APPENDIX D1-D5

Geotechnical Reports

APPENDIX D1

60% DESIGN DEVELOPMENT REPORT

GEOTECHNICAL REPORT
PUMP STATION AND CUT & COVER SECTIONS
MORENA PUMP STATION, WW FORCE MAIN, AND BRINE/CENTRATE CONVEYANCE PREDESIGN (NC01)

SAN DIEGO, CALIFORNIA

Prepared for

City of San Diego
Public Utilities Department
San Diego, California

September 19, 2017
AECOM Project No. 60530732

Prepared by

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September 19, 2017

Ms. Laila Nasrawi
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Subject: 60% Design Development Report
Geotechnical Report
Pump Station and Cut & Cover Sections
Morena Pump Station, WW Force Main, and
Brine/Centrate Conveyance Predesign (NC01)
San Diego, California
AECOM Project No. 60530732

Dear Ms. Nasrawi:

AECOM Technical Services Inc. (AECOM) has prepared this Geotechnical Report to support the 60 percent Design Development for Morena Pump Station and the cut and cover portions of the pipeline for the above referenced project. This report provides the findings from previous and recent subsurface explorations, a discussion of geologic and geotechnical conditions, and conclusions and recommendations pertaining to the geotechnical aspects of design and construction.

The purpose of this report is to provide geologic and geotechnical information for 60% design of the Morena Pump Station, connections with the existing sewer main, and the cut and cover pipeline sections. Results of field subsurface explorations completed to date are described in this report. The report will be supplemented based on additional explorations planned within the pump station property limits once the property is available for ongoing design. Geotechnical and geologic conclusions and recommendations related to fault hazards and the specific tunneled portions of the pipeline alignment are presented under separate cover.

We appreciate the opportunity to work with you on this project. If you have any questions, please contact us.

Sincerely,

AECOM Technical Services, Inc.

Steven M. Fitzwilliam, G.E. 2501
Principal Geotechnical Engineer

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Principal Engineering Geologist

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LIST OF ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Technical Services, Inc.
ASCE	American Society of Civil Engineers
ASTM	ASTM International, formerly American Society for Testing and Materials
bgs	below ground surface
BMPs	Best Management Practices
CBC	California Building Code
CDSM	Cement Deep Soil Mixing
CGS	California Geological Survey
CPTs	Cone Penetration Tests
CRR	cyclic resistance ratio
CSM	Cutter Soil Mixing
CSR	cyclic stress ratio
EI	Expansion Index
EPA	Environmental Protection Agency
EQFZ	Earthquake Fault Zone
FS	Factor of Safety
ft	feet
g	Gravitational Acceleration
IBC	International Building Code
MCE	Maximum Considered Earthquake
mgd	million gallons per day
MPS	Morena Pump Station
MWWD	Metropolitan Waste Water Department
NCWPF	North City Water Purification Facility
NCWRP	North City Water Reclamation Plant
NGVD 29	National Geodetic Mean Datum of 1929
NPDES	National Pollutant Discharge Elimination System
OCPs	organochlorine pesticides
PCBs	polychlorinated biphenyls
pcf	pounds per cubic foot
PGA	Peak Ground Acceleration
pci	pounds per cubic inch
PLWTP	Point Loma Wastewater Treatment Plant
psf	pounds per square foot
PVC	polyvinyl chloride
RCFZ	Rose Canyon Fault Zone
SAM	Site Assessment and Mitigation
SPT	Standard Penetration Test
SVOC	semi-volatile organic compound
TPH	total petroleum hydrocarbons
URS	URS Corporation
USA	Underground Service Alert
USGS	United States Geological Survey
VOCs	volatile organic compounds
WW	Wastewater

1.0 INTRODUCTION

This geotechnical report prepared by AECOM Technical Services, Inc. (AECOM) supports 60% Design Development for the Morena Pump Station (MPS), Wastewater (WW) Force Main, and Brine/Centrate Conveyance Predesign (NC01) Project ("Project") for Pure Water San Diego. Specifically, the report provides a summary of geotechnical conditions and design considerations for the Morena Pump Station, connections to the existing sewer main (including tunnels) via diversion structure pipelines, and the cut-and-cover (open trench) portions of the pipeline alignments. Geotechnical recommendations for the design and construction of the project are provided. The planned locations of the pump station and pipelines are shown on Figure 1.

This report does not address the fault hazards associated with the project, or the tunnel crossings at Interstate-805 (I-805), San Clemente Canyon, and Rose Creek/North County Transit District (NCTD) Railroad Crossing that are proposed for portions of the pipeline alignments. The field explorations for the tunnel crossings and fault investigation are discussed below as they are related to the other portions of the alignment as well; however, these topics are addressed in greater detail under separate cover (Faulting Report and Tunnel Report).

1.1 PROJECT DESCRIPTION

The planned Project will convey an average of 37.7 million gallons per day (mgd) of raw wastewater to the North City Water Reclamation Plant (NCWRP). Wastewater will be conveyed from MPS via a new 48-inch-diameter force main approximately 10.7 miles north to NCWRP. A new 30-inch-diameter brine/centrate pipeline will convey 13.5 mgd of brine/centrate (generated from the North City Water Purification Facility [NCWPF]) south, by gravity flow (by way of MPS) for treatment at the Point Loma Wastewater Treatment Plant (PLWTP). The brine/centrate line will run parallel to the force main in a joint trench for approximately 95 percent of the overall alignment. A detailed description of the Project is provided in the Draft Final Design Development Basis of Design Report. A summary of the planned foundations and below-grade features is provided below as it relates to the geotechnical considerations discussed in this report.

The layout of the primary components of the Morena Pump Station is shown on Figure 2. The planned finished grade for the Morena Pump Station is approximately Elevation 16 feet Natinal Geodetic Vertical Datum of 1929 (NGVD 29). The Intake Screening Building has a planned bottom of foundation elevation of -18.25 feet, which will require an approximate excavation depth of 34 feet. The Pump Station Building will require an excavation depth of about 51 feet to accommodate the foundation (bottom elevation of -32.5 feet NGVD 29) and underlying base layer. The Energy Dissipator Structure has a planned bottom of foundation elevation of -7.33 feet NGVD 29, which will require an excavation of about 25 feet deep. Other supporting facilities, including the Electrical Building, Maintenance Building, transformers, Odor Control structures and High Purity Oxygen Injection Skid will be constructed at or near finished grade.

The general alignment of the wastewater and brine/centrate pipelines is shown on Figure 1. Shorter stretches of cut-and-cover pipeline and jack and bore installation will be constructed extending south of the planned pump station site to connect with existing infrastructure. The planned pipe invert depths for the cut-and-cover portions of the pipelines generally range from 10 to 30 feet below grade.

1.2 SUBSURFACE INFORMATION

The conclusions and recommendations presented in this report are based on previous data performed by others and additional subsurface data collected by AECOM as part of the ongoing geotechnical investigation.

Previous studies include the "Desktop Geotechnical Study Report, Pure Water Program Task 7, Morena Pump Station, WW Force Main and Brine Conveyance Pre-Design, City of San Diego" prepared by Allied Geotechnical Engineers (Allied, 2015), as well as other geotechnical reports available in AECOM's files. The references reviewed are listed in Section 7 of this report. The geotechnical evaluation also included a review of published geologic maps, and City and County of San Diego hazard maps.

1.2.1 Current Subsurface Explorations

The field explorations for this 60% Design phase of the project were conducted between March and August 2017. Field explorations and geologic reconnaissance were performed for the tunnel crossings, the pump station, the diversion structure, and the trench portions of the alignment.

1.2.1.1 Summary

AECOM prepared a Safe Work Plan for our work prior to commencing our field investigation. Underground Service Alert was notified prior to advancing all the borings.

Logs of the borings are provided in Appendix A, which also provides details of the field exploration program. A summary of the borings is provided as Table A-1 in Appendix A. The borings were numbered based on spacing along the project alignment. Some of the planned boring locations were eliminated based on nearby available information or due to utility conflicts, and therefore the numbering of the borings is not sequential.

1.2.1.2 Pump Station

The initial explorations were focused at the Morena Pump Station to investigate the general subsurface and ground conditions, as well as the potential for fault hazards. Three soil borings PS-1 through PS-3 were advanced around the perimeter of the MPS. Boring PS-2 was converted to a monitoring well. Boring logs are attached to this report. Cone Penetration Tests (CPTs) were also performed around the perimeter of the pump station site; CPT logs are provided in the Faulting Report. Approximate locations of the borings and CPTs adjacent to the MPS are shown on Figure 2. Due to access restrictions, recent explorations for the pump station were performed in the streets around the perimeter of the site. Additional explorations are planned within the pump station property once access to the site is available.

The borings were extended to depths ranging between 61.5 and 81 feet. Drilling was performed with a truck-mounted drill rig equipped to drill with hollow-stem augers methods. The test borings were drilled, logged, sampled and backfilled under supervision of an AECOM engineering geologist. The borings were located in the City right-of-way in accordance with City Traffic Control Permits. The borings were backfilled in accordance with County of San Diego

Department of Environmental Health requirements, and the surfaces were restored with concrete to match existing conditions.

1.2.1.3 Tunnel Borings

Borings were advanced for the four originally planned tunnel crossings, including the I-805 tunnel crossing, the Rose Creek/NCTD tunnel crossing, the San Clemente Canyon tunnel crossing, and the Tecolote Creek tunnel crossing. The Tecolote Creek tunnel crossing has been modified to be a conventional cut and cover (open trench) construction crossing. The field investigation for the tunnels consisted of advancing eight exploratory borings (EX-1; RC-1, RC-2, RC-3 and RC-4; and SC-1, SC-2 and SC-3) and collecting soil/core samples for more detailed review and laboratory testing. The field investigation for the tunnel crossings is described in more detail in our tunnel report.

The borings for the Tecolote Creek crossing (TC-1 and TC-2) were drilled to depths 96.5 feet. Drilling was performed with a truck-mounted drill rig equipped to drill with hollow-stem augers and mud rotary drilling methods. Hollow-stem auger methods were used until groundwater was encountered. Mud rotary drilling methods were used below the groundwater. Test borings were drilled, logged, sampled and backfilled under supervision of an AECOM engineering geologist.

These borings were located in the City right-of-way in accordance with City Traffic Control Permits. Monitoring wells were constructed and borings were backfilled in accordance with County of San Diego Department of Environmental Health requirements. Disturbed surfaces were restored to match existing conditions.

1.2.1.4 Cut-and-Cover (Open Trench)

AECOM advanced 67 borings along the Morena Pipeline alignment where conventional cut-and-cover, open trenching methods are planned for construction of the force main, the water main, and the smaller water lines. The borings were extended to depths up to 19.5 or 20 feet. Drilling was performed with truck-mounted drill rigs equipped to drill with hollow-stem auger methods. The test borings were drilled, logged, sampled and backfilled under supervision of an AECOM engineering geologist or engineer. The borings were located in the City right-of-way in accordance with City Traffic Control Permits. The borings were backfilled with a combination of soil cuttings and hydrated bentonite. The surface was capped with concrete.

1.2.1.5 Diversion Structures

Four borings were advanced along Friars Road, south of the Morena Pump Station location, for the diversion structure tie-ins. The borings were extended to depths ranging between 20 and 61.5 feet. Drilling was performed with a truck-mounted drill rig equipped to drill with hollow-stem augers methods. The test borings were drilled, logged, sampled and backfilled under supervision of an AECOM engineer. The borings were located in the City right-of-way in accordance with City Traffic Control Permits. The borings were backfilled in accordance with County of San Diego Department of Environmental Health requirements, and the surfaces were restored with concrete to match existing conditions.

1.2.2 Laboratory Testing

Geotechnical laboratory tests were performed on selected samples to aid in estimating soil properties and validate visual classifications of the materials. The tests include grain size, plasticity characteristics, strength and corrosivity. Test results are presented in Appendix B and are summarized at the corresponding sample location on the logs of the borings in Appendix A.

1.2.3 Groundwater Sampling

Groundwater sampling was performed three days after the installation of the monitoring well to evaluate the groundwater for construction dewatering and groundwater disposal. Analytical laboratory testing was performed on the selected groundwater sample for total petroleum hydrocarbons (TPH) extended range by EPA Modified Method 8015B, title 22 metals including mercury by EPA Methods 6010B and 7470A, organochlorine pesticides (OCPs) by EPA Method 8081A, polychlorinated biphenyls (PCBs) by EPA Method 8082, semi-volatile organic compounds (SVOCs) by EPA Method 8270C, and volatile organic compounds (VOCs) by EPA Method 8260B. The results of the analytical testing are presented in Appendix C.

Additional sampling and testing will be performed as the geotechnical investigation for the Project progresses and additional monitoring wells are installed within the pump station property.

1.2.4 Previous Ground Improvement

We understand that ground improvement was performed for other projects in the area south of the MPS. Stone columns were installed across the San Diego River Valley for the North Metro Interceptor Sewer to improve the ground. Stone columns may be encountered for the diversion tie-in structures. In addition, we understand that grouting may have been performed for the Mid-Coast Trolley project along Friars Road. Grouting may be encountered in the subsurface near the Diversion Structures for the Project. Records of these ground improvement projects are not available but these ground improvement projects are suspected in the area.

2.0 SITE CONDITIONS

This section of the report summarizes the site and subsurface conditions at the Morena Pump Station and along the pipeline alignments. Additional detail on geologic and seismic setting is provided in the Fault Hazard Report and the Tunnel Report

2.1 GEOLOGIC AND SEISMIC SETTING

The project physiographic/geologic setting includes the 1) former floodplain of the San Diego River and 2) upland mesas with canyons.

Historically, the San Diego River deposited thick alluvium over a broad floodplain delta extending from Old Town north along the easterly margins of Mission Bay. Land development over the years, including freeways and railroads, required raising and leveling the former floodplain surface with fill soil, locally more than 10 feet deep. Along most of the southerly reach of the planned pipeline (between Ingulf Street and Friars Road) the combined thickness of fill and alluvium is greater than pipeline trench depths, except for short reaches within the Bay Point Formation, a soft Pleistocene age sedimentary formation consisting mostly of dense sand, hard clay and gravel.

The Morena Pump Station and the southern portion of the pipeline alignment are considered to lie within the Rose Canyon Fault Zone (RCFZ). The on-shore portion of the RCFZ extends along the northeast flank of Mount Soledad at La Jolla and continues southward along the eastern margins of Mission Bay (just west of Interstate 5) towards downtown San Diego. Between Mission Bay and San Diego Bay, the zone appears to widen and diverge. Active faults (i.e. Holocene-age fault rupture) and potentially active faults (i.e. Quaternary-age fault rupture) are present in the Project area.

The RCFZ has been known for years to have the potential to produce a large damaging earthquake (M7 or greater). The pipeline and pump station will likely experience strong seismic shaking, and possibly fault rupture during their design life. The saturated alluvium below the groundwater table is potentially liquefiable under strong seismic shaking from a local or distant earthquake.

2.2 GEOLOGIC UNITS

The geologic units present across the Project alignment include fill soil, recent alluvium, Quaternary older alluvium/Bay Point Formation, and older formational materials. These units are described below. The surface geology along the planned pipeline route is shown on Figures 3a through 3e.

2.2.1 Fill

Fill soils are present at the ground surface at many locations across the Project, due to the construction of both public infrastructure and private development. Most of the Morena/West Morena Boulevard reach is underlain by varying thicknesses of fill. The fill has been placed in conjunction with land-filling along former low-lying areas, road grading and underground utility construction. Fill soils tend to be erratic mixtures of sand, clay, gravel and sometimes

construction debris. The fill contains a wide range of particle sizes, up to boulder sized. The fill along the alignment is considered undocumented, i.e. compaction records are not available. The fill may have been hydraulically placed at the southern end of the alignment and in the vicinity of the pump station.

2.2.2 Alluvium

Alluvial deposits, predominantly loose to dense silty sands, clean sands and sandy gravels underlie the former floodplain areas and the inland canyon-creek crossings. The Morena/West Morena Boulevard pipeline reach is underlain by alluvium at greater depth than the pipeline. Between the Morena Pump Station and Ingulf Street, the composition of the alluvium varies considerably, with more fine-grained silts and some clays present within the alluvium near the pump station. In the vicinity of Tecolote Creek, the alluvium was characterized as loose to medium dense sand and stiff clay, although in nearby previous borings, young estuarine deposits (primarily silts and clays with some sands and organic deposits) were logged above the alluvium. Toward the northern portion of the Morena Boulevard stretch, the material below the fill may be more colluvial in nature due to its proximity to the hills to the east.

The inland natural canyons at San Clemente Creek and Rose Creek are mapped as underlain by alluvium (Kennedy, 1975). Recent borings suggest alluvium is relatively thin, less than about 15 feet thick.

2.2.3 Older Deposits and Formational Materials

The other materials present along the Project alignment, arranged from younger to older deposits, are briefly described below:

Old Paralic Deposits (formerly called Bay Point Formation) – late to middle Pleistocene aged, marine and non-marine poorly consolidated sandstone (medium dense to very dense sand, silty sand and clayey sand, some localized zones of gravel and cobbles).

Very Old Paralic Deposits (formerly called Lindavista Formation) – middle to early Pleistocene, interfingered strandline, beach, estuarine and colluvial deposits (siltstone, sandstone, conglomerate), can have strong cementation, cobbles.

Stadium Conglomerate – Eocene aged, cobble conglomerate in silty sand matrix with some sandstone, strongly cemented.

Friars Formation – middle to late Eocene aged, marine and non-marine sandstone, siltstone and claystone. Claystone portions can be highly expansive and prone to landslide hazards.

Scripps Formation – Eocene aged, silty sandstone and sandy siltstone with occasional cobble conglomerate beds, strong cementation/concretions.

Ardath Shale – lower to middle Eocene aged, sandy siltstone and claystone with local concreted zones, claystone portions are potentially expansive and prone to landslide hazards.

Old Paralic Deposits, Very Old Paralic Deposits, and Scripps Formation were encountered in borings performed for the project.

2.3 SUBSURFACE CONDITIONS – MORENA PUMP STATION

The preliminary available data indicates that within the depth of the explorations (maximum depth about 80 feet below ground surface [bgs]), the site is underlain by a thin fill layer over alluvium. The fill ranges from about 3 to 5 feet in depth and consists primarily of silty sand. The underlying alluvium varies significantly, and is highly interlayered in some locations.

Within the upper portion of the alluvium to depths ranging from about 19 to 29 feet, the soil is mostly poorly graded sand to silty sand that is primarily loose with some zones of very loose and medium dense material. At some exploration locations, significant interbeds of low-plasticity silt were present within this upper zone of the alluvium.

The upper sandy zone is generally underlain by a fine-grained zone that extends to a depth of about 50 feet bgs. It consists primarily of silt, with interbeds of clay, as well as silty sand. The consistency ranges from soft to stiff.

A deeper granular zone of sand to silty sand is present below a depth of about 50 feet. It is generally medium dense to dense, with some looser zones. There are some zones of fine-grained soil within the deeper granular layer, and in many locations, there is a bed approximately 5 feet thick of stiff silt at depths that range from 55 to 65 feet bgs. Boring PS-3 encountered gravel at a depth of 76 feet bgs. Some of the CPTs reached practical refusal between depths of about 60 to 80 feet, possibly in gravel layers or denser portions of the lower sand layer.

2.4 SUBSURFACE CONDITIONS – PIPELINE ALIGNMENT

Along most of the southerly pipeline reach (Morena/West Morena Boulevard between Friars Road and Ingulf Street), planned trench depths are expected to be within fill over alluvium and/or estuarine deposits, except for short reaches within the Bay Point Formation. In general, fill thicknesses range from about 5 to 10 feet and are generally silty and clayey sands with some gravel. Alluvium (and colluvium, within the northern portion of the stretch) is generally very loose to dense sands with some silts and clays, and potentially some cobbles and boulders. Estuarine-type deposits consisting mostly of sands, clays and some very soft organic soil are present below the fill along West Morena/Morena Boulevard between Dorcas Street on the south and Savannah Street on the north. Bay Point Formation has been logged as shallow as 2 feet bgs along the northern portion of the Morena Boulevard reach, and as shallow as about 2 feet bgs along Ingulf Street as ground elevations rise.

From where the pipeline route ascends up to the coastal mesa at Clairemont Drive toward the NCWRP, the route is mostly within dense sedimentary formations including the Lindavista Formation and the Scripps Formation. Trenches may be classified as CalTrans Class A soils for trench stability (to be verified by the contractor's geotechnical engineer), although these

formations are known to contain cemented zones and cobble intervals that can pose difficult excavation conditions for trenching. Some canyon fill will be encountered along discreet sections of the alignment.

Subsurface conditions along the cut-and-cover portions of the pipeline alignment are summarized in Table 1 and presented in Appendix D.

2.5 GROUNDWATER

Within the mesas, groundwater is assumed to be deeper than 100 feet bgs, with shallow perched water present at varying depths along the alignment. Throughout the portion of the alignment along the coastal plain, groundwater has been measured at depths ranging from 10 to 20 feet bgs. Groundwater was measured at depths of about 9 to 10 feet bgs in the recent pump station borings during drilling, and the initial stabilized reading in monitoring well PS-2 measured groundwater at a depth of about 8 feet bgs (about Elevation 5 to 6 feet NGVD 29). Groundwater was measured at a depth of 15 feet near Tecolote Creek. Groundwater can be assumed to be as shallow as 2 feet within the active stream channel. Groundwater depths will vary with rainfall and seasonal influences.

The groundwater table is mostly above anticipated trench depths along the southern coastal portion of the pipeline alignment and will require dewatering for construction. Groundwater (and soil) contamination may be present along West Morena Boulevard associated with former leaking underground storage tanks.

3.0 GEOLOGIC AND SEISMIC HAZARDS

3.1 FAULTING

Active and potentially active faults are present in the Project vicinity. The planned pipeline alignment generally parallels the active RCFZ along east Mission Bay. Locations of active strands of the RCFZ are known near Balboa Avenue, at Buenos Avenue, and at Old Town; otherwise active faults in the southern Project area are generally mapped as suspected or "concealed" (i.e., not well located) on geologic and fault maps by the City of San Diego. Active faults are not mapped or suspected within the Project area east of the RCFZ; fault rupture does not present a potential geologic hazard in these areas. The potential for faulting as it relates to the planned Project is discussed in the Faulting Report.

Faults crossing the pipeline alignment may require the use the flexible connections or other measures to accommodate fault-related displacement. Fault hazards and mitigations are discussed further in the Faulting Report.

3.2 LIQUEFACTION

Liquefaction is a phenomenon in which loose to medium dense, saturated, granular materials undergo matrix rearrangement, develop high pore water pressure, and lose shear strength because of cyclic ground vibrations induced by earthquakes. This rearrangement and strength loss is followed by a reduction in bulk volume of the liquefied soils. The effects of liquefaction can include the loss of bearing capacity below foundations, settlement in level ground, large horizontal deformations of relatively level ground with an unconfined vertical face (referred to as lateral spreading) and instability in areas of sloping ground (also known as flow sliding).

A potential for liquefaction exists at the Morena Pump Station site within the alluvial sand and silt layers present below the groundwater table (about 9 feet bgs). The borings and CPTs within Sherman Street and Custer Street were used to evaluate liquefaction potential at the pump station site. The evaluation methodology and the results of the evaluations are presented below. The evaluations will be refined pending the results of laboratory testing and additional subsurface explorations within the pump station property.

A potential for liquefaction also exists within the fill and alluvium present along the southern portion of the pipeline alignment (south of Ingulf Street and crossing Tecolote Creek), and potentially within some of the canyon crossings (Rose Creek and San Clemente Creek). Liquefaction potential and possible effects within the cut-and-cover portions of the pipeline alignment are discussed in this report in a qualitative manner. Liquefaction potential within the planned tunnel segments is discussed in the Tunnel Report.

3.2.1 Methodology

The procedure for evaluating liquefaction potential is empirical and is based on data and observations at sites that have, and have not, liquefied during an earthquake. In the procedure, the capacity of the soil to resist liquefaction is expressed as the cyclic resistance ratio (CRR). The seismic demand is a function of the anticipated Peak Ground Acceleration (PGA) at the site

and is termed the cyclic stress ratio (CSR). The potential for liquefaction was assessed at each sample (or CPT measurement) depth for the pump station site in terms of a Factor of Safety (FS). This factor of safety is defined as the CRR divided by the CSR generated by the design ground motion. A potential for liquefaction was interpreted to exist at each subsurface layer where the FS against liquefaction is less than 1.1. Settlement in each layer where the FS was less than 1.1 was then calculated using empirical correlations of the liquefaction potential to volumetric strain.

The potential for liquefaction and the amount of associated settlement are evaluated differently for the borings and CPTs, as described below:

SPT Method – This method uses penetration resistance of the sampler (blow counts per foot) from the borings to obtain the resistance of the soil to liquefaction. SPT N-Values are obtained from the blow counts. A correction factor of 0.65 was applied to blow counts obtained from the 2.5-inch inner diameter sampler to account for the difference in size from the SPT sampler. Laboratory test results provided fines contents for use in the analyses.

CPT Method - The analysis was performed using the CLiq software (developed by GeoLogismiki, in collaboration with Gregg Drilling and Dr. Peter Robertson). The software uses the tip resistance and sleeve friction obtained from the CPT soundings to interpret soil type, relative density/consistency and other properties to calculate the FS against liquefaction and assess secondary effects.

The SPT method incorporates the procedures outlined by Idriss and Boulanger (2008) for liquefaction triggering and the empirical method proposed by Ishihara and Yoshimine (1992) to estimate liquefaction induced settlements. Within the CLiq program, the CPT method used the updated procedures in Boulanger and Idriss (2014) for liquefaction triggering and the calibrated procedures for estimating liquefaction-induced ground settlement by Zhang et al. (2002).

The following input parameters were used in the liquefaction analysis for the MPS:

- Earthquake Magnitude, Mw: 7.0
- Peak Ground Acceleration ($PGA_)$: 0.59g
- Depth to groundwater: 9 feet bgs

The PGA used for liquefaction analyses is the Risk-Targeted PGA adjusted for Site Class D from the 2016 California Building Code. The PGA is roughly equivalent to a ground motion with a 1% probability of exceedance in 50 years and is intended to correspond to the ground motion associated with structure collapse. PGA was evaluated for both Site Classes D and E, with Site Class D resulting in a higher PGA of 0.59g, which was used in the analyses, compared to 0.53g for Site Class E. See Section 4.3 of this report for additional discussion.

3.2.2 Results

The results of the analyses for the MPS site suggest that liquefaction is expected to occur within the very loose to medium dense sand layer that is present from near the ground surface to depths

generally ranging from 19 to 29 feet bgs. Other underlying sandy layers are also subject to liquefaction and are expected to contribute to a smaller extent to liquefaction-induced settlement.

Surface expression of liquefaction is generally considered to occur as a result of liquefaction within soil layers present within about 50 feet of the ground surface. Engineering analyses of the recent borings and CPTs around the Morena Pump Station perimeter suggest that surface expression of liquefaction could result in ground surface settlements ranging from about 5 to 11 inches. Differential settlement over relatively short horizontal distances could occur due to the highly variable subsurface conditions. Settlements at the lower end of this range are expected to occur at the locations where more layering of fine-grained soils is present in the upper, potentially liquefiable layer.

The below-grade portions of some of the planned structures will extend through the upper granular layer where much of the liquefaction is expected to occur. The excavation for the Pump Station Building is expected to extend to a depth of about 50 feet bgs. However, some of the subsurface explorations around the site perimeter indicate that the sand layer that is present below about 50 feet is sufficiently loose and has a relatively low fines content, such that liquefaction could also occur in the soil at this depth. Engineering analyses suggest that settlement within this lower granular layer could result in settlement up to about 5 inches that could impact the deeper structures.

Detailed results of the liquefaction analyses are presented in Appendix E.

Although no detailed analyses were performed, the potential for soil liquefaction is suspected along the southern portion of the pipeline alignments south of Ingulf Street within the alluvial soils. Mitigation of potential liquefaction along the pipeline alignments south of Ingulf Street and north of the MPS is not planned.

3.2.3 Performance of Fine-Grained Soils

The loss of shear strength in fine-grained soil from strong ground shaking can also cause potential surface deformations and adversely impact the performance of foundations. A potential for liquefaction susceptibility in fine-grained soils can be evaluated using the criteria presented by Idriss and Boulanger (2008). The majority of the fine-grained soils encountered in our explorations are silts that are expected to exhibit sand-like behavior and hence considered to potentially liquefy. Preliminary visual observations of soil samples indicate that there are likely to be limited soil layers that exhibit clay-like behavior, which should not be susceptible to liquefaction.

Strength loss in the fine-grained soils was estimated using the correlation between plasticity characteristics and soil sensitivity (Idriss and Boulanger, 2008). However, due to the relatively limited presence of clays, it is unlikely that significant surface deformations will arise from cyclic softening of quick clays.

3.3 LATERAL SPREADING

Lateral spreading is a phenomenon where surficial soil displaces along a shear zone that has formed within an underlying liquefied layer. Upon reaching mobilization, the surficial blocks are

transported downslope or in the direction of a free face by earthquake and gravitational forces. Lateral spreading is thought to occur on slopes as level as ½ percent, or on level ground with a "free face", such as a stream bank.

The pump station site itself is relatively flat, and a levee about 8 to 10 feet high borders the site on the south. However, south of the berm, the ground surface slopes down about 13 feet to Friars Road. South of Friars Road, a more gradual slope is present between the road and the San Diego River.

It is expected that the potentially liquefiable layers present at the pump station site may be laterally continuous to the south in the vicinity of the river. Engineering evaluations suggest that there is a potential for lateral spreading to impact the Morena Pump Station and surrounding pipelines, particularly to those to the south of the pump station site. Engineering considerations associated with lateral spreading are discussed in Sections 4 and 5.

3.4 SEISMIC SETTLEMENT OF DRY SAND/SEISMIC COMPACTION

Strong ground motion can also cause the densification of soils above the groundwater level, resulting in settlement of the ground surface. This phenomenon is known as seismically-induced settlement or seismic compaction, which typically occurs in dry, loose cohesionless soils. During an earthquake, soil grains may become more tightly packed due to the collapse of voids or pore spaces, resulting in a reduction in the thickness of the soil column. Several feet of loose alluvial soils are present between the thin surficial fill layer and the groundwater table; however, considering the relatively large liquefaction-induced settlements expected, the amount of seismic compaction should be relatively low compared to the estimated liquefaction-induced settlement. Further, any liquefaction mitigation performed at the site should also mitigate the potential for liquefaction-induced settlement.

3.5 OTHER HAZARDS

Other seismic and geologic hazards that could impact the Project have been considered. In general, the local geologic conditions indicate that other seismic and geologic hazards are not likely to affect the site. Slopes in the Project vicinity are generally sufficiently flat and/or far enough from the improvements that stability is not expected to be a significant issue. Static loading from new improvements could initiate settlement within the underlying deposits; however, surface loading is relatively small and settlement should occur within relatively short time frames. Settlement is further discussed within the context of foundation design (Section 4.4). Potentially expansive and/or collapsible soil has not been identified in significant quantities along the project alignment, and should not impact Project design.

Given the location of the site, the potential for seiches or tsunamis affecting the site is considered low (County of San Diego, 2009). While the Morena Pump Station site is protected from flooding of the San Diego River by the adjacent levee, some flooding potential exists along West Morena/Morena Boulevard to the north of the pump station. From West Morena Boulevard at Tecolote Creek (just north of the Tecolote Road overcrossing) approximately 2,000 feet north along West Morena/Morena Boulevard, the Project area is within the 100-year floodplain (Federal Emergency Management Agency, 2012). This area could experience flood depths

between 1 to 2 feet, however, this hazard should not constitute constraints to the planned pipelines in this area.

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4.0 CONCLUSIONS & RECOMMENDATIONS – PUMP STATION

The primary geotechnical considerations for the design of the Morena Pump Station are the presence of potentially liquefiable soil and the need for deep excavations to facilitate construction of below-grade facilities, combined with the presence of a relatively shallow groundwater table. These considerations are discussed below. Geotechnical recommendations for design are also provided.

Based on our geotechnical investigation and analyses, it is our opinion that the site location shown on Figure 2 is suitable for development of the pump station and associated structures from a geotechnical and geologic standpoint provided the recommendations provided below are incorporated into the design and construction of the project.

4.1 LIQUEFACTION MITIGATION

As discussed in Section 3, ground surface settlements ranging from about 5 to 11 inches could occur at the MPS site during the design seismic ground motion. These settlements could be erratic with large differential settlement occurring within short horizontal distances. Some lateral movements could also occur due to lateral spreading toward the San Diego River.

Possible structural solutions to mitigate the effects of liquefaction settlement include supporting the structures on stiffened shallow foundations (mats) or deep foundations such as drilled piers or piles. Relatively thick stiffened shallow or mat foundations would limit differential settlement across the foundation, and may reduce total settlements slightly, however, significant settlement and some tilting could still occur, and it is understood that structure settlements of this magnitude are not considered acceptable from a structural standpoint. Deep foundations to support the numerous facilities would need to extend to depths estimated to range from 60 to 100 feet bgs, which could be costly. In addition, considering the large amount of below-grade infrastructure planned for the pump station site (in addition to the main structures), it is expected that it would be difficult to accommodate differential settlement between the structures and the other infrastructure.

Ground improvement is considered the most feasible approach to limit total settlement of structures to acceptable levels, provide improved foundation support, and limit differential settlement between structures and interconnected utilities and structures. At a minimum, the treatment would need to improve the potentially liquefiable sandy layer that extends to depths ranging from 19 to 29 feet. Deeper treatment is recommended to address deeper granular layers that were encountered in some locations, as well as below the Pump Station Building and other below-grade structures.

The soil liquefaction mitigation (ground improvement) will mitigate the potential for lateral spreading and seismic settlement of dry sands at the pump station property. Total post-liquefaction and dry sand seismic settlements are estimated to be less than 2 inches, which is within the tolerable settlement limits for the structures provided by the project structural engineer.

Selection of the type of ground improvement depends on the soil conditions, surface conditions, and the desired level of improvement. Some options are discussed below. Regardless of the option selected, flexible connections on pipelines exiting the pump station site will be required. If the entire pump station site is not improved, flexible connections on utilities within the site would also be needed. Due to the presence of nearby buildings, strong vibration-induced densification techniques were not considered because of the possibility of settlement of those structures.

The ground improvement methods discussed below are all considered technically feasible for the soil conditions present at the site. Cost, schedule, and plan area to be improved (below individual structures vs. entire site) should be considered to select the most appropriate method. It may also be possible to combine shoring of the deep excavations with the ground improvement system. The recommended method (vibro-replacement) is considered the most technically appropriate and cost-effective, however, other techniques can be considered based on discussions with the selected ground improvement contractor.

4.1.1 Compaction Grouting

Compaction grouting injects a low-mobility grout under relatively high pressures into the soil to displace and compact soils, improve shear strength and reinforce fine-grained soils. Each depth increment of grout injection is called a "stage" and is typically on the order of 1 to 2 feet. The process can be optimized by sequencing primary and secondary injection points, which are grouted in an alternating pattern. The injection points are typically located within planned building footprints, with the treatment area extending a minimum of five feet horizontally outside the edge of the planned foundations.

The purpose of the compaction grouting would be to increase the relative density of the potentially liquefiable layers to reduce the estimated settlement to an amount that can be tolerated by the structures. The design of compaction grouting program, which is typically executed by a specialty geotechnical contractor, is typically dependent on the following criteria: 1) allowable post-improvement settlement (liquefaction-induced); 2) depth of soil improvement; 3) lateral limits of soil improvement, 4) construction monitoring tolerances and requirements, and 5) verification testing acceptance criteria (e.g., post improvement CPTs). It is common to design a compaction grouting program such that the post-improvement liquefaction-induced settlement is limited to less than an inch.

4.1.2 Vibro-Replacement

Vibro-replacement involves inserting a probe into the ground to densify the surrounding soils and filling the void created with gravel to create a "stone column" or "aggregate pier". The procedure is repeated along a grid pattern over the area to be improved. The minimum diameter of the stone columns is typically 3 feet. The column spacing is typically 6 to 10 feet.

Vibro-replacement can mitigate the potential for liquefaction by: 1) densifying the soils, 2) reinforcing the soil mass with columns of gravel, and 3) providing increased drainage to alleviate the excess pore pressures developed by strong ground shaking (Idriss and Boulanger 2008).

Vibro-replacement is suitable for sands, silts and clays (Idriss and Boulanger 2008), although drainage and liquefaction mitigation are maximized in sands. The method improves bearing capacity and typically allows for shallow foundations for support of structures due to the reduced potential for liquefaction-induced settlement.

A specialty geotechnical contractor designs and constructs the vibro-replacement using performance criteria specified by the Geotechnical Engineer. The criteria are typically:

- Allowable vertical bearing pressure (post improvement).
- Allowable liquefaction-induced settlement (post improvement).
- Depth of soil improvement.
- Lateral limits of soil improvement.
- Acceptance Testing (e.g., post improvement CPTs).

4.1.3 Soil Mixing

Various methods and types of soil mixing are available and typically involve in-situ mixing of cement slurry with existing soil to create columns of improved soil.

Deep Soil Mixing produces relatively large diameter soil-cement columns (up to about 9 feet in diameter). It can typically extend to depths of about 80 feet, and is well suited to liquefaction mitigation. Variations of this method can be used to construct reinforced and/or tied-back secant and tangent pile walls for basement excavations.

Other methods use multiple cutting heads or augers to create overlapping or continuous columns of improved soil. Cement Deep Soil Mixing (CDSM) is often used to create "cells" of improved soil to mitigate liquefaction. Cutter Soil Mixing (CSM) is generally used to create soil-cement panels, similar to a diaphragm wall, which, when reinforced, can be used as basement wall excavations. The selection of the appropriate cutting tool should consider the presence of the gravel layers in the subsurface.

4.1.4 Selected Ground Improvement Option

Based on the site constraints (limited site size and surrounding improvements), the subsurface conditions, and cost considerations, we recommend bottom feed vibro-replacement (stone columns) be utilized to improve the ground conditions for mitigation of liquefaction potential. Due to the numerous planned below-grade utility connections within the pump station facility, ground improvement should extend across the entire pump station site (to the property line) as shown on Figure 4a. We understand that flexible connections are also planned between the underground utilities and buildings within the pump station facility. We further understand that the flexible connections will allow for approximately 1 inch of differential movement between these utilities and the buildings.

To reduce total and differential liquefaction-induced settlement to acceptable levels, stone columns should be installed on a grid pattern of approximately 10 feet by 10 feet. The recommended stone column depths across the site are shown on Cross Section A-A' on Figure

4b. Across the majority of the pump station site, stone columns should be installed to a depth of 50 feet to limit ground surface settlement and associated impacts to at-grade structures and near-surface utilities. Within the footprint of the Pump Station Dry Well/Wet Well (foundation depth of about 50 feet) and the Intake Screening Building (foundation depth of about 33 feet), stone columns should be installed to approximately 75 feet bgs to densify sand layers that are present below those relatively deep foundations. Stone column recommendations will be refined based on additional planned field exploration and engineering analyses, and a pre-production ground improvement test program will be implemented to define the actual stone column spacing for production.

Evaluation of the test section and acceptance of the ground improvement will be based on the results of post-ground improvement CPTs, which should be performed on a grid pattern of about 40 feet by 40 feet in between the stone columns. The calculated post-liquefaction settlement based on the CPTs will be required to be less than 2 inches, which should provide a differential settlement of less than 1 inch over a 20 foot horizontal distance. The post ground improvement CPT results will be evaluated using the procedures outlined by Idriss and Boulanger (2008) for liquefaction triggering and the empirical method proposed by Ishihara and Yoshimine (1992) to estimate liquefaction induced settlements.

4.2 BELOW GRADE DESIGN & CONSTRUCTION

The three main planned below-grade structures at the Morena Pump Station, the Intake Screening Building (excavation depth of about 34 feet), Pump Station Building (about 51 feet) and Energy Dissipator Structure (about 25 feet deep) will require significant excavation depths that will extend into the alluvium and below the groundwater table. Due to the depths and the presence of surrounding structures, the below-grade excavations will require temporary or permanent shoring and temporary groundwater control during construction. The permanent below-grade walls will need to be designed to resist lateral earth pressures, groundwater and seismic effects. Several feasible shoring and dewatering methods, as well as recommendations for below-grade wall design, are presented in the following sections.

4.2.1 Shoring Types

Much of the below-grade construction in previous developments in and near downtown San Diego has used soldier piles (driven steel H-piles or drilled and concreted H-piles) with wood or steel lagging between the soldier piles to provide temporary support for "bottom-up" construction. Soldier pile and lagging shoring systems generally require global dewatering (discussed further in the following section), which could require significant pumping to achieve acceptable conditions at the pump station site due to the predominantly sandy conditions. While the shallower Energy Dissipator Structure may be practical to construct with soldier piles and lagging, the deeper structures may require excessive dewatering using this method. Further, the length of the soldier piles needed for the Pump Station Building may be impractical. If used, soldier piles should be drilled rather than driven due to presence of gravel layers and to minimize the potential for settlement of adjacent structures due to densification of loose sand layers during pile driving.

Shoring generally requires lateral support to construct a basement that extends more than one level. Most San Diego based contractors use temporary ground anchors (tiebacks) behind the

wall, rather than internal bracing (struts and walers) in front of the wall to maximize accessibility within the excavation, however, internal bracing could be practical for some of the structures planned for this site. The most common anchors are auger drilled and pressure grouted tendons. The number of levels of tiebacks would depend on the depth of excavation, lateral and other loads, and the serviceability requirements of nearby infrastructure.

Sheet pile walls may also be feasible to retain the shallower excavations planned for the site. Structural sections of piles, typically panels of interlocking "Z" or "W" shapes, are driven into the ground sequentially to form a relatively water-tight excavation. Dewatering would still be required within the excavation. The sands and silts present at the site should result in acceptable installation conditions for sheet pile walls, although additional investigation is needed to determine the depth and extent of gravel layers at the site. Installation is typically accomplished by vibrating or driving the sheet piles into the ground. Care would be needed to avoid damaging nearby structures due to vibrations. While tiebacks can be used to provide lateral restraint of sheet piles, this type of shoring is typically used for shallow excavations where lateral restraint is not needed. Alternatively, internal bracing could be used for smaller excavations.

For the Pump Station Building and the Intake Screening Building, several types of reinforced concrete walls, such as diaphragm walls or secant/tangent walls, should be considered. These methods use various excavation techniques to create a water-tight shoring/cut-off wall that can also act as the permanent below-grade wall. Similar to sheet pile walls, dewatering is limited to within the excavation. For diaphragm walls, excavation is typically achieved using a clamshell excavator bucket to create a wall that is several feet thick. A secant or tangent wall is generally a series of overlapping drilled shafts. Considering the subsurface conditions and shallow groundwater level, excavation for both types of walls would likely be advanced using drilling fluid to maintain stability of the excavation until concrete is placed. Various types of reinforcement can be set in the concrete. As discussed previously, soil-cement can also be used to construct basement walls, and could be used in combination with liquefaction mitigation.

Regardless of the shoring method selected, monitoring of the infrastructure surrounding the site, including public roads, neighboring buildings, and the trolley tracks, will require careful monitoring to check that the excavation is not significantly impacting these features. Preliminary lateral earth pressures for the design of temporary tied-back shoring systems are presented on Figures 5 and 6 for excavation depths of 30 and 50 feet, respectively.

4.2.2 Dewatering

Considering the shallow depth to groundwater, dewatering of the area ahead of the major excavations will be required to reduce the possibility of soil instability at the bottom of the excavation and to allow for dry, firm working conditions. The groundwater surface should remain at least 5 feet below the bottom of the excavation until the foundations are poured and adequate structure loads are in place to resist hydrostatic uplift. Dewatering volumes could be substantial due to the predominate presence of sands and silts within the planned excavation depths.

The typical approach would be to globally dewater the excavation area with closely-spaced wells around the perimeter of the excavation and possibly within the excavation as well. This method would be required if soldier pile and lagging is used for shoring. Other shoring methods that

create a water-tight shoring wall, such as sheet piles, diaphragm wall and contiguous pile or soil-cement walls, should require less pumping to lower the groundwater level within the excavation. Alternate dewatering methods such as ground freezing, which would reduce or eliminate groundwater discharge concerns, could be considered but are costly.

Dewatering for the Pump Station Building will likely need to consider permeabilities within both the upper and lower sandy alluvial layers. The excavations for the Intake Screening Building and Energy Dissipator Structure may extend into the finer grained intermediate layer between depths of about 20 to 30 feet and 50 feet; this layer is much siltier and will be less transmissive than the more sandy layers above and below this depth, which will be a factor in dewatering design.

We have performed a preliminary evaluation of the groundwater pumping rate for construction dewatering that will likely be required to provide dry excavation for below-grade construction. The subsurface stratigraphy used in this evaluation was based on Boring PS-2 advanced on March 28, 2017. The subsurface was modeled to include 4 layers as shown in Table 2 below:

Table 2
Subsurface Layering for Groundwater Pumping Rate Evaluation

Layer	Elevation (feet, NGVD 29)	Soil Description
1	+16 to -10	Poorly graded sand with silt (SP-SM)
2	-10 to -35	Silt/clay (ML/CL)
3	-35 to -55	Poorly graded sand with silt (SP-SM)
4	-55 to -100	Silt/clay (ML/CL)

The design groundwater elevation is +5 feet, NGVD 29 based on measurements for the well development on March 31, 2017 and the slug tests performed on July 26, 2017. Slug tests were performed to evaluate the hydraulic conductivity of the subsurface. Correlations with index properties were also used to evaluate the hydraulic conductivity.

We used the computer program GeoSlope SEEP/W to evaluate the water flow rate during dewatering. Various boundary conditions and subsurface conditions were modeled for both a cross sectional model and a plan model. The cross sectional models assumed a 100-foot wide excavation with a row of dewatering wells on each side of the excavation. The plan models assumed an 80 by 100 foot excavation with dewatering wells spaced at 20 feet around the perimeter of the excavation. A summary of the SEEP/W analyses is presented in Table 3 below, and the results of the analyses are presented in Appendix F.

Table 3
Model Assumptions and Flow Rates for Groundwater Pumping Rate Evaluation

Model	Model Conditions	Flow Rate (gpd[1])
1	Cross Sectional Model, 1000-ft model width and individual soil layers	93,070
2	Cross Sectional Model, 500-ft model width and individual soil layers	208,631
3	Cross Sectional Model, 500-ft model width and composite soil layer	56,876
4	Plan View Model with 500-ft width, composite soil layer, and K_h/K_v=1	168,689
5	Plan View Model with 500-ft width, composite soil layer, and K_h/K_v=5	430,447

Note:
1. gpd = gallons per day

Based on these evaluations, we recommend that a flow rate between 168,000 and 430,000 gpd be assumed for planning and permitting purposes. The flow rate and total volume of water extracted may be reduced depending on the shoring method used to perform the excavation. Different shoring methods can reduce the flow of water into the side walls of the excavation and reduce the dewatering requirements.

Pump tests and additional borings and laboratory testing may be performed within the pump station property once access is permitted. Pump tests may be performed to provide additional data on soil permeability at various depths for design of the dewatering system and estimation of disposal estimates.

Analytical laboratory testing was performed on the groundwater sample collected from the monitoring well PS-2. The metals barium and molybdenum were detected at concentrations of 0.142 and 0.0287 milligrams per liter (mg/l), respectively. Total TPH was detected at 73 micrograms per liter (µg/l); and the VOCs cis-1,2-dichloroethene (c-1,2-DCE) and trans-1,2-dichloroethene (t-1,2-DCE) were detected at 480 and 2.6 µg/l, respectively. No PCBs, OCPs or SVOCs were detected above their respective laboratory detection limits.

The analytical results were compared to State and Federal hazardous waste criteria. Based on the metals, VOCs and TPH concentrations detected, the wastewater is not considered Federal Resource Conservation and Recovery Act (RCRA) or California hazardous. However, for project dewatering purposes, pumped groundwater is anticipated to either be disposed to the municipal stormwater or sewer systems. Both disposal options will require a discharge permit and additional analytical testing to satisfy permit requirements. Additionally, because of the presence of VOCs and TPH, predisposal treatment of the wastewater from construction dewatering would likely be required. However, given the low concentration of contaminants detected, it is likely treatment will be successful in meeting permit requirements. Permit requirements will also include the identification of a discharge location, estimation of the volume and rate of discharge and discharge duration, and payment of related discharge fees. Dewatering will require a permit from the Metropolitan Waste Water Department (MWWD) to divert effluent to the sewer or a National Pollutant Discharge Elimination System (NPDES) permit if effluent is diverted to a storm drain. Further analytical testing of groundwater is planned as access to the pump station site is provided.

The dewatering contractor is responsible for designing, installing, and operating a dewatering system capable of lowering and maintaining the groundwater to the desired depths during

construction. As part of final design, AECOM should be consulted to evaluate the depth of required drawdown to check that the shoring system is stable against geotechnical failure mechanisms, such as external stability, foundation heave and hydraulic failure, and also estimate settlement of the adjacent ground due to dewatering.

4.2.3 Below-Grade Wall Design

To construct the permanent subterranean walls, cast-in-place concrete walls can be placed within the shoring system, or a finished surface can be placed over the permanent shoring wall. Permanent subterranean walls should be designed for earth, hydrostatic, seismic, and surcharge pressures. A preliminary lateral pressure diagram for the design of below-grade walls is presented as Figure 7.

The subterranean walls along the streets will be subject to traffic loading (car and truck traffic). The vertical surcharge load to account for traffic was assumed to be the equivalent of 2 feet of soil overburden or 250 pounds per square foot (psf). While loading from the Trolley is not expected to impact below-grade wall design, considering the currently planned pump station layout, the vertical surcharge load from the Trolley is considered to be 1,880 psf, based on our previous experience working with similar projects in Downtown San Diego.

When designing the walls for the static case only, the restrained earth pressure increment should be added to the active earth pressure in addition to the hydrostatic and surcharge pressures. When designing the walls for seismic case only, the seismic pressure increment should be added to the active earth pressure in addition to the hydrostatic and surcharge pressures.

The recommended seismic pressure increment was estimated as an equivalent fluid, and was developed by considering recommendations by Lew and others (2010). They completed a comprehensive review of the methods used to assess seismic earth pressures on deep subterranean retaining walls and provided updated recommendations for design. The seismic pressure increment was developed using a conservative estimate of the pseudostatic acceleration coefficient (K_h) that is equal to 0.5 PGA (PGA=0.59G) as recommended by Lew and others (2010).

4.2.4 Subsurface Drainage and Waterproofing

Design of the portion of the permanent subterranean walls above the groundwater level should incorporate adequate drainage behind the wall to collect water from sources such as irrigation or surface runoff to reduce the potential for hydrostatic pressure to build up behind the wall. The wall drainage should extend at least 5 feet below the design groundwater elevation. The drainage system should consist of a prefabricated geocomposite drainage structure, such as Miradrain or equivalent, or filter material behind the wall. Filter materials should conform to the gradation requirements specified in Section 300-3.5.2 (Pervious Backfill) of the current "Standard Specifications for Public Works Construction." If filter material is used behind the wall, the horizontal width should be at least 18 inches and the material should extend up to within 18 inches of the ground surface.

Basement walls should be waterproofed for end use. Because of the potential for increased moisture from landscaping and underground utilities, it may be necessary to place the

waterproofing over the entire height of the walls, depending on the functionality of the wall surface needed. A limited degree of waterproofing is expected to be required for the Project; this typically allows damp patches and minor leakage through construction joints. A high degree of waterproofing may be needed if functionality requires the interior of the basement wall surface to be free of all leakage, seepage and damp patches. The Project Architect and qualified waterproofing consultant should review and select waterproofing requirements relative to the desired functionality.

4.3 SEISMIC DESIGN

The Project area will likely be subject to moderate to severe ground shaking in response to a local or more distant large-magnitude earthquake occurring during the expected life of the planned facilities. We understand seismic design parameters are required for design of the Morena Pump Station facilities. Parameters can also be provided for other locations along the pipeline alignment, if needed. For design in accordance with the 2016 CBC (based on ASCE 7-10), the following parameters should be used. These parameters are developed in the code based on Risk-Targeted Maximum Considered Earthquake (MCE_R) ground motion response accelerations.

Based on the presence of potentially liquefiable soils, the Site Class would be F in accordance with ASCE 7-10. However, since we understand the fundamental period of the structures will be 0.5 seconds or less, Site Class D may be used in lieu of F for structural design. In addition, if ground improvement is used to mitigate the potentially liquefiable soils, Site Class D may also be appropriate. Seismic design parameters for Site Class E were evaluated to aid in the evaluation of PGA for liquefaction studies; however since the short period acceleration for Site Class D is higher than Site Class E, the Site Class D acceleration was used for engineering evaluations. The seismic design coefficients for Site Classes D and E are summarized in Table 4.

Table 4
2016 CBC Seismic Coefficients

Parameter	Value	Value	Reference
Site Class	D	E	ASCE 7-10, Table 20.3-1
Mapped Spectral Acceleration - Short Period, S_s (g)	1.291	1.291	2016 CBC Figure 1613.3.1(2)[1]
Mapped Spectral Acceleration - 1 Sec. Period, S_1 (g)	0.500	0.500	2016 CBC Figure 1613.5(4)[1]
Site Coefficient - Short Period, F_a	1.000	0.900	2016 CBC Table 1613.3.3(1)[1]
Site Coefficient - 1 Sec. Period, F_v	1.500	2.400	2016 CBC Table 1613.3.3(2)[1]
MCE[2] Spectral Response Acceleration - Short Period, S_{MS} (g)	1.291	1.162	2016 CBC Equation 16-37, $S_{MS}=F_aS_S$
MCE[2] Spectral Response Acceleration - 1 Sec. Period, S_{M1} (g)	0.750	1.200	2016 CBC Equation 16-38, $S_{M1}=F_vS_1$
Design Spectral Response Acceleration - Short Period, S_{DS} (g)	0.861	0.775	2016 CBC Equation 16-39, $S_{DS}=2/3*S_{MS}$
Design Spectral Response Acceleration - 1 Sec. Period, S_{D1} (g)	0.500	0.800	2016 CBC Equation 16-40, $S_{D1}=2/3*S_{M1}$

Table 4
2016 CBC Seismic Coefficients

Parameter	Value	Value	Reference

Notes:
1. Calculated using U.S. Seismic Design Maps web application developed by USGS.
2. MCE – Maximum Considered Earthquake.
3. Site coordinates estimated from 'Google Earth' computer program used to evaluate coefficients: 32.76331; -117.20021.

4.4 FOUNDATION DESIGN

Structure foundations at the Morena Pump Station will vary between near-surface to depths of about 50 feet bgs. Therefore, foundation recommendations have been developed for the near-surface soil above the groundwater level, the upper sandy zone below the groundwater level, the finer grained/silty intermediate zone, and the (relatively denser) lower sandy zone.

Near-surface foundations may consist of conventional continuous strip and spread footings founded on existing, recompacted or improved fill or alluvium. Mat foundations may also be used to support near-surface structures. Foundations below the groundwater level should be supported on thick mat foundations. Tiedowns may be required if structure weights are insufficient to resist buoyancy effects due to the shallow groundwater level. Pad foundations (small mats) may be used to support lightly-loaded equipment at grade.

4.4.1 Continuous Strip and Spread Footings

Continuous strip and spread footings above the groundwater should be embedded at least 18 inches below lowest adjacent grade and should be at least 12 inches wide. Footings dimensioned as recommended may be designed using the following allowable soil bearing pressure.

Table 5
Allowable Bearing Pressures for Footing Design

Footing Depth (feet, bgs)	Allowable Bearing Pressure (psf) [a]	Increase per Foot of Embedment (psf) [b]	Increase per Foot of Width (psf) [c]	Maximum Allowable Bearing Pressure (psf)
0 to 6 (above groundwater)	2,000	1,000	500	3,000
6 to 9 (above groundwater)	1,800	NA	NA	1,800

Notes:
a. Allowable bearing pressure may be increased by one-third for loads that include wind or seismic forces.
b. Per foot of embedment beyond 18 inches below lowest adjacent grade.
c. Per foot of width beyond 12 inches.

Adjacent footings bearing at different elevations should be located such that the slope from bearing level to bearing level is flatter than 1:1 horizontal:vertical (H:V).

For foundations designed as recommended above, the total settlement due to foundation loads only is estimated to range from about ½ to 1 inch, with differential settlements approximately half that amount between adjacent columns. The majority of this settlement should occur when

structure loads are applied. The estimated settlement should be re-evaluated by the Geotechnical Engineer when the structure design is complete, especially where the footings are not similarly proportioned, embedded, and loaded.

The upper 12 inches of material in areas not protected by hardscape should not be included in design for passive resistance. If friction is to be used to resist lateral loads, we recommend using an allowable coefficient of friction of 0.4 between the soil and foundation concrete. If it is desired to combine frictional and passive resistance in design, we recommend using an allowable friction coefficient of 0.3. Passive resistance may be increased by one-third for loads that include wind or seismic forces.

4.4.2 Mat Foundations

Mat foundations with a minimum width of 5 feet can be designed for the following allowable bearing pressures, based on the depth of the mat below grade.

Table 6
Allowable Bearing Pressures for Mat Foundation Design

Depth of Mat Foundation (feet, bgs)	Allowable Bearing Pressure (psf) [a,b]
0 to 55	4,000
>55	6,000

Notes:
a. Allowable bearing pressure may be increased by one-third for loads that include wind or seismic forces.
b. Based on an assumed foundation width of 10 feet.

The immediate settlement at the center of the mat subject to these bearing pressure is estimated to be ¾- to 1 inch.

The geotechnical analysis of large mat foundations typically uses the Modulus of Vertical Subgrade Reaction (k) developed from evaluations of settlement that consider actual loads, the plan layout of the mat and local variations in subsurface conditions. AECOM recommends a Modulus of Vertical Subgrade Reaction of 75 pounds per cubic inch (pci) for foundations below the groundwater level, if ground improvement techniques are not employed. The installation of stone columns, as recommended in the ground improvement section above, will densify the subsurface soils across the entire pump station site and below proposed foundations. Based on the presence of stone columns, we recommend that the mat foundations planned for the structures founded below the groundwater level be designed for a Modulus of Vertical Subgrade Reaction of 125 pounds per cubic inch (pci). Shallow mat foundations founded in fill soils above the groundwater may be designed for a Modulus of Vertical Subgrade Reaction of 150 pounds per cubic inch (pci). The densification of the sandy soils should be verified as part of the stone column program; the Modulus of Vertical Subgrade Reaction may need to be reevaluated at that time. We should review the plots of mat contact pressures and deflections for compatibility with the geotechnical assumptions used to develop the modulus and the strength and stiffness characteristics interpreted to exist within the materials supporting the foundation.

4.4.3 Lateral Resistance

Resistance to lateral loads on the foundations can be provided by passive resistance along the edge of the footings and by frictional resistance along the bottom of the footings. For passive resistance, we recommend using the following allowable equivalent fluid weights for footings or grade beams poured neat against the excavation or properly backfilled.

Table 7
Foundation Allowable Passive Resistance

Depth of Footing (feet, bgs)	Allowable Passive Resistance (pcf) [a, b]
0 to 9 (above groundwater)	250
9 to 25 (below groundwater)	115
25 to 55 (below groundwater)	100
>55 (below groundwater)	175

Notes:
a. Allowable bearing pressure may be increased by one-third for loads that include wind or seismic forces.
b. pcf – pounds per cubic foot.

4.5 RETAINING WALL DESIGN

We understand small gravity retaining walls may be used to retain surface improvements at the site. Retaining walls should be designed for earth, seismic, and surcharge pressures (seismic pressure can be neglected for walls less than 6 feet high). Hydrostatic pressures should not develop on the near-surface retaining walls considering the depth to groundwater and assuming proper drainage behind the walls. Foundations for retaining walls can be designed using the recommendations for continuous strip and spread footing presented in Section 4.4.1 of this report. The following sections provide specific recommendations for subsurface drainage and wall design.

4.5.1 Subsurface Drainage

Retaining walls should have adequate drainage behind the wall to avoid developing hydrostatic pressure from leaking underground utilities or surface runoff. Retaining walls should have a perimeter drain at the base of the wall. The base drain should be a minimum four-inch diameter perforated pipe. The pipe should be surrounded with at least one cubic foot per lineal foot of pipe of ¾-inch crushed rock wrapped with filter fabric, such as Mirafi 140NL, or approved equivalent.

Adequate weep holes or collector pipes need to be incorporated into the system to provide an outlet for the drained water. Drainage from collector pipes should be directed to a suitable outlet. Existing or proposed water bearing utilities, or surface conditions that could promote infiltration (e.g., irrigated landscaping) behind walls, may require additional subsurface drainage.

4.5.2 Lateral Earth Pressures

Lateral earth pressures behind retaining walls depend on the allowable wall movement, wall inclination, backfill material and backfill slope. Retaining walls that are free to deflect at the top should be designed for an equivalent fluid weighing 35 pcf for level backfill. This earth pressure assumes the free standing walls will have a vertical back and will mainly retain properly processed, placed and compacted coarse grained soils. They also assume compaction within four feet of the wall will be completed with light hand-held or equivalent equipment; the lateral pressures would be higher if heavy equipment is used for soil compaction next to the walls.

For typical car and truck traffic, the lateral pressure can be estimated as a vertical surcharge equivalent to 2 feet of soil overburden or 250 psf.

Walls with heights over 6 feet should be designed for a seismic pressure increment applied as an inverted triangular distribution equal to 27 pcf. To develop the seismic pressure, the seismic pressure increment should be added to the active earth pressure. The seismic pressure increment was developed using the Mononobe-Okabe pseudo-static approach and a repeatable ground acceleration of 0.3g.

