Appendix E:
Geotechnical Reports

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PRELIMINARY SOIL INVESTIGATION UPDATE
SUISUN BUSINESS PARK
PETERSEN ROAD BUILDINGS
Petersen Road East of Walters Road
Suisun City, California

RANEY GEOTECHNICAL INC. JOB NO. 146-607

Raney Geotechnical Inc

Raney Geotechnical Inc

August 31, 2020

Buzz Oates Development LP
Attention: Frank Ramos
555 Capitol Mall, Ninth Floor
Sacramento, CA 95814

PRELIMINARY SOIL INVESTIGATION UPDATE
SUISUN BUSINESS PARK
PETERSEN ROAD BUILDINGS
Petersen Road east of Walters Road
Suisun City, California
Job No. 146-607

INTRODUCTION

We have reviewed conditions at the site of a proposed warehouse development south of Petersen Road and east of Walters Road adjacent to Suisun City in Solano County. Our firm prepared a Preliminary Soil Investigation Report for the development in 2015.[1] The site limits and proposed building configuration has changed since the referenced report was prepared. The purpose of this review has been to evaluate current site conditions, and provide an opinion regarding applicability of the original report to the currently planned improvements.

Our work has included observation of the site by an experienced engineer from our office, and review of the original Preliminary Soil Investigation Report and explorations. A copy of the original Preliminary Soil Investigation Report is appended.

PROPOSED CONSTRUCTION

We understand the property would be developed for warehouse construction. Planning indicates four large warehouses ranging from about 211,000 to 1,054,000 square feet would be constructed. The buildings are expected to be of concrete tilt-up-panel design with a concrete slab-on-grade floor. Depressed Portland cement concrete paved loading docks would be provided along the north and south sides of the buildings. Asphalt concrete paved parking and driveways would surround the buildings.

SITE CONDITIONS

The subject site encompasses about 119.8 acres on the south side of Petersen Road and east side of

[1]Raney Geotechnical Inc: "Preliminary Soil Investigation, Suisun Business Park, Petersen Road Buildings, Petersen Road east of Walters Road, Suisun City, California",November 17, 2015; Job No.146-607.

Walters road. The development is about 2100 feet in the north-south dimension and 2500 feet in the east-west dimension. The site is bordered on the east and south by similar undeveloped land. Travis Air Force Base is about one-half mile east of the property and State Highway 12 is to the south. Petersen Road has recently been realigned and repaved. A drainage ditch on the order of four feet deep and a new barbed wire fence are along the Petersen Road south shoulder. A concrete sidewalk is along the east side of Walters Road. Two north-south drainage ditches on the order of four feet deep cross the central portion of the property. Most of the site surface has been mowed leaving dry stubble on the order of six inches high. Markers indicate high pressure gas lines cross the property from east to west.

CONCLUSION

The planned construction is of the same type addressed in the original Preliminary Soil Investigation. Current surface conditions in the area investigated in 2015 remain similar to those described in the the 2015 report. The currently proposed site is shifted about 1000 feet westerly of the area investigated in 2015. Our review of surface conditions on the westerly portion that was not a part of the original investigation indicates soil conditions are likely to be similar to those described in the original preliminary soil report. Based on this, we consider the findings and conclusions of the referenced Prelimnary Soil Investigation Report to be applicable to the currently planned improvements.

Reference should be made to the original Preliminary Soil Investigation Report for further information and conclusions. A copy of the Preliminary Soil Investigation Report is appended to this update.

This letter is subject to the limitations stated in the Preliminary Soil Investigation Report.

Sincerely,

RANEY GEOTECHNICAL, INC.

William C. Boli
Geotechnical Engineer No. 2004

(1) addressee

PRELIMINARY SOIL INVESTIGATION
SUISUN BUSINESS PARK
PETERSEN ROAD BUILDINGS
Petersen Road east of Walters Road
Suisun City, California

RANEY GEOTECHNICAL INC. JOB NO. 146-607

Raney Geotechnical Inc

Raney Geotechnical Inc

November 17, 2015

Buzz Oates Development LP
Attention: Cybil Bryant
555 Capitol Mall, Ninth Floor
Sacramento, CA 95814

PRELIMINARY SOIL INVESTIGATION
SUISUN BUSINESS PARK
PETERSEN ROAD BUILDINGS
Petersen Road east of Walters Road
Suisun City, California
Job No. 146-607

INTRODUCTION

Our firm has completed a Preliminary Soil Investigation for the proposed warehouse development on the south side of Petersen Road in Suisun City. The purposes of this investigation have been to provide soil information; evaluate the suitability of the soils for support of the planned warehouse construction; and provide an indication of soil related design requirements for buildings as well as pavements. This report presents the results of the investigation.

Field exploration for this investigation has included the drilling of six test borings to a depth of 15 feet below the existing site grade. A seventh test boring was drilled to a depth of 50 feet to provide deeper soil profile information. Both disturbed and undisturbed soil samples were obtained from the borings for classification and laboratory testing. The test boring locations together with outlines of the envisioned construction are shown on Plate 1, *Plot Plan*. Logs of the test borings completed for this study are shown on Plates 2 through 8, *Log of Boring*. The nomenclature used to describe the soils on the logs is defined on Plate 9, *Unified Soil Classification System*. Moisture, density and unconfined compressive strength test data are presented on the logs at the depths of each sample tested. Atterberg Limits tests were performed two samples of the surface soils for classification purposes; these test results are shown on Plate 10, *Atterberg Limit Data*. A subsurface sandy soil sample was subjected to sieve analyses for use in liquefaction analyses; these test results are depicted on Plate 11, *Grain Size Distribution*.

PROPOSED CONSTRUCTION

We understand the property would be developed for warehouse construction. Planning indicates three large warehouses of about 825,000 and 1,150,000 square feet are anticipated. The buildings are expected to be of concrete tilt-up-panel design with a concrete slab-on-grade floor. Depressed portland

cement concrete paved loading docks would be provided along the west and east sides of the buildings. Asphalt concrete paved parking and driveways would surround the buildings.

SITE CONDITIONS AND CONCLUSIONS

SURFACE

The subject site encompasses about 165 acres on the south side of Petersen Road and about 1000 feet east of Walters Road. The site is bordered on the west, south and east by similar undeveloped land. Travis Air Force Base is about 1000 feet east of the property and State Highway 12 is to the south. Petersen Road has recently been realigned and repaved. A drainage ditch on the order of four feet deep and a new barbed wire fence are along the south road shoulder. A formerly paved road, now mostly gravel, runs along the east edge of the property. Two north-south drainage ditches on the order of four feet deep cross the westerly portion of the property. Most of the site surface has been disced and little surface vegetation remains. Markers indicate high pressure gas lines are along the former road at the east edge of the site and cross the property from east to west.

SUBSURFACE

The test borings revealed soils that appear to be derived from the Tehama Formation. The Tehama Formation includes partially cemented clays, silts, and sands that have characteristic light orange, yellow, tan and white colors, and are derived from volcanic sources. The Tehama formation is exposed along the west margin of the central valley and is prominent in northeast Vacaville as well as other portions of the Interstate 505 corridor. Though current geologic maps do not show Tehama Formation on the subject site, the Tehama Formation is shown a few thousand feet to the north.

The upper eight to ten inches of the soils at the test boring locations were observed to consist of light brown clayey fine sandy silts. We also noted patches of dark gray and gray-brown silty clays elsewhere on the site surface. These surface materials appear to have been worked and amended for agricultural purposes. At the time of our drilling, we found the surface soils disced and loose to depths on the order of eight inches.

Underlying the immediate surface and extending to the 15-foot depth drilled in most borings, we found interlayered, stiff to very stiff, mottled light yellow-brown, orange-brown, and tan silty to very silty clays and clayey silts. A few isolated lenses of medium dense, yellow- to orange-brown silty to clayey fine to coarse sands also were observed. Clays dominated the upper three to seven feet of the soil profile. Most clays appear to be of low plasticity. However, the clays within about the upper two feet often appear darker and to be of moderate plasticity.

