostats. Steam turbines and electrical generators, which will be located at centralized power block facilities, will be used to produce electrical energy. We understand that a transmission line will connect this project to the existing electrical grid. Evaluation of geotechnical conditions along the transmission line alignment was not a part of the evaluation described in this report.

4. GENERAL SITE CONDITIONS

The project site is located approximately 12 miles southwest of the city of Blythe on the Palo Verde Mesa in Riverside County, California (Figure 1). The community of Palo Verde is located approximately 2 miles southeast of the project site. The site is generally bordered by undeveloped land to the north, west, and south. The site is primarily on a mesa that ends at a distinct scarp on the east side of the site. Developed agricultural land is located in the Palo Verde Valley east of the site. Bradshaw Trail extends along the north portion of the site and the Riverside County and Imperial County border extends along the south boundary of the site. An unpaved access road extends along the Western Area Power Administration (WAPA) 115kV overhead power transmission line in a northeast to southwest direction through the eastern portion of the site. We understand that a buried high pressure gas line also extends through the site along the WAPA transmission line corridor.

Several large ephemeral (typically dry) washes extend through the site in a roughly northwest to southeast direction. These drainage washes were observed to be up to approximately 1,500 feet wide and 30 feet deep or more in certain areas. Along the WAPA transmission line, the large washes running through the project site are approximately 1 mile, 2 miles, and 1/2 mile apart where they cross the transmission line access road, The northernmost wash is outside of the project area where it crosses the transmission line access road. Field observations indicate that water runoff generally drains toward the east end of the mesa via sheet-flow and smaller natural drainage swales that feed into the larger drainage washes. A wash extending in an approximately north to south orientation through the central portion of the site feeds into one of the large washes that crosses the WAPA transmission line access road in the southern portion of the project area.

At the time of our field activities, the site was essentially undeveloped and covered with sparse native desert vegetation. This vegetation consisted primarily of shrubs and grasses. Existing improvements in the site area include the unpaved Bradshaw Trail, which extends through the north portion of the site, and a utility corridor with overhead power transmission lines, a gas line, and associated unpaved access road. Although not observed by our personnel or marked by Underground Service Alert, additional utilities may be present.

5. GEOLOGY AND SUBSURFACE CONDITIONS

Ninyo & Moore's findings regarding the regional geologic setting, previous site studies, potential geologic hazards, ground motions, and groundwater at the site are provided in the following sections.

5.1. Regional Geologic Setting

The site is located in Riverside County in southeastern California, at the western edge of Palo Verde Valley, approximately 3 miles west of the Colorado River, which flows through the valley. The site is located on an elevated plateau identified as Palo Verde Mesa. Palo Verde Valley is underlain by Quaternary-age fluvial sediments and Late Tertiary-age marine sediments that fill a buried river valley cut into basement rocks ranging from Tertiary volcanics to Precambrian granitic rocks. Palo Verde Mesa is underlain by Quaternary-aged Colorado River fluvial deposits consisting of silty sands with varying amounts of gravel.

Precambrian granitic rocks are exposed in the Mule Mountains at the western edge of Palo Verde Mesa. Coalescing Quaternary-age colluvium and alluvial deposits extend eastward from the Mule Mountains onto Palo Verde Mesa. Recent deposits of sands and gravels occur within numerous active washes that extend eastward across Palo Verde Mesa to Palo Verde Valley.

5.2. Previous Site Studies

Selected portions of the referenced report (San Diego Gas & Electric Company, 1977) were provided for review. A geologic cross-section entitled "East-West Profile," shows an interpretation of materials encountered in exploratory borings. The cross-section shows the site to be underlain by Intermediate Colorado River Fluvial Deposits extending from the surface to depths of approximately 125 feet. This geologic unit becomes thinner towards the west and is not present at the western portion of the cross-section. This unit is shown as being underlain by Older Colorado River Fluvial Deposits that extend to a depth of about 400 feet on the east portion of the site and about 100 feet on the west portion of the site. An approximately 50 to 100 foot thick course grained sedimentary unit is shown beneath the Older

Colorado River Fluvial Deposits and resting directly on the marine sedimentary rocks of the Tertiary Aged Bouse Formation.

5.3. Potential Geologic Hazards

Ninyo & Moore performed an evaluation of the possible presence of geologic hazards, such as faults, in the site area. This evaluation included visual observation of the site for indications of adverse geologic features and review of published geologic and soils maps and literature, and other data listed in the References section of this report. Referenced geologic data were also reviewed to evaluate seismic activity levels, and associated potential earthquake hazards, for faults in the site vicinity. It should be noted that the fault seismic activity levels provided in this report were obtained/interpreted primarily from United States Geological Survey (USGS, 2011b) data.

Based on our field observations and review of referenced data, no faults traverse the project site. Review of referenced geologic data (Jennings, C.W., et al., 2010) indicates that the nearest active fault (i.e., a fault that has experienced ground surface rupture within Holocene time, the past 11,000 years) to the site is the San Andreas fault. Review of the referenced information indicates that the Coachella Segment of the San Andreas fault zone has the potential to generate an earthquake of moment magnitude of 7.0 (USGS, 2011a).

Additional faults (Jennings, C.W, et al, 2010) in the vicinity of the project site include the Salton Creek fault with reported activity in Quaternary time (last 1,600,000 years). Several unnamed Pre-Quaternary faults are mapped in the nearby Mule Mountains (Jennings, C.W., et al, 2010, and Jennings, C.W., 1967). Distances from the site to these faults are provided in the following table.

Table 1 – Faults in the Site Vicinity

Fault Name	Seismic Activity Level *	Approximate Distance From Project Site to Fault
San Andreas fault (Coachella Segment)	Active (Holocene)	55 miles
Salton Creek fault	Quaternary	25 miles
Unnamed faults in Mule Mountains	Pre-Quaternary	1.5 miles
*From California Geological Survey (Jennings, C.W., et al, 2010).		

5.4. Ground Motions

Using the referenced United States Geological Survey database (USGS, 2010a), the subject site is located in a zone of estimated peak ground acceleration (PGA) between approximately 0.10g and 0.12g with a 10 percent probability of being exceeded in 50 years, and a PGA between 0.12g, and 0.16g with a 2 percent probability of being exceeded in 50 years.

5.5. Groundwater

Groundwater was not encountered in the exploratory borings and test pits excavated as part of this study. Review of logs of exploratory borings drilled in 1977 (San Diego Gas & Electric Company, 1977) indicates that groundwater was reported at depths ranging from approximately 100 to 200 feet below the ground surface at the site.

6. FIELD EXPLORATION, LABORATORY TESTING, AND SUBSURFACE CONDITIONS

Ninyo & Moore's subsurface exploration of the project site was performed on April 25, through May 3, 2011. This exploration consisted of drilling, logging, and sampling of 16 small-diameter exploratory borings and excavation, logging, and sampling of 15 exploratory test pits. The borings were advanced to depths up to approximately 20 feet with a track-mounted CME-75 drill rig utilizing 8-inch diameter hollow-stem augers. The test pits were excavated to depths up to approximately 10 feet deep with a rubber tire backhoe. The purpose of the borings and test pits was to evaluate subsurface conditions at the subject site, as well as to collect bulk and relatively undisturbed soil samples for laboratory testing. The approximate locations of the borings and test pits are shown on Figure 2 and Figure 3.

Laboratory tests were performed on representative soil samples collected from the borings and test pits to evaluate in-place moisture content and dry density, gradation, plasticity, consolidation characteristics, shear strength, maximum dry density and optimum moisture content, chloride content, pH, reduction-oxidation potential, sodium content, sulfate content, sodium sulfate

content, solubility potential (total salts), and resistivity. The results of the in-place moisture content and dry density tests are provided on the boring and test pits logs in Appendix A. Descriptions of the laboratory testing procedures utilized and the other test results are presented in Appendix B and Appendix C.

Our exploration also included performance of 16 cone penetration tests (CPT) at the subject site adjacent to each of the boring locations. The CPTs were advanced to depths up to approximately 25 feet with a truck-mounted rig using a DSG1104 cone. The CPT results are provided in Appendix D.

6.1. Subsurface Soils Encountered

Our knowledge of the subsurface conditions at the project site is based on our review of background documents, field exploration, and laboratory testing. Generalized descriptions of the subsurface soils encountered in the exploratory borings and test pits are provided in the following sections. More detailed descriptions are presented on the excavation logs in Appendix A.

6.1.1. Native Soil

Native soil extended to the total depths of our exploratory borings and test pits. The encountered native soil consisted primarily of loose to very dense sands and gravels with varying amounts of silt, cobbles, and boulders. Some slightly gypsiferous and slightly to moderately porous materials were also observed in the borings and test pits. Sampler refusal in the exploratory borings, backhoe refusal in the test pits, and CPT refusal were encountered predominantly in the western portion of the site in very dense soils.

A few layers of moderately hard, moderately cemented soil (caliche) were encountered in the exploratory borings and test pits. Caliche is a naturally occurring cemented soil with rock-like characteristics that is considered to be the lithification of fine-grained sediments and coarse-grained sands and gravels through secondary cementation primarily by calcium carbonate. Our observations and field testing of the encountered

cemented material indicate the presence of calcium carbonate cementation, which is typically found in caliche. In addition, our observations indicate that the caliche samples collected from the site have relative strengths similar to R1, very weak rock (WSDOT, 2005). Caliche typically forms from evaporation of lime-rich groundwater moving upward by capillary action, or downward via percolation. The following describes typical properties of caliche.

- Generally occurs in layers a few inches to several feet thick.
- Layers typically vary significantly in thickness, degree of cementation, and hardness over relatively short distances.
- Varies in composition from primarily fine-grained material to primarily coarse-grained material.
- Moderately hard, moderately cemented caliche can generally be gouged with a knife with difficulty and broken with a few hammer blows.
- Hard and very hard, strongly cemented caliche is difficult to scratch with a knife and breaks with difficulty with repeated hammer blows.
- Impedes earthwork operations, including grading and utility line trenching. Rock excavation methods are generally needed.

The following table describes the approximate depth, thickness, and hardness and degree of cementation of caliche layers encountered in the borings and test pits.

Table 2 – Caliche Layers Encountered

Boring	Approximate Depth to Top of Layer (feet)*	Approximate Thickness of Layer (feet)	Hardness and Degree of Cementation
B-5	12.0	3.1**	Moderately hard, moderately cemented
TP-6	4.0	0.4**	Moderately hard, moderately cemented
TP-12	3.3	0.6**	Moderately hard, moderately cemented

*Depth measured from ground surface adjacent to boring.
**Exploration terminated in caliche.

Laboratory tests were performed on representative samples of native soil obtained from the exploratory borings. Results of these tests are summarized in the following table.

Table 3 – Summary of Laboratory Test Results

Test Type	Test Results	Remarks
Atterberg Limits Liquid Limit Plastic Limit Plasticity Index	 -- -- Non-plastic	Low plasticity
Consolidation Collapse Potential	0.1 to 0.7 percent collapse	Low collapse potential
Direct Shear Cohesion Friction Angle	0 to 126 pounds per square foot (psf) 27 to 30 degrees	-- --
Maximum Dry Density and Optimum Moisture Content	116.0 pcf at 9.5% and 145.0 pcf at 6.0%	--
Chloride Content	2.8 to 3715 mg/kg	Low to moderately corrosive to buried metal
pH	8.20 to 9.04 S.U.	--
Redox Potential	154 to 187 mV	--
Sodium Sulfate Content	0.00 to 0.51 percent	Low to moderate chemical heave (salt heave) potential
Sodium Content	0.00 to 0.17 percent	--
Sulfate Content	0.00 to 1.12 percent	Negligibly to severely deleterious to concrete
Total Salts (Solubility)	0.03 to 1.06 percent	Low solubility potential
Resistivity (Saturated Condition)	52.5 to 4,546 Ohm-cm	Moderately to very severely corrosive to steel

6.2. Groundwater

Groundwater was not encountered during our field explorations. Seasonal fluctuations in groundwater levels and surface water flow may occur. These fluctuations may be due to variations in ground surface topography, subsurface geologic conditions, rainfall, irrigation, and other factors. Evaluation of factors associated with groundwater fluctuations was beyond the scope of this study.

7. PRELIMINARY FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Based on the preliminary findings of this evaluation, it is our opinion that there are no known geotechnical or geologic conditions that would preclude development of the proposed project at the subject site. The conclusions provided in this report should be considered preliminary and are intended for planning purposes. A design-level geotechnical evaluation, including additional

subsurface evaluation and laboratory testing, will need to be performed for the project in the future. Our preliminary findings and conclusions regarding geotechnical aspects of the proposed project include the following:

- Layers of moderately hard, moderately cemented soil (caliche) were encountered at depths as shallow as approximately 3 feet in a few of our exploratory borings and test pits. Our observations and field testing of the encountered cemented material indicate the presence of calcium carbonate cementation, which is typically found in caliche. In addition, our observations indicate that the caliche samples collected from the site have relative strengths similar to R1, very weak rock (WSDOT, 2005). Due to its variable nature, caliche may be present in subsurface soils between and beyond our exploratory excavations at the subject site. Excavations and pylon foundation installation will be impeded due to the presence of these relatively indurated layers of caliche, which is rock-like in nature. Rock excavation techniques and predrilling prior to pylon foundation installation should be anticipated for some excavations and foundation installation.

- Relatively shallow refusal was encountered during CPT testing (see Appendix D). Backhoe refusal in the test pits and sampler refusal in the exploratory borings were also encountered (see Appendix A). Predrilling prior to pylon foundation installation should be anticipated in some areas, particularly in the western portion of the site.

- Some oversized materials will be generated during excavation of cobbles and boulders at the site. These oversized materials will need to be crushed prior to being used as structural fill or backfill, or removed from the site and disposed of in a suitable manner.

- Loose, native, coarse-grained soils were encountered in our explorations. These loose soils were noted particularly in explorations performed in natural drainage channels throughout the site. The results of cone penetration tests (CPT) also indicated relatively loose layers of surficial soils.

- Sidewall caving was observed in some of our test pits. Based on the relatively dry, loose, granular nature of native soils encountered in our exploratory excavations, caving of the soils should be anticipated during earthwork operations, particularly in deeper excavations.

- The results of our subsurface explorations and laboratory tests indicate the presence of relatively loose soils. These soils are prone to settlement and should be considered unsuitable for support of structures and improvements in their existing condition. Shallow foundations, concrete slabs-on-grade, exterior concrete flatwork, pavement sections, and other improvements will need to be founded on a zone of adequately placed and compacted structural fill. The composition, thickness/depth, lateral extent, and compaction of structural fill will need to be addressed as part of a design-level geotechnical evaluation.

- Based on the findings of our subsurface evaluation and laboratory test results, native soils encountered in our exploratory borings and test pits should generally be suitable for use as

structural fill and backfill material for the project. However, zones of slightly gypsiferous (potentially water-soluble and settlement-prone) soils were encountered in some of the explorations. Sampling and testing of soil to be utilized as structural fill and backfill for this project should be performed during earthwork operations to evaluate solubility potential. Soils with an elevated solubility potential will need to be either blended with non-soluble soils to adequately reduce the solubility potential, or exported from the project site.

- Due to the relatively loose nature of some of the native soils on site, adequate surface drainage should be provided to reduce ponding and infiltration of water into the subsurface soils, as appropriate. Surface runoff should be intercepted, collected, and not permitted to flow or infiltrate into subsurface soils adjacent to or beneath structures. Consideration should be given to utilization of swales and other drainage devices to reduce the adverse effects of surface water runoff.

- Based on our field observations and review of referenced data, no faults traverse the project site. However, the nearby San Andreas fault is considered by United States Geological Survey (USGS, 2011b) to be active. The Coachella Segment of the San Andreas fault is located approximately 55 miles west of the project site and has the potential to generate an earthquake of moment magnitude 7.0. Peak ground accelerations of between 0.10g and 0.12g, and between 0.12g and 0.16g are anticipated for earthquakes that have a 10 percent and 2 percent probability of being exceeded in 50 years, respectively.

- The results of our laboratory resistivity tests indicate the presence of on-site soils that are moderately to very severely corrosive to steel. We recommend that corrosion reduction methods be implemented for this project for steel in contact with on-site soils.

- The results of our sulfate content tests indicated that some of the on-site soils are severely deleterious to normal strength concrete. Therefore, we recommend that concrete in contact with on-site soils contain Type V cement and have a design compressive strength of 4,500 pounds per square inch (psi). The concrete should have a water-cement ratio of 0.45 by weight or less.

- Based on our review of the referenced geologic and hydrologic literature, groundwater at the site should be anticipated to be relatively deep (greater than approximately 100 feet deep). Due to the relatively deep groundwater, it is our opinion that there is a low potential for liquefaction of the subsurface soils at the site.

- Stability of the native slopes and proximity of project improvements to slopes will need to be evaluated as part of a design-level geotechnical evaluation.

8. LIMITATIONS

The limited field evaluation, laboratory testing, and geotechnical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for planning purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur

due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

9. REFERENCES

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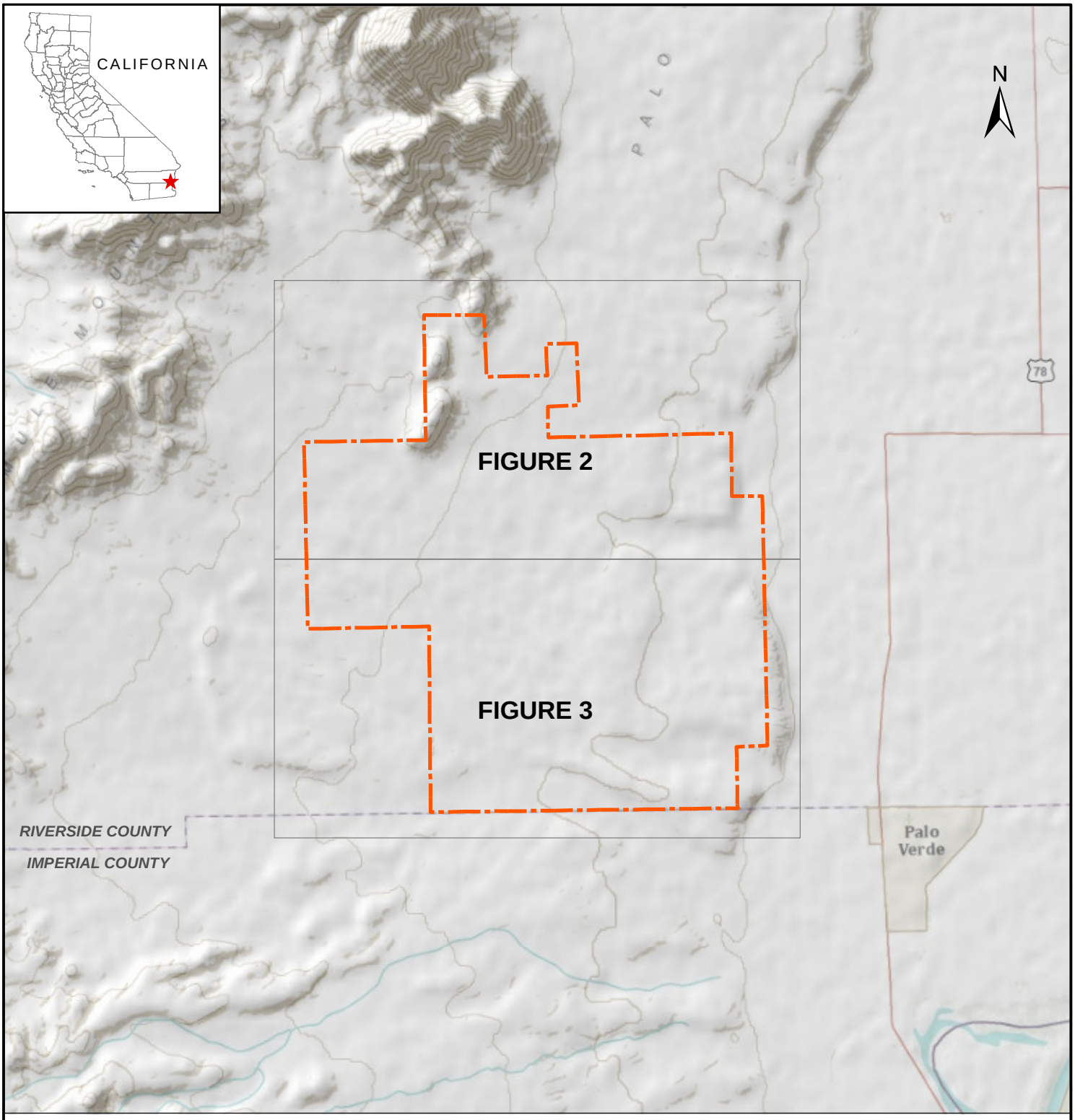

SOURCE: USGS, FAO, NPS, EPA, ESRI, DeLorme, TANA, other suppliers

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

SCALE IN FEET

0 3,000 6,000 12,000

Ninyo & Moore	SITE AND VICINITY	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	1
303256001 / 6/11		

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BRADSHAW TRAIL

TRANSMISSION LINE ACCESS ROAD

WESTERN AREA POWER ADMINISTRATION

WEST AVENUE

B-1
TD=16.5

CPT-1
TD=8.0

TP-1
TD=10.6

B-2
TD=15.1

CPT-2
TD=2.5

TP-2
TD=9.1

TP-4
TD=9.6

TP-3
TD=10.0

B-3
TD=20.8

CPT-3
TD=10.2

TP-5
TD=10.6

B-4
TD=16.5

CPT-4
TD=24.0

B-5
TD=15.1

CPT-5
TD=5.2

TP-6
TD=4.4

B-6
TD=16.5

CPT-6
TD=25.4

B-7
TD=21.5

CPT-7
TD=25.4

LEGEND

B-16
TD=21.5
CPT-16
TD=25.4
BORING / CONE PENETRATION TEST
TD = TOTAL DEPTH IN FEET

TP-15
TD=9.0
TEST PIT
TD = TOTAL DEPTH IN FEET

UNPAVED ROADWAY

SITE BOUNDARY

MAP INDEX

FIGURE 2

FIGURE 3

78

RIVERSIDE COUNTY

IMPERIAL COUNTY

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

SOURCE: SOURCE: Aerial Imagery - Photo Date: February, 2010, ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

SCALE IN FEET

0 700 1,400 2,800

Ninyo & Moore	EXPLORATORY EXCAVATIONS	FIGURE
PROJECT NO. 303256001 / DATE 6/11	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	2

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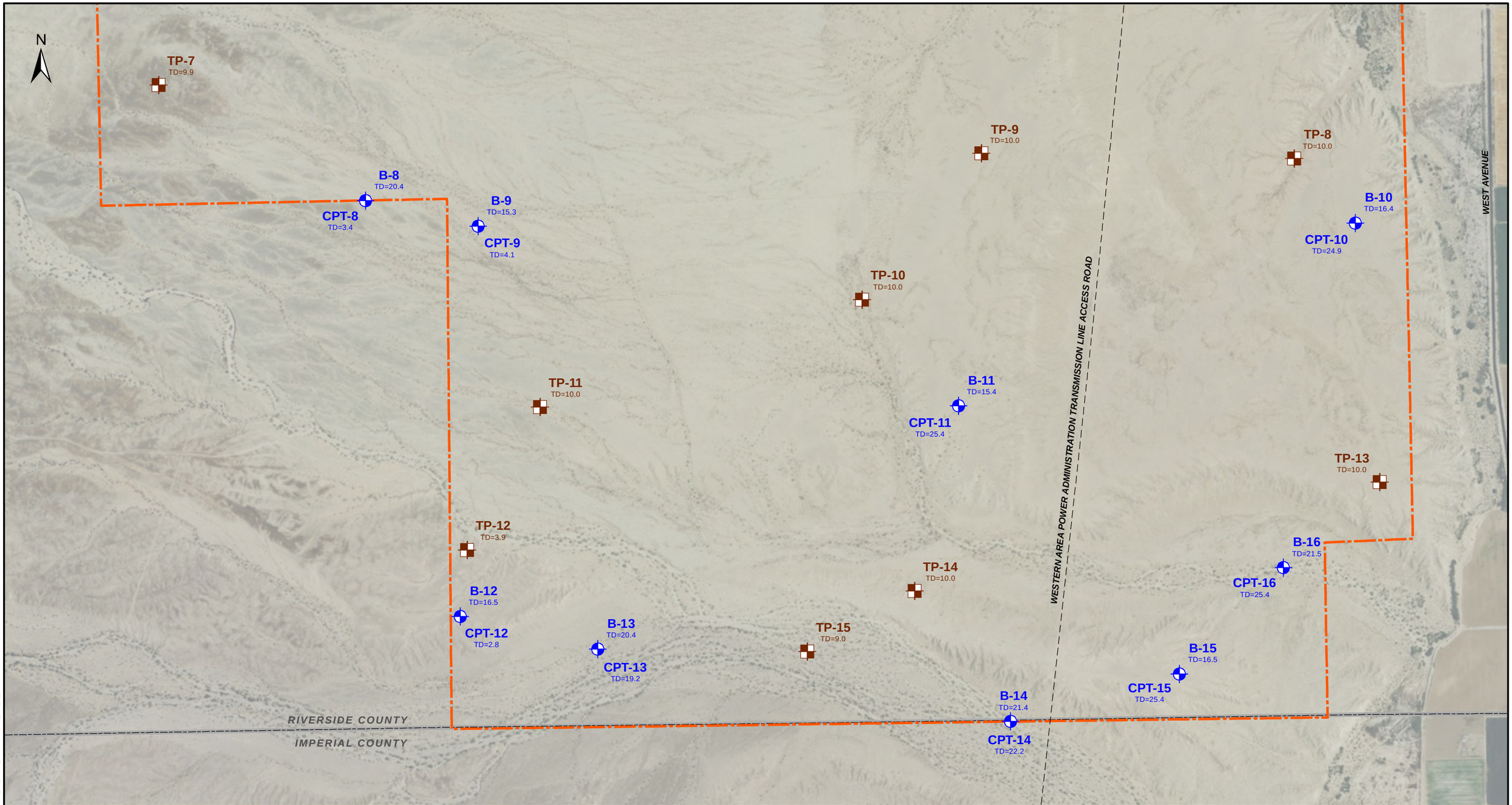


LEGEND

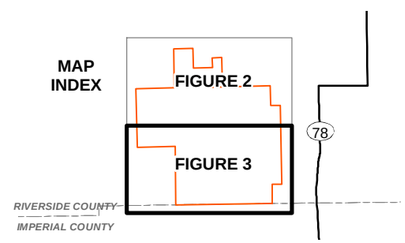
B-16 TD=21.5 / CPT-16 TD=25.4 — BORING / CONE PENETRATION TEST, TD = TOTAL DEPTH IN FEET

TP-15 TD=9.0 — TEST PIT, TD = TOTAL DEPTH IN FEET

UNPAVED ROADWAY

SITE BOUNDARY

MAP INDEX



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

SOURCE: SOURCE: Aerial Imagery - Photo Date: February, 2010, ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

SCALE IN FEET

0 700 1,400 2,800

Ninyo & Moore	EXPLORATORY EXCAVATIONS	FIGURE
PROJECT NO. 303256001 / DATE 6/11	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	3

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APPENDIX A

EXPLORATORY BORING AND TEST PIT LOGS

Field Procedure for the Collection of Disturbed Samples

Bulk samples of representative earth materials were obtained from the exploratory excavations. The samples were bagged and transported to the laboratory for testing.

Field Procedure for the Collection of Ring-lined Samples

Ring-lined soil samples were obtained in the field using a modified split-barrel drive sampler. The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows during driving are presented on the excavation logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

U.S.C.S. METHOD OF SOIL CLASSIFICATION

MAJOR DIVISIONS		SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 1/2 of soil >No. 200 sieve size)	**GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)**	GW	Well graded gravels or gravel-sand mixtures little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction <No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (More than 1/2 of soil <No. 200 sieve size)	**SILTS & CLAYS Liquid Limit <50**	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit >50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils

GRAIN SIZE CHART

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL	3" to No. 4	76.2 to 4.76
Coarse	3" to 3/4"	76.2 to 19.1
Fine	3/4" to No. 4	19.1 to 4.76
SAND	No. 4 to No. 200	4.76 to 0.074
Coarse	No. 4 to No. 10	4.76 to 2.00
Medium	No. 10 to No. 40	2.00 to 0.420
Fine	No. 40 to No. 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

Hardness of Caliche*

Descriptive Term	Characteristics
Moderately Hard	Can be scratched with a knife with light to moderate pressure; breaks with moderate hammer blow.
Hard	Can be scratched with a knife with difficulty; can be broken with heavy hammer blow.
Very Hard	Cannot be scratched with a knife; can only be broken with repeated heavy hammer blows.

* Rock-like cemented soil

Ninyo & Moore

SOIL CLASSIFICATION

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	■							Bulk sample.
		■						Modified split-barrel drive sampler.
		☒						No recovery with modified split-barrel drive sampler.
		▬						Sample retained by others.
		◥						Standard Penetration Test (SPT).
5		◺						No recovery with a SPT.
		▯	XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
		◺						No recovery with Shelby tube sampler.
		▤						Continuous Push Sample.
				♀				Seepage.
10				▽				Groundwater encountered during drilling.
				▼				Groundwater measured after drilling.
						▦	SM	NATIVE SOIL: Solid line denotes unit change.
								Dashed line denotes material change.
15								Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Sheared Bedding Surface
20								The total depth line is a solid line that is drawn at the bottom of the boring.

DATE DRILLED _____ BORING NO. EXPLANATION

GROUND ELEVATION _____ SHEET 1 OF 1

METHOD OF DRILLING _____

DRIVE WEIGHT _____ DROP _____

SAMPLED BY _____ LOGGED BY _____ REVIEWED BY _____

Ninyo & Moore

BORING LOG

EXPLANATION OF BORING LOG SYMBOLS

PROJECT NO.	DATE	FIGURE
	Rev. 01/06	A-0

DATE DRILLED 4/25/11 BORING NO. B-1

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	■						GP	NATIVE SOIL: Light brown, damp, medium dense, poorly graded GRAVEL with sand.
5		X	28/6" 42/6" 50/4"					Very dense; sampler refusal after 16 inches.
10		⊠	50/2"					Sampler refusal after 2 inches.
15	■	■	18/6" 27/6" 32/6"	1.5	96.4			Medium dense.
20								Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled 4/25/11. NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-1

DATE DRILLED 4/25/11 BORING NO. B-2

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	■						SM	NATIVE SOIL: Light brown, damp, medium dense, silty SAND with gravel.
								Very dense.
5		X	50/5"					Sampler refusal after 5 inches.
10		■	22/6" 40/6" 50/5"	1.4	121.5			Sampler refusal after 17 inches.
15		X	50/2"					Sampler refusal after 2 inches.
								Total depth = 15.1 feet. Groundwater not encountered during drilling. Backfilled 4/25/11.
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
20								

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-2

DATE DRILLED 4/25/11 BORING NO. B-3

GROUND ELEVATION Not measured SHEET 1 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	■						SP	NATIVE SOIL: Light brown, damp, loose, poorly graded SAND with gravel.
5		■	22/6" 25/6" 36/6"	2.0	117.7		SM	Light brown, damp, medium dense, silty SAND.
10		■	30/6" 50/3"	3.4	98.2			Very dense; sampler refusal after 9 inches.
15		■	17/6" 50/5"	3.2	106.8			Sampler refusal after 11 inches.
20								

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-3

DATE DRILLED 4/25/11 BORING NO. B-3

GROUND ELEVATION Not measured SHEET 2 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		■	28/6" 50/3"	4.1	96.8		SM	NATIVE SOIL (continued): Light brown, damp, dense, silty SAND; slightly gypsiferous. Sampler refusal after 9 inches.
								Total depth = 20.8 feet. Groundwater not encountered during drilling. Backfilled 4/25/11.
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
25								
30								
35								
40								

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-4

DATE DRILLED 4/27/11 BORING NO. B-4

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	NATIVE SOIL: Light brown, damp, medium dense, silty SAND; trace gravel.
	Driven	10/6" 20/6" 35/6"	1.7	111.9			
5	Driven	20/6" 20/6" 40/6"	1.5	109.2			
10	Driven	6/6" 15/6" 21/6"					
15	Driven	15/6" 20/6" 28/6"	1.2	90.9		SP	Light brown, damp, medium dense, poorly graded SAND; trace gravel.
20							Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled on 4/27/11.