4.6 CORROSIVITY

Analytical testing for corrosion potential was performed on select soil samples at the pump station and along the project alignment. The results of the analytical testing are presented in

Appendix B; sample locations are shown on the boring logs (Appendix A). Due to the marine depositional environment, it is expected that the on-site soil may be somewhat corrosive, and that concrete and steel design will need to consider potential effects of corrosion. We understand that a corrosion engineer is part of the project design team. The analytical tests for corrosion potential have been forwarded to the corrosion engineer for evaluation and development of design recommendations.

Additional testing of groundwater samples may be required to provide data on corrosivity as part of the application for groundwater disposal for dewatering.

4.7 STORMWATER INFILTRATION

Infiltration testing has not been performed, as access to the site will not be permitted by the current property owner until October 2017. Based on the AECOM field explorations near the Morena Pump Station, the soils underlying the site are shallow fills overlying alluvium consisting of interbedded silty sands, clays, and sands. These soils are most likely attributable to Hydraulic Group D soils (City of San Diego 2016 Storm Water Standards). These soils are expected to provide an infiltration rate between 0.01 and 0.5 inches per hour, consistent with partial infiltration. However, the measured groundwater at the site is approximately 9 feet below the existing ground surface. Based on the City of San Diego Storm Water Standards, Part 1: BMP Design Manual, the depth to the seasonal high groundwater table must be greater than 10 feet for infiltration Best Management Practices (BMPs) for stormwater infiltration to be allowed.

Soil and groundwater contamination have been mapped in the vicinity of the site. Analytical laboratory tests were performed on one groundwater sample recovered from the monitoring well developed in Custer Street near the pump station location. Total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) were detected in the groundwater sample. The presence of on-site groundwater contamination further restricts the feasibility of stormwater infiltration at the site due to the potential for spreading contamination. Analytical test data are discussed in Section 4.2.2 above and presented in Appendix C. In addition, and as discussed above, groundwater was measured at 9 feet below the ground surface in the monitoring well installed in Custer Street. In accordance with Section C.3 of the Storm Water Standards, this should also preclude infiltration of stormwater at the site. Both of these issues are addressed in Criteria 3 and 7 of Worksheet C.4-1 (Appendix G).

Due to shallow groundwater and potential contaminants in the subsurface, infiltration of stormwater is not recommended at the pump station site. Infiltration of stormwater could also lead to mounding of groundwater in the area and increase the risk of soil liquefaction on neighboring properties. As indicated in Worksheet C.4-1, if any of the criteria "…from rows 5-8 is no then infiltration of any volume is considered to be infeasible within the drainage area."

The above evaluation is summarized in the attached Worksheet C.4-1 (Appendix D of the San Diego Storm Water Standards). Partial infiltration is indicated as feasible per this worksheet from a subsurface soil standpoint, however, due to the shallow groundwater, the potential liquefaction and the presence of groundwater contaminants, infiltration of stormwater is not recommended at this site.

5.0 CONCLUSIONS & RECOMMENDATIONS – CUT & COVER PIPELINES

The primary geotechnical considerations for the design of the pipelines are the presence of shallow groundwater at the southern end of the project and potential concretions in the formation soils. In addition, pipeline sections south of the MPS may be installed using trenchless techniques. These considerations are discussed below. Geotechnical recommendations for design are also provided.

Based on our geotechnical investigation and analyses, it is our opinion that the pipeline alignments shown on Figures 3a through 3e are suitable for pipeline development from a geotechnical and geologic standpoint provided the recommendations provided below are incorporated in the design and construction of the project.

5.1 LIQUEFACTION

A potential for liquefaction exists for the portions of the pipelines both south of the Morena Pump Station and extending north from the pump station along Morena/West Morena Boulevard to Ingulf Street, as shown in Table 1. Liquefaction-induced ground surface settlement is expected to vary across the alignment, but magnitudes could be as high as what is estimated at the pump station site (5 to 11 inches). Mitigation for soil liquefaction along the pipeline alignments outside of the MPS pump station facility will not be performed; some differential settlement may be experienced along the pipelines near the edge of the improved area adjacent to MPS.Liquefaction may also be experienced along the southern portions of the pipeline alignments in the Morena Blvd. and W. Morena Blvd. areas.

Generally, the pipelines will settle along with the ground surface, with the pipelines somewhat moderating the differential settlement that will occur along the alignment. In general, since liquefaction can essentially "fluidize" the soil, pipelines below the groundwater table can "float" during post-liquefaction conditions, typically resulting in apparent heave at the ground surface. However, we understand that the pipeline will essentially be continuously full of water/effluent. The weight of the filled pipeline will be similar to the weight of the liquefied soil displaced by the pipeline, if soil liquefaction occurs. Therefore, the potential for the pipe to float as a result of liquefaction is considered negligible. From an operational standpoint, we understand that the pumps will be shut-off in the event of a significant earthquake, reducing the volume of fluid that could leak if the pipe ruptures.

5.2 EXCAVATION AND SHORING

Considerations related to pipeline trench excavation, dewatering and shoring are presented in this section. While not discussed in this geotechnical report, trenchless technology could be considered in some of the areas of high groundwater to reduce the need for dewatering and addressing difficult shoring and excavation conditions. Trenchless technology may also be considered at crossings of major intersections to address logistical concerns.

5.2.1 Excavatibility

Trench excavatibility will vary along the alignment. Near the Morena Pump Station, the fill, alluvium, and Bay Point Formation should mostly be excavatible using conventional earth-moving equipment. Some cobbles and boulders or other obstructions could be present within the fill and alluvium; these could require hoe-rams or other equipment to break up the oversized material for removal. Excavation will also extend below the groundwater level in much of this area.

As the alignment extends east from Morena Boulevard and Ingulf Street into older formational material, excavation conditions will be more difficult. Larger equipment will likely be required for excavation. Hoe-rams and breaker bars will likely be required in some areas due to zones of cementation/concretions, as well as cobbles and boulders within the various units.

5.2.2 Dewatering

Excavation along much of the southern stretch of the alignment will require excavation below the groundwater table. It will be necessary to lower the groundwater level below the bottom of the trench a minimum of 2 feet. The method of dewatering will depend on the type of shoring selected (see next section), but options include installing dewatering wells along the alignment or placing sumps within the bottom of the excavation. The soil below the groundwater level along much of this stretch consists of granular material with relatively high permeability and therefore high flow rates. Estimated permeability is expected to be similar to conditions at the pump station site (see Section 4.2).

5.2.3 Shoring

Shoring east of the Morena Boulevard/Ingulf Street intersection will need to retain primarily dense formational material, with some areas of fill soil. The formational soils can likely be retained using standard trench shields. Some caving could occur within the fill soils as well as within zones of clean sand within the more granular formations. These sections will likely require continuous shoring to retain the soil.

South of the Morena Boulevard/Ingulf Street intersection, shoring will need to retain potentially loose and granular soil, with possible cobbles and boulders, and will extend below the groundwater level in some reaches of the pipeline alignments. Where cobbles and boulders are not present, sheet piles would likely be the most appropriate shoring method due to its relatively water-tight seal (with the benefit of reduced dewatering demands) and ease of installation in loose and soft soils. However, oversize rock could cause refusal to sheet pile installation. Where oversize rock is encountered or suspected, or where denser materials may be present within the excavation depths, pre-augering can be used in advance of sheet pile installation to disturb the ground and potentially remove obstructions. Sheet piles are typically driven or vibrated into place; settlement of nearby improvements due to vibrations should be considered and monitoring may be required.

In areas of denser ground, deeper excavations, or significant zones of oversize rock, other shoring methods should be considered. Driven or drilled soldier piles and lagging, with internal bracing or tiebacks as needed, would likely be an appropriate shoring method, although

additional dewatering would be required. Other water-tight walls such as secant pile or tangent walls, while costly, could also be considered.

Trench box or braced shoring should be designed to resist at-rest soil pressures. An equivalent fluid pressure (EFP) of 60 pounds per cubic foot (pcf) may be assumed for at-rest lateral pressures above the water table. Below the water table, an EFP of 29 pcf and 30 pcf may be assumed for fill/alluvium and formational soils, respectively. A hydrostatic pressure of 62.4 pcf should be assumed below the water table if construction dewatering is not employed (i.e. use of sumps to control groundwater in the bottom of the trenches).

Lateral forces may be resisted by passive resistance. An EFP of 240 pcf, and 260 pcf may be assumed for fill/alluvium and formational soils above the water table, respectively. An EFP of 115 pcf, and 130 pcf may be assumed for fill/alluvium and formational soils below the water table, respectively.

5.3 EARTHWORK

Earthwork for the pipelines is expected to consist of trench excavation, placement of the pipe bedding and pipe, trench backfill, and replacement of the pavement section or other existing surface. Earthwork should be completed according to the applicable and most recent versions of the City of San Diego Grading requirements, the California Building Code and the Standard Specifications for Public Works Construction.

5.3.1 Trench Backfill Materials

Soil to be used as trench backfill outside of the pipe bedding zone should meet the criteria listed below:

- No oversize materials greater than 6 inches in maximum dimension.
- An Expansion Index (EI) less than 30 and a Plasticity Index less than 25.
- A relatively well-graded particle size distribution with at least 60 percent (by weight) passing a 1-inch sieve and fines content (percent, by weight, passing the No. 200 sieve) not exceeding 30 percent.

Most of the soil excavated from the trenches should meet the above requirements, although north of Ingulf Street, some of the native formational material may need to be screened to remove oversize material.

Bedding within the pipe bedding zone (12 inches below pipes to 6 inches above the pipes) should consist of clean sand in accordance with the Green Book. Class 2 Aggregate Base will be required within roadway sections. The Geotechnical Engineer should review and test all import sources.

Geotechnical laboratory R-value testing for the project is not complete. Pavement restoration above the pipe trenches will be addressed in an update to this report.

5.3.2 Excavation and Disposal Considerations

Prior to excavating trenches, any existing pavements, structures, abandoned utilities and improvements, vegetation, and other debris and rubble should be removed and disposed of offsite. Soils containing organic matter should be removed from the planned development area.

Following site preparation, excavated soil should be considered for re-use as trench backfill. See Section 5.3.1 for fill material requirements. Soil below the groundwater level will likely be too wet for use as backfill (even if the trench area has been dewatered) unless it can be spread out and dried before re-use, which may require a large processing area. Material that is suitable for re-use will require an area for stockpiling. Excess soil will need to exported or stored for future use.

5.3.3 Fill Placement and Compaction

Fill soils should be placed in loose horizontal lifts that do not exceed eight inches, or as needed to obtain adequate compaction. Each layer should be spread evenly and thoroughly mixed during spreading to uniformly obtain a moisture content that is above the optimum moisture content for compaction. After each layer has been mixed and spread, it should be compacted to a relative compaction of not less than 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry unit weight of the compacted fill divided by the maximum dry unit weight evaluated in accordance with ASTM D1557.

Within paved areas, the upper 12 inches of backfill (below the Class 2 Aggregate base and pavement) should be compacted to a minimum of 95 percent relative compaction. Class 2 Aggregate base for roadway pavement should be compacted to a minimum of 95 percent relative compaction.

5.4 TRENCHLESS INSTALLATION

We understand that several sections of the pipeline alignments for the influent and effluent connections to the existing sewer main south of the MPS along Friars Road may be installed using trenchless construction techniques (tunneling methods). These portions of the pipelines would be installed below the existing groundwater level in the area in loose alluvial soils. Due to the subsurface conditions, the use of an open-face tunneling method may not be appropriate. Below the groundwater, the Tunnelman's Ground Classification for Soils may be considered to be flowing sands. Above the groundwater level, the Tunnelman's Ground Classification for Soils may be considered to be running or slow raveling sands. The use of pressurized face microtunneling techniques are recommended for tunnels in this portion of the project.

6.0 GENERAL CONDITIONS AND LIMITATIONS

Geotechnical engineering and the geological sciences require interpretations based on limited subsurface data. A relatively small portion of the pertinent soil and groundwater conditions along the planned Project route have been observed. The recommendations made herein are based on the assumption that soil and groundwater conditions will not deviate appreciably from those found during our current field investigation and previous explorations. Professional judgment discussed herein is based on an understanding of the planned construction and partly on general experience. Actual subsurface conditions encountered during construction will likely vary from those discussed in this report. If variations in subsurface conditions are encountered during construction, AECOM should be consulted for further recommendations.

This report is intended for design purposes. If reviewed by building contractors they should make their own interpretation of the data contained and referenced in this report.

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7.0 REFERENCES

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FIGURES

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Figure 1
Alignment Map
Morena Pipeline Project
San Diego, CA

Alignments

- City Alternative No. 1a (20151123)
- City Alternative No. 2 (20151123)
- Alvarado Morena Pipeline
- Tunnel Crossing

0 1,750 3,500 ft

1:42,000 1 inch = 3,500 feet

AECOM

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Reference: KEH 30% Design 4–7–17

LEGEND

△	SH–01	Cone Penetration Test (CPT), 2017
⊕	PS–01	Exploratory Boring, 2017
⊕	PS–02	Exploratory Boring with Monitoring Well, 2017

MORENA PUMP STATION SITE PLAN
MORENA PIPELINE PROJECT
SAN DIEGO, CALIFORNIA

AECOM

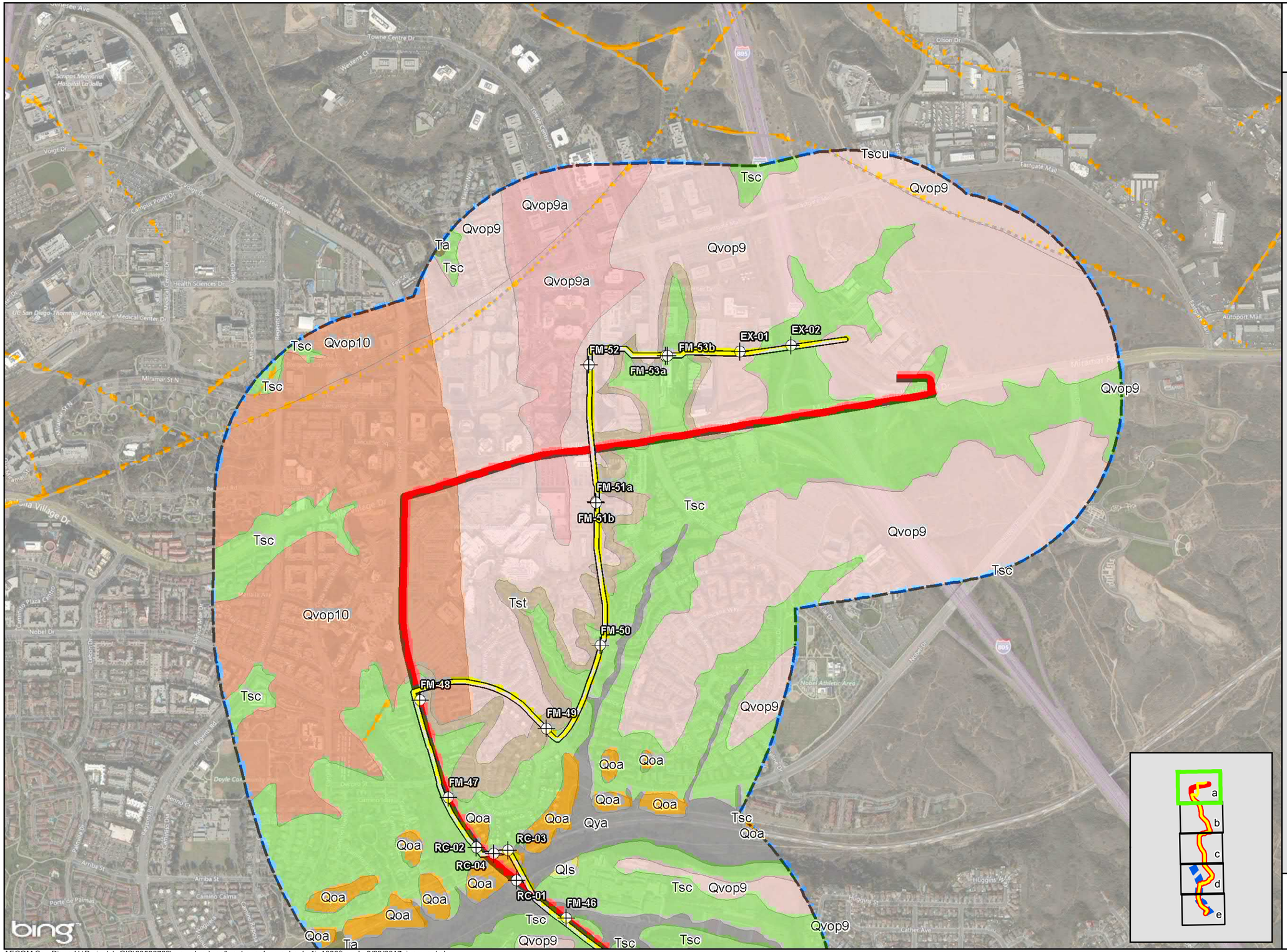
20 0 20 40
SCALE: 1"= 40'

CHECKED BY: MEH | DATE: 4–20–17
PM: JL | PROJ. NO: 60530732

FIG. NO: **2**

U:\Resources\GEOEng\GEO Proposal Resources\PURE Water\Maps\Figures\Fault Hazard Pump Station Site Plan.dwg Apr 17, 2017 – 3:54pm

Figure 3a
Geologic Map of Project Alignment
Morena Pipeline Project
San Diego, CA



Alignments
- City Alternative No. 1a (20151123)
- City Alternative No. 2 (20151123)
- Alvarado Morena Pipeline
- 2,000-ft Buffer
- Geotechnical Boring

Alquist Priolo (EFZ) Faults
- Accurately Located Fault Trace
- Approximately Located Fault Trace
- Inferred Fault Trace
- Concealed Fault Trace
- Alquist-Priolo Earthquake Fault Zone

Faults (SanGIS)
- FAULT
- INFERRED FAULT
- CONCEALED ZONE
- SHEAR ZONE

Faults (Compiled interpretations)
- Distinct geomorphic features in historic aerial photos
- Moderately expressed geomorphic features in historic aerial photos
- Concealed
- Graben

Modern Surficial Deposits
- Qaf, Artificial fill
- Qls, Landslide deposits undivided
- Qmo, Undivided marine deposits in offshore region

Young Surficial Deposits
- Qya, Young alluvial flood plain deposits
- Qyc, Young colluvial deposits

Old Surficial Deposits
- Qoa, Old alluvial flood plain deposits undivided
- Qop6 and fault zone, Old paralic deposits Unit 6 and fault zone
- Qop6, Old paralic deposits Unit 6

Very Old Surficial Deposits
- Qvop10, Very old paralic deposits Unit 10
- Qvop10a, Very old paralic deposits Unit 10a
- Qvop11, Very old paralic deposits Unit 11
- Qvop9, Very old paralic deposits Unit 9
- Qvop9a, Very old paralic deposits Unit 9a

Sedimentary and Volcanic Bedrock Units
- Ta and fault zone, Ardath Shale and fault zone
- Ta, Ardath Shale
- Tf, Friars Formation
- Tmsc, Mount Soledad Formation cobble conglomerate
- Tmv, Mission Valley Formation
- Tp, Pomerado Conglomerate
- Tsc, Scripps Formation
- Tscu, Scripps Formation tongue in Carroll Canyon
- Tsd, San Diego Formation
- Tst, Stadium Conglomerate

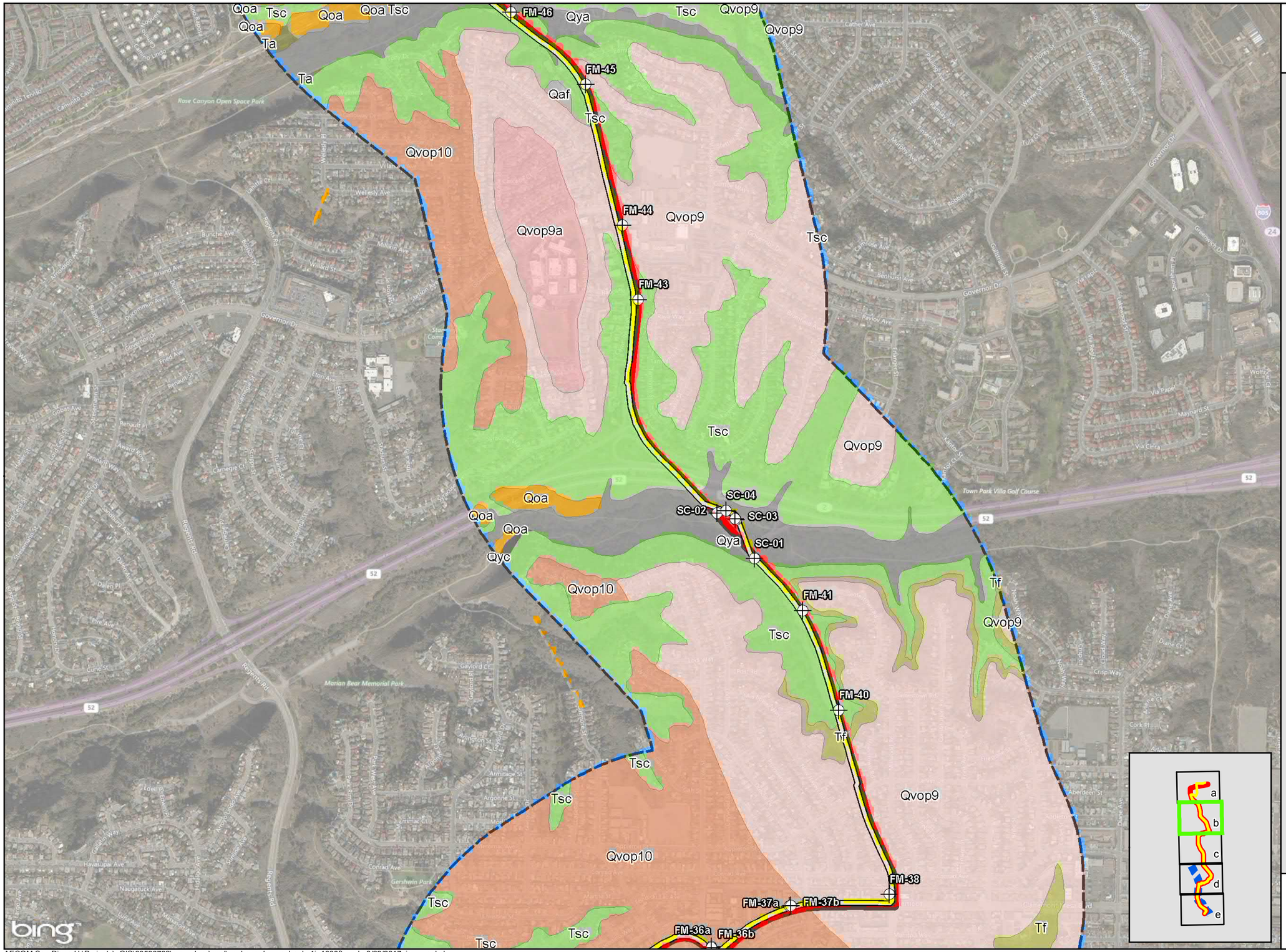
Sources: SanGIS; Kennedy and Tan, 2008.

0 1,000 Feet

1:12,000 1 inch = 1,000 feet

AECOM

Figure 3b
Geologic Map of Project Alignment
Morena Pipeline Project
San Diego, CA



Alignments
- City Alternative No. 1a (20151123)
- City Alternative No. 2 (20151123)
- Alvarado Morena Pipeline
- 2,000-ft Buffer
- Geotechnical Boring

Alquist Priolo (EFZ) Faults
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Sources: SanGIS; Kennedy and Tan, 2008.

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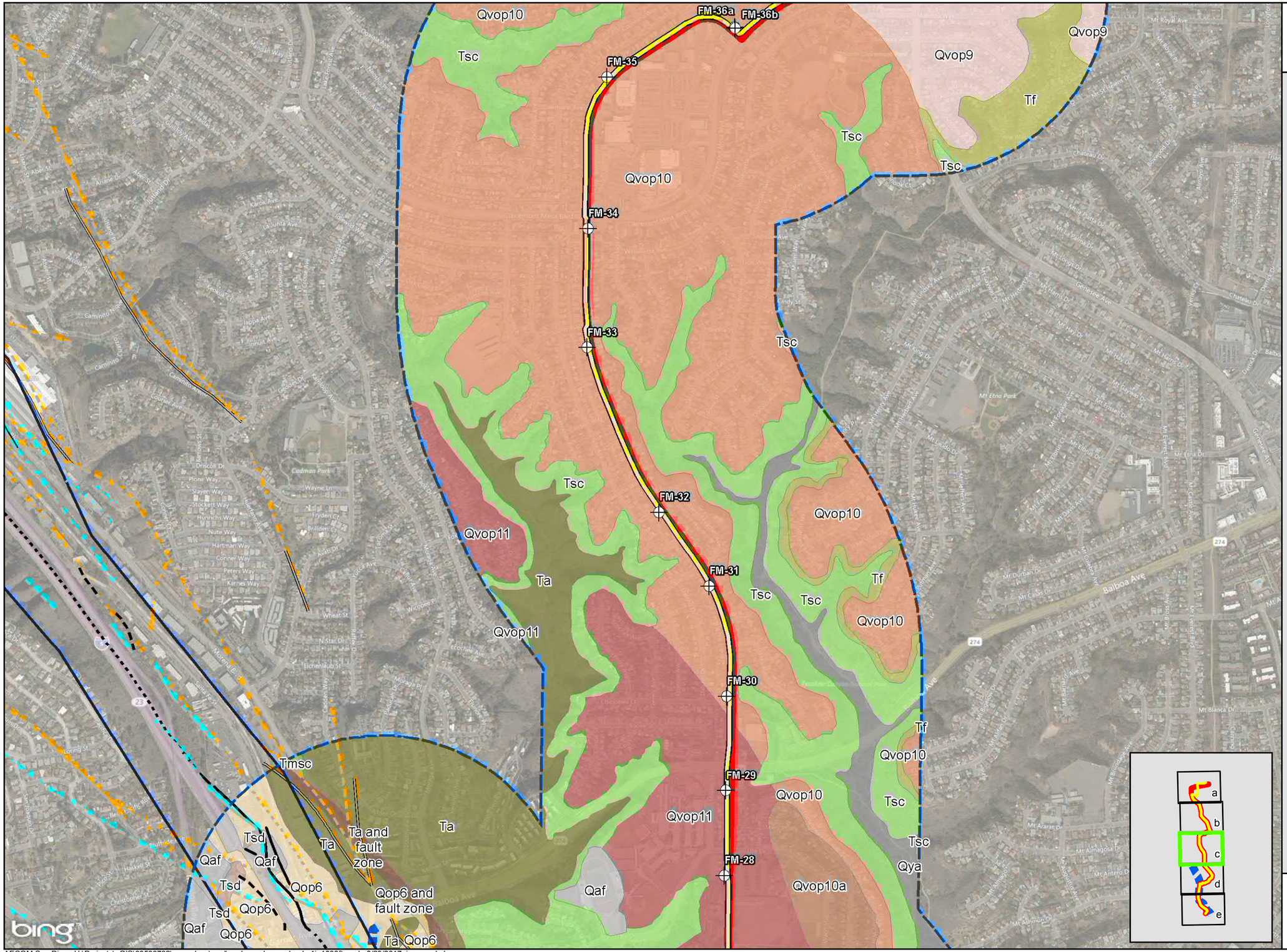
AECOM

Figure 3c
Geologic Map of Project Alignment
Morena Pipeline Project
San Diego, CA



Alignments
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- Alvarado Morena Pipeline
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Figure 3d
Geologic Map of Project Alignment
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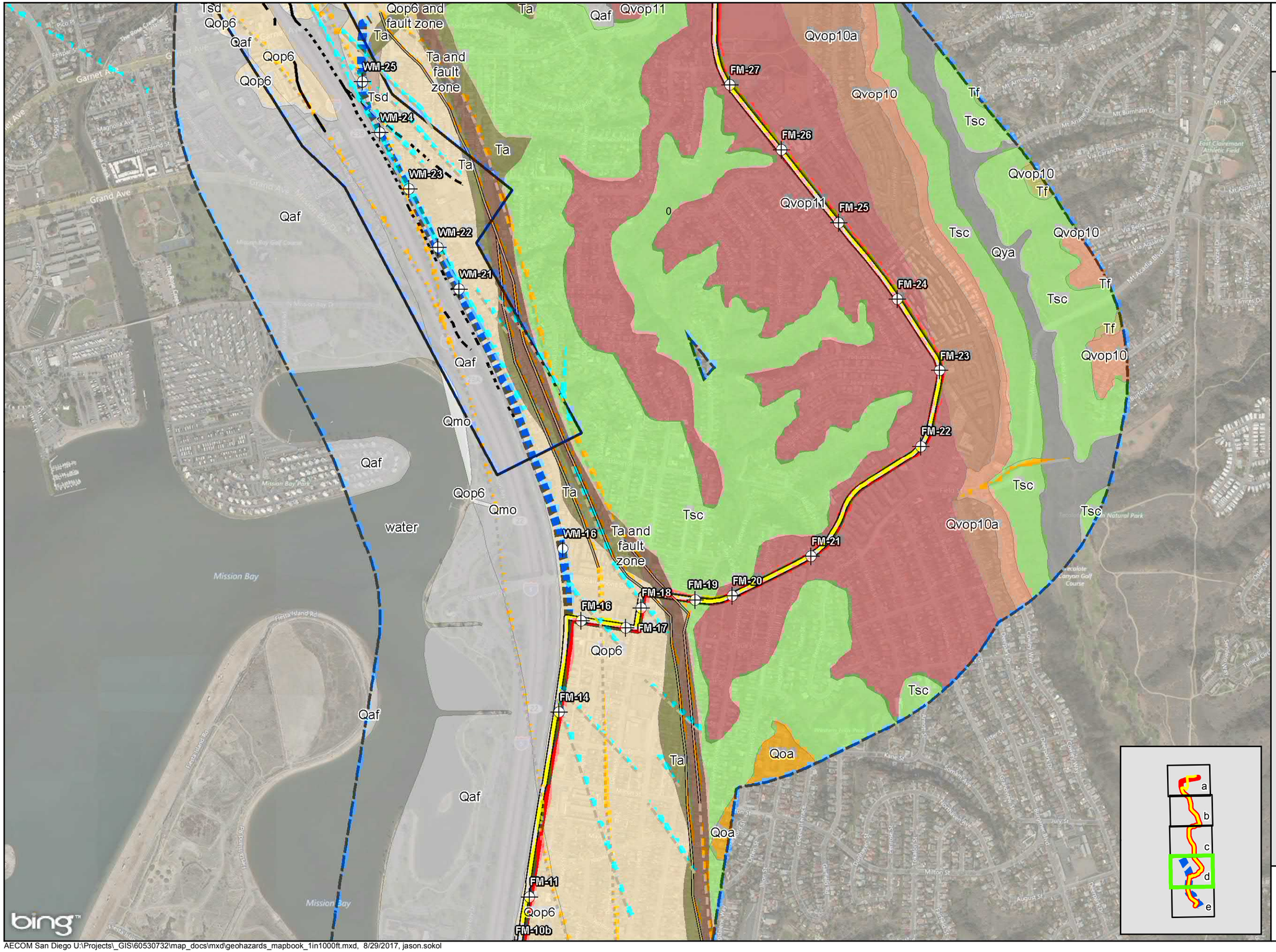

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Figure 3e
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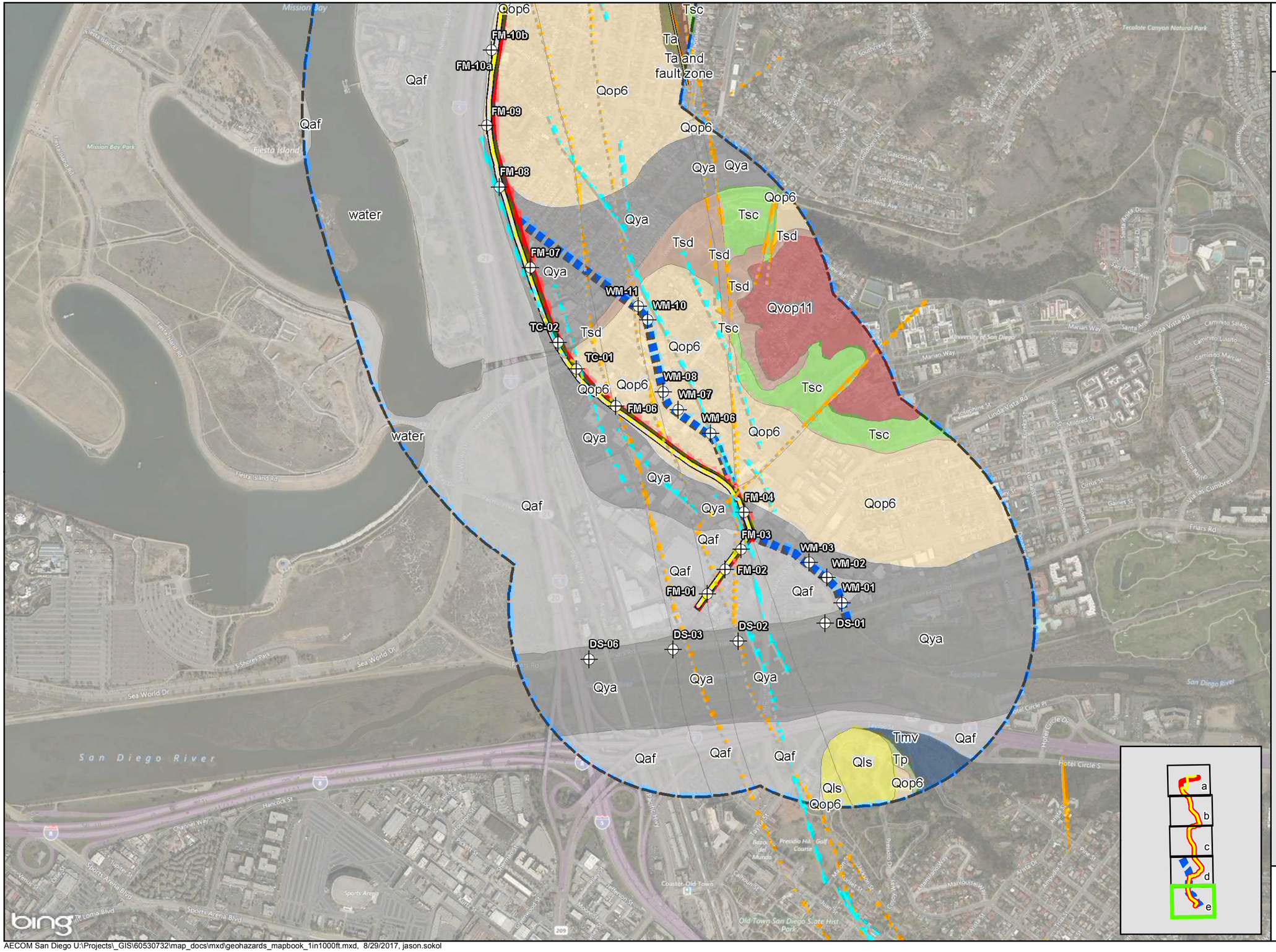
San Diego, CA



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Modern Surficial Deposits
- Qaf, Artificial fill
- Qls, Landslide deposits undivided
- Qmo, Undivided marine deposits in offshore region

Young Surficial Deposits
- Qya, Young alluvial flood plain deposits
- Qyc, Young colluvial deposits

Old Surficial Deposits
- Qoa, Old alluvial flood plain deposits undivided
- Qop6 and fault zone, Old paralic deposits Unit 6 and fault zone
- Qop6, Old paralic deposits Unit 6

Very Old Surficial Deposits
- Qvop10, Very old paralic deposits Unit 10
- Qvop10a, Very old paralic deposits Unit 10a
- Qvop11, Very old paralic deposits Unit 11
- Qvop9, Very old paralic deposits Unit 9
- Qvop9a, Very old paralic deposits Unit 9a

Sedimentary and Volcanic Bedrock Units
- Ta and fault zone, Ardath Shale and fault zone
- Ta, Ardath Shale
- Tf, Friars Formation
- Tmsc, Mount Soledad Formation cobble conglomerate
- Tmv, Mission Valley Formation
- Tp, Pomerado Conglomerate
- Tsc, Scripps Formation
- Tscu, Scripps Formation tongue in Carroll Canyon
- Tsd, San Diego Formation
- Tst, Stadium Conglomerate

Sources: SanGIS; Kennedy and Tan, 2008.

0 1,000 Feet

1:12,000 1 inch = 1,000 feet

AECOM

Reference: KEH 60% Design 7-25-17

LEGEND

- SH-01 — Cone Penetration Test (CPT), 2017
- PS-01 — Exploratory Boring, 2017
- PS-02 — Exploratory Boring with Monitoring Well, 2017
- A — A′ — Location of Geologic Cross Section
- Possible Fault Zone With Setback
- STONE COLUMNS TO 50 FEET BELOW GROUND SURFACE
- STONE COLUMNS TO 80 FEET BELOW GROUND SURFACE
- Q_{al} - FILL
- Q_f - ALLUVIUM (CIRCLED WHERE BURIED)

MORENA PUMP STATION LIQUEFACTION MITIGATION
MORENA PIPELINE PROJECT
SAN DIEGO, CALIFORNIA

AECOM

SCALE: 1"= 40' (20 0 20 40)

CHECKED BY: SF	DATE: 7-31-17	FIG. NO: 4a
PM: JL	PROJ. NO: 60530732	

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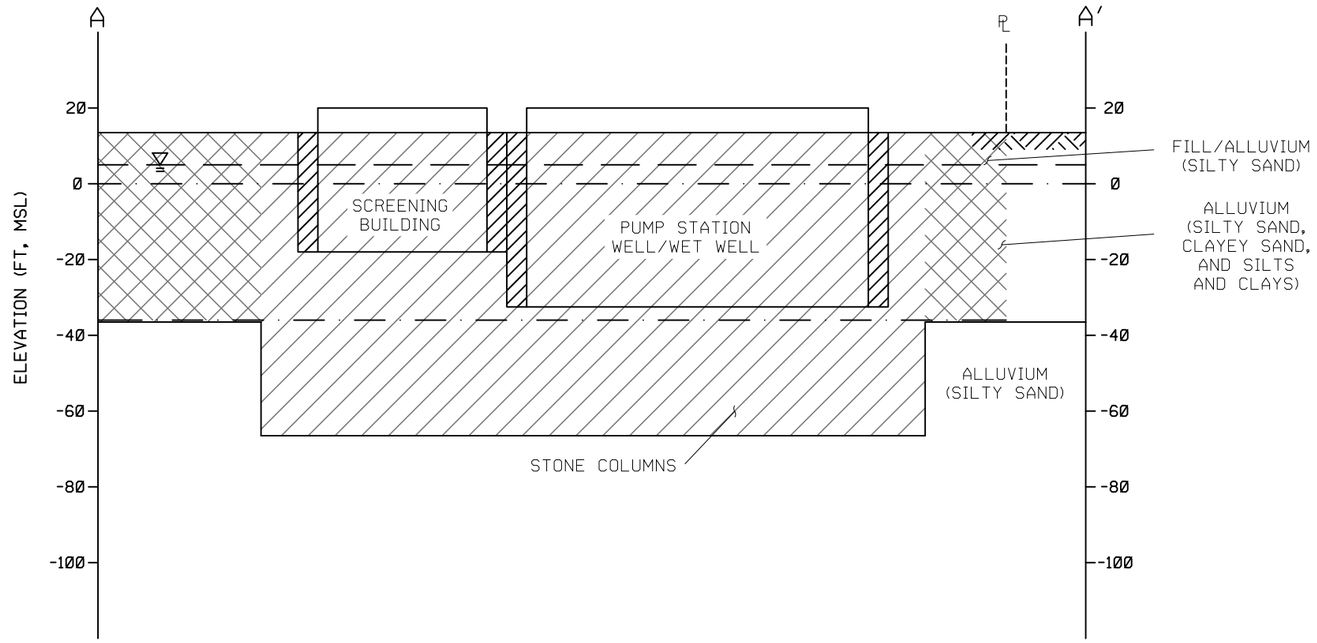

LEGEND

- GEOLOGIC CONTACT
- STONE COLUMNS TO 50 FEET BELOW GROUND SURFACE
- STONE COLUMNS TO 80 FEET BELOW GROUND SURFACE

CROSS SECTION A-A
MORENA PIPELINE PROJECT
SAN DIEGO, CALIFORNIA

AECOM

20 0 20 40
SCALE: 1"= 40'

CHECKED BY: SF | DATE: 7-31-17
PM: JL | PROJ. NO: 60530732

FIG. NO: **4b**

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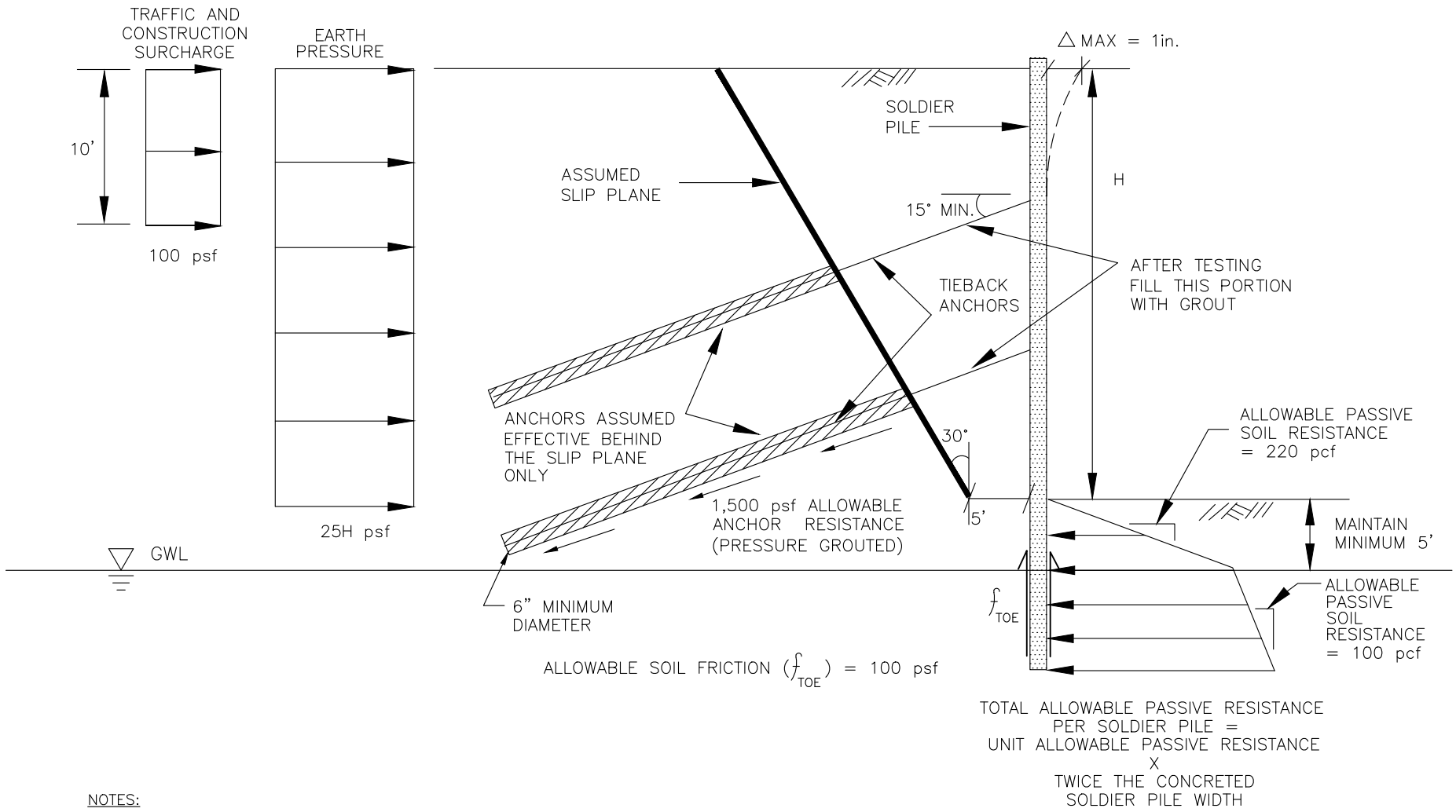


NOTES:

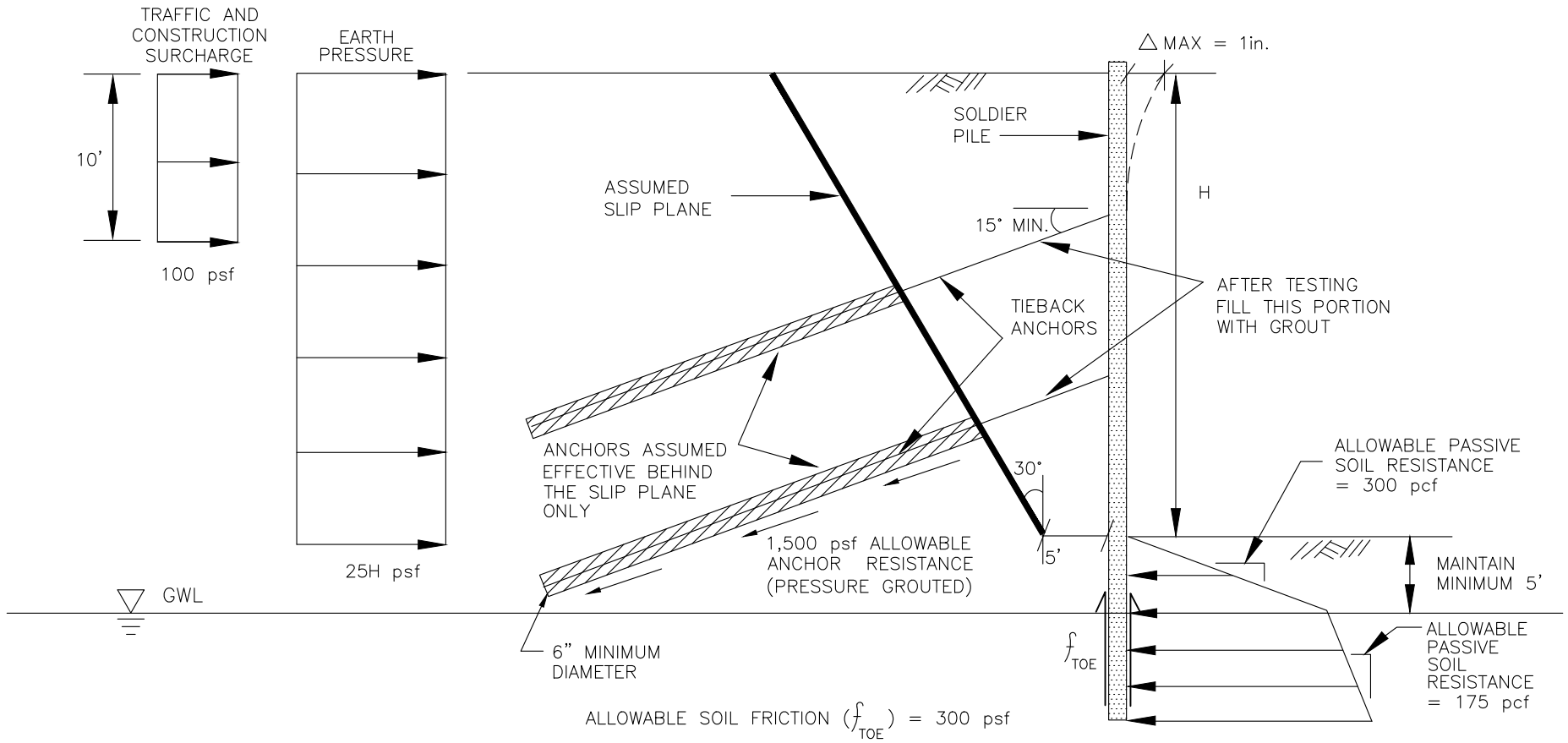
A. ASSUMES LEVEL BACKFILL AND NO HYDROSTATIC PRESSURE.

B. FOR PRELIMINARY DESIGN.

C. GWL – DESIGN GROUNDWATER LEVEL DURING CONSTRUCTION PER GEOTECHNICAL REPORT (5' BELOW BOTTOM OF EXCAVATION).

LATERAL EARTH PRESSURES AND RESISTANCES FOR TEMPORARY TIEBACK WALLS (0 '- 30' bgs)
MORENA PIPELINE PROJECT
SAN DIEGO, CALIFORNIA

AECOM	NOT TO SCALE	CHECKED BY: PB	DATE: 5–17–17	FIG. NO: 5
		PM: JL	PROJ. NO: 60530732	



NOTES:

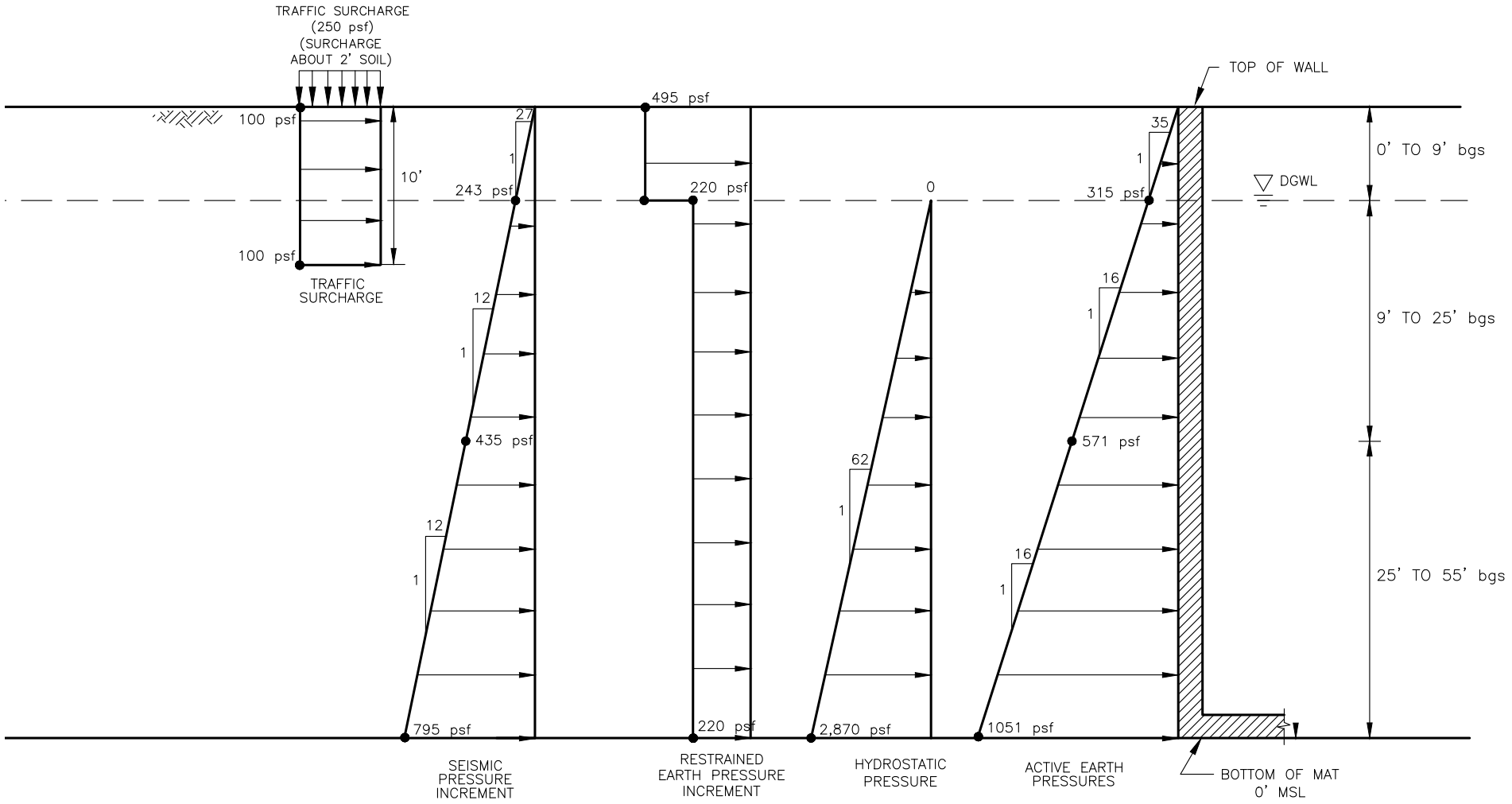
A. ASSUMES LEVEL BACKFILL AND NO HYDROSTATIC PRESSURE.

B. FOR PRELIMINARY DESIGN.

C. GWL – DESIGN GROUNDWATER LEVEL DURING CONSTRUCTION PER GEOTECHNICAL REPORT (5' BELOW BOTTOM OF EXCAVATION).

LATERAL EARTH PRESSURES AND RESISTANCES FOR TEMPORARY TIEBACK WALLS (0' - 50' bgs)
MORENA PIPELINE PROJECT
SAN DIEGO, CALIFORNIA

AECOM	NOT TO SCALE	CHECKED BY: PB	DATE: 5–17–17	FIG. NO: 6
		PM: JL	PROJ. NO: 60530732	



NOTES:

1. DGWL: DESIGN GROUNDWATER LEVEL PER GEOTECHNICAL REPORT
2. STATIC AT REST PRESSURE = ACTIVE EARTH PRESSURE + RESTRAINED EARTH PRESSURE INCREMENT
3. SEISMIC PRESSURE = ACTIVE EARTH PRESSURE + SEISMIC PRESSURE INCREMENT

LATERAL EARTH PRESSURES FOR PERMANENT SUBTERRANEAN WALL
MORENA PIPELINE PROJECT
SAN DIEGO, CALIFORNIA

AECOM	NOT TO SCALE	CHECKED BY: PB	DATE: 5-17-17	FIG. NO: 7
		PM: JL	PROJ. NO: 60530732	

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TABLES

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Table 1
Summary of Geotechnical Conditions Along Cut & Cover Pipeline Alignment

Location	Soils/Formations	Groundwater Depth (feet)	Geologic Hazards	Construction Considerations
Friars Rd. between the I-5 and Napa St.	Fill over deep alluvium	7 to 9 feet	Liquefaction, lateral spreading, flooding	Shallow groundwater, soft soils, shoring
South of Morena Pump Station	Fill over deep alluvium ~~(assumed)~~	6 to 10 feet (estimated)	Liquefaction, lateral spreading	Shallow groundwater, soft soils, shoring
Morena Pump Station to Morena Blvd.	Fill over alluvium	9 to 10 feet (at MPS) becoming deeper (10 to 15 feet) to the north	Liquefaction	Shallow groundwater, soft soils, shoring
Morena Blvd. near Napa St. to West Morena Blvd. near Vega St.	Fill over Bay Point Formation	10 to 14 feet	Flooding	Shallow groundwater, gravel & possible cobble layer
West Morena Blvd. near Vega St. to Morena Blvd. near Kane St.	Shallow to deep fill over alluvium or Bay Point Formation	10 to 18 feet	Liquefaction, flooding	Shallow groundwater, soft soils, shoring, possible cementation/concretions
Ingulf St. between Morena Blvd. and Denver St.	Shallow fill over Bay Point Formation	19.5 feet (near Morena), otherwise greater than trench depths	-	-
Denver St. and Clairemont Dr. to near Galveston St.	Shallow to deep fill over Scripps/Ardath Formation, some with Lindavista over Scripps Formation	Greater than trench depths	-	Possible cementation/concretions, gravel
Clairemont Dr. near Clairemont Ct. to Clairemont Mesa Blvd. and Genessee Ave.	Shallow to no fill over Lindavista Formation	19.5 feet (near Lakehurst Ave), otherwise greater than trench depths	-	Possible cementation/concretions, cobbles & boulders
Genessee Ave. near Appleton St. to near Radcliffe Ln.	Deep fill~~, with some~~ over Scripps Formation or alluvium	Greater than trench depths	-	Soft soils, shoring, possible cementation/concretions, cobbles & boulders
Genessee Ave. near Governor Dr. to near Centurion Square	Lindavista Formation, deep fill over alluvium, or shallow to deep fill over Scripps Formation	Greater than trench depths	-	Soft soils, shoring, possible cementation/concretions, cobbles & boulders
Genessee Ave. near Decoro St. to Towne Centre Dr. near Executive Dr.	Shallow to deep fill over Scripps Formation	Greater than trench depths	-	Possible cementation/concretions, cobbles & boulders, possible contamination (on Towne Centre Dr. near La Jolla Village Dr.)

~~Note:~~

1. ~~Subsurface data is based on preliminary sources.~~

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APPENDIX A

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Key to Logs

Elevation, feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Dry Density, pcf	Dry Density, pcf	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation in feet referenced to NAVD88 or site datum.

2 **Depth:** Depth in feet below the ground surface.

3 **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

4 **Sample Number:** Sample identification number.

5 **Blows per foot:** Number of blows required to advance driven sampler 12 inches beyond first 6-inch interval, or distance noted, using a 140-lb hammer with a 30-inch drop.

6 **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.

7 **Material Description:** Description of material encountered; may include relative density/consistency, moisture, color, particle size; texture, weathering, and strength of formation material. If shown, designation in parentheses denotes Munsell color classification.

8 **Water Content:** Water content of soil sample measured in laboratory, expressed as percentage of dry weight of specimen.

9 **Dry Unit Weight:** Dry density of soil sample measured in laboratory, in pounds per cubic foot.

10 **Remarks and Other Tests:** Comments and observations regarding drilling or sampling made by driller or field personnel.