Below a depth of 15 feet and extending to the 50-foot depth drilled, Boring 4 encountered interlayered, very stiff to hard yellow, orange, and tan clays and silts similar to those observed in the upper 15 feet.

Groundwater was measured in four test borings at depths varying from six to nine feet below the existing ground surface. At two borings groundwater was encountered at depths of about 14 feet, and at one

location groundwater was not found with in the 15-foot depth of the boring.

CONCLUSIONS

GROUNDWATER

Groundwater was encountered in the test borings at depths varying from about six to 15 feet below the ground surface. The variation in groundwater levels measured is likely due to local variations in distribution of nearly impermeable clay layers that confine groundwater to deeper levels. Based on our borings and experience, we expect that the groundwater piezometric level is in the range of six to eight feet below most site grades. Considering the recent drought conditions and season, this groundwater level is likely near the lowest that can be expected for this site. During rainy periods, groundwater levels can be expected to rise somewhat. Soil coloring suggests that periodic groundwater levels within three to four feet of the existing ground surface are possible.

Assuming standard grading practices with building areas raised above existing grades with fill, we anticipate that groundwater levels will remain at least a few feet below building pad levels, but may sometimes be near dock and lower pavement grades. The groundwater is not expected to have a significant effect on the completed building construction. Docks may experience some wetness during extreme and probably rare high groundwater periods. Utility and other construction excavations extending more than a few feet below the native ground surface may experience groundwater inflow. Areas receiving fill as well as pavement subgrades cut to within a few feet of groundwater may have high moisture contents and experience instability (pumping and displacement) under earthwork equipment. Unstable subgrades can prevent adequate compaction. Stabilization procedures such as chemical treatment or overexcavation and replacement with geotextiles and aggregate may be necessary to prepare subgrades exhibiting instability.

The presence of relatively shallow groundwater should be considered in setting of building pad and pavement grades. On long buildings, varying floor levels along the length of the building would be preferable to cutting building pad areas significantly below original grades. Assuming most site areas are raised with fill, the instance of unstable subgrades due to proximity of the groundwater table is expected to be low, provided construction is undertaken near the summer or early fall months. During or shortly following the wet season, added soil moisture from precipitation may result in subgrade instability at any level. The potential for high soil moisture conditions should be considered in construction scheduling.

BEARING CAPACITY

Our work indicates that strength and compressibility properties of the on-site soils are favorable for support of the anticipated construction. The surface soils to depths on the order of eight inches are indicated to be loose and disturbed by cultivation; the loose surface soils can be recompacted during normal site grading procedures.

Our test data shows that the undisturbed soils have sufficient strength to support light to moderate loads,

such as those imposed by warehouse construction on conventional spread foundations, with only nominal settlement. Engineered fills composed of on-site materials are expected to be capable of supporting light to moderate loads.

EXPANSIVE SOILS

The surface soils predominately consist of low to moderate plasticity clays. Such clays are considered capable of developing significant swelling pressures with variations in moisture content. The clays will cause movements of floor slabs, flatwork and pavements, and may affect foundations. Expansion effects on foundations can be reduced by extending the depth of foundations to bear on soils with lower moisture variation. Several procedures are commonly used for reducing expansive soil effects on floor slabs, including the construction of building pads using imported nonexpansive soils; reinforcement of floor slabs and preswelling of subgrade soils by saturation of the building pad prior to concrete placement; and chemical treatment of clays to alter their expansive properties. Chemical treatment has been used for many warehouse building pads in the area, and would be recommended for building pad construction on this project. Treatment of floor subgrades to depths of 12 to 15 inches has produced significant reductions in expansive soil movements on similar soils, although some floor movement still can occur. For cost estimating purposes, we expect that such treatment will require the addition on the order of five percent high calcium quicklime to the upper 15 inches of the building pad soils.

DISPERSIVE SOILS

Experience on Tehama Formation materials in the Vacaville area indicates the near surface soils can exhibit dispersive properties. Although the soils generally consist of cohesive clays and silts, soils on the surface can lose cohesion when exposed to water. This makes the soil highly susceptible to erosion. Because of the association of soils on this site to Tehama formation soils in the Vacaville area, we consider it possible that there may be similar soil behavior. Sloping soil surfaces must be vegetated or otherwise protected from erosion. Concentrated runoff should not be allowed on soil slopes.

SOIL LIQUEFACTION POTENTIAL

Soil liquefaction is the loss of strength of low- to no- cohesion soils (usually sands) that occurs when pore water pressure exceeds the confining stress (weight) of the soils. Liquefaction normally occurs only under saturated conditions and in soils with a low relative density. Liquefaction can occur during earthquakes as vibrations induce soils to readjust to a more compact state. Experience has shown that earthquake induced liquefaction normally occurs only within the upper 50 to 60 feet of the soil profile.

The test borings show soils within 50 feet of the ground surface predominately consist of clays and clayey silts. Such cohesive soils are not considered susceptible to liquefaction. A few medium dense sand and sandy silt layers or lenses were found within the upper 40 feet. We have used the methods of Seed and others as implemented in the LiquefyPro software by CivilTech Corporation to evaluate the liquefaction potential of the sandy soils on this site. The method correlates standard penetration resistance and liquefaction potential based on historical case studies. In determining liquefaction potential, groundwater depth, confining pressures, and, intensity and duration of potential ground shaking are considered.

Probabilistic seismic hazards mapping by the United States Geological Survey and as interpreted according to the ASCE 7-10 standard indicates that the peak ground acceleration produced by maximum credible earthquakes on nearby faults (2 percent probability of exceedance in 50 years) is likely to be on the order of 0.67 g. The peak ground acceleration associated with a 10 percent probability of exceedance in 50 years is likely to be on the order of 0.43g The controlling earthquakes in developing these accelerations appear to mostly be events of magnitude 6.5 to 6.7 occurring on the Green Valley Fault, 13 kilometers to the west, and within the Coast Range/Central Valley (CRCV) boundary zone between zero and 10 kilometers to the northeast. Using these data, our analysis indicates that seismic induced liquefaction on this site is unlikely.

SITE CLASS

The site soils generally exhibit a stiff soil profile. In design using the lateral force provisions of the California Building Code, the soil profile is consistent with Site Class D.

GRADING

We anticipate that preparation of the proposed construction areas will require normal site clearance procedures, including removal of existing surface vegetation and any rubbish, soil stockpiles and any other debris. Previous ditches will require clean-out of saturated and disturbed soils, and backfill with engineered fill.

Compaction of in place soils as well as engineered fills to 90 percent of the maximum dry density, determined by the ASTM D1557 test procedure, will provide adequate support for floor slabs and building foundations.

As indicated above, we anticipate that building pads will require chemical treatment to a depth of 15 inches to reduce expansive tendencies. Treatment will likely require on the order of five percent high calcium quicklime by dry weight. Treated soils would require compaction to at least 92 percent of the ASTM D1557 maximum dry density.

FOUNDATIONS

Warehouse construction developing light to intermediate loads likely can be supported upon conventional continuous and isolated spread foundations based at a comparatively shallow depth in undisturbed or recompacted soils, engineered fill, or a combination of those materials. We anticipate that minimum building foundation depths would be on the order of 24 inches and that bearing pressures on the order of 2700 to 3000 pounds per square foot, dead plus live load, will be available for such foundations.

Foundations constructed as suggested above are expected to undergo tolerable settlements. Shallow continuous foundations are expected to require reinforcement to reduce the effects of soil expansion. Reinforcement consisting of at least four No. 4 reinforcing bars -- two each, top and bottom -- or equivalent reinforcement is expected to be required, as a minimum.

EXCAVATION

Our investigation indicates that on-site soils can be excavated utilizing conventional earth moving equipment. We anticipate that spread foundation trenches can be cut vertically, with only minor sloughing of trench sidewalls. Foundation concrete likely can be placed neat, without forming, against trimmed excavations.