NOTE:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-5

DATE DRILLED 4/26/11 BORING NO. B-5

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0		■	6/6" 11/6" 20/6"	1.4	110.0		SM	NATIVE SOIL: Light brown, damp, medium dense, silty SAND; trace gravel.
5		■	30/6" 50/5"	2.2	104.6			Very dense; slightly gypsiferous; sampler refusal after 11 inches.
10		☒	40/6" 50/4"					Sampler refusal after 10 inches.
								Tan, damp, moderately hard CALICHE; moderately cemented; composed primarily of coarse-grained material.
15		☒	25/<1"					Sampler refusal.
								Total depth = 15.1 feet. Groundwater not encountered during drilling. Backfilled 4/26/11.
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
20								

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-6

DATE DRILLED 4/27/11 BORING NO. B-6

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	NATIVE SOIL: Light brown, damp, medium dense, silty SAND; trace gravel.
		■	11/6" 20/6" 22/6"	1.3	106.8			
5		■	8/6" 14/6" 18/6"	1.2	103.5		SP	Light brown, damp, medium dense, poorly graded SAND.
10	■	╳	12/6" 13/6" 14/6"					
15	■	╳	15/6" 22/6" 32/6"					
20								Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled on 4/27/11.

NOTE:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-7

DATE DRILLED 4/27/11 BORING NO. B-7

GROUND ELEVATION Not measured SHEET 1 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SP	NATIVE SOIL: Light brown, damp, medium dense, poorly graded SAND; trace gravel.
		■	19/6" 40/6" 50/6"	1.1	117.9			Dense.
5		■	18/6" 30/6" 30/6"	1.1	119.3			Medium dense.
10		■	11/6" 24/6" 46/6"	1.2	113.6			Dense.
15		■	11/6" 33/6" 50/6"	0.8	107.2		SM	Light brown, damp, dense, silty SAND.
20								

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-8

DATE DRILLED 4/27/11 BORING NO. B-7

GROUND ELEVATION Not measured SHEET 2 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		■	11/6" 25/6" 40/6"	1.8	97.7		SM	NATIVE SOIL (continued): Light brown, damp, dense, silty SAND.
								Total depth = 21.5 feet. Groundwater not encountered during drilling. Backfilled on 4/27/11. NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
25								
30								
35								
40								

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-9

DATE DRILLED 4/26/11 BORING NO. B-8

GROUND ELEVATION Not measured SHEET 1 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SP-SM	NATIVE SOIL: Light brown, damp, medium dense, poorly graded SAND with silt and gravel.
		32/6" 50/5"	1.4	115.4			Very dense; sampler refusal after 11 inches.
5		32/6" 50/4"	3.0	109.9			Sampler refusal after 10 inches.
10		20/<1"					Sampler refusal.
15		8/6" 20/6" 26/6"					Medium dense.
							Very dense.
20							

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-10

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		X	50/4"				SM	NATIVE SOIL (continued): Light brown, damp, very dense, silty SAND. Sampler refusal after 4 inches.
								Total depth = 20.4 feet. Groundwater not encountered during drilling. Backfilled 4/26/11. NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
25								
30								
35								
40								

DATE DRILLED 4/26/11 BORING NO. B-8

GROUND ELEVATION Not measured SHEET 2 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-11

DATE DRILLED 4/26/11 BORING NO. B-9

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0		■	1/6" 5/6" 7/6"	0.4	109.7		SM	NATIVE SOIL: Light brown, damp, loose, silty SAND; few gravel.
								Very dense.
5		■	50/5"	2.7	94.5			Sampler refusal after 5 inches.
10		■	36/6" 50/5"	2.7	102.0			Sampler refusal after 11 inches.
15		☒	50/4"					Sampler refusal after 4 inches.
								Total depth = 15.3 feet. Groundwater not encountered during drilling. Backfilled 4/26/11.
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
20								

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-12

DATE DRILLED 4/27/11 BORING NO. B-10

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	NATIVE SOIL: Light brown, damp, medium dense, silty SAND; few gravel.
		X	13/6" 22/6" 33/6"					
5		X	13/6" 18/6" 22/6"					
10		X	12/6" 18/6" 22/6"					
15			42/6" 40/6" 50/5"	5.1	106.8		SP	Light brown, damp, very dense, poorly graded SAND; trace gravel. Sampler refusal after 17 inches.
20								Total depth = 16.4 feet. Groundwater not encountered during drilling. Backfilled on 4/27/11.

NOTE:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-13

DATE DRILLED 4/27/11 BORING NO. B-11

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	NATIVE SOIL: Light brown, damp, medium dense, silty SAND.
		■	8/6" 13/6" 20/6"	0.9	95.5			
5		X	30/6" 50/5"					Very dense; sampler refusal after 11 inches.
10	■	X	8/6" 25/6" 30/6"				SP-SM	Light brown, damp, medium dense, poorly graded SAND with silt.
15	■	X	50/5"					Very dense; sampler refusal after 5 inches.
20								Total depth = 15.4 feet. Groundwater not encountered during drilling. Backfilled on 4/27/11.

NOTE:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-14

DATE DRILLED 4/26/11 BORING NO. B-12

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	NATIVE SOIL: Light brown, damp, medium dense, silty SAND; little gravel.
		X	16/6" 50/5"					Very dense; sampler refusal after 11 inches.
5	■	■	12/6" 24/6" 16/6"					Medium dense.
10		■	10/6" 16/6" 30/6"	0.9	106.5			
15		■	16/6" 30/6" 32/6"	1.0	99.5			
20								Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled on 4/26/11.

NOTE:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-15

DATE DRILLED 4/26/11 BORING NO. B-13

GROUND ELEVATION Not measured SHEET 1 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	■						SP	NATIVE SOIL: Light brown, damp, medium dense, poorly graded SAND with gravel and cobbles.
		X	17/6" 28/6" 30/6"					
5		■	13/6" 18/6" 20/6"	2.1	108.1			
10		■	10/6" 18/6" 20/6"	2.4	103.3			
15		X	5/6" 13/6" 33/6"					
20								

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-16

DATE DRILLED 4/26/11 BORING NO. B-13

GROUND ELEVATION Not measured SHEET 2 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		X	50/5"				SM	NATIVE SOIL (continued): Light brown, damp, very dense, silty SAND with cobbles; trace gravel. Very dense; sampler refusal after 5 inches.
								Total depth = 20.4 feet.
								Groundwater not encountered during drilling.
								Backfilled on 4/26/11.
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
25								
30								
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40								

Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-17

DATE DRILLED 4/26/11 BORING NO. B-14

GROUND ELEVATION Not measured SHEET 1 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	NATIVE SOIL: Light brown, damp, medium dense, silty SAND; trace gravel.
		24/6" 45/6" 50/5"	2.5	113.0			Very dense; sampler refusal after 17 inches.
5		14/6" 23/6" 40/6"	2.5	115.0			Medium dense to dense.
10		7/6" 16/6" 24/6"	1.6	95.2			Medium dense; slightly gypsiferous.
15		10/6" 18/6" 20/6"	3.1	108.6			Thin layer of dark brown, fat clay approximately 2 inches thick.
20							

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-18

DATE DRILLED 4/26/11 BORING NO. B-14

GROUND ELEVATION Not measured SHEET 2 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		■	15/6" 30/6" 50/5"	7.7	98.0		SM	NATIVE SOIL (continued): Light brown, damp, very dense, silty SAND; trace gravel. Sampler refusal after 17 inches.
								Total depth = 21.4 feet. Groundwater not encountered during drilling. Backfilled on 4/26/11. NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
25								
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Ninyo & Moore

BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-19

DATE DRILLED 4/26/11 BORING NO. B-15

GROUND ELEVATION Not measured SHEET 1 OF 1

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	NATIVE SOIL: Light brown, damp, dense, silty SAND; trace gravel.
		■	14/6" 32/6" 50/6"	2.3	99.9			
5		■	15/6" 32/6" 36/6"	6.4	99.5			
10		■	13/6" 23/6" 24/6"	3.0	92.2			Medium dense.
15		■	16/6" 13/6" 20/6"	0.6	93.8			Slightly gypsiferous.
20								Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled on 4/26/11.

NOTE:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-20

DATE DRILLED 4/26/11 BORING NO. B-16

GROUND ELEVATION Not measured SHEET 1 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	NATIVE SOIL: Light brown, damp, loose, silty SAND; trace gravel.
		■	8/6" 28/6" 40/6"	3.6	109.1			Dense.
5		■	7/6" 8/6 8/6"	1.5	108.1			Loose.
10		■	8/6" 17/6" 8/6"	1.2	105.0			Medium dense.
15		■	12/6" 18/6" 28/6"					
20								

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-21

DATE DRILLED 4/26/11 BORING NO. B-16

GROUND ELEVATION Not measured SHEET 2 OF 2

METHOD OF DRILLING CME 75 hollow-stem auger drill rig

DRIVE WEIGHT 140 lbs. (cathead) DROP 30"

SAMPLED BY SLM LOGGED BY SLM REVIEWED BY BDB

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20		■	13/6" 26/6" 33/6"	1.4	107.2		SP	NATIVE SOIL (continued): Light brown, slightly moist, medium dense, poorly graded SAND; trace gravel.
								Total depth = 21.5 feet. Groundwater not encountered during drilling. Backfilled on 4/26/11. NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
25								
30								
35								
40								

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BORING LOG

RIO MESA SOLAR FACILITY, BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
303256001	6/11	A-22

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

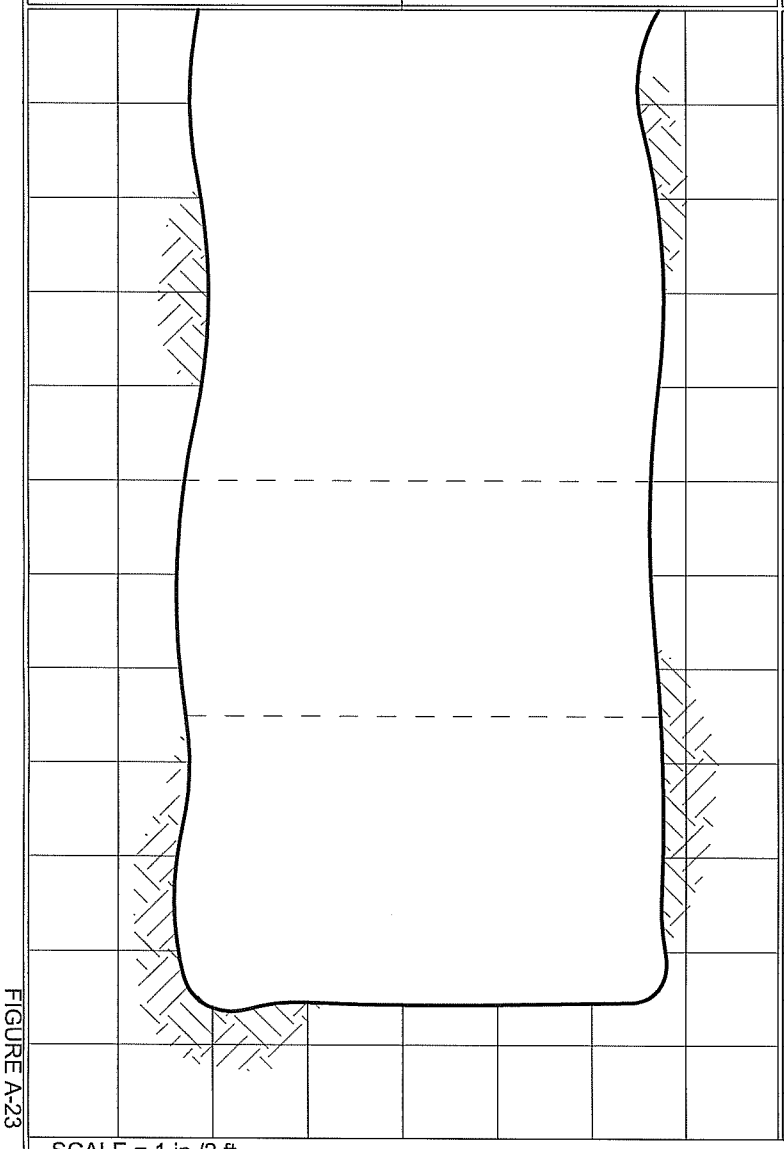
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 5/3/11 TEST PIT NO. TP-1

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 2



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					GM	NATIVE SOIL: Brown, damp, very dense, silty GRAVEL with sand and cobbles; cobbles up to approximately 6 inches in diameter.
2	■						
4							
	■					GW-GM	@ 4.0 feet: Light brown, dry to damp, very dense, well-graded GRAVEL with silt, sand, cobbles, and boulders; boulders up to approximately 15 inches in diameter.
6	■						
						SP-SM	@ 7.5 feet: Brown, damp, dense, poorly graded SAND with silt.
8	■						
10							
12							Total depth = 10.6 feet. Groundwater not encountered during excavation. Backfilled on 5/3/11.

FIGURE A-23

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

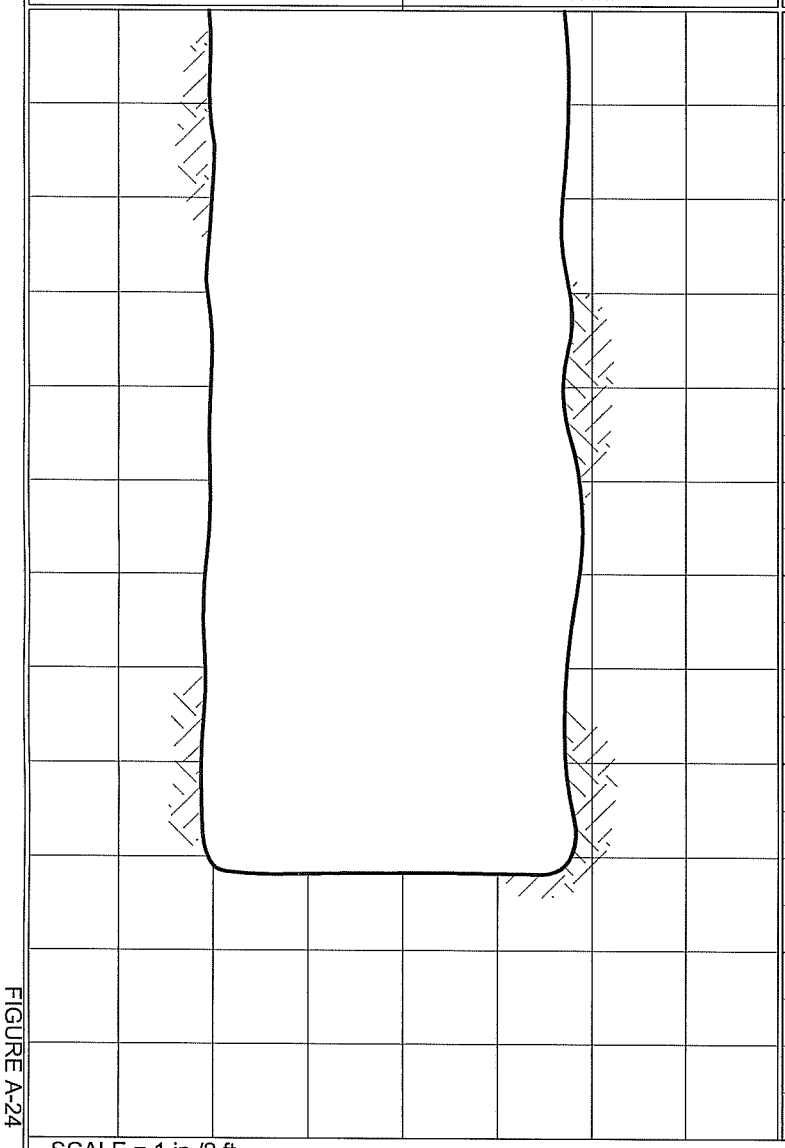
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/28/11 TEST PIT NO. TP-2

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 2



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					GM	NATIVE SOIL: Brown, damp, very dense, silty GRAVEL with sand and cobbles; cobbles up to approximately 12 inches in diameter.
2	■						
4	■						
6							
8	■						
10							Total depth = 9.1 feet. Groundwater not encountered during excavation. Backfilled on 4/28/11.
12							

FIGURE A-24

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

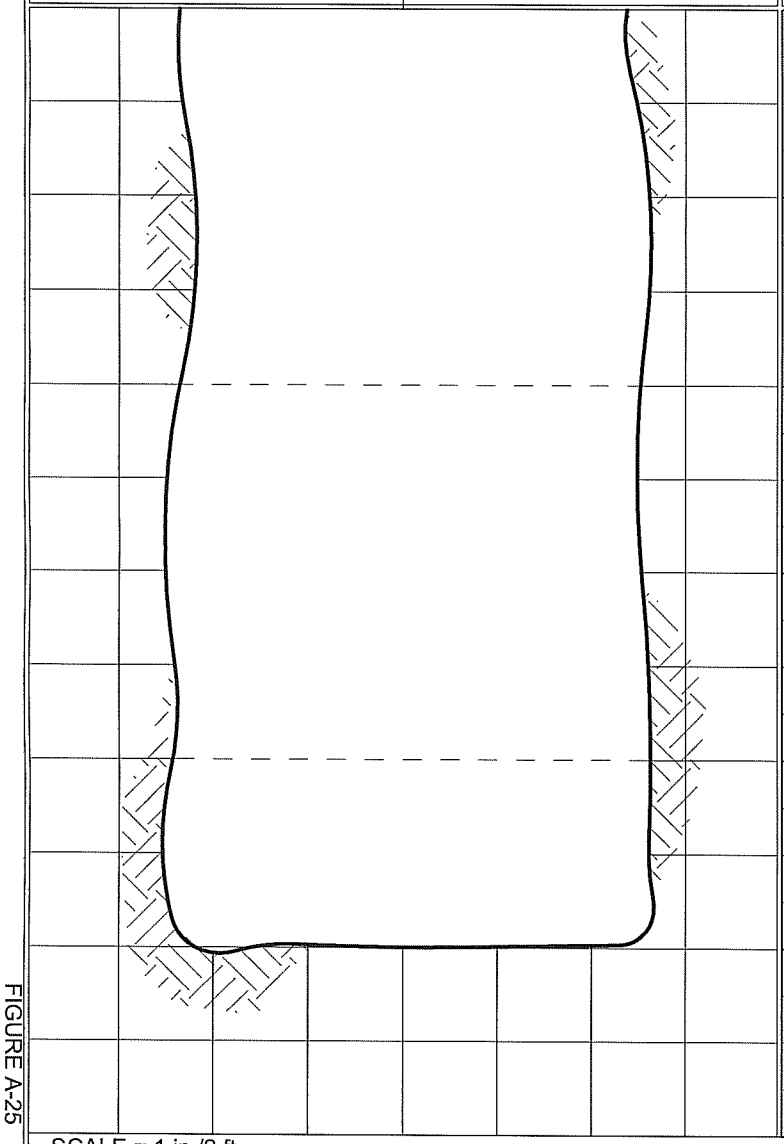
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 5/3/11 TEST PIT NO. TP-3

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 2



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					GP	NATIVE SOIL: Brown, damp, dense, poorly graded GRAVEL with sand and cobbles; cobbles up to approximately 9 inches in diameter; trace silt.
2	■						
4						SP-SM	@ 4.0 feet: Brown, damp, dense to very dense, poorly graded SAND; trace clay and gravel; scattered calcium carbonate nodules.
6	■						
8						GP-GM	@ 8.0 feet: Brown, damp, dense to very dense, poorly graded GRAVEL with silt and sand.
10							Total depth = 10.0 feet. Groundwater not encountered during excavation. Backfilled on 5/3/11.
12							

FIGURE A-25

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TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

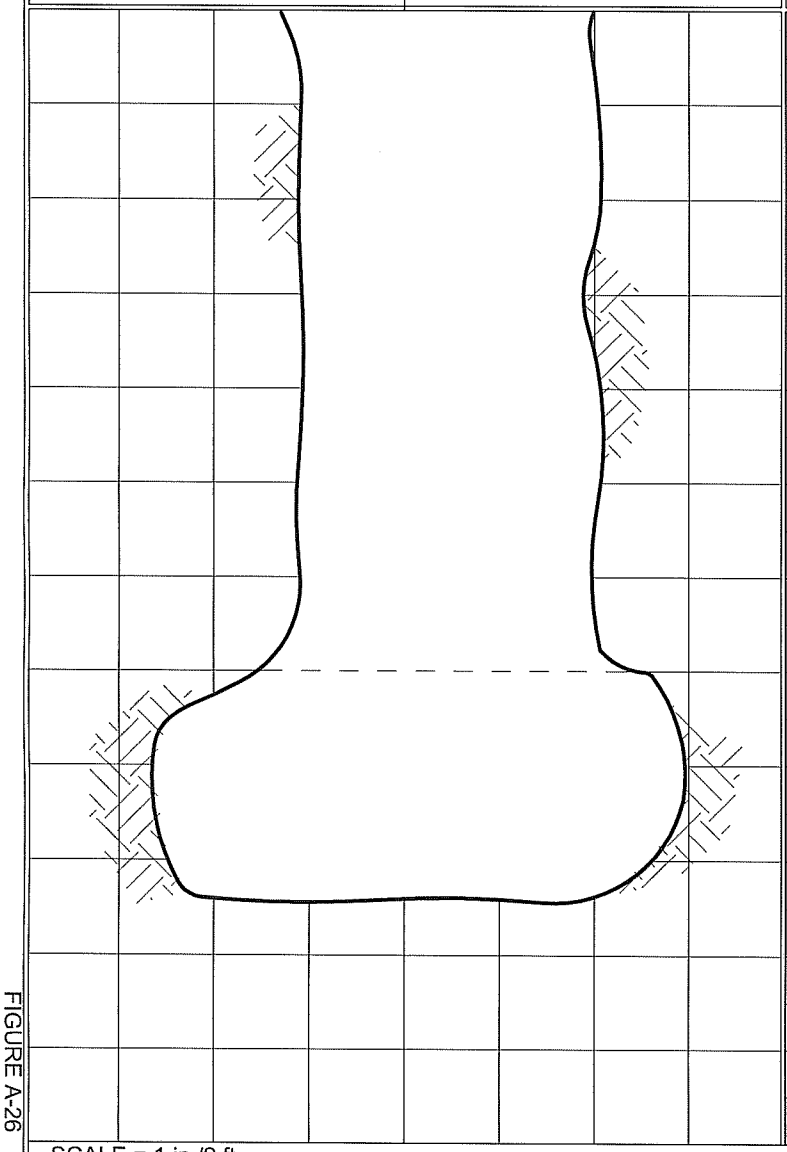
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 5/3/11 TEST PIT NO. TP-4

GROUND ELEVATION Not measured LOGGED BY EDE

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 2



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					SM	NATIVE SOIL: Brown, dry to damp, medium dense, silty SAND; trace gravel.
2	■						
4							
6							
8	■					SP-SM	@ 7.0 feet: Brown, dry to damp, medium dense, poorly graded SAND with silt.
10							Total depth = 9.6 feet. Groundwater not encountered during excavation. Backfilled on 5/3/11. Note: Moderate to severe caving occurred below depth of approximately 7.0 feet.
12							

FIGURE A-26

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

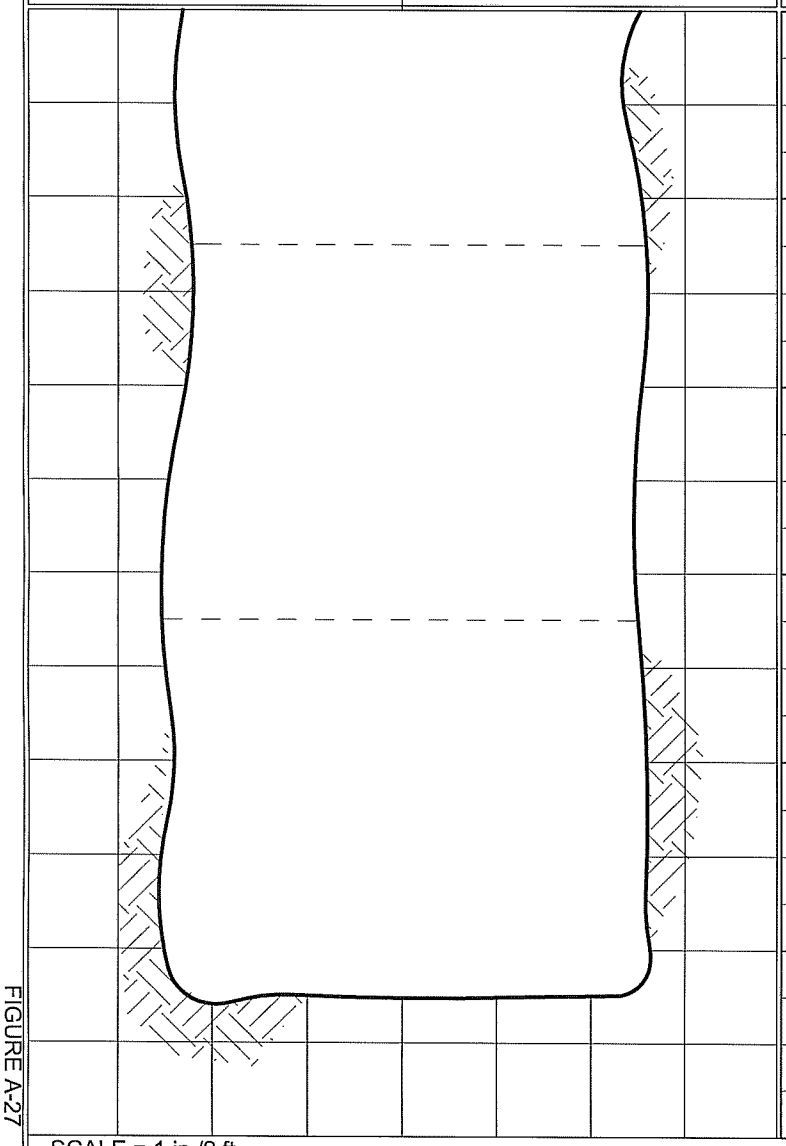
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 5/3/11 TEST PIT NO. TP-5

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 2



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					SW-SM	NATIVE SOIL: Brown, damp, loose to medium dense, well-graded SAND with silt, gravel, and cobbles; cobbles up to approximately 8 inches in diameter.
2						SM	@ 2.5 feet: Reddish brown, damp, medium dense, silty SAND; trace gravel; scattered roots to approximately 1/16-inch in diameter; moderately porous with pore holes up to approximately 1/32-inch in diameter.
4	■						
6						SP-SM	@ 6.5 feet: Brown, dry to damp, loose to medium dense, poorly graded SAND with silt.
8	■						
10							Total depth = 10.6 feet. Groundwater not encountered during excavation. Backfilled on 5/3/11. Note: Slight caving occurred below depth of approximately 6.5 feet.
12							

FIGURE A-27

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

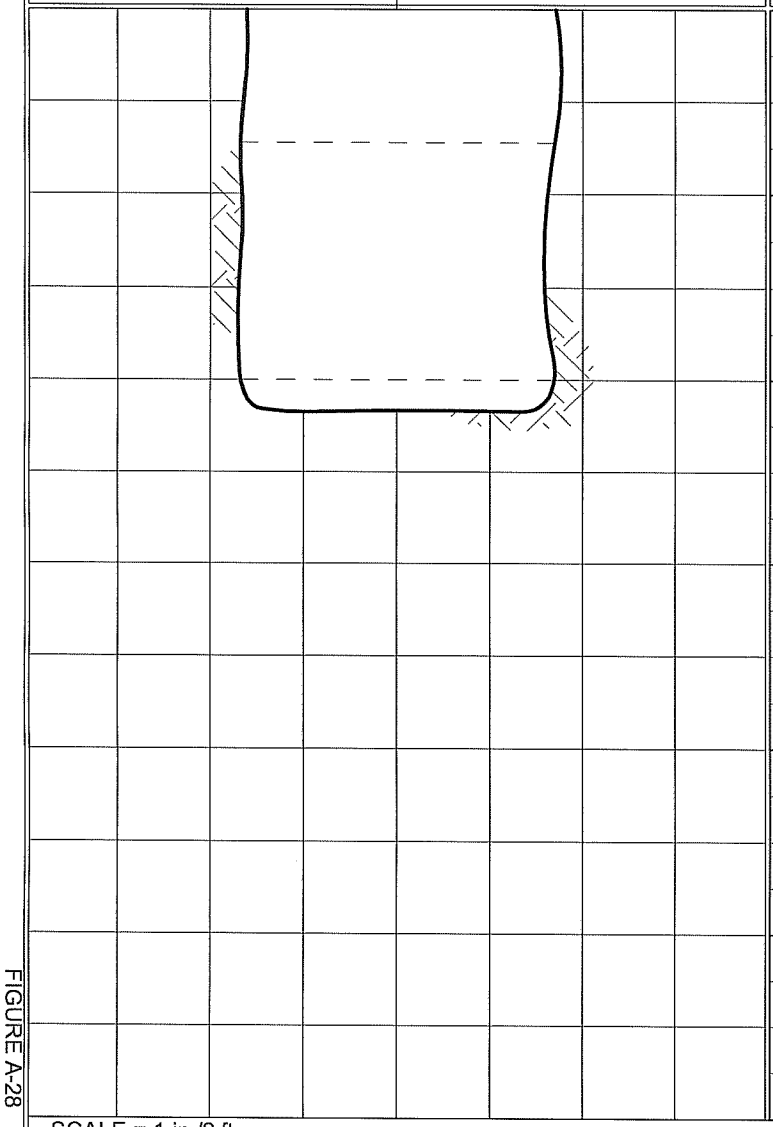
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/28/11 TEST PIT NO. TP-6

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 2



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					GP-GM	NATIVE SOIL: Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.
2	■					SM	@ 1.5 feet: Brown, damp, dense, silty SAND with gravel; slightly cemented; slightly porous with pore holes up to approximately 1/16-inch in diameter.
4	■						@ 4.0 feet: Brown, damp, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material; slightly porous with pore holes up to approximately 1/16-inch in diameter. @ 4.4 feet: Backhoe refusal.
6							Total depth = 4.4 feet. Groundwater not encountered during excavation. Backfilled on 4/28/11.
8							
10							
12							

FIGURE A-28

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

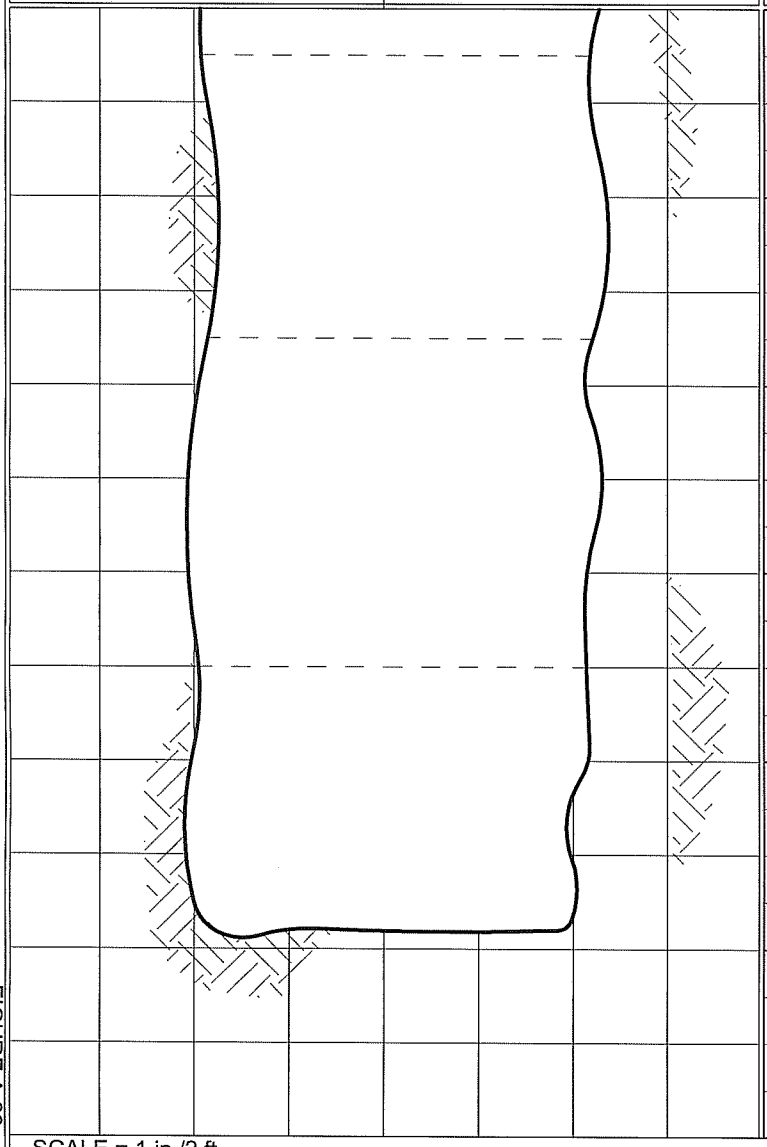
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 5/3/11 TEST PIT NO. TP-7