SA	Sieve analysis, %<#200 sieve
WA	Three-point wash sieve, %<#200 sieve
LL	Liquid limit (from Atterberg limits test), %
PI	Plasticity Index [LL - PL], %; NP=nonplastic
DS	Direct Shear test
CORR	Corrosivity Test suite

TYPICAL MATERIAL GRAPHIC SYMBOLS

- FILL
- Lean CLAY (CL)
- Fat CLAY (CH)
- Silty CLAY (ML-CL)
- Clayey SILT (CL-ML)
- SILT (ML)
- Elastic SILT (MH)
- Clayey SAND (SC)
- Silty SAND (SM)
- Well-graded SAND with silt (SW-SM)
- Well-graded SAND (SW)
- Poorly-graded SAND with clay (SP-SC)
- Poorly-graded SAND with silt (SP-SM)
- Poorly-graded SAND (SP)
- Well-graded GRAVEL with silt (GW-GM)
- Poorly-graded GRAVEL with silt (GP-GM)
- Poorly-graded GRAVEL (GP)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- 2.5" I.D. sampler
- Standard Penetration samper
- Core Sample
- Bulk Sample

OTHER GRAPHIC SYMBOLS

- First water encountered at time of drilling and sampling (ATD)
- Water level measured at specified time after completion of drilling and sampling
- General change in material
- Inferred or gradational contact between strata

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

AECOM

Figure A-1

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring DS-01

Sheet 1 of 2

Date(s) Drilled	**08/02/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**51.5 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**18 feet**
Water Level Depth	**12 ft**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cement/Bentonite Grout**	Location	**N32.763304, W117.195882**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
15	0		1			7" AC over 12"AB over **Fill** Moist, red, poorly-graded fine SAND, trace clay			CORR
5	5		2	9			9		
-10	10								
10	10		3	5		**Alluvium** Loose, moist, mottled dark brown and red, clayey fine SAND (SC), trace fine to coarse gravel	13		
-5						Loose, moist, very dark brown, poorly-graded SAND (SP), trace fine gravel, trace silt ▽			
0	15		4	2		Soft, wet, dark brown, lean CLAY (CL), some fine sand, trace gravel Very loose, wet, silver-gray, clayey SAND (SC), some oxidation stains, interbeds of light gray clay	20	37	WA(37), LL(24), PI(8)
-5	20		5	7		Loose, wet, gray, poorly-graded fine to medium SAND (SP), trace silt	25		
-10	25		6	4		Loose, wet, gray, silty fine to medium SAND (SM)			
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 DS-01

AECOM

Figure A-2

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring DS-01

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30								
			7	8		Decrease in fines content	28	14	WA(14)
-15									
	35					Becomes very micaceous, increase in fines content	38		
			8	6		Medium stiff, wet, gray, lean CLAY (CL), some fine sand, micaceous, interbeds of poorly-graded sand with silt			LL(39), PI(19)
-20									
	40					Increase in mica, increase in fine sand content			
			9	7					
-25									
	45					Stiff, wet, gray, SILT (ML), little fine sand, interbeds of clay	41		
			10	10					
-30									
	50					Stiff, wet, gray, clayey SILT (CL-ML), trace shells	35		
			11	11					
-35						Bottom of boring at 51.5 feet below ground surface			
	55								
-40									
	60								
-45									
	65								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 DS-01

AECOM

Figure A-2

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring DS-02

Sheet 1 of 1

Date(s) Drilled	**08/02/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**9 feet**
Water Level Depth	**8.4 ft**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.762757, W117.198883**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					7" AC over 7" AB over **Fill** Moist, red, poorly-graded fine SAND, trace silt, trace gravel and cobbles			
5									
	5		1	14		**Alluvium** Medium dense, moist, gray, clayey fine SAND (SC), trace small pockets of olive brown, poorly-graded sand Medium dense, moist, very dark gray, silty fine SAND (SM), trace roots, micaceous	25	92	
0						▽			
	10		2	1		Increase in mica content, decrease in silt content	49		WA(12)
-5									
	15		3	6		Loose, wet, gray, poorly-graded fine to medium SAND (SP-SM) with silt, micaceous	45		
-10			4	10		Trace shells, increase in mica content			
	20					Bottom of boring at 20.0 feet below ground surface			
-15									
	25								
-20									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 DS-02

AECOM

Figure A-3

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring DS-03

Sheet 1 of 2

Date(s) Drilled	**08/03/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**51.5 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**8 feet**
Water Level Depth	**8.3 ft**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cement/Bentonite Grout**	Location	**N32.76249, W117.201137**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					7" AC over 7" AB over			
						Fill			
			1			Moist, red, poorly-graded SAND, trace silt, trace gravel			
5									
	5					**Alluvium**			
			2	28		Very stiff, moist, mottled gray and olive, CLAY (CL), few fine sand, weakly cemented	28	95	
						Medium dense, moist, very dark gray, poorly-graded fine SAND (SP-SM) with silt, micaceous			
0						▽			
	10					becomes wet			
			3	3					
-5									
	15								
			4	6		Loose, wet, gray, well-graded SAND with silt (SW-SM), few fine to coarse gravel	33		SA(12)
-10									
	20					Wet, medium dense, gray, poorly-graded fine SAND (SP-SM) with silt			
			5	10		Trace shells			
-15									
	25					Increase in sand grain size	25		
			6	5					
						Medium stiff, wet, black, SILT (ML), few fine sand, micaceous			
-20									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 DS-03

AECOM

Figure A-4

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring DS-03

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30					Soft, wet, very dark gray, lean CLAY (CL), few fine sand, trace shells	34		WA(42), LL(36), PI(15)
			7	2					
-25									
	35					Becomes medium stiff and micaceous			
			8	6					
-30									
	40					Medium stiff, wet, very dark gray, silty CLAY (ML-CL), trace shells	44		
			9	5					
-35									
	45					Medium stiff, wet, very dark gray, SILT (ML)			
			10	5					
-40									
	50					Increase in sand content 2" interbed of black lean CLAY (CL)	39		
			11	7					
						Medium stiff, wet, very dark gray, silty lean CLAY (ML-CL), gray and black thinly bedded			
-45						Bottom of boring at 51.5 feet below ground surface			
	55								
-50									
	60								
-55									
	65								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 DS-03

AECOM

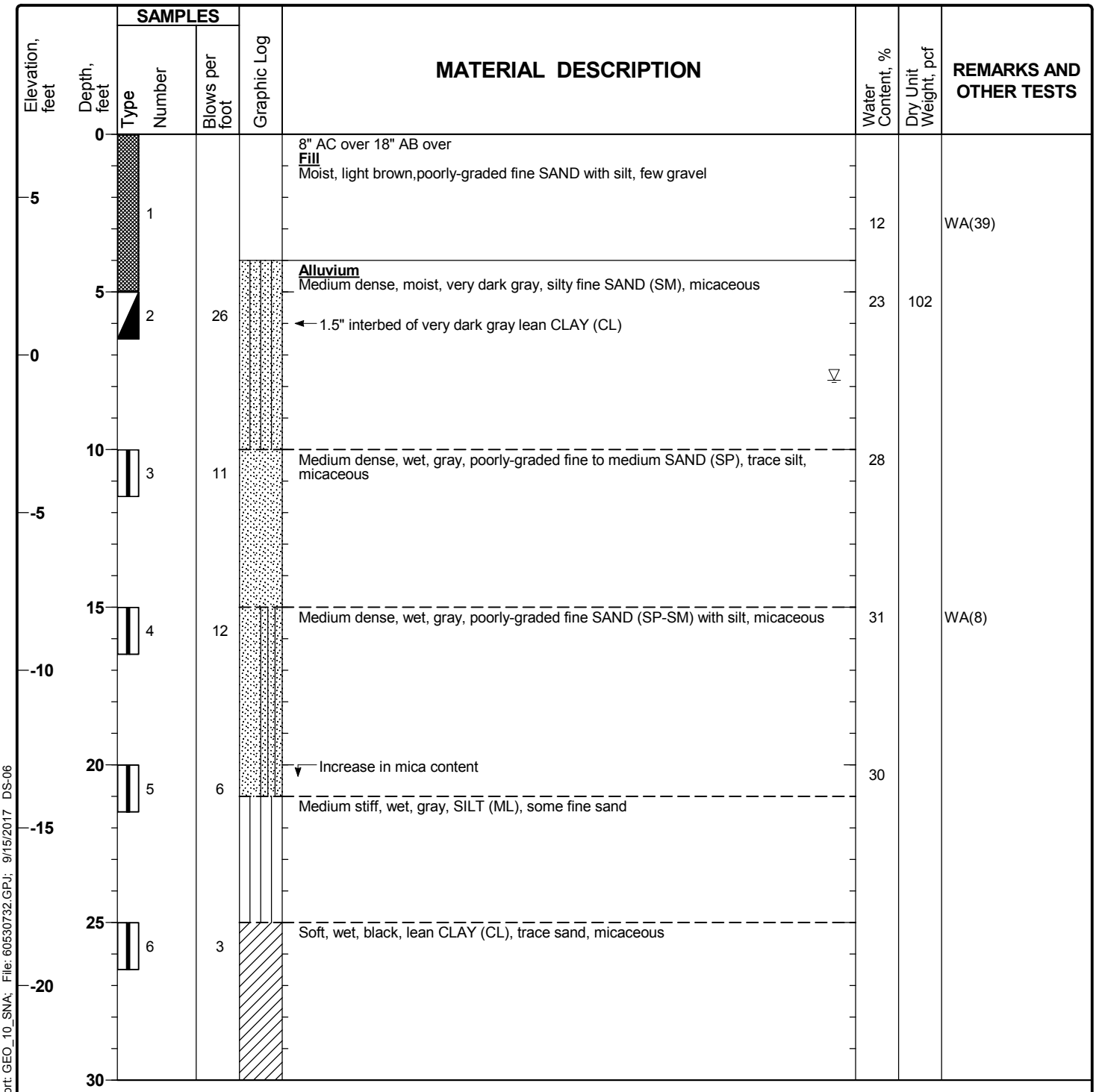
Figure A-4

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring DS-06

Sheet 1 of 2

Date(s) Drilled	**08/04/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**61.5 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**7 feet**
Water Level Depth	**7.8 ft**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cement/Bentonite Grout**	Location	**N32.76218, W117.20404**		



Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 DS-06

AECOM

Figure A-5

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring DS-06

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30								
			7	3		Becomes very dark gray, little fine sand, trace shells	36		LL(41), PI(16)
-25									
	35								
			8	4		Decrease in sand content			
-30									
	40								
			9	3			53		
-35									
	45					Increase in shell and sand content			
			10	3					
-40									
	50					Becomes medium stiff			
			11	7		Decrease in sand content	43		
-45									
	55					Dense, wet, very dark gray, poorly-graded fine SAND (SP-SM) with silt, micaceous			
			12	35					
-50									
	60					Stiff, wet, very dark gray, silty lean CLAY (ML-CL), few fine sand, micaceous			
			13	13					
-55						Bottom of boring at 61.5 feet below ground surface			
	65								

AECOM

Figure A-5

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-01

Sheet 1 of 1

Date(s) Drilled	**04/27/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**11 feet**
Water Level Depth	**10 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.76413, W117.19996**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					2"of AC over 6" of concrete over **Fill** Moist, dark grayish brown, silty fine SAND, few fine gravel, few chunks of intact formational soil			
10			1			Moist, brown, CLAY, mixed/disturbed structure	11		WA(31), COMP
	5		2	6		**Alluvium (Qal)** Loose, moist, grayish brown (2.5Y 5/3), poorly-graded fine SAND (SP), trace fines, few laminations of darker minerals, few thin silty SAND (SM) interbeds, micaceous			CORR
5									
	10		3	12		becomes wet ▽	24	98	
0									
	15		4	12		becomes medium dense, coarsens to predominantly fine to medium sand			
-5									
			5	6		becomes loose, few fines	22		WA(6)
	20					Bottom of boring at 20 feet below ground surface			
-10									
	25								
-15									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-01

AECOM

Figure A-6

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-02

Sheet 1 of 1

Date(s) Drilled	**04/27/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**13 feet**
Water Level Depth	**10 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.76485, W117.19935**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					2" of AC over 6" of concrete over **Fill** Moist, dark grayish brown, silty fine SAND, trace fine gravel			
10			1				9		SA(23), COMP
5	5		2	12			5	96	
5						**Alluvium (Qal)** Medium dense, moist, brown (10YR 5/3), poorly-graded fine to medium SAND (SP), micaceous			
	10		3	8		becomes wet, trace iron oxide staining, few laminations of darker minerals ▽			CORR
0									
	15		4	7		few thin interbeds of silty SAND (SM)	30		WA(12)
-5						becomes loose			
	20		5	5					
-10						Bottom of boring at 20 feet below ground surface			
	25								
-15									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-02

AECOM

Figure A-7

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-03

Sheet 1 of 1

Date(s) Drilled	**04/27/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**16 feet**
Water Level Depth	**15 fbgs (after drilling)**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.765444, W117.198803**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
15	0					5"of AC over **Fill** Moist, dark grayish brown, poorly-graded fine to medium SAND with silt			
			1			contains chunks of intact formational soil, becomes light olive brown two 2" to 4" size chunks of rock			
						becomes dark grayish brown			
10	5		2	5			3		WA(11)
5	10		3	4		**Alluvium (Qal)** Medium stiff, moist, very dark grayish brown (10YR 3/2), SILT (ML), micaceous, trace roots			
						becomes soft			CORR
0	15		4	2		becomes medium stiff ▽			
			5	6					
-5	20		6	2		Very loose, wet, very dark gray (2.5YR 3/1), silty fine SAND (SM), micaceous			
						Bottom of boring at 20 feet below ground surface			
-10	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-03

AECOM

Figure A-8

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-04

Sheet 1 of 1

Date(s) Drilled	**05/02/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**22 feet**
Water Level Depth	**14 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.76653, W117.19873**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
20	0					7"of AC over 7" of AB over **Fill** Moist, brown, silty fine SAND, trace fine gravel			
	5					few fine to coarse gravel			
15	10		1	27		**Bay Point Formation (Qbp)** Medium dense, moist, brown (7.5YR 4/3), silty fine SAND (SM), few fine gravel, material is oxidized	8		WA(38)
10						▽			
	15		2	30		becomes wet, moderately cemented, few fine to coarse gravel	18	109	
5						Medium dense, wet, brown (7.5YR 5/3), well-graded SAND (SW-SM) with silt, few fine gravel, oxidized			
	20		3	20					
0						Bottom of boring at 20 feet below ground surface			
	25								
-5									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-04

AECOM

Figure A-9

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-06

Sheet 1 of 1

Date(s) Drilled	**05/02/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**16 feet**
Water Level Depth	**10.5 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.769601, W117.203201**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					7" of AC over 7" of AB over **Fill** Moist, brown, silty fine to medium SAND			
15						**Bay Point Formation (Qbp)** Medium dense, moist, brown (7.5YR 4/4), silty fine to medium SAND (SM), material is oxidized, few thin interbeds of finer grained soil			
	5		1	13			7		SA(13)
10						contains gravel / potentially few cobbles			
	10		2	19 50/5"		▽			
5						Medium dense, wet, brown (7.5YR 4/3), silty fine SAND (SM), micaceous, few thin interbeds of sandier material			CORR
			3	22					
	15		4	34			22	108	
0						Very loose, wet, brown (7.5YR 5/3), well-graded SAND (SW), trace to few fine gravel, trace fines, micaceous			
			5	1			19		WA(1)
	20					Bottom of boring at 20 feet below ground surface			
-5									
	25								
-10									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-06

AECOM

Figure A-10

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-07

Sheet 1 of 1

Date(s) Drilled	**05/02/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**12 feet**
Water Level Depth	**10 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.77364, W117.2062**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
10	0					6" of AC over 6" of AB over			
						Fill			
			1			Moist, dark grayish brown, silty SAND, trace gravel, black staining	15		WA(45), COMP
						Alluvium (Qal)			
						Loose, moist, dark brown, silty fine SAND (SM)			
5	5					6" thick interbed of sandy lean CLAY (CL)			
			2	10		Medium dense, moist, brown, poorly-graded fine SAND (SP)	8	104	
5									
	10					becomes wet, trace fine gravel, trace iron oxide staining ▽			
			3	5			21		WA(5)
0									
	15					becomes loose			
			4	5					
-5									
						becomes medium dense, mostly fine to medium grained sand			
			5	12			20	105	
	20					Medium dense, wet, brown, silty fine SAND (SM)			
-10						Bottom of boring at 20 feet below ground surface			
	25								
-15									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-07

AECOM

Figure A-11

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-08

Sheet 1 of 1

Date(s) Drilled	**05/10/17**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch / 4" drag bit and tri-cone bit**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**13 feet**
Water Level Depth	**17.5 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.77599, W117.20729**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					17" AC over 3" AB over			
						Fill			
						Moist, brown, poorly graded SAND, some gravel			CORR
10			1			**Alluvium (Qal)**			
						Moist, brown (7.5YR 3/3), lean CLAY (CL)			
5	5		2	20		Very stiff, brown (7.5YR 4/4), silty fine SAND (SM), some iron oxide staining	12		
5									
	10		3	40		Hard, moist, dark yellowish brown, sandy lean CLAY (CL), some fine to medium sand, some manganese oxide spots	9	123	SA(51)
0									
	15		4	8		Stiff, brown (7.5YR 3/3), lean CLAY (CL), iron oxide staining, manganese oxide spots	19		LL(28), PI(18)
-5						becomes wet ▽			
			5	9					
	20					Bottom of boring at 20.0 feet below ground surface			
-10									
	25								
-15									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-08

AECOM

Figure A-12

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-09

Sheet 1 of 1

Date(s) Drilled	**05/17/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**23 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.77778, W117.20776**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
20	0					9" AC over 11" of AB over **Fill** Moist, brown, clayey fine to medium SAND, trace fine gravel			
						few fine to coarse gravel (trench backfill for sewer main)			
15	5		1	4			8		
						3/4" gravel			
10	10		2	14		**Bay Point Formation (Qbp)** Medium dense, moist, brown (7.5YR 5/4), poorly-graded fine to coarse SAND with silt (SP-SM), trace to few fine to coarse gravel, oxidized	3		SA(10)
10									
	15		3	15		moist, brown, lean CLAY (CL) thin interbed	3		
5									
			4	20		Stiff, moist, brown (7.5YR 4/3), lean CLAY (CL), few fine sand, little iron oxide staining, trace manganese oxide spots			
	20					Bottom of boring at 20 feet below ground surface			
0									
	25								
-5									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-09

AECOM

Figure A-13

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-10a

Sheet 1 of 1

Date(s) Drilled	**05/10/17**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch / 4" drag bit and tri-cone bit**	Total Depth of Borehole	**7.5 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**20 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.77999, W117.20762**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
20	0					14" AC over 3" AB over **Fill** Moist, brown, sandy SILT, some fine sand			CORR
			1						
						Alluvium (Qal) Medium dense, moist, brown (7.5YR 4/4), silty fine SAND (SM), iron oxide staining			
15	5								
			2	13		Medium dense, moist, brown (7.5YR 3/3), clayey fine to medium SAND (SC)	17		
						Bottom of boring at 7.5 feet below ground surface (refusal on hard material)			
10	10								
5	15								
0	20								
-5	25								
-10	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-10a

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Figure A-14

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-10b

Sheet 1 of 1

Date(s) Drilled	**05/10/17**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch / 4" drag bit and tri-cone bit**	Total Depth of Borehole	**7.5 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**20 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.78000, W117.207619**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
20	0					14" AC over 3" AB over **Fill** Moist, brown, clayey fine SAND (SC)			
						Alluvium (Qal) Moist, brown (7.5YR 4/4), silty fine SAND (SM), iron oxide staining			
15	5								No Recovery
						Bottom of boring at 7.5 feet below ground surface (refusal on hard material)			
10	10								
5	15								
0	20								
-5	25								
-10	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-10b

AECOM

Figure A-15

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-11

Sheet 1 of 1

Date(s) Drilled	**05/09/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**18 feet**
Water Level Depth	**14.7 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.78142, W117.20714**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					9" of AC over 6" of AB over **Fill** Moist, brown, sandy SILT			
15			1						
						Alluvium (Qal) Loose, moist, brown (7.5YR 4/4), silty fine SAND (SM), material is oxidized			
5	5		2	7		Loose, moist, dark yellowish brown (10YR 4/4), poorly-graded fine SAND (SP-SM) with silt, trace iron oxide staining, trace clay films within soil, micaceous	7		SA(11)
10									
	10		3	24		**Bay Point Formation (Qbp)** Very stiff, moist, olive brown (2.5Y 4/2), sandy lean CLAY (CL), few iron oxide staining, few manganese oxide spots	19	113	LL(32), PI(18)
5									
	15		4	6		Medium stiff, wet, dark grayish olive (10YR 4/2), SILT (ML), few fine sand, micaceous, little iron oxide staining, moderate hydrocarbon odor ▽	30		
0									
	20		5	19		Medium dense, wet, dark yellowish brown (10YR 4/4), poorly-graded fine to medium SAND (SP-SM) with silt, micaceous, slight hydrocarbon odor			
						Bottom of boring at 20 feet below ground surface			
-5	25								
-10	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-11

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Figure A-16

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-14

Sheet 1 of 1

Date(s) Drilled	**05/09/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**15 feet**
Water Level Depth	**10 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.78684, W117.20617**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
15	0					4" of AC over 9" of AB over **Fill** Moist, yellowish brown, sandy SILT, mixed soils (chaotic structure)			CORR
			1			Moist, brown, silty fine SAND			
10	5		2	10		**Alluvium (Qal)** Medium dense, moist, poorly-graded fine to medium SAND (SP), trace fines, trace fine gravel, trace iron oxide staining, micaceous	6		
						Bay Point Formation (Qbp) Stiff, moist, brown (10YR 4/3), sandy lean CLAY (CL), few calcium carbonate and manganese oxide spots (Btk)	16		
						Medium dense, moist, light olive brown (2.5YR 5/3), poorly-graded fine to medium SAND (SP-SM) with silt, little iron oxide staining, micaceous, few thin interbeds of silty SAND (SM)			
5	10		3	34		becomes wet ▽			Non-Plastic
						Medium dense / stiff, wet, brown (7.5YR 4/4), moderate to thick interbedded poorly-graded SAND (SP-SM) with silt, sandy lean CLAY (CL) and lean CLAY (CL), little iron oxide staining, few manganese oxide spots			
0	15		4	14			15		
						Very stiff, wet, brown (7.5YR 4/3), sandy lean CLAY (CL), little iron oxide staining, few manganese oxide spots	17		
-5	20		5	19		Bottom of boring at 20.0 feet below ground surface			
-10	25								
-15	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-14

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Figure A-17

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-16

Sheet 1 of 1

Date(s) Drilled	**05/09/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**31 feet**
Water Level Depth	**19.5 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.78952, W117.20543**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
30	0					3" of AC over 7" of AB over **Fill** Moist, yellowish brown, sandy SILT, few fine gravel, mixed soils (chaotic structure)			
						Bay Point Formation (Qbp) Moist, reddish brown (10YR 5/4), lean CLAY (CL) with fine sand, few manganese oxide spots			
25	5		1	19		Very stiff, moist, dark yellowish brown (10YR 4/6), SILT (ML) with fine sand, few iron oxide staining, few manganese oxide spots			
20	10		2	25			12	119	
15	15		3	14		becomes stiff	12		
						Stiff, moist, dark yellowish brown (10YR 4/4), sandy lean CLAY (CL)			
10	20		4	13		becomes wet ▽	20	108	SA(63)
						Bottom of boring at 20 feet below ground surface			
5	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-16

AECOM

Figure A-18

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-17

Sheet 1 of 1

Date(s) Drilled	**05/10/17**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch / 4" drag bit and tri-cone bit**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**50 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.78933, W117.20388**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
50	0					3" AC over 3" AB over **Fill** Moist, brown, clayey fine SAND, tree root in top 1'			
45	5		1	40		becomes dark brown (7.5YR 3/3)	13	115	
						Bay Point Formation (Qbp) Dense, moist, yellowish brown (10YR 5/5), poorly-graded fine SAND (SP), trace fines			
40	10		2	67		Very dense, moist, gray brown (10YR 5/2), poorly graded fine SAND (SP), iron oxide staining, trace black spots	18		
						Very dense, moist, olive yellow, silty SAND (SM), little iron oxide staining			
35	15		3	83		increase iron oxide staining	16	113	SA(41)
						Very dense, moist, light brown gray, well-graded SAND (SW), some gravel, trace fines			
			4	45		Dense, moist, gray brown (10YR 5/2), poorly-graded fine SAND (SP), iron oxide staining			
30	20					Bottom of boring at 20.0 feet below ground surface			
25	25								
20	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-17

AECOM

Figure A-19

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-18

Sheet 1 of 1

Date(s) Drilled	**05/17/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**58 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.78992, W117.20335**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
55	0					9" of AC over **Fill** Moist, yellowish brown, silty fine SAND, few fine to coarse gravel			CORR
			1			← coarse gravel/cobble			
	5		2	31		**Scripps/Ardath Formations (Tsc/Ta)** Highly weathered, extremely weak, very soft to soft sedimentary rock Fragments to: Hard, moist, mottled yellowish brown (10YR 5/6), and light brownish gray (2.5Y 6/2), lean CLAY (CL), few fine sand, some iron oxide staining, trace manganese oxide staining, localized weak to moderate cementation	15		
50									
	10		3	53			19	107	WA(93)
45									
	15		4	43		← slight decrease in weathering, little iron oxide staining, predominantly gray (2.5Y 5/1)	18		
40			5	50 6"			21	107	
	20					Bottom of boring at 19.5 feet below ground surface			
35									
	25								
30									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-18

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Figure A-20

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-19

Sheet 1 of 1

Date(s) Drilled	**06/26/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**105 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.790166, W117.201486**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
105	0					5" AC over 6" AB over **Fill** Moist, dark yellowish brown, SILT, little to some sand, trace gravel, some chunks of Scripps Fm. material, trace chunks of clay			
100	5		1	33			18		SA(71)
95	10		2	40			14	115	
						Scripps Formation (Tsc) Hard, moist, dark yellowish brown (10YR 4/4), SILT (ML) with gravel			
90	15		3	70					
			4	77					
85	20					Bottom of boring at 20.0 feet below ground surface			
80	25								
75	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-19

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Figure A-21

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-20

Sheet 1 of 1

Date(s) Drilled	**06/26/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.8 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**151 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.79029, W117.200206**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
150	0		1			5" AC over 4" AB over **Fill** Moist, dark yellowish brown, SILT, trace sand, some harder fragments of silty SAND			CORR
145	5		2	95 12"		**Lindavista Formation (Qln)** Very dense, moist, dark yellowish brown (10YR 4/6), clayey SAND (SC), trace gravel, little laminations of darker-grained minerals, some iron oxide staining, interbeds of silty sand, little manganese oxide nodules	18		SA(48)
140	10		3	97 12"		Hard, moist, brown (10YR 4/3), sandy lean CLAY (CL), little iron oxide staining	19	101	LL(47), PI(24)
135	15		4	87		**Scripps Formation (Tsc)** Hard, moist, pale brown (10YR 6/5), lean CLAY (CL) with sand, trace gravel, laminations of iron-oxide rich materials and darker-grained minerals	18		SA(82)
			5	84 9"			19	97	
130	20					Bottom of boring at 19.8 feet below ground surface			
125	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-20

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Figure A-22

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-21

Sheet 1 of 1

Date(s) Drilled	**06/26/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**212 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.791472, W117.197492**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
210	0					2" AC over 7" concrete over 1" AB over **Fill** Moist, dark yellowish brown, SAND with silt			CORR
			1			**Lindavista Formation (Qln)** Moist, dark yellowish brown (10YR 3/6), lean CLAY (CL) with gravel, little small cobbles			
205	5		2	59		Hard, moist, dark yellowish brown (10YR 3/4), clayey SAND (SC), few fine to medium gravel, some laminations of sandy lean CLAY (CL), trace roots	6		SA(31)
	10		3	42		Dense, moist, very pale brown (10YR 7/4), clayey SAND (SC), some iron oxide staining	5	105	
200									
195	15		4	47					
	20		5	65		Hard, moist, light brownish gray (10YR 6/2), lean CLAY (CL) with fine sand, some iron oxide staining	21	90	
190						Bottom of boring at 20.0 feet below ground surface			
185	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-21

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Figure A-23

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-22

Sheet 1 of 1

Date(s) Drilled	**06/27/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**296 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.79472, W117.19372**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
295	0					8" AC over **Fill** Moist, dark yellowish brown, silty SAND with clay, little AC chunks			
	5		1	50 6"		becomes very moist			
290						**Lindavista Formation (Qln)** Very dense, moist, strong brown (7.5YR 5/8), clayey SAND (SC), trace manganese oxide nodules			
	10		2	50 6"			11	100	
285						Dense, moist, strong brown (7.5 YR 4/6), silty SAND (SM) with clay			
	15		3	50 6"		medium to coarse gravel layer			
280			4	72		becomes micaceous	11	105	
	20					Bottom of boring at 20.0 feet below ground surface			
275									
	25								
270									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-22

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Figure A-24

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-23

Sheet 1 of 1

Date(s) Drilled	**06/27/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**323 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.796941, W117.193087**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
320	0		1			5" AC over **Fill** Moist, dark reddish brown, clayey SAND, trace construction debris			LL(22), PI(11)
	5		2	70		**Lindavista Formation (Qln)** Hard, moist, strong brown (7.5YR 4/6), CLAY (CL)			
315									
	10		3	50 6"		Very dense, moist, strong brown (7.5YR 4/6), clayey SAND (SC)	12	103	
310									
	15		4	70					
305						Very dense, moist, strong brown (7.5YR 4/6), silty SAND (SM)			
	20		5	64			11	114	
						Bottom of boring at 20.0 feet below ground surface			
300									
	25								
295									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-23

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Figure A-25

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-24

Sheet 1 of 1

Date(s) Drilled	**06/27/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**311 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.79902, W117.19457**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
310	0					8" AC over **Fill** Moist, yellowish red, SILT with sand			
						Lindavista Formation (Qln) Very dense, moist, strong brown (7.5YR 5/8), clayey SAND (SC), trace medium gravel, interbeds of well-cemented, brown (10YR 4/5), poorly-graded SAND (SP-SM) with silt			
305	5		1	50 3"			6		WA(21)
	10		2	50 4"		Very dense, moist, strong brown (7.5 YR 4/6), silty SAND (SM) with clay, little fine to coarse gravel	9		
300									
295	15		3	50 6"		Hard, moist, strong brown (7.5YR 5/8), clayey SAND (SC), little fine to coarse gravel, some manganese oxide staining			
			4	50 6"		Hard, moist, strong brown (7.5YR 4/6), silty SAND (SM) with clay	9		
290	20					Bottom of boring at 19.5 feet below ground surface			
285	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-24

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Figure A-26

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-25

Sheet 1 of 1

Date(s) Drilled	**07/27/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.3 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**303 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.80125, W117.196628**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					5" AC over 3" AB over **Fill** Moist, brown, poorly-graded fine SAND			
300			1			**Lindavista Formation (Qln)** Moist, olive-gray,clayey SAND (SC)	10		WA(30), CORR, LL(22), PI(11)
	5		2	83 12"		Very dense, moist, olive-gray, clayey fine SAND (SC), strongly cemented interbed at 5 ft bgs			
295									
	10		3	85 12"		Hard, moist, olive-gray, lean CLAY (CL), some mottled brown fine sand Very dense, moist, olive-brown, poorly-graded fine SAND with clay (SP-SC), trace coarse sand and gravel	11	107	
290									
	15		4	50 6"		Very dense, moist, olive-brown, poorly-graded fine SAND (SP), few gravel, ~0.5 ft gravel layer at 15 ft bgs			
285									
			5	78 9"		Very dense, moist, olive-brown, clayey fine to coarse SAND (SC), few gravel, trace mottle oxidation	10		SA(20)
	20					Bottom of boring at 19.25 feet below ground surface			
280									
	25								
275									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-25

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Figure A-27

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-26

Sheet 1 of 1

Date(s) Drilled	**07/27/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**113 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.803355, W117.198636**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
113	0					6" AC over 4" AB over **Fill** Moist, brown, poorly-graded fine SAND			
						Lindavista Formation (Qln) Moist, dark gray, lean CLAY (CL)			
110						Moist, gray-brown, poorly-graded fine SAND (SP), trace coarse sand and gravel, gravel and cobble layer at 3 - 8 ft bgs			
	5		1	50 6"		Very dense, moist, olive-gray, well-graded SAND (SW), little gravel and trace clay gravel and cobble layer	8		SA(19)
105									
	10		2	88 12"		no gravel Very dense, moist, olive-gray, poorly-graded SAND (SP)			
100									
	15		3	90 12"		Very dense, moist, olive-gray, poorly-graded SAND (SP), trace fine gravel, mottle oxidation, interbeds of weak cementation, thin clay interbeds	19		
95			4	91 12"					
	20					Bottom of boring at 19.5 feet below ground surface			
90									
	25								
85									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-26

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Figure A-28

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-27

Sheet 1 of 1

Date(s) Drilled	**07/28/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**291 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.80525, W117.200454**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
290	0					8" AC over 4" AB over **Fill** Moist, red, poorly-graded SAND with clay, trace gravel			
			1			**Lindavista Formation (Qln)** Moist, olive-brown, poorly-graded fine SAND (SP), few gravel, trace clay, trace cobbles, trace strongly cemented formation chunks			
285	5		2	65		Very dense, moist, pale gray, poorly-graded fine SAND with clay (SP-SC), mottle oxidation, weak cementation	20		WA(78), LL(43), PI(25)
280	10		3	82 12"		becomes olive, decrease in clay			
275	15		4	95 12"		thin weakly cemented interbeds	19		
						Very dense, moist, olive, clayey fine SAND (SC), mottled oxidation, thin weakly cemented interbeds			
			5	95 10"					
270	20					Very dense, moist, olive-gray, poorly-graded fine SAND with clay (SP-SC), trace oxidation, weak to moderate cementation Bottom of boring at 20.0 feet below ground surface			
265	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-27

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Figure A-29

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-28

Sheet 1 of 1

Date(s) Drilled	**07/26/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**303 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.808603, W117.201152**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					AC over AB over **Fill** Moist, red-brown, poorly-graded fine to medium SAND, trace fines			
300						**Lindavista Formation (Qln)** Very dense, moist, red-yellow, poorly-graded fine to coarse SAND (SP), trace gravel, trace weakly cemented chunks			
	5		1	85 6"			8		
						Very dense, moist, gray, poorly-graded SAND with clay (SP-SC), few mottle oxidation stains			
295									
	10		2	92 12"					
290									
	15		3	80 12"		becomes olive-brown	17		
285									
			4	78 12"		Very dense, moist, olive-gray, poorly-graded fine SAND (SP), trace gravel			
	20					Bottom of boring at 19.5 feet below ground surface			
280									
	25								
275									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-28

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Figure A-30

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-29

Sheet 1 of 1

Date(s) Drilled	**07/26/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**311 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.811064, W117.201125**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
310	0					6" AC over 3" AB over **Fill** Moist, red-yellow, poorly-graded fine SAND with silt, trace weakly cemented chunks			
			1				7		CORR
305	5		2	50 6"		**Lindavista Formation (Qln)** Very dense, moist, orange-brown, poorly-graded fine SAND (SP), trace silt, oxidized			
300	10		3	85 12"		← 2" gravel in shoe ← becomes orange	8	97	
295	15		4	50 6"		Very dense, moist, orange, poorly-graded SAND with clay (SP-SC), trace gravel, oxidized			
			5	50 6"		Very dense, moist, gray, poorly-graded SAND (SP), weak cementation	17		
290	20					Bottom of boring at 19.0 feet below ground surface			
285	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-29

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Figure A-31

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-30

Sheet 1 of 1

Date(s) Drilled	**07/26/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**313 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.813809, W117.201113**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					4" AC over 3" AB over **Lindavista Formation (Qln)** Very dense, moist, olive-brown, clayey SAND (SC), trace oxidation			
310									
	5		1	50 3"		becomes very dense, gravel layer, fine to coarse gravel, trace weakly cemented chunks			
305									
	10		2	83 12"		Very dense, moist, dark red-brown, clayey fine SAND (SC) Very dense, moist, yellow-brown, clayey SAND (SC), weakly cemented, few mottled oxidation stains	9	96	
300									
	15		3	85 12"		Very dense, moist, olive-brown, poorly-graded fine SAND (SP), trace fines, few weakly cemented chunks, trace mottled oxidation stains			
295									
			4	79 12"		becomes orange-brown, increased oxidation; interbed of gray-brown, lean CLAY (CL), little sand	15	93	
	20					Bottom of boring at 19.5 feet below ground surface			
290									
	25								
285									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-30

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Figure A-32

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-31

Sheet 1 of 1

Date(s) Drilled	**7/25/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**324 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.817006, W117.201764**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					4" AC over 3" AB over **Lindavista Formation (Qln)** Very dense, moist, dark yellowish brown (10YR 4/4), clayey SAND (SC) cobble/gravel layer, fine gravel to large cobbles			
320			1						
	5		2	78 12"		becomes very dense light gray (10YR 7/1) interbed at 5.25 to 6 ft			
315									
	10		3	70		sandier interbed at 10.25 to 10.75 ft Hard, moist, light yellowish brown (10YR 6/4), lean CLAY (CL) with sand, little iron oxide stains			
310									
	15		4	58					
305			5	90 12"					
	20					Bottom of boring at 19.5 feet below ground surface			
300									
	25								
295									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-31

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Figure A-33

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-32

Sheet 1 of 1

Date(s) Drilled	**7/25/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**327 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.819132, W117.20351**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
325	0					5" AC over 3" AB over **Lindavista Formation (Qln)** Very dense, moist, brownish yellow (10YR 6/8), clayey SAND (SC), few fine to coarse gravel, trace roots, trace iron oxide stains			
						Very dense, moist, mottled pale olive (5Y 6/4) and light olive gray (5Y 6/2), silty SAND (SM), trace clay, trace fine-red gravel, trace roots, trace cobbles, clay rich laminations and laminations of iron oxide rich material			
320	5		1	85 12"					
315	10		2	52		interbed of hard, moist, pale olive (5YR 6/3), sandy lean CLAY (CL), some iron oxide stains becomes dense, increase in clay content			
310	15		3	78 12"		becomes very dense			
			4	75 12"		Hard, moist, pale olive (5YR 6/4), sandy lean CLAY (CL), few iron oxide stains			
305	20					Bottom of boring at 20.0 feet below ground surface			
300	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-32

AECOM

Figure A-34

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-33

Sheet 1 of 1

Date(s) Drilled	**7/25/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**18.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**335 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk / Grab**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.823902, W117.206029**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
335	0					5" AC over 4" AB over **Lindavista Formation (Qln)** Very dense, moist, yellowish brown (10YR 5/6), clayey SAND (SC), few chunks of dark brown (10YR 3/3) CLAY (CL) 3" cobble layer			
			1						
330	5		2	50 1"		Hard, moist, brown (10YR 5/3), lean CLAY (CL), few fine to coarse gravel, trace fine sand, laminations of iron rich material			
			3						
325	10		4	50 2"					
			5						
320	15		6	50 0"					
			7						
			8			Bottom of boring at 18.5 feet below ground surface, refusal on large cobble			
315	20								
310	25								
305	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-33

AECOM

Figure A-35

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-34

Sheet 1 of 1

Date(s) Drilled	**06/28/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**340 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.827359, W117.206037**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
340	0					6" AC over 8" AB over **Lindavista Formation (Qln)** Very dense, moist, olive yellow (2.5Y 6/6), clayey SAND (SC), <2" chunks of moist, dark olive brown CLAY (CL), few roots, trace fine to medium gravel } gravel layer			
335	5		1	50 6"		Very dense, moist, yellow (10YR 7/8), clayey SAND (SC), laminations of iron-oxide rich layers			
330	10		2	50 6"		Very dense, moist, olive yellow (2.5YR 6/6), silty SAND (SM), few to little gravel	10	107	SA(27)
325	15		3	50 6"		Very dense, moist, olive (5YR 4/4), clayey SAND (SC), interbeds of very dark grayish brown (10YR 3/2) CLAY (CL)	14		
			4	50 6"		Very hard, moist, olive (5YR 5/4), lean CLAY (CL), trace fine sand, micaceous, laminations, interbeds of SILT (ML)	12		
320	20					Bottom of boring at 19.5 feet below ground surface			
315	25								
310	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-34

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Figure A-36

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-35

Sheet 1 of 1

Date(s) Drilled	**06/28/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**348 feet**
Water Level Depth	**19.5 fbgs (during drilling)**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.31759, W117.205434**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					6" AC over 6" AB over **Fill** Moist, yellowish brown, clayey SAND, trace very coarse gravel, few dark brown chunks of clay, trace AC and brick fragments			CORR
345			1						
	5		2	11		**Lindavista Formation (Qln)** Medium dense, moist, yellowish brown (10YR 5/8), clayey SAND (SC), trace very coarse gravel, trace roots, interbeds of dark yellowish brown (10YR 3/4) sandy lean CLAY (CL)	14		
340									
	10		3	54		Hard, moist, pale brown (10YR 6/3), sandy lean CLAY (CL), micaceous, some iron oxide staining, laminations	24	98	
335									
	15		4	81 12"		Very dense, moist, light olive brown (10YR 5/6), clayey SAND (SC), some iron oxide staining, laminations			
330									
	20		5	18		Very stiff, moist, light olive brown (2.5Y 5/4), lean CLAY (CL) with sand trace very coarse gravel ▽	23		
						Bottom of boring at 20.0 feet below ground surface			
325	25								
320									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-35

AECOM

Figure A-37

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-36a

Sheet 1 of 1

Date(s) Drilled	**06/29/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**2.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**356 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**none**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.833234, W117.20105**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
355	0					6" AC over **Lindavista Formation (Qln)** Dense, moist, yellowish brown (10YR 5/8), sandy SILT (ML), trace fine sand, few fine to very coarse gravel, some chunks of well cemented material, trace small cobbles			
						Bottom of boring at 2 feet below ground surface (refusal on hard material)			
350	5								
345	10								
340	15								
335	20								
330	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-36a

AECOM

Figure A-38

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-36b

Sheet 1 of 1

Date(s) Drilled	**06/29/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**18.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**356 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.83321, W117.20104**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
355	0					7" AC over **Lindavista Formation (Qln)** Very dense, moist, brownish yellow (10YR 6/6), clayey fine SAND (SC), few fine to very coarse gravel, trace small cobbles			CORR
			1			very hard cemented layer/concretion, few manganese oxide nodules			
						trace iron oxide staining			
	5		2	85 12"			8		LL(21), PI(9)
350									
	10		3	92 12"					
345						Very dense, moist, brownish yellow (10YR 6/8), poorly-graded SAND (SP), trace clay, laminations of alternating bleached and iron-oxide rich layers, few manganese oxide nodules			
	15		4	89 12"		Very dense, moist, yellow brown (10YR 5/6), clayey SAND (SC), trace gravel, laminations of alternating clay-rich, iron-oxide rich layers and layers of darker minerals	8		
340									
			5	50 0"		Bottom of boring at 18.5 feet below ground surface (refusal on hard materials)			
	20								
335									
	25								
330									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-36b

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Figure A-39

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-37a

Sheet 1 of 1

Date(s) Drilled	**06/29/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**5.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**373 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**none**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.834441, W117.198367**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					8" AC over			
						Lindavista Formation (Qln)			
						Dense, moist, brown (7.5YR 4/4), sandy SILT (ML), few very coarse gravel			
						Hard cemented layer/concretion over			
			1			Moist, brown (7.5YR 4/4), poorly-graded GRAVEL with silt and sand (GP-GM)			
370									
	5					Bottom of boring at 5 feet below ground surface (refusal on hard materials)			
365									
	10								
360									
	15								
355									
	20								
350									
	25								
345									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-37a

AECOM

Figure A-40

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-37b

Sheet 1 of 1

Date(s) Drilled	**06/29/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**4.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**373 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**none**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.834445, W117.198321**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
370	0					8" AC over **Lindavista Formation (Qln)** Dense, moist, dark yellowish brown, sandy SILT (ML), some fine gravel to small cobbles. Cobble layer at 1'			
						Bottom of boring at 4 feet below ground surface (refusal on hard materials)			
365	5								
360	10								
355	15								
350	20								
345	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-37b

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Figure A-41

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-38

Sheet 1 of 1

Date(s) Drilled	**06/30/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.2 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**369 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**Bulk / SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.834805, W117.194949**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					7" AC over 5" AB over **Lindavista Formation (Qln)** Dense, moist, strong brown (7.5YR 5/8), clayey SAND (SC), some fine to very coarse gravel, trace small cobbles			CORR
365			1			gravel layer			
	5		2	56		Very dense, moist, yellowish brown (10YR 5/6), clayey SAND (SC)			
360									
	10		3	76 11"		Very dense, moist, brownish yellow (10YR 6/6), poorly-graded SAND (SP-SM) with silt, trace clay	15	105	
355									
	15		4	80 12"		increase in iron oxide staining, decrease in clay content			
350			5	90 8"		increase in manganese oxide staining. Grades to silty SAND (SM)	22		
	20					Bottom of boring at 19.2 feet below ground surface			
345									
	25								
340									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-38

AECOM

Figure A-42

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-40

Sheet 1 of 1

Date(s) Drilled	**06/30/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**18.9 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**333 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.84014, W117.19674**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					7"AC over **Fill** Very dense, moist, dark yellowish brown (10YR 4/4), silty SAND, some fine to coarse gravel, few small cobbles, fragments of weathered and unweathered formation, trace clay			
330									
	5		1	68		increase in iron oxide staining			
325									
	10		2	75 12"			14	102	
320									
	15		3	76 8"					
315									
			4	50 5"			13		
	20					Bottom of boring at 18.9 feet below ground surface			
310									
	25								
305									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-40

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Figure A-43

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-41

Sheet 1 of 1

Date(s) Drilled	**06/30/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**18.8 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**254 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**Bulk / SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.843028, W117.198012**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					8" AC over			
						Fill			
						Moist, yellowish brown (10YR 5/6), sandy SILT, little medium to very coarse gravel, little AC pieces, little chunks of unweathered formation, trace clay	18		WA(55), CORR
						Scripps Formation (Tsc)			
250			1			Very dense, moist, yellow (2.5Y 7/6), silty SAND (SM), trace iron oxide staining, laminations of lighter material			
	5		2	50 2"					
						cobble layer			
245									
	10		3	50 5"			16	96	
240									
	15		4	50 5"					
			5	50 4"			6		
235						Bottom of boring at 18.8 feet below ground surface			
	20								
230									
	25								
225									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-41

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Figure A-44

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-43

Sheet 1 of 1

Date(s) Drilled	**07/05/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**341 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**Bulk / SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.852015, W117.203768**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
340	0					6.5" AC over 6" AB over **Fill** Medium dense to very dense, moist, yellowish brown (10YR 5/8), clayey SAND, little chunks of weathered and weakly cemented formation, trace fine to very coarse gravel, micaceous			
			1						
335	5		2	43		**SCRIPPS FORMATION** Dense, moist, yellowish brown, clayey SAND (SC), weakly cemented, few iron oxide staining, micaceous			
330	10		3	52		few inclusions of clay, increase in iron oxide staining	12	109	
325	15		4	20		increase in sand grain size			
			5	44		interbed of hard, moist, dark grey (7.5 YR 4/1), sandy CLAY, little fine to coarse gravel	14	102	
320	20					Bottom of boring at 20.0 feet below ground surface			
315	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-43

AECOM

Figure A-45

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-44

Sheet 1 of 1

Date(s) Drilled	**06/28/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**373 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.854173, W117.204321**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					7" AC over **Fill** Moist, yellowish brown (10YR 5/6), SILT, trace fine sand, few AC chunks, trace chunks of dark yellowish brown (10YR 3/4) CLAY, little to some fine to very coarse gravel and small cobbles			
370									
	5		1	89 12"		**Linda Vista Formation (Qln)** Very dense, moist, strong brown (10YR 5/6), poorly-graded SAND with clay (SP-SC), interbeds of clayey SAND (SC), some iron oxide staining, weathered	12		LL(28), PI(11)
365									
	10		2	60					
360						**Scripps Formation (Tsc)** Very dense, moist, light brownish gray (10YR 6/2), silty SAND (SM), laminations of iron oxide rich material, micaceous, interbeds of finer grained material, slightly weathered, trace clay			
	15		3	75 12"		increase in clay content			
355									
			4	78 12"			21	91	
	20					Bottom of boring at 19.5 feet below ground surface			
350									
	25								
345									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-44

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Figure A-46

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-45

Sheet 1 of 1

Date(s) Drilled	**07/28/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**291 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.858257, W117.205637**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
290	0					4" AC over 3" AB over **Lindavista Formation (Qln)** Moist, olive-gray, poorly-graded SAND (SP), few gravel, trace clay, trace weakly cemented chunks, trace mottle oxidation			
			1						
285	5		2	81 12"		Very dense, moist, olive, clayey fine SAND (SC), mottle oxidation	20		
280	10		3	60			20		WA(97), LL(46), PI(19)
						Hard, moist, olive, lean CLAY (CL), little fine sand			
275	15		4	82 12"		Very dense, moist, mottled gray and olive, clayey fine SAND (SC), weak cementation, mottled oxidation	19		
			5	75 10"		increase clay			
270	20					Very dense, moist, olive, poorly-graded fine SAND (SP-SC) with clay, mottled oxidation Bottom of boring at 20.0 feet below ground surface			
265	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-45

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Figure A-47

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-46

Sheet 1 of 1

Date(s) Drilled	**07/06/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**216 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.860329, W117.208244**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
215	0					9" AC over **Fill** Moist, olive brown, silty SAND, few gravel, trace cobbles			
						Moist, olive brown, silty SAND, few gravel, chunks of cemented Scripps Fm.			
210	5		1	22					
	10		2	31			18	103	
205						**Alluvium (Qal)** Hard, moist, dark brown, lean CLAY (CL), some fine sand			
	15		3	20					
200			4	19			23	100	WA(65), LL(31), PI(16)
	20					Bottom of boring at 20.0 feet below ground surface			
195									
	25								
190									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-46

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Figure A-48

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-47

Sheet 1 of 1

Date(s) Drilled	**07/05/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**284 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**Bulk / SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.863786, W117.21234**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					5" AC over **Fill** Moist, olive yellow (2.5Y 6/6), SILT, few chunks of weakly cemented material, few chunks of formation			
280			1						
	5		2	97 12"		**Scripps Formation (Tsc)** Very hard, moist, mottled light yellowish brown (10YR 6/4) and gray (10YR 6/1), fat CLAY (CH), few fine sand, few iron oxide staining, moderately cemented, weathered	16		WA(93), LL(56), PI(32)
275									
	10		3	78 12"					
270									
	15		4	50 6"		increase in sand content, increase in iron oxide staining, laminations of iron-oxide rich layers			
265			5	65 12"			19	96	
	20					Bottom of boring at 19.5 feet below ground surface			
260									
	25								
255									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-47

AECOM

Figure A-49

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-48

Sheet 1 of 1

Date(s) Drilled	**07/05/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.1 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**330 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.866619, W117.213338**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
330	0					4" AC over **Fill** Moist, yellowish brown (10YR 5/6), poorly-graded SAND with silt, few fine to coarse gravel, little chunks of weakly cemented material			
						Scripps Formation (Tsc) Hard, moist, mottled strong brown (7.5YR 5/8) and gray (7.5YR 5/1), lean CLAY (CL) with sand, weakly cemented, laminations of alternating gray and brown materials, interbeds of sandier material			
325	5		1	77 9"					
320	10		2	70			9	97	
315	15		3	78 12"					
			4	75 7"			17		
						Bottom of boring at 19.1 feet below ground surface			
310	20								
305	25								
300	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-48

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Figure A-50

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-49

Sheet 1 of 1

Date(s) Drilled	**07/06/2017**	Logged By	**R. Bourdette**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.8 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**301 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**Bulk / SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.865829, W117.208979**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
300	0					5.5" AC over **Fill** Moist, yellow brown, silty fine to medium SAND, trace gravel	13		WA(34), CORR
			1			**Scripps Formation (Tsc)** Very dense, moist, yellow brown, silty fine SAND (SM), trace gravel, some slightly cemented chunks of formation, interbeds of olive-brown silty SAND and oxidized yellow-red poorly-graded SAND			
295	5		2	78 12"		Very dense, moist, pale gray brown, poorly-graded SAND (SP-SM) with silt, trace oxidation, interbeds of very oxidized, yellow-red layers	18		
290	10		3	75 12"		Very dense, moist, light gray, poorly graded SAND (SP)	14	98	
285	15		4	84 12"		increase in oxidation	7		
			5	90 9"		increase in SILT content (SP-SM) becomes yellow brown			
280	20					Bottom of boring at 19.8 feet below ground surface			
275	25								
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-49

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Figure A-51

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-50

Sheet 1 of 1

Date(s) Drilled	**7/24/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.5 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**289 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.86825, W117.207153**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					5" AC over 3" AB over **Fill** Moist, dark yellowish brown (10YR 4/4), clayey SAND, some fine to very coarse gravel, trace small cobbles			
285			1			**Scripps Formation (Tsc)** Medium dense, moist, mottled brownish yellow (10YR 6/8) and gray (10YR 6/1), clayey SAND (SC) ←~0.5 ft layer of very coarse gravel			CORR
	5		2	20		←interbed of very dark gray (10YR 3/1), sandy CLAY (CL)			
280						Dense, moist, dark yellowish brown (10YR 4/6), poorly-graded SAND with silt (SP-SM), few fine to coarse gravel, trace clay			
	10		3	32					
275									
	15		4	35		Hard, moist, mottled grayish brown (10YR 6/2) and yellowish brown, SILT (ML), trace sand, trace medium to coarse gravel			
270			5	74		←increase in sand content			
	20					Bottom of boring at 19.5 feet below ground surface			
265									
	25								
260									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-50

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Figure A-52

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-51a

Sheet 1 of 1

Date(s) Drilled	**7/24/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**4.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**379 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**none**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.872422, W117.20358**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					6" AC over 2" AB over **Fill** Moist, yellowish brown, clayey SAND, little coarse gravel and large cobbles, few chunks of strongly cemented formation			
						Moist, dark yellowish brown, CLAY			
375						Bottom of boring at 4 feet below ground surface, refusal on possible slurry			
	5								
370									
	10								
365									
	15								
360									
	20								
355									
	25								
350									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-51a

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Figure A-53

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-51b

Sheet 1 of 1

Date(s) Drilled	**7/24/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**3.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**379 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**none**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.872397, W117.207355**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					6" AC over 2" AB over **Fill** Moist, olive-brown, clayey SAND, few fine to medium gravel cobble/sandier layer becomes sandy CLAY with an odor, possibly contaminated			
375	5					Bottom of boring at 3 feet below ground surface, refusal on possible concrete			
370	10								
365	15								
360	20								
355	25								
350	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-51b

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Figure A-54

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-52

Sheet 1 of 1

Date(s) Drilled	**07/07/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**19.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**382 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**Bulk / SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.876399, W117.207639**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
380	0					6.5" AC over **Lindavista Formation (Qln)** Very dense, moist, red, poorly-graded SAND (SP-SM) with silt, little fine to coarse gravel			CORR
			1						
	5		2	50 6"		gravel layer			
375									
	10		3	95 12"		some chunks of formation material, few chunks of CLAY (CL) with sand	19		
370									
	15		4	88 12"		**Scripps Formation (Tsc)** Hard, moist, gray (10YR 6/1), lean CLAY (CL) with sand, little iron oxide staining	19		WA(69)
365			5	50 6"					
	20					Bottom of boring at 19.0 feet below ground surface			
360									
	25								
355									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-52

AECOM

Figure A-55

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-53a

Sheet 1 of 1

Date(s) Drilled	**07/07/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**2.0 feet**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**359 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.876687, W117.205001**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					6" AC over 8" gravelly slurry over 6" loose gravelly sand over 6" gravelly slurry			
						Bottom of boring at 2 feet below ground surface			
355	5								
350	10								
345	15								
340	20								
335	25								
330	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-53a

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Figure A-56

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring FM-53b

Sheet 1 of 1

Date(s) Drilled	**07/07/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**1.0 foot**
Drill Rig Type	**CME 85**	Drilling Contractor	**Cascade Drilling**	Approximate Surface Elevation	**359 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.876684, W117.20493**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					6" AC over gravelly slurry			
						Bottom of boring at 1.0 feet below ground surface			
355	5								
350	10								
345	15								
340	20								
335	25								
330	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 FM-53b

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Figure A-57

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring PS-1

Sheet 1 of 2

Date(s) Drilled	**03/27/2017**	Logged By	**A . Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**61.5 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**13.5 feet**
Water Level Depth	**9.0**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cement/Bentonite Grout**	Location	**N32.76323, W117.1995**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					6" of concrete over **Fill** Moist, very dark grayish brown, silty fine SAND, trace fine to coarse gravel			
10						**Alluvium (Qal)** Loose, moist, dark olive brown (2.5Y 3/3), poorly-graded fine SAND (SP-SM) with silt, micaceous			
	5		1	9			10		
5						becomes wet ▽			
	10		2	10		few manganese oxide staining; micaceous, trace iron oxide staining, mostly fine to medium sand			
0									
	15		3	6		contains very thin to thin bedding with fine to medium SAND (SP) interbeds	22		
-5									
	20		4	3		manganese oxide stained bedding laminations, few fine sandy SILT (ML) bedding laminations			
-10									
	25		5	8			28		
-15									
	30					Loose, wet, dark grey (2.5Y, 4/1) to very dark grey (2.5Y, 3/1), silty fine SAND (SM), few thin interbeds of fine sandy SILT (ML); manganese oxide stained			

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 PS-1

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Figure A-58

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring PS-1

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30		6	8		bedding laminations in finer grained materials			
						Medium stiff, wet, black (10YR, 2/1), SILT with sand (MH), micaceous			
-20									
	35		7	4			54		LL(56), PI(23), HYD(74)
-25									
	40		8	8		becomes stiff, few small shell fragments, little fine sand			
			9	13		Stiff, wet, black (10YR, 2/1), sandy SILT (ML), few shell fragments			
-30			10	9		trace shell fragments, few thin CLAY (CL) interbeds			
	45		11	10		Medium dense, wet, dark gray (2.5Y, 4/1), poorly-graded fine SAND (SP-SM) with silt, micaceous	29		
			12	10		Stiff, wet, dark grey to black (5Y, 4/1), lean CLAY(CL), few fine sand, micaceous, few thin bedding	36		LL(45), PI(21), HYD(56)
-35									
	50		13a	27			26		WA(25)
						Medium dense, wet, dark grey (5Y, 4/1) to black (5Y, 2.5/1), silty fine SAND (SM), manganese oxide stained bedding laminations, micaceous, few thin SILT (ML) interbeds			
-40									
	55		14a	23			23		HYD(10)
						Medium dense, wet, dark gray (GLEY1 4), poorly-graded fine SAND (SP), trace fines, few manganese oxide stained bedding laminations			
-45									
	60		15	50					Sample S-15, blow counts may be inflated due to overpacked sampler.
						Bottom of boring at 61.5 feet below ground surface			
-50									
	65								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 PS-1

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Figure A-58

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring PS-2

Sheet 1 of 2

Date(s) Drilled	**03/28/2017**	Logged By	**A . Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**65.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**13.0 feet**
Water Level Depth	**7.8 ft**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Well Construction Per County Well Permit Guidelines**	Location	**N32.76364, W117.20007**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					5" of concrete over **Fill** Moist, very dark grayish brown, silty fine SAND			
10									
	5		1	7		**Alluvium (Qal)** Loose, moist, grayish brown (2.5Y 5/2), poorly-graded fine SAND (SP-SM) with silt, trace iron oxide stain, micaceous			
5						▼ ▽			
	10		2a	5		contains interbeds of very dark grey, silty SAND (SM), few iron oxide staining			
0									
	15		3-1	6			25	98	Driller added water to inside of auger
-5									
	20		4	3					Some issues with heaving sands, driller began taping end of shoe prior to sampling. Sample S-4, potentially compromised with effort to mitigate flowing sands
-10									
	25		5	4		Soft, wet, very dark gray (GLEY1 3) to black (GLEY1 2.5), very thin to moderate interbeds of SILT (ML) and CLAY (CL), few fine sand, micaceous, few bedding laminations	46		WA(80)
-15									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 PS-2

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Figure A-59

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring PS-2

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30					becomes very stiff			
			6-1-1/2	21		poorly-graded fine to medium SAND (SP-SM) with silt interbeds, dark greenish gray (GLEY1 4/1), micaceous, contact in Tube = 1			
-20									
	35		7	5		becomes medium stiff, trace shell fragments			Flowing sands
-25									
	40		8	16		becomes very stiff			
-30						Loose, wet, very dark gray to black, silty fine SAND (SM)			
	45		9	10		similar to above, trace small shell fragments	23		HYD(27)
-35									
	50		10 (1)	27		Medium dense, wet, dark gray (GLEY1 4), poorly-graded fine to medium SAND (SP-SM) with silt, darker bedding laminations			Flowing sands
-40									
	55		11	27					Sample S-11, Only drove 12"- sample is probably disturbed/sluff
-45									
	60		12	39		becomes dense			
-50									
	65					Bottom of boring at 65 feet below ground surface			

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 PS-2

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Figure A-59

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring PS-3

Sheet 1 of 3

Date(s) Drilled	**04/03/2017**	Logged By	**D. Rector**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**8-inch**	Total Depth of Borehole	**81.0 feet**
Drill Rig Type	**Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**13.5 feet**
Water Level Depth	**10.0**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cement/Bentonite Grout**	Location	**N32.76344, W117.20058**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					2" of AC over 6" of concrete over **Fill** Moist, dark olive gray, silty fine SAND, micaceous			
10						**Alluvium (Qal)** Loose, moist, dark gray (5Y 4/1), silty fine to medium SAND (SM), micaceous			
	5		1-1/2	7			14	94	
5									
	10		2	5		Loose, wet, dark gray (2.5Y 4/1), poorly-graded fine to medium SAND with silt (SP-SM), micaceous bedding laminations of dark minerals (biotite) ▽	35		WA(6.5)
0									
	15		3-1/2	24		becomes medium dense	25	95	
-5									
	20		4	3		Soft, wet, very dark gray (5Y 3/1), sandy SILT (ML), micaceous	38		WA(63.9) Heaving sand in auger, driller began taping the end of the samples
-10									
	25		5	5					
-15									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 PS-3

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Figure A-60

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring PS-3

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30								No sample due to flowing sand: 7 feet of sand surged into auger when pulling out the plug.
-20									
	35		6	7		becomes medium stiff, trace shell fragments			Flowing material
-25									
	40		7-1	14		becomes stiff, few interbedded silty fine SAND (SM) laminations and very thin interbeds, few shell fragments	33	89	
-30									
	45		8	12		silty SAND (SM) interbed			
-35									
	50		9	10		Medium dense, wet, dark gray (GLEY1 4), poorly-graded fine to medium SAND with silt (SP-SM), micaceous, bedding laminations of darker minerals (biotite), trace shell fragments	28		WA(9) Surging material in auger
-40									
	55		10	16					Drillller says drilling is becoming tougher - material is tighter
									Surging material
-45						few very thin SILT (ML) interbeds			
	60		11a	11		Medium dense, wet, greenish black (GLEY1 2.5/5GY), silty fine SAND (SM), micaceous	21		2 samples collected due to change in lithology: S-12a is CLAY (CL) and S-12b is SILT (ML)
-50									
	65								

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Figure A-60

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring PS-3

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	65					Stiff, wet, very dark gray (GLEY N3), fat CLAY (CH) interbed, trace organics	38		LL(58), PI(40)
						Stiff, wet, very dark gray (GLEY1 N3), SILT (ML), little fine sand, micaceous			
-55									
	70		12	8		trace fine gravel, trace iron oxide spots	26		
-60			13	6					
	75		14	53					Moderate rig chatter
-65						Dense to very dense, fine to coarse GRAVEL (GP)			
	80					clasts becoming larger and increase in amount of clasts			Heavy rig chatter
			15	50 6"		auger refusal at 80.5 fbgs on gravel/cobble			
						Bottom of boring at 81 feet below ground surface			
-70									
	85								
-75									
	90								
-80									
	95								
-85									
	100								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 PS-3

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Figure A-60

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring TC-1

Sheet 1 of 3

Date(s) Drilled	**04/06/17, 04/07/17**	Logged By	**A . Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**HSA / Mud Rotary**	Drill Bit Size/Type	**8-inch / 4" drag bit and tri-cone bit**	Total Depth of Borehole	**96.5 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**17 feet**
Water Level Depth	**15.0 ft**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cement/Bentonite Grout**	Location	**N32.77068, W117.20457**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					7" of AC over 8" of AB over **Fill** Moist, very dark grayish brown, sandy CLAY			
15						Moist, brown, clayey fine to medium sand SAND (SC)			
						Moist, very dark grayish brown, sandy CLAY (CL)			
5	5		1	22		Moist, very stiff, very dark gray, sandy CLAY (CL), trace fine to coarse gravels, few olive gray sandy pockets, material appears mixed and heterogeneous			
10									
	10		2	13		small AC fragments, trace organics			
5									
	15		3	7		**Alluvium (Qal)** Medium stiff, moist, very dark grayish brown (2.5Y 3/2), lean CLAY with sand (CL) ▽ micaceous, trace very fine shells, homogeneous, massive becomes wet			
0			4	Push		becomes very soft			LL(47), PI(26), HYD(84)
	20		5	9		Loose, wet, brown (10YR 5/3), poorly-graded fine to medium SAND (SP-SM) with silt, slight mottled coloration, massive			
-5						Stiff, wet, dark grayish brown (10YR 4/2), fat CLAY (CH), trace iron oxide staining, trace mica			
	25		6	9		Becomes black (GLEY1 N2.5), trace shells, few organics, slight organic odor contains thin to laminated interbeds of wet, dark greenish gray (GLEY1 5G 4/1) to very dark gray (GLEY1 N3), poorly-graded SAND (SP-SM) with silt, silty SAND (SM), and SILT (ML)			LL(84), PI(55), HYD(92)
-10									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 TC-1