SLAB-ON-GRADE

Concrete slab-on-grade floors can likely be supported upon prepared building pads without adverse settlement. Use of four inches of aggregate base beneath warehouse slabs would be recommended as a leveling course. In office and other moisture sensitive areas, slab underlayment by at least four inches of clean three-quarter inch crushed rock would be recommended.

Nominal steel reinforcement of floor slabs to reduce cracking associated with soil expansion is considered advisable. For concrete tilt-up panel buildings, a minimum six inch thick floor slab will probably be required. Heavy forklift loads or high racks may require thicker floor slabs.

FLATWORK

The expansive soils on the site will cause movement of exterior walkway slabs, resulting in cracking as well as horizontal and vertical separations at joints. These effects can be reduced by extending lime/cement treatment over these areas, or by placing nonexpansive fill beneath walkway slabs. Consideration also should be given to use of reinforcement, frequent control joints, and thickened edges to retard subgrade moisture changes beneath flatwork.

PAVEMENT DESIGN

Resistance (R) value tests are used to evaluate pavement subgrade properties. The near surface soils are primarily clays with poor pavement support properties. Experience indicates that such soils typically have R values ranging from 5 to 7. We have used an R value of 5 for the untreated subgrade soils, in the Caltrans Design Method for Flexible Pavements to estimate pavement sections that may be required on this site.

The Caltrans design method uses a traffic index (TI) to account for anticipated pavement loads, usage, and design life. A design life of 20 years is commonly used for commercial pavements. The Asphalt Institute has suggested that TI 4.5 may be reasonably representative of automobile parking lot traffic. Truck use areas require a higher traffic index. The standard Oates structural pavement section consisting of three inches of asphalt concrete (AC) over three inches of aggregate base (AB) over 12 inches of chemically treated soil is considered to have a traffic capacity equivalent to TI 7.0. A TI of 7.0 is considered capable of supporting up to about 60 fully loaded, five-axle semi-trucks per week using any one section of the pavement. Pavement sections designed for TI 8.0 are considered capable of supporting up to about 190 fully loaded, five axle semi-trucks per week. Estimated pavement section alternatives for a range of traffic indices are presented in Table 3.

TABLE 3
ESTIMATED PAVEMENT SECTION ALTERNATIVES

Design Traffic Index/ Use	Type B Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)	Chemically Treated Soil (inches)
4.5	2.5	9	--
Auto	3	8	--
Parking	3	--	10
6.0	3	14	--
10 to 20	4	11	--
Trucks per Week	3	3	12
7.0	3	17	--
Up to 60	4	15	--
Trucks per Week	3	3	12
8.0	3.5	20	--
Up to 190	4	19	--
Trucks per Week	3.5	6	12
	5	3	12

We estimate that chemically treated subgrades would require the addition of five percent high calcium lime as measured by dry unit weight of the compacted soils. The chemically treated soil layer will likely be required to be compacted to at least 92 percent of the maximum dry density determined by the ASTM D1557-02 test procedure. The above concentration of lime is approximate only and based on experience with similar soils. The actual percentages of treatment chemicals to be used should be established by further testing during a final geotechnical study and review of subgrades during construction.

FINAL GEOTECHNICAL STUDY

The opinions and conclusions of this report are based on limited field investigation and are intended for planning purposes only. Further geotechnical study, including additional test borings and analyses, should be performed prior to design of improvements. The conclusions of this letter are tentative and subject to revision upon further study.

LIMITATIONS

This report necessarily assumes uniform variation of soils between borings. The conclusions are based upon this uniformity and the information provided regarding the proposed construction. The conclusions in this report regarding construction on the property are preliminary only, and are not intended for final design or construction.

This report is applicable only to the Suisun Business Park, as described herein, and should not be utilized for any other site.

oOo

The following Plates are attached and complete this report:

Plate 1 - Plot Plan
Plates 2 through 8 - Log of Boring, Borings 1 through 7
Plate 9 - Unified Soil Classification System
Plate 10 - Atterberg Limits Data
Plate 11 - Grain Size Distribution

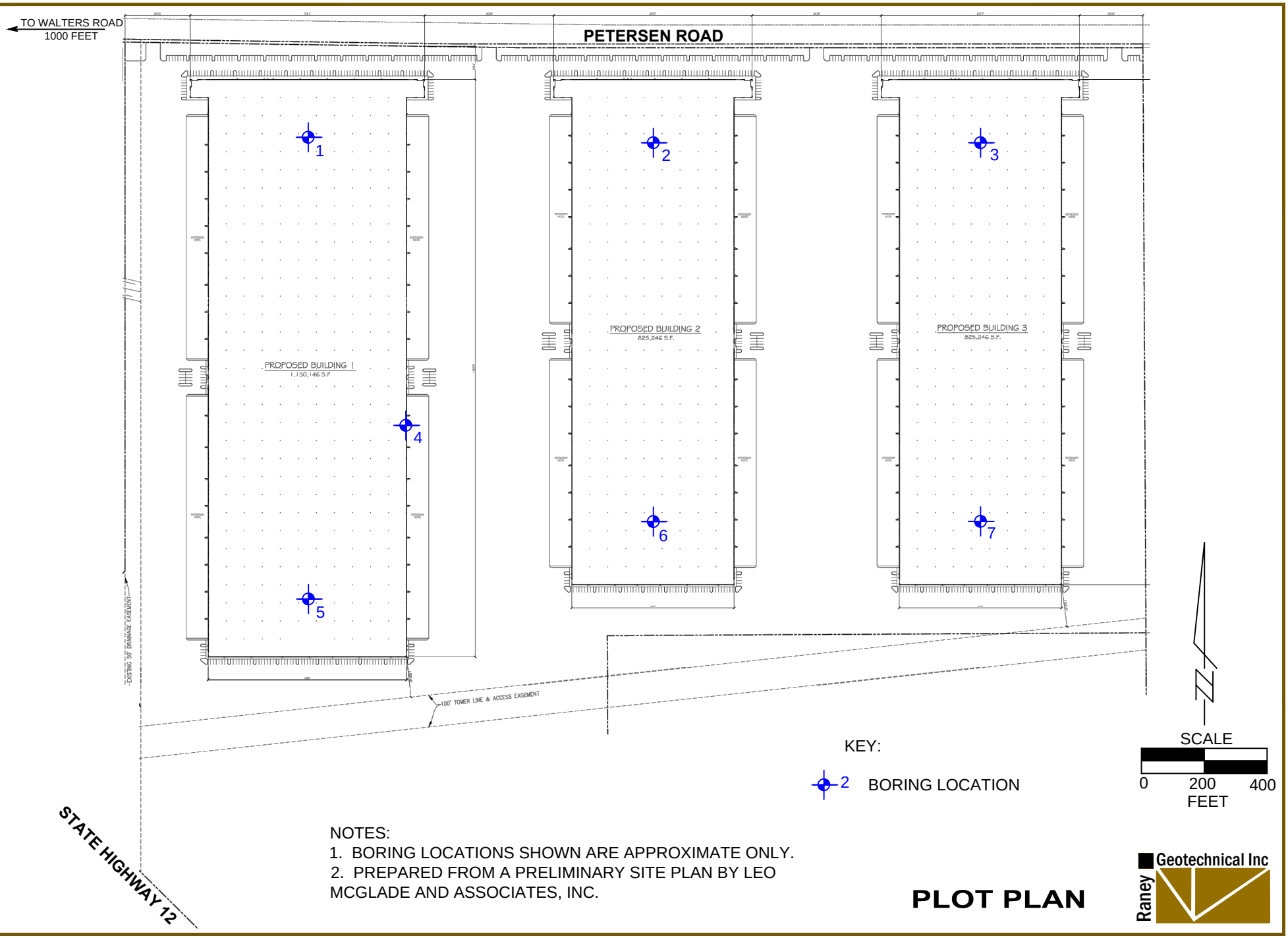
Sincerely,

RANEY GEOTECHNICAL, INC.