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 3



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						GM	NATIVE SOIL: Brown, dry to damp, medium dense, silty GRAVEL with sand.
						SM	@ 0.5 feet: Brown, dry to damp, medium dense, silty SAND with gravel.
2	■						
4	■					GM	@ 3.5 feet: Brown, dry to damp, dense, silty GRAVEL with sand and cobbles; cobbles up to approximately 8 inches in diameter.
6	■						
8						GW-GM	@ 7.0 feet: Brown, damp, dense to very dense, well-graded GRAVEL with silt, sand, and cobbles; cobbles up to approximately 9 inches in diameter.
10							Total depth = 9.9 feet. Groundwater not encountered during excavation. Backfilled on 5/3/11.
12							

FIGURE A-29

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

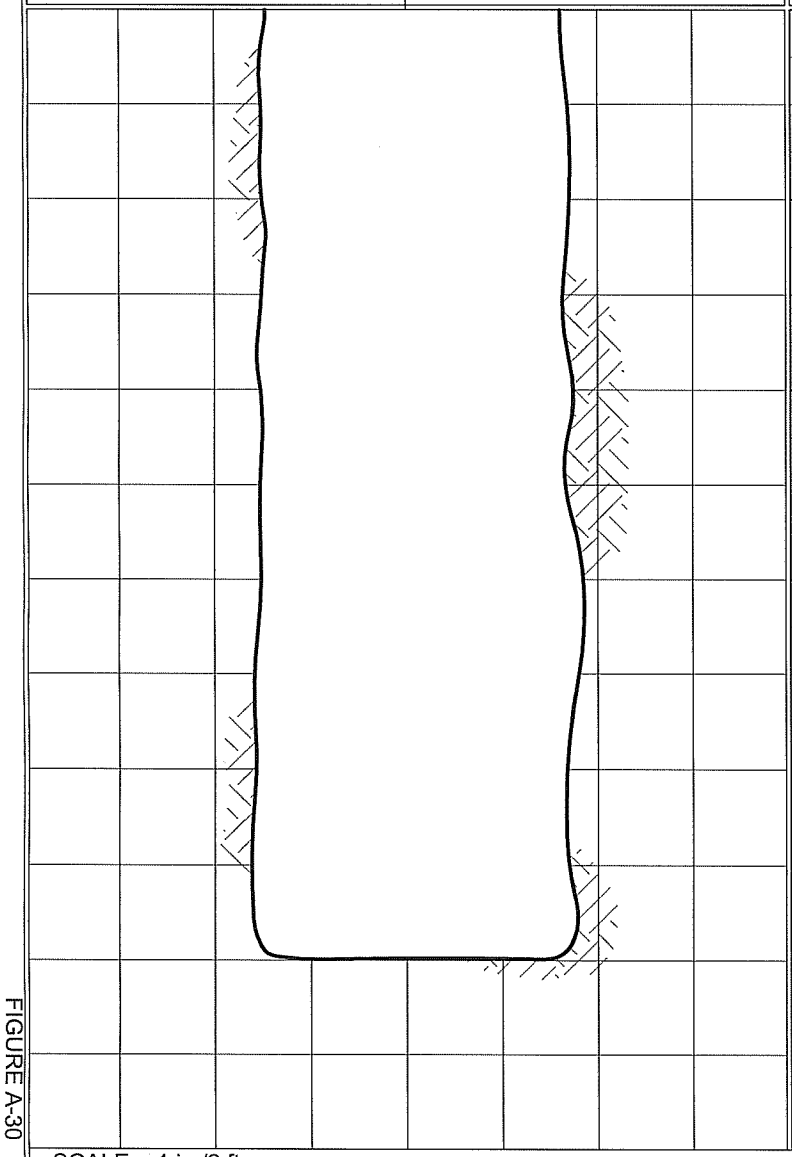
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED: 4/27/11 | TEST PIT NO.: TP-8

GROUND ELEVATION: Not measured | LOGGED BY: EDE

METHOD OF EXCAVATION: JCB 215 backhoe

LOCATION: See Figure 3



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					SM	NATIVE SOIL: Tan, dry to damp, medium dense, silty SAND; trace gravel.
2	■						
4							
6							
8							
10	■						Total depth = 10.0 feet. Groundwater not encountered during excavation. Backfilled on 4/27/11.
12							

FIGURE A-30

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

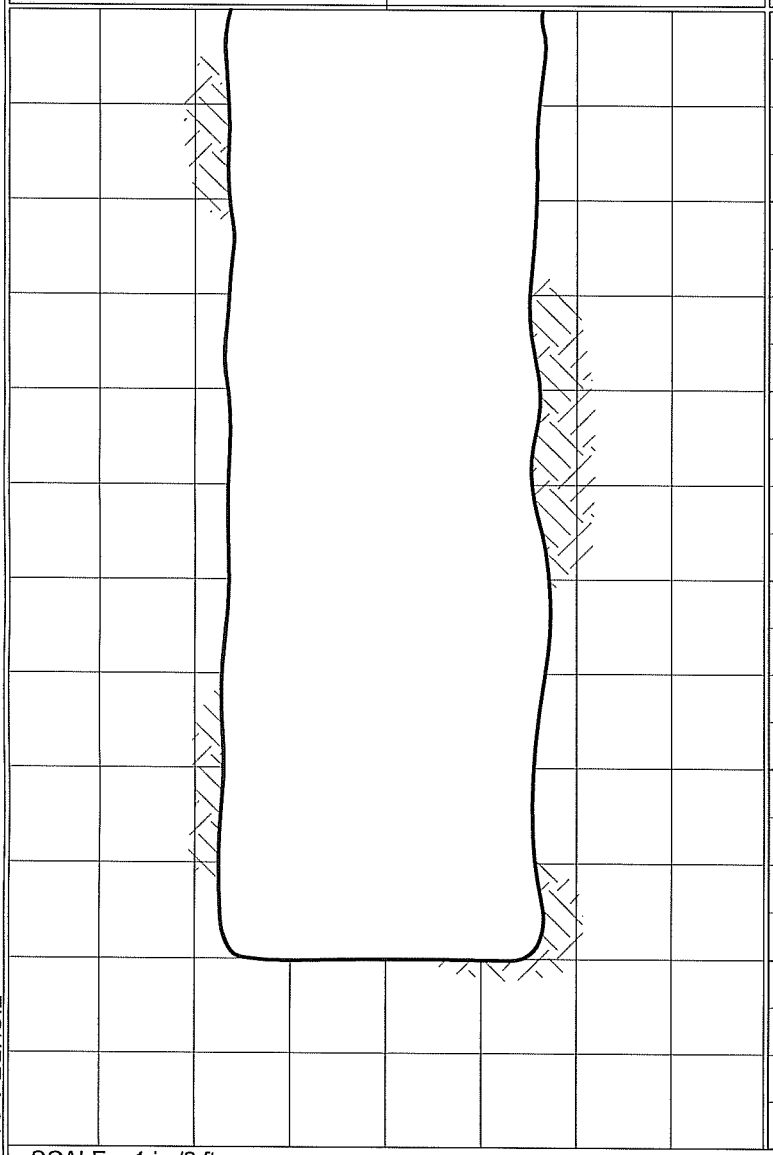
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/27/11 TEST PIT NO. TP-9

GROUND ELEVATION Not measured LOGGED BY EDE

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 3



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SM	NATIVE SOIL: Tan, dry, loose, silty SAND; few gravel.
							@ 1.0 feet: Damp; medium dense.
2	■						
4	■						
6							
8	■						
10	■						Total depth = 10.0 feet. Groundwater not encountered during excavation. Backfilled on 4/27/11.
12							

FIGURE A-31

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

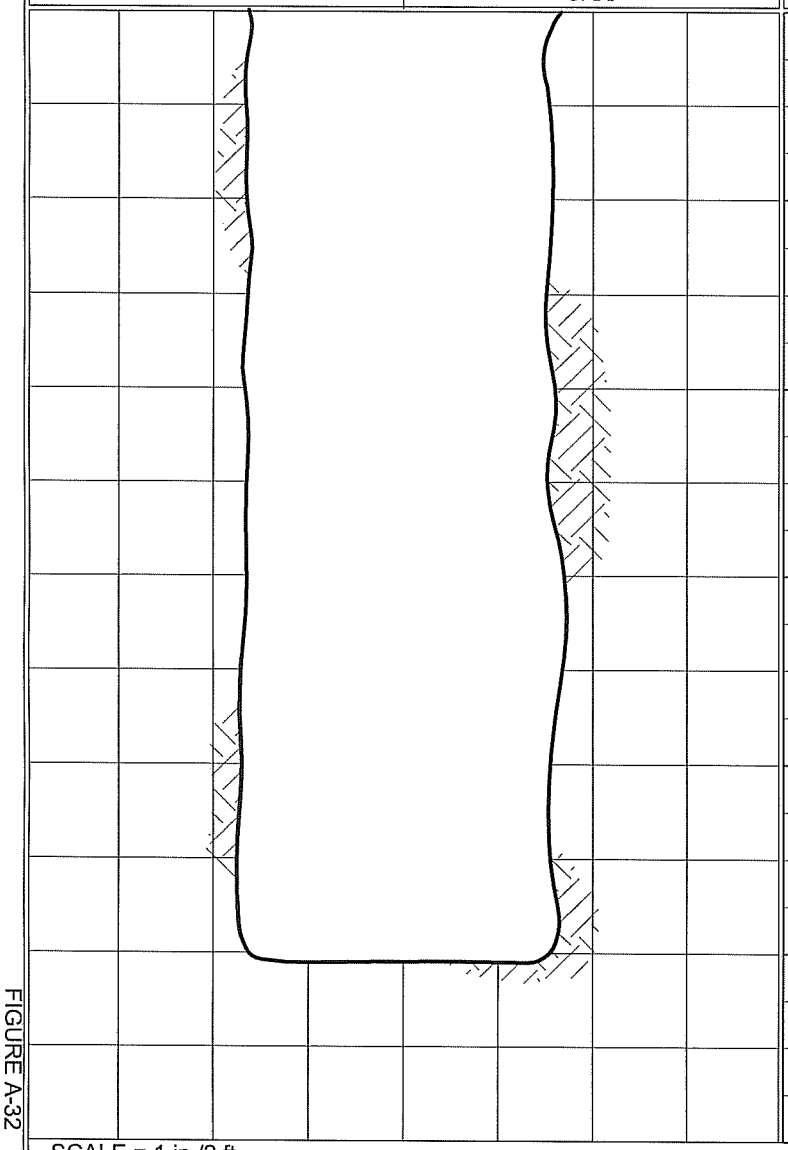
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/27/11 TEST PIT NO. TP-10

GROUND ELEVATION Not measured LOGGED BY EDE

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 3



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SM	NATIVE SOIL: Tan, dry, medium dense, silty SAND.
	■						@ 1.0 feet: Damp.
2							
4							
6							
							@ 7.0 feet: Few gravel.
8							@ 8.0 feet: Increase in gravel content.
	■						
10							Total depth = 10.0 feet. Groundwater not encountered during excavation. Backfilled on 4/27/11.
12							

FIGURE A-32

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

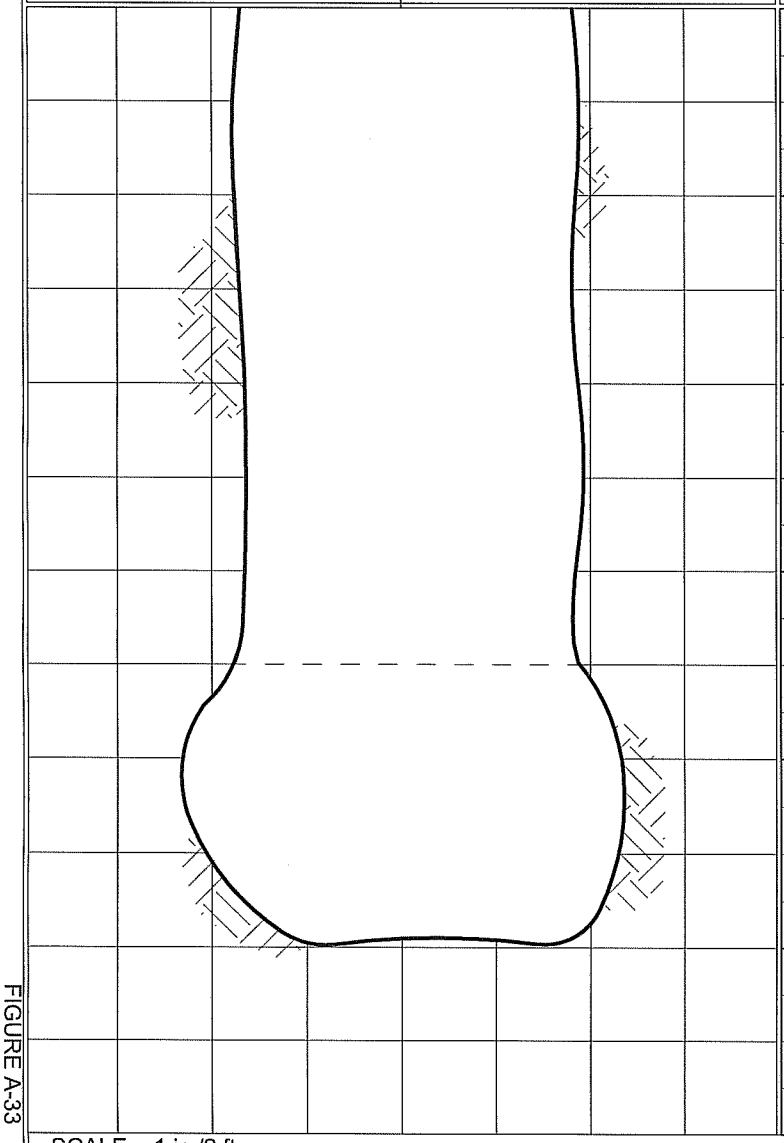
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/28/11 TEST PIT NO. TP-11

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 3



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SM	NATIVE SOIL: Light brown, dry to damp, loose, silty SAND with gravel.
	■						@ 1.0 feet: Reddish brown, damp, medium dense to dense, trace gravel; few scattered calcium carbonate nodules.
2	■						
	■						@ 3.0 feet: Dense.
4							
6							@ 6.0 feet: Light brown, dry to damp, loose to medium dense.
	■					SP-SM	@ 7.0 feet: Light brown, damp, loose to medium dense, poorly graded SAND with silt.
8	■						
10							Total depth = 10.0 feet. Groundwater not encountered during excavation. Backfilled on 4/28/11.
12							Note: Moderate caving occurred below depth of approximately 7.0 feet.

FIGURE A-33

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

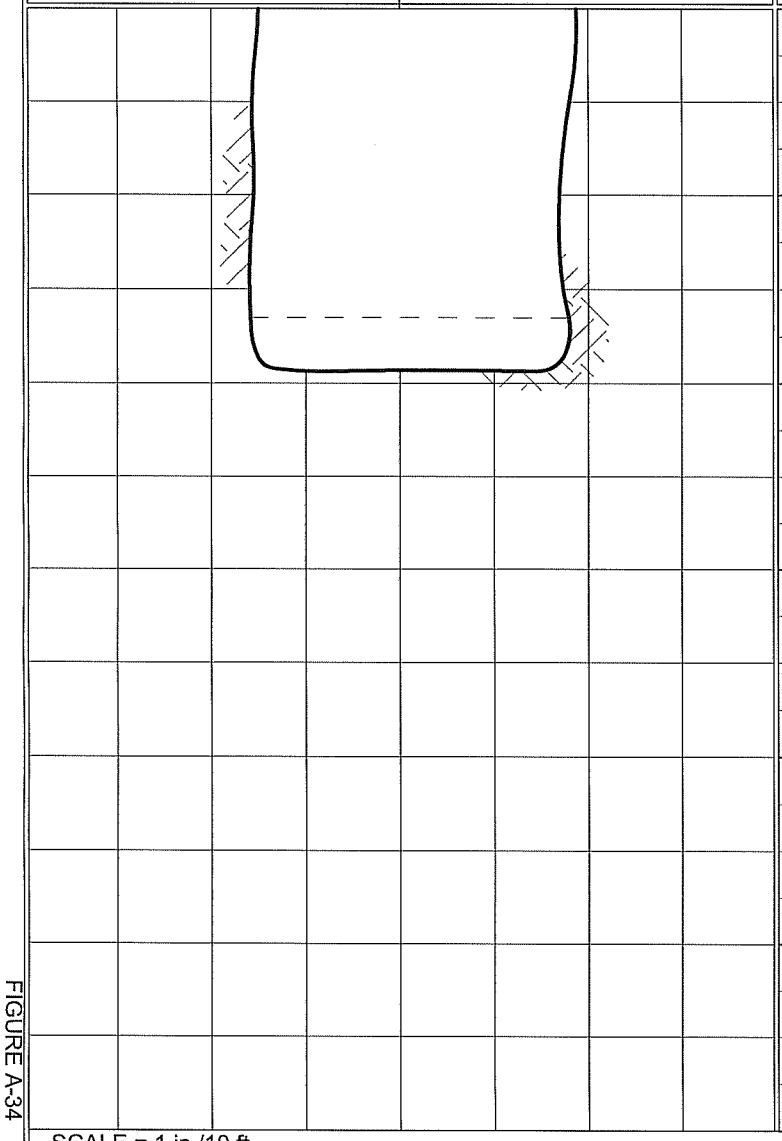
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/28/11 TEST PIT NO. TP-12

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 3



DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SM	NATIVE SOIL: Brown, damp, medium dense, silty SAND; little gravel.
	■						@ 1.0 feet: Dense.
2							@ 1.5 feet: Very dense; slightly cemented; moderately porous with pore holes up to approximately 1/8-inch in diameter.
							@ 3.3 feet: Mottled brown and white, dry to damp, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material; moderately porous with pore holes up to approximately 1/8-inch in diameter.
4							@ 3.9 feet: Backhoe refusal.
							Total depth = 3.9 feet. Groundwater not encountered during excavation. Backfilled on 4/28/11.
6							
8							
10							
12							

SCALE = 1 in./10 ft.

FIGURE A-34

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

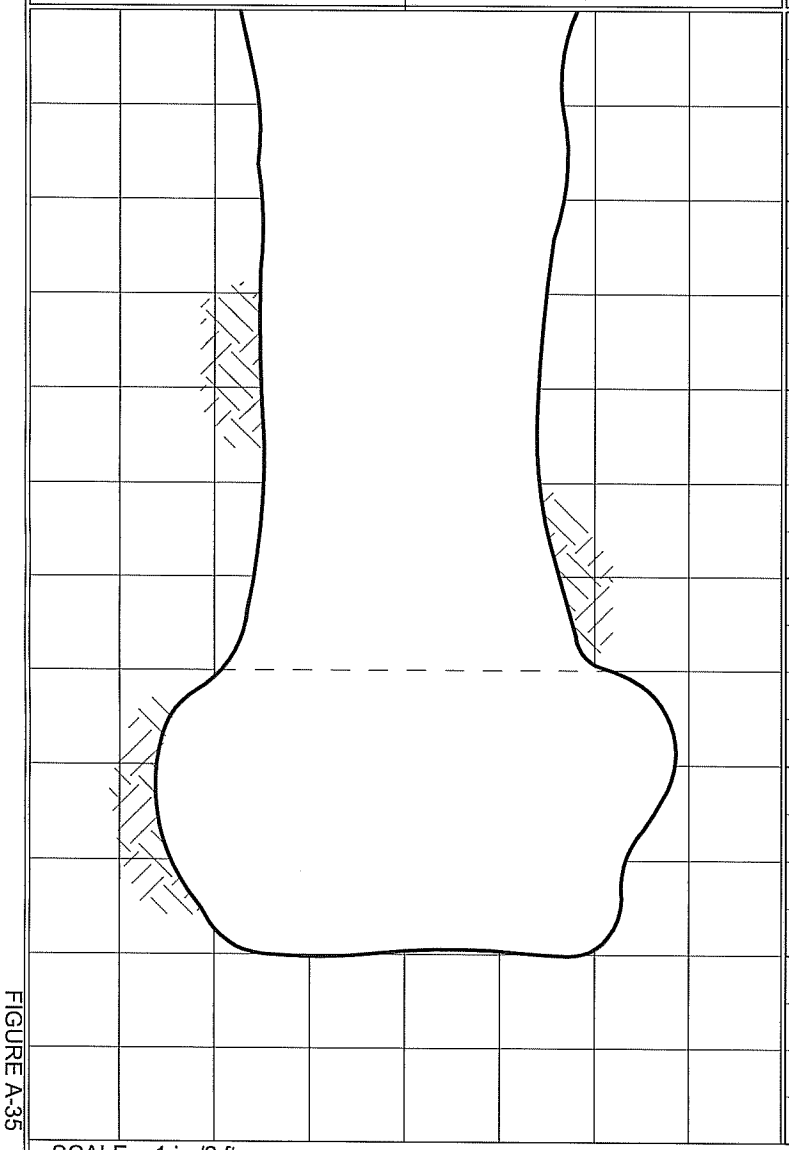
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/27/11 TEST PIT NO. TP-13

GROUND ELEVATION Not measured LOGGED BY EDE

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 3



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					SP	NATIVE SOIL: Tan, dry, medium dense, poorly graded SAND; trace silt and gravel.
2							@ 1.5 feet: Damp.
4							
6							
						SP	@ 7.0 feet: Grayish brown to tan, damp, loose to medium dense, poorly graded SAND; trace gravel.
8	■						
10							Total depth = 10.0 feet. Groundwater not measured during excavation. Backfilled on 4/27/11. Note: Moderate to severe caving occurred below depth of approximately 7.0 feet.
12							

FIGURE A-35

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
BRADSHAW TRAIL AND WEST AVENUE
RIVERSIDE COUNTY, CALIFORNIA

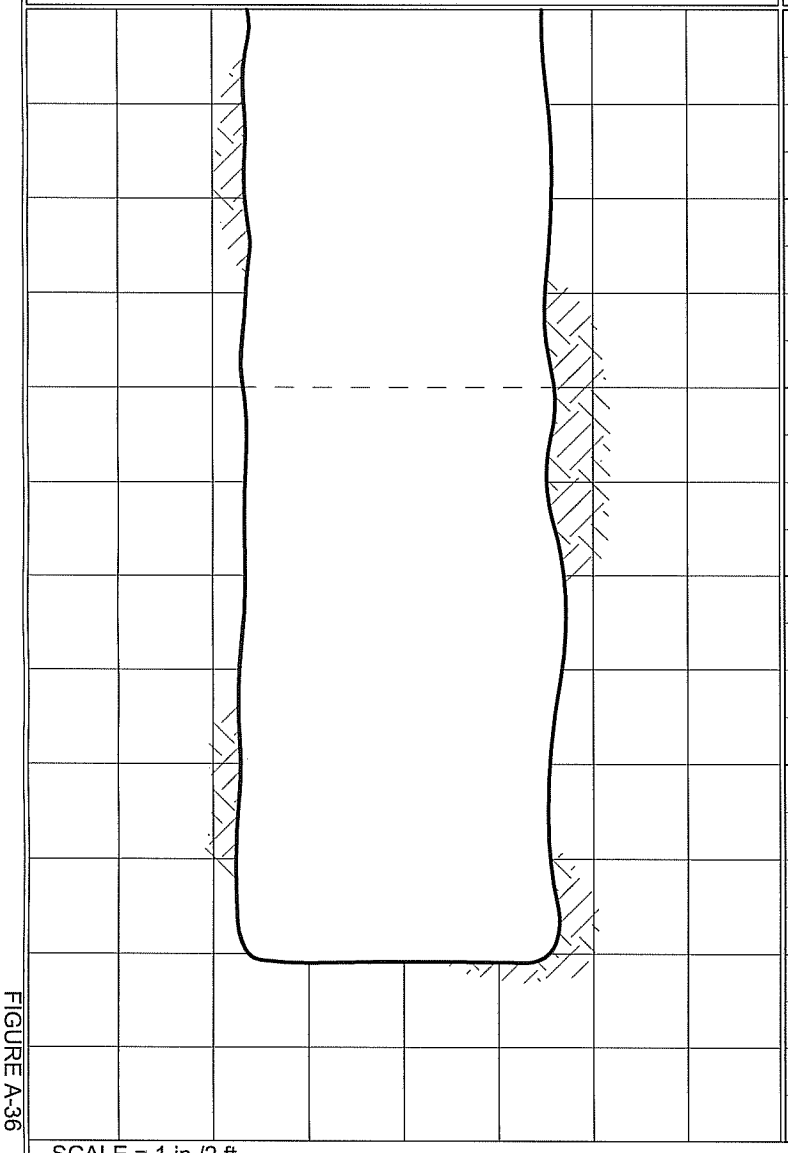
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/28/11 TEST PIT NO. TP-14

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 3



DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SM	NATIVE SOIL: Brown, damp, loose to medium dense, silty SAND; few gravel.
2	■						
4						SP	@ 4.0 feet: Light brown, dry to damp, medium dense, poorly graded SAND; trace silt and gravel.
6	■						
							@ 7.0 feet: Gravel layer a few inches thick.
8	■						
10							Total depth = 10.0 feet. Groundwater not encountered during excavation. Backfilled on 4/28/11.
12							

SCALE = 1 in./2 ft.

FIGURE A-36

Ninyo & Moore

TEST PIT LOG

RIO MESA SOLAR FACILITY
RIVERSIDE COUNTY, CALIFORNIA

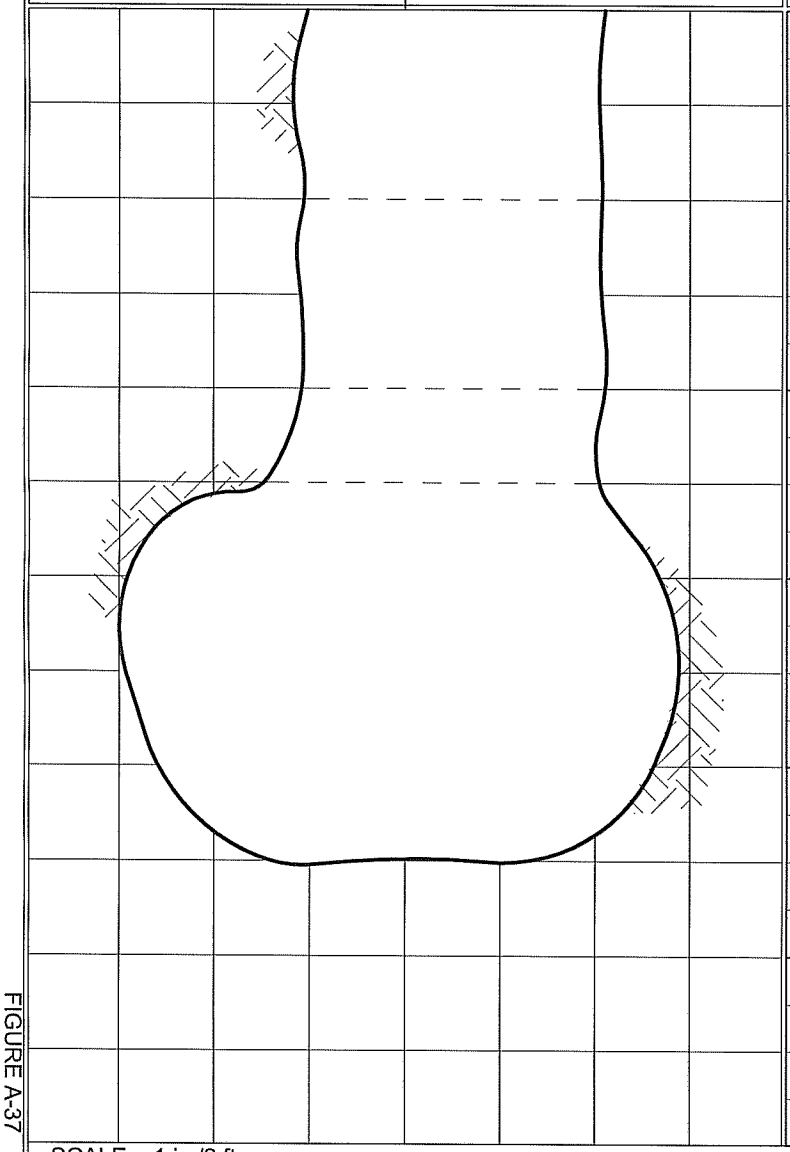
PROJECT NO.	DATE
303256001	5/11

DATE EXCAVATED 4/28/11 TEST PIT NO. TP-15

GROUND ELEVATION Not measured LOGGED BY RCH

METHOD OF EXCAVATION JCB 215 backhoe

LOCATION See Figure 3



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0	■					SW-SM	NATIVE SOIL: Brown, damp, loose, well-graded SAND with silt and gravel.
2	■					GW	@ 2.0 feet: Reddish brown, damp, medium dense to dense, well-graded GRAVEL with sand and cobbles; cobbles up to approximately 8 inches in diameter.
4	■					SC	@ 4.0 feet: Reddish brown, damp, medium dense, clayey SAND; few gravel.
						SP-SM	@ 5.0 feet: Light brown, dry to damp, loose, poorly graded SAND with silt; few gravel.
6	■						
8	■						
10							Total depth = 9.0 feet. Groundwater not encountered during excavation. Backfilled on 4/28/11.
12							Note: Moderate to severe caving occurred below depth of approximately 5.0 feet.

FIGURE A-37

KEY TO SYMBOLS

Symbol Description

Strata symbols

Poorly graded gravel

silty sand (Qaf, Qal)

Poorly graded sand

Caliche

Poorly graded sand
with silt

Soil Samplers

California sampler

No recovery with modified
Split-Barrel Drive Sampler

APPENDIX B

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory excavations in Appendix A.

In-Place Moisture and Density

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory excavations were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation Analysis

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. These test results were utilized in evaluating the soil classifications in accordance with the USCS. The grain-size distribution curves are shown on Figure B-1 through Figure B-17.

Atterberg Limits

Tests were performed on selected representative soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classifications are shown on Figure B-18 through Figure B-20.

Consolidation

Consolidation tests were performed on selected relatively undisturbed soil samples in general accordance with ASTM D 2435. The samples were inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The consolidation test results are summarized graphically on Figure B-21 and Figure B-22.