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Figure A-61

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring TC-1

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30		7	11			40		DS, LL(100), PI(63), HYD(97)
-15									
	35		8	5					
-20									
	40		9	18		Wet, medium dense, dark grey, silty fine SAND (SM)			
-25									
	45		10	17		Very stiff, wet, very dark greenish gray (GLEY1 5Y 3/1), clayey fine SAND (SC), few mica, massive			LL(34), PI(18), HYD(42)
-30									
	50		11	30		similar to above			
-35									
	55		12	44		Dense, wet, very dark grayish brown (2.5Y 3/2), silty fine to medium SAND with gravel (SM)			
-40						gravel layer			Moderate rig chatter (1-2 minutes to get through)
	60		13	38		few to little fine to coarse gravel, trace coarse sand	10		SA(20)
-45									Light rig chatter
	65					**Old Alluvium (Qoa) / Bay Point Formation (Qbp)** Hard, dark greenish gray (GLEY1 10GY 4/1), lean CLAY (CL), micaceous, few iron oxide staining			

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Figure A-61

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring TC-1

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	65								
			14	48		becomes brown (10YR 5/3) 1" thick poorly-graded SAND (SP) interbed (not included in sample) 2" thick paleosol (S-14c)			
-50						Dense, wet, olive brown (2.5Y 4/4), silty fine SAND (SM), micaceous, material is oxidized			
						gravel layer			slight rig chatter
	70								
-55						Very dense, wet, grayish brown (2.5Y 5/2), well-graded SAND (SW-SM) with silt, micaceous			
	75								
			15	86		little iron oxide staining (material looks more oxidized), slight increase in fine content	16		SA(10)
-60									Driller comment: 1' thick hard layer
	80								
-65									
						gravel layer			Light rig chatter
	85								
			16	51		trace to few fines, slight increase in general grain size, little iron oxide staining			
-70									
	90								
-75						Very dense, wet, very dark gray (GLEY1 N3), silty fine SAND (SM), few thin interbeds of increased/decreased fines content, micaceous			
	95								
			17	80			19		SA(36)
-80						Bottom of boring at 96.5 feet bgs			
	100								

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Figure A-61

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring TC-2

Sheet 1 of 3

Date(s) Drilled	**04/10/17 - 04/11/17**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**HSA / Mud Rotary**	Drill Bit Size/Type	**8-inch / 4" drag bit and tri-cone bit**	Total Depth of Borehole	**96.5 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**17 feet**
Water Level Depth	**not measured**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cement/Bentonite Grout**	Location	**N32.77146, W117.20521**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
15	0					6" of asphalt over **Fill** Moist, brownish yellow, clayey SAND, few fine to medium gravel			
5	5		1	17		becomes dark gray			
-10	10					few brick pieces			
10	10		2	7		**Alluvium (Qal)** Loose, moist, grayish brown (10YR 5/2), silty SAND (SM) with clay, trace mica			
5	15		3	5		Medium stiff, moist, grayish brown (10YR 5/2), sandy lean CLAY(CL), some fine sand, few mica flakes			LL(39), PI(20), HYD(62)
0	20		4	14		Stiff, moist, dark gray (10YR 4/1), sandy fat CLAY (CH)			
-5	25		5	6					LL(65), PI(41), HYD(71)
-10	30					Stiff, moist, dark gray (2.5Y 4/1), fine sandy SILT (ML), trace mica, few thin beds of silty sand			

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 TC-2

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Figure A-62

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring TC-2

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	30								
			6	9					
-15									
	35								
			7	4					
-20									
	40								
			8	18		Medium dense, moist, light brownish gray (10YR 6/2), silty fine to medium SAND (SM), trace mica			
-25									
	45								
			9	16			19		SA(37)
-30						Very dense, wet, grayish brown (10YR 5/2), poorly-graded fine to medium SAND (SP-SM) with silt			
	50								
			10	60					
-35									
	55								
			11	70			15		SA(10)
-40									
	60								
-45						Very dense, wet, dark gray (GLEY1 N4), clayey fine to medium SAND (SC) with fine to coarse gravel, contains interbeds of gravel layers			
	65					concretion			

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Figure A-62

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring TC-2

Sheet 3 of 3

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	65		12	50 6"					
-50						interbedded gravel layers, from 68.5' to 69.0'			
	70		13	50 2"			15		SA(16)
-55									
	75		14	24		Medium dense, wet, dark gray (10YR 4/1), silty fine to medium SAND (SM)	23		SA(14)
-60						Medium dense, wet, dark gray (2.5Y 4/2), clayey fine to medium SAND (SC), some iron oxide staining			
						← gravel			
	80								
-65									
						Very dense, wet, grayish brown, poorly-graded fine to medium SAND (SP-SM) with silt, trace fine gravel			
	85		15	50 5"			18		SA(12)
-70									
	90					interbedded gravel			
-75									
						Very stiff, wet, very dark gray (GLEY1 N3), sandy SILT (ML), some fine sand, micaceous			
	95		16	27					
-80						Bottom of boring at 96.5 feet below ground surface			
	100								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 TC-2

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Figure A-62

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-01

Sheet 1 of 1

Date(s) Drilled	**06/08/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**23 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.76391, W117.1953**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
20	0		1			7" AC over 6" AB over **Fill** Moist, brown (7.5YR 4/4), gravelly lean CLAY with fine to medium sand, little fine gravel			LL(34), PI(20)
5	5		2	13		**Alluvium (Qal)** Medium dense, moist, grayish brown (2.5YR 5/2), silty fine SAND (SM), micaceous	8		
15	10		3	5		becomes loose, very dark gray (5Y 3/1)	11	91	
10	15		4	11		Medium dense, moist, grayish brown (10YR 5/2), poorly-graded fine SAND (SP-SM) with silt, micaceous, trace roots	16		
5	20		5	13		few thin to moderately thick interbeds of poorly-graded SAND (SP) and silty SAND (SM) increased moisture content	27		Note: S-1-1/2 contains multiple soil types/interbeds
0	25					Bottom of boring at 20 feet below ground surface			
-5	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-01

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Figure A-63

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-02

Sheet 1 of 1

Date(s) Drilled	**06/08/2017**	Logged By	**A. Avakian / E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**17 feet**
Water Level Depth	**14.5 ft**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.76464, W117.19582**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					5" AC over 4" AB over **Fill** Moist, dark brown (10YR 3/3), silty fine SAND, few glass, few brick fragments, trace fine to medium gravel, micaceous			
15									
	5								
10									
	10		1	9		**Alluvium (Qal)** Stiff, moist, very dark grayish brown (10YR 3/2), silty fine SAND (SM), micaceous	18	103	
						becomes dark grayish brown (10YR 3/2)	23		WA(40)
			2	5		moisture content increases			
5									
	15					Loose, wet, brown (10YR 4/3), poorly-graded fine SAND (SP-SM) with silt, trace fine gravel, micaceous ▽			
			3	5			22		Water level measured through auger after drilling
0									
						becomes medium dense			
			4	18		bedding laminations of dark minerals becomes dark grayish brown (2.5Y 4/2), no gravel			Flowing sand in auger. S-4 overpacked with soil.
	20					Bottom of boring at 20 feet below ground surface			
-5									
	25								
-10									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-02

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Figure A-64

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-03

Sheet 1 of 1

Date(s) Drilled	**06/08/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**18 feet**
Water Level Depth	**15 ft**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.765073, W117.196454**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
15	0		1			6" AC over 7" AB over **Fill** Dark grayish brown (2.5YR 4/2), silty fine SAND, micaceous	7		CORR, SA(14)
5	5		2	4		**Alluvium (Qal)** Medium stiff, moist, dark brown (10YR 3/3), SILT (ML) with fine sand, micaceous ← interbeds of brown (10YR 4/3), silty SAND (SM) ← trace sands	21		S-2a is ML; S-2b is SM
-5	10		3	11		Medium dense, moist, very dark grayish brown (10YR 3/2), silty fine SAND (SM), micaceous, laminations of darker grained minerals ← increased fines, material becomes darker in color, slight increase in moisture	26	95	
-10	15		4	6		▽			Water level measured after hole drilled
-15	20		5	17		Medium dense, wet, dark grayish brown (10YR 4/2), poorly-graded fine SAND (SP-SM) with silt, micaceous, laminations of darker grained minerals Bottom of boring at 20 feet below ground surface	20		S-5a is SM; S-5b is SP-SM
-20	25								
-25	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-03

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Figure A-65

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-06

Sheet 1 of 1

Date(s) Drilled	**05/18/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**28 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.76883, W117.19991**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					4" AC over 6" AB over **Fill** Moist, dark reddish brown, sandy CLAY (CL), some fine sand			LL(31), PI(20), CORR
25			1						
	5		2	13		**Bay Point Formation (Qbp)** Medium dense, moist, brown (7.5YR 4/2), silty fine SAND (SM), oxidized	9		
20									
	10		3	88 11"		material becomes moist to wet, grayish brown (10YR 5/2), micaceous, contains some fines Very dense, moist, brown (7.5YR 4/2), poorly-graded fine to medium sand SAND (SP-SC) with clay and gravel, mostly, oxidized	4	127	
15									
	15		4	81 7"					
10						Hard, moist, dark yellowish brown (10YR 4/4), sandy SILT (ML), some fine sand, little iron oxide staining, micaceous			
	20		5	60			15	120	
5						Bottom of boring at 20.2 fbgs			
25									
0									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-06

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Figure A-66

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-07

Sheet 1 of 1

Date(s) Drilled	**05/17/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**25 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.76951, W117.20103**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
25	0					5" AC over 4" AB over **Fill** Moist, dark reddish brown, sandy CLAY, trace to few fine to coarse gravel			
						Bay Point Formation (Qbp) Medium dense, moist, brown (7.5YR 4/3), clayey fine SAND (SC), some iron oxide staining			
20	5		1	26		gravel Medium dense, moist, brown (10YR 4/3), clayey fine to medium SAND (SC) with fine to coarse gravel, little iron oxide staining, localized gravel interbeds			
						slight increase in fines content gravel			
15	10		2	23		gravel	9		LL(36), PI(24), SA(19)
						Medium dense, moist, brown (7.5YR 4/4), clayey fine to medium SAND (SC), some iron oxide staining, micaceous			
10	15		3	21			19	109	
						Very stiff, moist, brown (7.5YR 4/2), sandy lean CLAY (CL), some fine sand, little iron oxide staining			
			4	23					
5	20					Bottom of boring at 20 feet below ground surface			
0	25								
-5	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-07

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Figure A-67

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-08

Sheet 1 of 1

Date(s) Drilled	**05/18/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**19.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**24 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.77003, W117.20155**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					3.5" AC over 8" AB over **Fill** Moist, dark brown, clayey fine SAND, trace to few fine to coarse gravel			
20						gravel			
5	5		1	36		**Bay Point Formation (Qbp)** Dense, moist, brown (7.5YR 4/3), clayey fine to medium SAND (SC), few fine to coarse gravel			
15									
10	10		2	50 3"		becomes very dense			
			3	38		Dense, moist, brown (7.5YR 4/4), clayey fine to medium SAND (SC), few fine to coarse gravel, oxidized	11		LL(45), PI(30), SA(19)
10	15					gravel			
			4	38		moderate (10-inch) interbed of moist, olive gray (5Y 5/2), SILT (ML)	19		
						Dense, moist, olive brown (2.5Y 4/4), silty fine SAND (SM), little iron oxide staining, micaceous			
5			5	50 6"		gravel			
	20					Bottom of boring at 19.2 feet below ground surface			
0									
	25								
-5									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-08

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Figure A-68

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-10

Sheet 1 of 1

Date(s) Drilled	**06/09/2017**	Logged By	**A. Avakian / E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.5 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**28 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.77214, W117.20211**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					3" AC over 7" concrete over **Fill** Moist, dark yellowish brown, SILT with fine sand, few chunks AC, few gravel			
25									
	5		1	2					
20									
	10		2	8			13	111	
15						**Bay Point Formation (Qbp)** Stiff, moist, dark brown (7.5YR 3/4), sandy SILT (ML), some fine sand			
	15					gravel layer			
						gravel			
10						gravel layer			
	20		3	46		Hard, moist, light olive brown (2.5Y 5/3), sandy CLAY (CL), few fine sand			S-3-1 and S-3-2 are CL; S-3-3 is SP-SM
						Dense, moist, light olive brown (2.5Y 5/4), poorly-graded SAND (SP-SM) with silt, few iron oxide staining			
						Bottom of boring at 20.5 feet below ground surface			
5									
	25								
0									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-10

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Figure A-69

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-11

Sheet 1 of 1

Date(s) Drilled	**06/09/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**24 feet**
Water Level Depth	**16 ft**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.77253, W117.20245**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					5" AC over 5" AB over			
						Fill			
						Moist, brown, sandy SILT, some fine sand, little fine gravel			
						Bay Point Formation (Qbp)			
			1			Very stiff, moist, dark reddish brown (5YR 3/4), sandy SILT (ML), some fine sand, few organics, few iron oxide staining			CORR
20	5		2	17			10		
15									
	10		3	30			14	116	
						Dense, moist, dark reddish brown (5YR 3/3), silty SAND (SM), few organics			
10									
	15					becomes wet, brown (10YR 4/3), micaceous gravel			
			4	55		▽			35 blowcounts possibly penetating through gravel
5						Medium dense/very stiff, wet, interbedded olive brown (2.5Y 4/3), sandy CLAY (CL) and yellowish brown (10YR 5/4), well-graded SAND (SW-SM) with silt			S-5 penetrated channel margin. Channel filled with SW-SM
			5	25		CL-little fine sand, some iron oxide staining, some calcium carbonate accumulation SW-SM-few fine gravel	24	106	LL(45), PI(27)
	20					Bottom of boring at 20 feet below ground surface			
0									
	25								
-5									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-11

AECOM

Figure A-70

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-16

Sheet 1 of 1

Date(s) Drilled	**06/09/2017**	Logged By	**E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**32 feet**
Water Level Depth	**16.5 ft**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Bentonite and cuttings with concrete cap**	Location	**N32.79163, W117.20609**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					6" AC over 7" AB over **Bay Point Formation (Qbp)** Moist, reddish brown (5YR 4/4), sandy SILT (ML), some fine sand			
30									
	5					Loose, moist, brown (10YR 4/3), poorly-graded SAND (SP-SM) with silt, trace fine gravel			
25			1	4			3		
			2	27		Very stiff, moist, strong brown (7.5YR 5/6), SILT (ML) with fine sand	15		WA(75)
	10		3	30			13	120	
20									
	15		4	9		Loose, moist, dark yellowish brown (10YR 4/6), silty SAND (SM), little iron oxide staining, little shell fragments becomes wet ▽			
15									
			5	37		← 4" silt interbed ← fine gravel Dense, wet, grayish brown (10YR 5/2), SAND (SP-SM) with silt, micaceous	17	116	Water level measured after dilling at 17.7 fgbs
	20					Bottom of boring at 20 feet below ground surface			
10									
	25								
5									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-16

AECOM

Figure A-71

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-21

Sheet 1 of 1

Date(s) Drilled	**06/14/2017**	Logged By	**A. Avakian / E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**49 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.799195, W117.20976**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					2" AC over 4" AB over **Fill** Moist, silty fine SAND, few asphalt fragments			
						Bay Point Formation (Qbp) Medium dense, moist, yellowish brown (10YR 5/6), silty fine SAND (SM), some iron oxide staining			
45	5		1	27		← sandy SILT (ML) interbed	17		
40	10		2	75		**Ardath (Ta)** Hard, moist, light yellowish brown (2.5Y 6/4), SILT (ML), few fine sand, iron oxide staining			
35	15		3	51			18		
30	20		4	50 5"		Bottom of boring at 20 feet below ground surface			
25	25								
20	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-21

AECOM

Figure A-72

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-22

Sheet 1 of 1

Date(s) Drilled	**06/14/2017**	Logged By	**A. Avakian / E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**14.2 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**47 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.80042, W117.21051**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
45	0					**Fill** Moist, yellowish brown, SILT with sand, AC fragments, few fine to coarse gravel			
	5		1	12					
40			2	14					
	10		3	9		**Bay Point Formation (Qbp)** Stiff, moist, yellowish brown (10YR 5/6), SILT (ML) with sand ← interbed of coarser grained materials: silty fine SAND (SM), trace fine gravels ← potential concretion	19	102	Hard drilling ~30 min
35			4						
	15					Bottom of boring at 14.2 feet below ground surface			Refusal on concretion (?)
30									
	20								
25									
	25								
20									
	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-22

AECOM

Figure A-73

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-23

Sheet 1 of 1

Date(s) Drilled	**05/18/2017**	Logged By	**A. Avakian**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Unimog Marl M5**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**52 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.802118, W117.211547**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
50	0					7" AC over 6" of AB over **Fill** Moist, brown, sandy SILT, some fine sand			
						Bay Point Formation (Qbp) Very stiff, moist, brown, (7.5YR 4/3), sandy SILT (ML), some fine sand, little iron oxide staining			
45	5		1	17		increase iron oxide staining	9		hard drilling reported by driller
	10		2	56		becomes hard, trace manganese oxide spots	8		SA(67)
40	15		3	23		becomes very stiff, brown (7.5YR 5/4)	8		
35						becomes hard			
			4	56		increase fine sand content			
30	20					Bottom of boring at 20 feet below ground surface			
25	25								
25	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-23

AECOM

Figure A-74

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-24

Sheet 1 of 1

Date(s) Drilled	**06/14/2017**	Logged By	**A. Avakian / E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**60 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT / 2.5" ID / Bulk**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.803758, W117.212571**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
60	0		1			6" AC over 7" AB over **Fill** Moist, brown (7.5YR 4/4), SILT wth sand, trace contruction debris, trace cobbles			CORR
55	5		2	9		**Bay Point Formation (Qbp)** Stiff, moist, strong brown (7.5YR 5/6), SILT (ML) with sand, some iron oxide staining	12		
50	10		3	47					
						Hard, moist, brown (10YR 4/2), CLAY (CL), some iron oxide staining interbed of moist, brown (7.5YR 5/4), poorly-graded SAND (SP)			
45	15		4a 4b	34			17		4a = SP; 4b = CL LL(57), PI(38)
			5	84		Hard, moist, brown (10YR 5/3), sandy SILT (ML), some fine sand, some shells, some iron oxide staining	4	133	
40	20					Bottom of boring at 20 feet below ground surface			
35	25								
30	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-24

AECOM

Figure A-75

Project: Pure Water, City of San Diego
Project Location: San Diego, California
Project Number: 60530732

Log of Boring WM-25

Sheet 1 of 1

Date(s) Drilled	**06/14/2017**	Logged By	**A. Avakian / E. Marquez**	Checked By	**S. Fitzwilliam**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch**	Total Depth of Borehole	**6.5 feet**
Drill Rig Type	**Diedrich D-50 Turbo**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**69 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**none**	Hammer Data	**140 lbs / 30-inch**
Borehole Completion	**Cuttings with concrete cap**	Location	**N32.80525, W117.21318**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					6" AC over 7" AB over **San Diego Formation (Tsd)** Moist, light yellowish brown (10YR 6/4), poorly-graded gravel (GP-GM) with silt and fine sand			Hard drilling ~ 40 min Skipped 5' sample due to dense cobbles and gravels @6' Driller broke shear pin on drill, 15 minutes to fix
65	5								
						Bottom of boring at 6.5 feet below ground surface			Refusal on cobbles/gravels
60	10								
55	15								
50	20								
45	25								
40	30								

Report: GEO_10_SNA; File: 60530732.GPJ; 9/15/2017 WM-25

AECOM

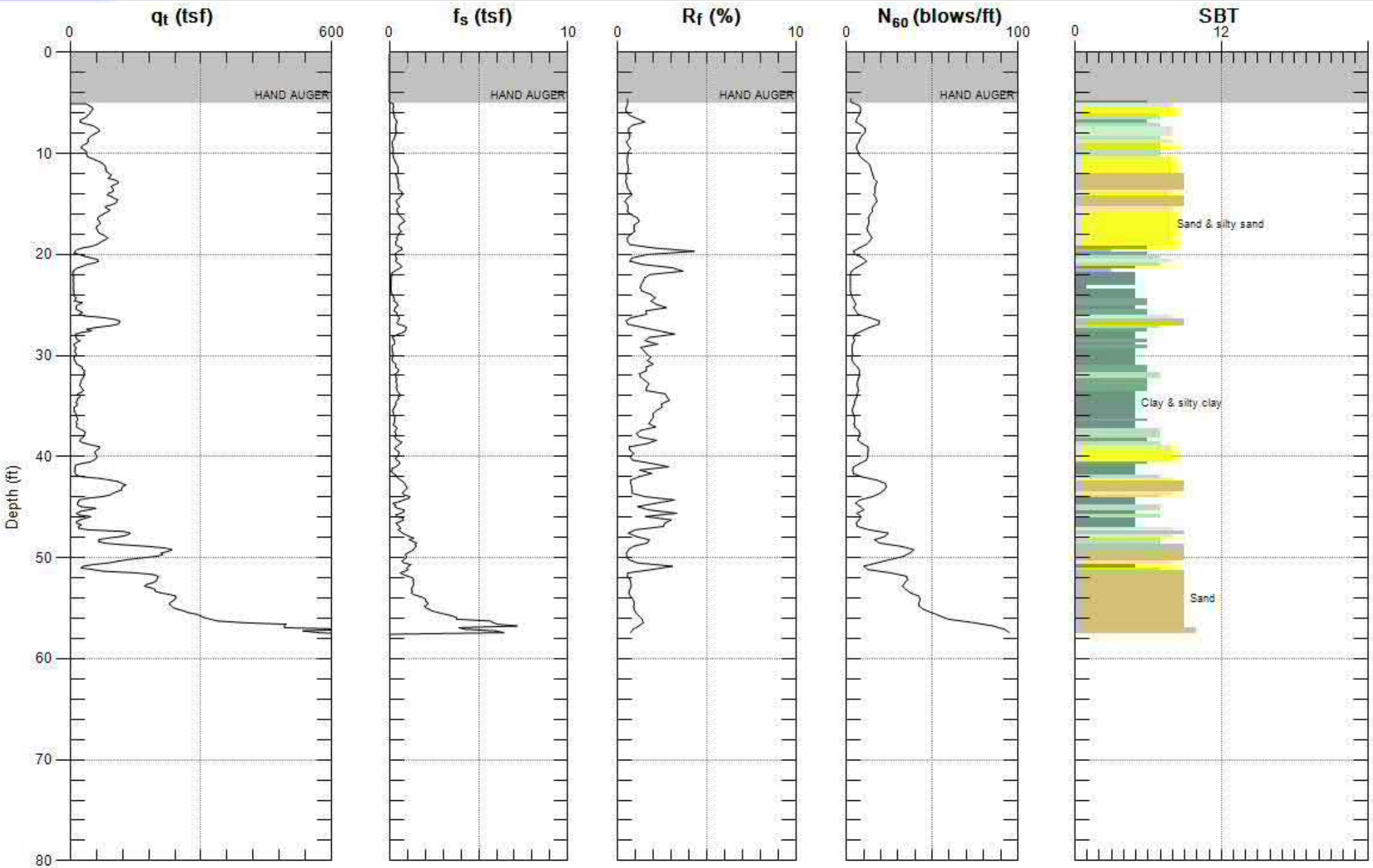
Figure A-76

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-01 **Date: 3/20/17 08:34**



Max. Depth: 57.743 (ft)
Avg. Interval: 0.328 (ft)

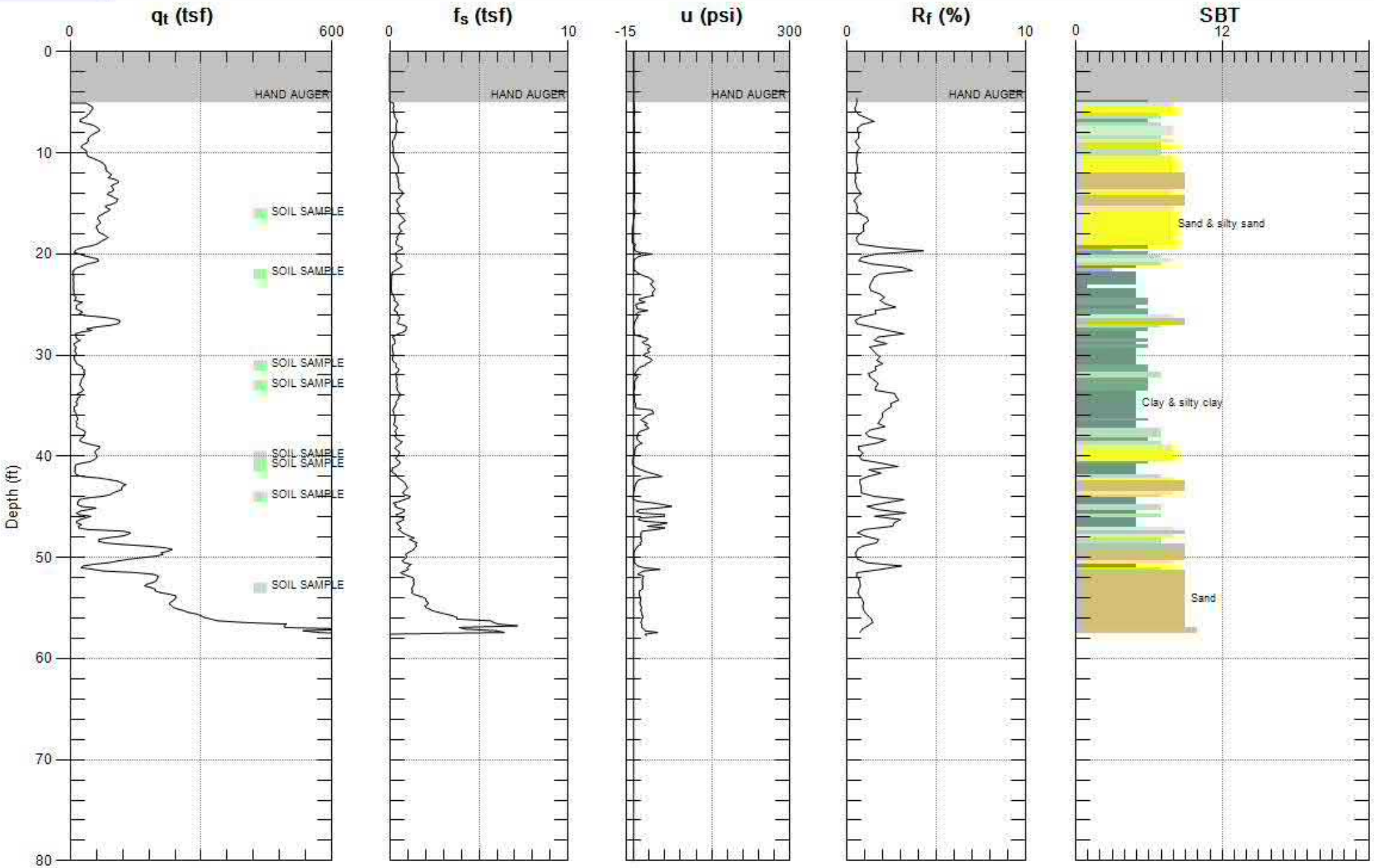
Figure A-77 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-01 **Date: 3/20/17 08:34**



Max. Depth: 57.743 (ft)
Avg. Interval: 0.328 (ft)

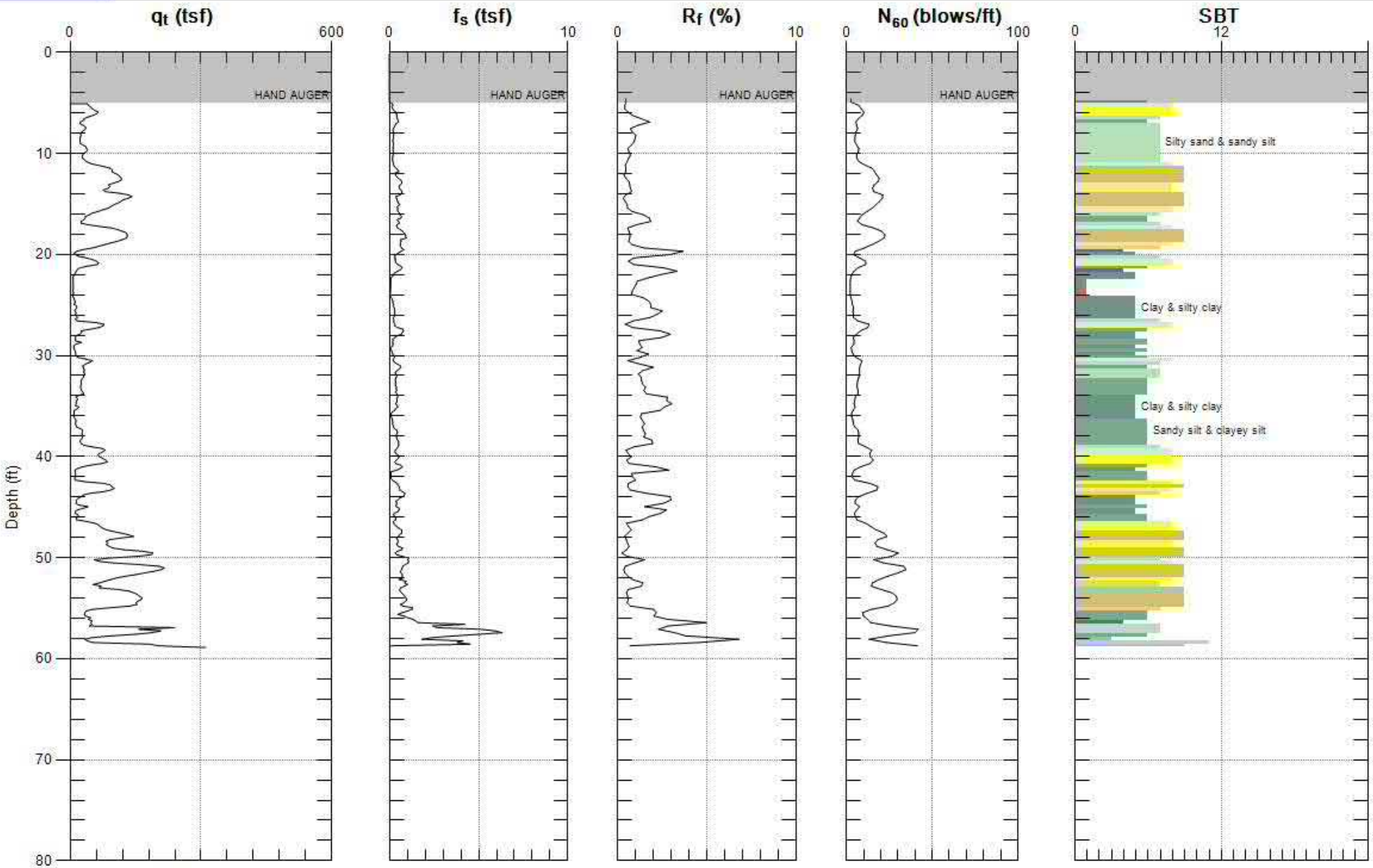
Figure A-77 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-02 **Date: 3/20/17 09:38**



Max. Depth: 58.891 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

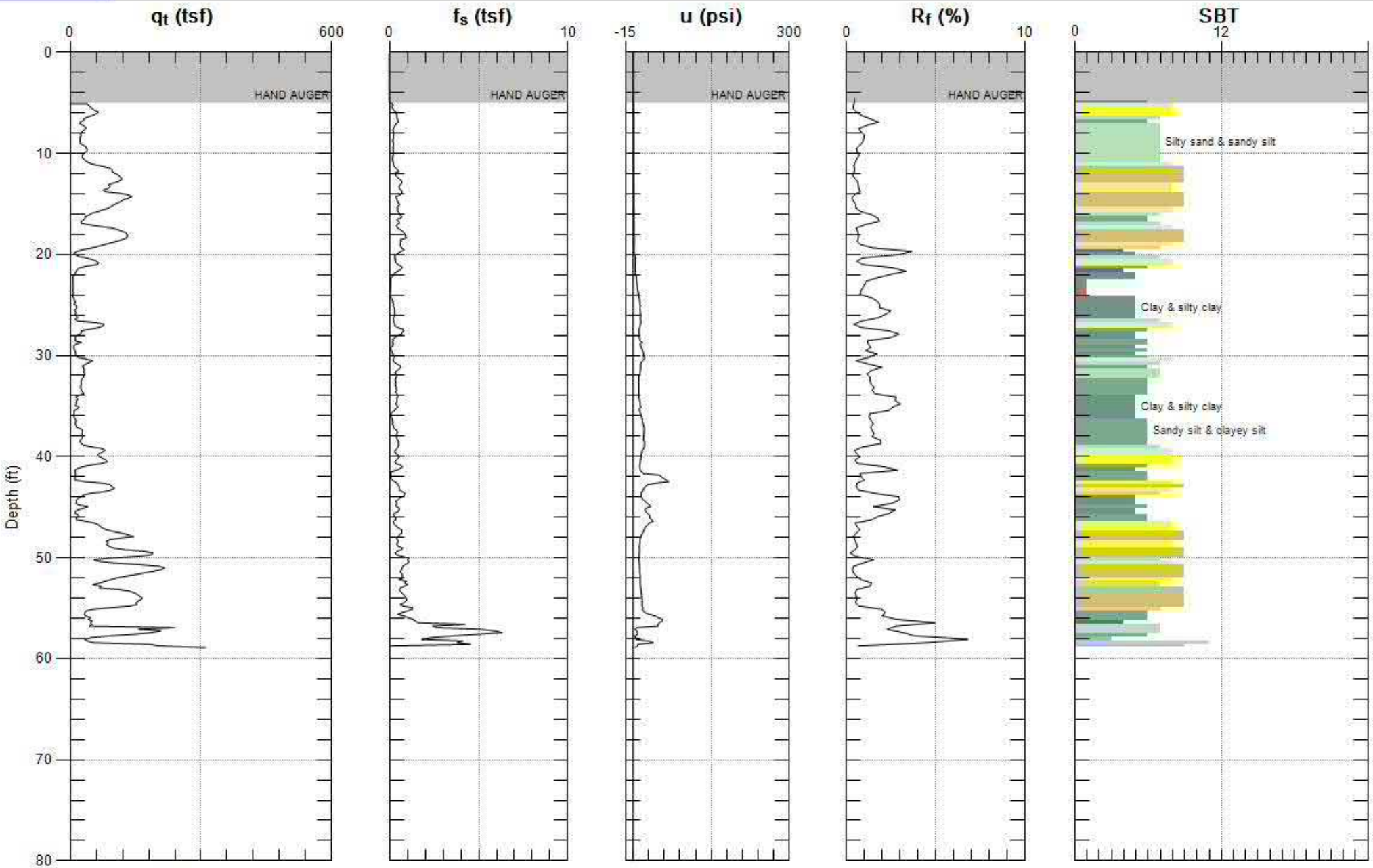
Figure A-78

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-02 **Date: 3/20/17 09:38**



Max. Depth: 58.891 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

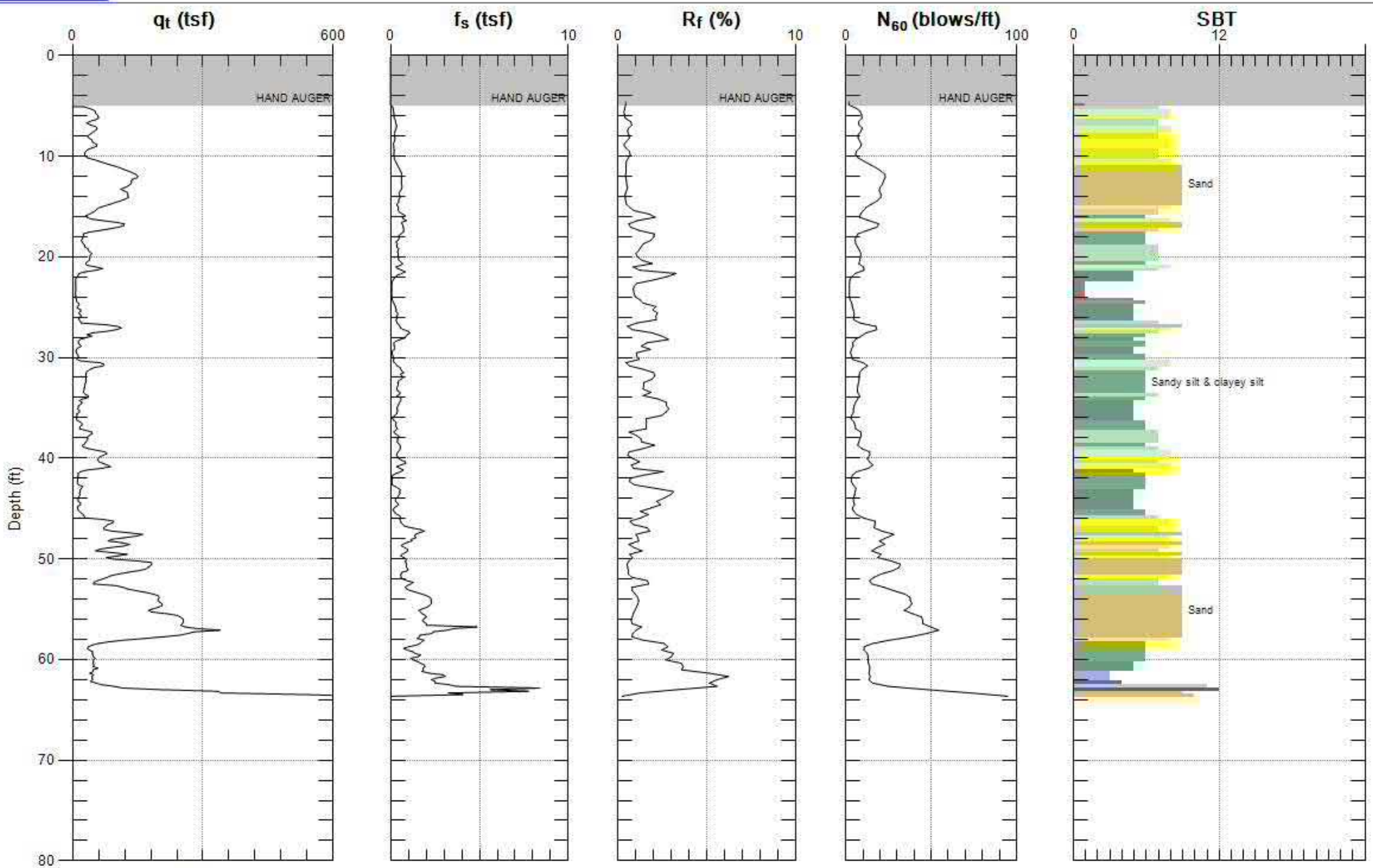
Figure A-78

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-03 **Date: 3/20/17 11:02**



Max. Depth: 63.812 (ft)
Avg. Interval: 0.328 (ft)

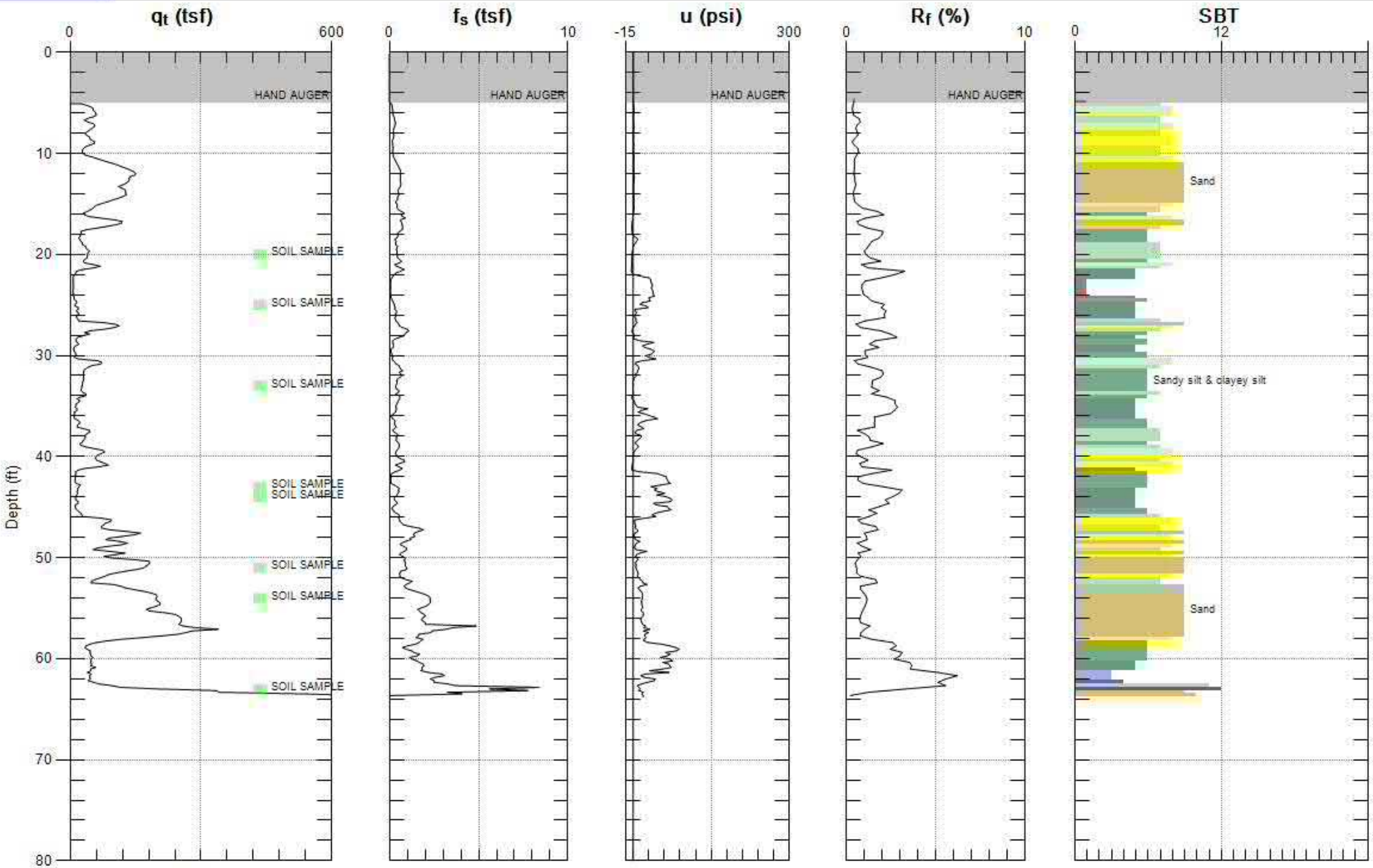
Figure A-79 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-03 **Date: 3/20/17 11:02**



Max. Depth: 63.812 (ft)
Avg. Interval: 0.328 (ft)

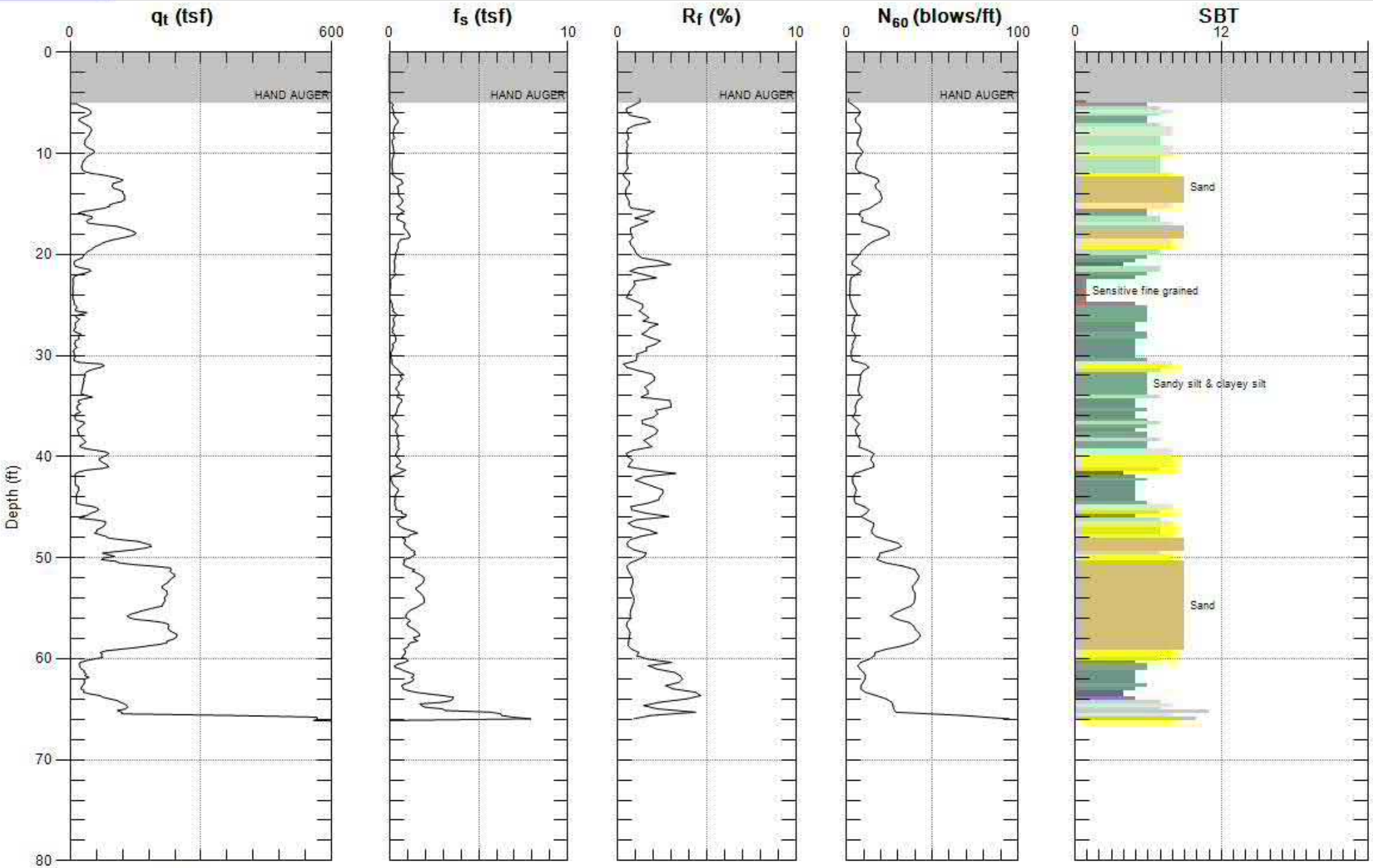
Figure A-79 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-04 **Date: 3/20/17 01:02**



Max. Depth: 66.273 (ft)
Avg. Interval: 0.328 (ft)

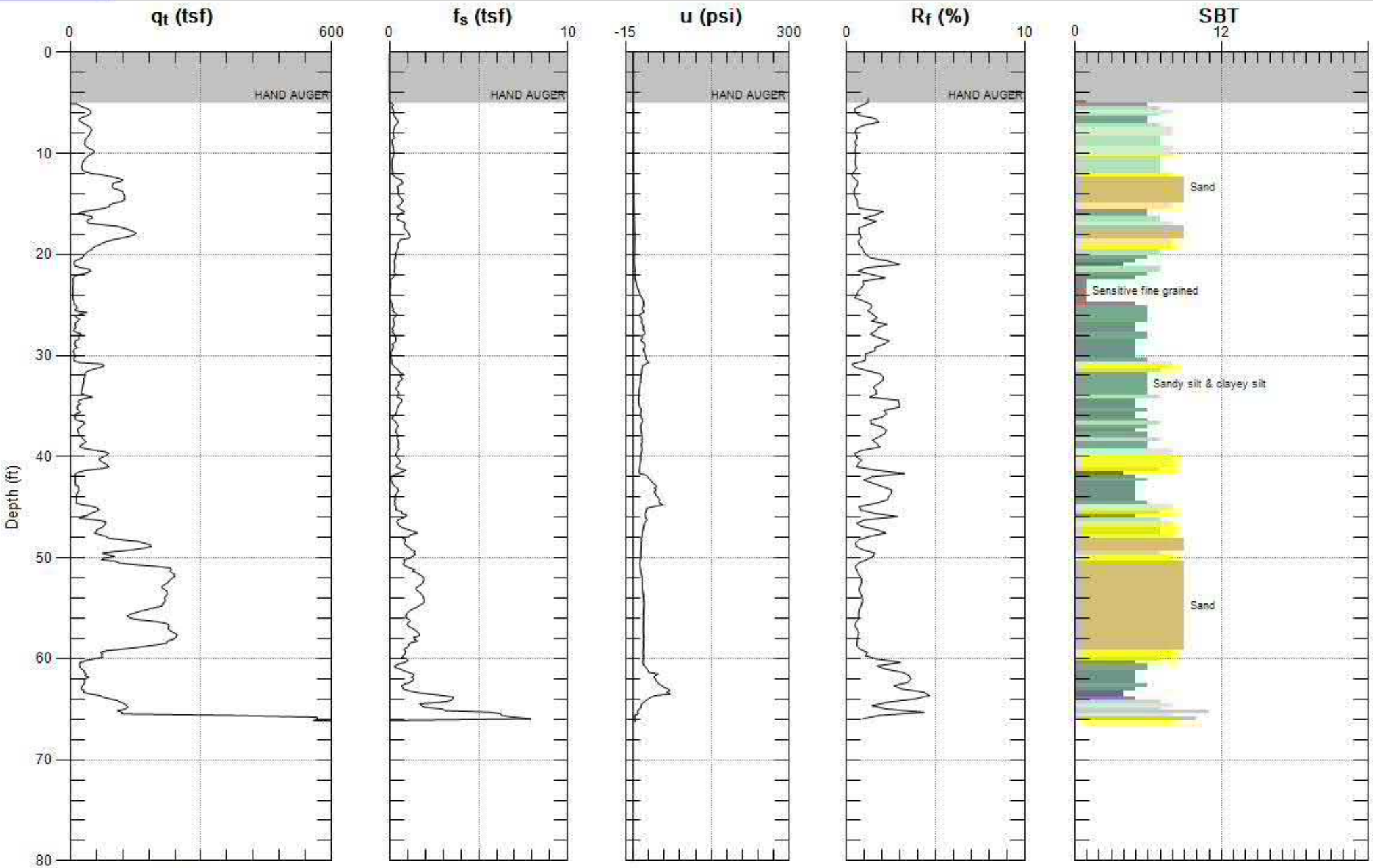
Figure A-80 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-04 **Date: 3/20/17 01:02**



Max. Depth: 66.273 (ft)
Avg. Interval: 0.328 (ft)

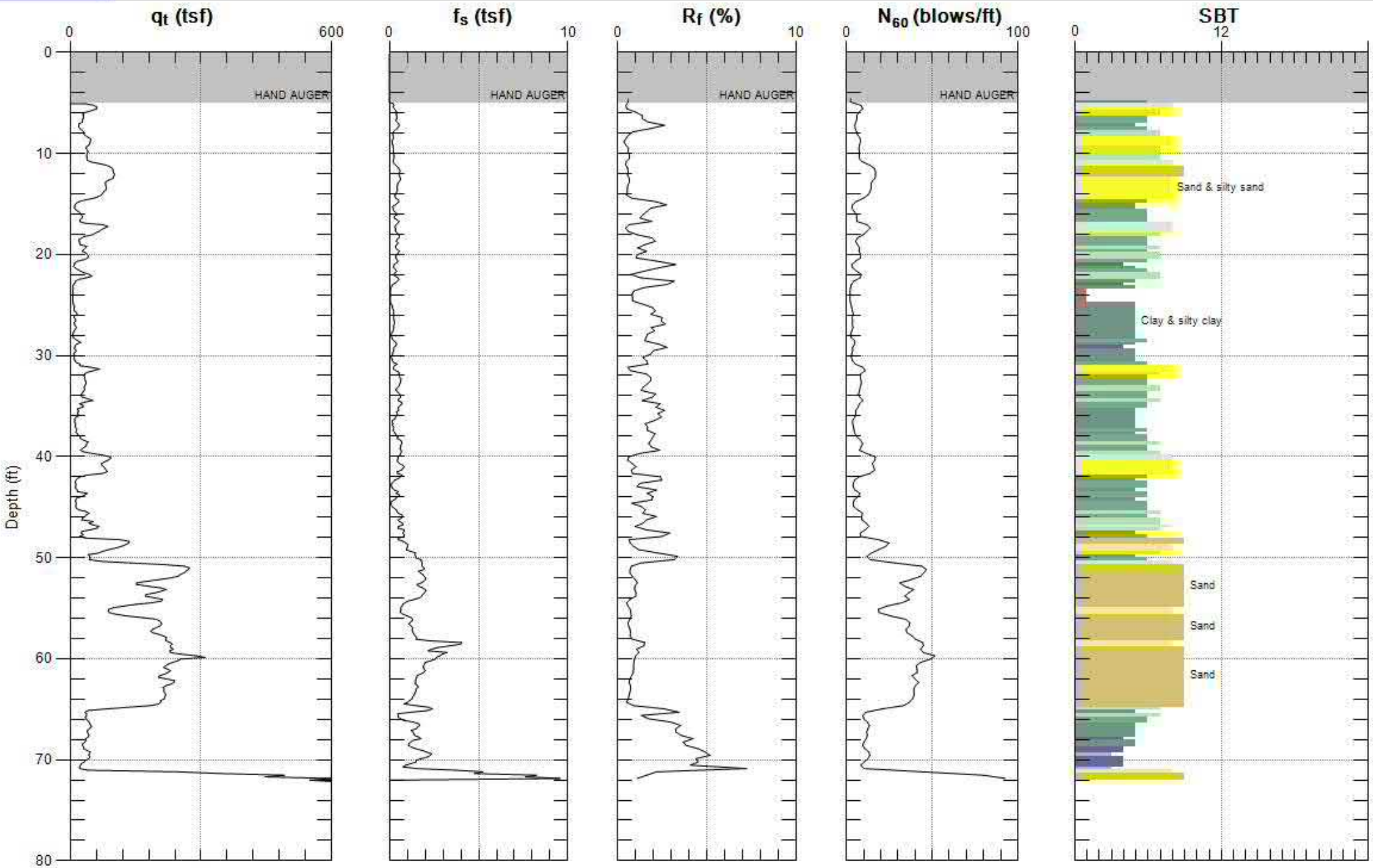
Figure A-80 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-05 **Date: 3/20/17 02:14**



Max. Depth: 72.178 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

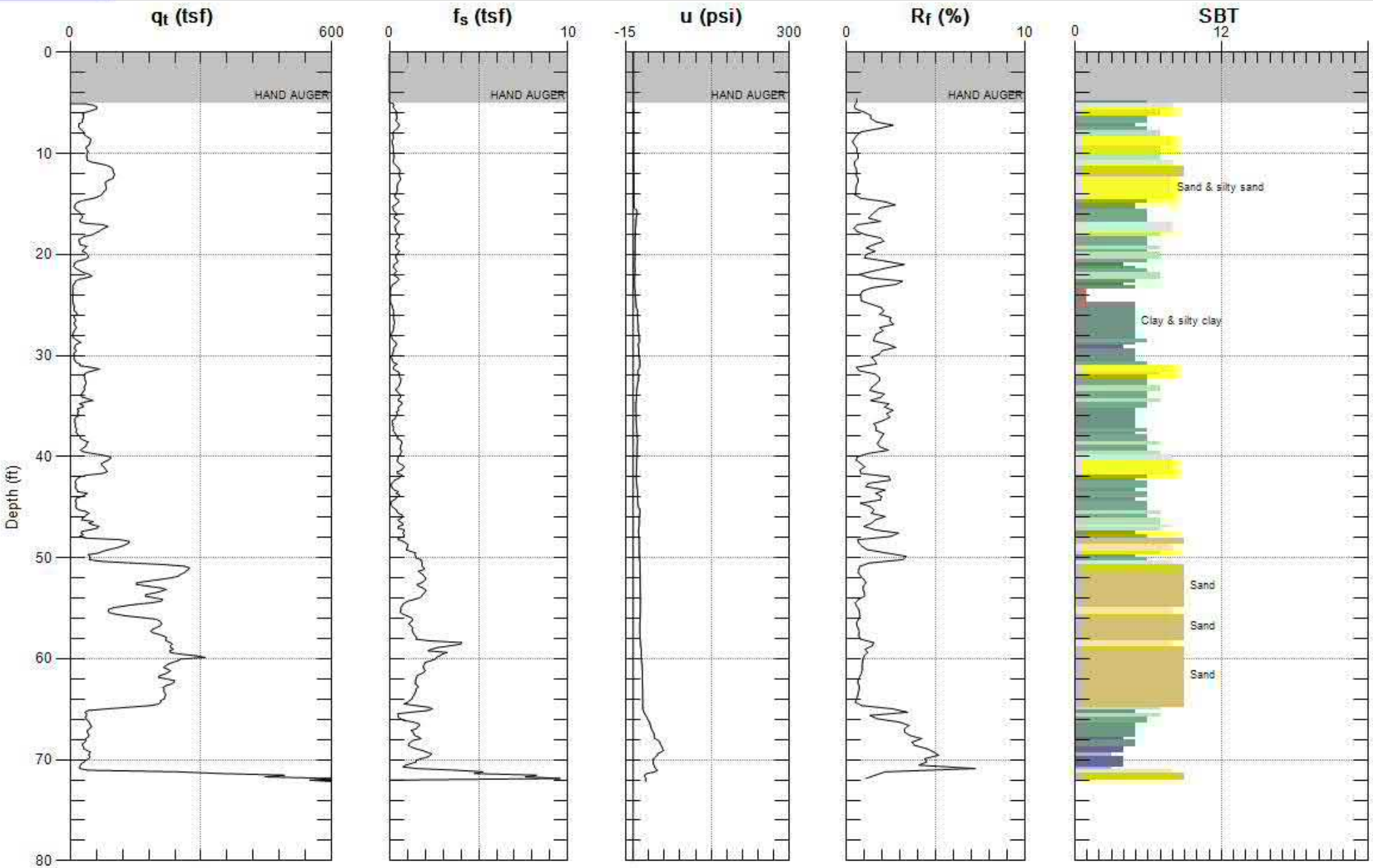
Figure A-81

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-05 **Date: 3/20/17 02:14**



Max. Depth: 72.178 (ft)
Avg. Interval: 0.328 (ft)

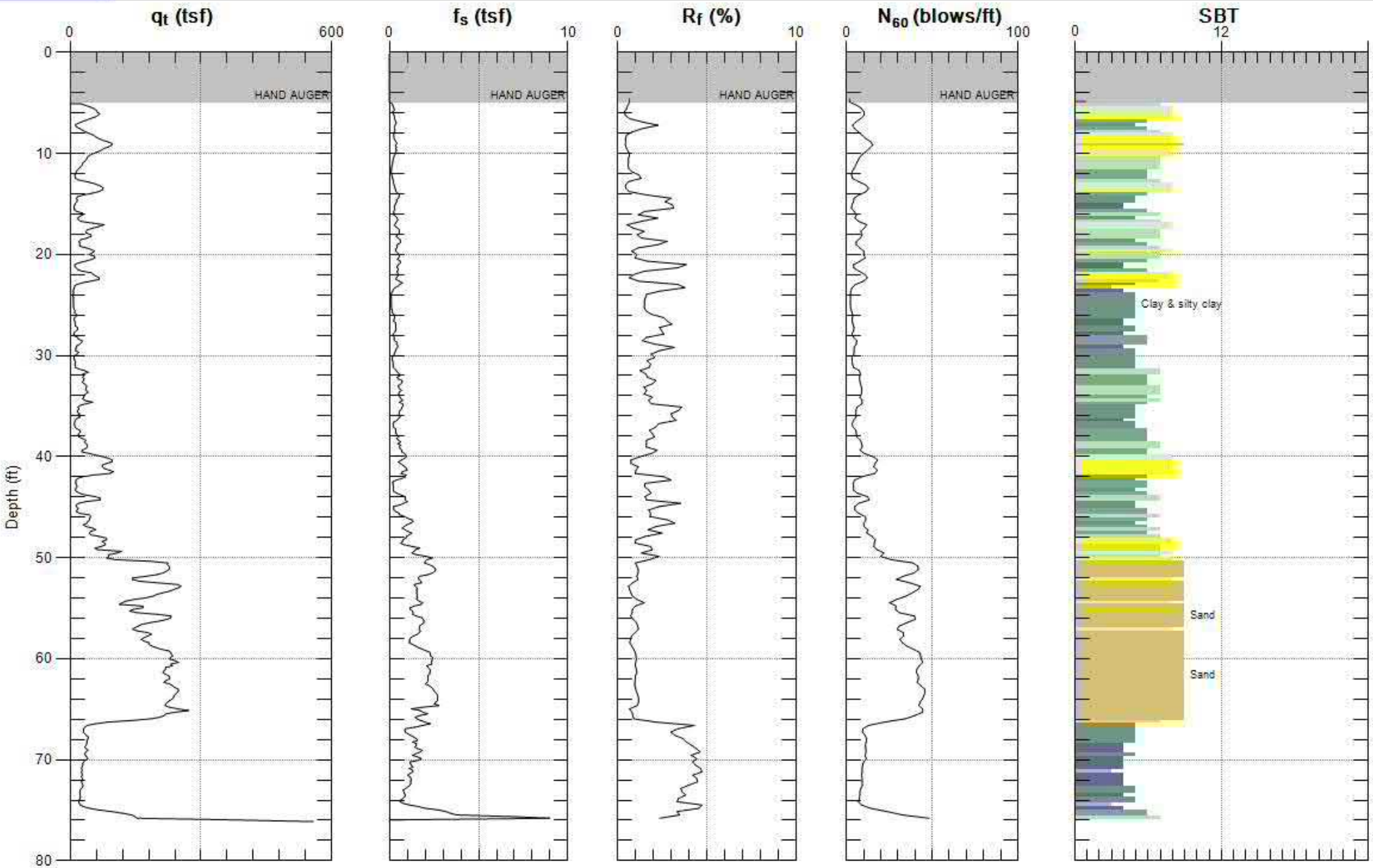
Figure A-81 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-06 **Date: 3/21/17 07:27**