William C. Boli
Geotechnical Engineer No. 2004

(5) addressee

PROJECT NUMBER: 146-607 PLATE NUMBER: 1
DRAWN BY: WCB DATE: 11/11/15



NOTES:
1. BORING LOCATIONS SHOWN ARE APPROXIMATE ONLY.
2. PREPARED FROM A PRELIMINARY SITE PLAN BY LEO MCGLADE AND ASSOCIATES, INC.

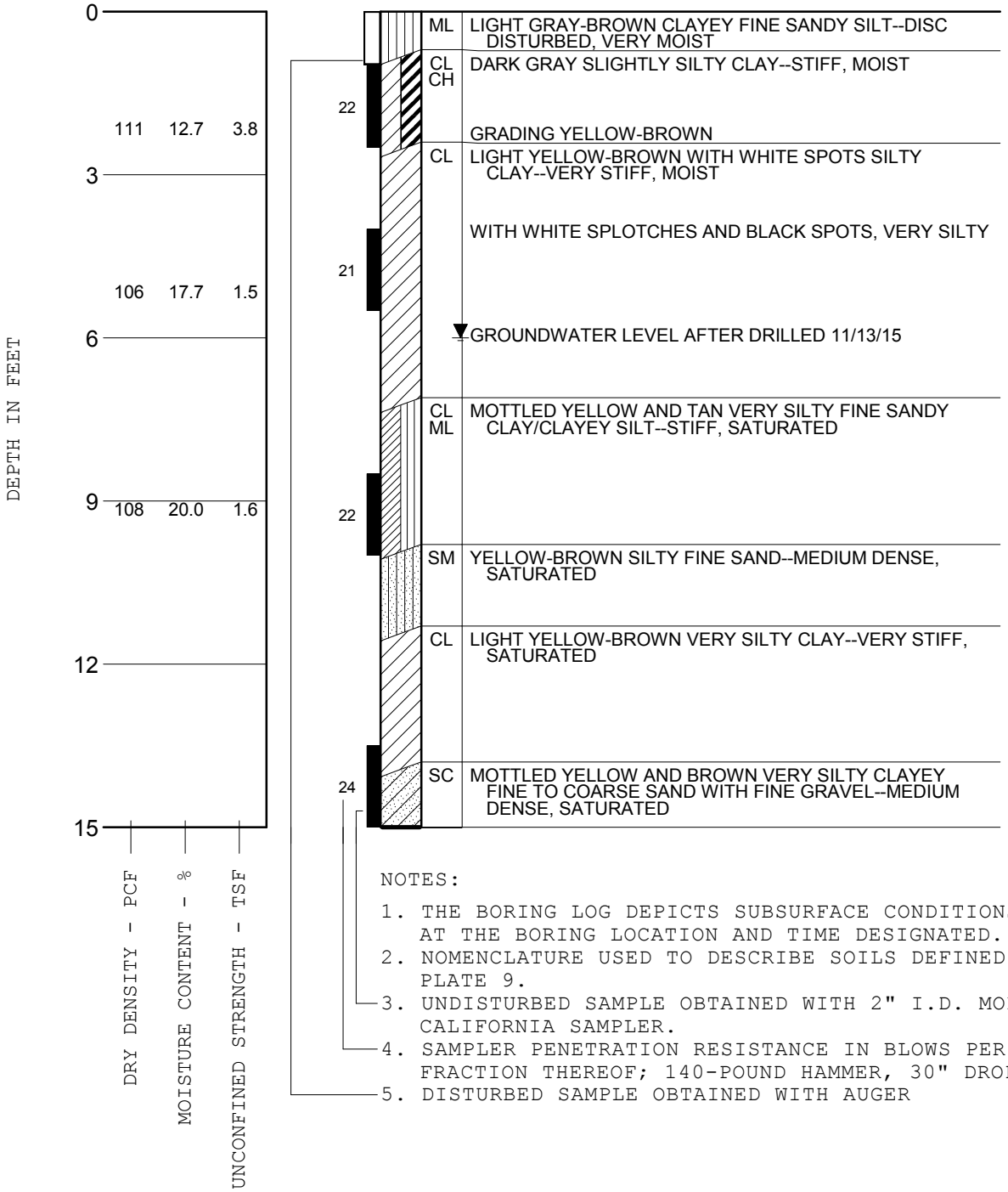
PLOT PLAN

Raney Geotechnical Inc

PLATE 1

BORING 1

DRILLED: 11/13/15



NOTES:

1. THE BORING LOG DEPICTS SUBSURFACE CONDITIONS ONLY AT THE BORING LOCATION AND TIME DESIGNATED.
2. NOMENCLATURE USED TO DESCRIBE SOILS DEFINED ON PLATE 9.
3. UNDISTURBED SAMPLE OBTAINED WITH 2" I.D. MODIFIED CALIFORNIA SAMPLER.
4. SAMPLER PENETRATION RESISTANCE IN BLOWS PER FOOT OR FRACTION THEREOF; 140-POUND HAMMER, 30" DROP.
5. DISTURBED SAMPLE OBTAINED WITH AUGER