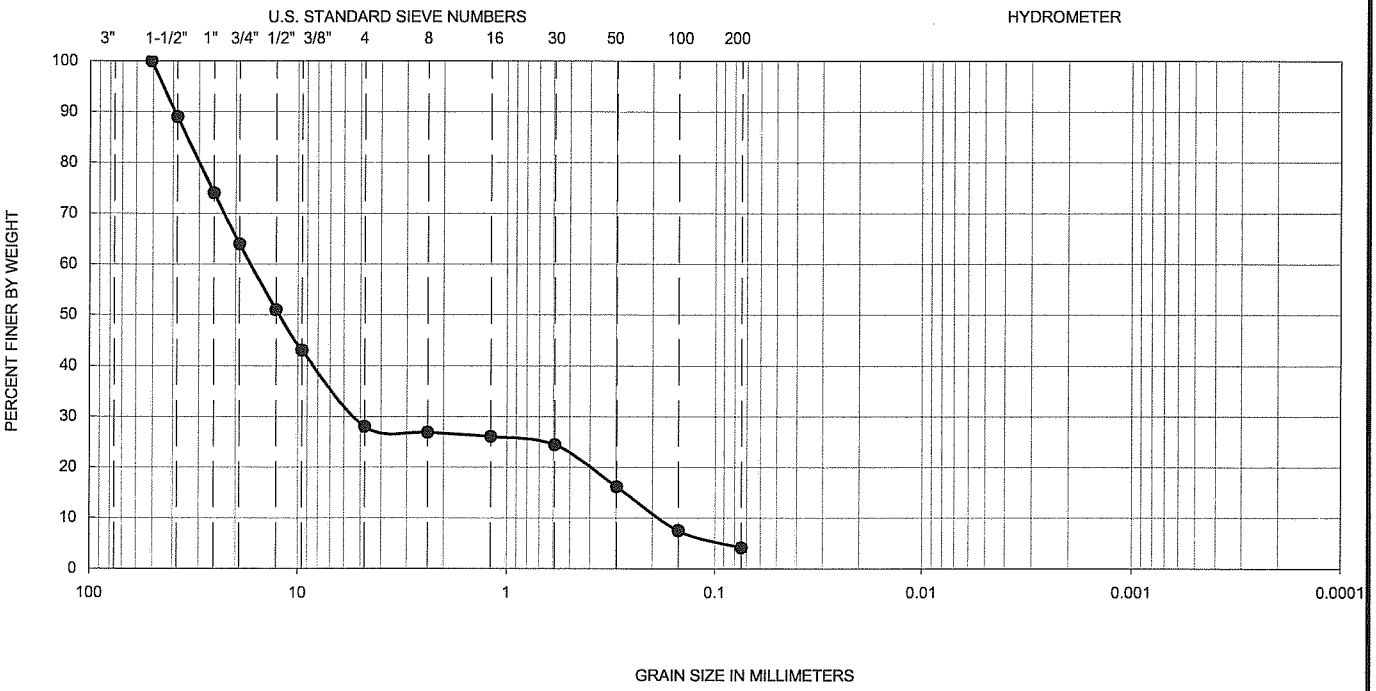
Direct Shear

Direct shear tests were performed on ring lined samples in general accordance with ASTM D 3080 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The results are shown on Figure B-23 through Figure B-27.

Proctor Density Tests

The maximum dry density and optimum moisture content of selected representative soil samples were evaluated using the Modified Proctor method in general accordance with ASTM D 1557. The results of these tests are summarized on Figure B-28 and Figure B-29.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



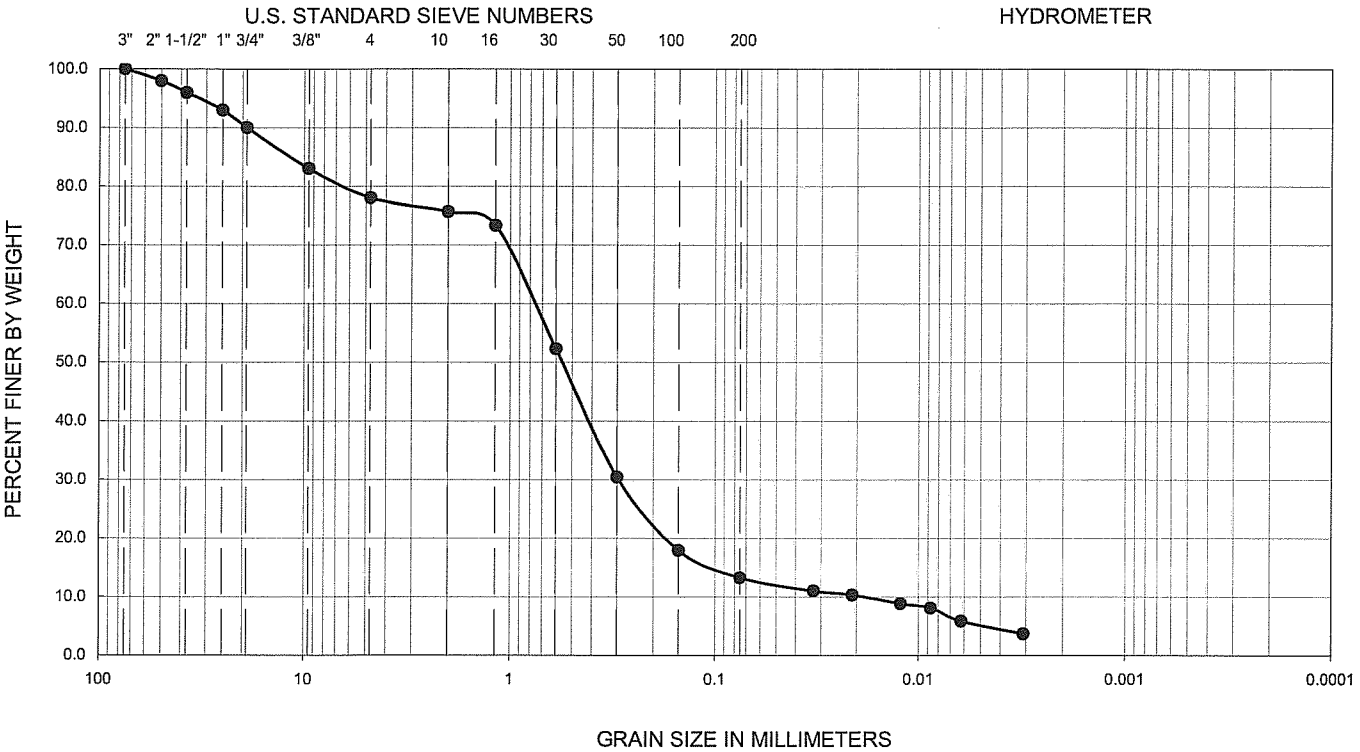
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-1	0.0-1.0	--	--	NP	0.19	5.50	15.00	78.9	10.6	4	GP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-1
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-2	0.0-1.0	--	--	NP	--	--	--	--	--	18	SM

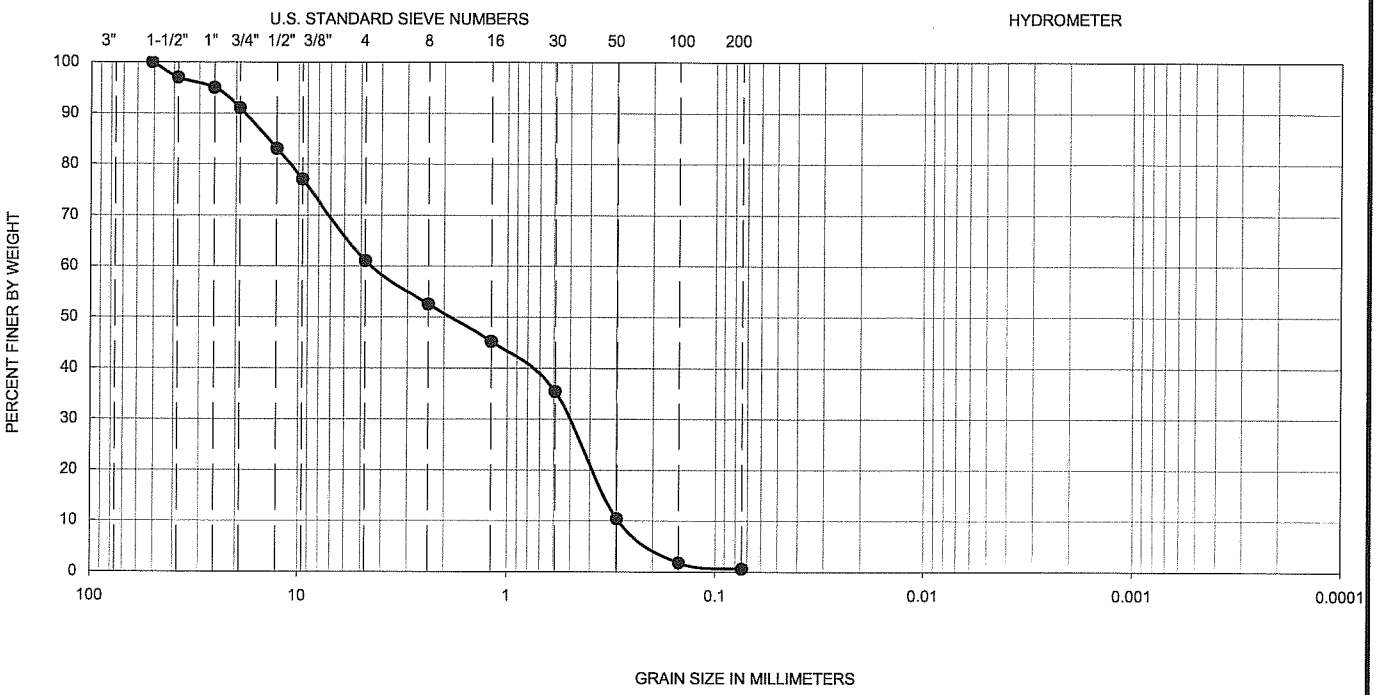
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-2
303256001 / 6/11		

(B-2) 303256001 B-2 0.0-1.0 HYD.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



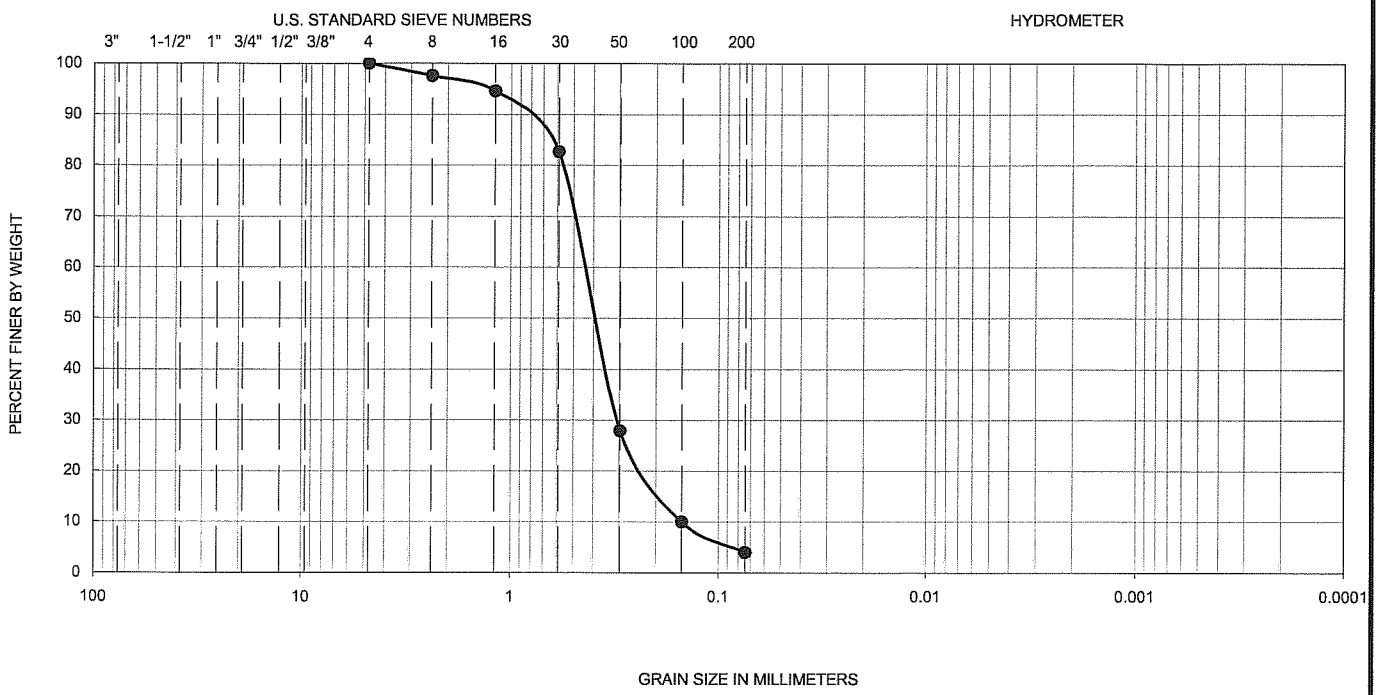
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-3	0.0-1.0	--	--	NP	0.30	0.50	4.20	14.1	0.2	1	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-3
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



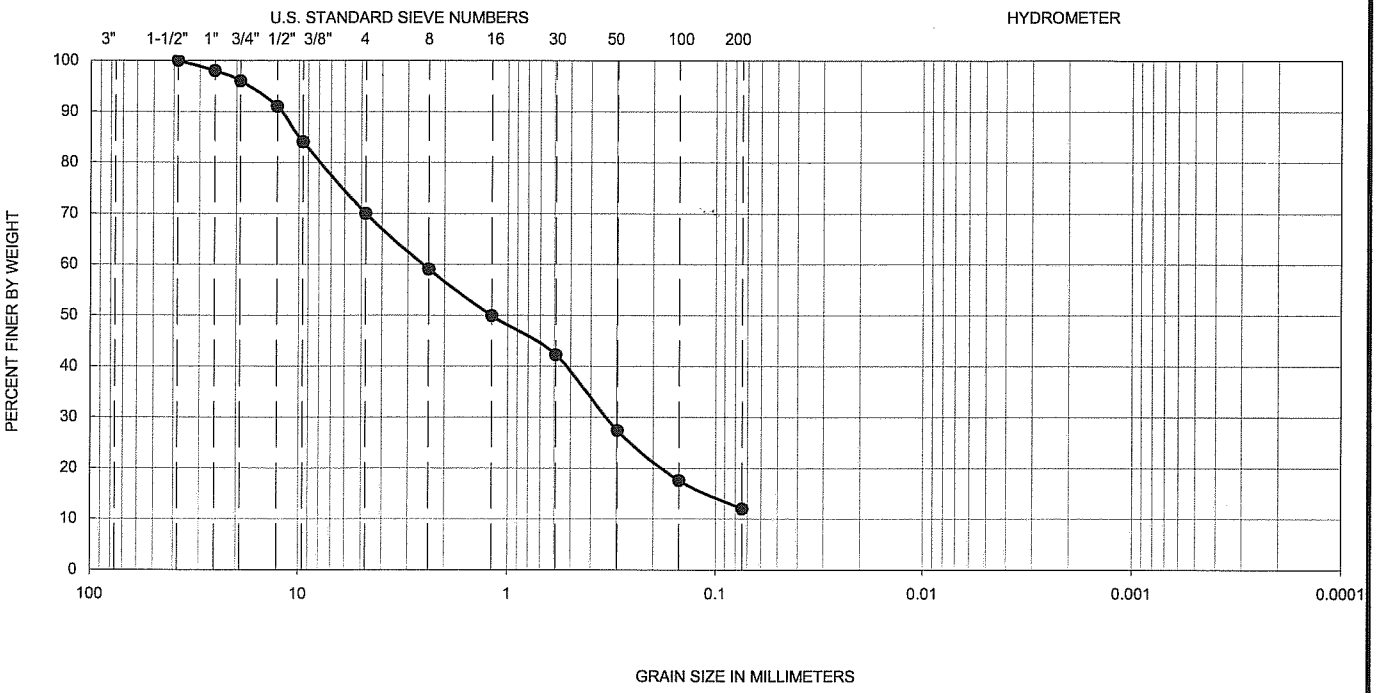
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-6	10.0-15.0	--	--	NP	0.15	0.31	0.43	2.9	1.5	4	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-4
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



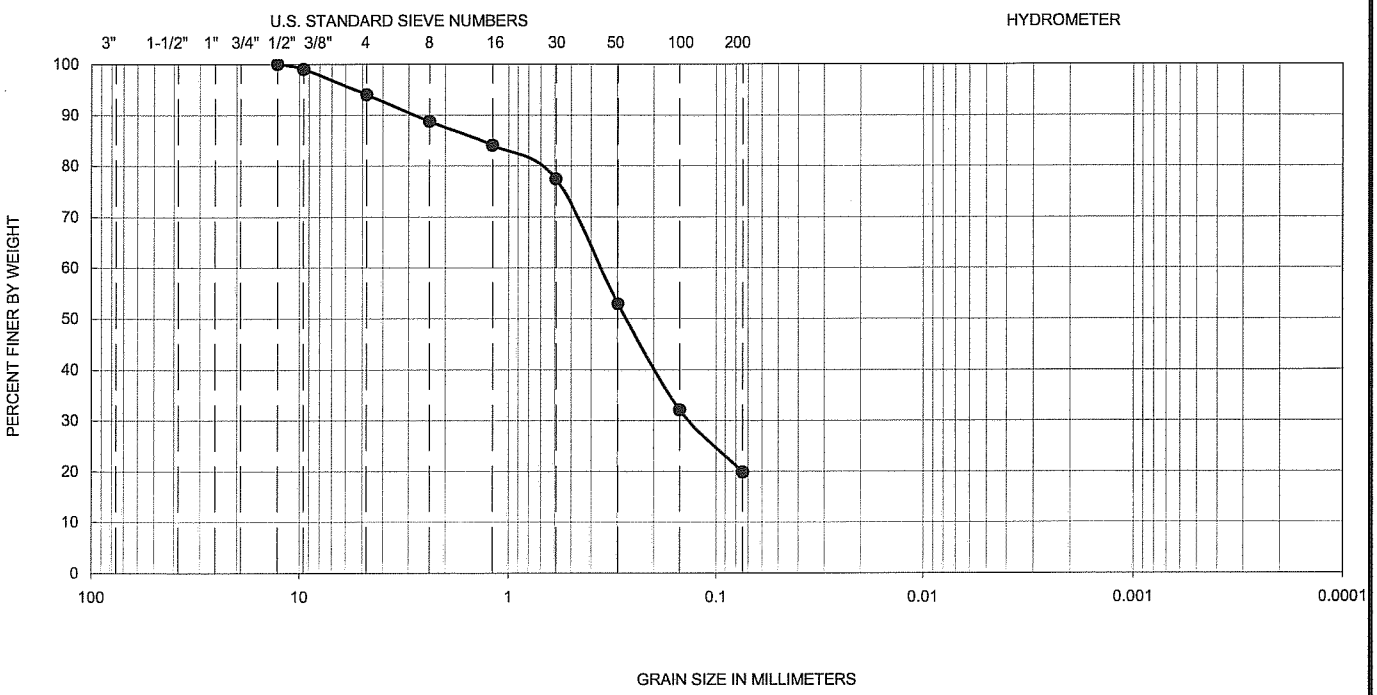
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-8	3.0-6.0	--	--	NP	0.05	0.32	2.40	48.0	0.9	12	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-5
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



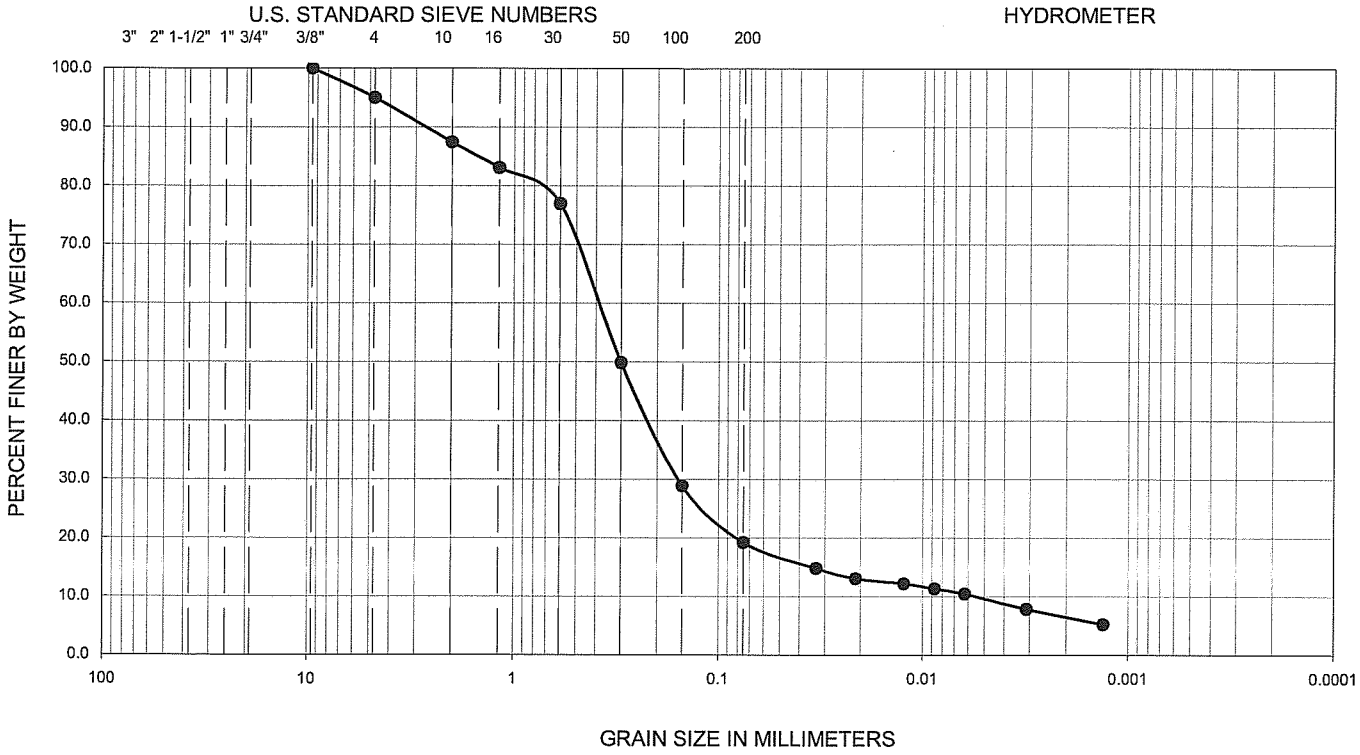
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-9	12.0-15.0	--	--	NP	--	--	--	--	--	20	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-6
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



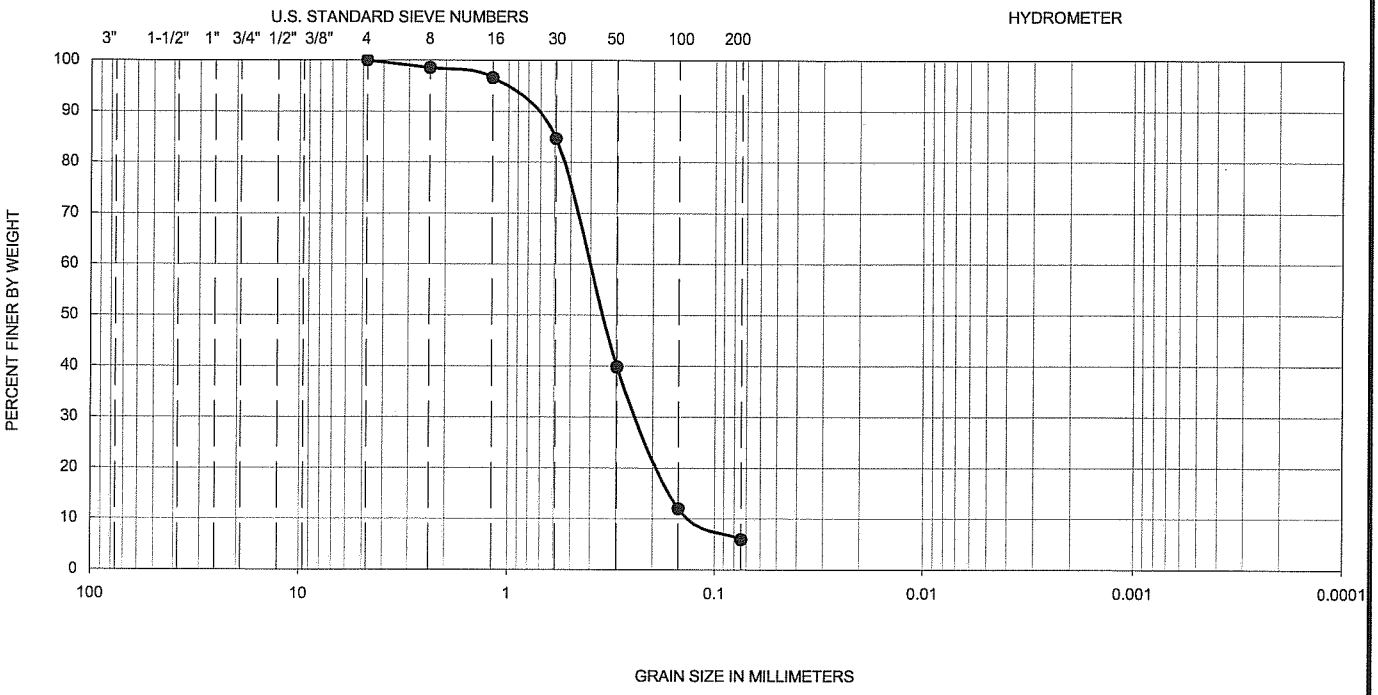
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-10	0.0-5.0	--	--	NP	--	--	--	--	--	19	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-7
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



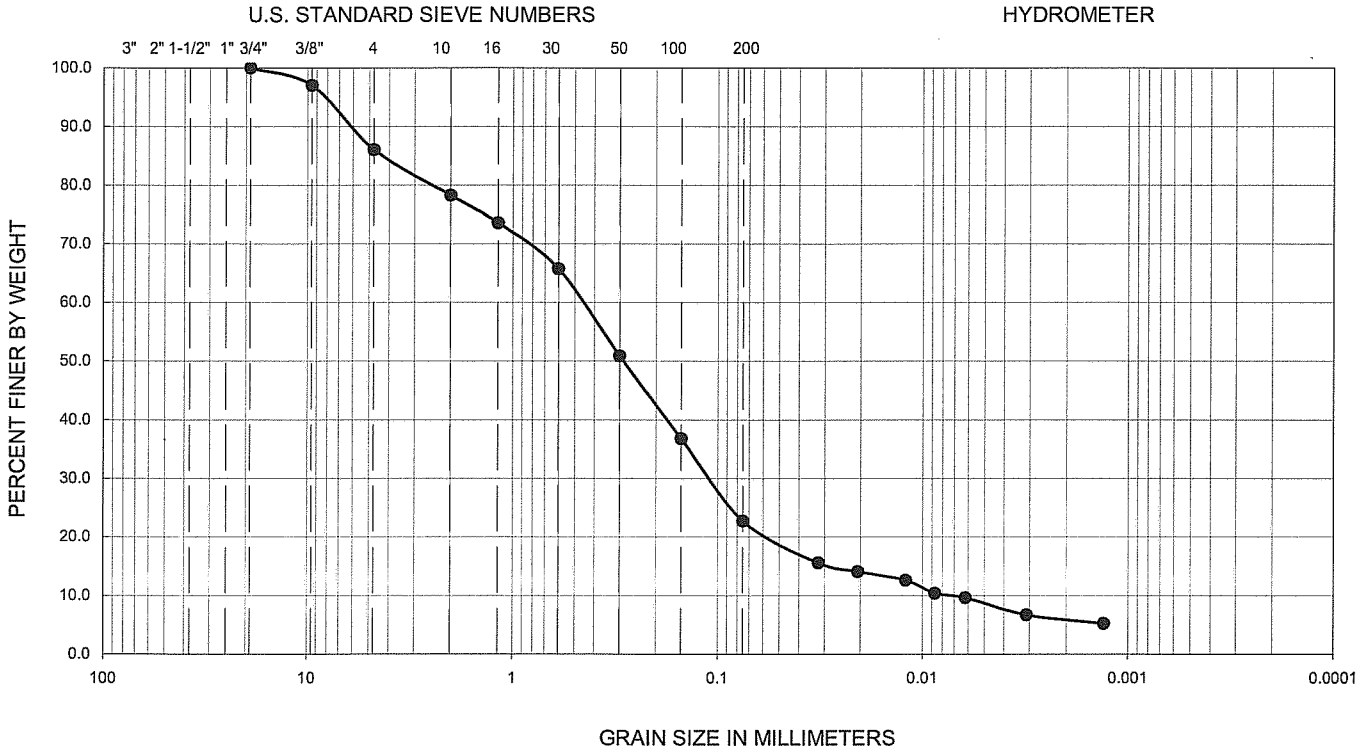
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-11	10.0-15.0	--	--	NP	0.13	0.25	0.40	3.1	1.2	6	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-8
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



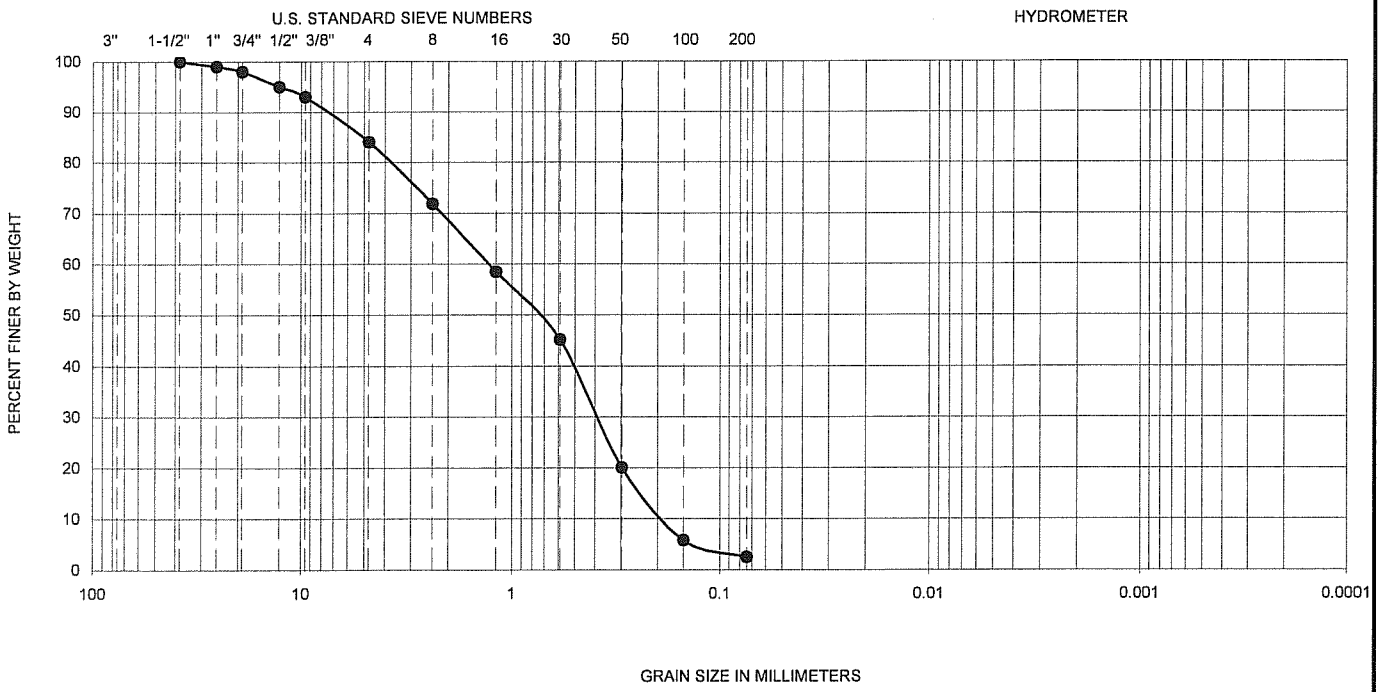
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-12	5.0-10.0	--	--	NP	--	--	--	--	--	23	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-9
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