Max. Depth: 76.115 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

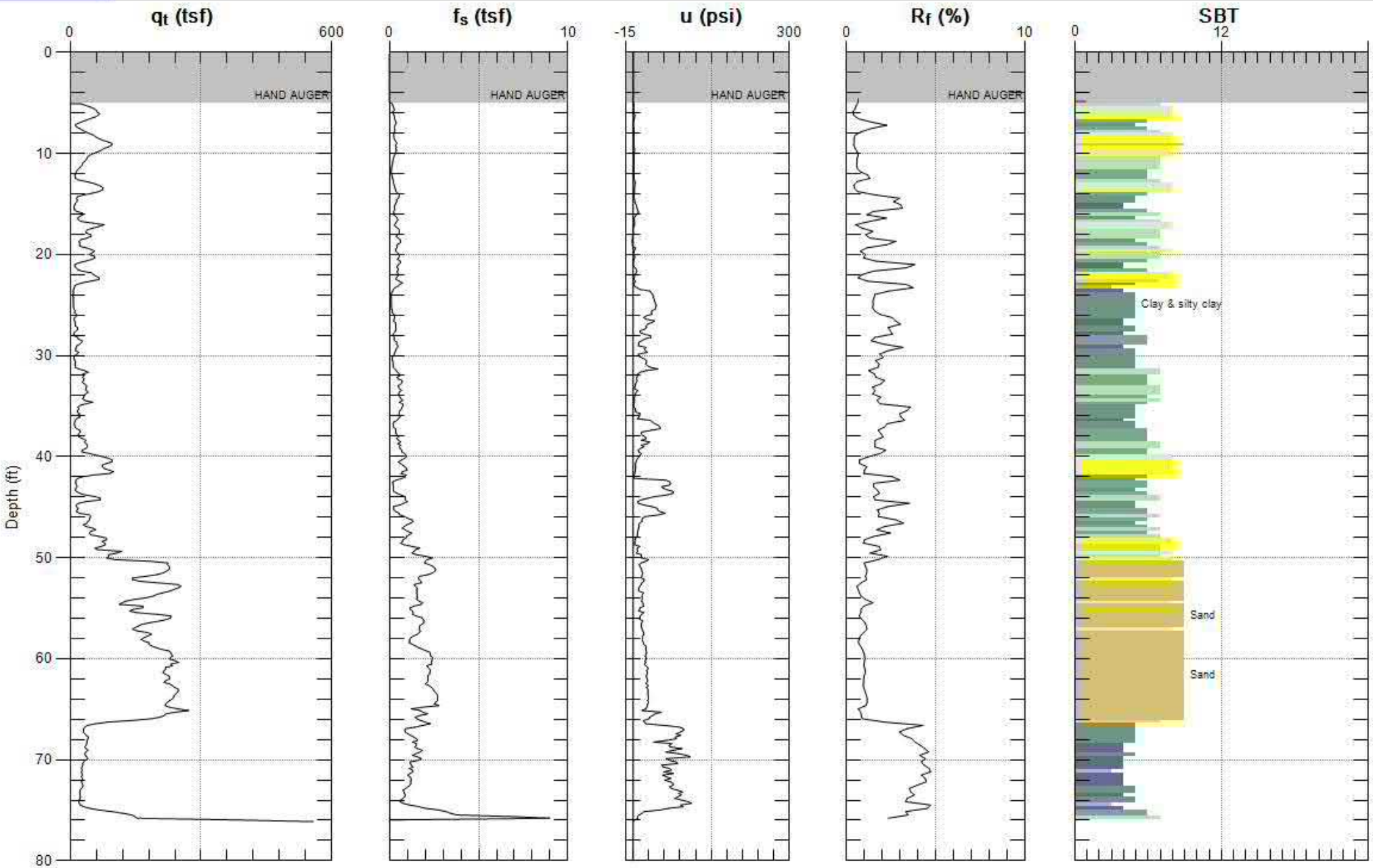
Figure A-82

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-06 **Date: 3/21/17 07:27**



Max. Depth: 76.115 (ft)
Avg. Interval: 0.328 (ft)

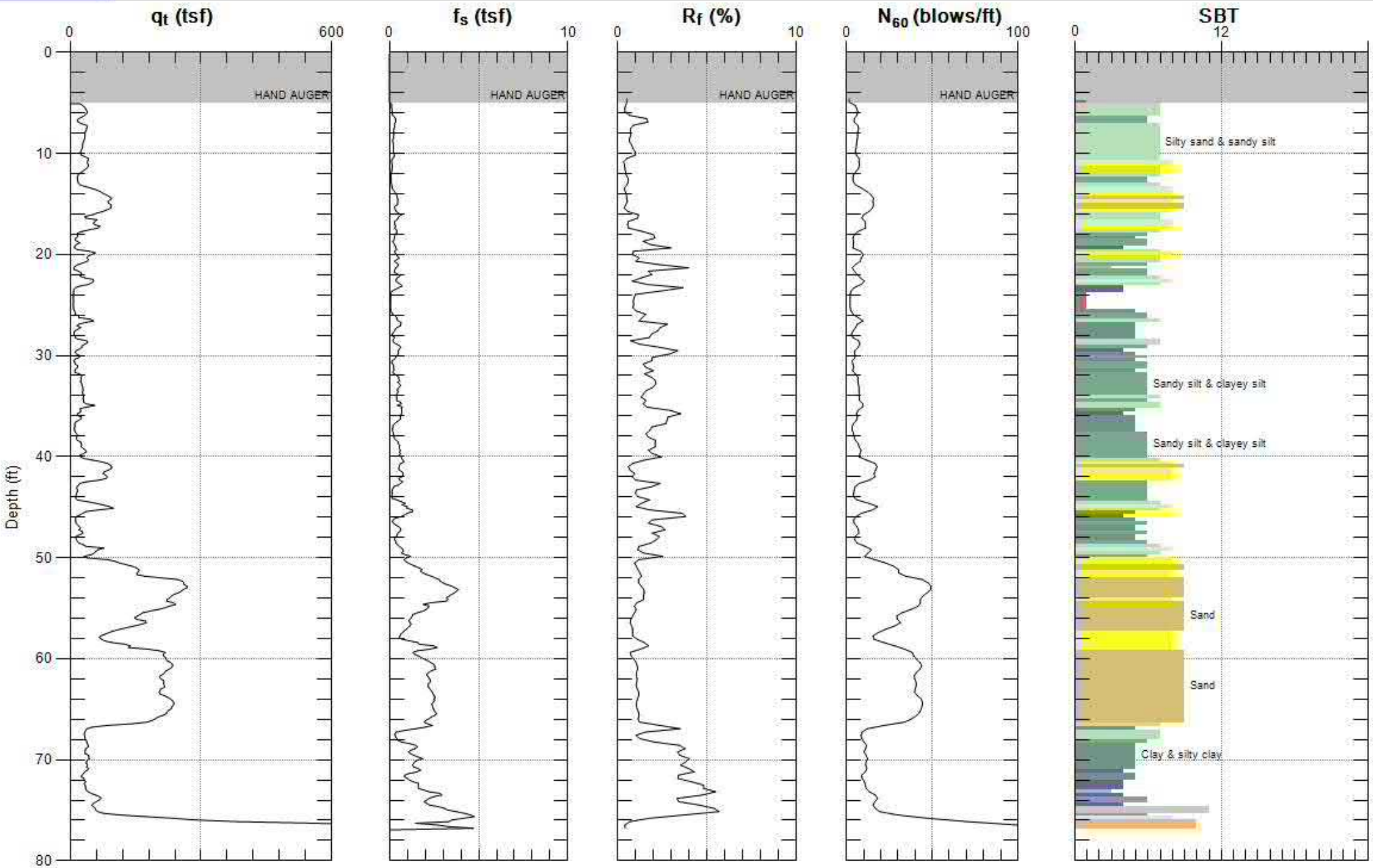
Figure A-82 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-07 **Date: 3/21/17 09:18**



Max. Depth: 77.100 (ft)
Avg. Interval: 0.328 (ft)

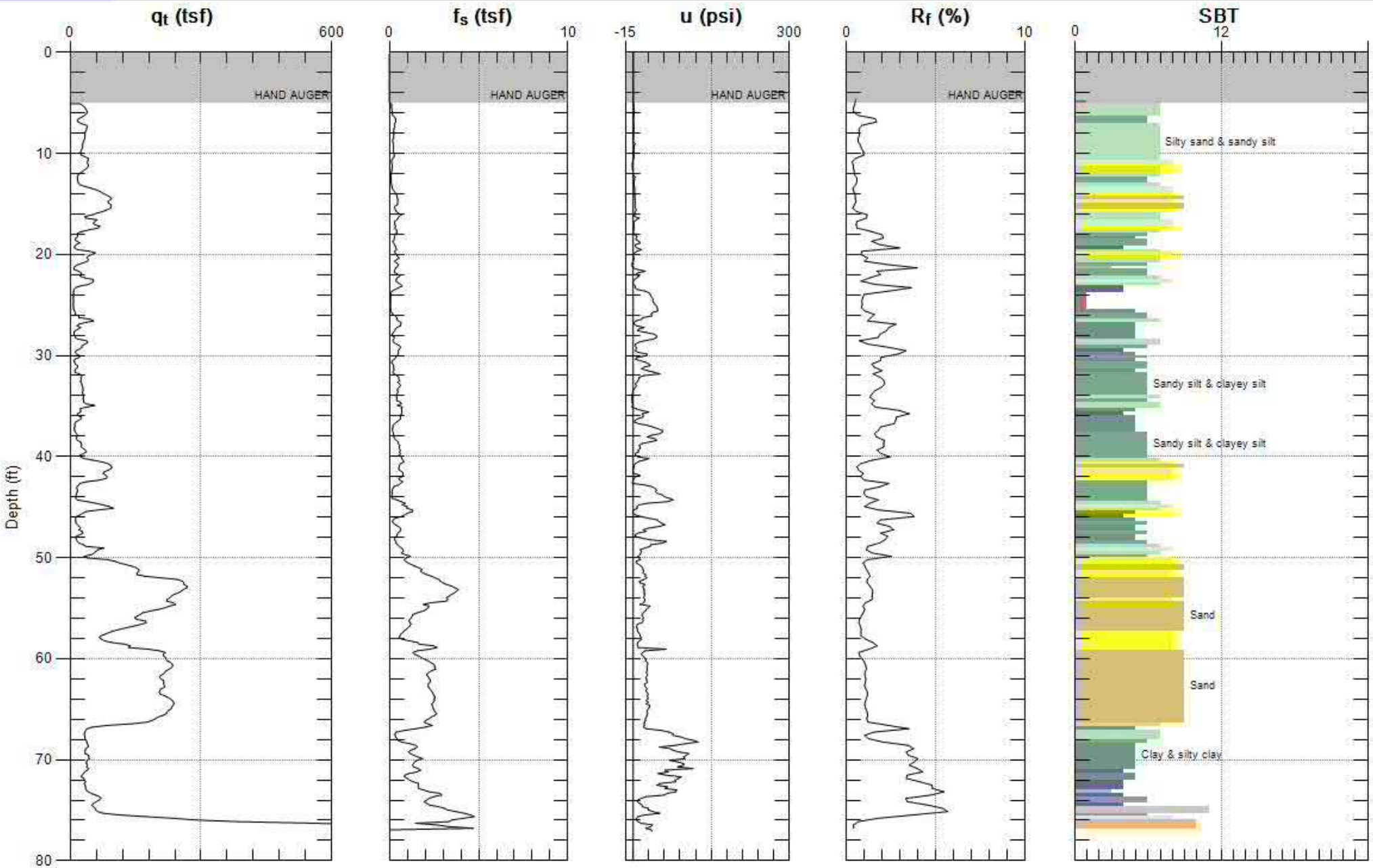
Figure A-83 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-07 **Date: 3/21/17 09:18**



Max. Depth: 77.100 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

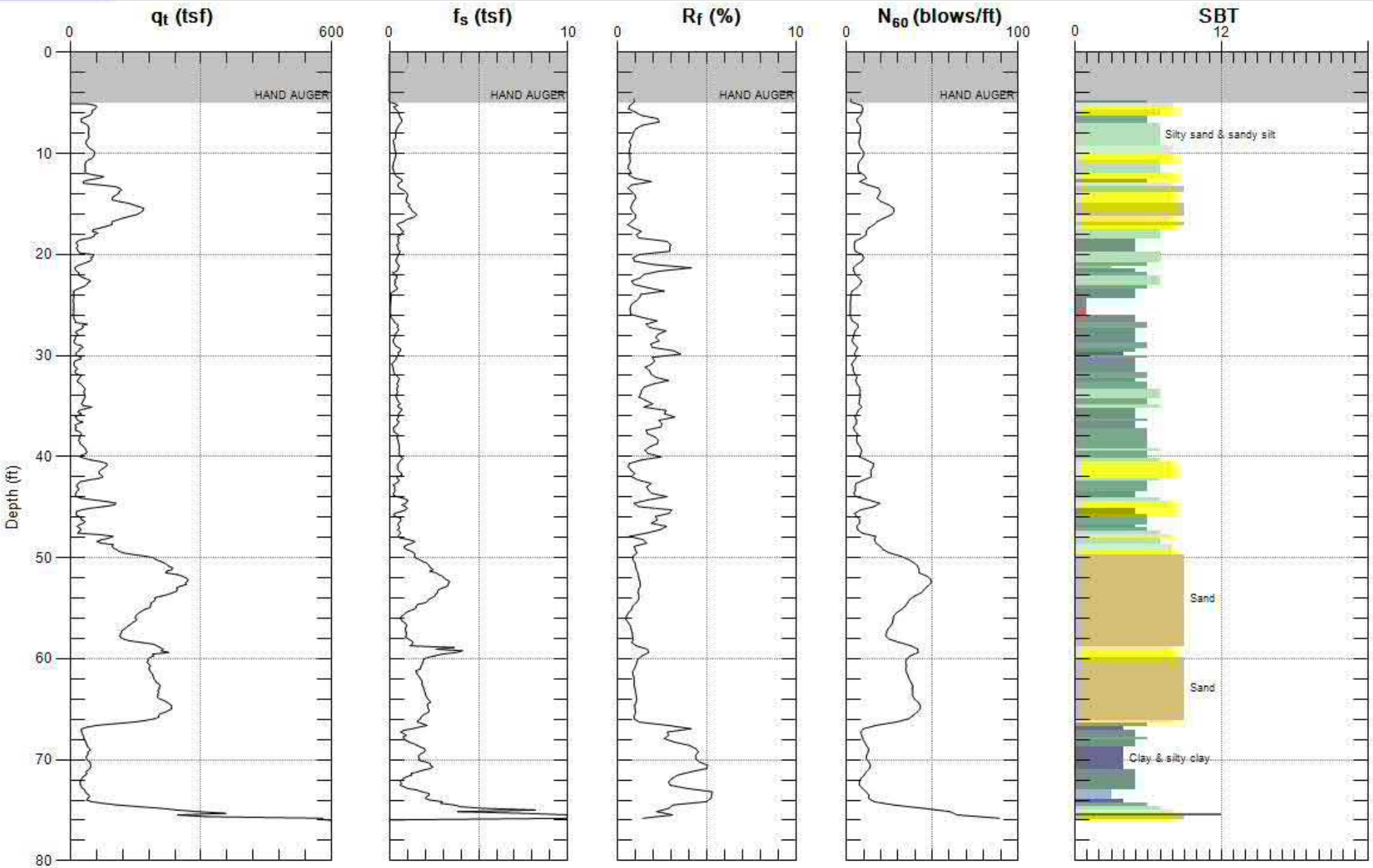
Figure A-83

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-08 **Date: 3/21/17 10:50**



Max. Depth: 76.115 (ft)
Avg. Interval: 0.328 (ft)

Figure A-84

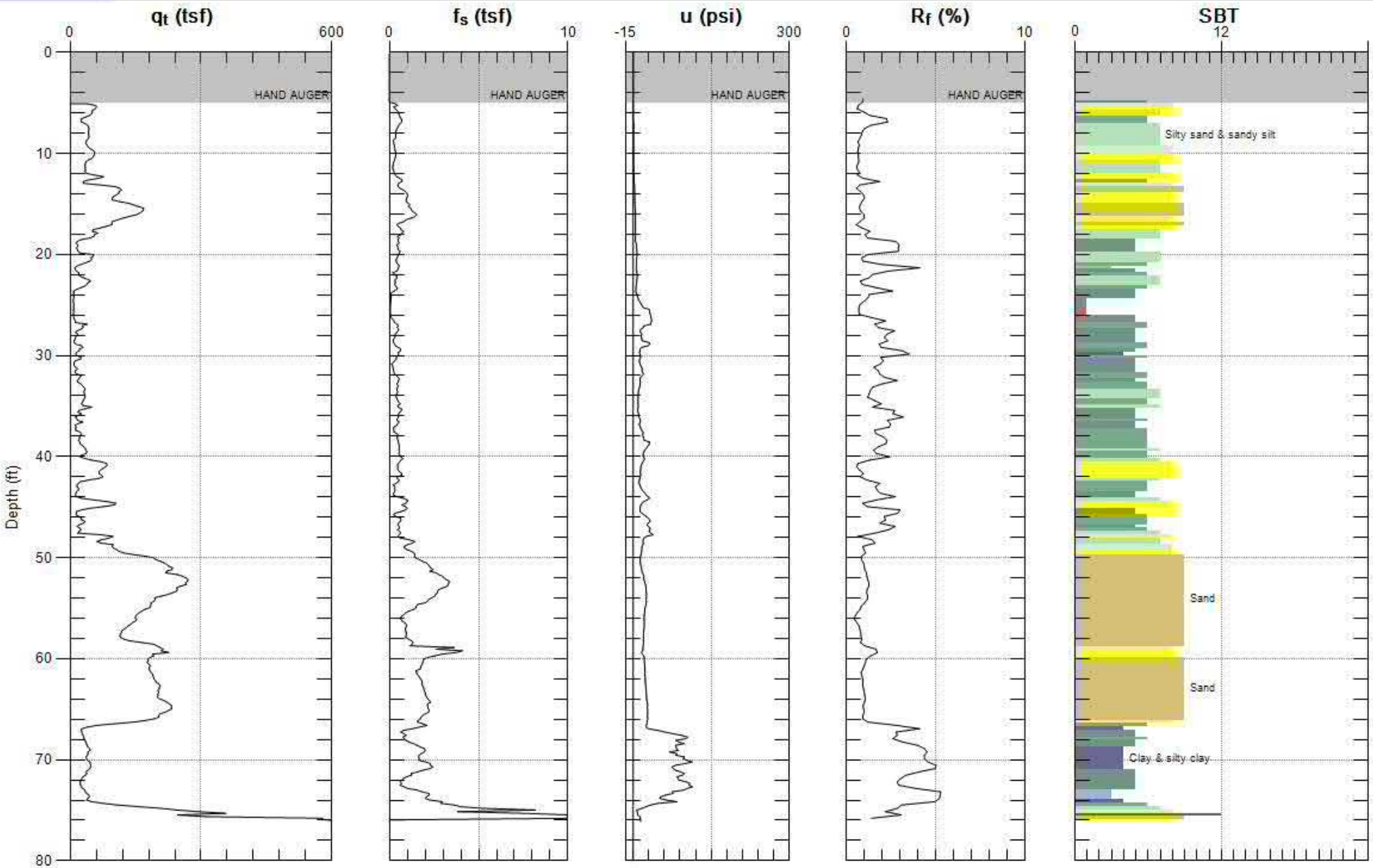
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-08 **Date: 3/21/17 10:50**



Max. Depth: 76.115 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

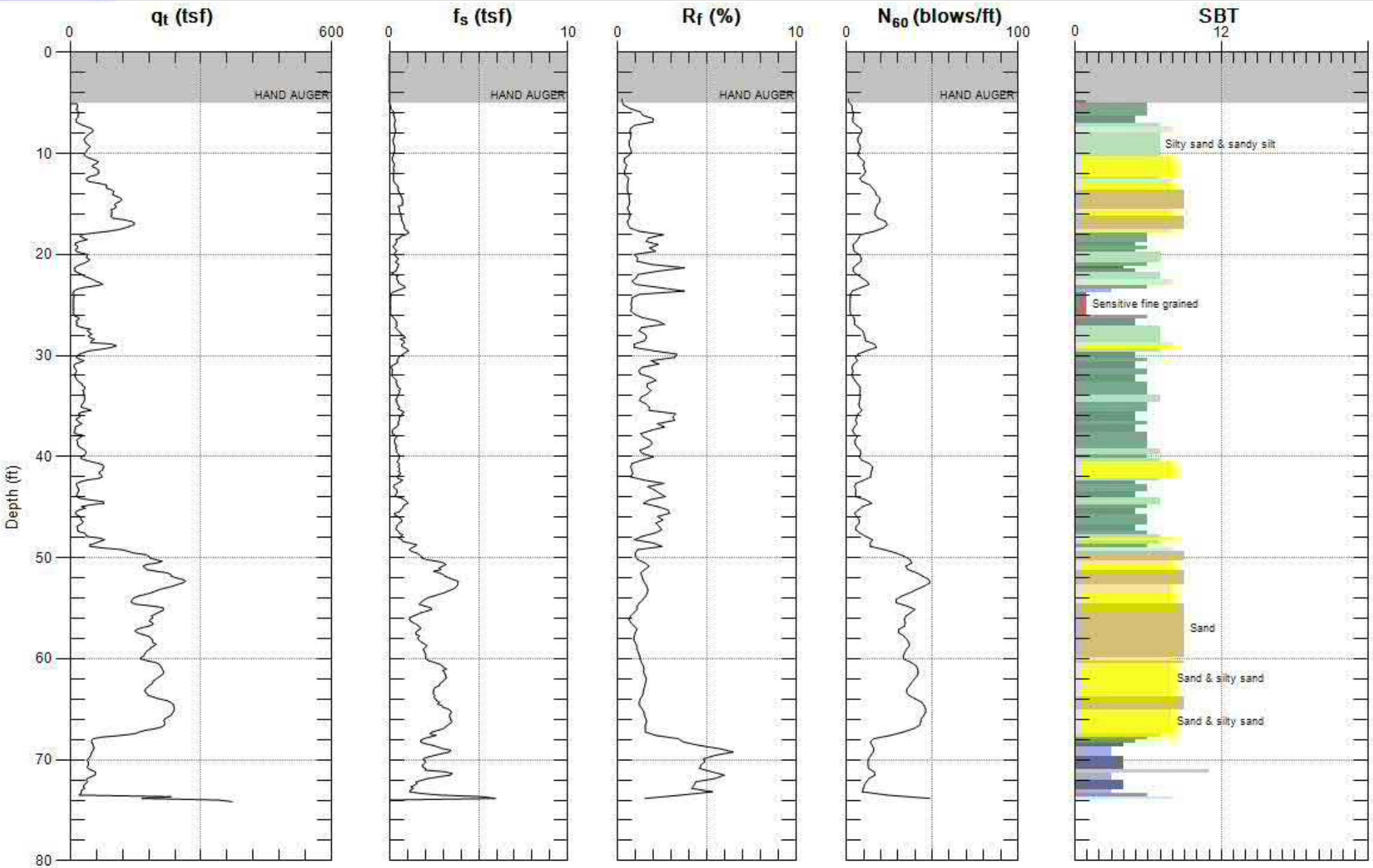
Figure A-84

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-09 **Date: 3/21/17 01:01**



Max. Depth: 74.147 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

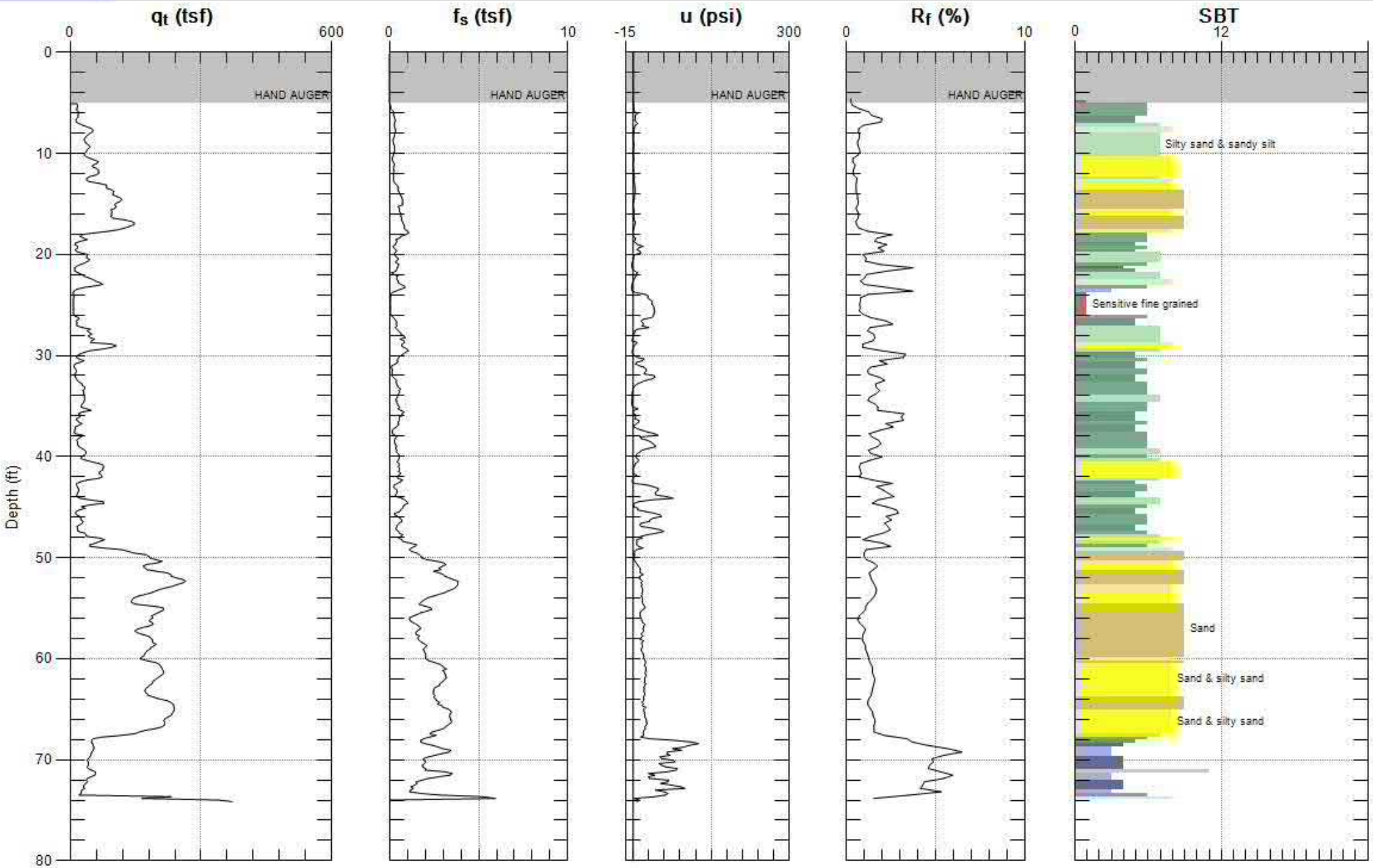
Figure A-85

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-09 **Date: 3/21/17 01:01**



Max. Depth: 74.147 (ft)
Avg. Interval: 0.328 (ft)

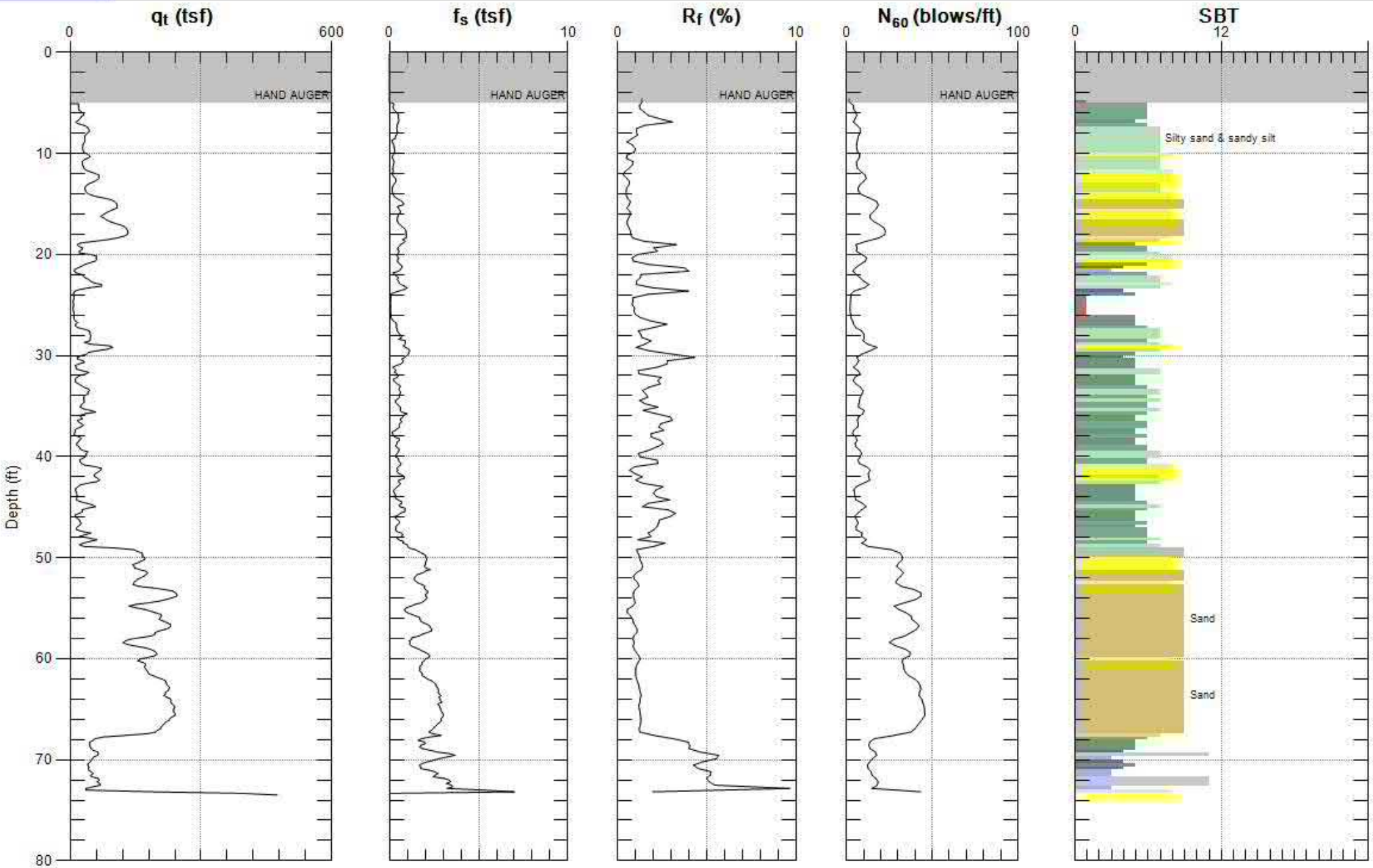
Figure A-85 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-10 **Date: 3/21/17 02:18**



Max. Depth: 73.491 (ft)
Avg. Interval: 0.328 (ft)

Figure A-86

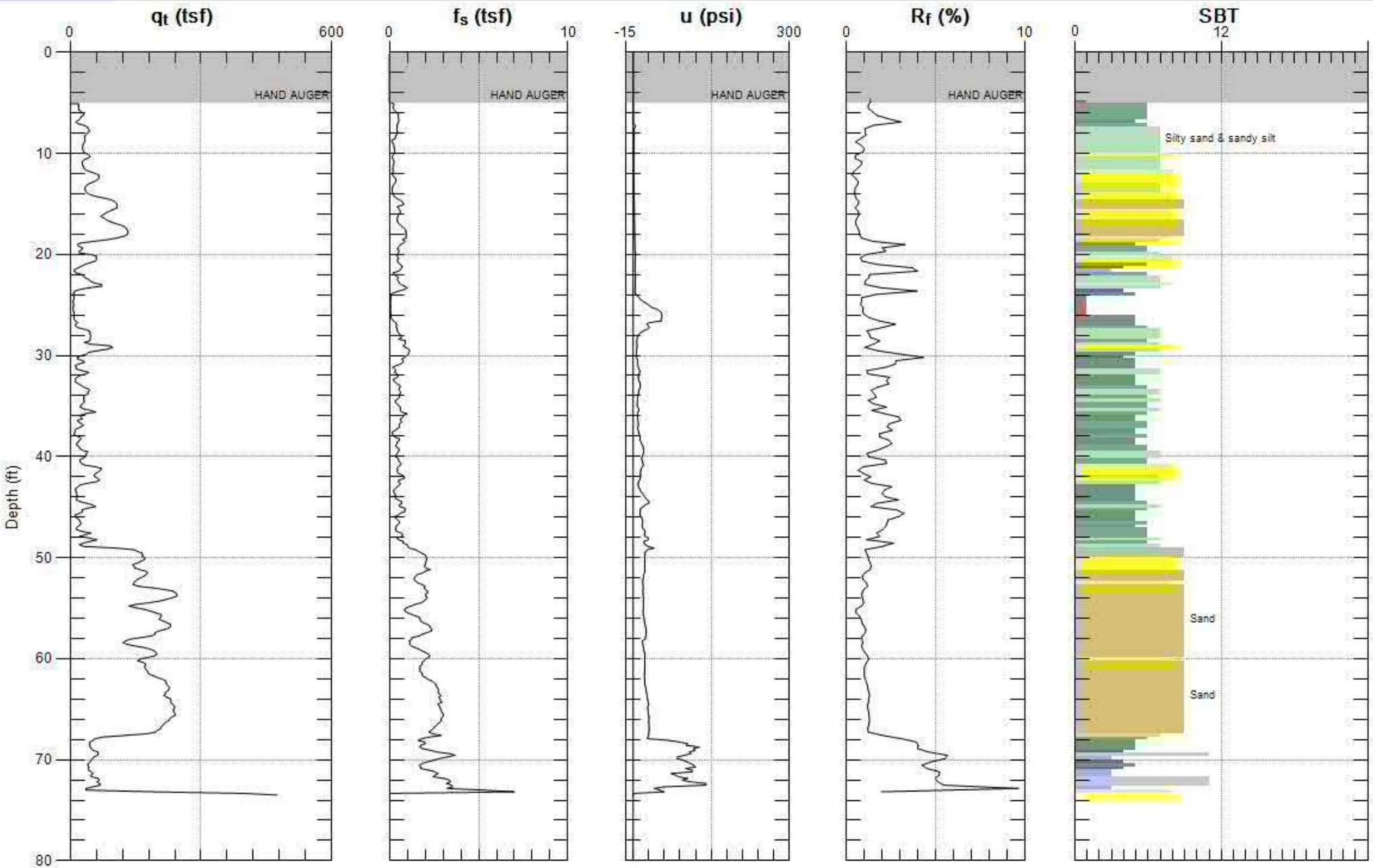
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-10 **Date: 3/21/17 02:18**



Max. Depth: 73.491 (ft)
Avg. Interval: 0.328 (ft)

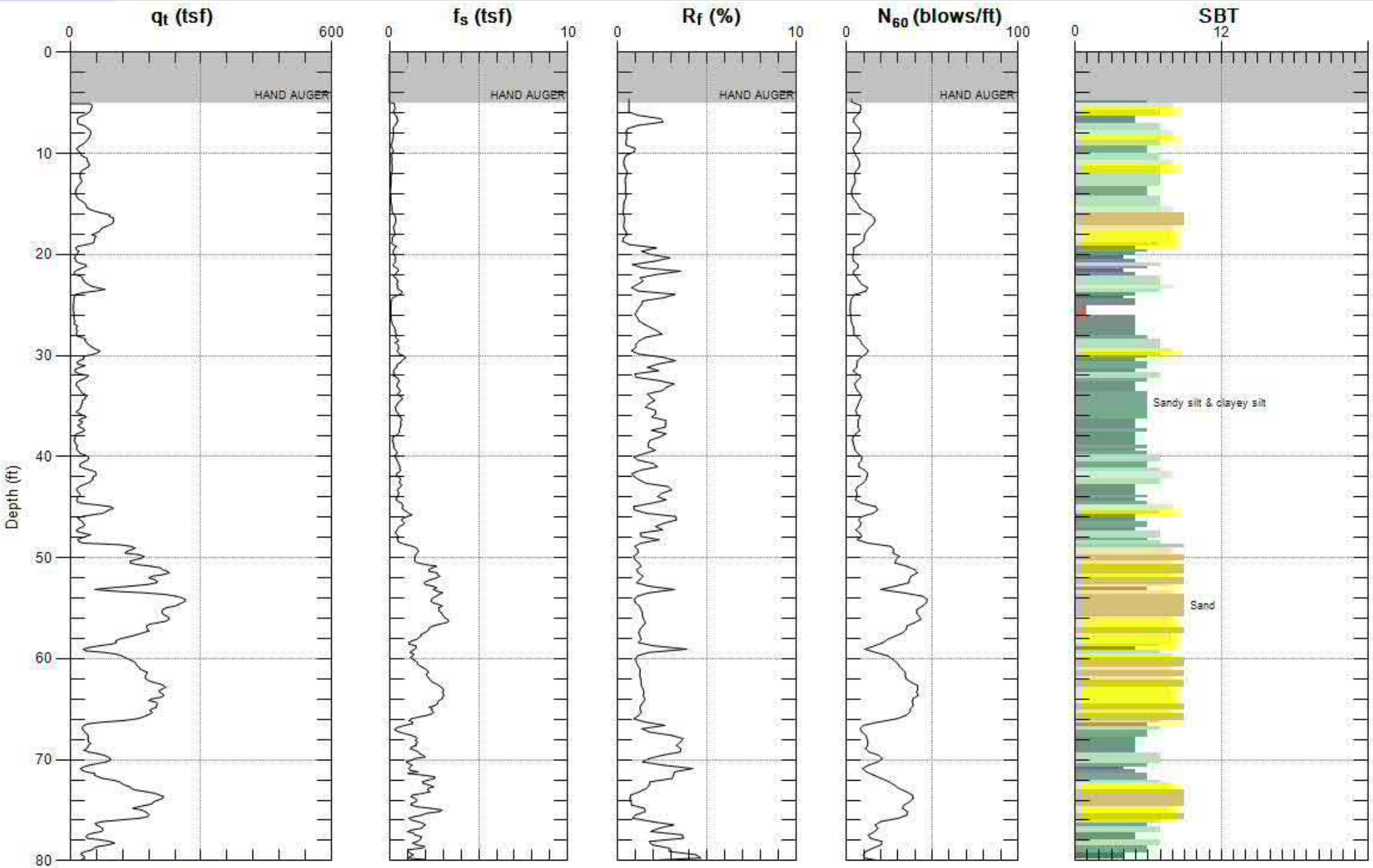
Figure A-86 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-11 Date: 3/22/17 07:42



Max. Depth: 80.217 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

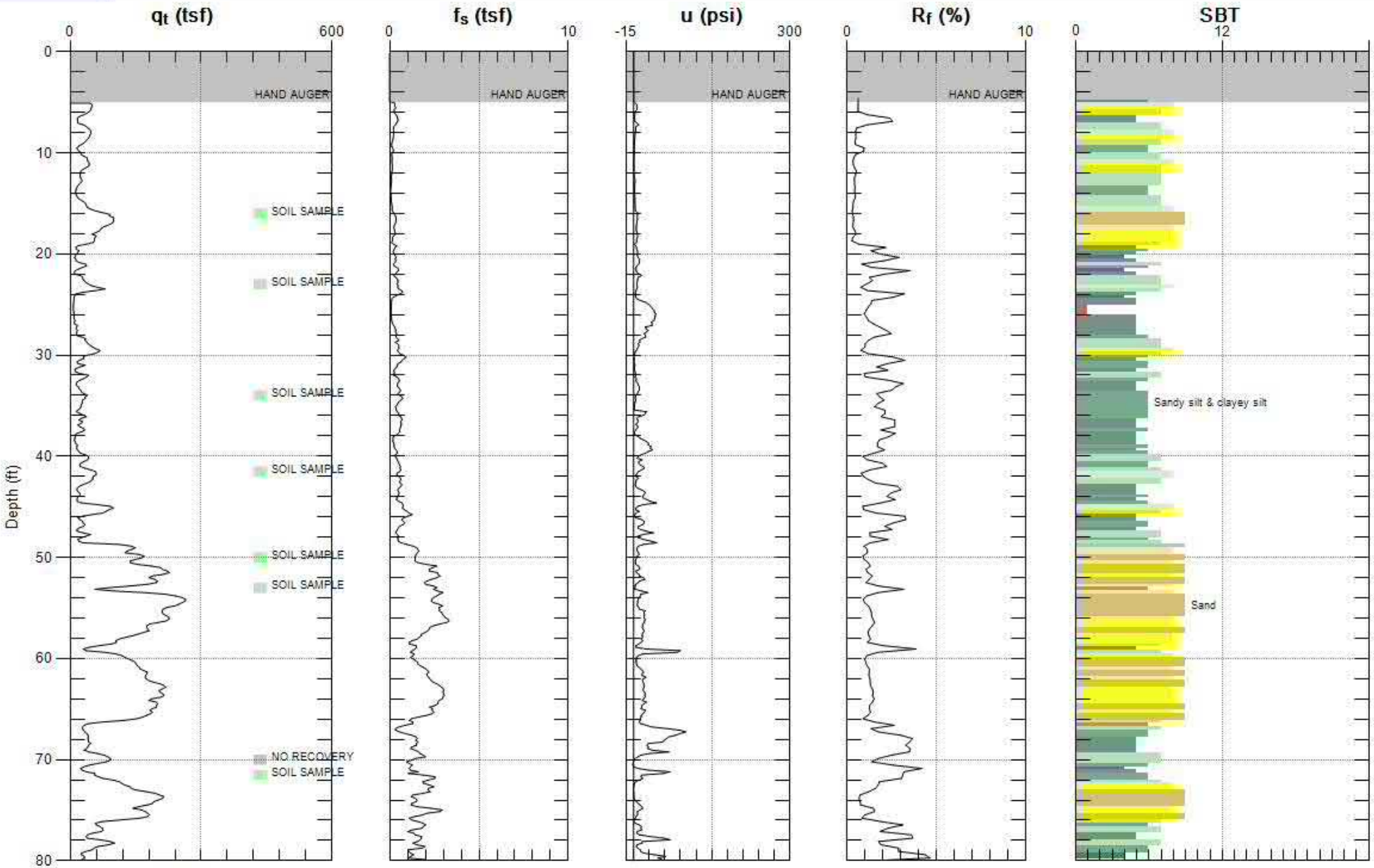
Figure A-87

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-11 **Date: 3/22/17 07:42**



Max. Depth: 80.217 (ft)
Avg. Interval: 0.328 (ft)

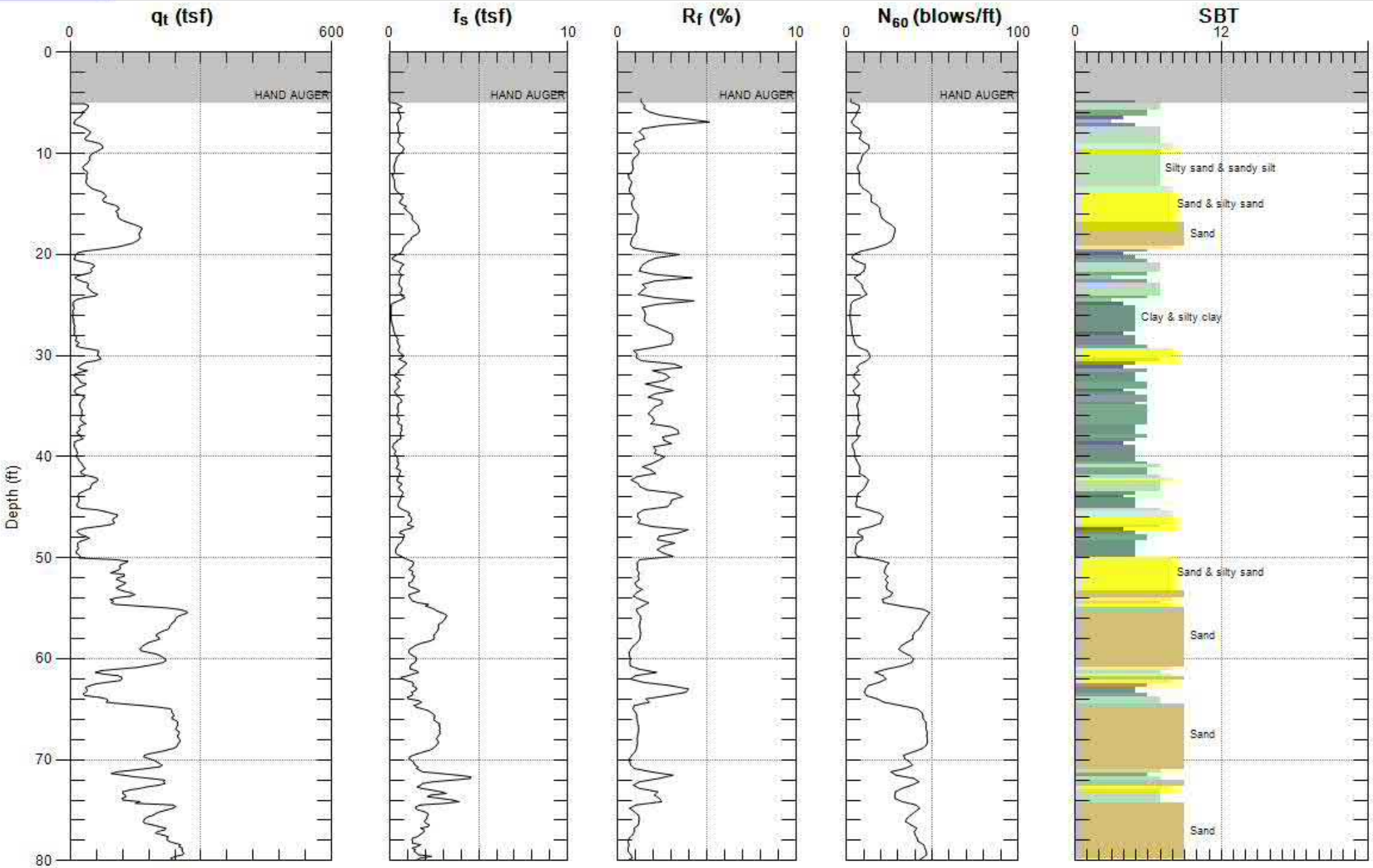
Figure A-87 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-12 **Date: 3/22/17 09:25**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

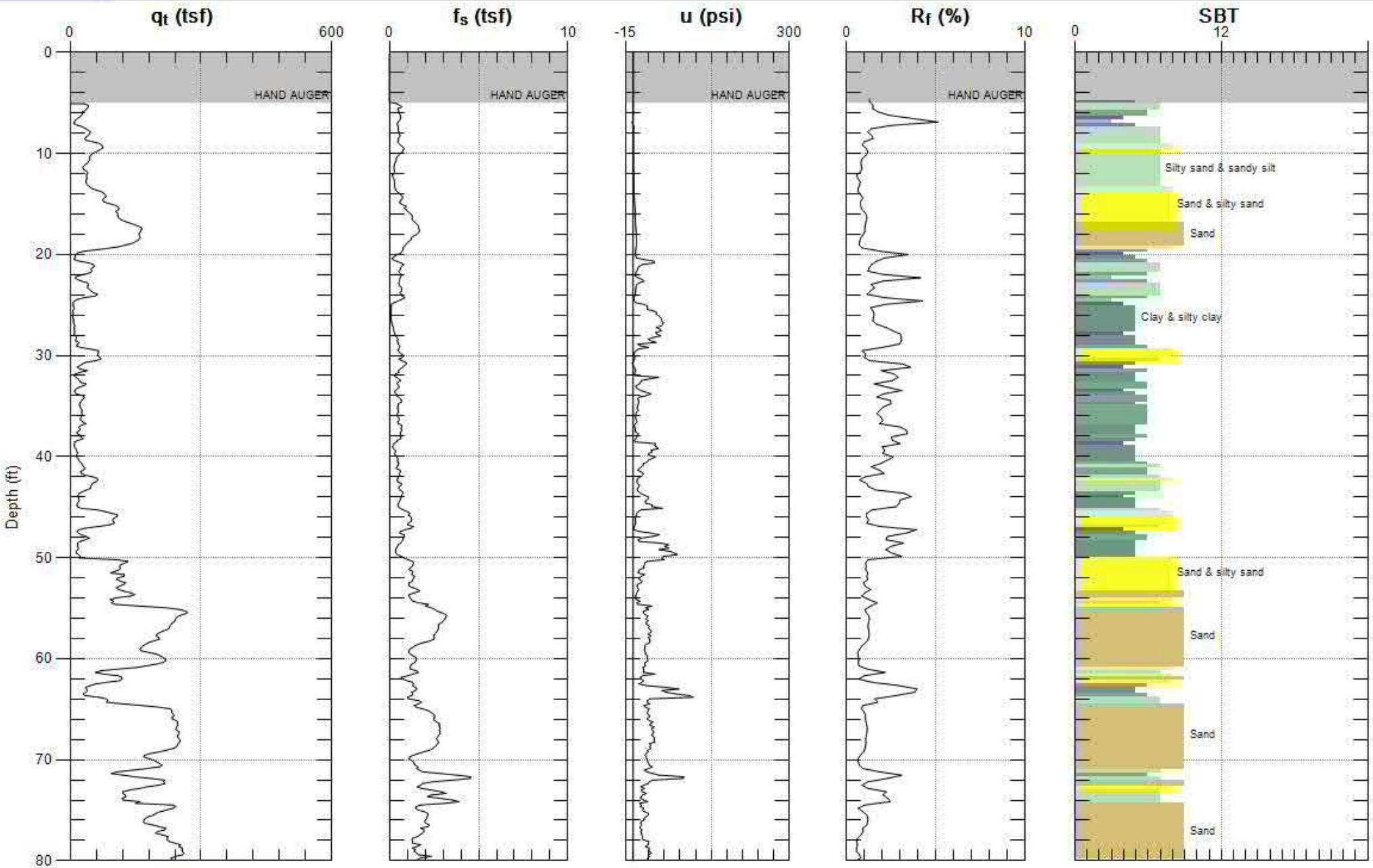
Figure A-88

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-12 **Date: 3/22/17 09:25**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

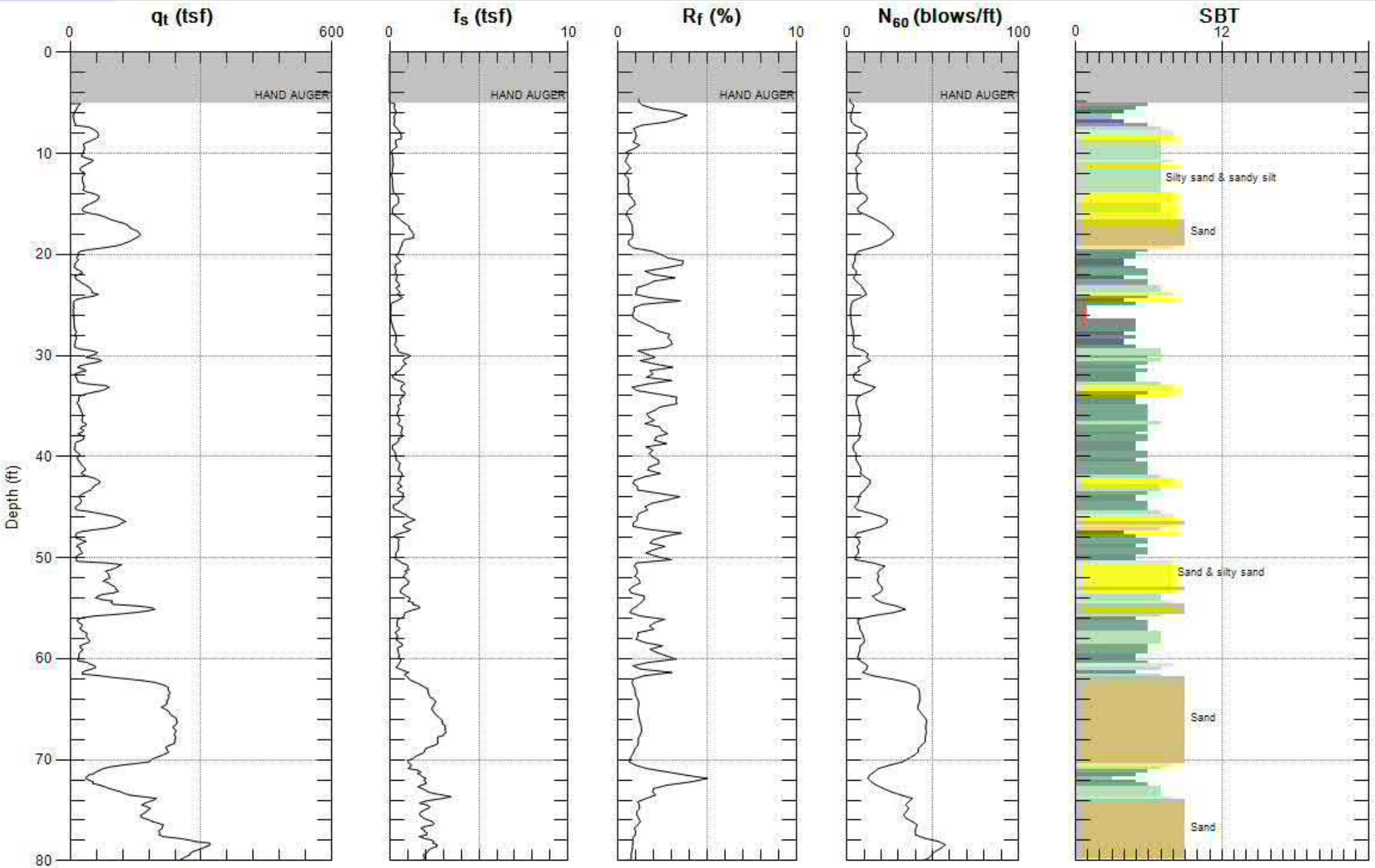
Figure A-88 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-13 **Date: 3/22/17 10:52**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-89

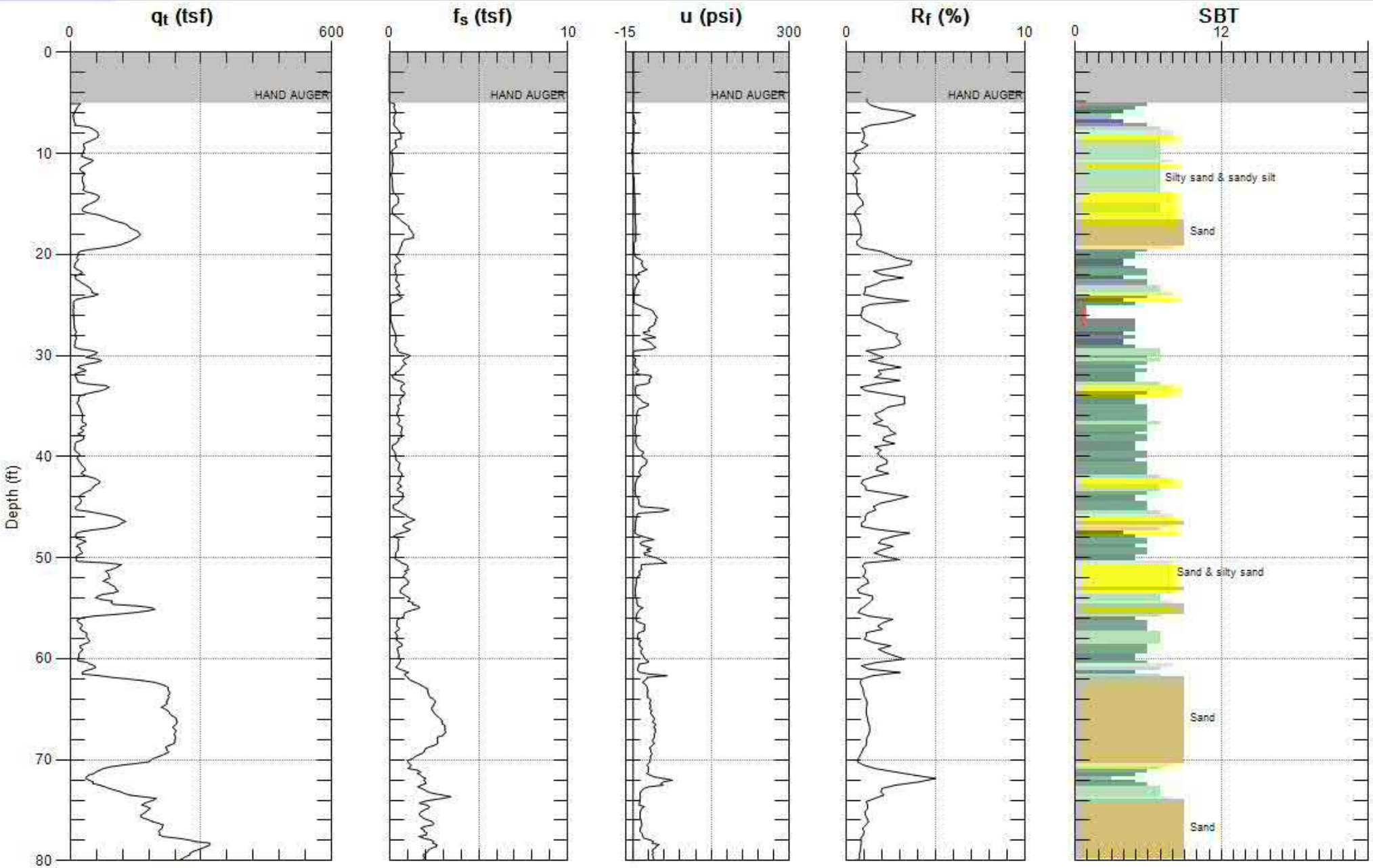
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-13 **Date: 3/22/17 10:52**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-89

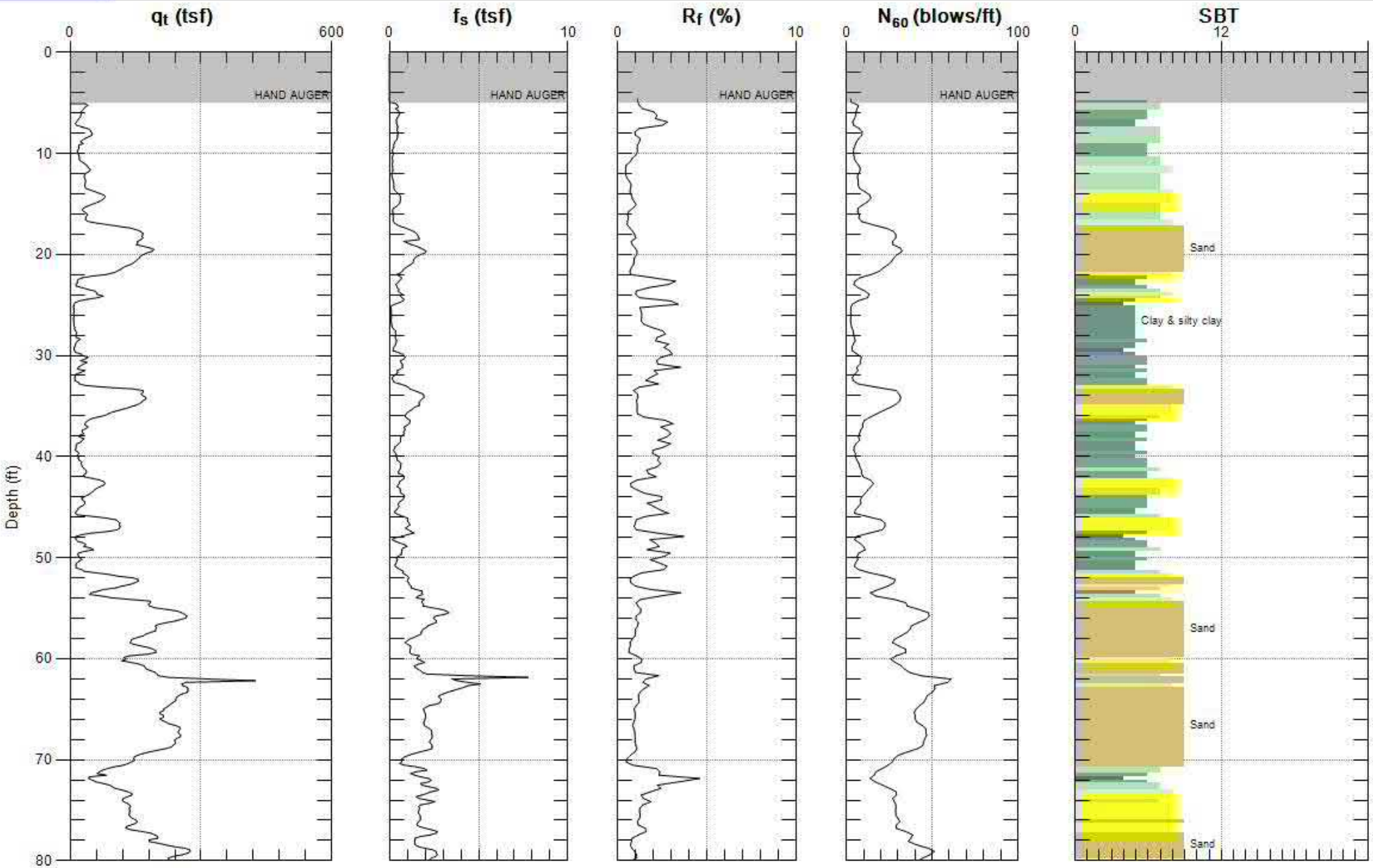
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-14 **Date: 3/22/17 01:04**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