PROJECT NUMBER: 146-607
PLATE NUMBER: 2

DRAWN BY: WCB
DATE: 11/16/15

LOG OF BORING

Raney Geotechnical Inc

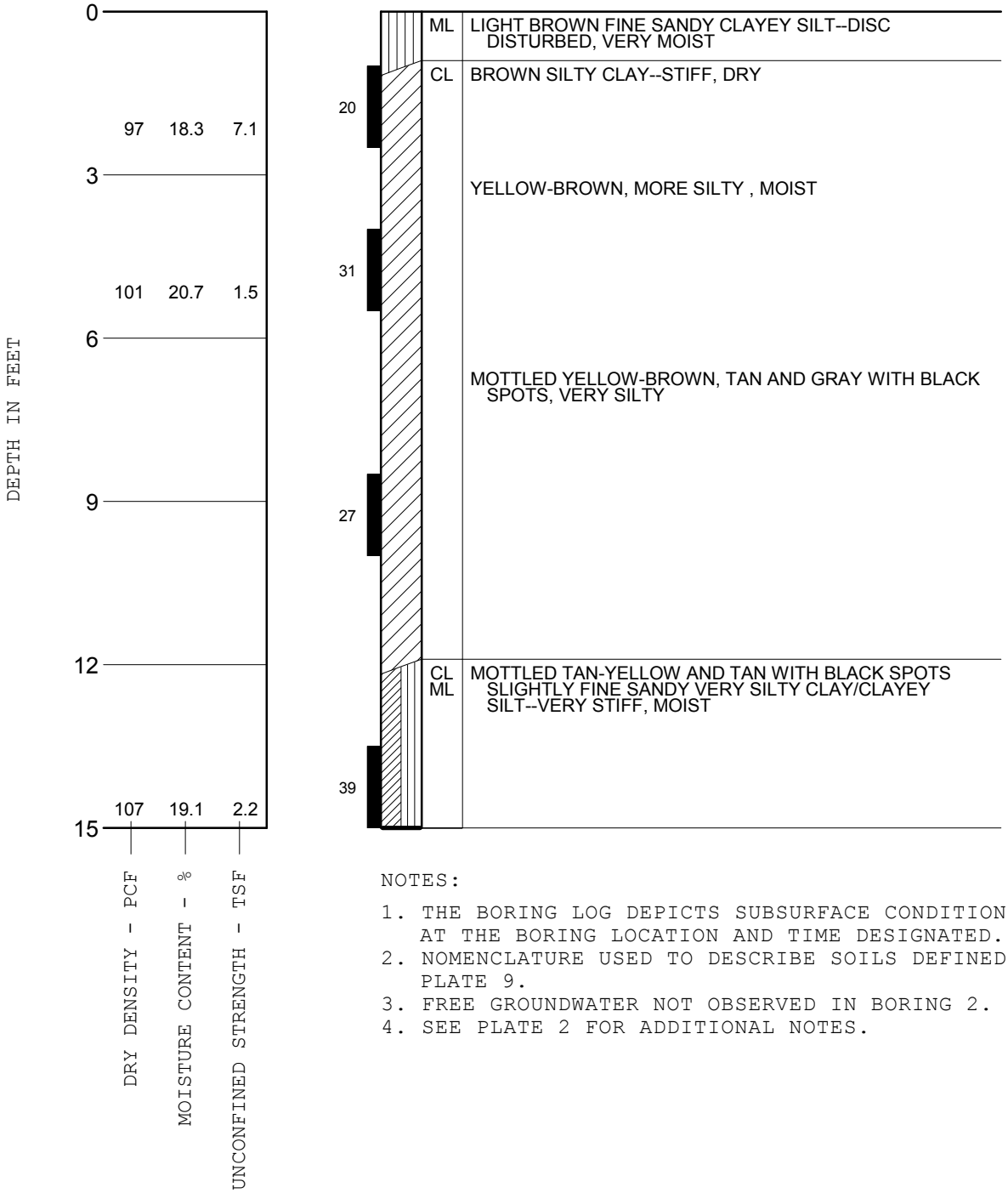
PLATE 2

PROJECT NUMBER: 146-607
PLATE NUMBER: 3

DRAWN BY: WCB
DATE: 11/16/15

BORING 2

DRILLED: 11/13/15



NOTES:

1. THE BORING LOG DEPICTS SUBSURFACE CONDITIONS ONLY AT THE BORING LOCATION AND TIME DESIGNATED.
2. NOMENCLATURE USED TO DESCRIBE SOILS DEFINED ON PLATE 9.
3. FREE GROUNDWATER NOT OBSERVED IN BORING 2.
4. SEE PLATE 2 FOR ADDITIONAL NOTES.

LOG OF BORING

Raney Geotechnical Inc

PLATE 3

PROJECT NUMBER: 146-607
PLATE NUMBER: 4

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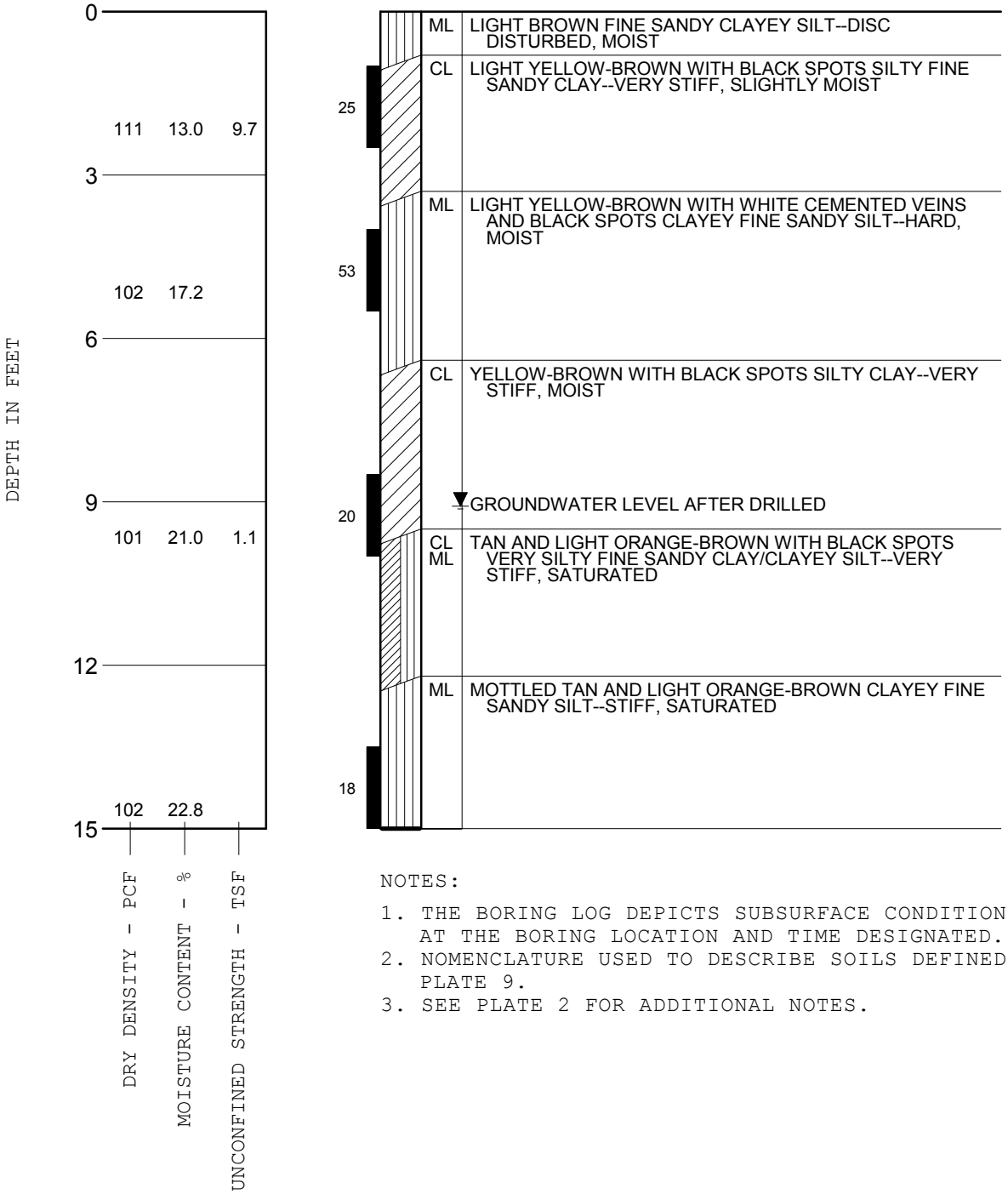
DATE: 11/16/15

BORING 3

DRILLED: 11/13/15



NOTES:

1. THE BORING LOG DEPICTS SUBSURFACE CONDITIONS ONLY AT THE BORING LOCATION AND TIME DESIGNATED.
2. NOMENCLATURE USED TO DESCRIBE SOILS DEFINED ON PLATE 9.
3. SEE PLATE 2 FOR ADDITIONAL NOTES.

LOG OF BORING

Raney Geotechnical Inc

PLATE 4

PROJECT NUMBER: 146-607
PLATE NUMBER: 5

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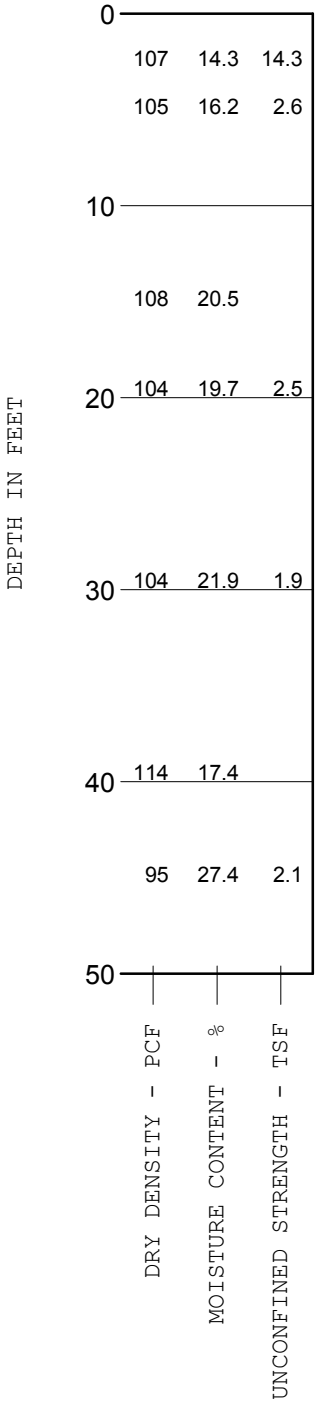
DATE: 11/16/15