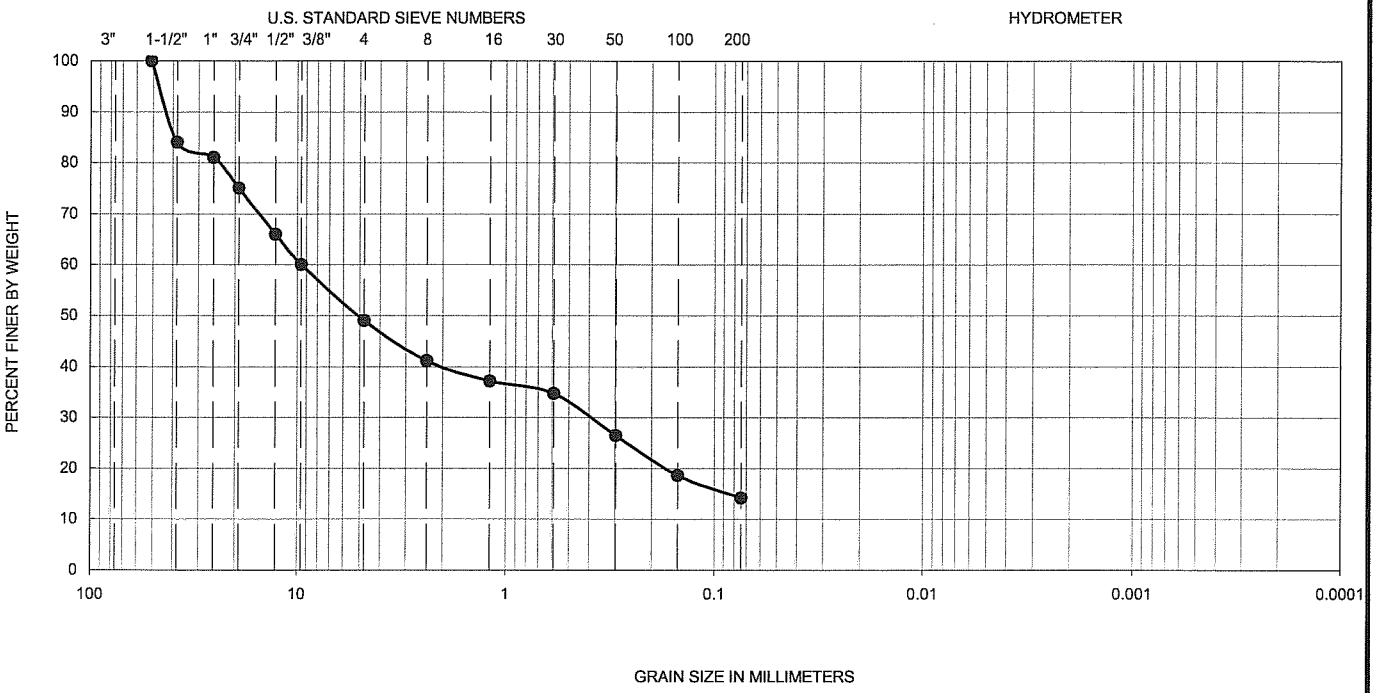
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-13	0.0-1.0	--	--	NP	0.20	0.40	1.20	6.0	0.7	3	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-10
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



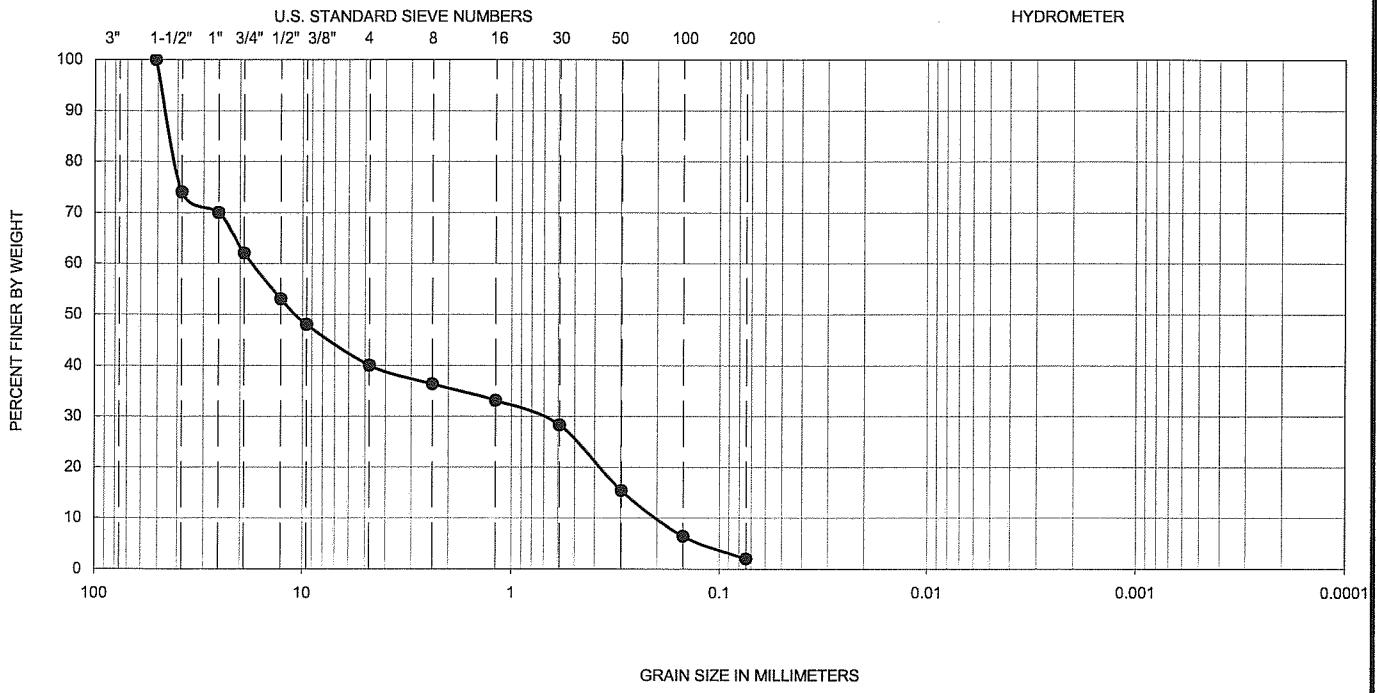
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	TP-2	2.0-4.0	--	--	NP	--	--	--	--	--	14	GM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-11
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



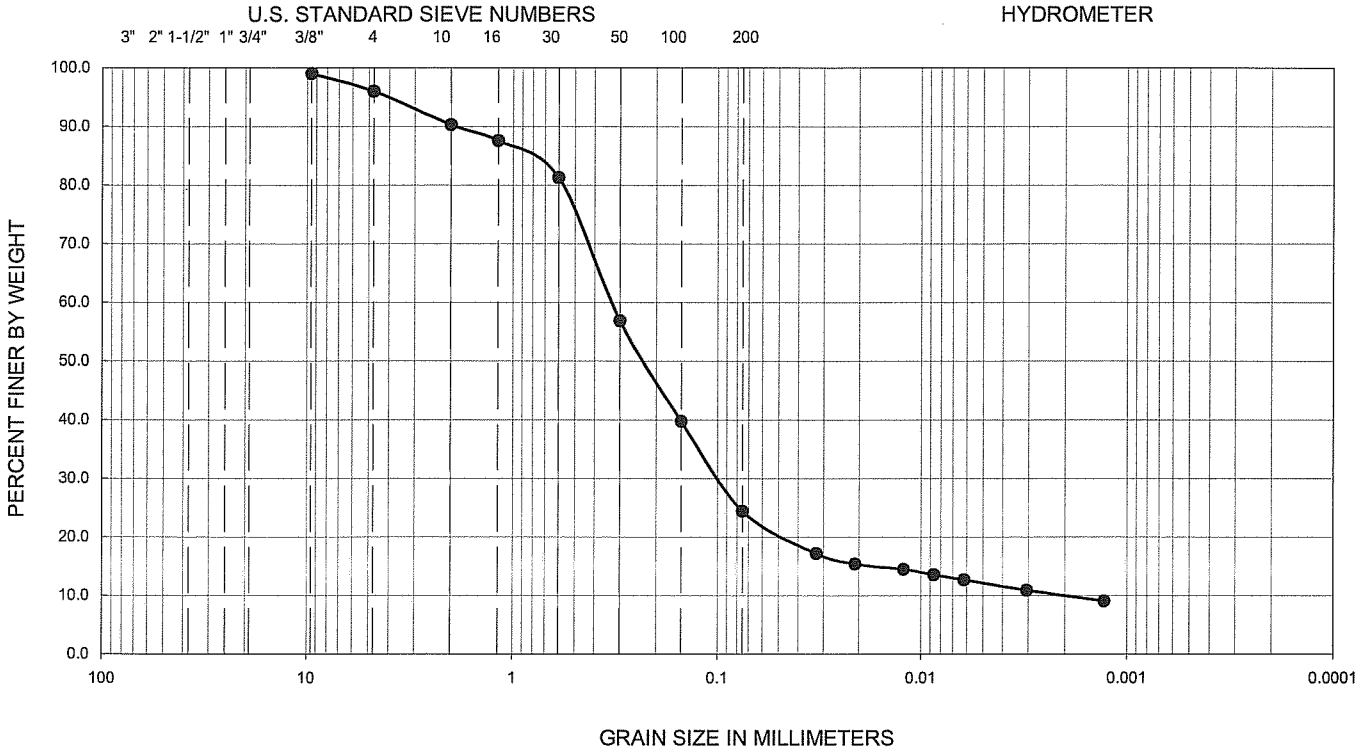
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	TP-3	0.0-4.0	--	--	NP	0.20	0.70	17.00	85.0	0.1	2	GP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-12
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



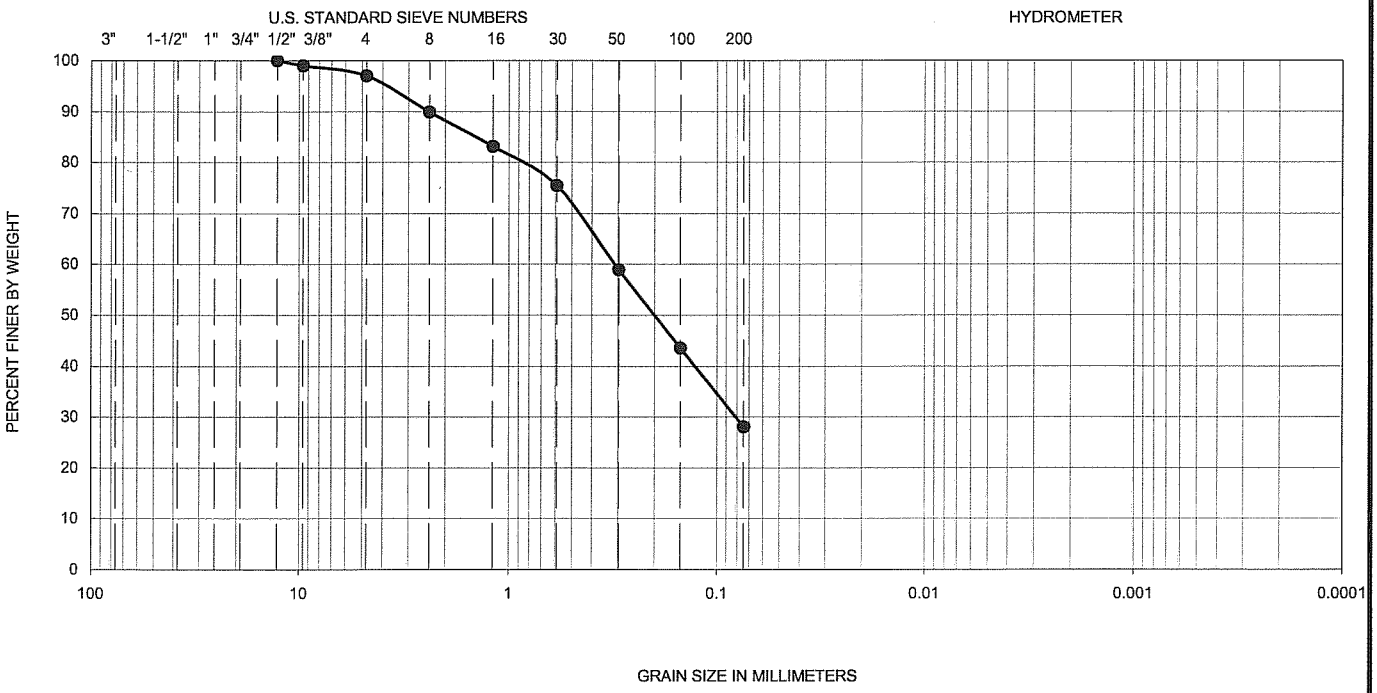
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	TP-5	3.0-5.0	--	--	NP	--	--	--	--	--	24	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-13
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



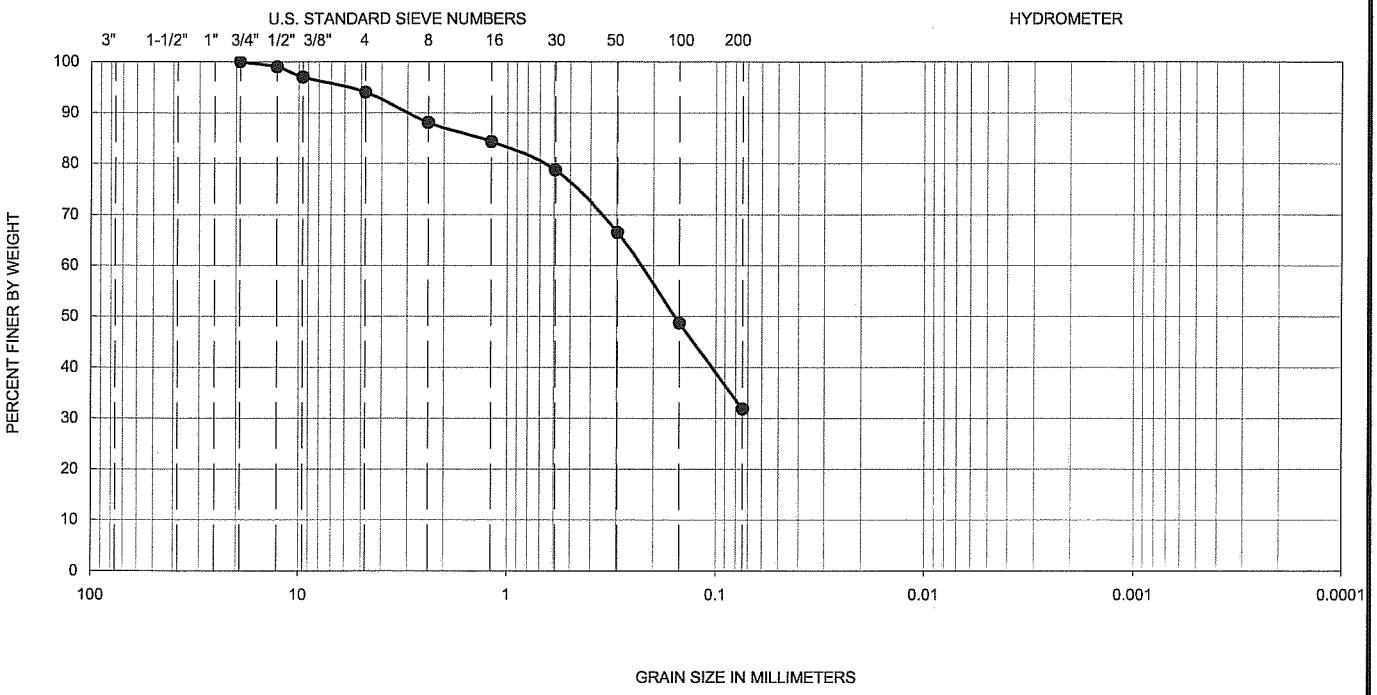
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	TP-11	1.0-4.0	--	--	NP	--	--	--	--	--	28	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-14
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



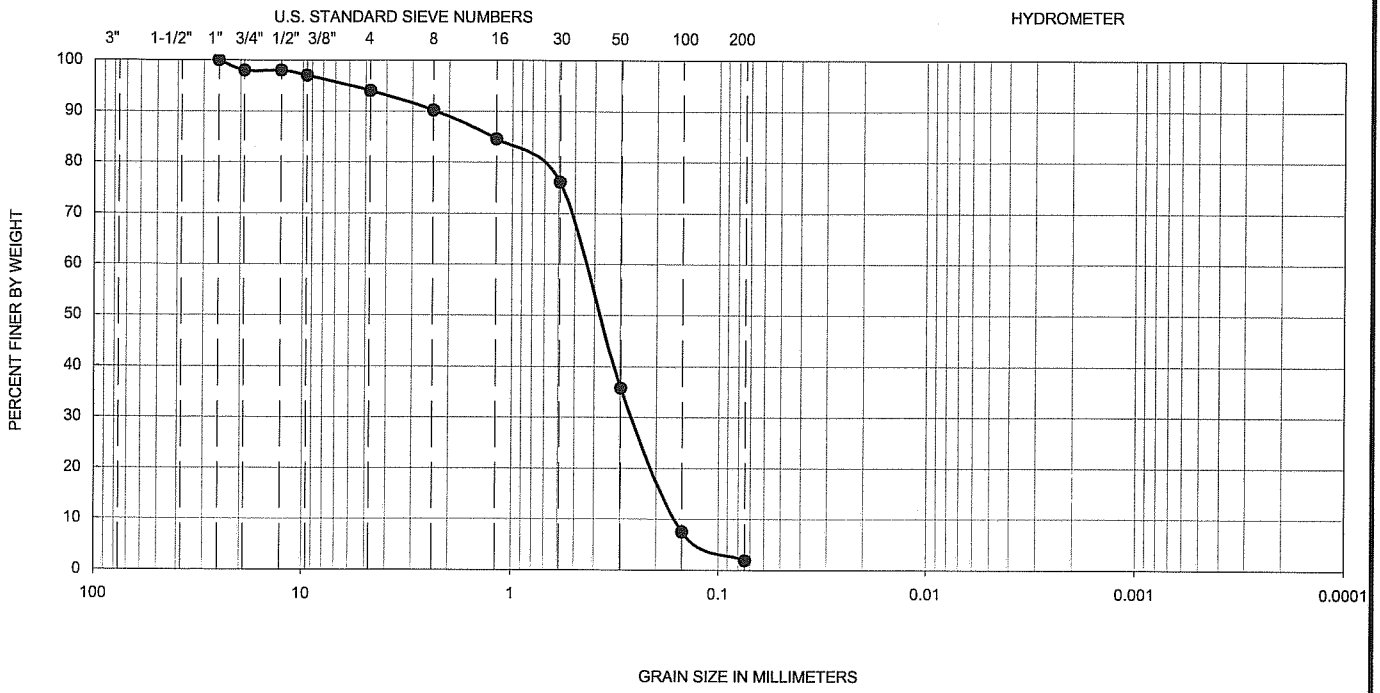
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	TP-12	1.0-2.0	--	--	NP	--	--	--	--	--	32	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-15
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



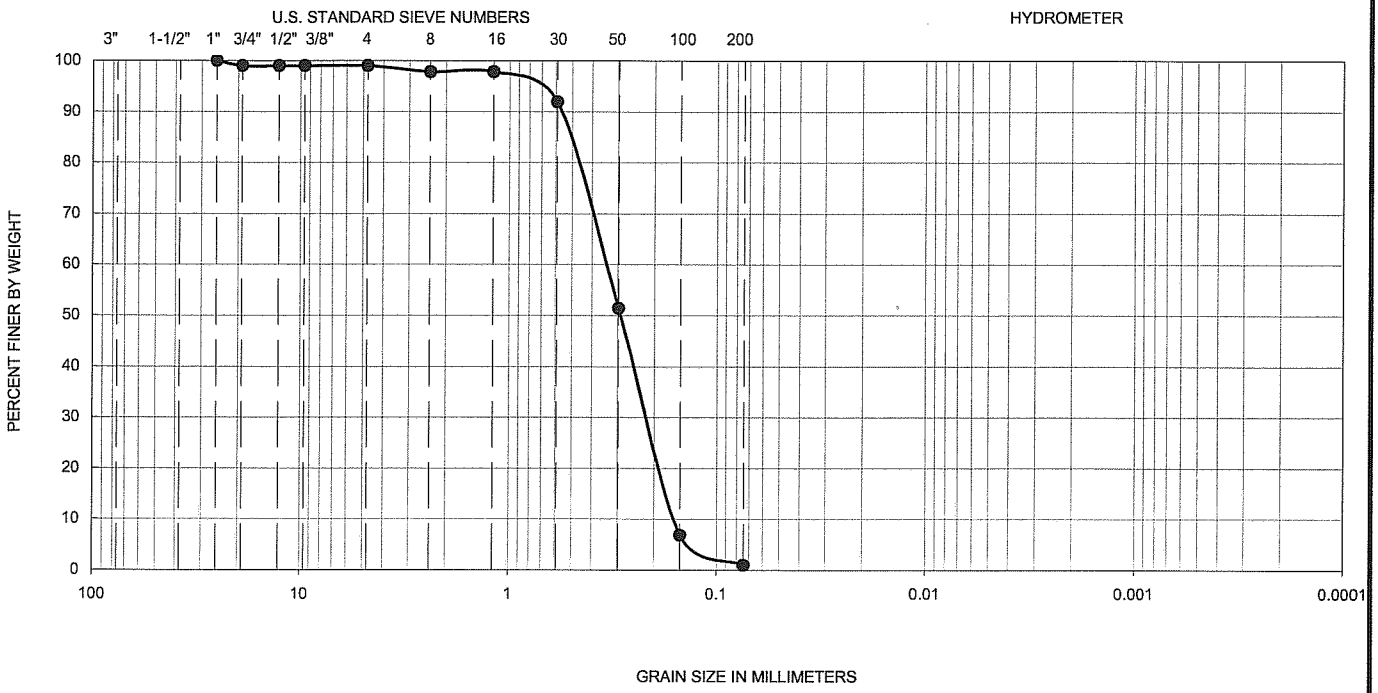
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	TP-13	8.0-10.0	--	--	NP	0.16	0.27	4.30	26.9	0.1	2	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-16
303256001 / 6/11		

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	TP-14	5.0-8.0	--	--	NP	0.15	0.22	3.50	23.3	0.1	1	SP

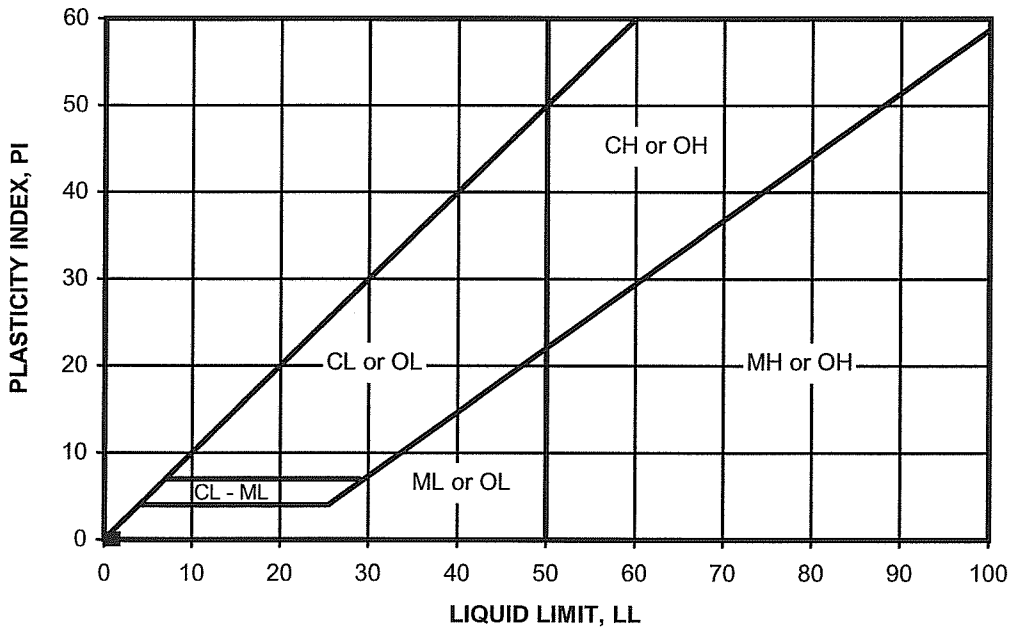
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

NP - INDICATES NON-PLASTIC

Ninyo & Moore	GRADATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-17
303256001 / 6/11		

SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
●	B-1	0.0-1.0	--	--	NP	ML	GP
■	B-2	0.0-1.0	--	--	NP	ML	SM
◆	B-3	0.0-1.0	--	--	NP	ML	SP
○	B-6	10.0-15.0	--	--	NP	ML	SP
□	B-8	3.0-6.0	--	--	NP	ML	SP-SM
Δ	B-9	12.0-15.0	--	--	NP	ML	SM
X	B-10	0.0-5.0	--	--	NP	ML	SM
+	B-11	10.0-15.0	--	--	NP	ML	SP-SM

NP - INDICATES NON-PLASTIC

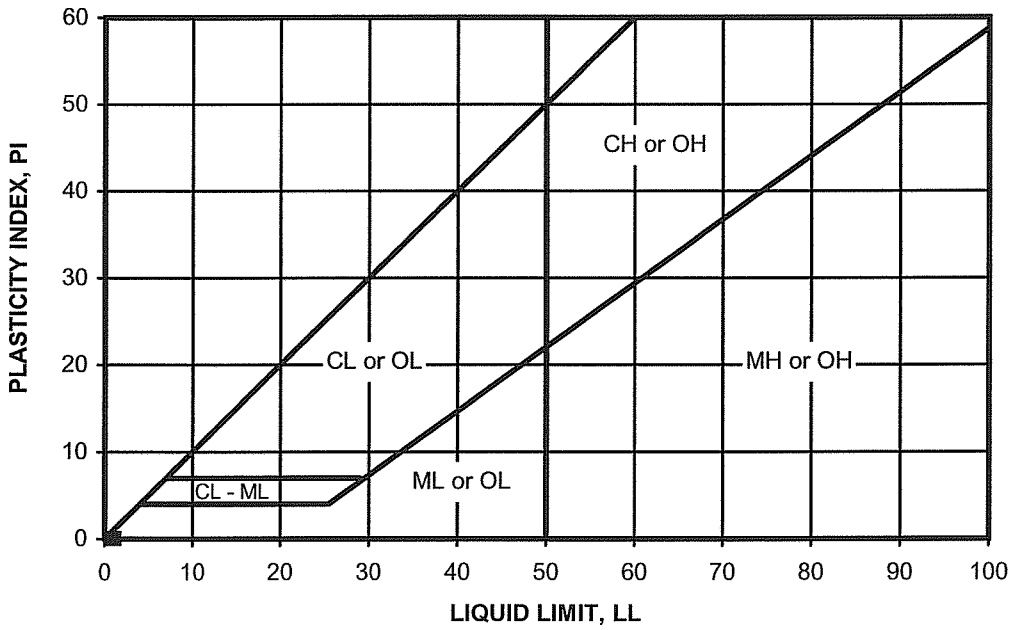


PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Ninyo & Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO. 303256001 / DATE 6/11	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-18

SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
●	B-12	5.0-10.0	--	--	NP	ML	SM
■	B-13	0.0-1.0	--	--	NP	ML	SP
◆	TP-2	2.0-4.0	--	--	NP	ML	GM
○	TP-3	0.0-4.0	--	--	NP	ML	GP
□	TP-5	3.0-5.0	--	--	NP	ML	SM
Δ	TP-11	1.0-4.0	--	--	NP	ML	SM
X	TP-12	1.0-2.0	--	--	NP	ML	SM
+	TP-13	8.0-10.0	--	--	NP	ML	SP

NP - INDICATES NON-PLASTIC

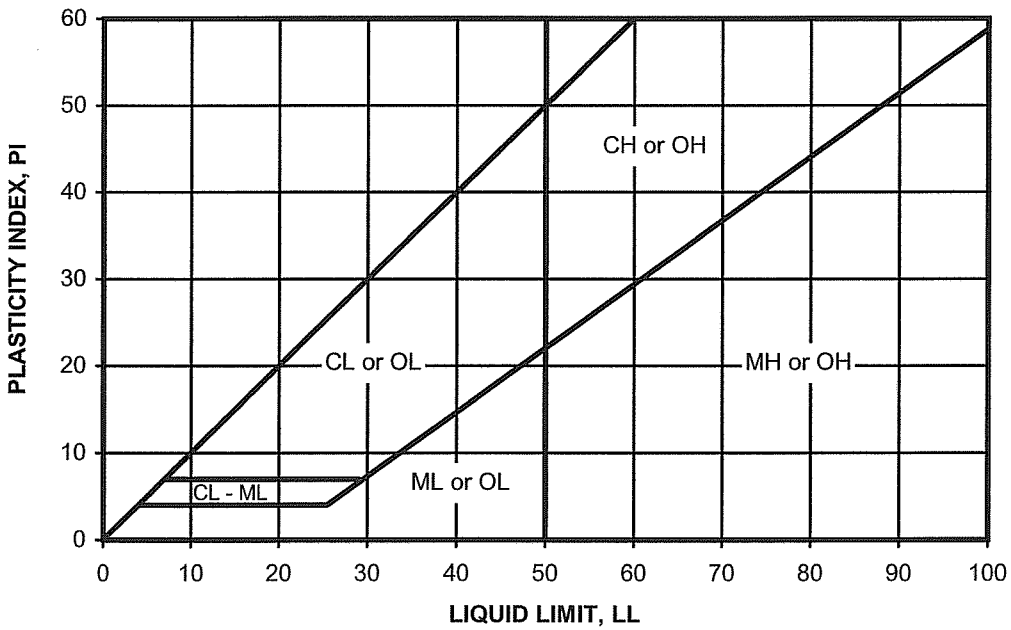


PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Ninyo & Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO. 303256001 / DATE 6/11	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-19

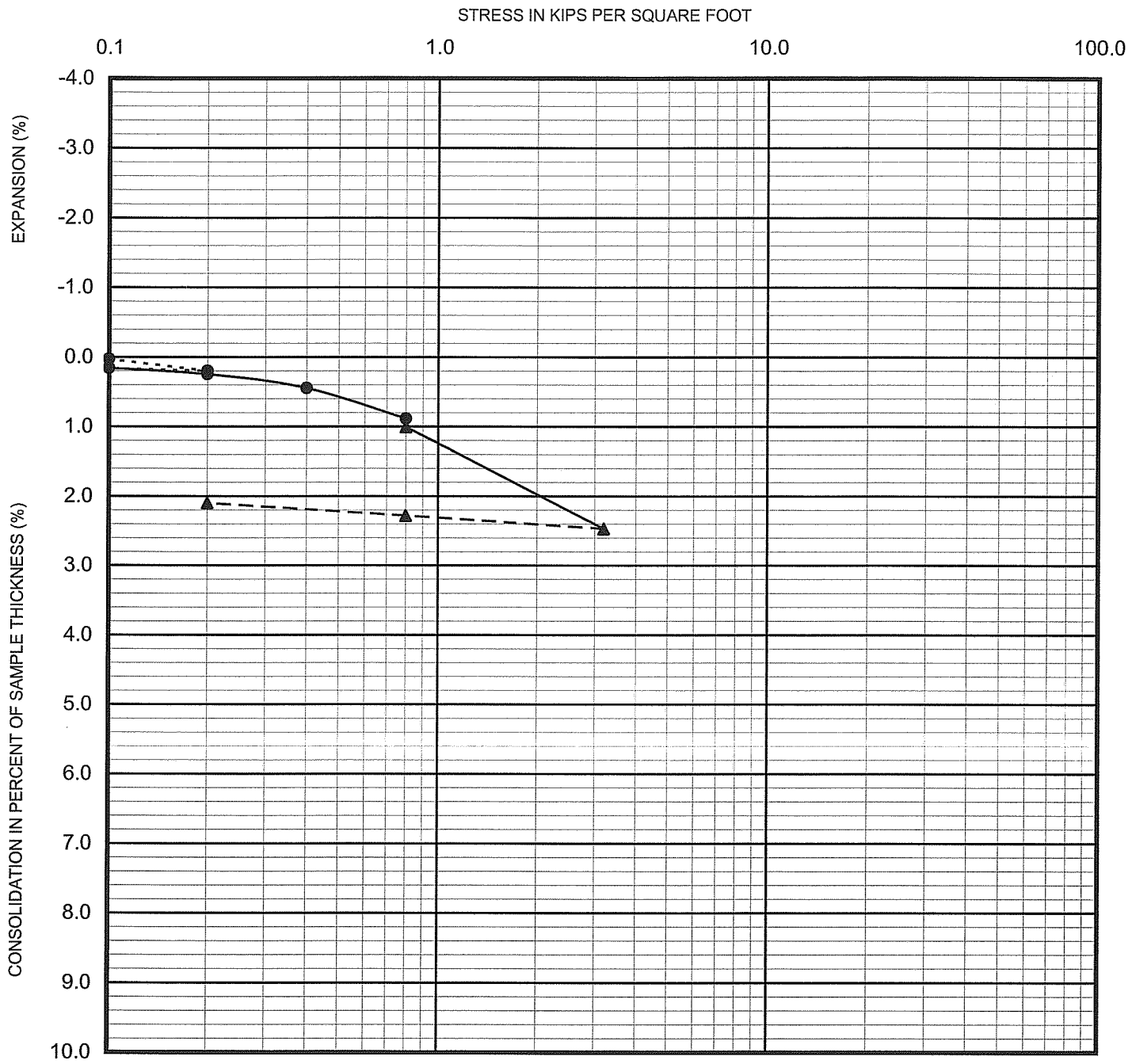
SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
●	TP-14	5.0-8.0	--	--	NP	ML	SP