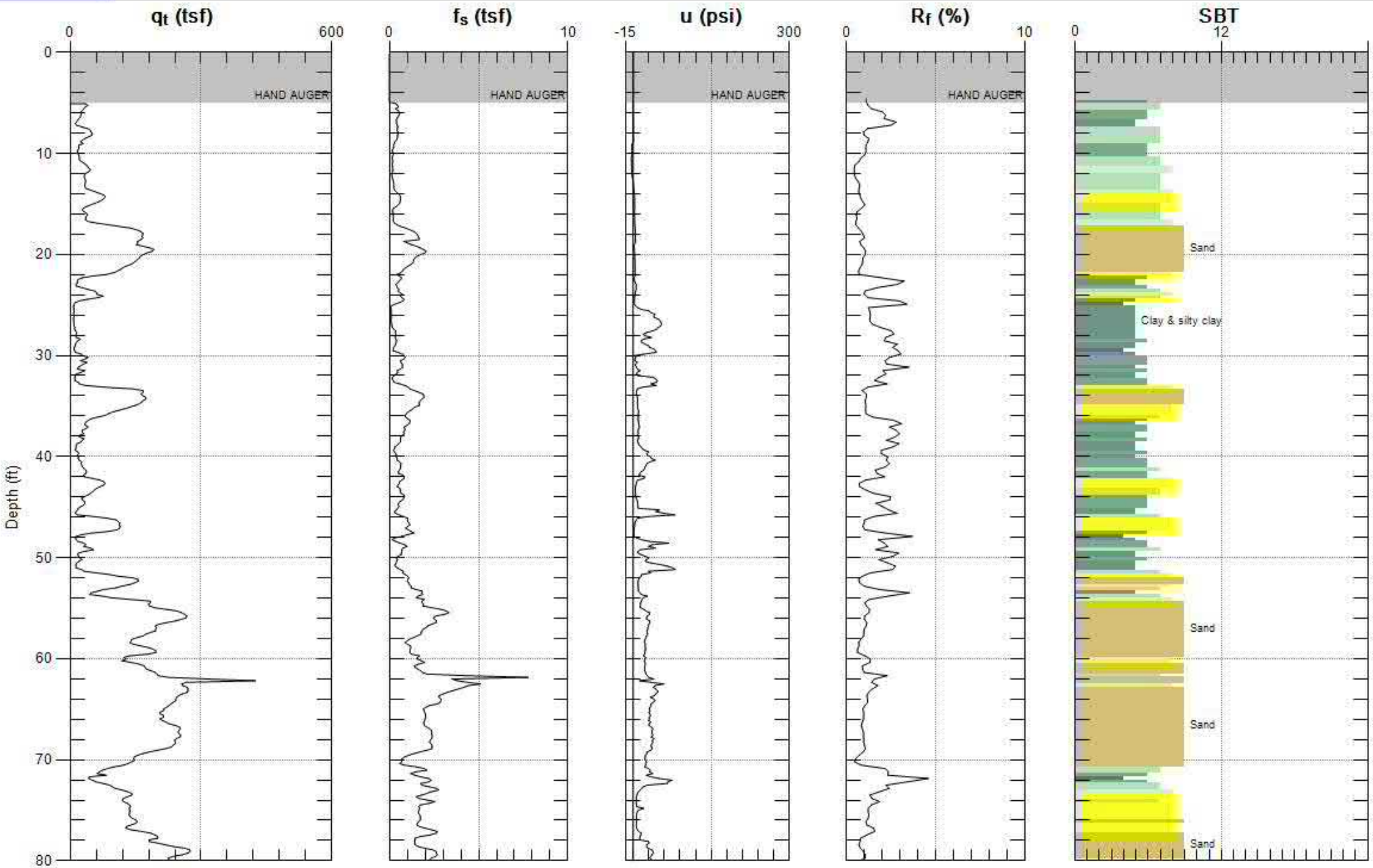
Figure A-90 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-14 **Date: 3/22/17 01:04**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

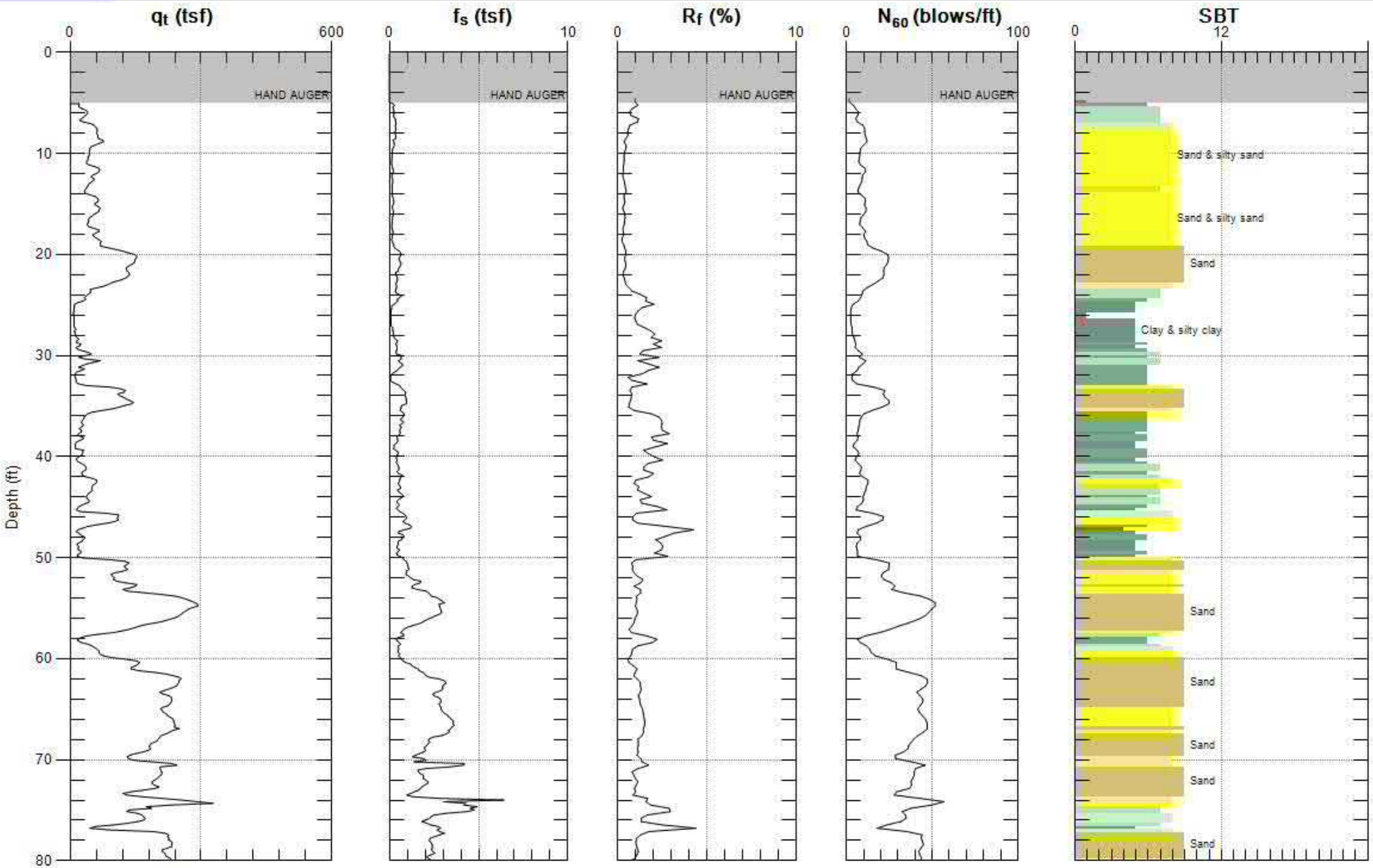
Figure A-90 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-15 **Date: 3/22/17 02:19**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

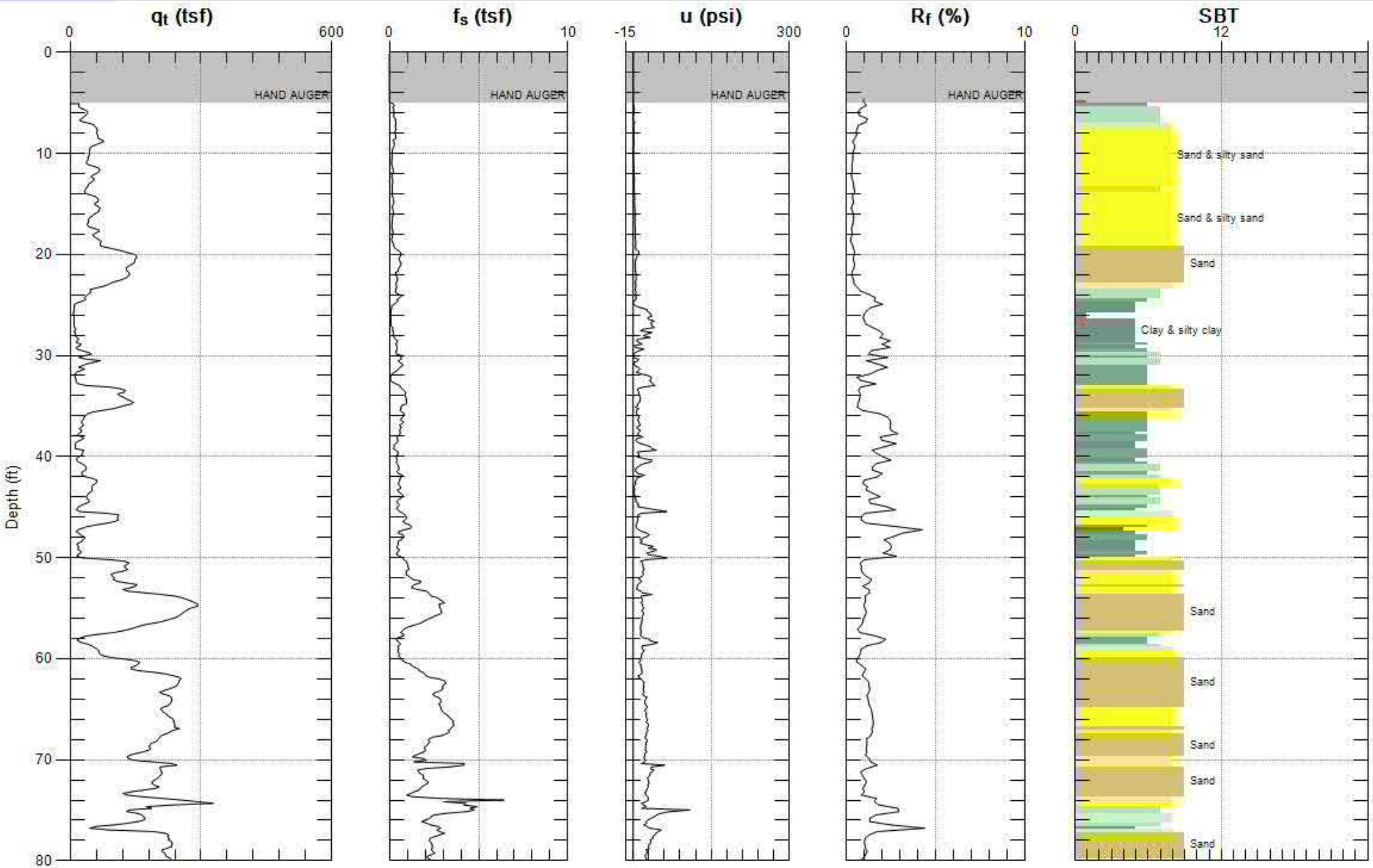
Figure A-91 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-15 **Date: 3/22/17 02:19**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

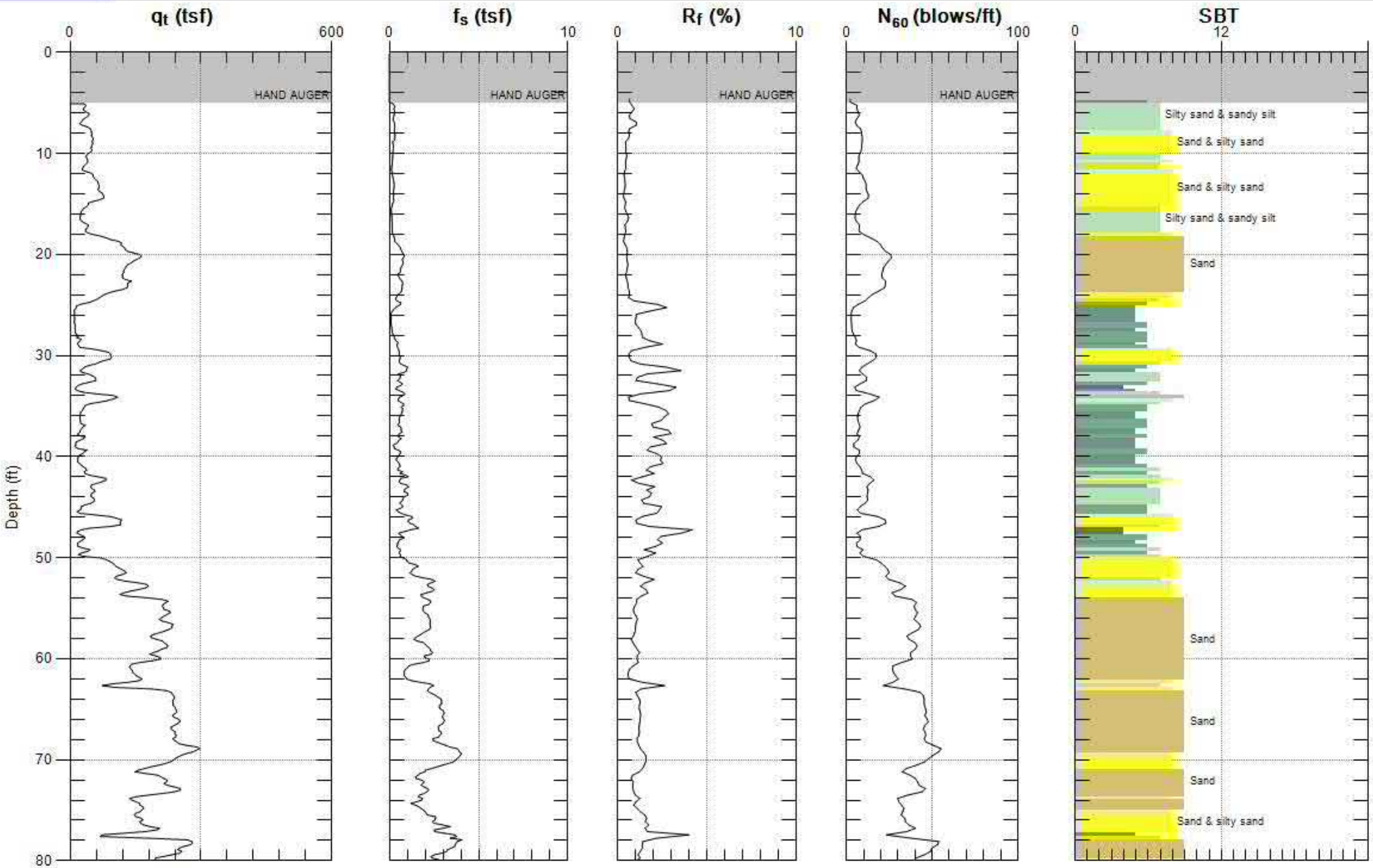
Figure A-91 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-16 **Date: 3/23/17 07:53**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

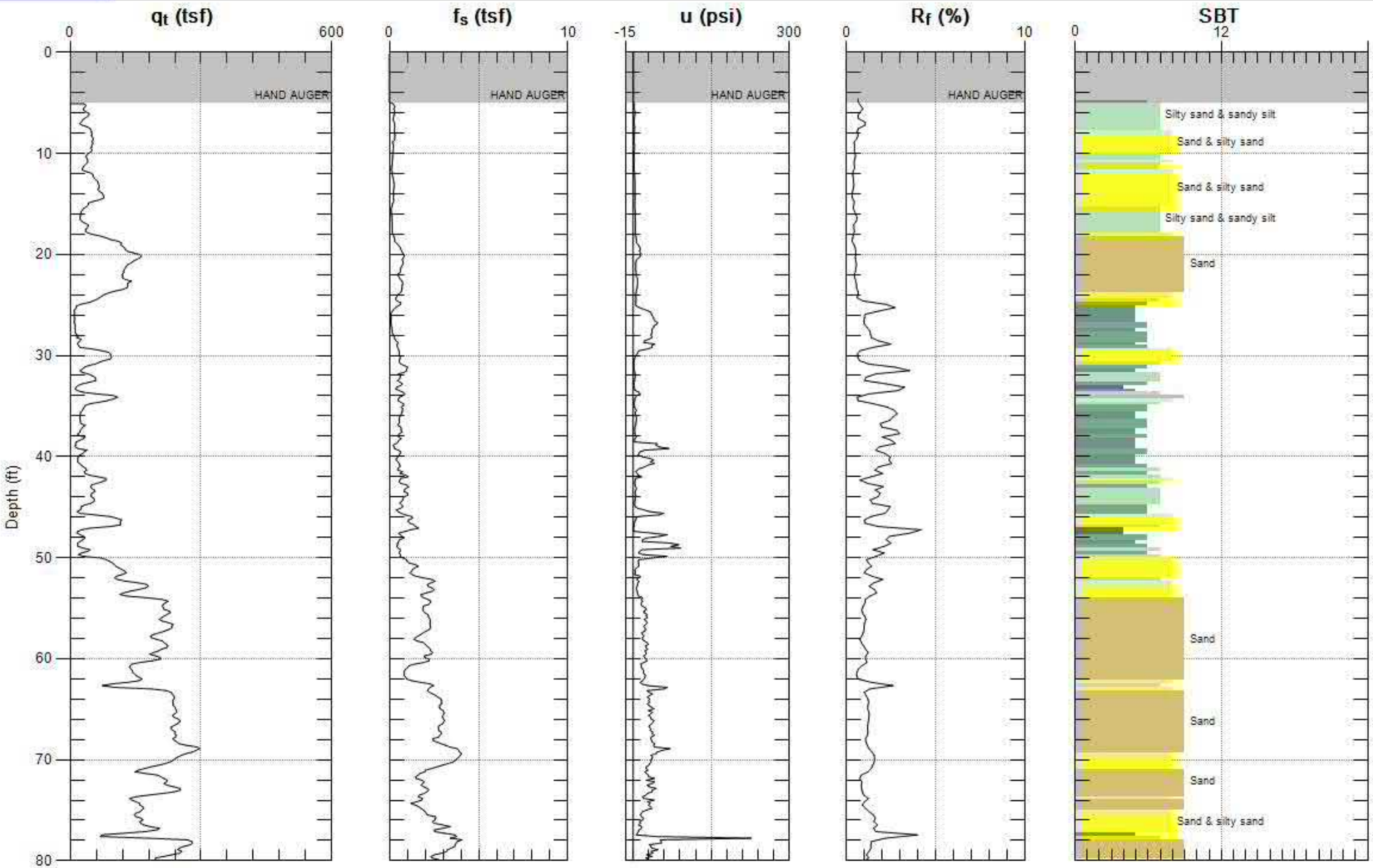
Figure A-92 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-16 **Date: 3/23/17 07:53**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

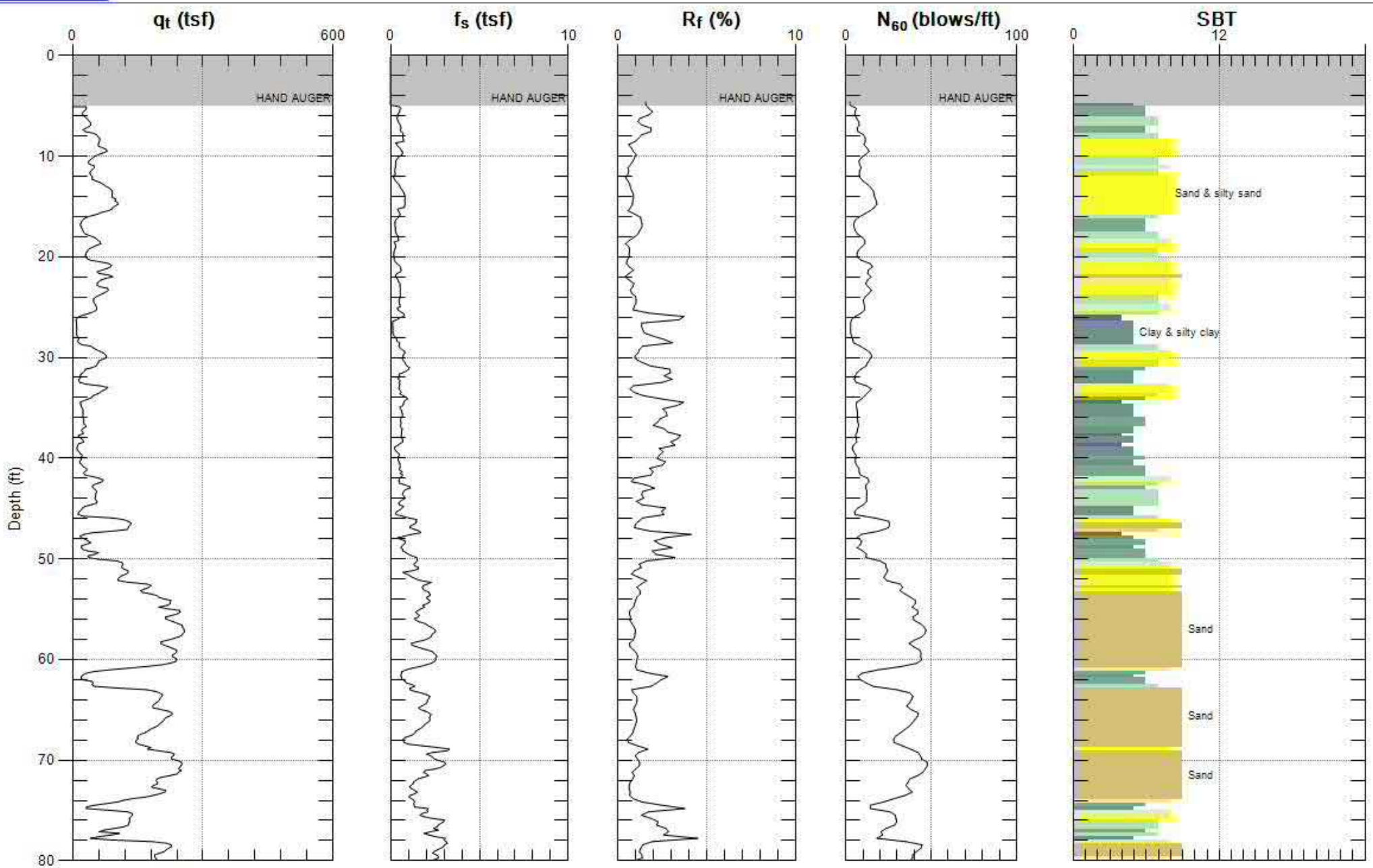
Figure A-92 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-17 **Date: 3/23/17 09:15**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

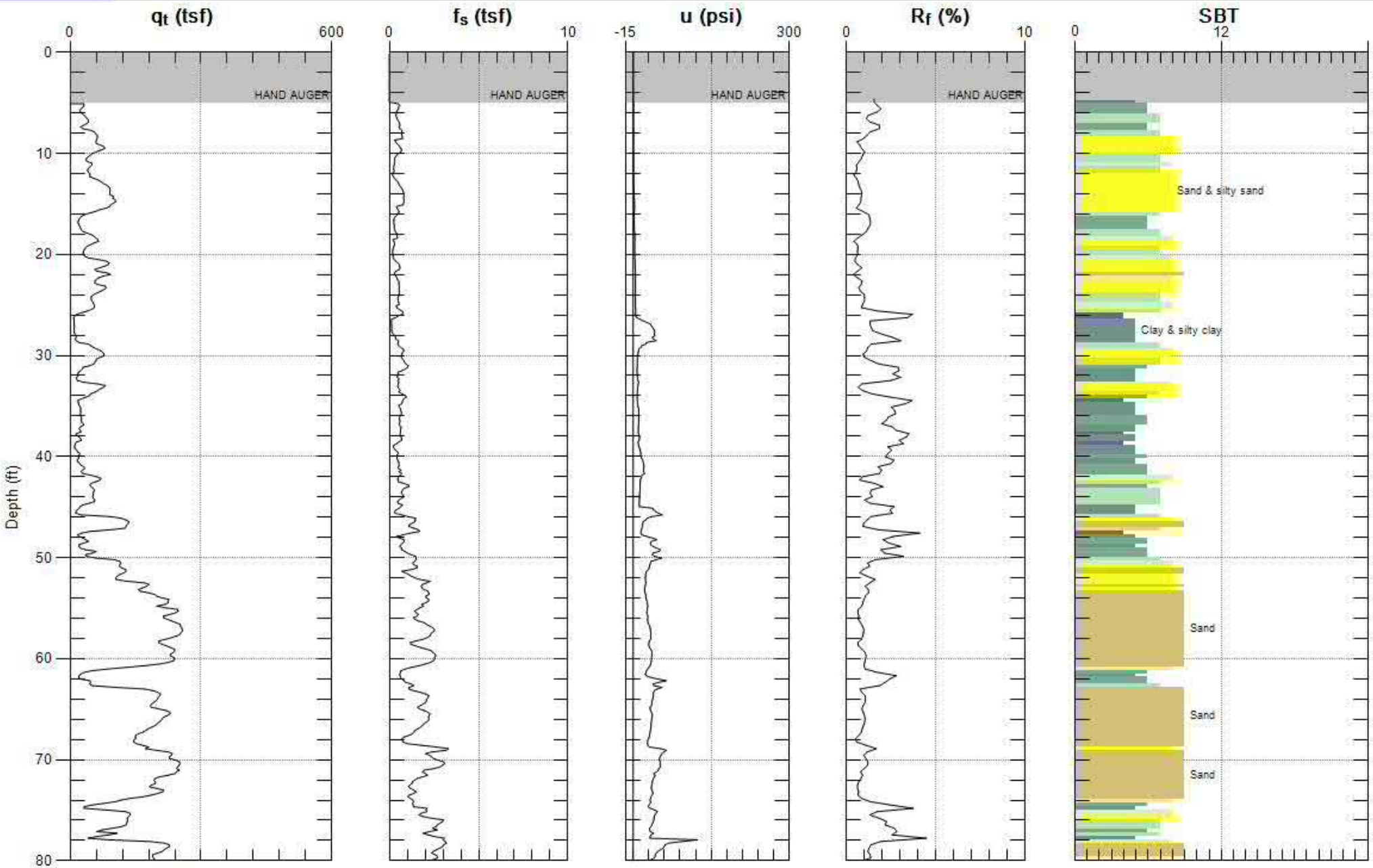
Figure A-93 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-17 **Date: 3/23/17 09:15**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-93

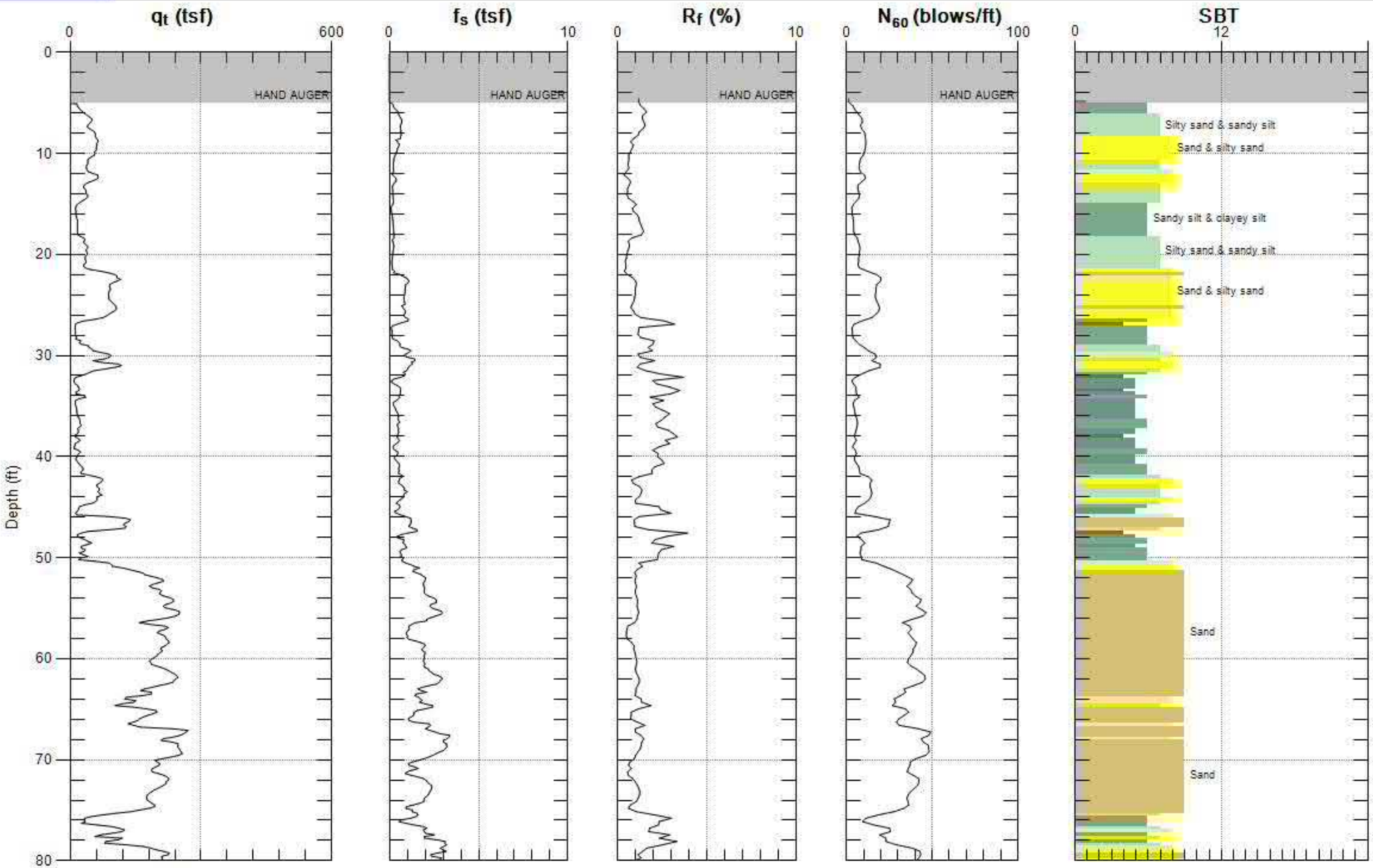
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-18 Date: 3/23/17 10:32



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-94

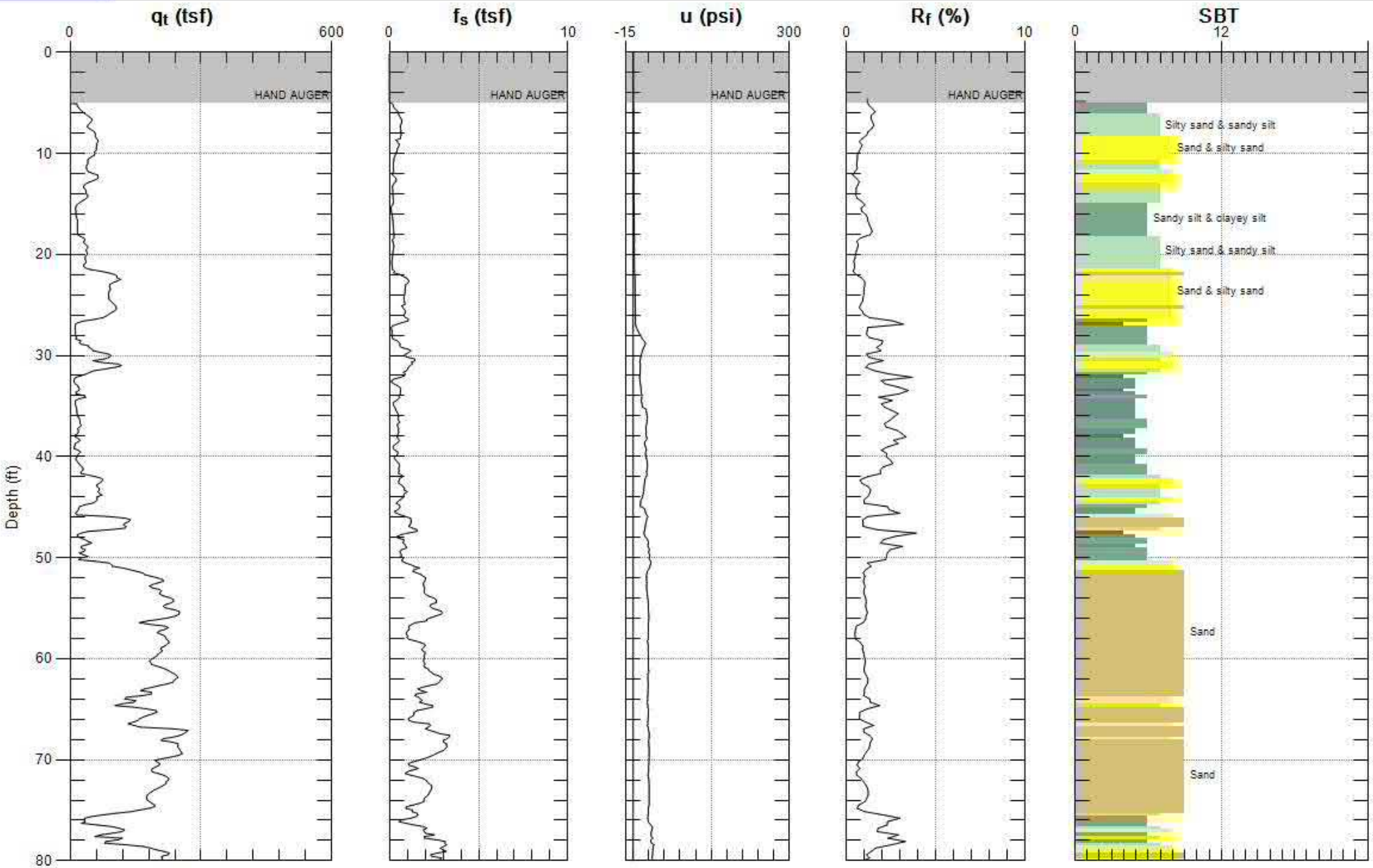
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-18 **Date: 3/23/17 10:32**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-94

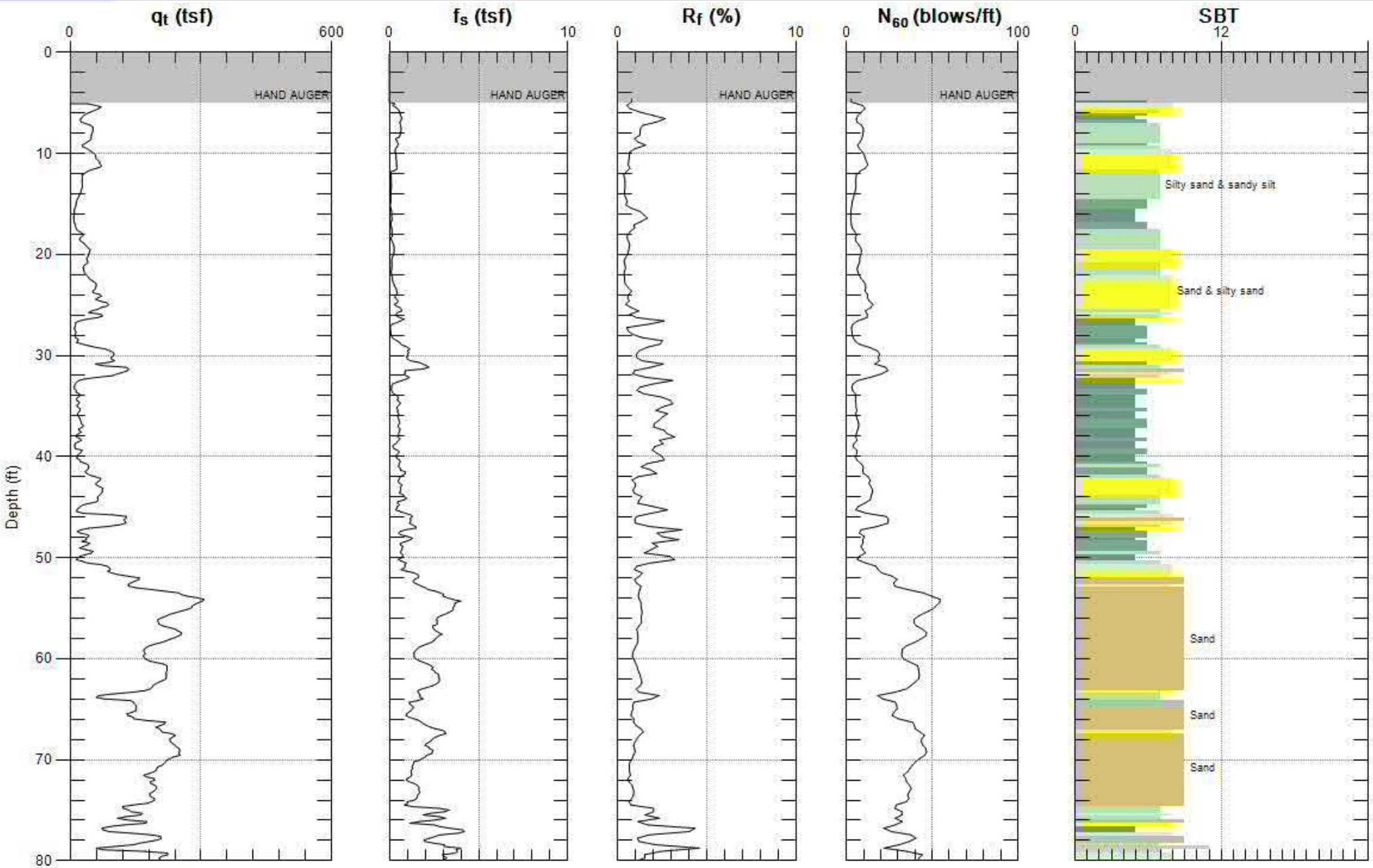
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-19 **Date: 3/23/17 12:38**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-95

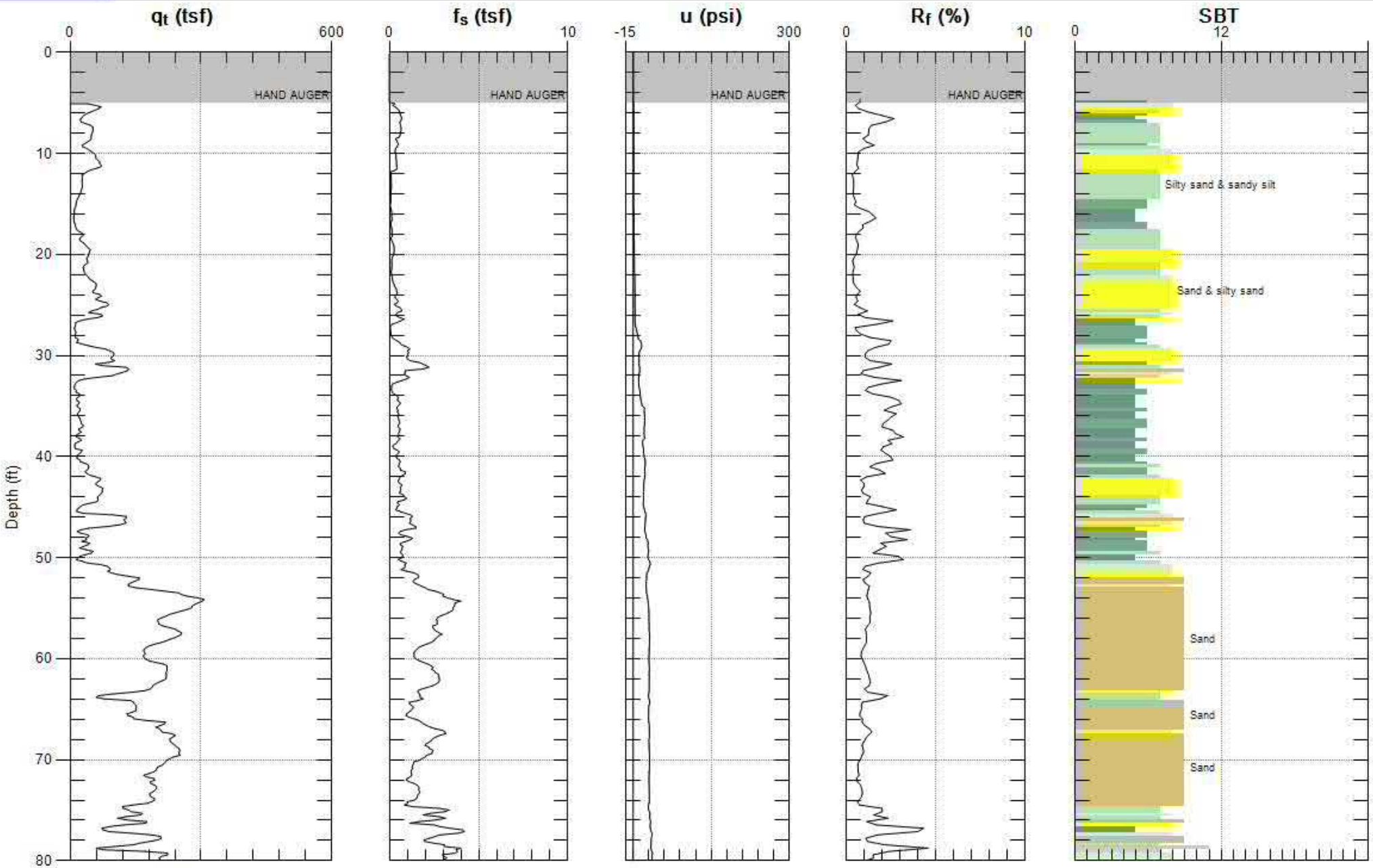
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: CU-19 **Date: 3/23/17 12:38**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

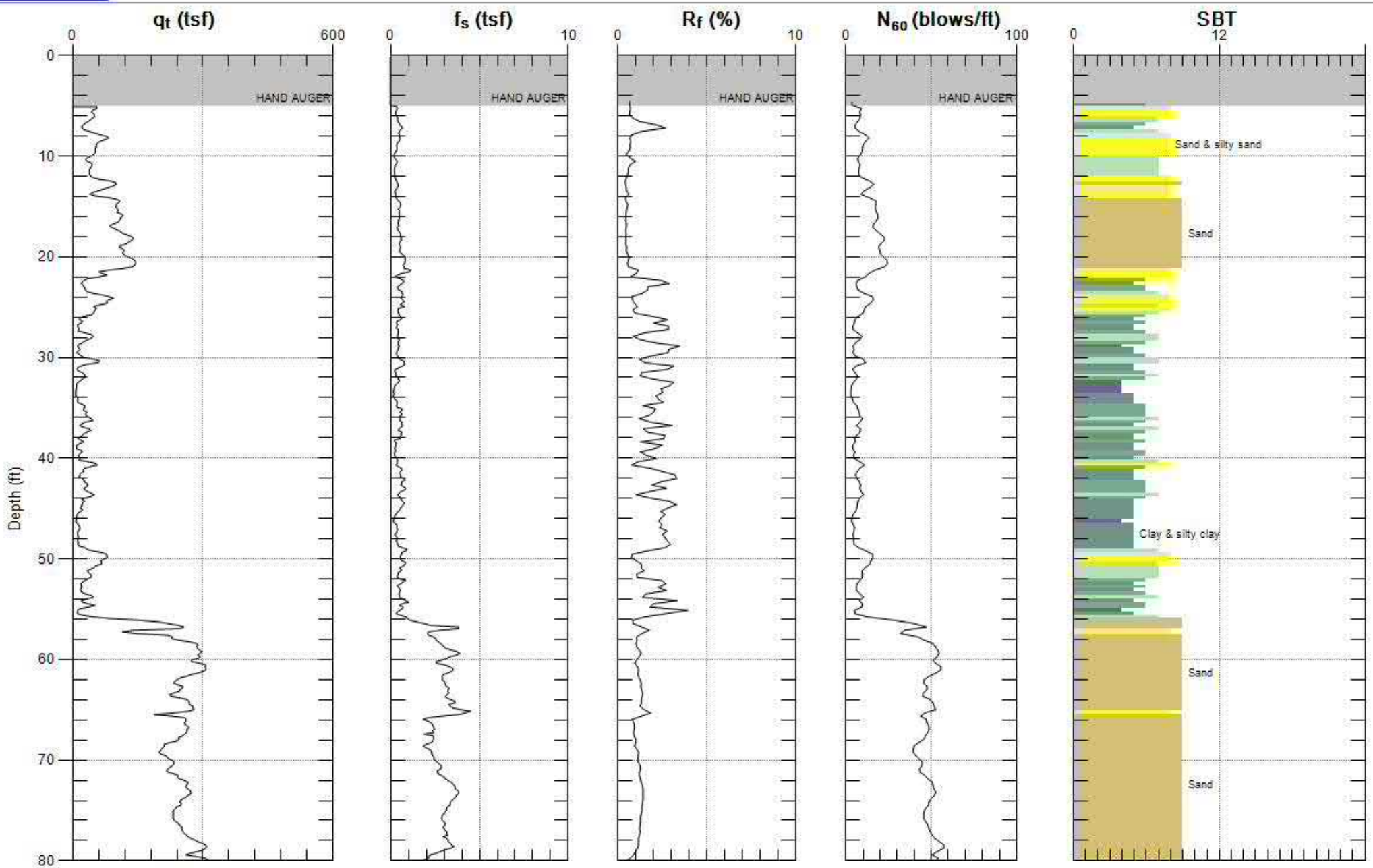
Figure A-95 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-01 **Date: 3/16/17 08:08**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

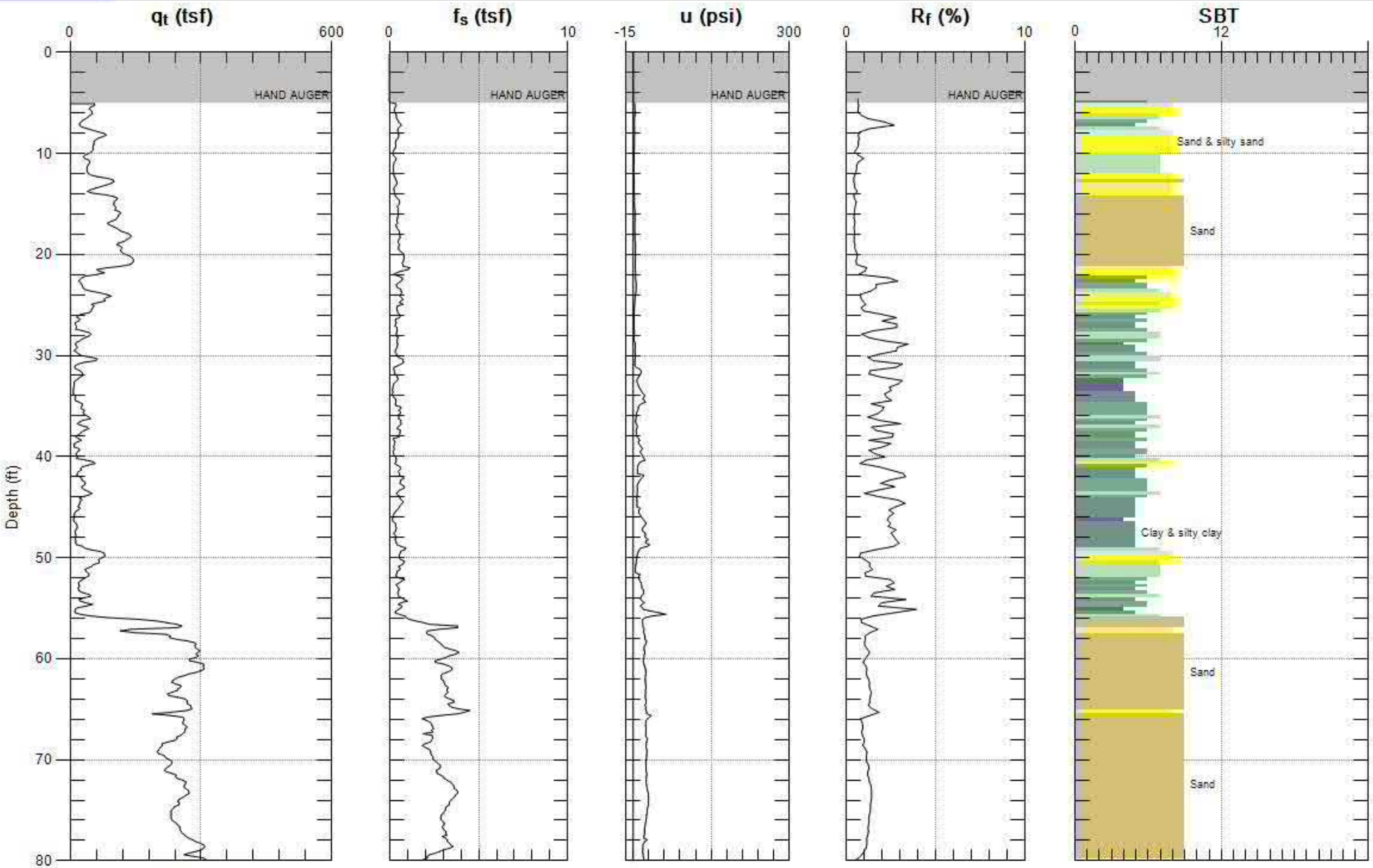
Figure A-96 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-01 **Date: 3/16/17 08:08**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

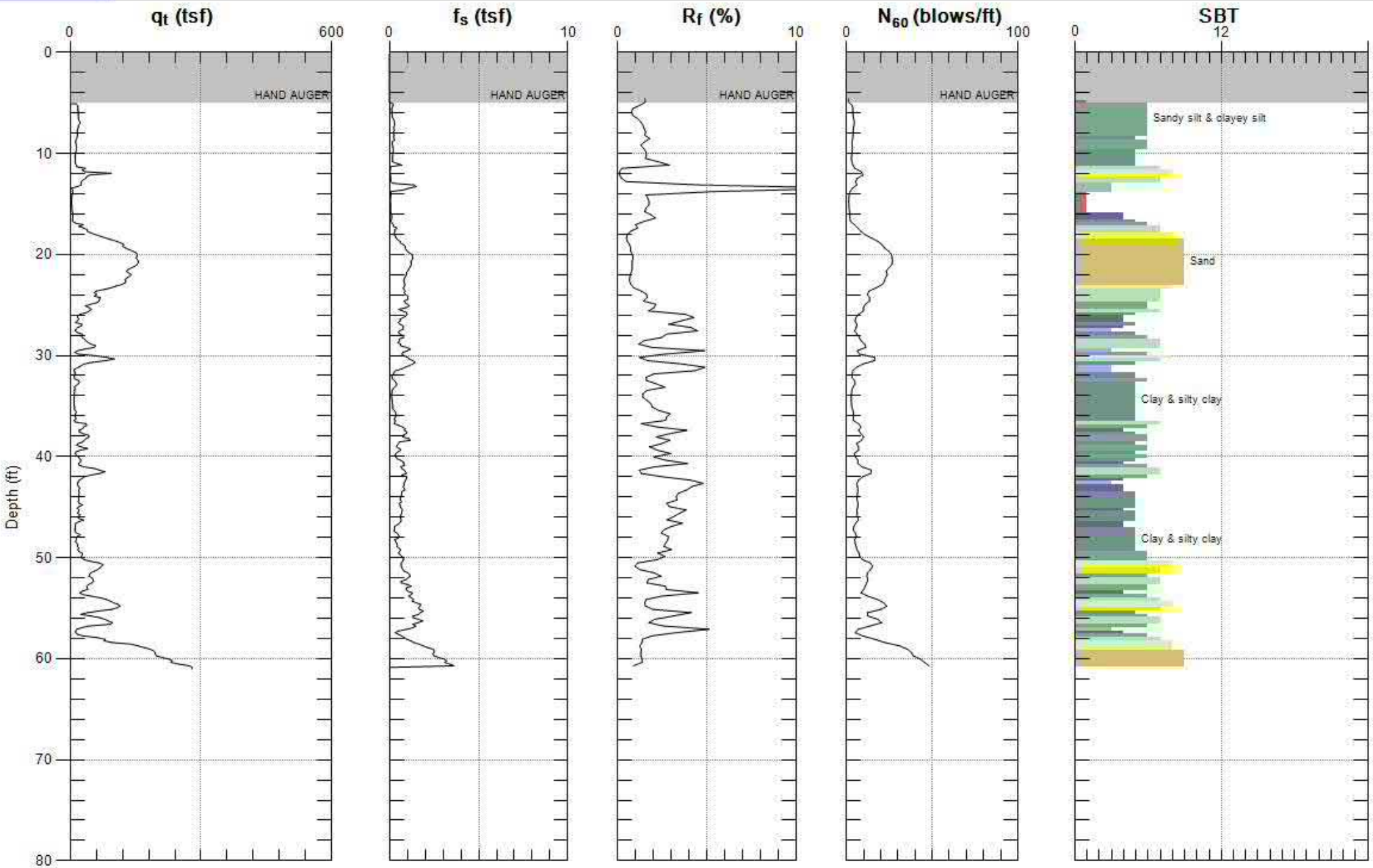
Figure A-96

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-02 **Date: 3/14/17 09:07**



Max. Depth: 61.024 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

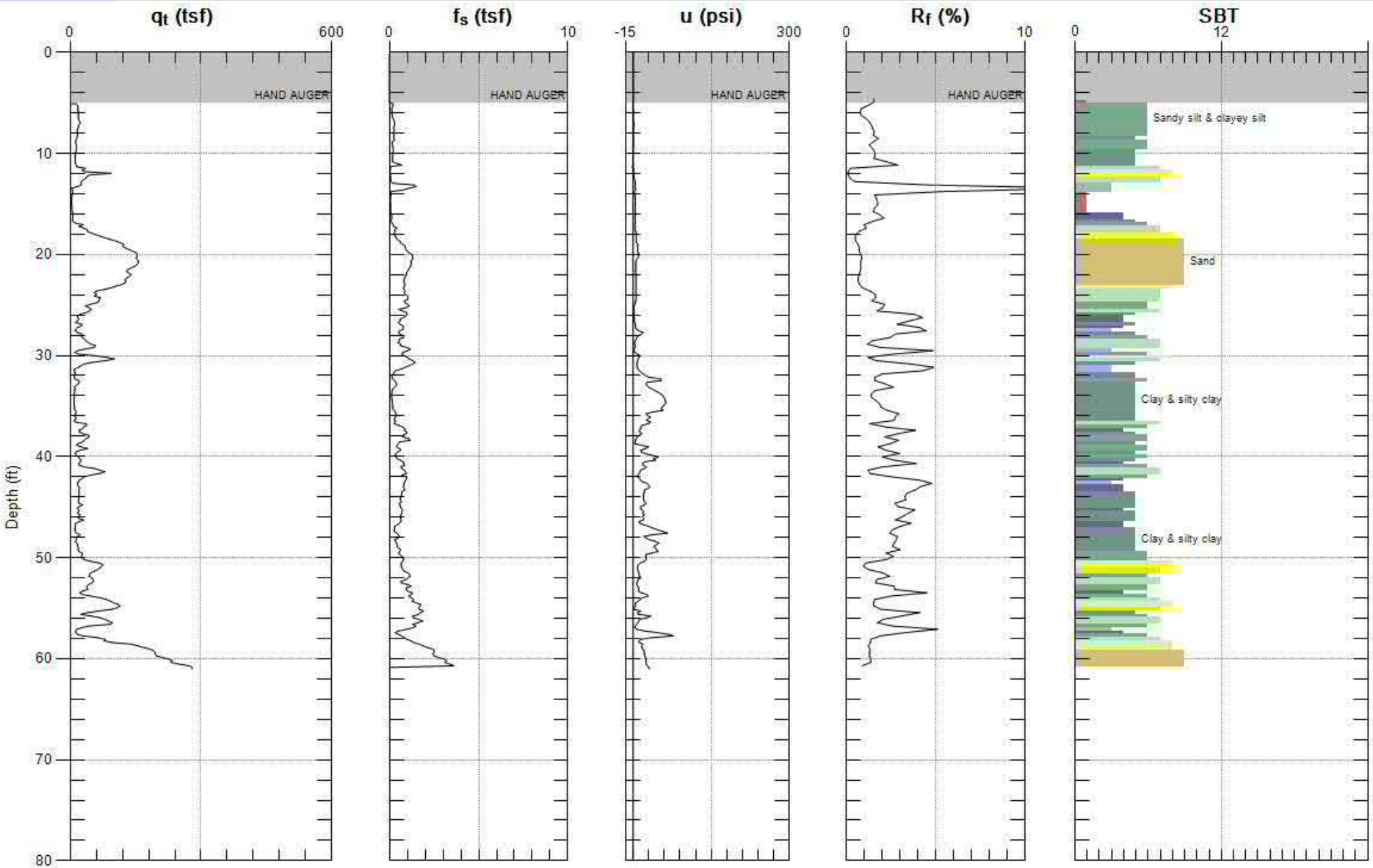
Figure A-97

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-02 **Date: 3/14/17 09:07**



Max. Depth: 61.024 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

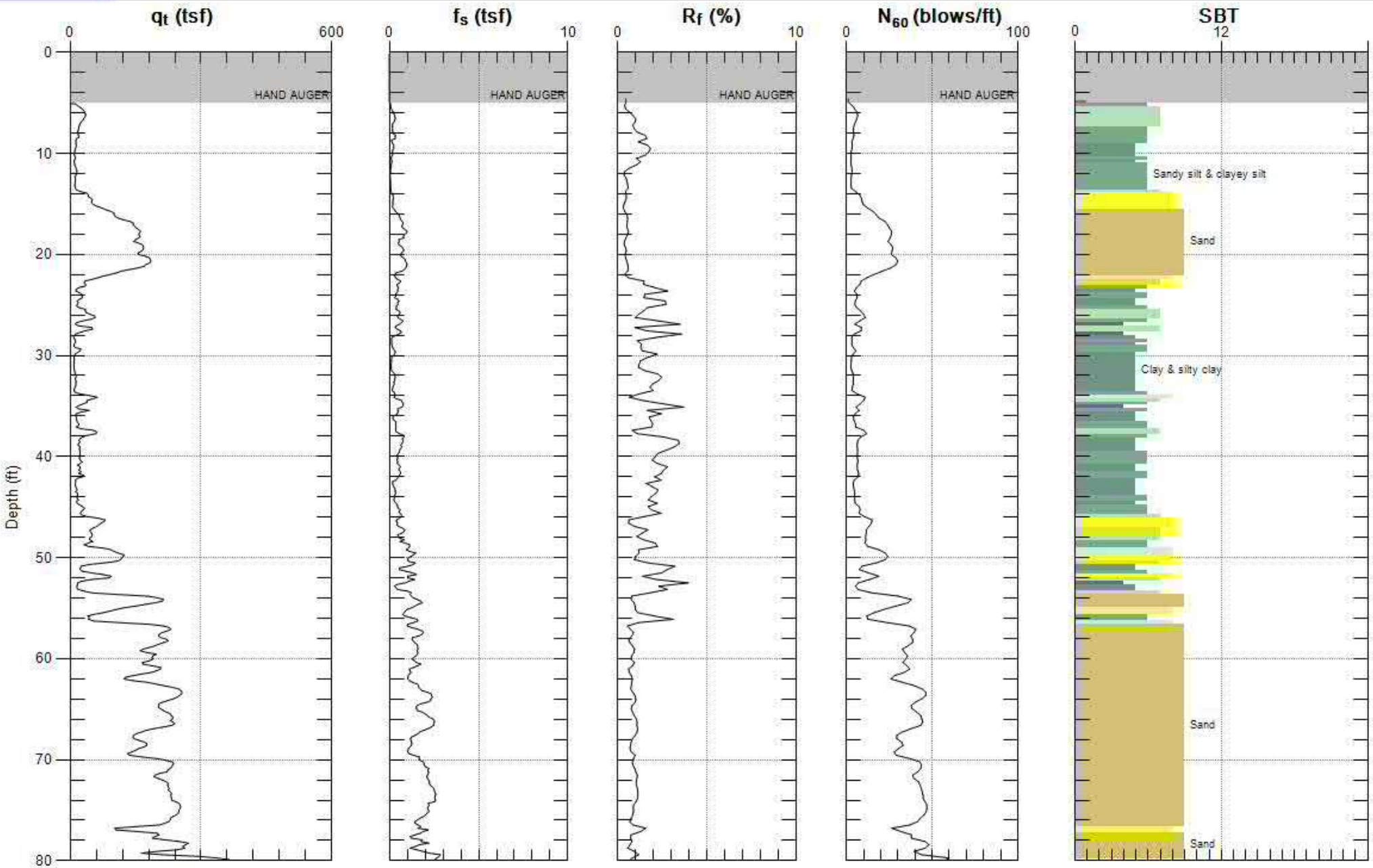
Figure A-97

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-03 **Date: 3/14/17 10:35**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