BORING 4

DRILLED: 11/13/15



17	ML	LIGHT BROWN CLAYEY SILT--DISC DISTURBED
	CL	Y.-BROWN WITH BLACK AND WHITE SPOTS SILTY F. SANDY CLAY--STIFF, MOIST
29		GROUNDWATER LEVEL AFTER DRILLED 11/13/15
	ML	LIGHT YELLOW-BROWN VERY CLAYEY FINE SANDY SILT--VERY STIFF, MOIST
25	CL ML	LT. YELLOW-BROWN WITH BLACK SPOTS V. SILTY CLAY/CLAYEY SILT--V. STIFF, SATURATED
	ML	MOTTLED TAN AND ORANGE VERY SANDY (FINE) SLIGHTLY CLAYEY SILT--MEDIUM DENSE, SATURATED
16		VERY CLAYEY, STIFF
	CL	MOTTLED TAN AND LIGHT ORANGE-BROWN WITH BLACK SPOTS SILTY CLAY--VERY STIFF, SATURATED
33		
	CL ML	MOTTLED TAN-GRAY AND ORANGE VERY SILTY FINE SANDY CLAY/CLAYEY SILT--VERY STIFF, SATURATED
29	CL	MOTTLED TAN-GRAY AND ORANGE WITH BLACK SPOTS SILTY CLAY--VERY STIFF, SATURATED
		YELLOW-BROWN WITH WHITE STREAKS
38		
21	ML CL	YELLOW-BROWN VERY SANDY (FINE) SILT--MEDIUM DENSE, SATURATED
		YELLOW-BROWN WITH BLACK SPOTS SILTY CLAY--VERY STIFF, SATURATED
22	ML	ORANGE-BROWN WITH BLACK SPOTS SILTY CLAY--VERY, STIFF, SATURATED
	CL	YELLOW-BROWN WITH WHITE SPLOTCHES SILTY CLAY--VERY STIFF, SATURATED
27		GRADING VERY SILTY
		MOTTLED TAN AND ORANGE WITH WHITE SPOTS
21		

NOTES:

1. THE BORING LOG DEPICTS SUBSURFACE CONDITIONS ONLY AT THE BORING LOCATION AND TIME DESIGNATED.
2. NOMENCLATURE USED TO DESCRIBE SOILS DEFINED ON PLATE 9.
3. SEE PLATE 2 FOR ADDITIONAL NOTES.

LOG OF BORING

Raney Geotechnical Inc

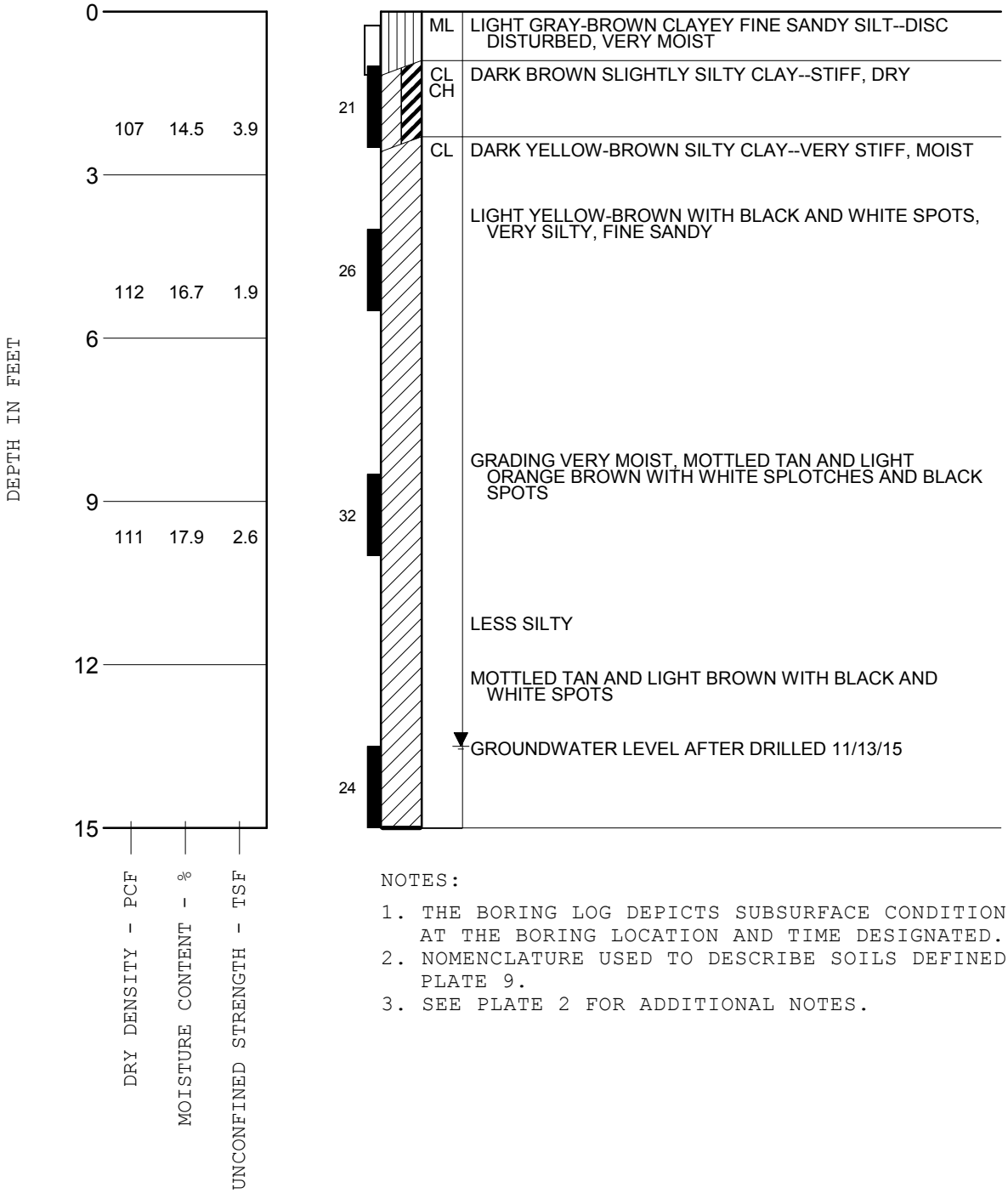
PLATE 5

PROJECT NUMBER: 146-607
PLATE NUMBER: 6

DRAWN BY: WCB
DATE: 11/16/15

BORING 5

DRILLED: 11/13/15



NOTES:

1. THE BORING LOG DEPICTS SUBSURFACE CONDITIONS ONLY AT THE BORING LOCATION AND TIME DESIGNATED.
2. NOMENCLATURE USED TO DESCRIBE SOILS DEFINED ON PLATE 9.
3. SEE PLATE 2 FOR ADDITIONAL NOTES.