NP - INDICATES NON-PLASTIC



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Ninyo & Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO. 303256001 / DATE 6/11	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-20

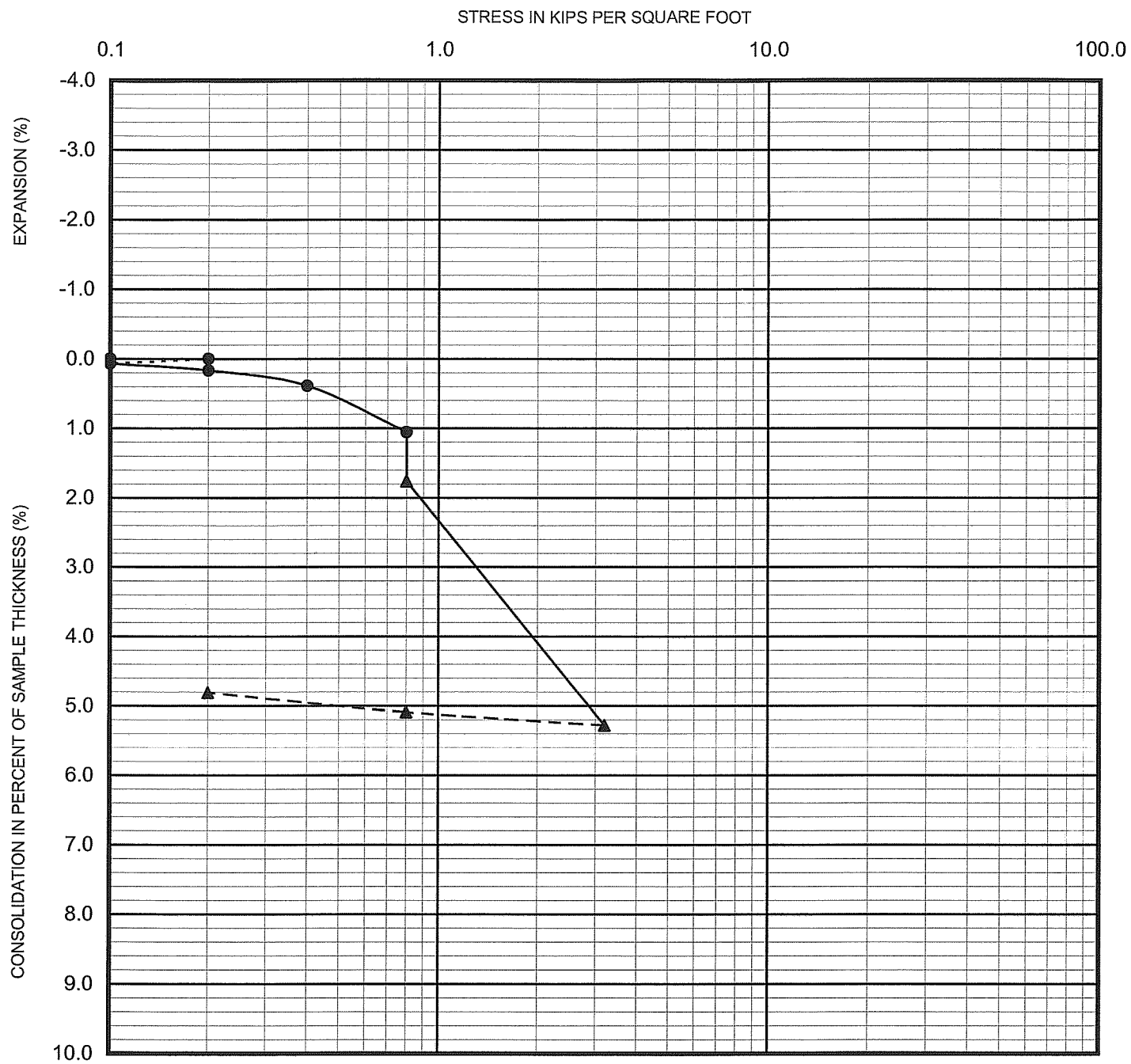


Sample Location	B-6
Depth (ft.)	5.0-6.5
Soil Type	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

Ninyo & Moore	CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADHSAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-21
303256001 / 6/11		

(B-21) 303256001 B-6 5.0-6.5 CN.xls

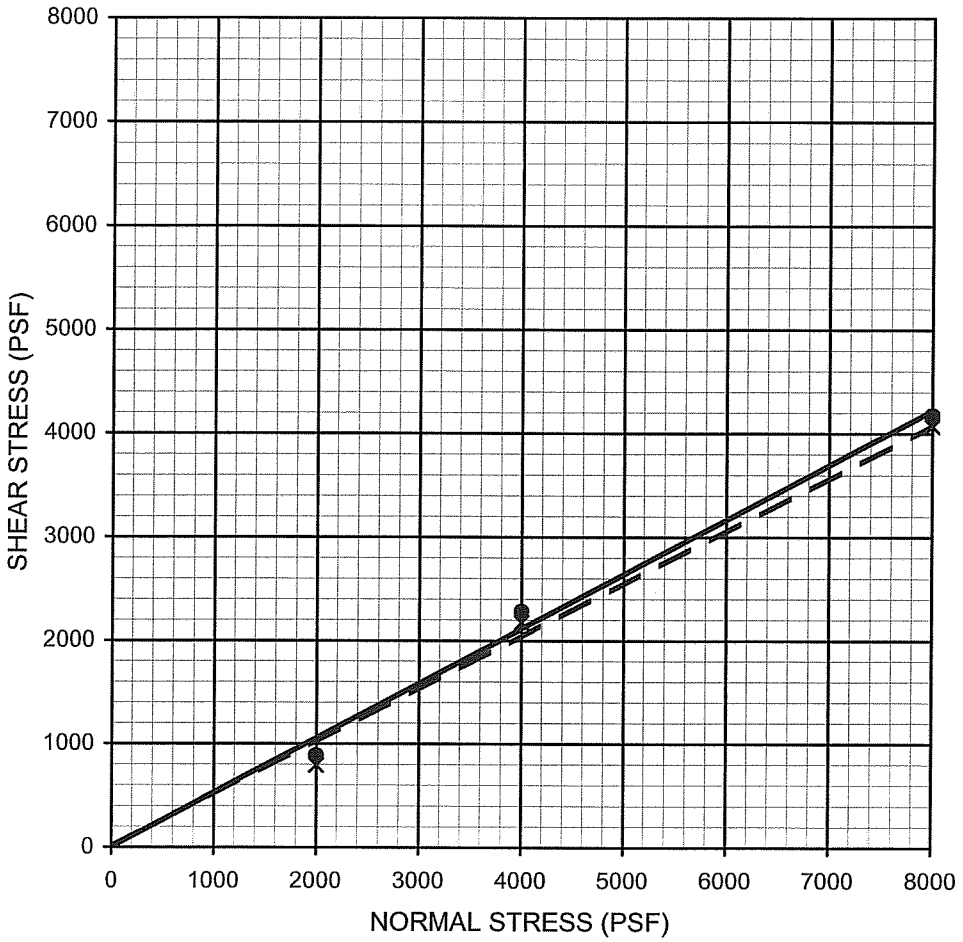


Sample Location	B-15
Depth (ft.)	5.0-6.5
Soil Type	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

Ninyo & Moore	CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-22
303256001 / 6/11		

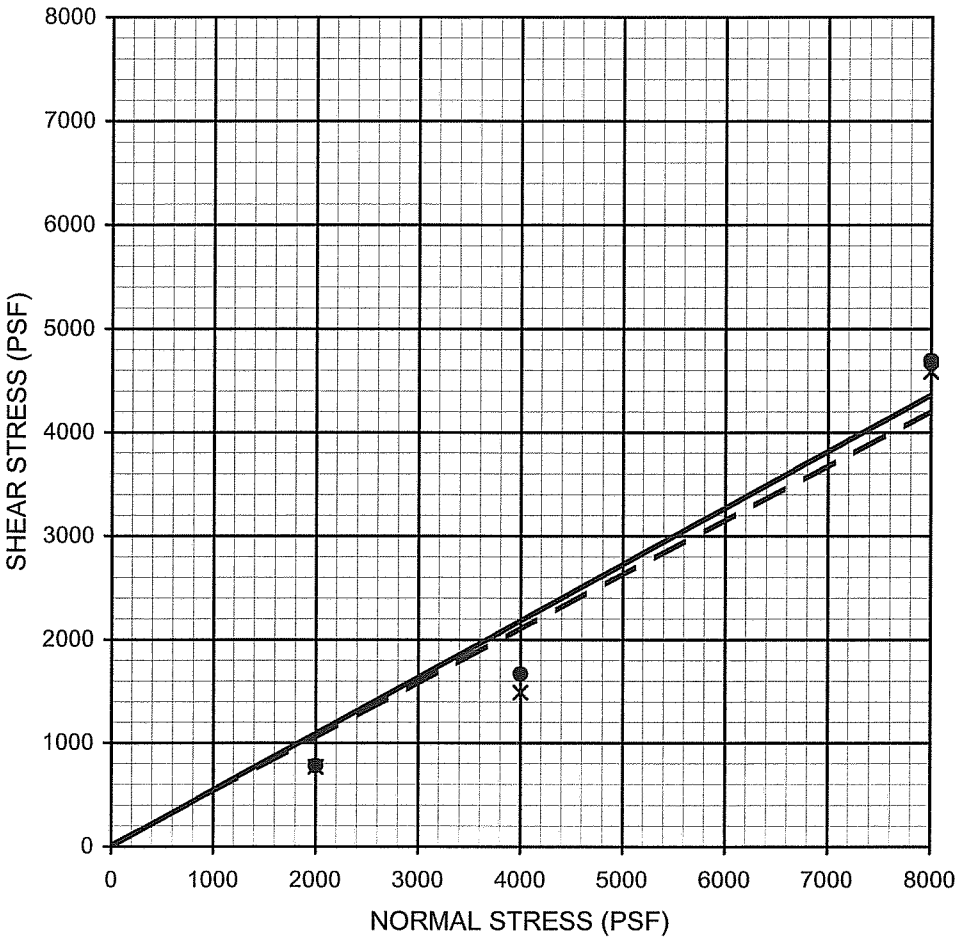
(B-22) 303256001 B-15 5.0-6.5 CN.xls



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
	—●—	B-4	5.0-6.5	Peak	0	28	SM
0	- - X - -	B-4	5.0-6.5	Ultimate	0	27	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore		DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO.	DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-23
303256001	6/11		

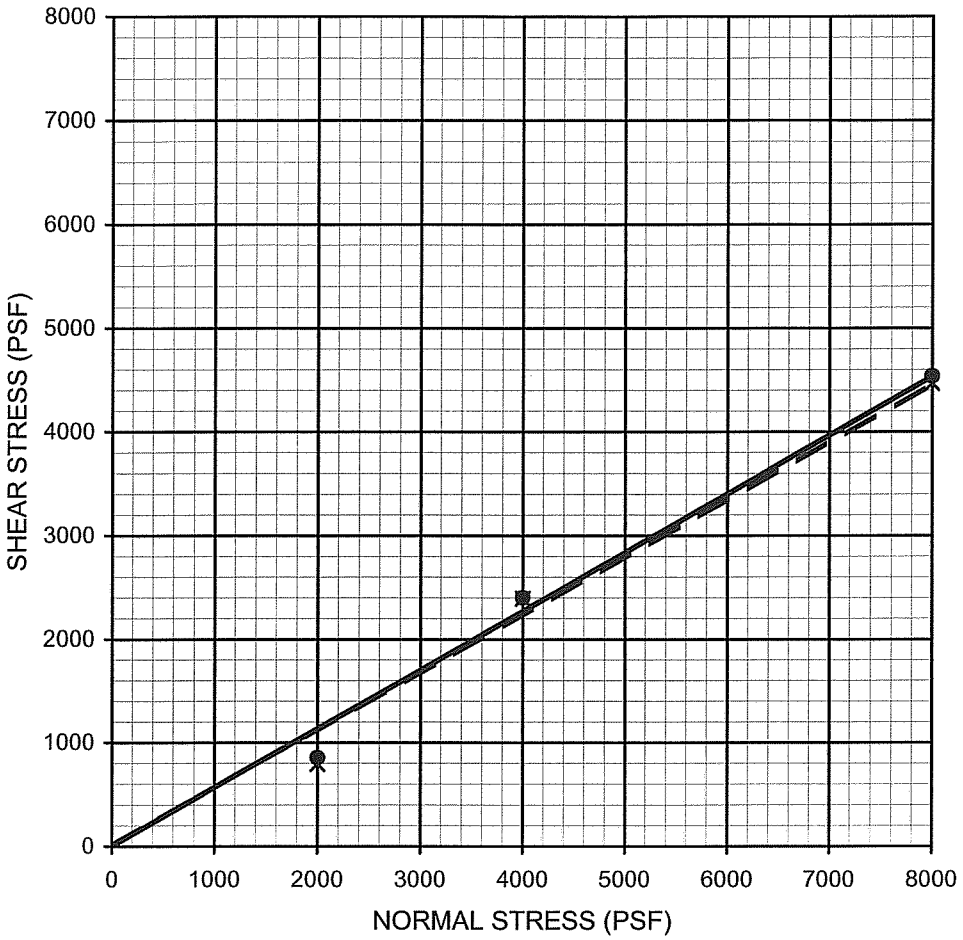


Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
	—●—	B-6	5.0-6.5	Peak	0	29	SP
0	- - X - -	B-6	5.0-6.5	Ultimate	0	28	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore		DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO.	DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-24
303256001	6/11		

(B-24) 303256001 B-6 5.0-6.5 DS.xls

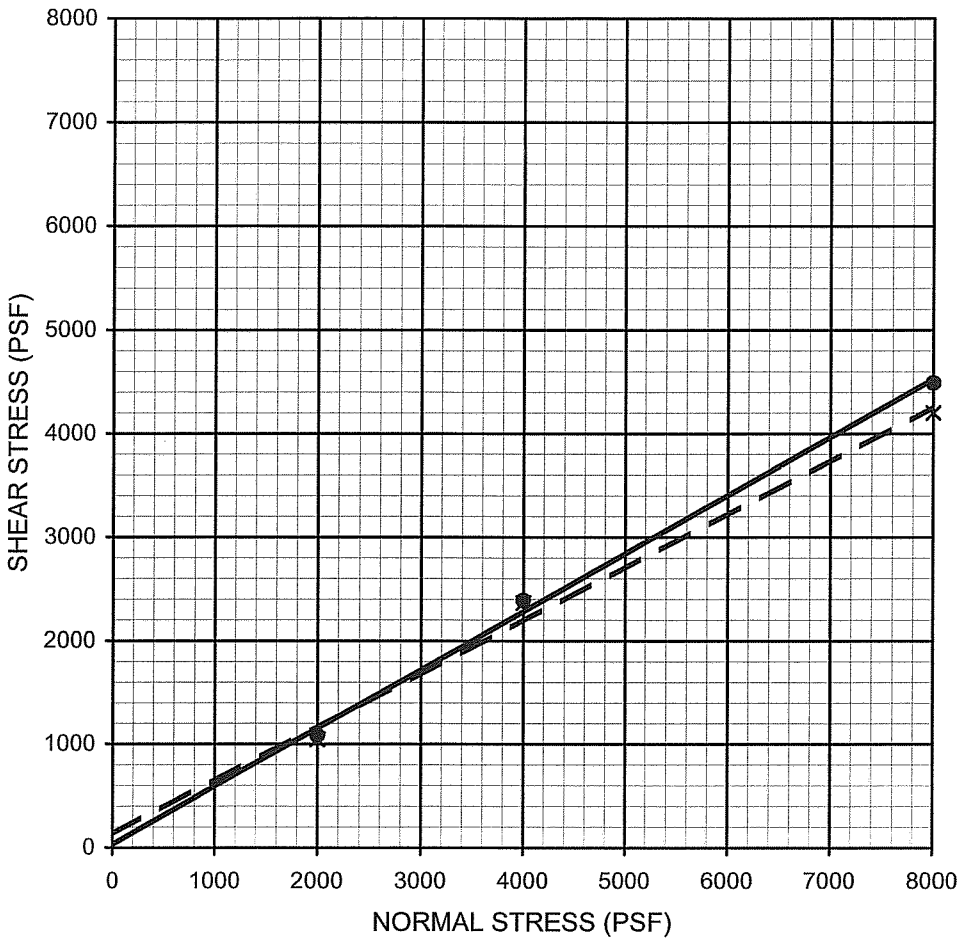


Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
	—●—	B-9	10.0-10.9	Peak	0	30	SM
0	- - X - -	B-9	10.0-10.9	Ultimate	0	29	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore		DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO.	DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-25
303256001	6/11		

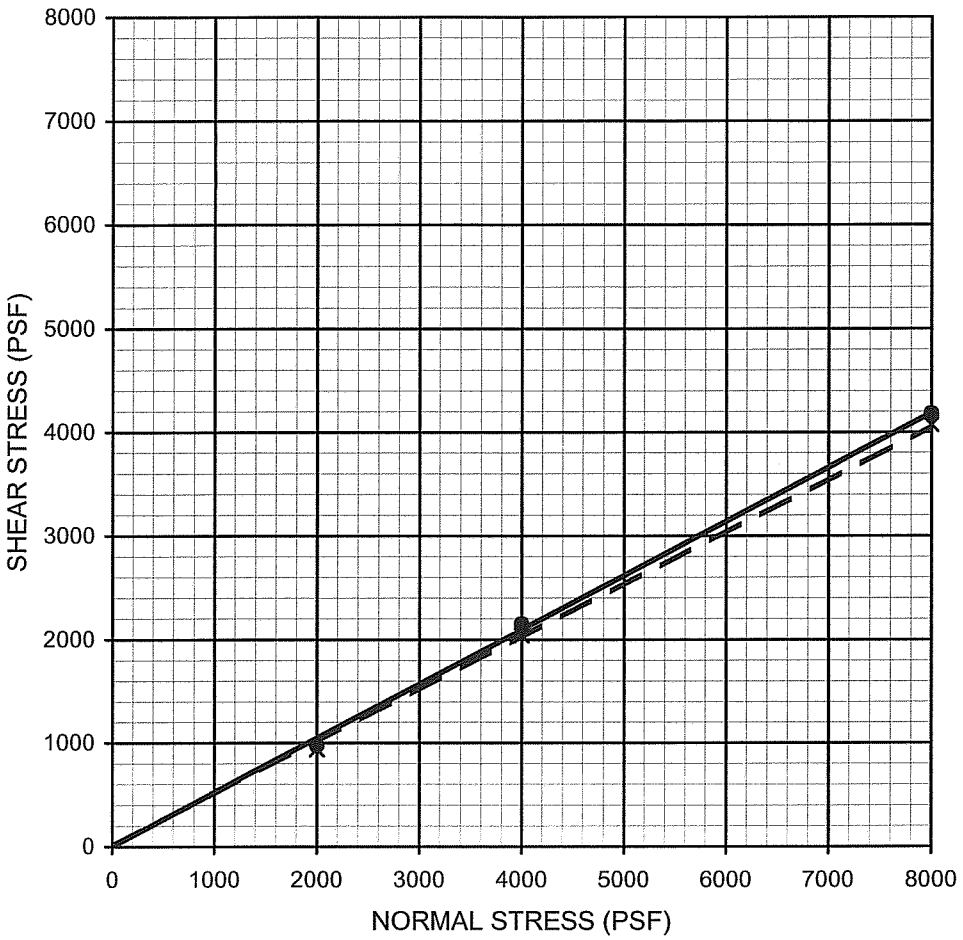
(B-25) 303256001 B-9 10.0-10.9 DS.xls



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
	—●—	B-12	10.0-11.5	Peak	30	29	SM
0	- - X - -	B-12	10.0-11.5	Ultimate	126	27	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore		DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO.	DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-26
303256001	6/11		

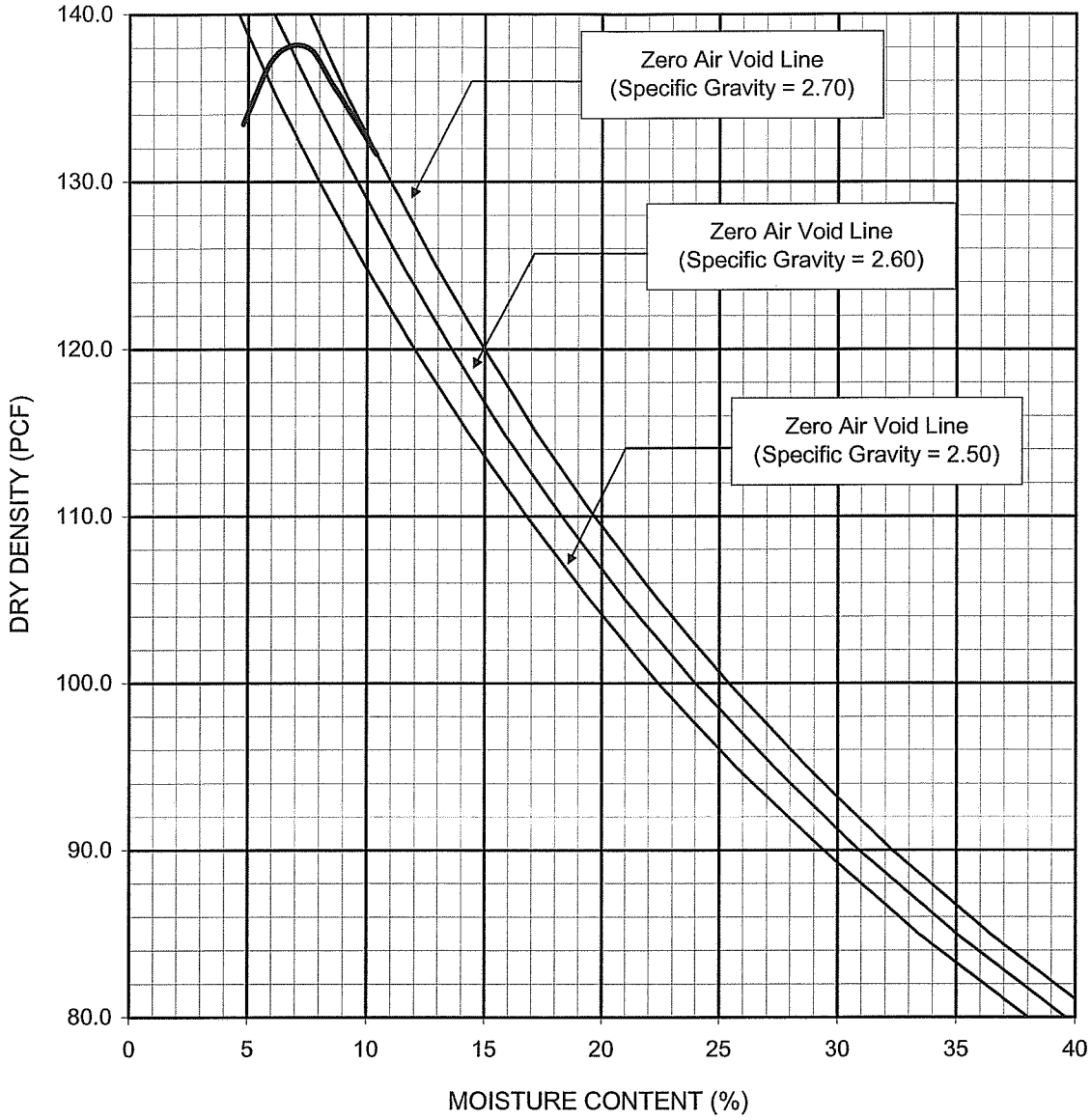


Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
	—●—	B-15	5.0-6.5	Peak	0	28	SM
0	- - X - -	B-15	5.0-6.5	Ultimate	0	27	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore		DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO.	DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-27
303256001	6/11		

(B-27) 303256001 B-15 5.0-6.5 DS.xls

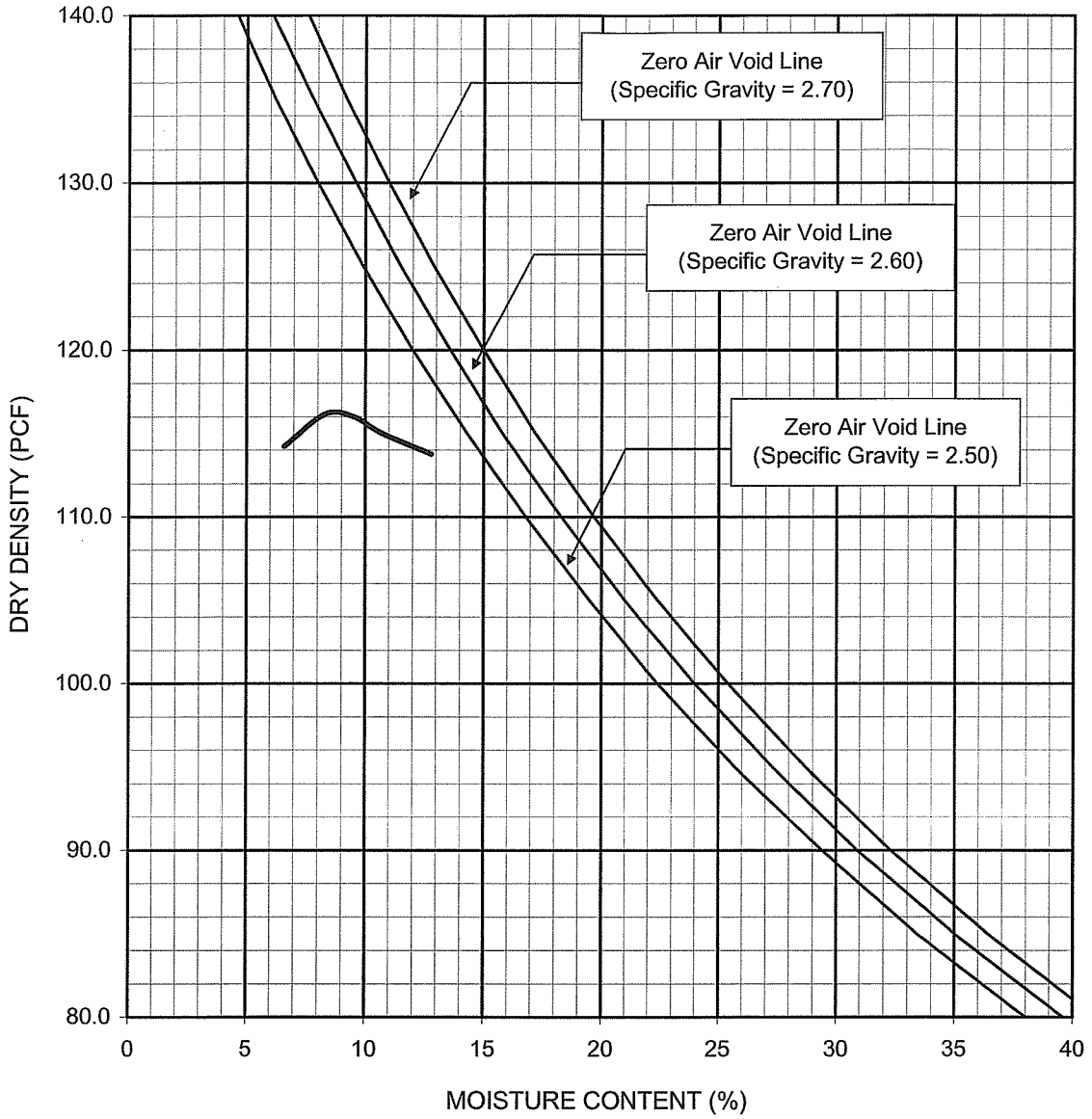


Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
TP-2	2.0-4.0	SILTY GRAVEL WITH SAND (GM)	138.0	7.5
Dry Density and Moisture Content Values Corrected for Oversize (ASTM D 4718-87)			145.0	6.0

PERFORMED IN GENERAL ACCORDANCE WITH ☑ ASTM D 1557 ☐ ASTM D 698 METHOD ☐ A ☐ B ☑ C

Ninyo & Moore		PROCTOR DENSITY TEST RESULTS	FIGURE
PROJECT NO.	DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-28
303256001	6/11		

(B-28) 303256001 TP-2 2.0-4.0 MX.xls



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
TP-10	1.0-2.0	SILTY SAND (SM)	116.0	9.5
Dry Density and Moisture Content Values Corrected for Oversize (ASTM D 4718-87)			N/A	N/A

PERFORMED IN GENERAL ACCORDANCE WITH ☑ ASTM D 1557 ☐ ASTM D 698 METHOD ☑ A ☐ B ☐ C

Ninyo & Moore	PROCTOR DENSITY TEST RESULTS	FIGURE
PROJECT NO. / DATE	RIO MESA SOLAR FACILITY BRADSHAW TRAIL AND WEST AVENUE RIVERSIDE COUNTY, CALIFORNIA	B-29
303256001 / 6/11		

(B-29) 303256001 TP-10 1.0-2.0 MX.xls

APPENDIX C

CHEMICAL TEST RESULTS

The results of chemical tests performed are provided in this appendix.