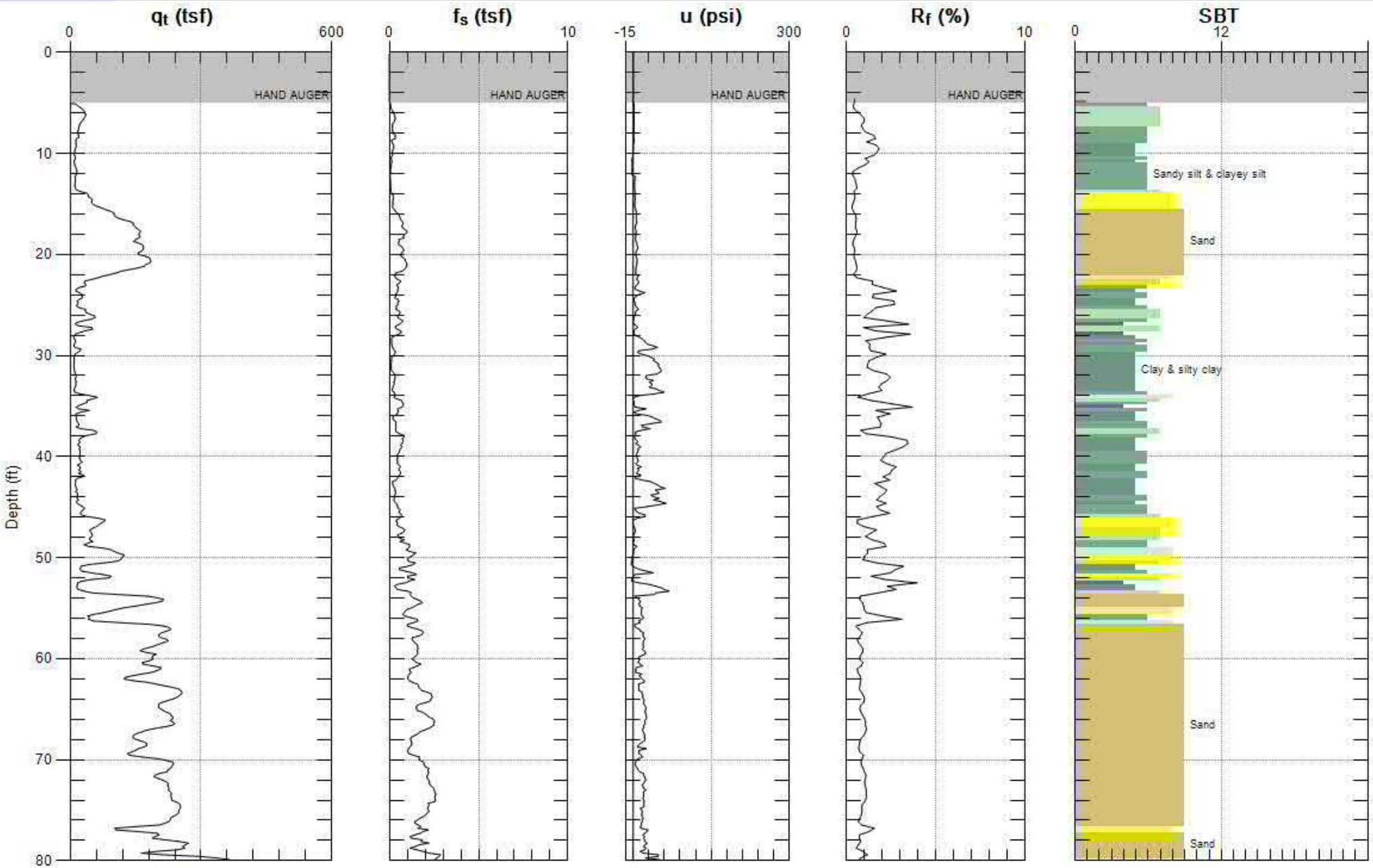
Figure A-98 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-03 **Date: 3/14/17 10:35**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

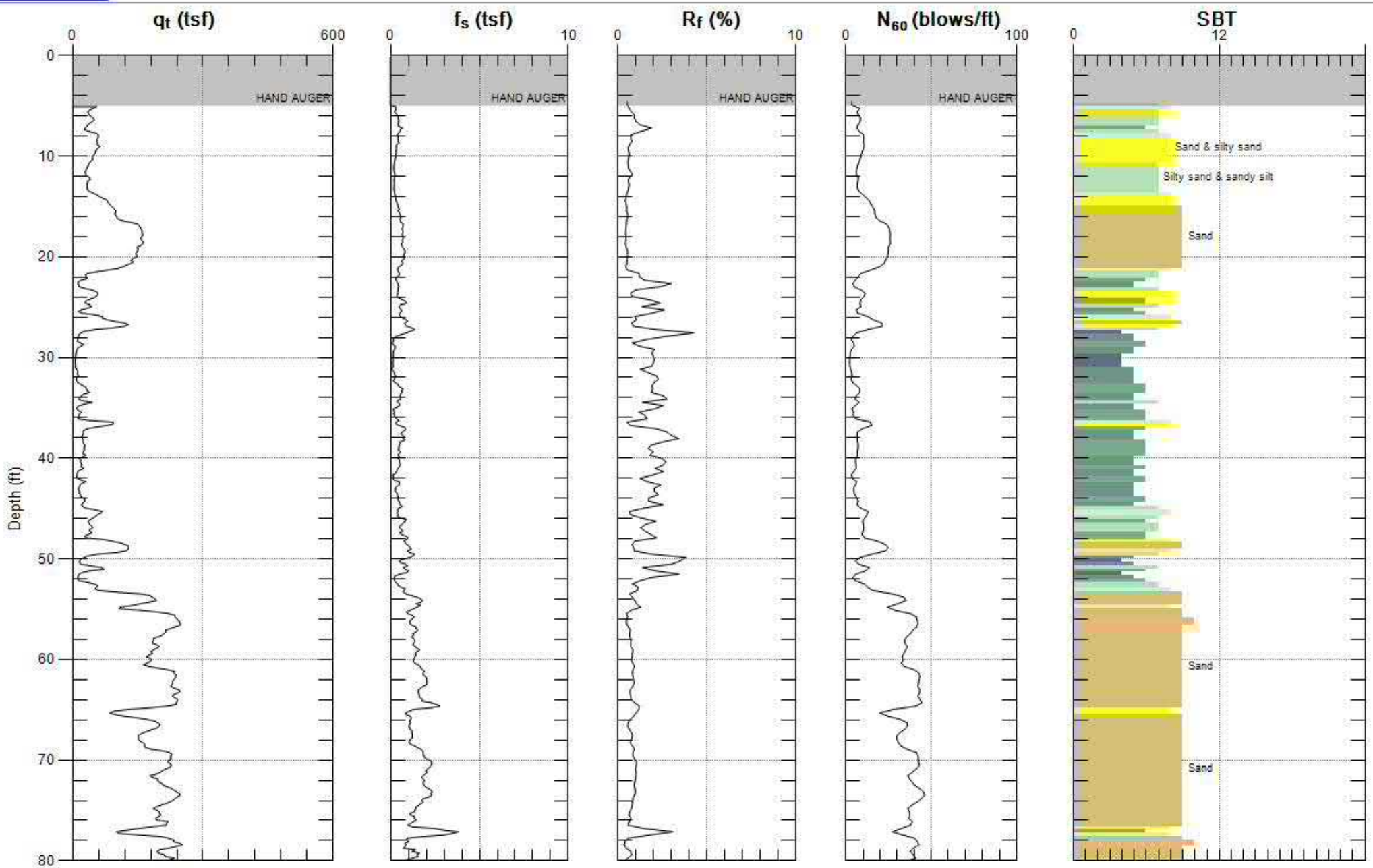
Figure A-98 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-04 **Date: 3/14/17 02:10**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

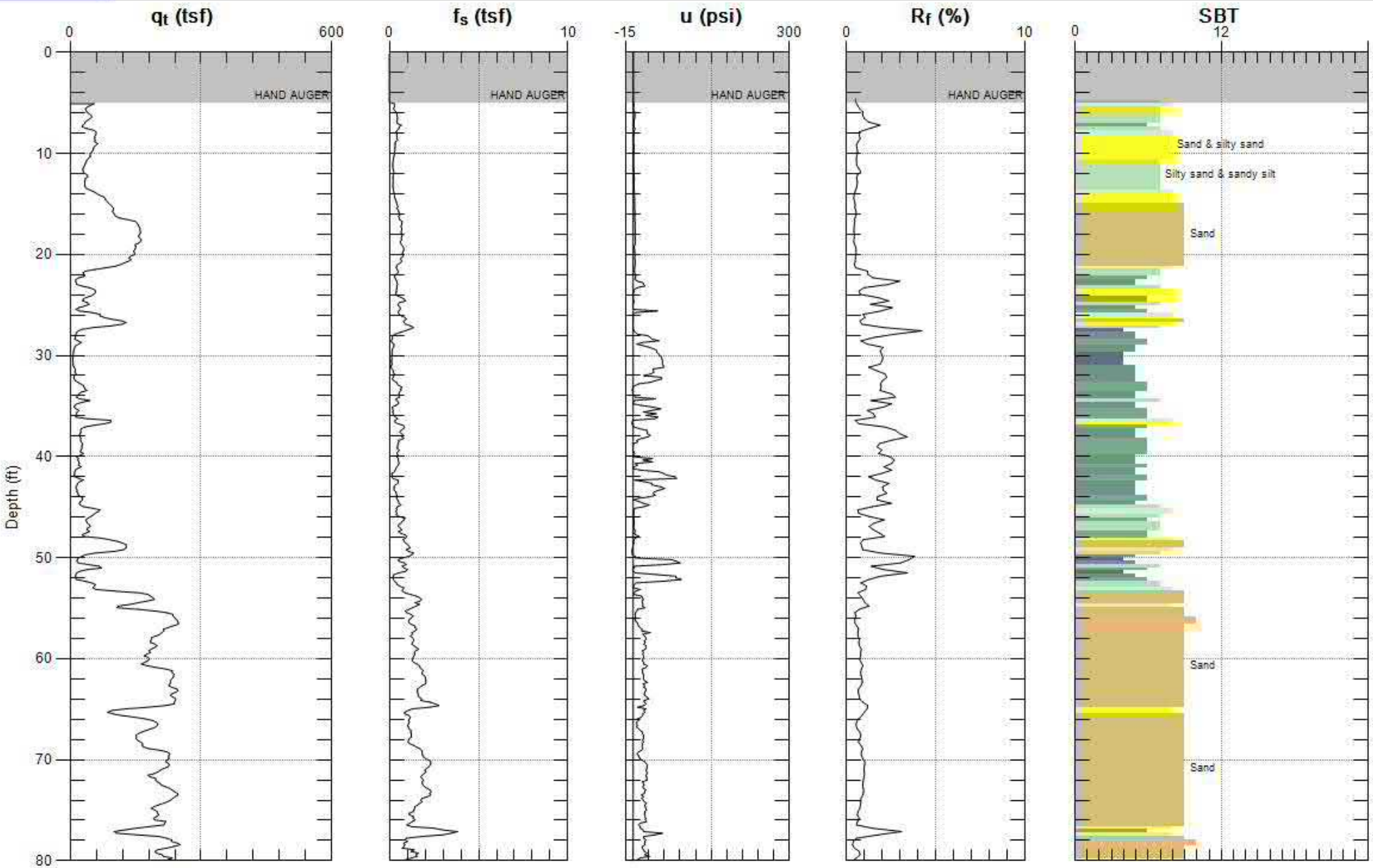
Figure A-99

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-04 **Date: 3/14/17 02:10**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-99

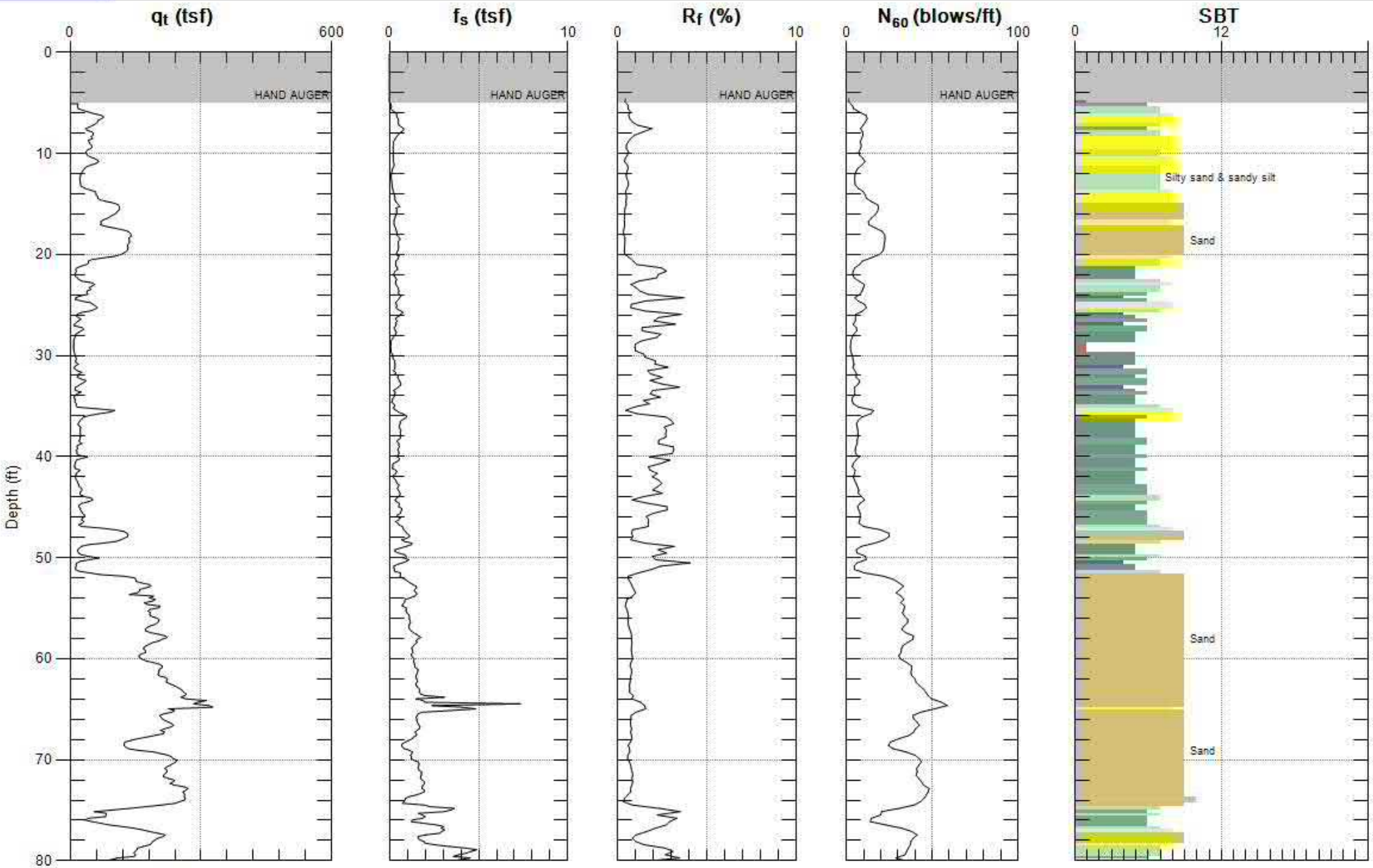
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-05 Date: 3/15/17 07:53



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-100

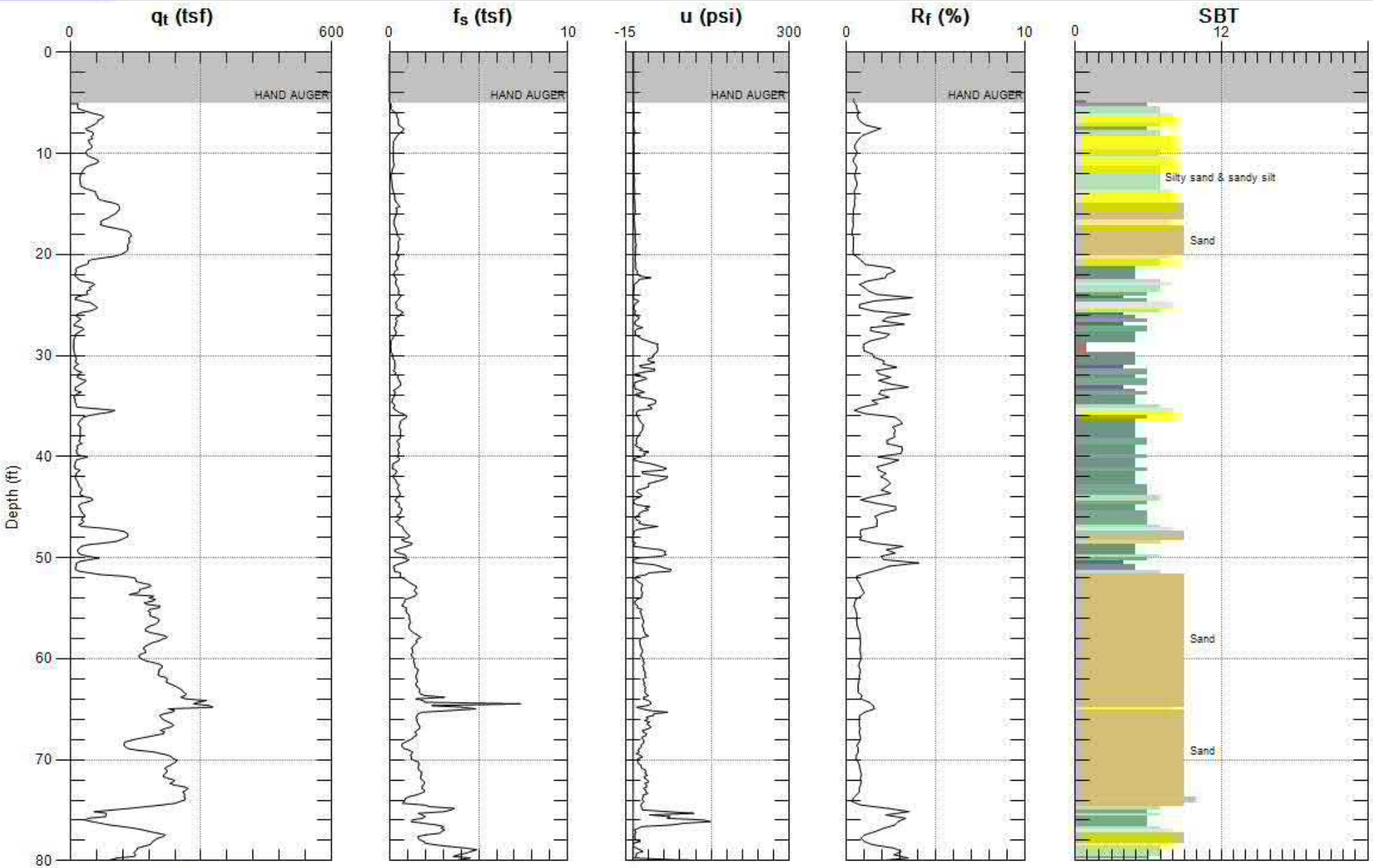
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-05 **Date: 3/15/17 07:53**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

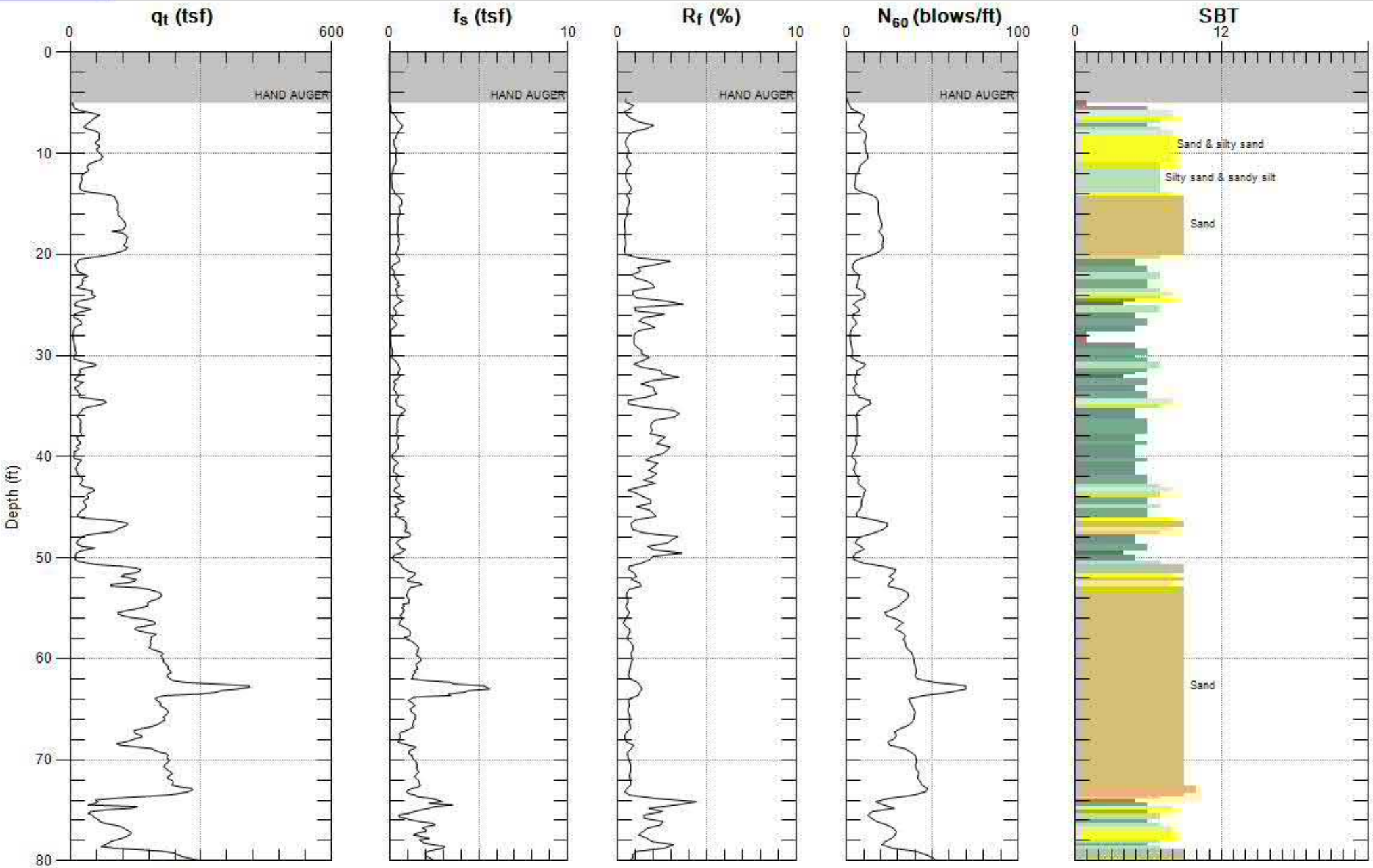
Figure A-100 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-06 **Date: 3/14/17 12:22**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

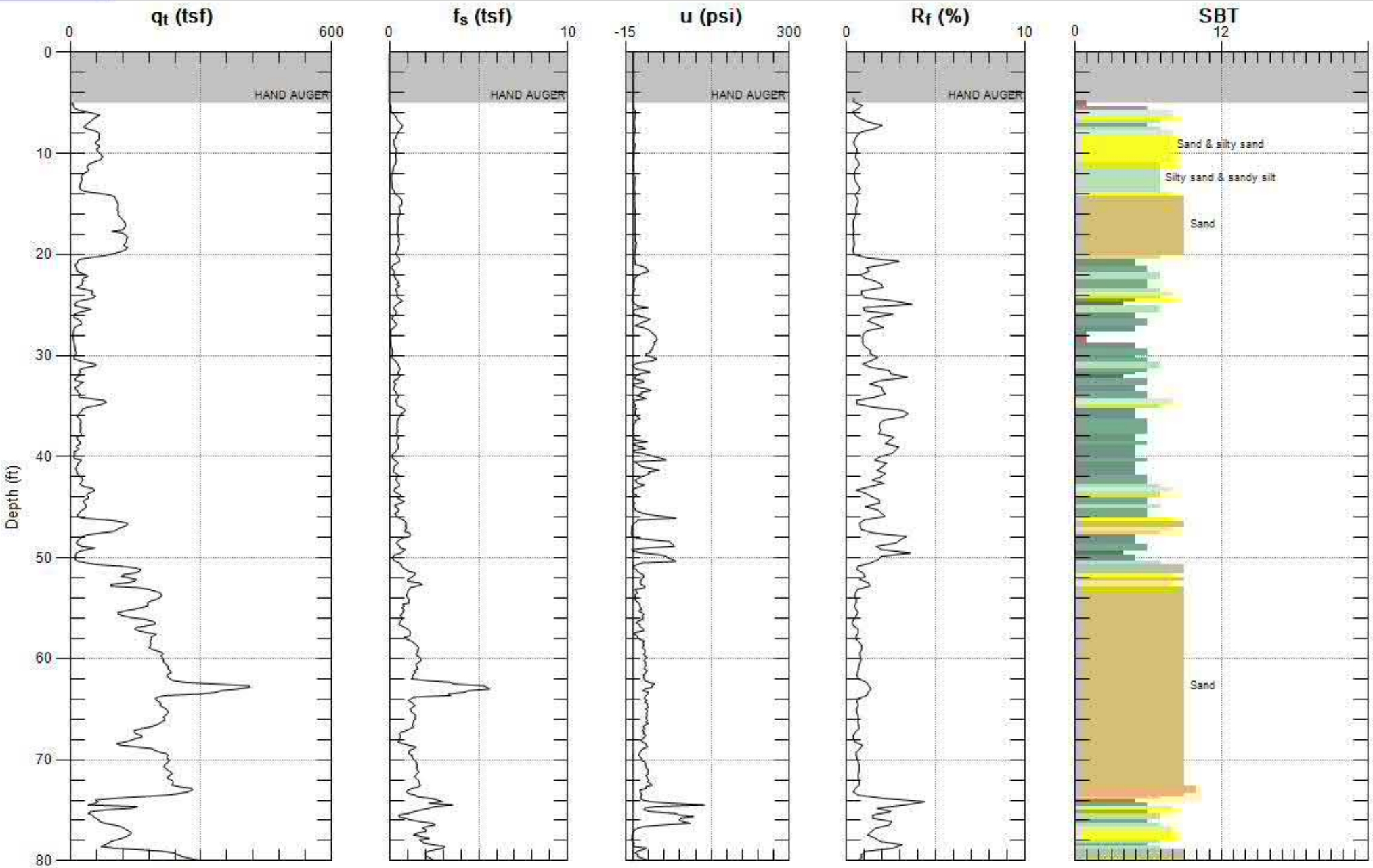
Figure A-101 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-06 **Date: 3/14/17 12:22**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

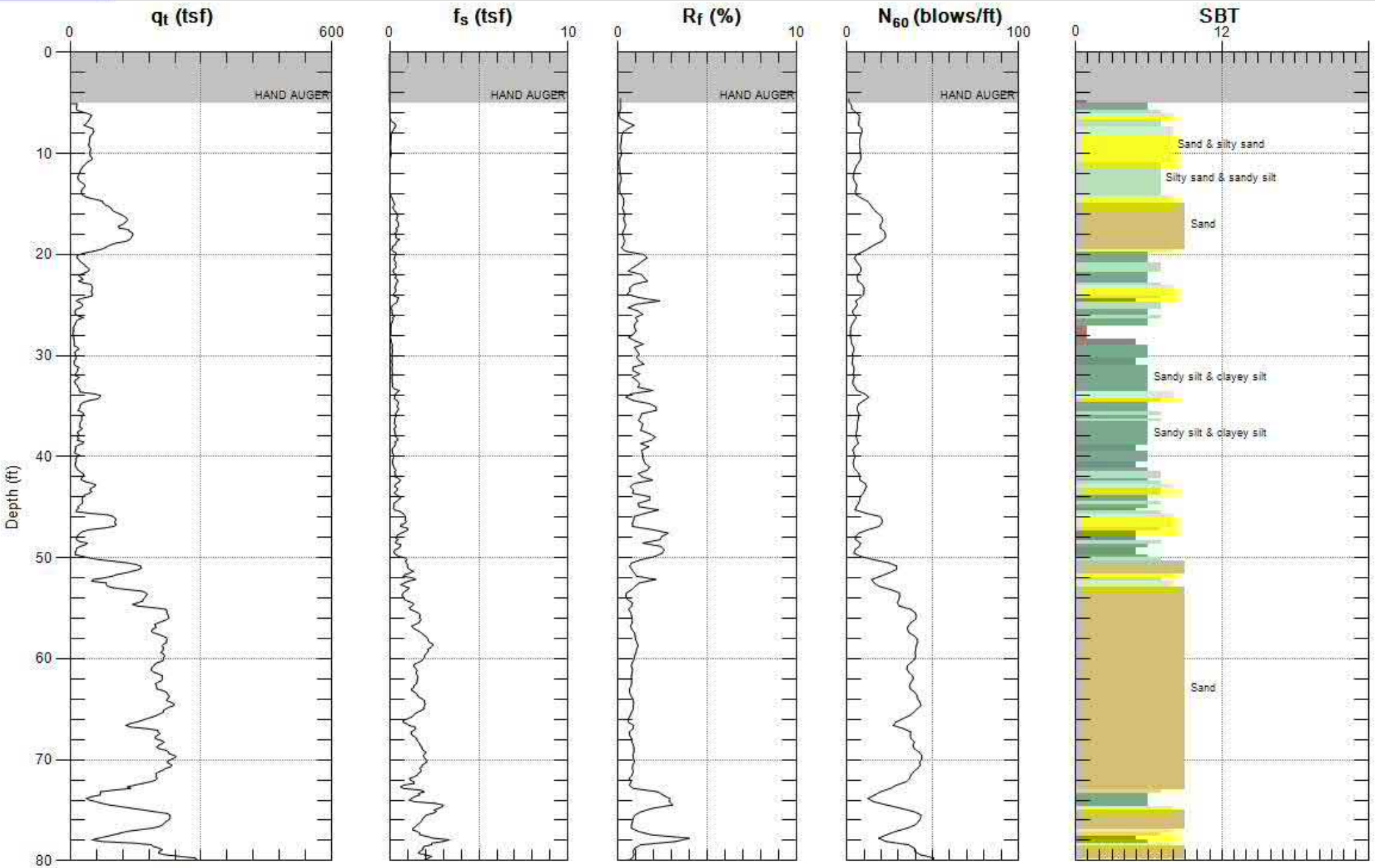
Figure A-101 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-07 **Date: 3/15/17 12:49**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-102

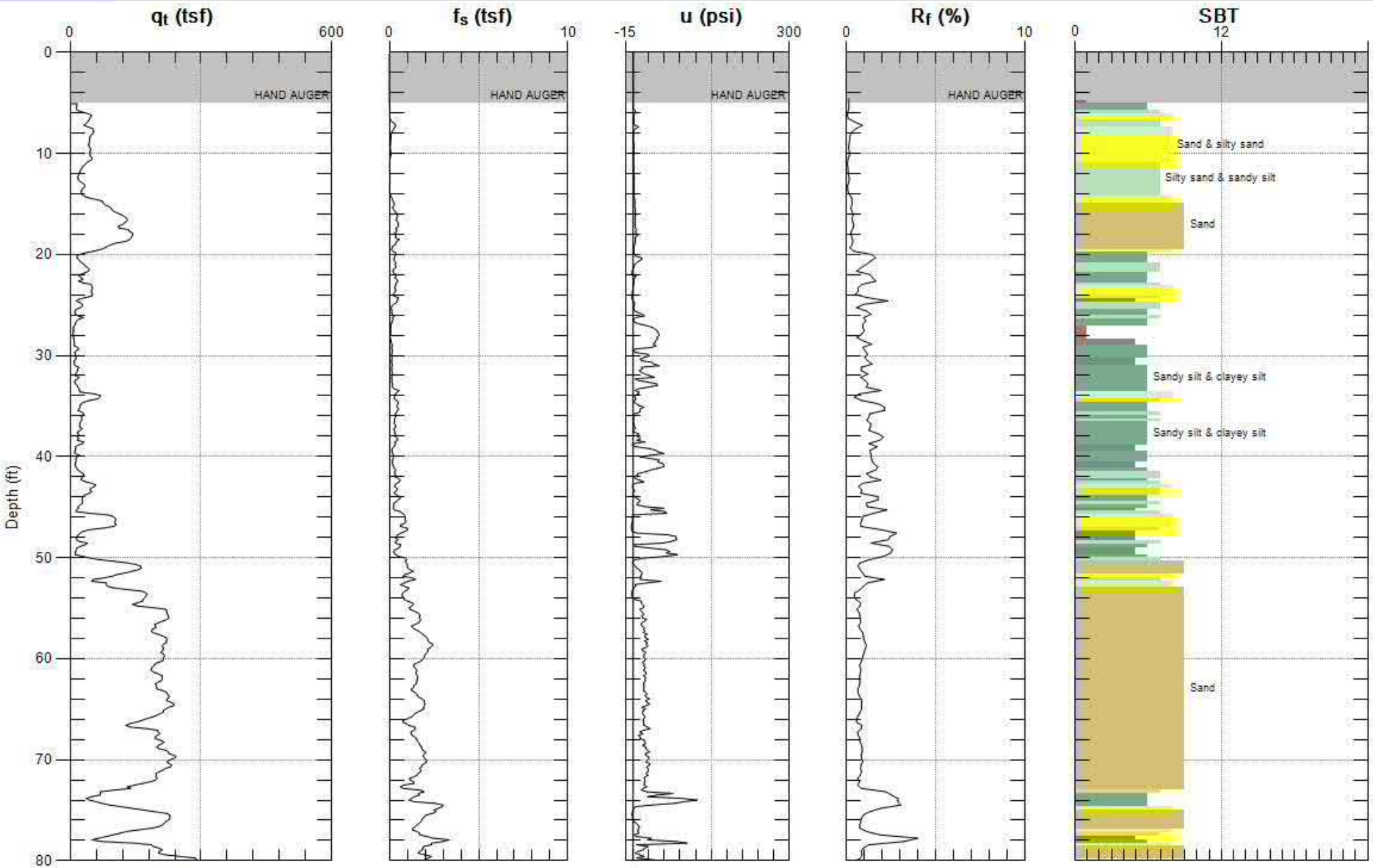
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-07 **Date: 3/15/17 12:49**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-102

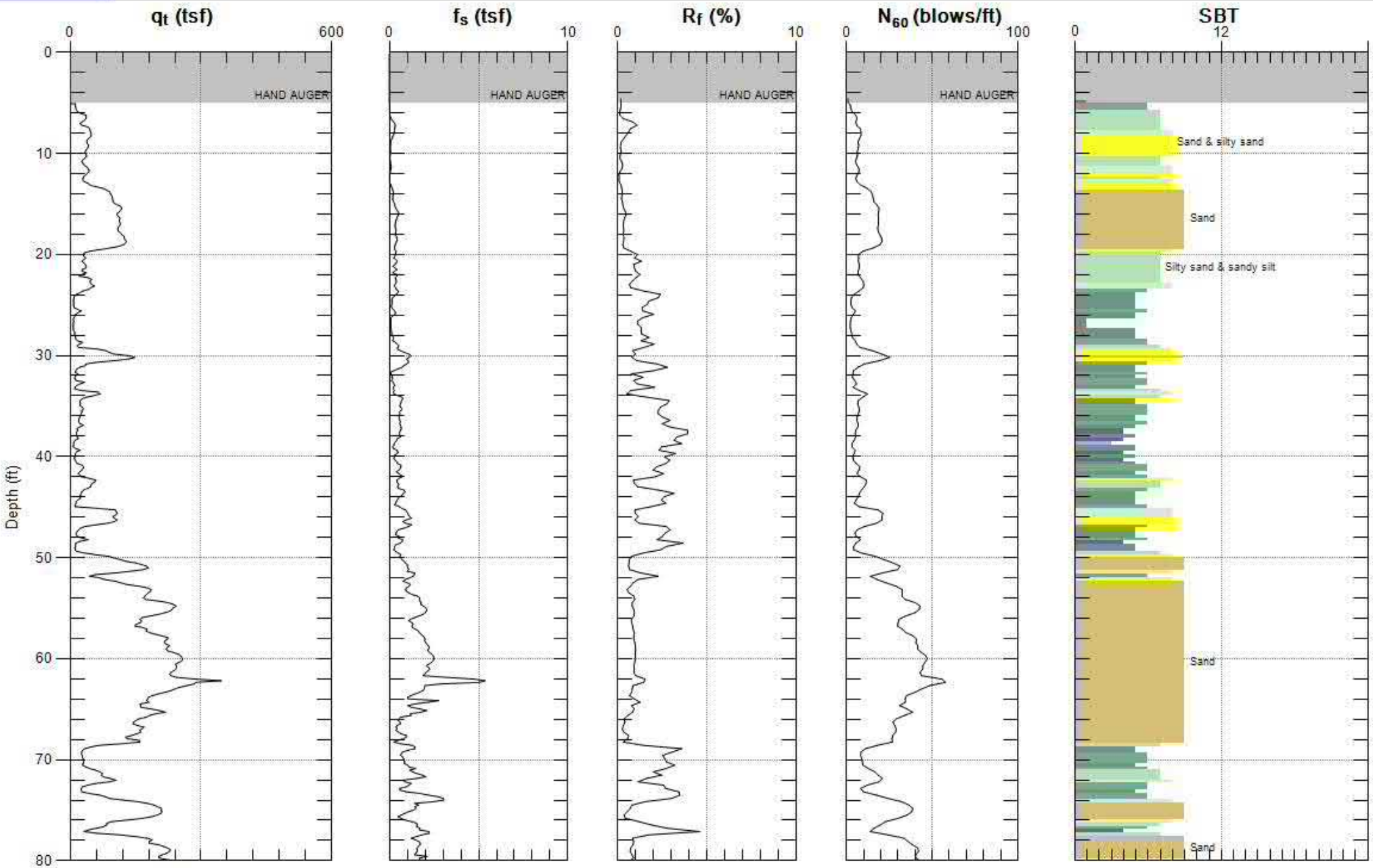
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-08 **Date: 3/15/17 02:18**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

Figure A-103

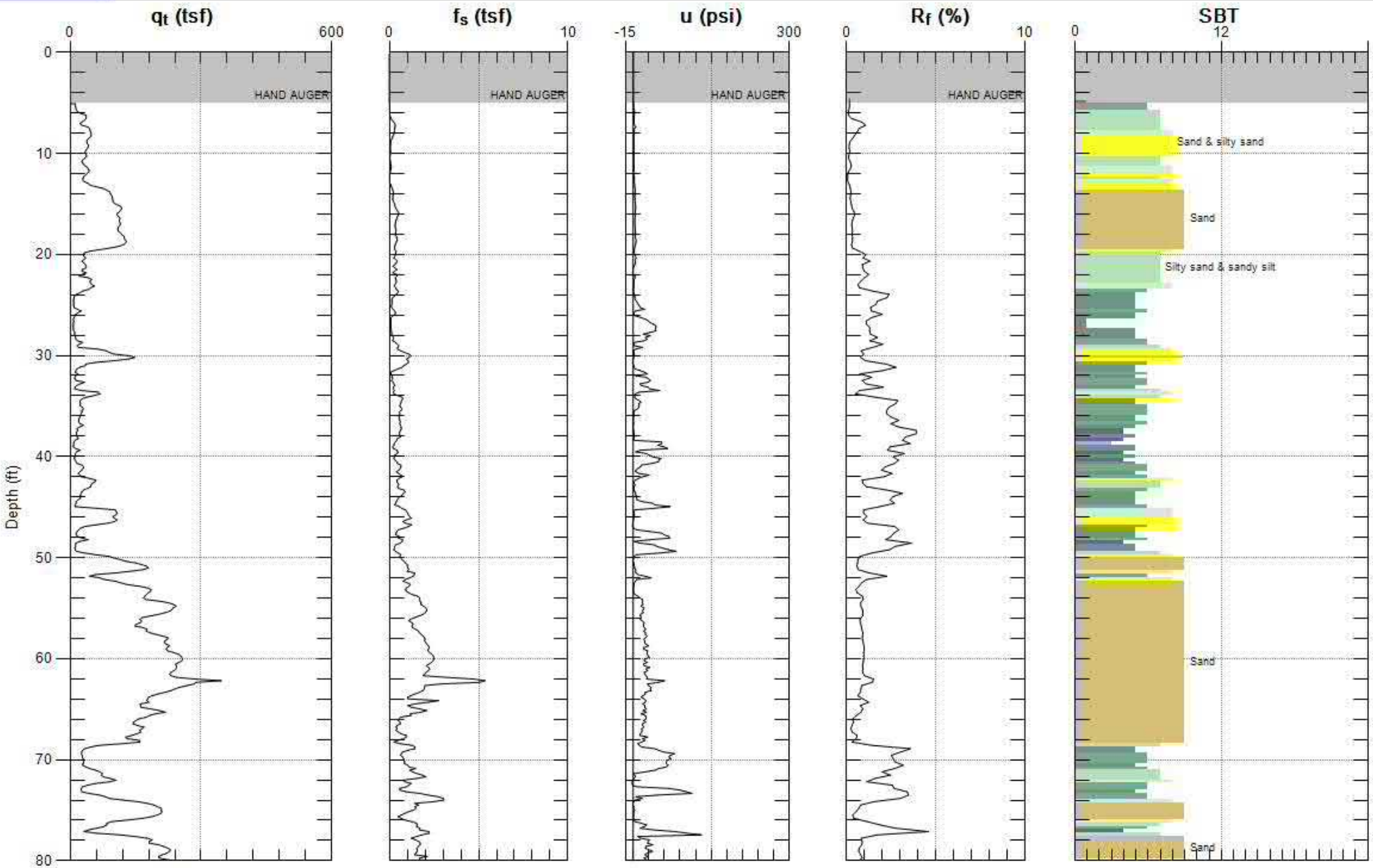
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-08 **Date: 3/15/17 02:18**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

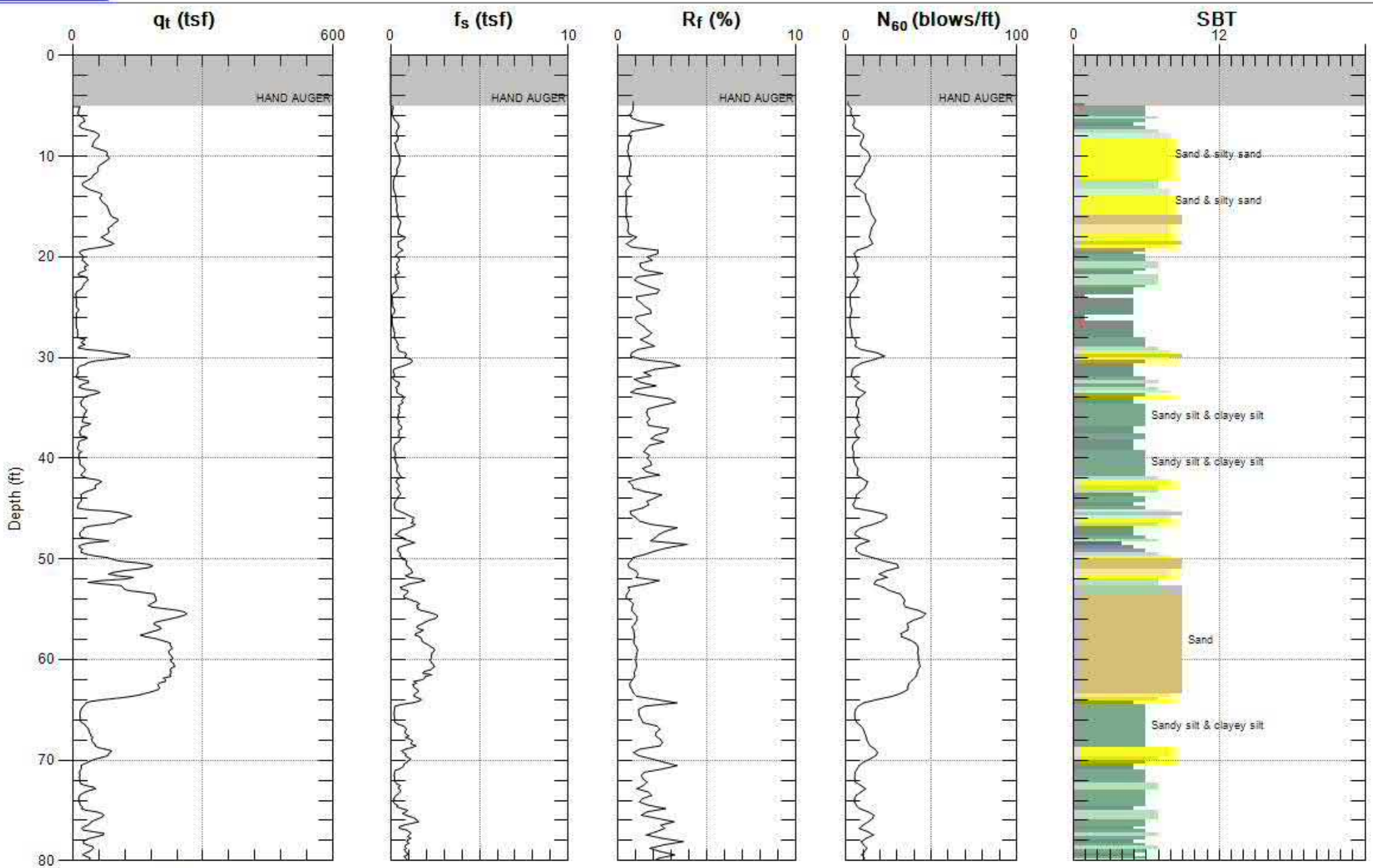
Figure A-103 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-09 **Date: 3/16/17 10:15**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

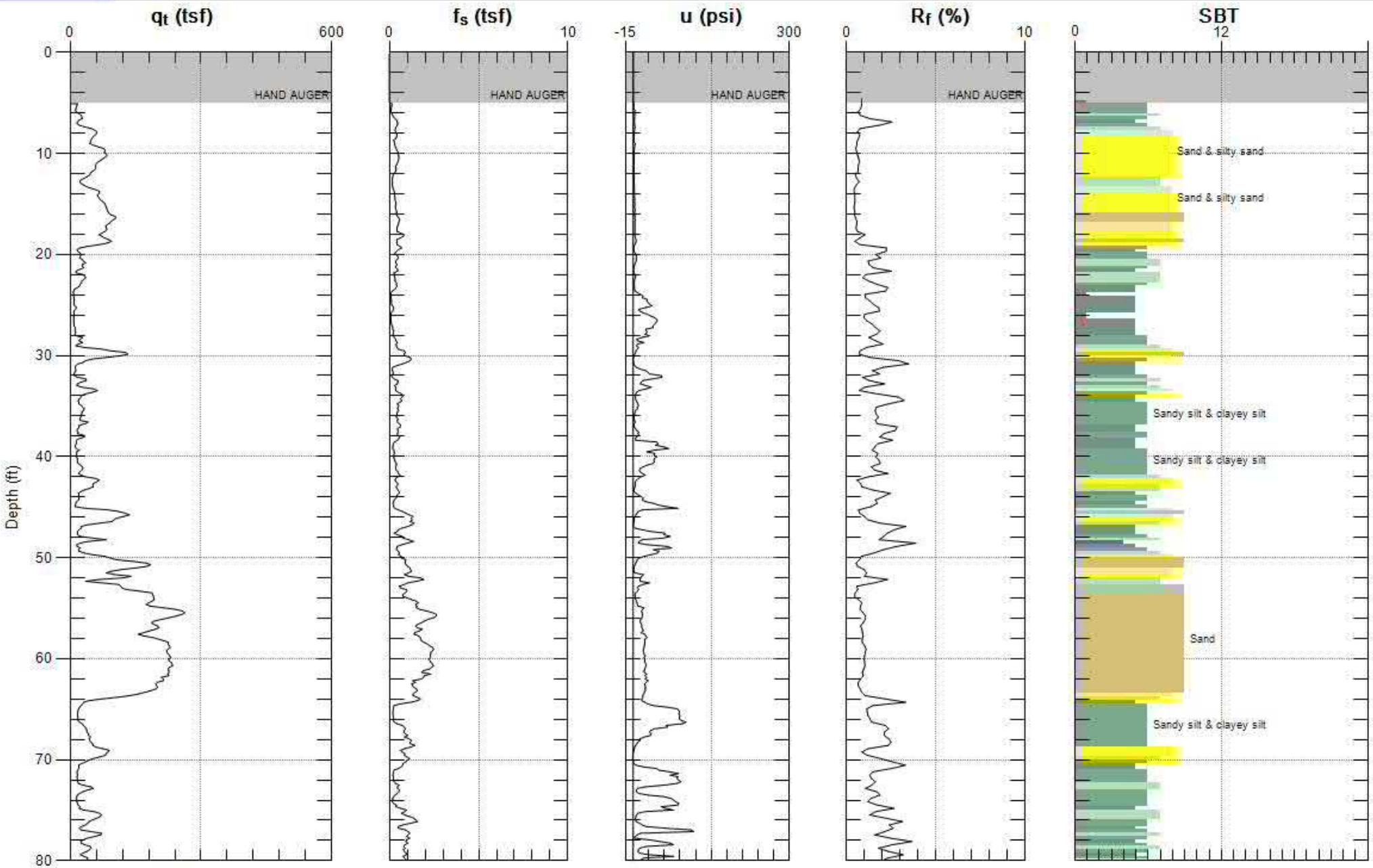
Figure A-104 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-09 **Date: 3/16/17 10:15**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

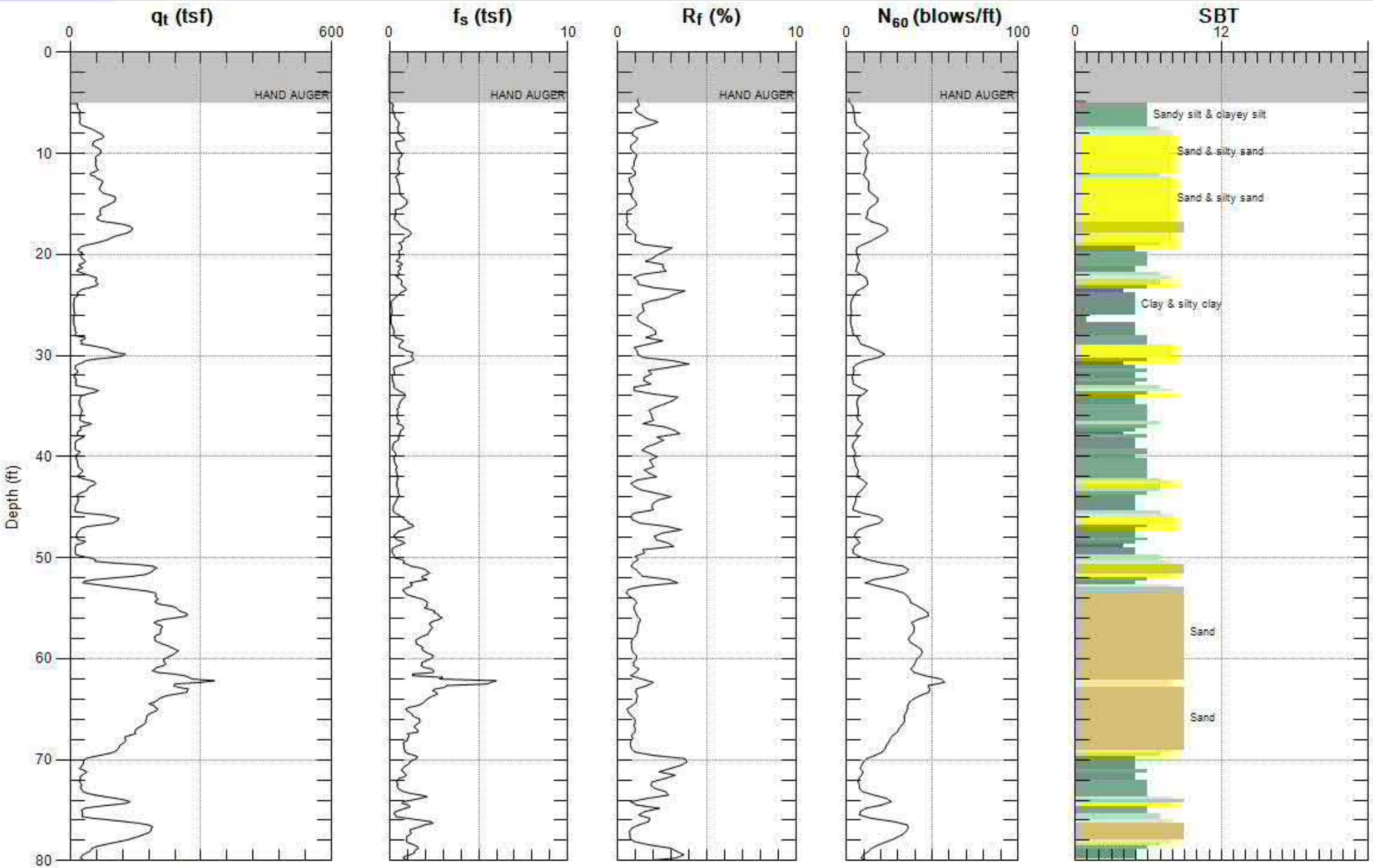
Figure A-104 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-10 **Date: 3/16/17 12:22**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

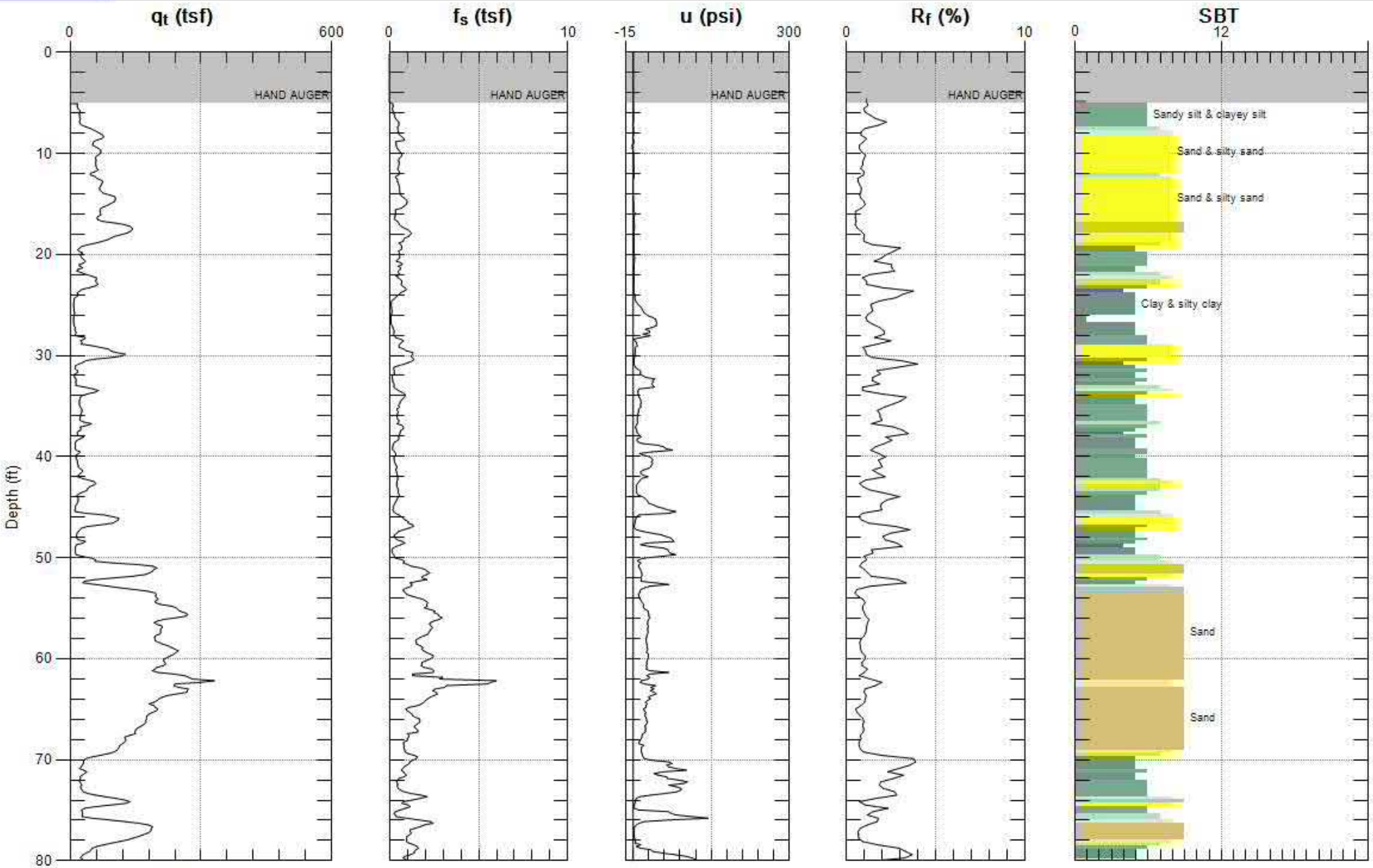
Figure A-105 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-10 **Date: 3/16/17 12:22**



Max. Depth: 80.381 (ft)
Avg. Interval: 0.328 (ft)

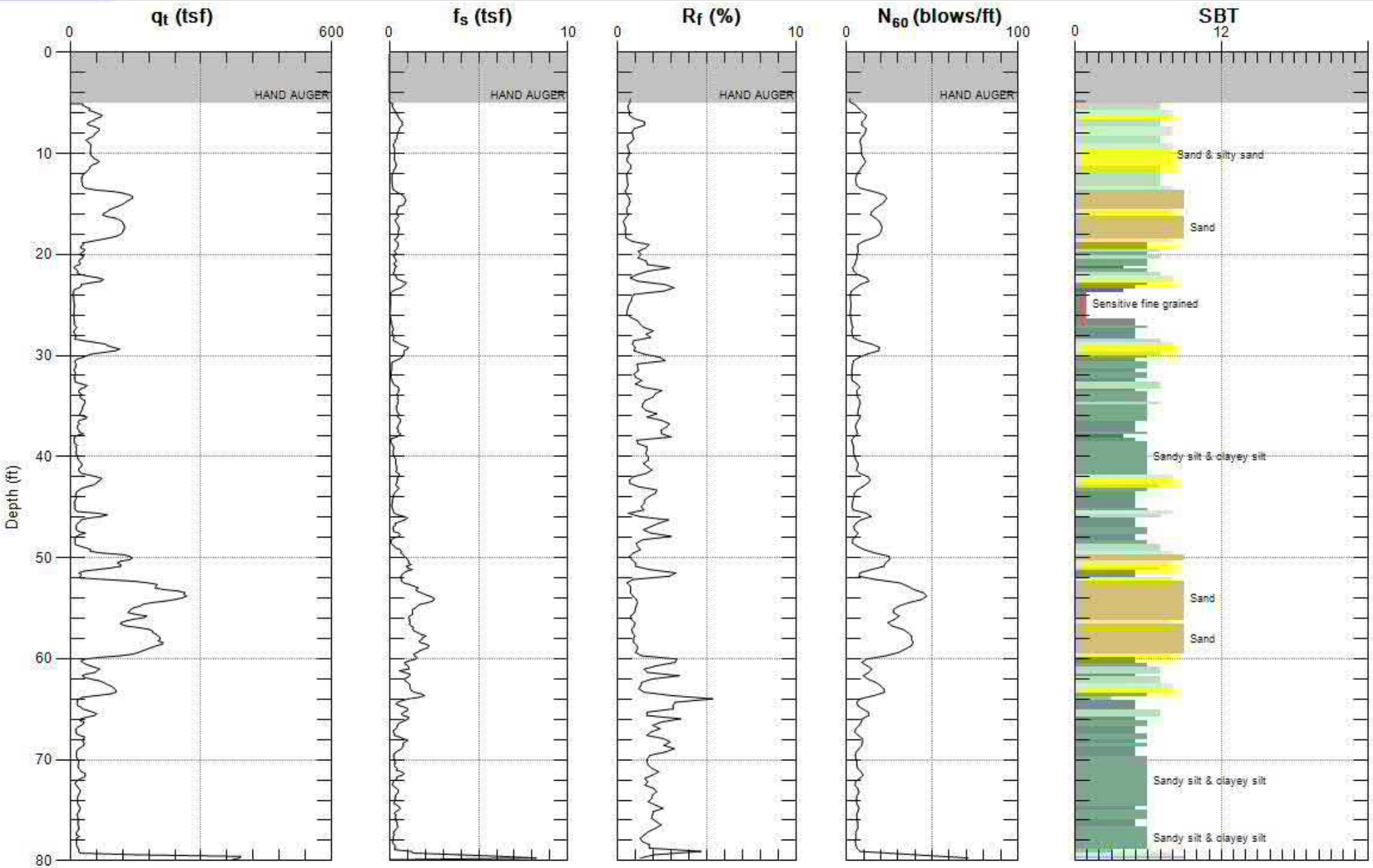
Figure A-105 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-11 **Date: 3/16/17 01:43**



Max. Depth: 80.052 (ft)
Avg. Interval: 0.328 (ft)

Figure A-106

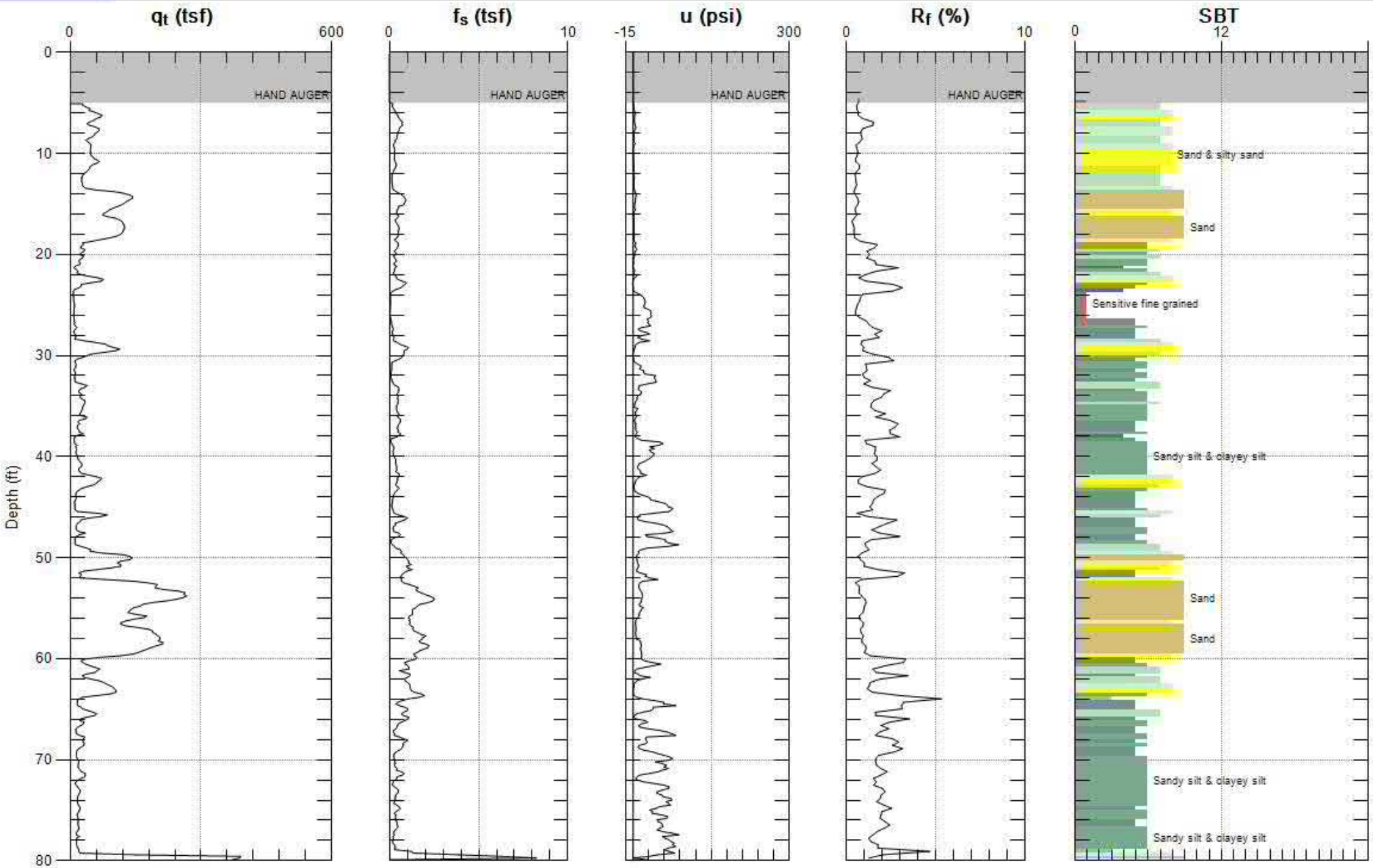
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-11 **Date: 3/16/17 01:43**