LOG OF BORING

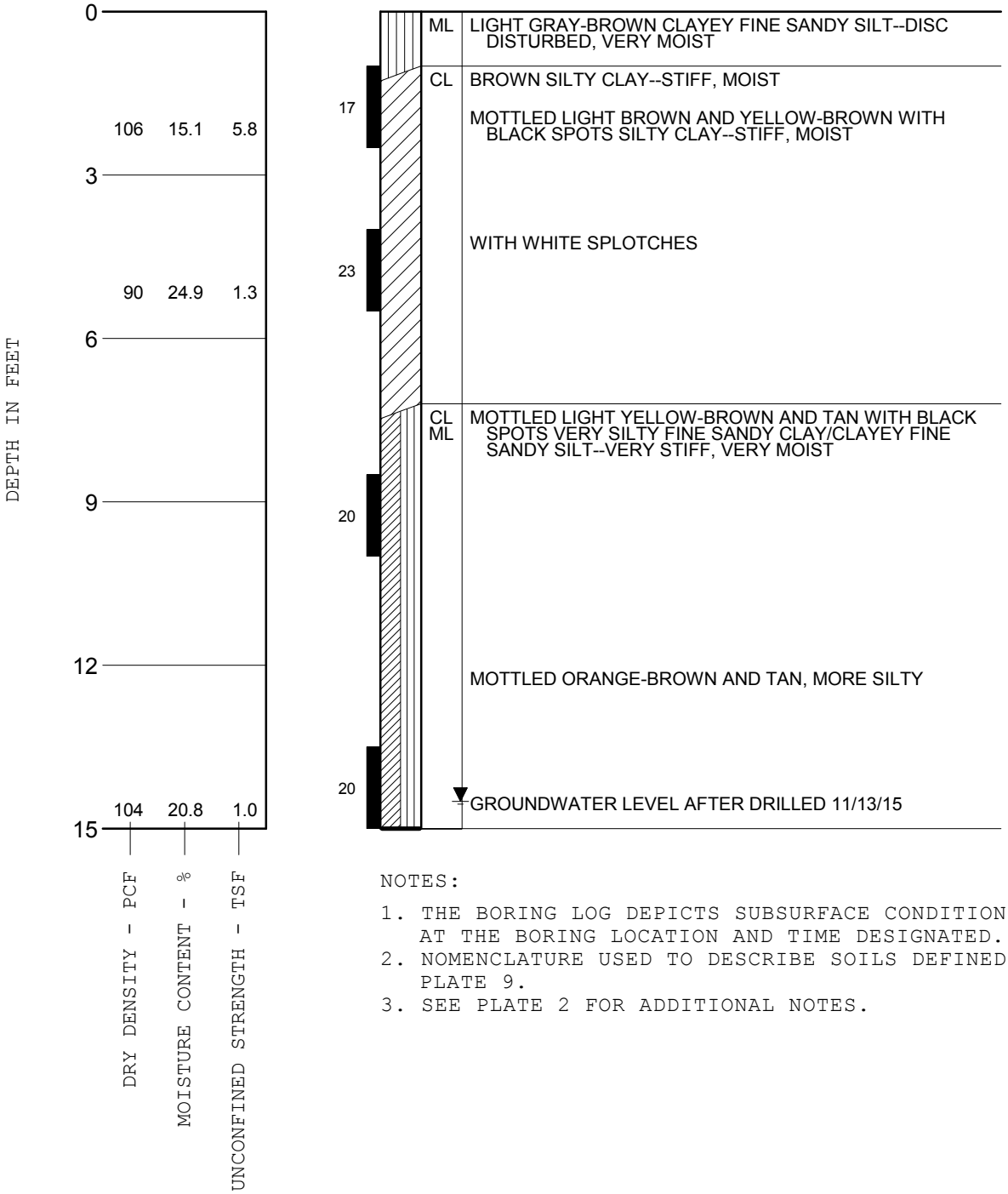
Raney Geotechnical Inc

PROJECT NUMBER: 146-607
PLATE NUMBER: 7

DRAWN BY: WCB
DATE: 11/16/15

BORING 6

DRILLED: 11/13/15



NOTES:

1. THE BORING LOG DEPICTS SUBSURFACE CONDITIONS ONLY AT THE BORING LOCATION AND TIME DESIGNATED.
2. NOMENCLATURE USED TO DESCRIBE SOILS DEFINED ON PLATE 9.
3. SEE PLATE 2 FOR ADDITIONAL NOTES.

LOG OF BORING

Raney Geotechnical Inc

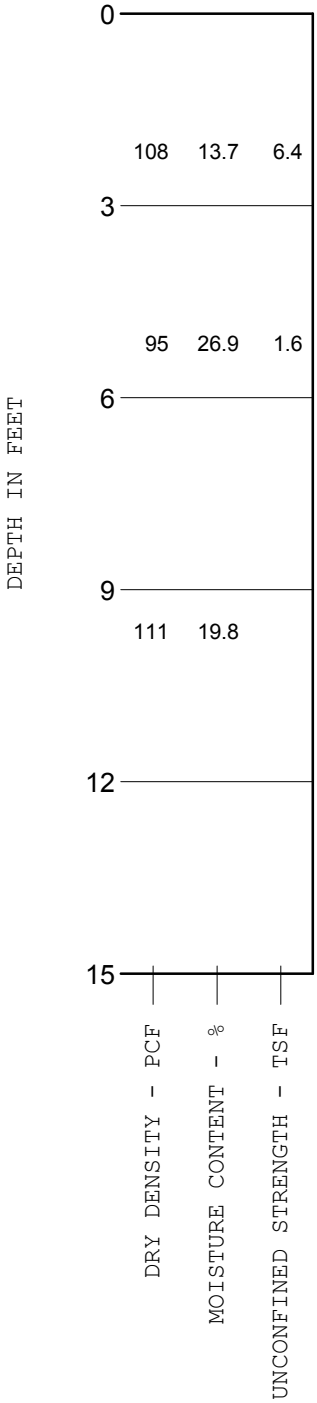
PLATE 7

PROJECT NUMBER: 146-607
PLATE NUMBER: 8

DRAWN BY: WCB
DATE: 11/16/15

BORING 7

DRILLED: 11/13/15



	ML	LIGHT BROWN CLAYEY FINE SANDY SILT--DISC DISTURBED, VERY MOIST
	CL	DARK BROWN SLIGHTLY SILTY CLAY--VERY STIFF, DRY
23		YELLOW-BROWN WITH WHITE STREAKS AND BLACK SPOTS, MORE SILTY, SLIGHTLY FINE SANDY, MOIST
	CL ML	YELLOW-BROWN WITH WHITE STREAKS AND BLACK SPOTS VERY SILTY FINE SANDY CLAY/CLAYEY SILT--STIFF, VERY MOIST
16		
	ML	MOTTLED ORANGE AND TAN FINE SANDY CLAYEY SILT--STIFF, SATURATED
		GROUNDWATER LEVEL AFTER DRILLED 11/13/15
18		
	SM ML	LIGHT ORANGE-BROWN VERY SILTY SLIGHTLY CLAYEY FINE SAND/SANDY SILT--MEDIUM DENSE, SATURATED
	CL ML	MOTTLED TAN AND YELLOW/ORANGE VERY SILTY FINE SANDY CLAY/CLAYEY SANDY SILT--VERY STIFF, SATURATED
20		VERY SANDY

NOTES:

1. THE BORING LOG DEPICTS SUBSURFACE CONDITIONS ONLY AT THE BORING LOCATION AND TIME DESIGNATED.
2. NOMENCLATURE USED TO DESCRIBE SOILS DEFINED ON PLATE 9.
3. SEE PLATE 2 FOR ADDITIONAL NOTES.

LOG OF BORING

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PROJECT NUMBER: 146-607

PLATE NUMBER: 9

GRAPH	SYMBOL	DESCRIPTION	MAJOR DIVISIONS		
	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES	CLEAN GRAVELS WITH LESS THAN 5% FINES	GRAVEL AND GRAVELLY SOILS	COARSE GRAINED SOILS MORE THAN 50% LARGER THAN NO. 200 SIEVE
	GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES			
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	GRAVELS WITH MORE THAN 12% FINES	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES			
	SW	WELL GRADED SANDS, GRAVELLY SANDS	CLEAN SANDS WITH LESS THAN 5% FINES	SANDS AND SANDY SOILS	
	SP	POORLY GRADED SANDS, GRAVELLY SANDS			
	SM	SILTY SANDS, SAND-SILT MIXTURES	SANDS WITH MORE THAN 12% FINES	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES			
	ML	INORGANIC SILTS, ROCK FLOUR, OR CLAYEY SILTS WITH SLIGHT PLASTICITY	LIQUID LIMIT LESS THAN 50	SILTS AND CLAYS	FINE GRAINED SOILS MORE THAN 50% SMALLER THAN NO. 200 SIEVE
	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			
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTS, ELASTIC SILTS	LIQUID LIMIT GREATER THAN 50	SILTS AND CLAYS	
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS			
	OH	ORGANIC CLAYS AND ORGANIC SILTS OF MEDIUM TO HIGH PLASTICITY			
	PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENT	HIGHLY ORGANIC SOILS		