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: May 5, 2011

REPORT NUMBER: 11-1892-1

CLIENT: Ninyo & Moore
6700 Paradise Road, Suite E
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 303256001

CLIENT PO #:

ANALYST: RL

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 05/04/11
Time Received: 1552

Sample ID: B-2, 0.0-1.0'

Analysis	Result	Unit	Method
Soluble Soil Chlorides	49.5	mg/kg	SM4500C
pH	8.39	S.U.	SM9045C
Redox	162	mV	SM2580B
Sodium	0.00	%	ASTMD2791
Sulfate	0.41	%	SM4500E
Sodium Sulfate	0.00	%	Calculation
Total Salts (Solubility)	0.07	%	SM2540B
Resistivity	861	Ω-cm	NDOT T235B

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: May 5, 2011

REPORT NUMBER: 11-1892-2

CLIENT: Ninyo & Moore
6700 Paradise Road, Suite E
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 303256001

CLIENT PO #:

ANALYST: RL

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 05/04/11
Time Received: 1552

Sample ID: B-4, 1.0-2.5'

Analysis	Result	Unit	Method
Sodium	0.00	%	ASTMD2791
Sulfate	0.00	%	SM4500E
Sodium Sulfate	0.00	%	Calculation
Total Salts (Solubility)	0.17	%	SM2540B

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: May 5, 2011

REPORT NUMBER: 11-1892-3

CLIENT: Ninyo & Moore
6700 Paradise Road, Suite E
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 303256001

CLIENT PO #:

ANALYST: RL

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 05/04/11
Time Received: 1552

Sample ID: B-12, 5.0-10.0'

Analysis	Result	Unit	Method
Soluble Soil Chlorides	214	mg/kg	SM4500C
pH	8.20	S.U.	SM9045C
Redox	184	mV	SM2580B
Sodium	0.03	%	ASTMD2791
Sulfate	1.12	%	SM4500E
Sodium Sulfate	0.09	%	Calculation
Total Salts (Solubility)	0.51	%	SM2540B
Resistivity	121	Ω-cm	NDOT T235B

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: May 5, 2011

REPORT NUMBER: 11-1892-4

CLIENT: Ninyo & Moore
6700 Paradise Road, Suite E
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 303256001

CLIENT PO #:

ANALYST: RL

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 05/04/11
Time Received: 1552

Sample ID: B-15, 1.0-2.5'

Analysis	Result	Unit	Method
Sodium	0.03	%	ASTMD2791
Sulfate	0.03	%	SM4500E
Sodium Sulfate	0.04	%	Calculation
Total Salts (Solubility)	0.46	%	SM2540B

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: May 9, 2011

REPORT NUMBER: 11-1933-2

CLIENT: Ninyo & Moore
6700 Paradise Road, Suite E
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 303256001

CLIENT PO #:

ANALYST: SW

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 05/06/11
Time Received: 1525

Sample ID: TP-2, 0.0-1.0'

Analysis	Result	Unit	Method
Soluble Soil Chlorides	3715	mg/kg	SM4500C
pH	8.28	S.U.	SM9045C
Redox	187	mV	SM2580B
Sodium	0.17	%	ASTMD2791
Sulfate	0.43	%	SM4500E
Sodium Sulfate	0.51	%	Calculation
Total Salts (Solubility)	1.06	%	SM2540B
Resistivity	52.5	Ω-cm	NDOT T235B

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: May 9, 2011

REPORT NUMBER: 11-1933-1

CLIENT: Ninyo & Moore
6700 Paradise Road, Suite E
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 303256001

CLIENT PO #:

ANALYST: SW

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 05/06/11
Time Received: 1525

Sample ID: TP-4, 0.0-3.0'

Analysis	Result	Unit	Method
Soluble Soil Chlorides	156	mg/kg	SM4500C
pH	8.43	S.U.	SM9045C
Redox	154	mV	SM2580B
Sodium	0.01	%	ASTMD2791
Sulfate	0.03	%	SM4500E
Sodium Sulfate	0.04	%	Calculation
Total Salts (Solubility)	0.20	%	SM2540B
Resistivity	318	Ω-cm	NDOT T235B

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: May 9, 2011

REPORT NUMBER: 11-1933-3

CLIENT: Ninyo & Moore
6700 Paradise Road, Suite E
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 303256001

CLIENT PO #:

ANALYST: SW

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 05/06/11
Time Received: 1525

Sample ID: TP-11, 1.0-4.0'

Analysis	Result	Unit	Method
Soluble Soil Chlorides	2.8	mg/kg	SM4500C
pH	9.04	S.U.	SM9045C
Redox	163	mV	SM2580B
Sodium	0.00	%	ASTMD2791
Sulfate	0.00	%	SM4500E
Sodium Sulfate	0.00	%	Calculation
Total Salts (Solubility)	0.03	%	SM2540B
Resistivity	4546	Ω-cm	NDOT T235B

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

APPENDIX D

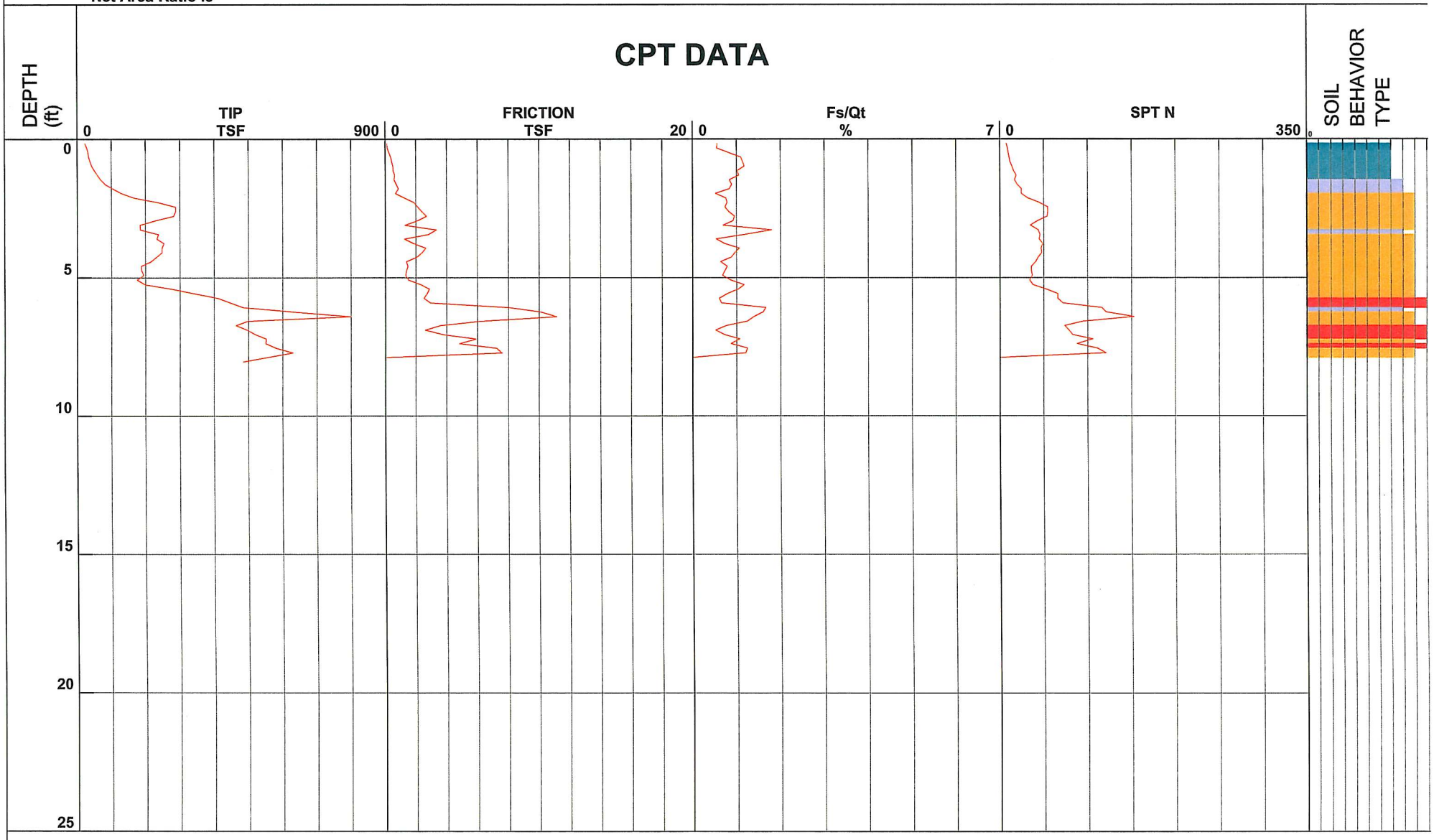
CONE PENETRATION TEST RESULTS

The results of cone penetration tests (CPT) performed are provided in this appendix.

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(144).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-01	Date and Time	5/10/2011 7:25:57 AM	Maximum Depth	8.04 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8



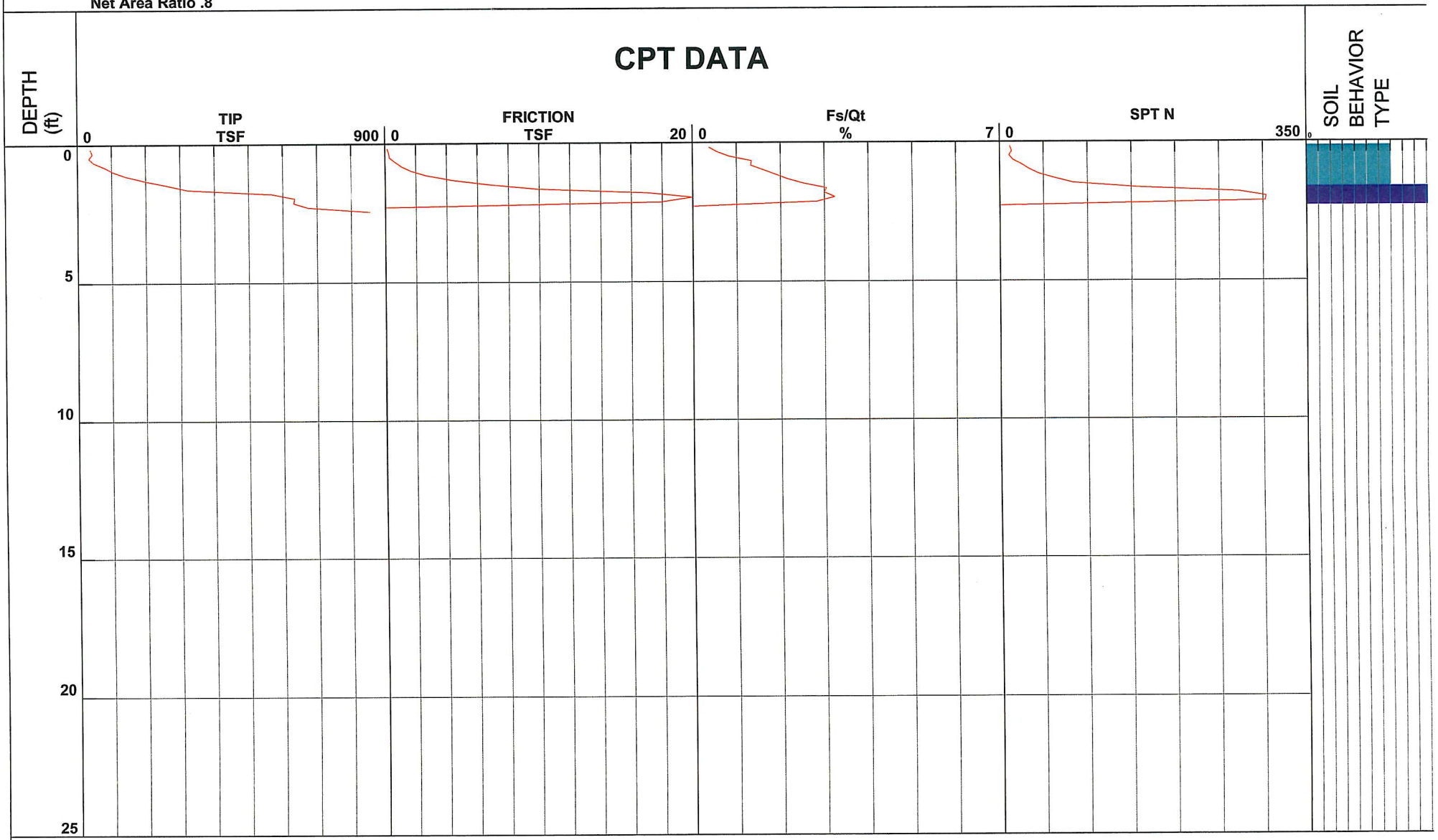
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(145).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-02	Date and Time	5/10/2011 8:17:13 AM	Maximum Depth	2.46 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA

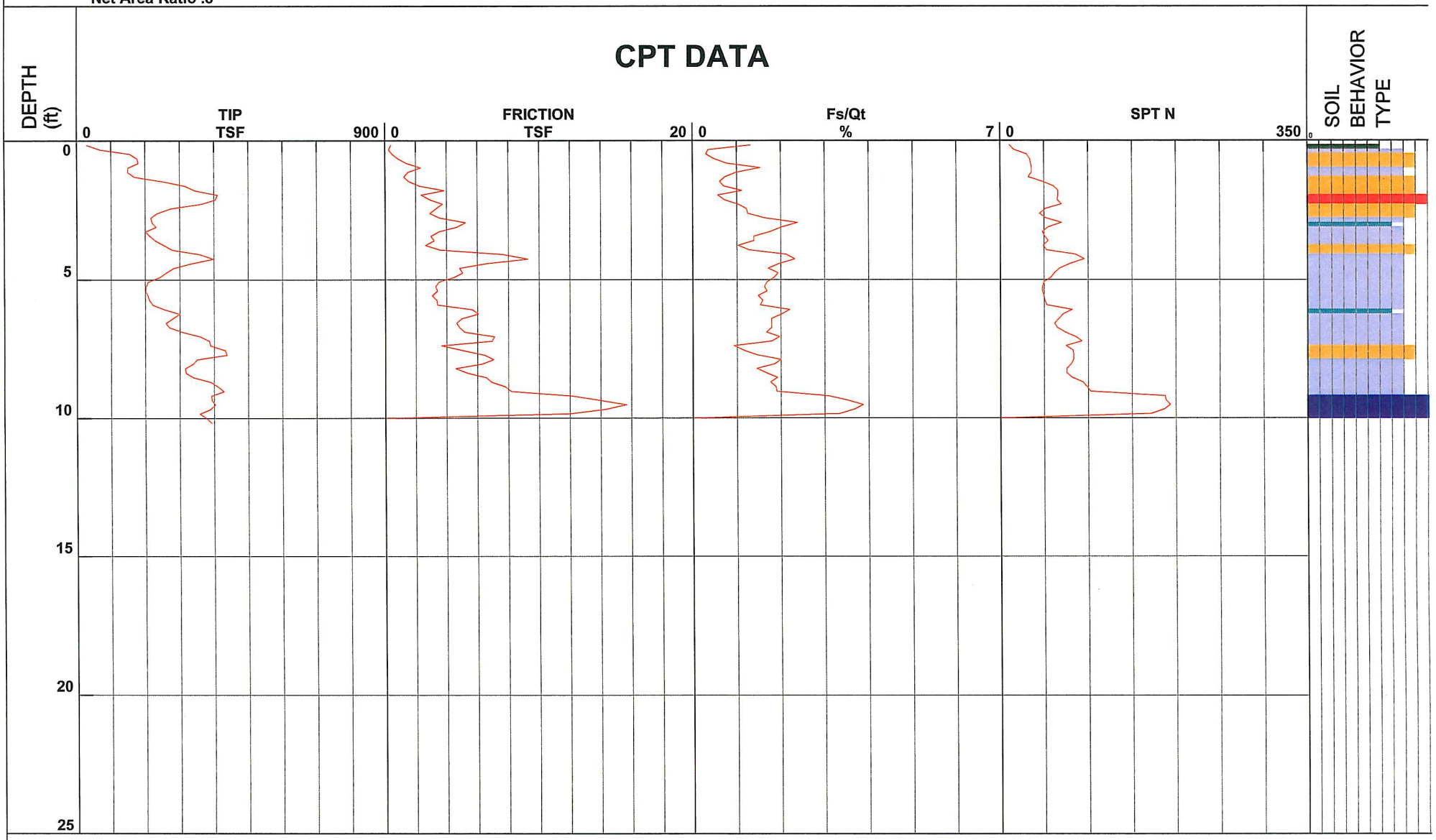


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(147).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-03	Date and Time	5/10/2011 9:28:44 AM	Maximum Depth	10.17 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8



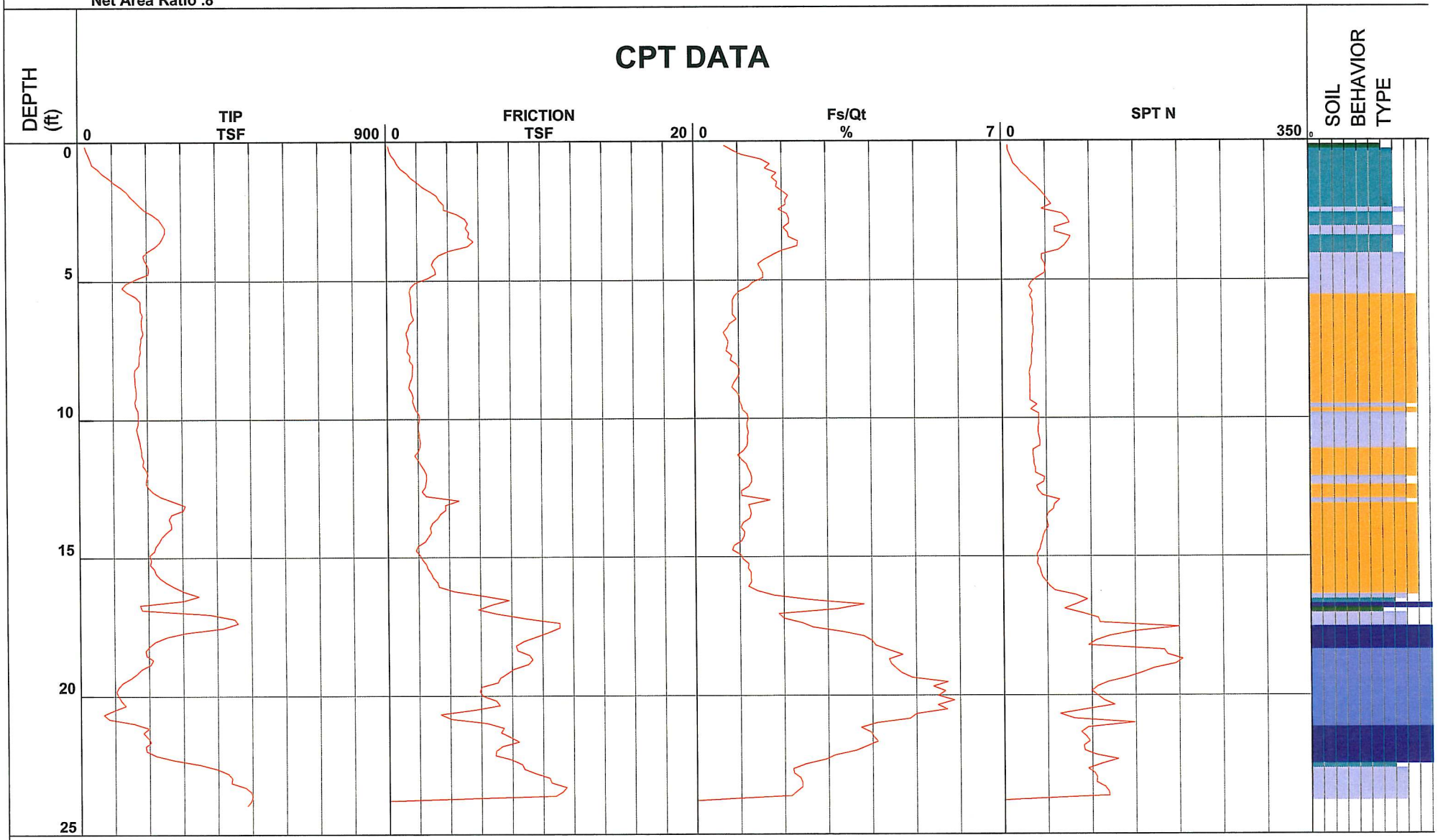
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(135).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-04	Date and Time	5/9/2011 8:39:19 AM	Maximum Depth	23.95 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA



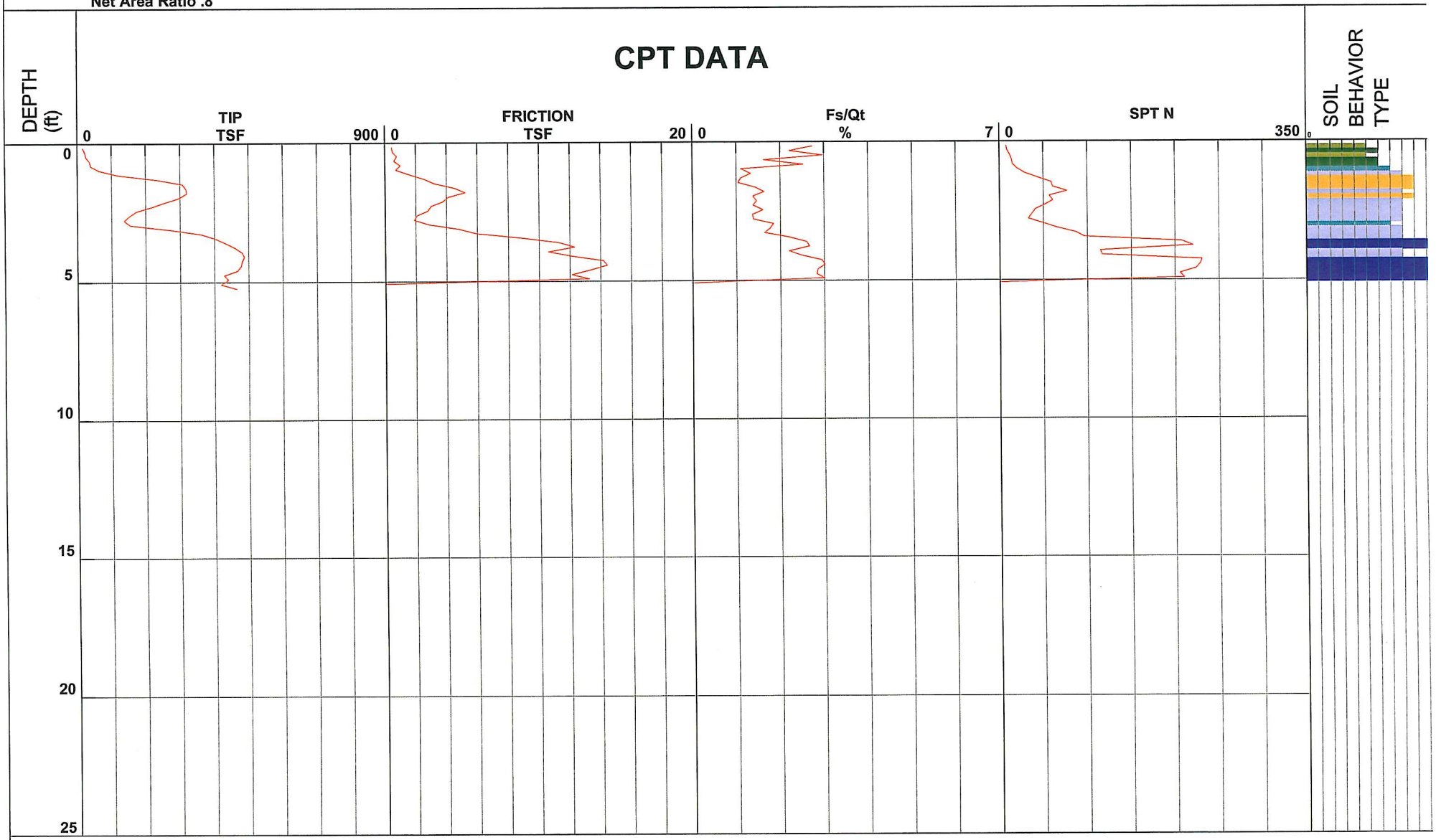
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(148).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-05	Date and Time	5/10/2011 10:20:09 AM	Maximum Depth	5.25 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA



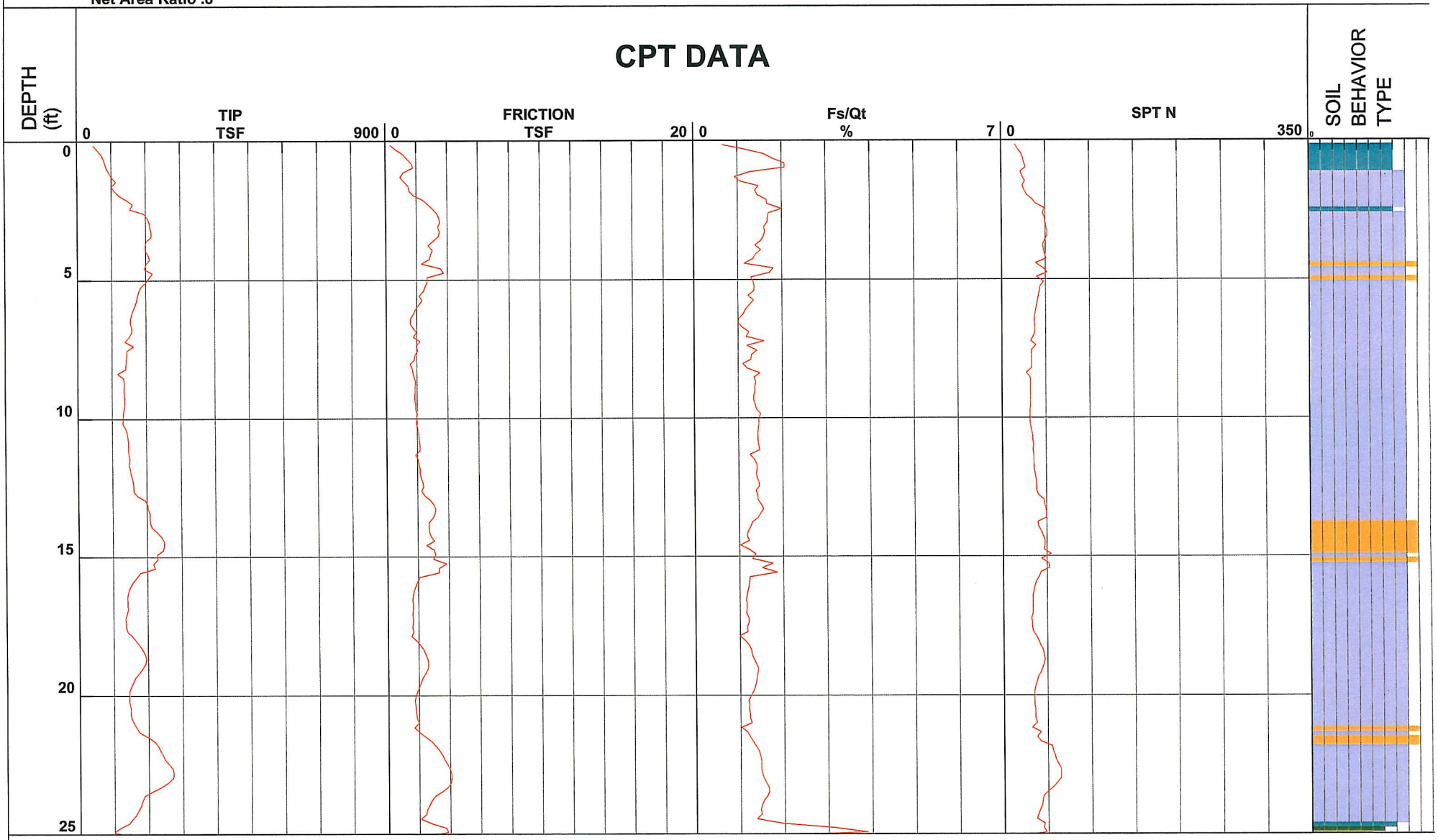
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(137).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-06	Date and Time	5/9/2011 11:42:50 AM	Maximum Depth	25.43 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA

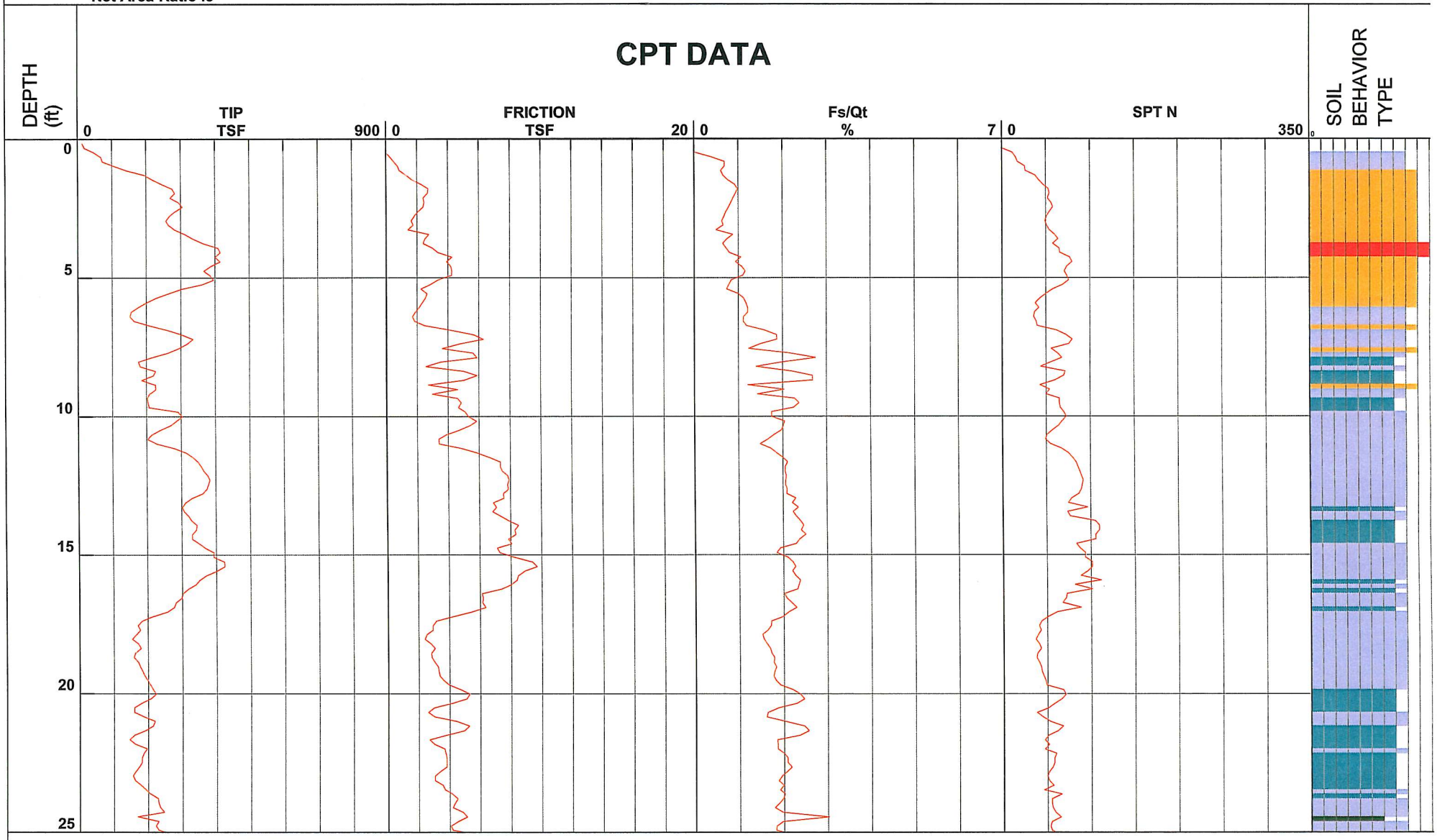


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(136).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-07	Date and Time	5/9/2011 9:24:12 AM	Maximum Depth	25.43 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8



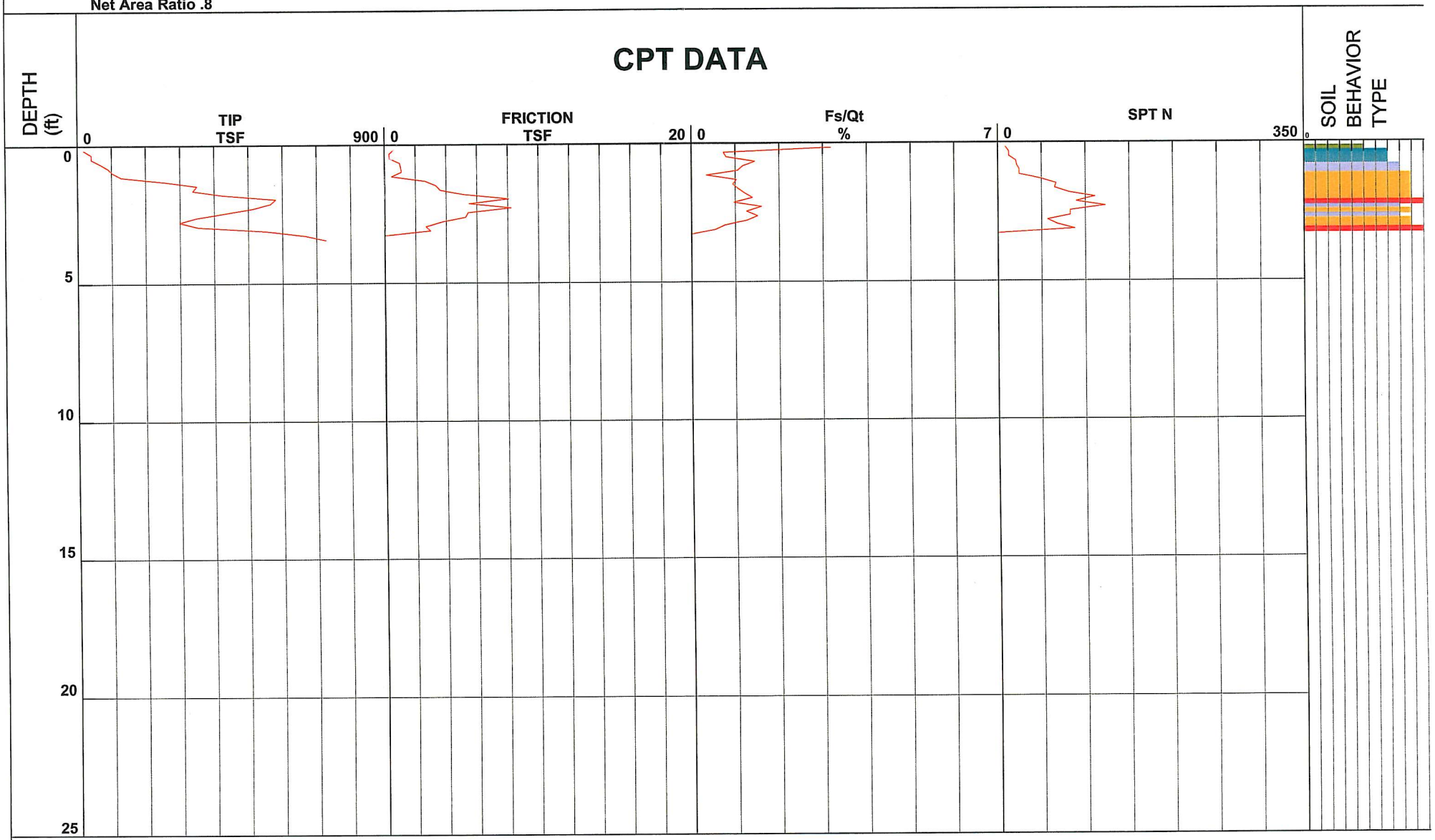
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(149).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-08	Date and Time	5/10/2011 11:54:48 AM	Maximum Depth	3.44 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA



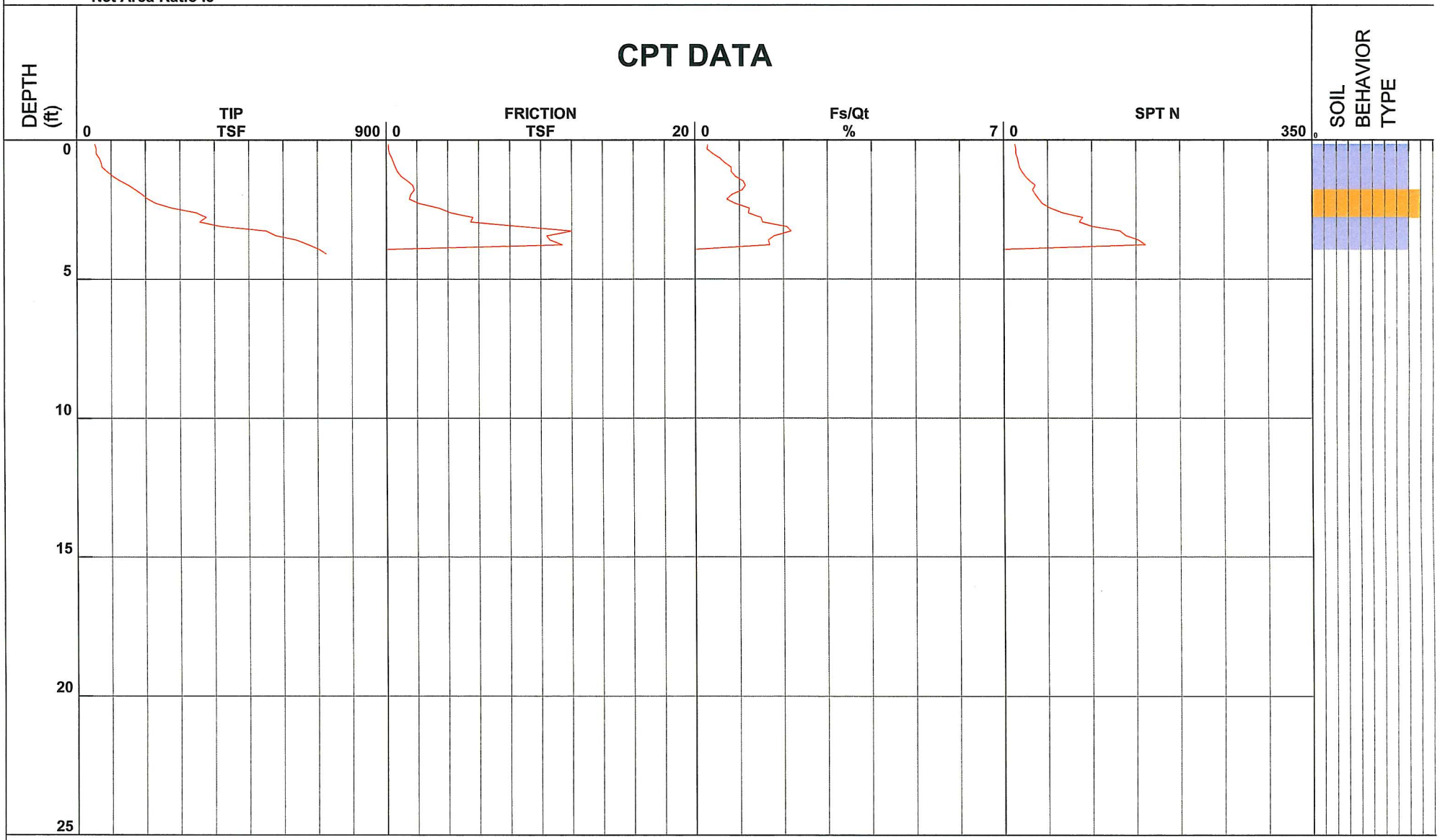
- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(150).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-09	Date and Time	5/10/2011 12:44:39 PM	Maximum Depth	4.10 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA



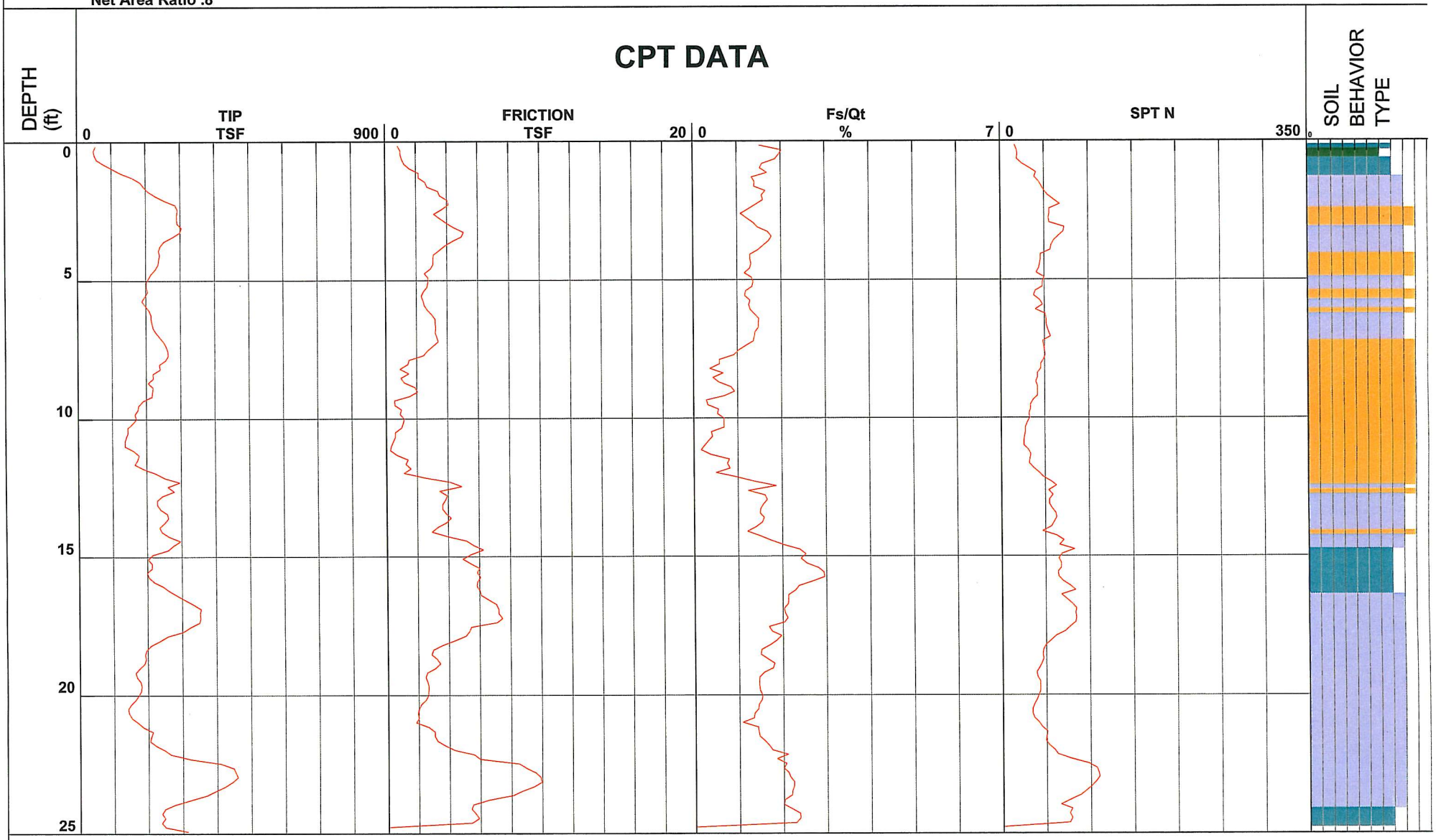
- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(138).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-10	Date and Time	5/9/2011 12:45:29 PM	Maximum Depth	24.93 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA

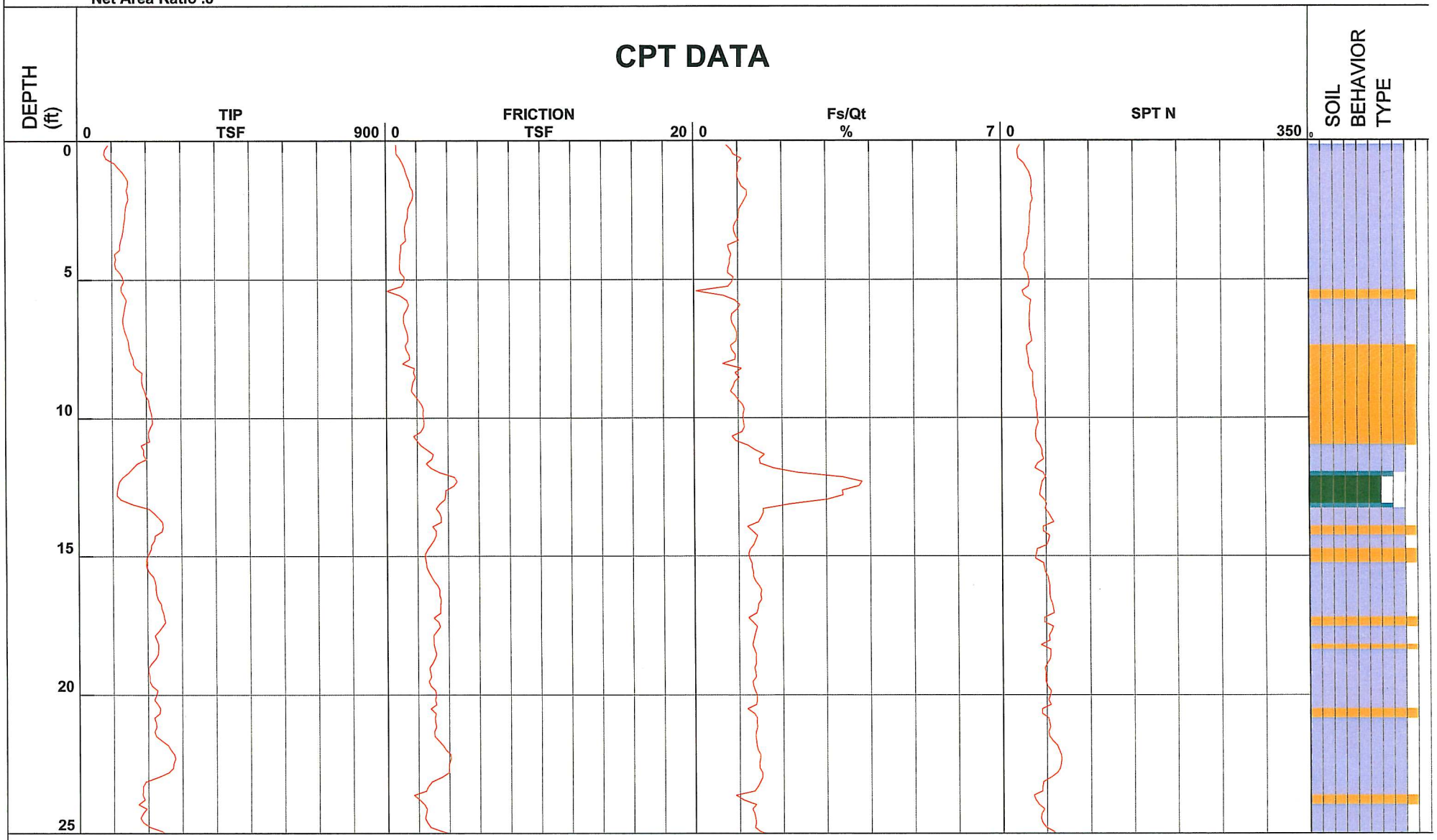


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(143).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-11	Date and Time	5/9/2011 4:45:36 PM	Maximum Depth	25.43 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

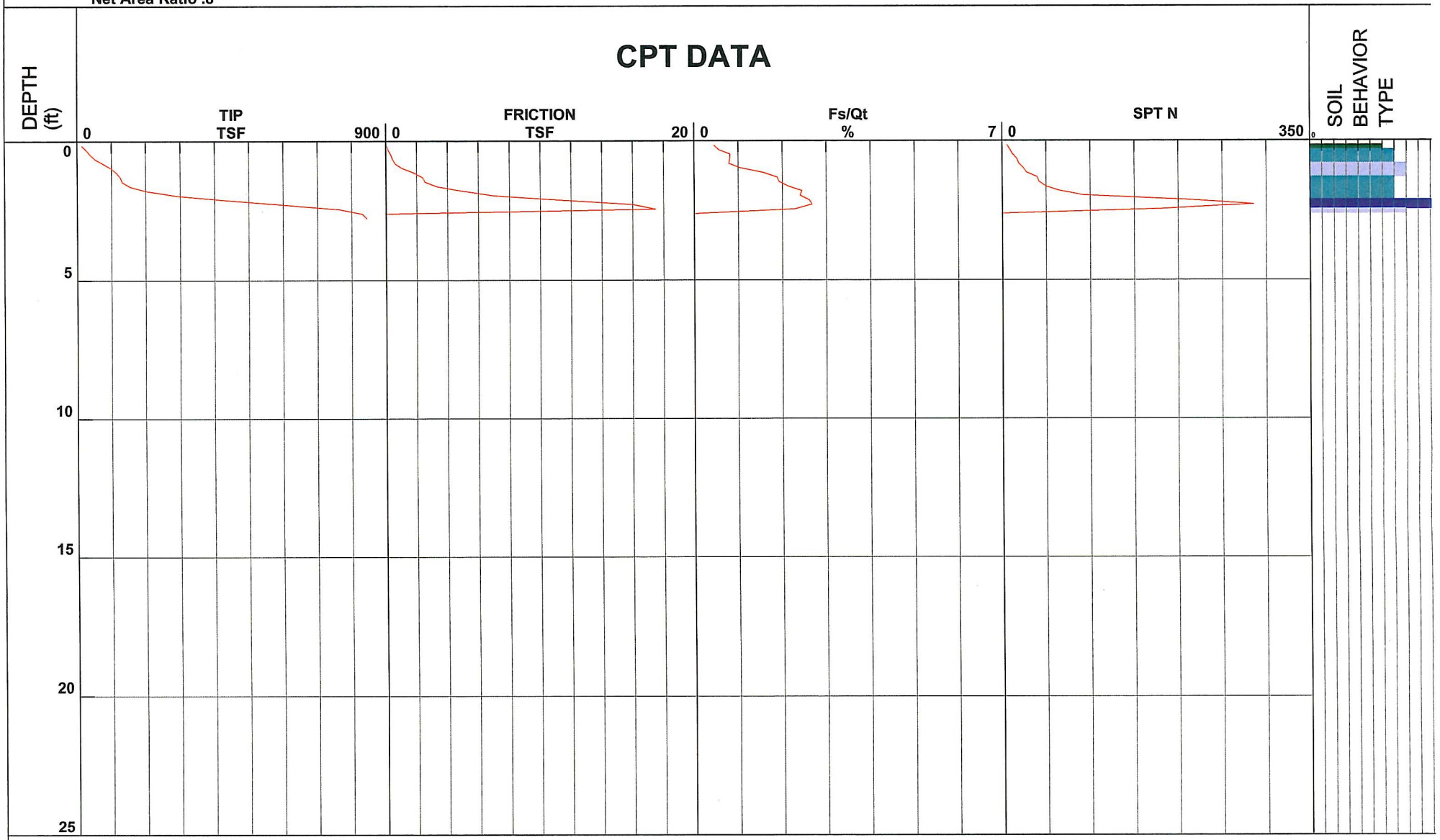


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(151).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-12	Date and Time	5/10/2011 2:04:17 PM	Maximum Depth	2.79 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8



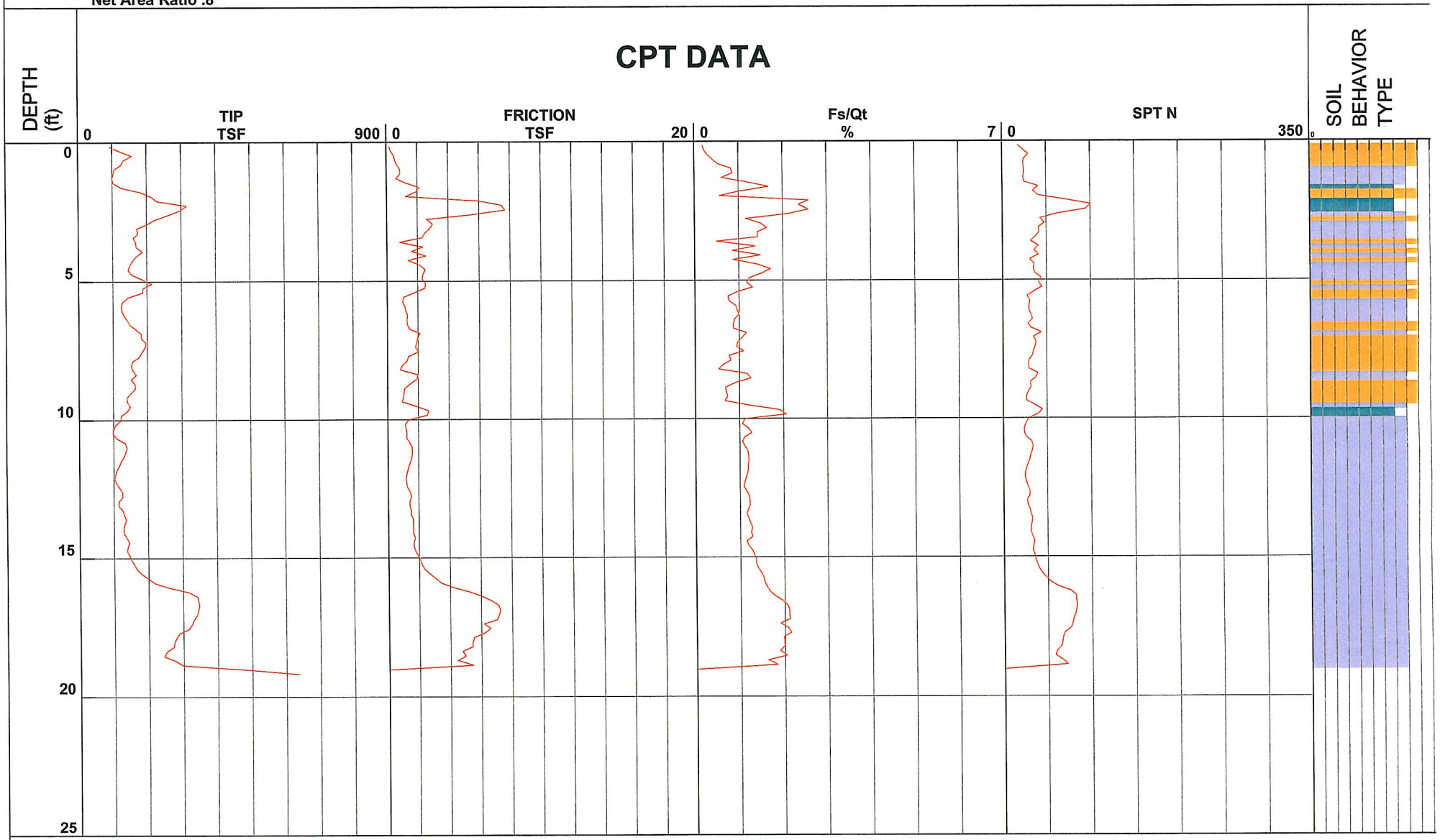
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(152).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-13	Date and Time	5/10/2011 2:44:54 PM	Maximum Depth	19.19 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA

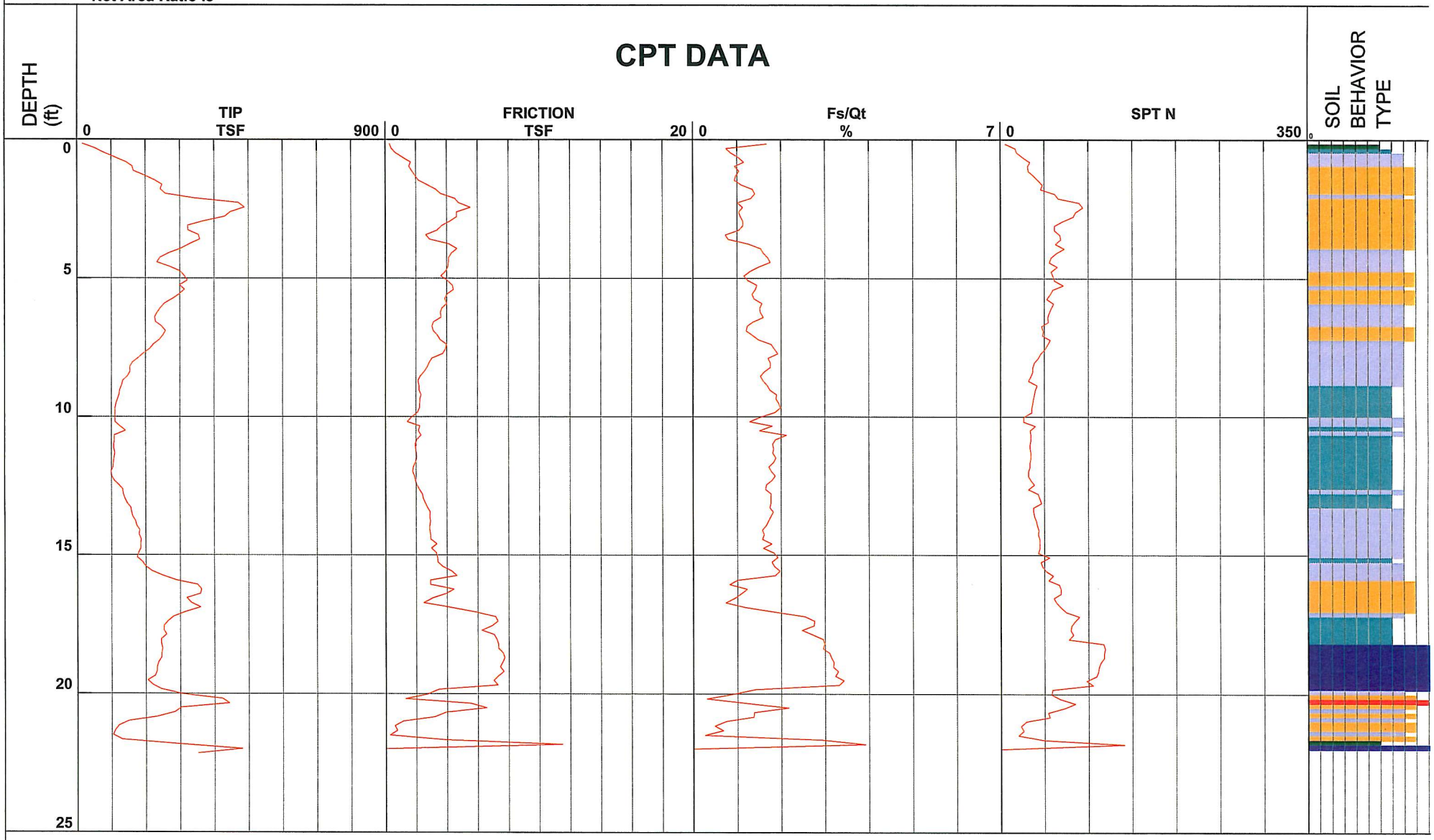


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(142).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-14	Date and Time	5/9/2011 3:43:27 PM	Maximum Depth	22.15 ft
Water Table Depth	0.00 ft				

Net Area Ratio .8

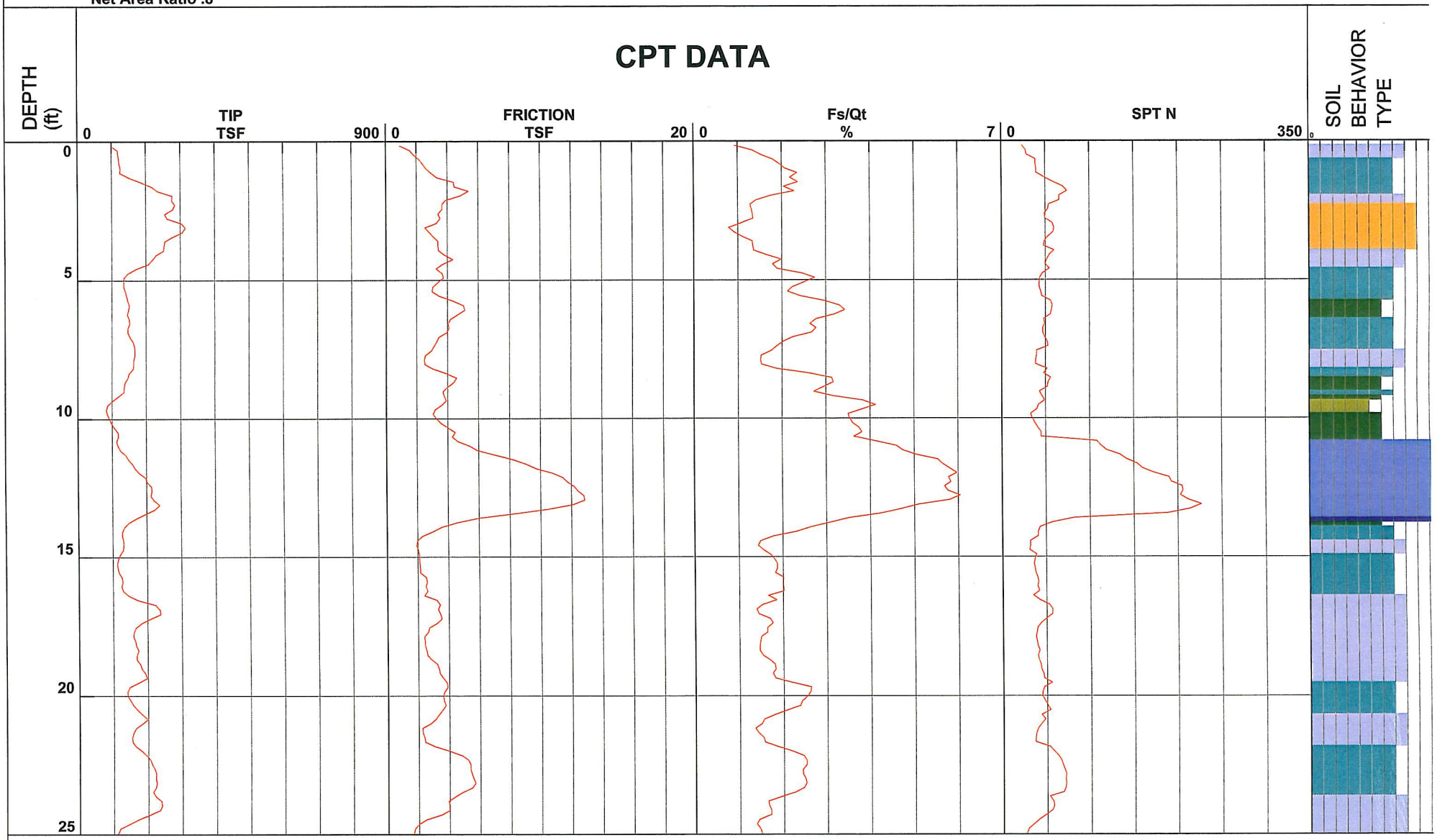


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(140).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-15	Date and Time	5/9/2011 2:59:47 PM	Maximum Depth	25.43 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8



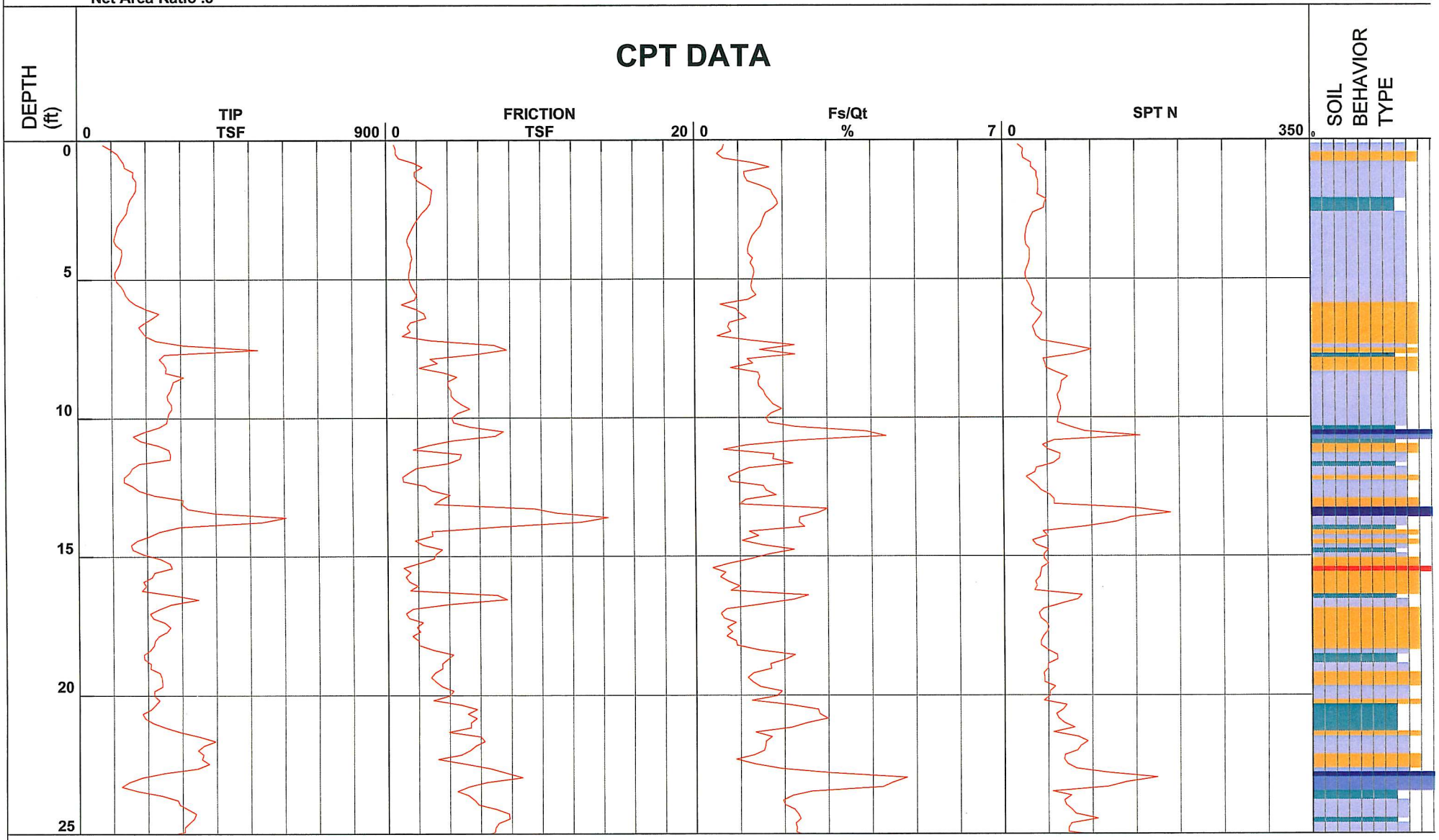
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Ninyo & Moore

Project	Rio Mesa Solar Facility	Operator	RS/JC	Filename	SDF(139).cpt
Job Number	303256001	Cone Number	DSG0906	GPS	
Hole Number	CPT-16	Date and Time	5/9/2011 1:59:13 PM	Maximum Depth	25.43 ft
Water Table Depth		0.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)