UNIFIED SOIL CLASSIFICATION SYSTEM

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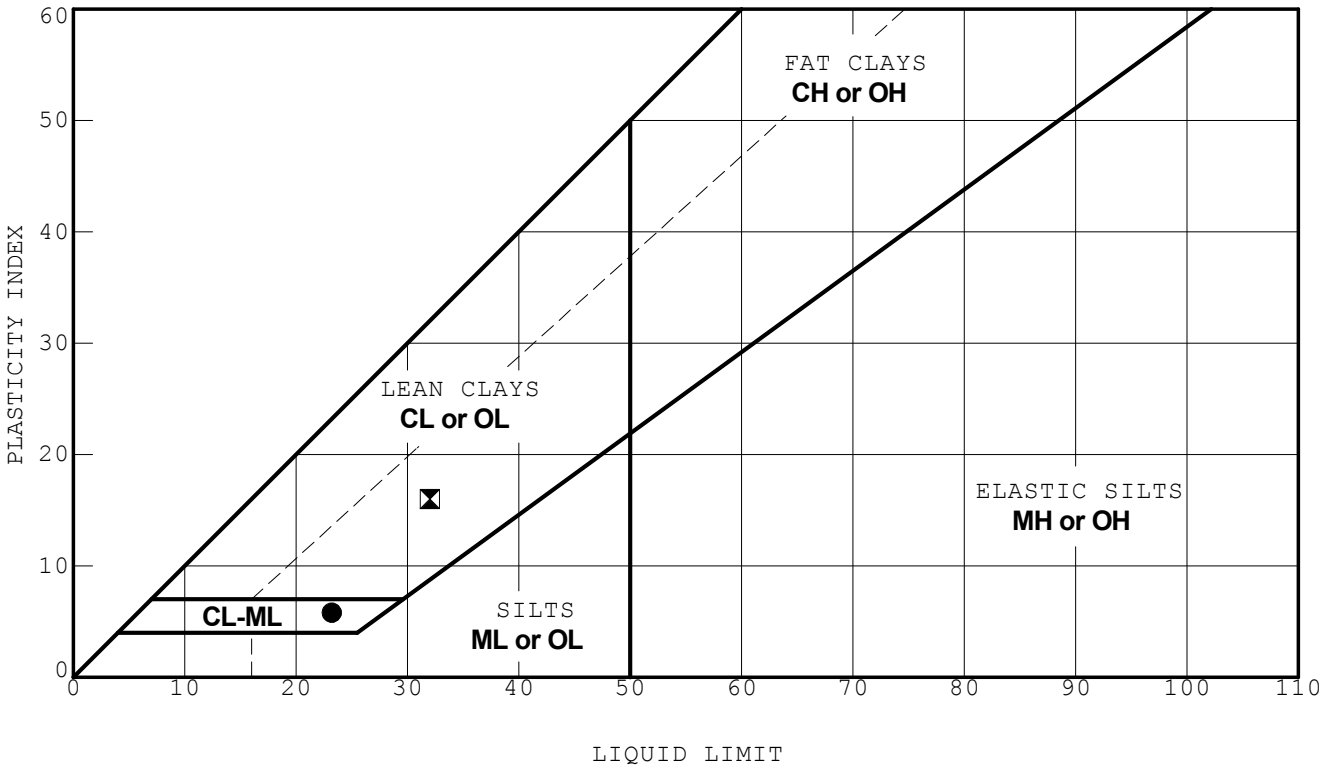
PLATE 9

PROJECT NUMBER: 146-607
PLATE NUMBER: 10



CLASSIFICATION TEST RESULTS						
SYMBOL	SAMPLE LOCATION	DEPTH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SOIL CLASSIFICATION
●	BORING 2	0 - 12"	23	17	6	CL-ML
⧓	BORING 7	0 - 12"	32	16	16	CL

ATTERBERG LIMIT DATA

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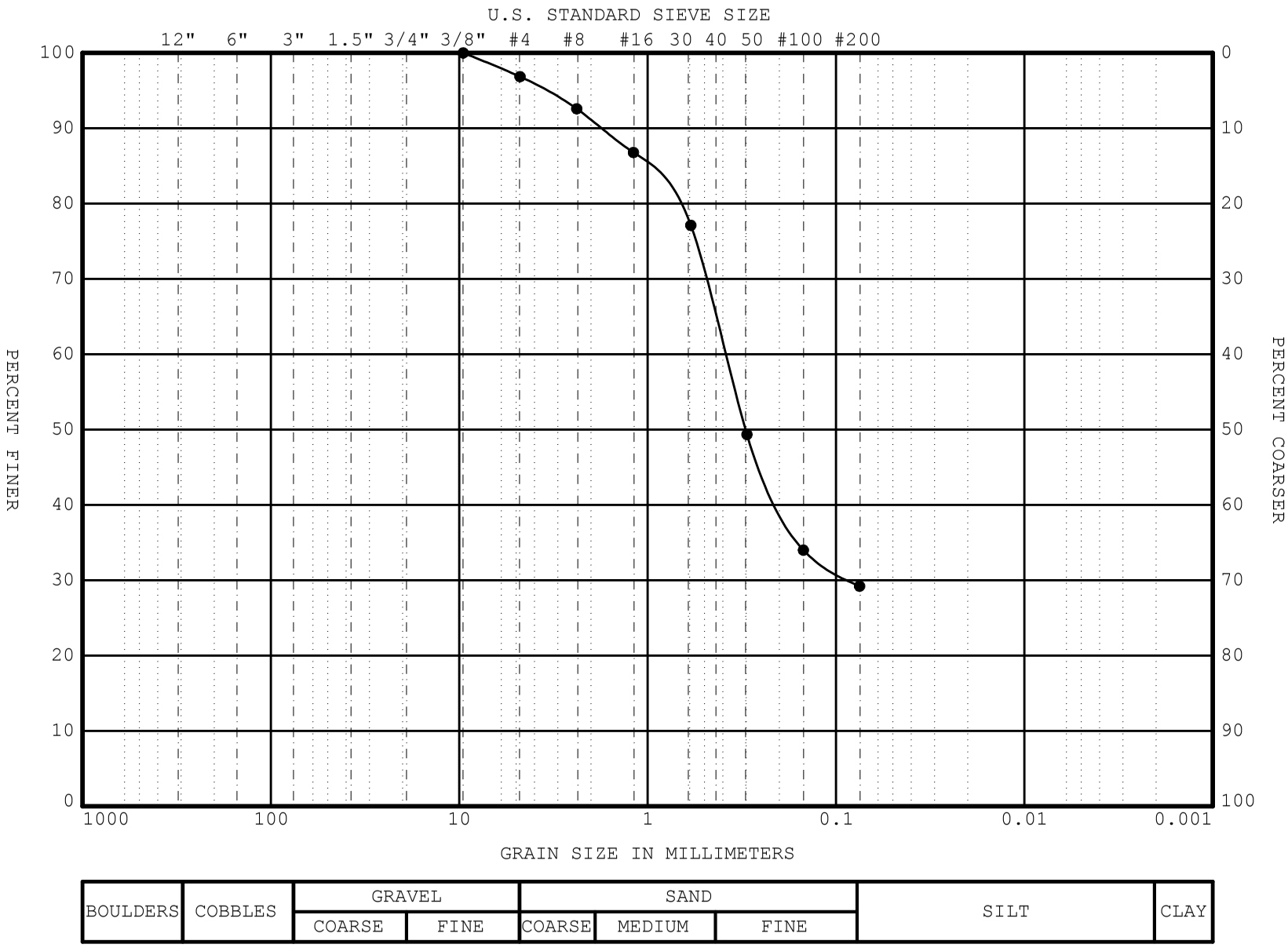
PLATE 10

PROJECT NUMBER: 146-607

PLATE NUMBER: 11

SYMBOL	LOCATION	DEPTH	UNIFIED CLASSIFICATION	DESCRIPTION
●	BORING 1	14.5'	SC	Y. BROWN SILTY CLAYEY F. TO C. SAND W/ GRAVEL



BOULDERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

GRAIN SIZE DISTRIBUTION

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PLATE 11

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