Max. Depth: 80.052 (ft)
Avg. Interval: 0.328 (ft)

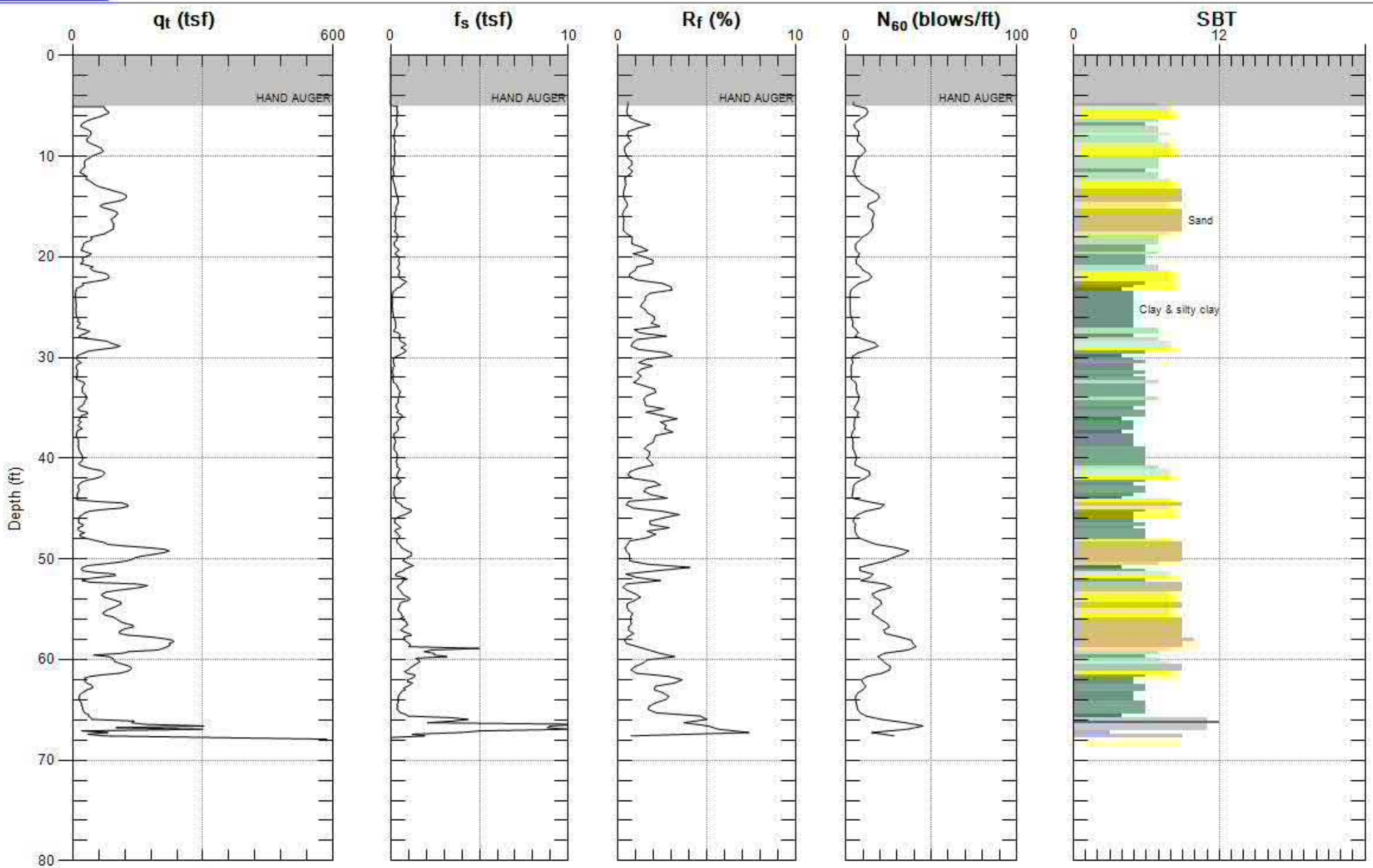
Figure A-106 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-12 **Date: 3/17/17 08:02**



Max. Depth: 67.913 (ft)
Avg. Interval: 0.328 (ft)

Figure A-107

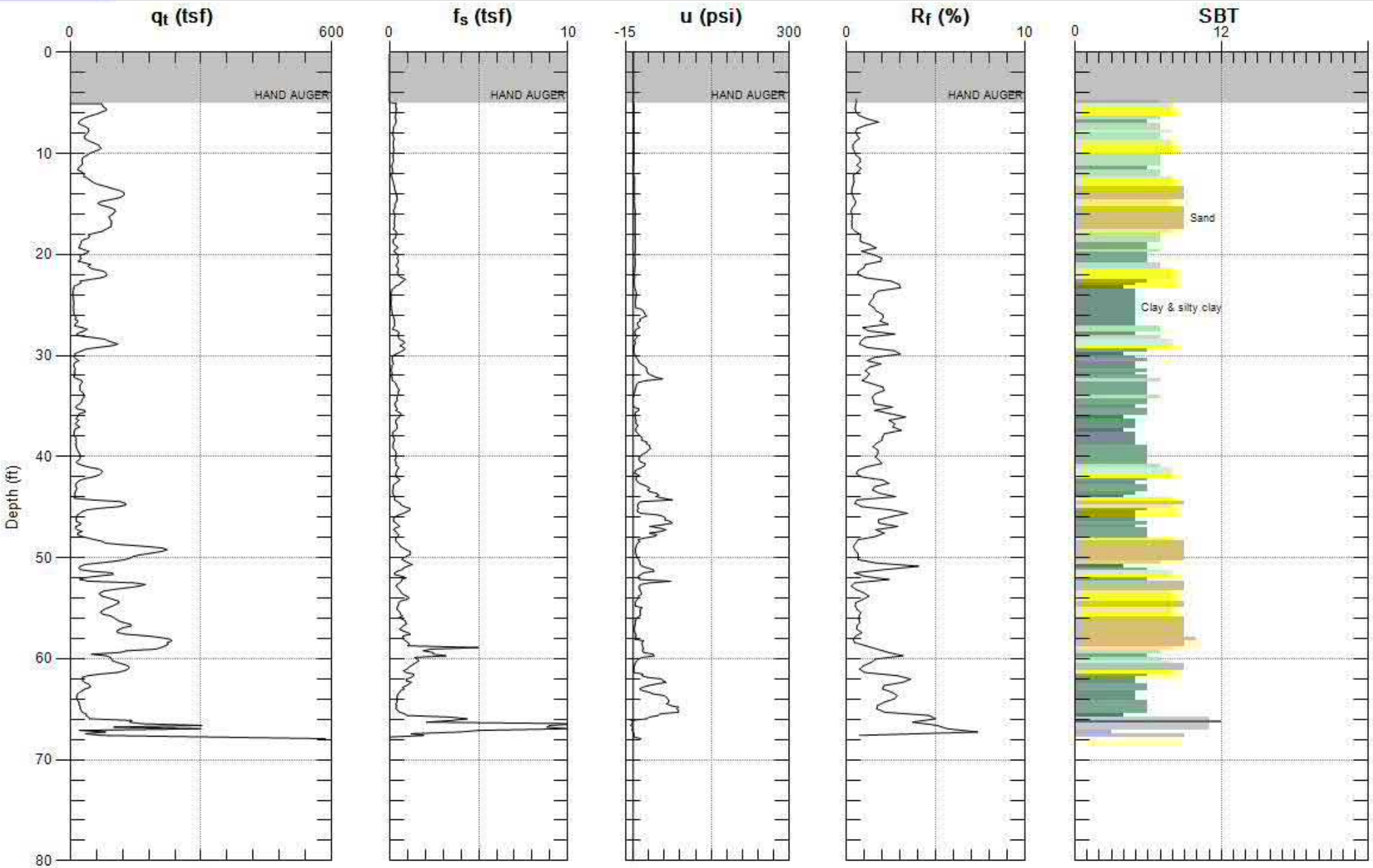
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-12 **Date: 3/17/17 08:02**



Max. Depth: 67.913 (ft)
Avg. Interval: 0.328 (ft)

Figure A-107

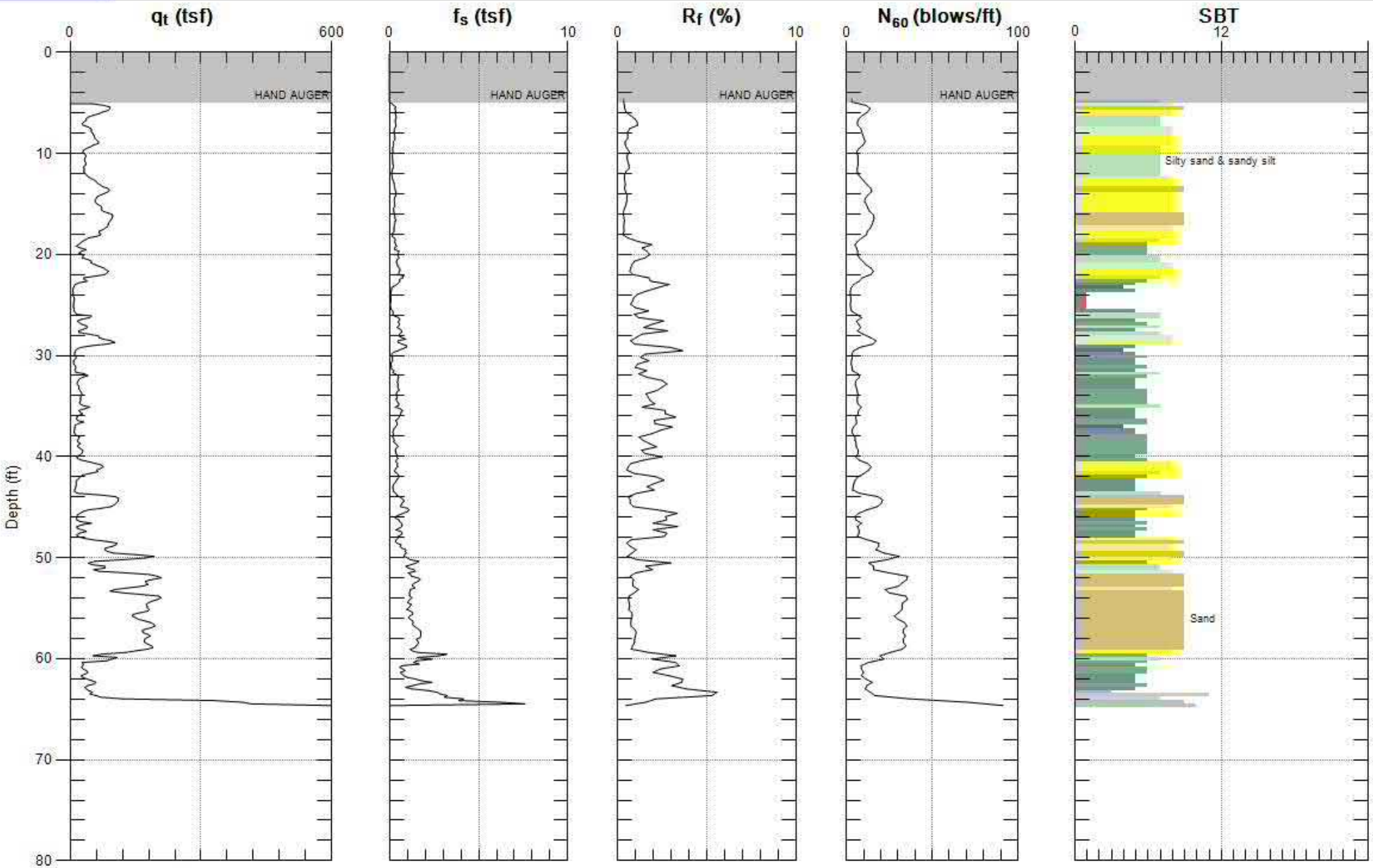
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-13 Date: 3/15/17 09:27



Max. Depth: 64.797 (ft)
Avg. Interval: 0.328 (ft)

Figure A-108

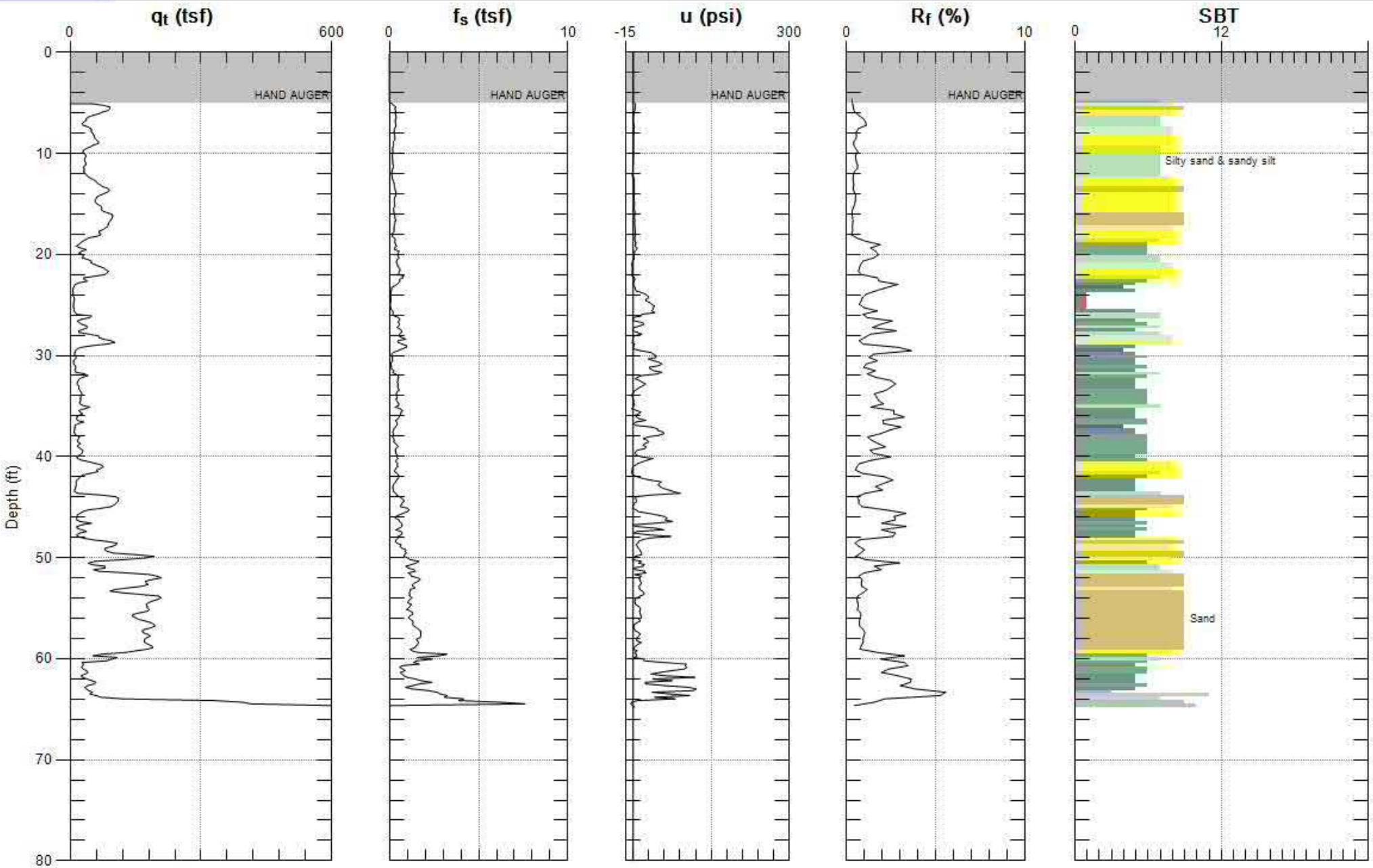
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-13 **Date: 3/15/17 09:27**



Max. Depth: 64.797 (ft)
Avg. Interval: 0.328 (ft)

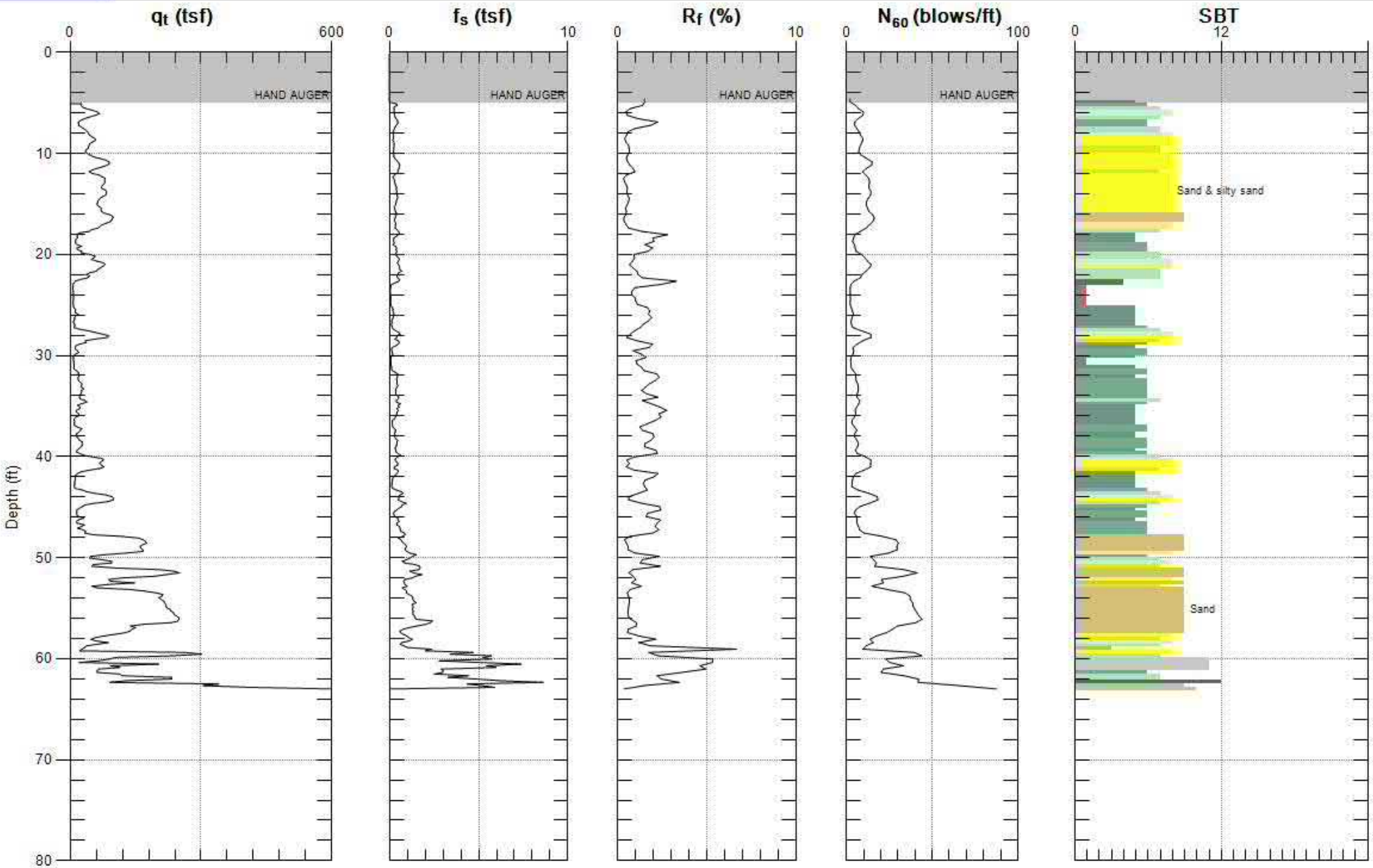
Figure A-108 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-14 **Date: 3/17/17 09:29**



Max. Depth: 63.156 (ft)
Avg. Interval: 0.328 (ft)

Figure A-109

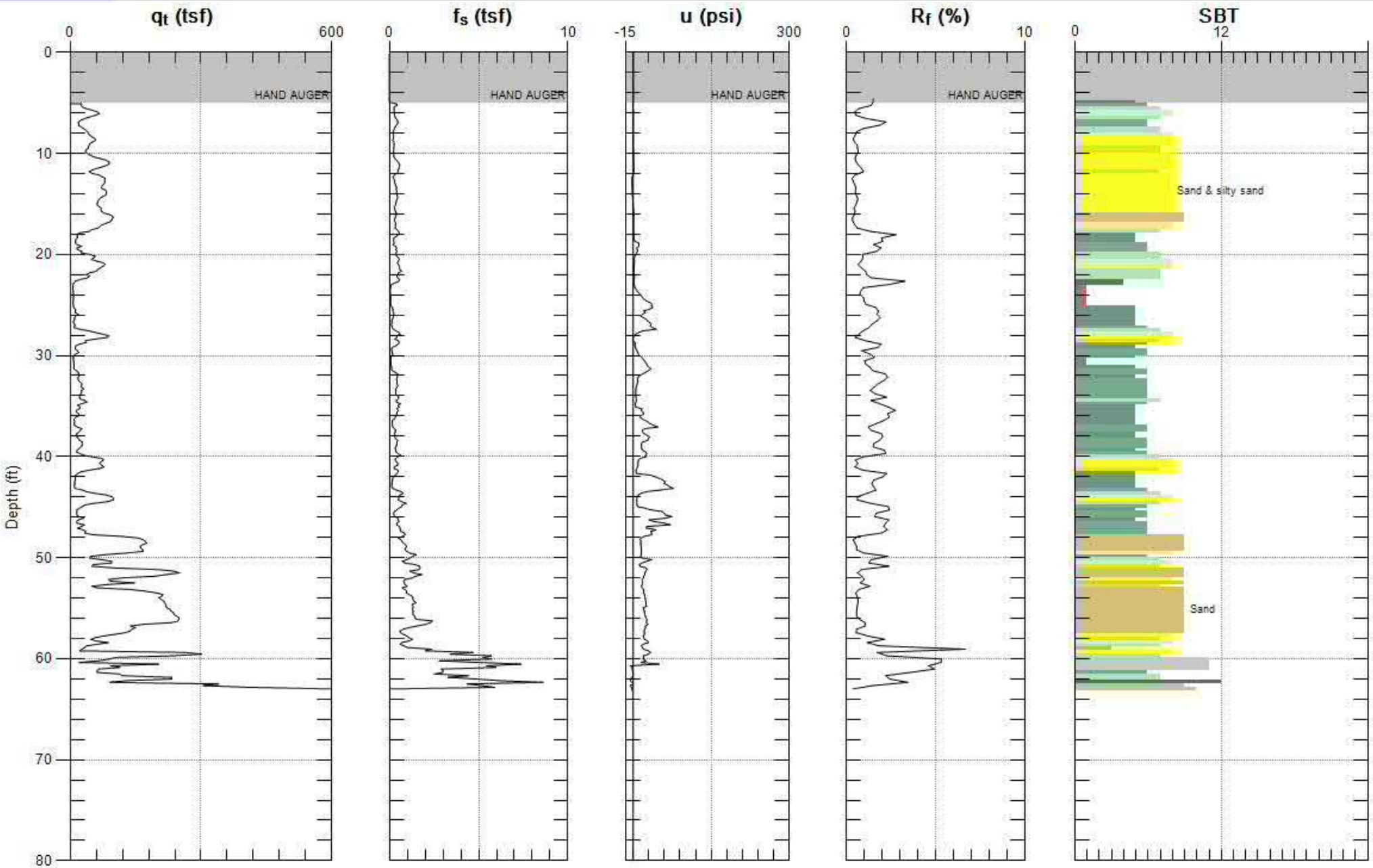
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-14 **Date: 3/17/17 09:29**



Max. Depth: 63.156 (ft)
Avg. Interval: 0.328 (ft)

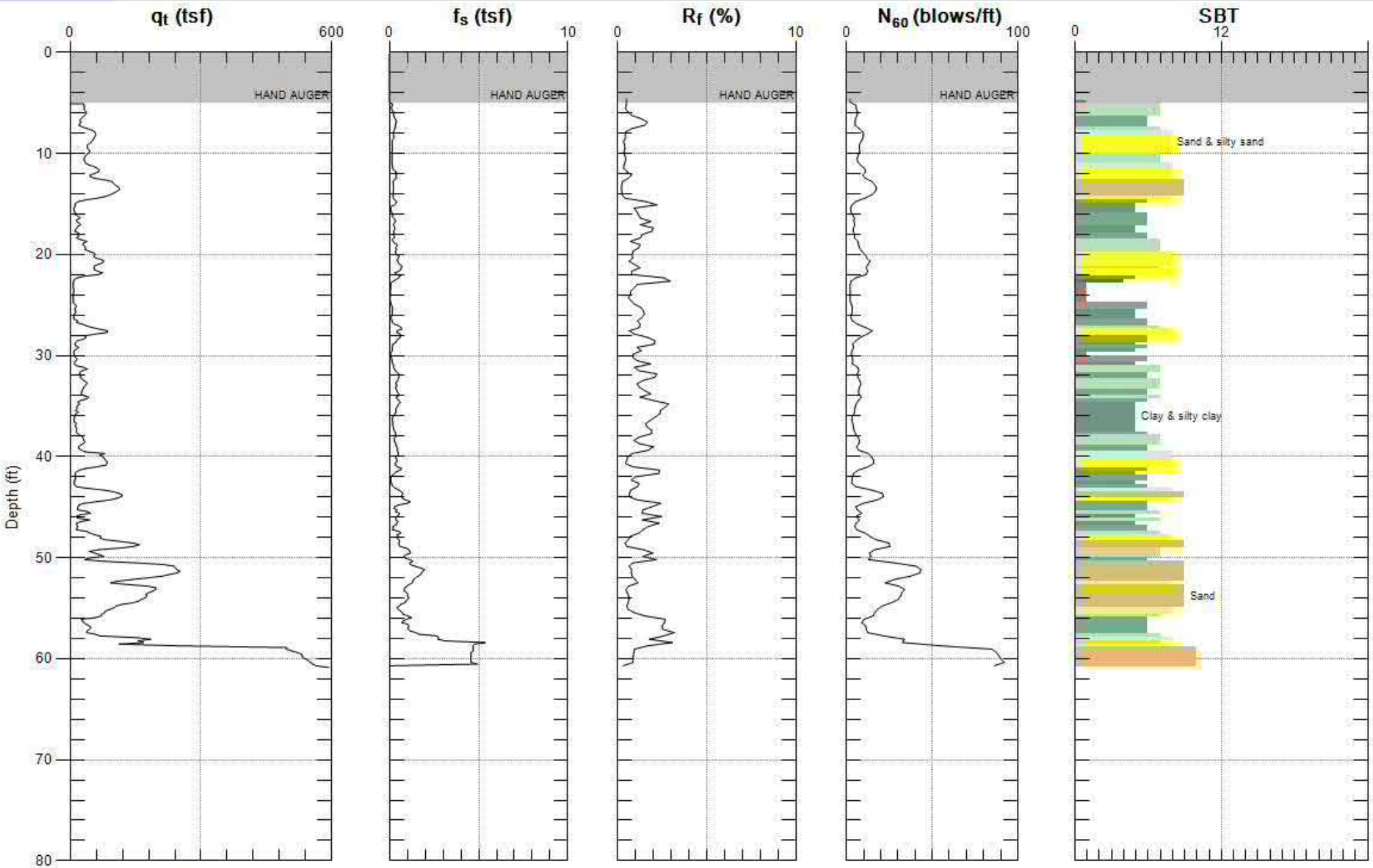
Figure A-109 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-15 **Date: 3/15/17 10:51**



Max. Depth: 60.860 (ft)
Avg. Interval: 0.328 (ft)

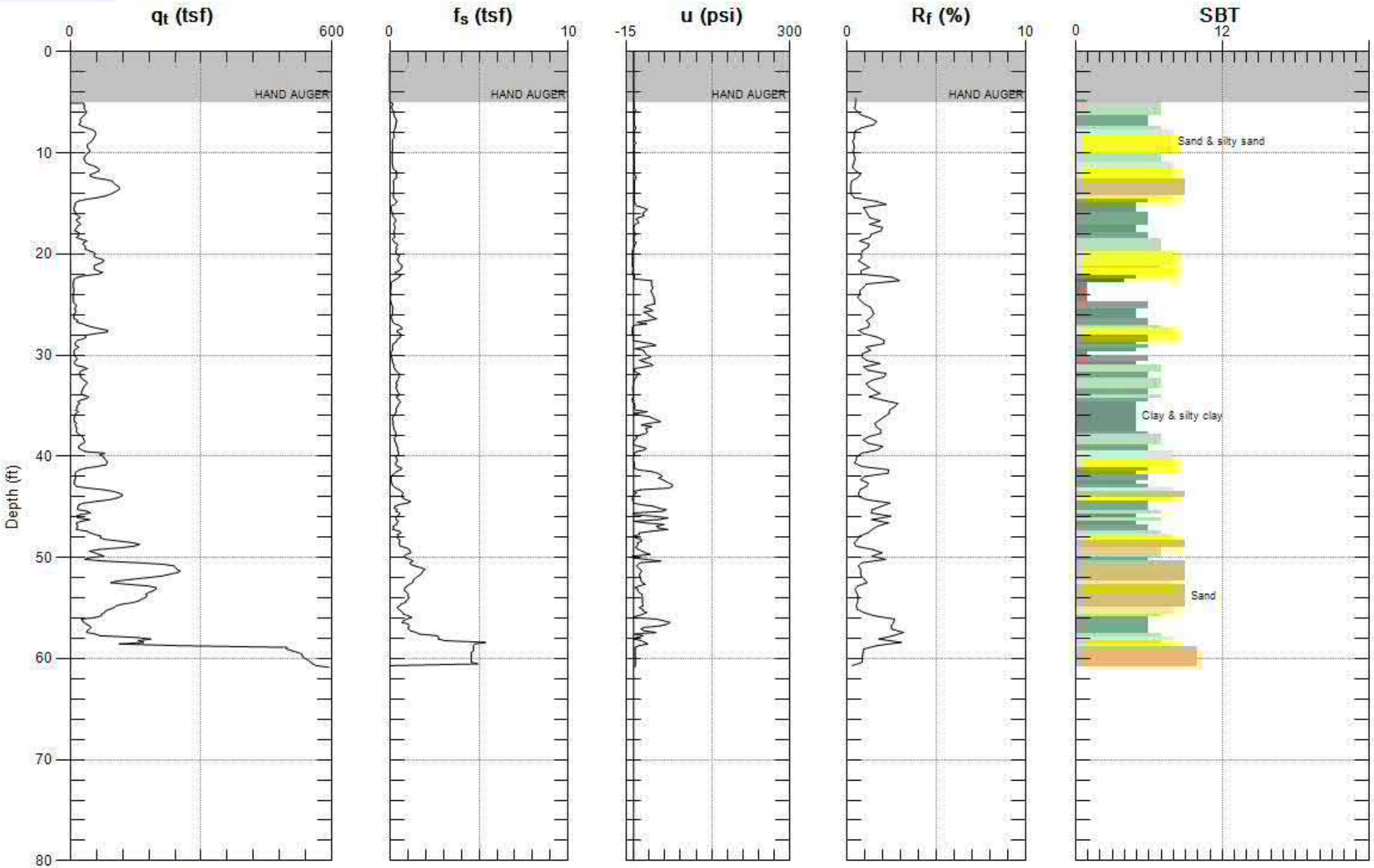
Figure A-110 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-15 **Date: 3/15/17 10:51**



Max. Depth: 60.860 (ft)
Avg. Interval: 0.328 (ft)

Figure A-110

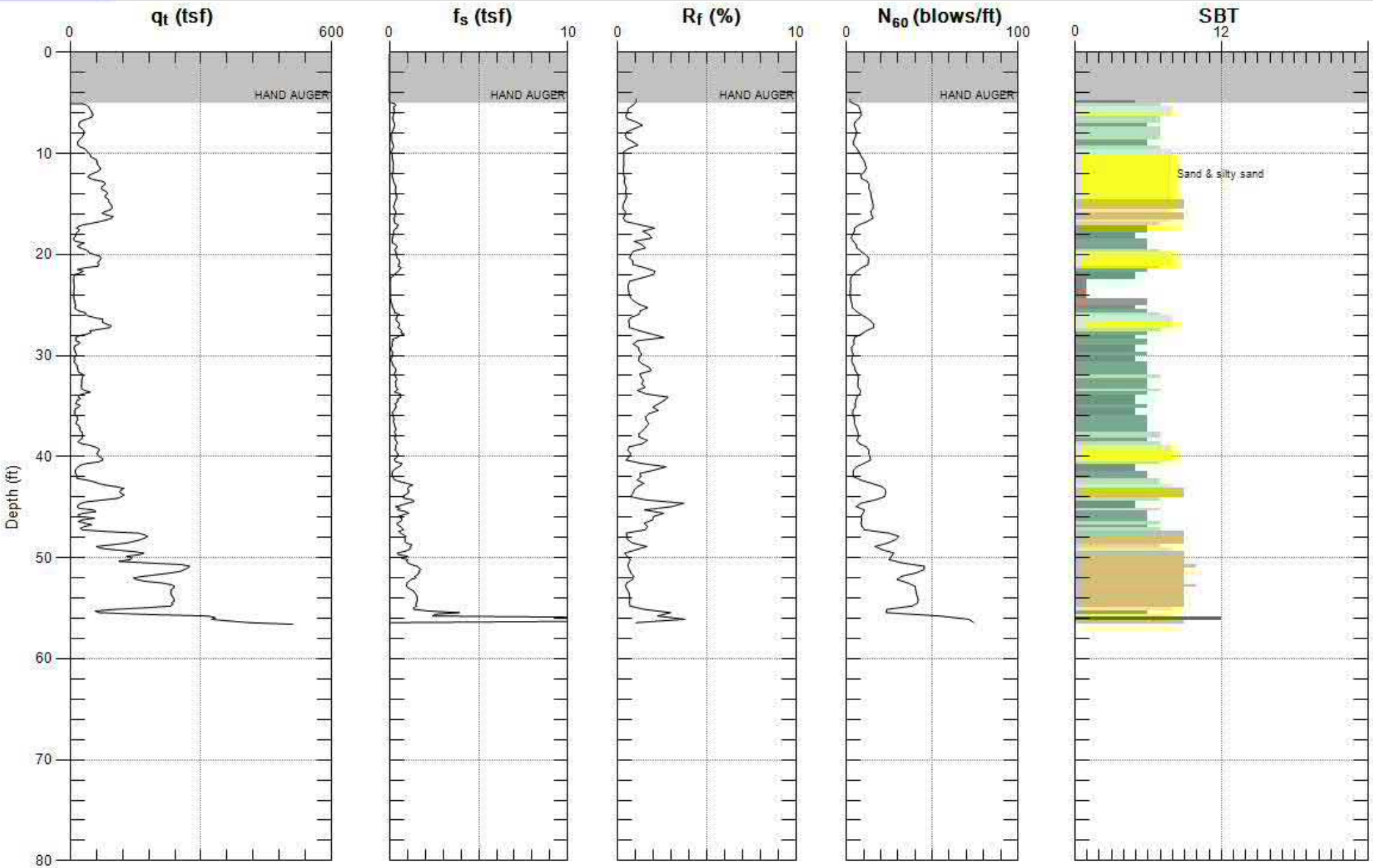
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-16 **Date: 3/17/17 10:45**



Max. Depth: 56.594 (ft)
Avg. Interval: 0.328 (ft)

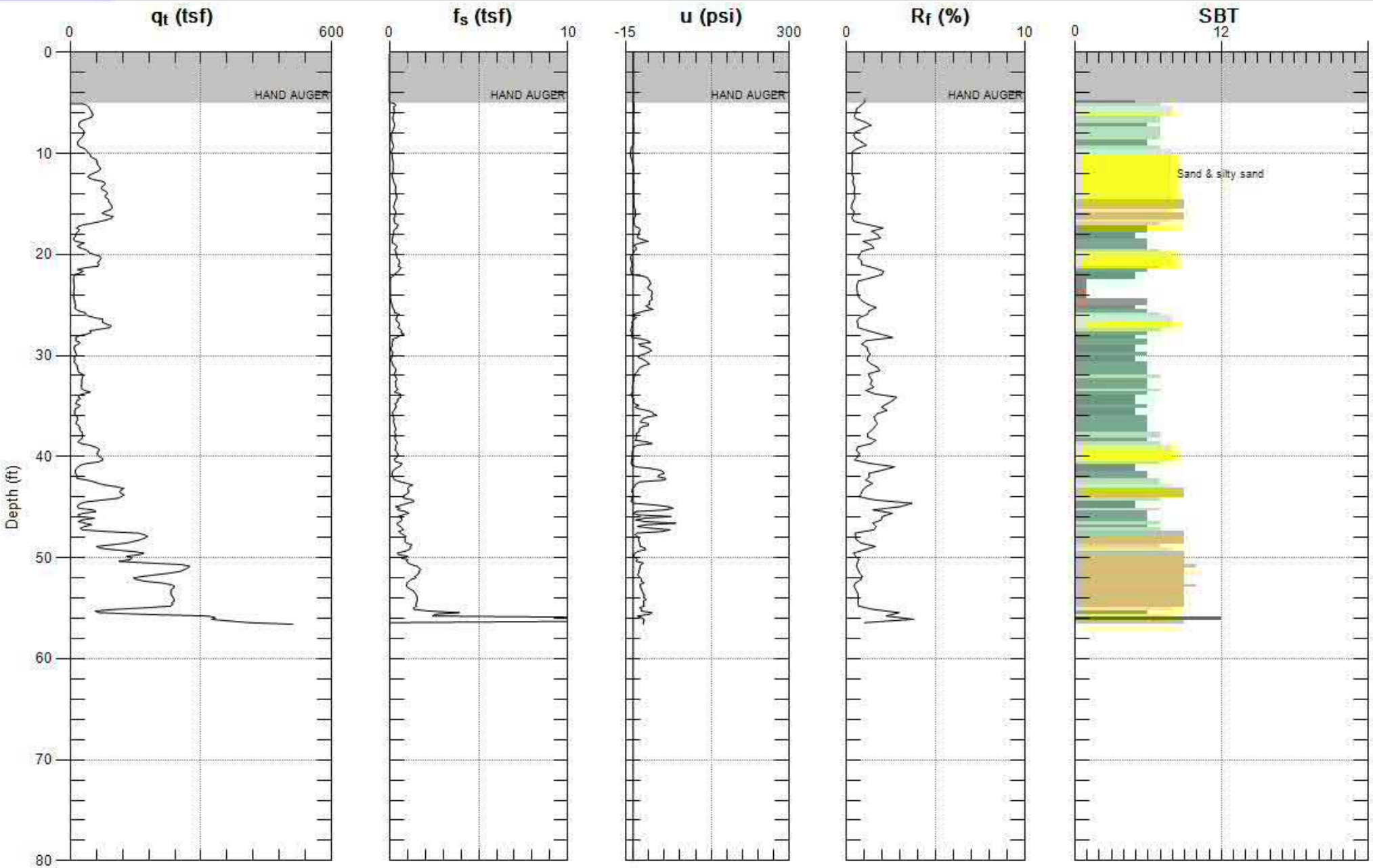
Figure A-111 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-16 **Date: 3/17/17 10:45**



Max. Depth: 56.594 (ft)
Avg. Interval: 0.328 (ft)

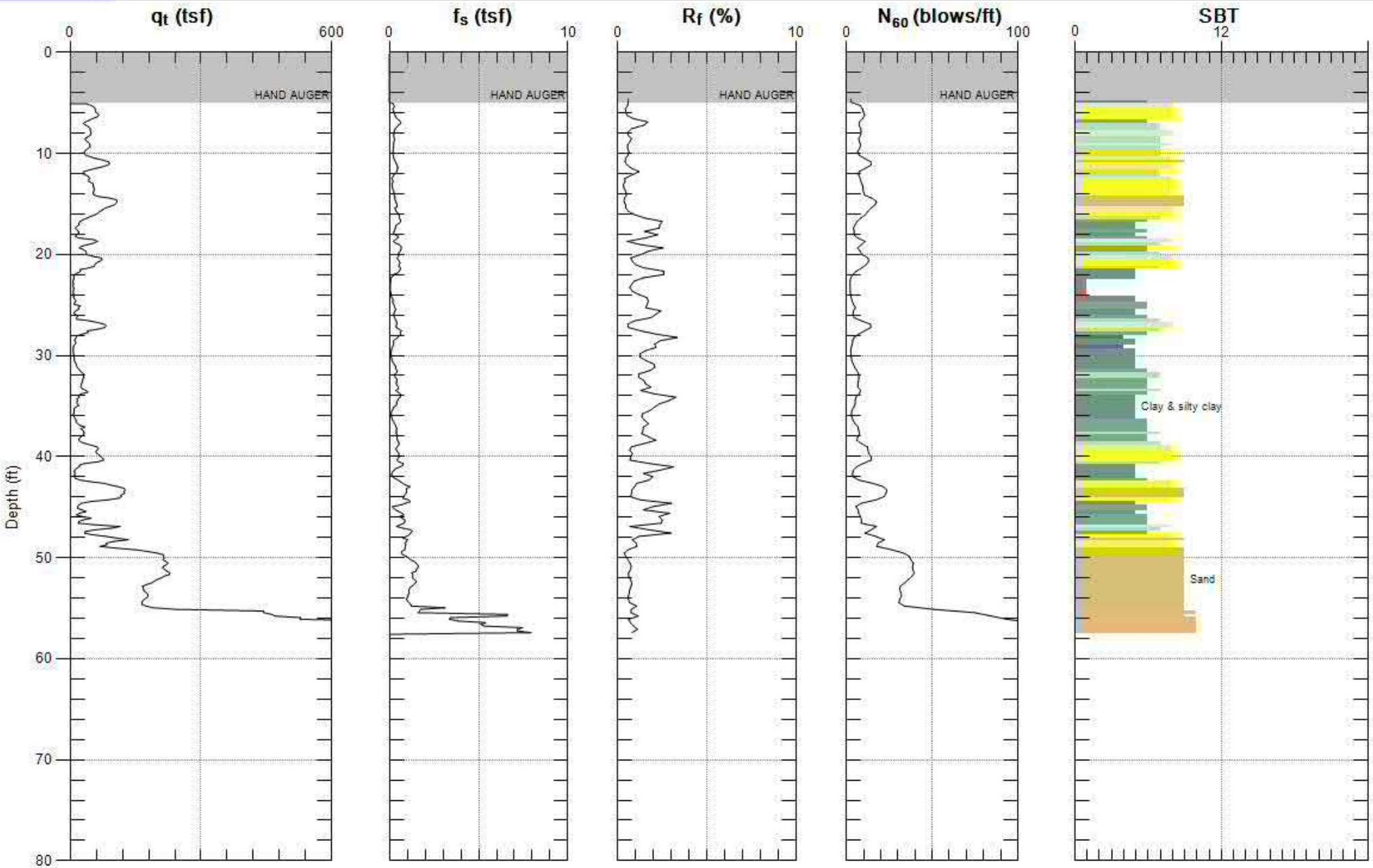
Figure A-111 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-17 **Date: 3/17/17 12:35**



Max. Depth: 57.743 (ft)
Avg. Interval: 0.328 (ft)

Figure A-112

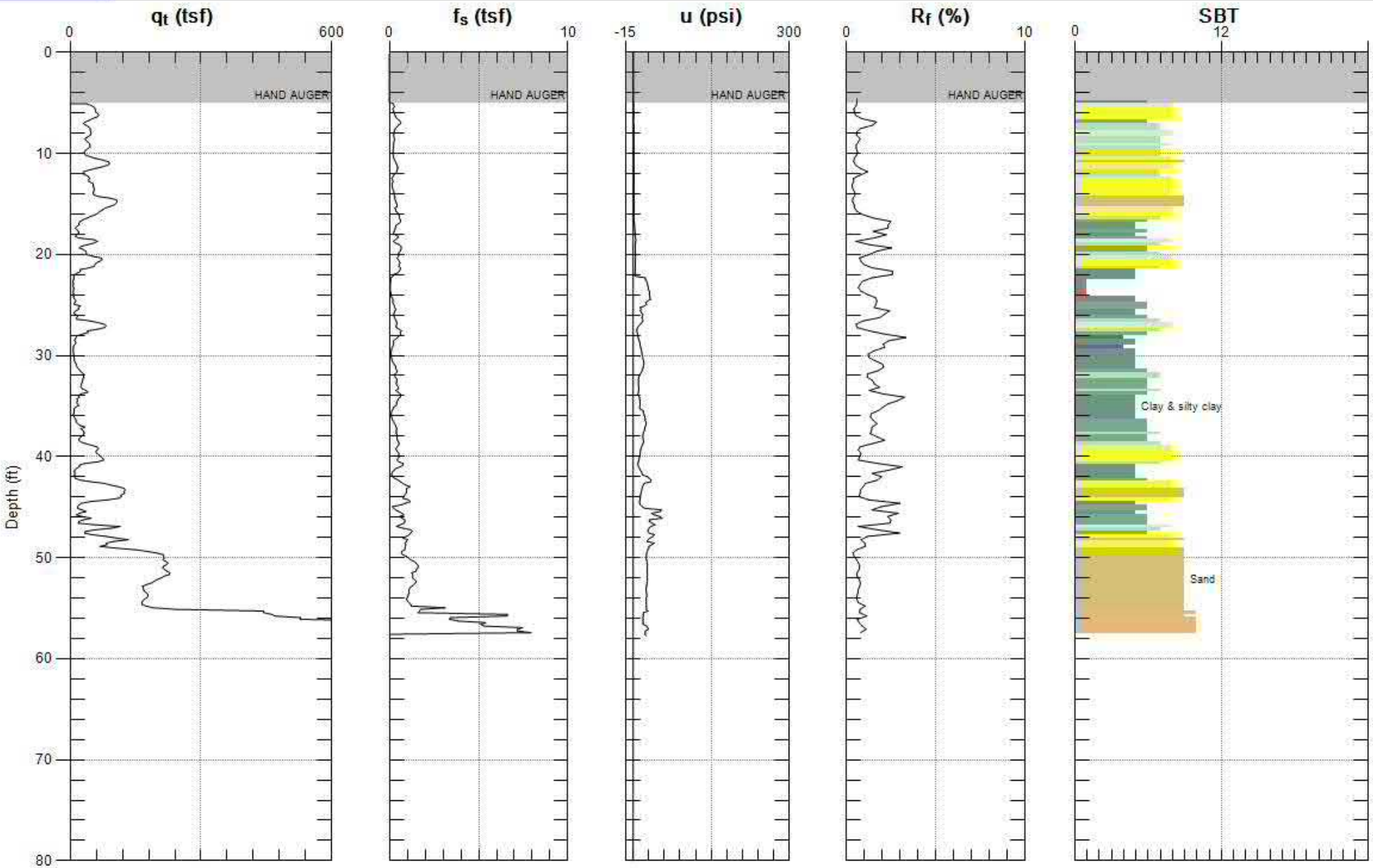
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-17 **Date: 3/17/17 12:35**



Max. Depth: 57.743 (ft)
Avg. Interval: 0.328 (ft)

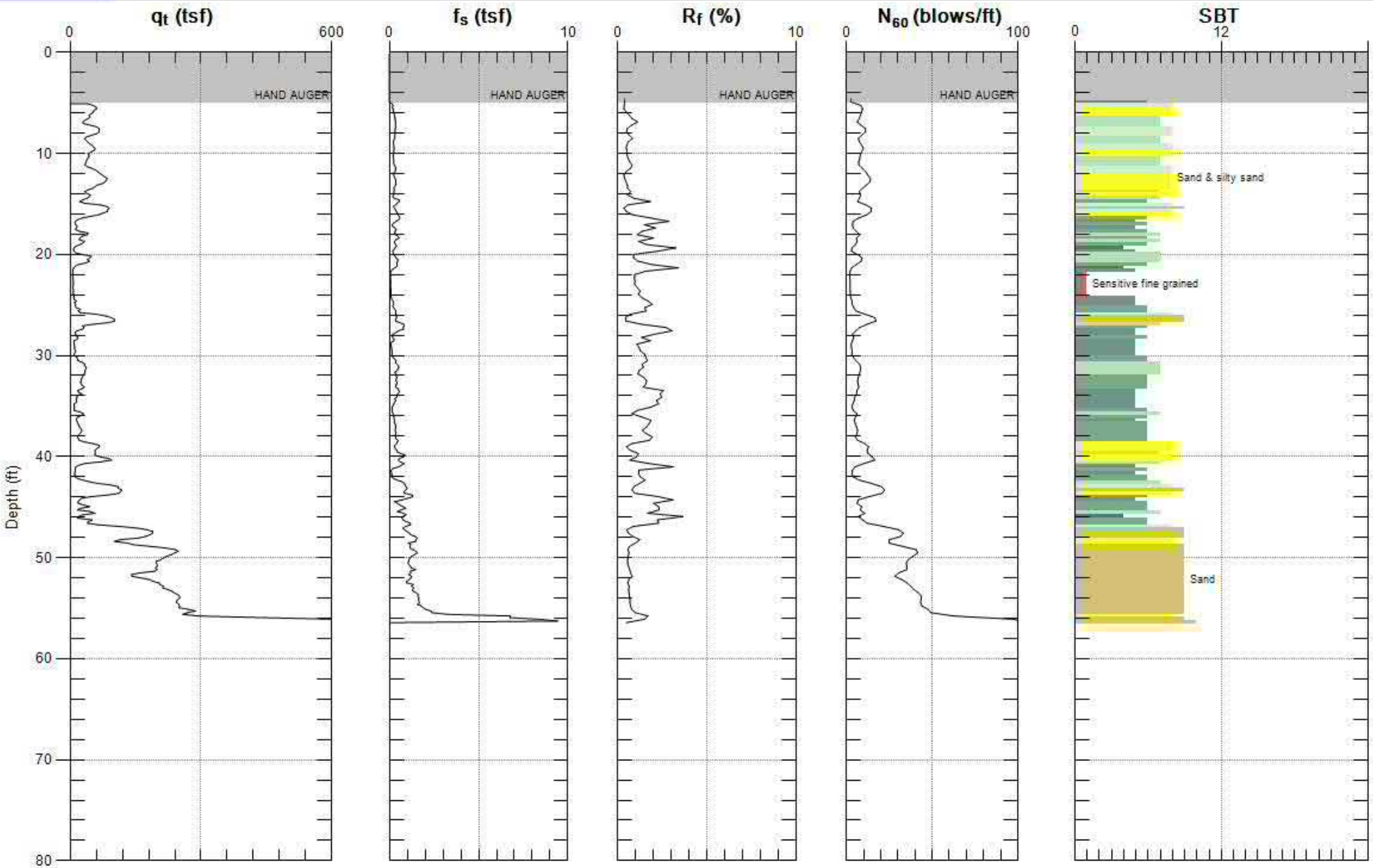
Figure A-112 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-18 **Date: 3/17/17 02:13**



Max. Depth: 56.594 (ft)
Avg. Interval: 0.328 (ft)

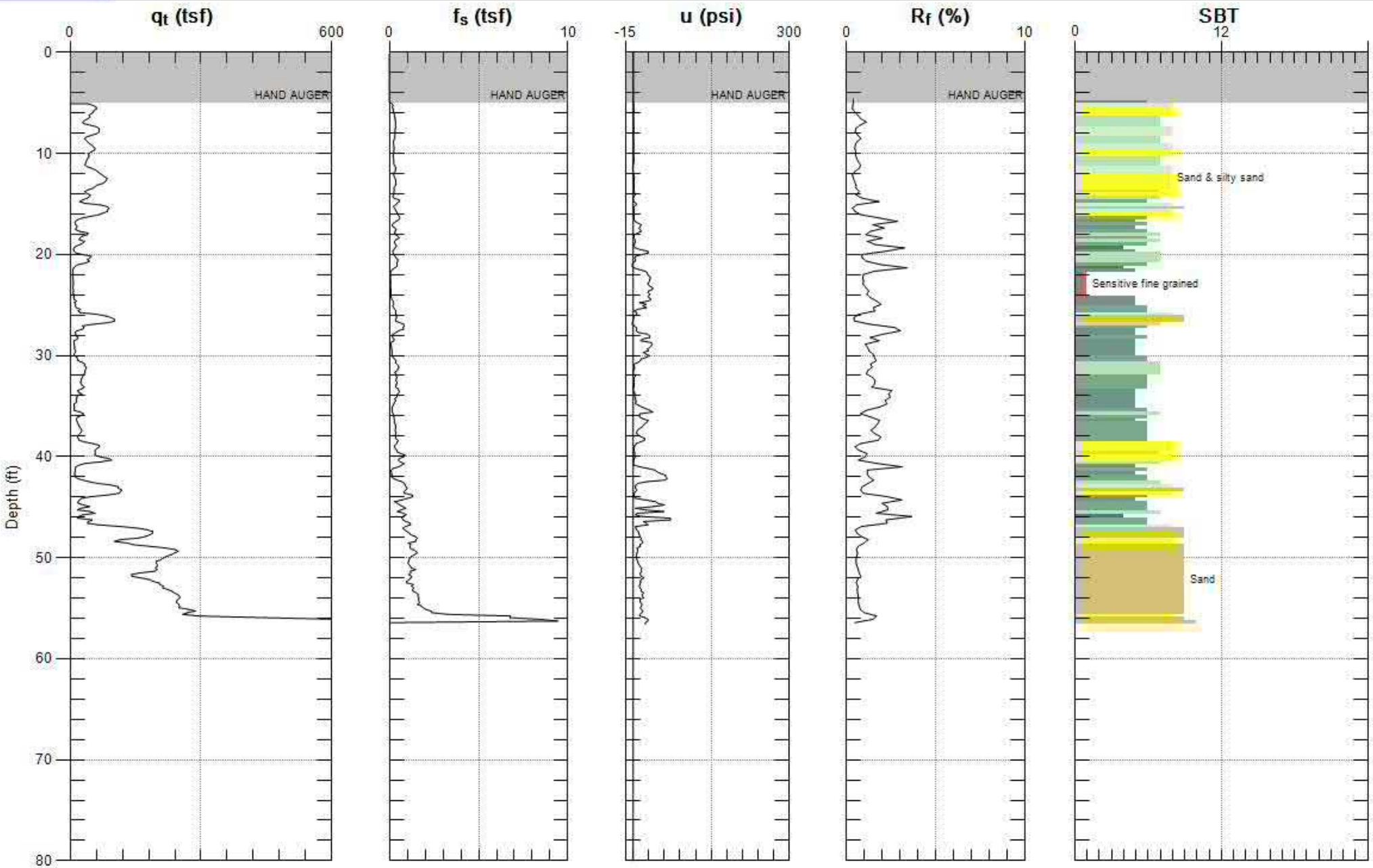
Figure A-113 SBT: Soil Behavior Type (Robertson 1990)

GREGG

AECOM

Site: MORENA PUMP STATION Engineer: K.MARTIN

Sounding: SH-18 **Date: 3/17/17 02:13**



Max. Depth: 56.594 (ft)
Avg. Interval: 0.328 (ft)

Figure A-113 SBT: Soil Behavior Type (Robertson 1990)

APPENDIX A – Boring Logs

The field investigation for the project included various types of explorations for the different project elements. Three (3) borings (PS-1 through PS-3) were advanced within Sherman Street and Custer Street for the pump station and sixty-seven (67) borings (WM-1 through WM-25 and FM-1 through FM-53) were advanced for the pipeline alignments. Thirty-seven (37) Cone Penetrometer Test (CPT) soundings were also advanced around the pump station site. Four (4) borings were advanced for the diversion structure connections in Friars Road (DS-1 through DS-6). In addition, borings were advanced for the four originally planned tunnel crossings: ONE borings (ex-1) for the I-805 crossing at Executive Drive, four borings (RC-1 through RC-4) at the railroad crossing near Rose Canyon, five (SC-1 through SC-5) near San Clemente Creek, and two (TC-1, 2) on West Morena Blvd. near Tecolote Creek. The Tecolote Creek crossing has been modified to be open trench and these borings are now considered part of the pipeline alignment borings. Some of the planned boring locations were eliminated based on nearby available information or due to utility conflicts, and therefore the numbering of the borings is not sequential.

The logs for the pump station borings, the pipeline alignment borings, and the diversion structure borings are presented in this appendix. The logs of borings for the tunnel crossings are presented in the Tunnel Report. Data for the CPT soundings are presented in the Faulting Report.

Field activities for the pump station borings were performed between April and August 2017 under the supervision of engineering geologists and engineers from our firm. Times and durations of field explorations varied based on traffic control permit constraints (typically 8:30 to 3:30 weekdays). Locations of the field explorations near the pump station, including CPT soundings and Borings PS-1 through PS-3, are presented in Figure 2. The remaining boring locations are presented on Figures 3a through 3e.

Procedures performed prior to any field activities included:

- Notifying Underground Service Alert (USA) 48 hours prior to drilling to mark out for subsurface utilities.
- Obtaining required County of San Diego Department of Environmental Health boring permits.
- Obtaining any necessary City of San Diego Right-of-Way permits.
- Generating plans and acquiring approved permits for traffic control.

Drilling for the borings was performed by Pacific Drilling or Cascade Drilling using hollow stem auger drilling methods. Either a truck-mounted Unimog Marl M5 drill rig with either 6-inch or 8-inch diameter hollow stem augers or a CME 85 with 6-inch diameter hollow stem augers were used to advance the borings. Each boring was advanced from the surface down to depths ranging from 2 feet to 81 feet. Borings shallower than 15 feet that met with refusal were moved and advanced to attempt to bypass the obstruction creating the refusal.

Relatively undisturbed samples of the subsurface materials were obtained within the exploratory borings using either a modified California sampler (2.5-inch outside diameter and 2-inch inside diameter) with thin stainless steel liners or a Standard Penetration Test (SPT) sampler (2.0-inch outside diameter and 1.5-inch inside diameter, without space for liners). The sampler was generally driven 18-inches into the material at the bottom of the boring by a 140-pound hammer falling 30-inches, and the blows required to advance the sampler was recorded in 6-inch increments for density correlations. The blow counts shown on the boring logs are for the final 12 inches of drive and have not been corrected for sample size or other corrections. The soil samples obtained were removed from the sampler, classified in the field, sealed to preserve the natural moisture content of the sample, and returned to the laboratory for further examination and testing.

Borings were backfilled according to San Diego County Site Assessment and Mitigation (SAM) Manual guidelines. The borings were finished with concrete or asphalt to approximately match the original surface. Soil cuttings collected from the borings were collected in 55 gallon steel drums affixed with non-hazardous labels. The drums were transported to a local City designated temporary storage location.

A monitoring well was completed in Boring PS-2. Perforated/slotted polyvinyl chloride (PVC) piping was installed from 6 feet below ground surface to the bottom of the boring at 61.5 feet. Solid pipe was installed at the top 6 feet. Filter sand was backfilled around the slotted pipe to one foot above the top of the slotted pipe. Bentonite was backfilled around the pipe over the filter sand to a depth of 2.5 feet. A traffic-rated vault was installed in concrete at the top of the boring, flush with the existing pavement surface. The monitoring well was developed and sampled. The groundwater samples recovered were sent to Eurofins Calscience analytical laboratory for further testing. Analtyical laboratory test results are presented in Appendix C. A slug test was performed within the monitoring well for Boring PS-2.

A key to boring logs and the boring logs are presented in this Appendix.

APPENDIX B

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APPENDIX B – Geotechnical Laboratory Data

Geotechnical laboratory tests were performed on selected samples to aid in estimating soil properties and verify visual classifications of the materials. The tests include grain size, plasticity characteristics, corrosion potential, and R-value for pavement design. Test results are shown on the corresponding sample location on the logs of the borings in Appendix A. Detailed laboratory results are presented in this appendix.

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WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-01

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S21			
Mass of Container & Wet Specimen, M1 (g)	528.89			
Mass of Container & Dry Specimen, M2 (g)	479.60			
Mass of Container, M3 (g)	104.85			
WATER CONTENT, wn (%)	**13.15**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	763.56
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	763.56
Specimen Diameter, D (in) or ( )	2.400
Specimen Length, L (in) or ( )	5.150
Specimen Area, A (in^2) or ( )	4.523
Specimen Volume, V (cm^3) or ( )	381.68
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	124.9
DRY UNIT WEIGHT, DUW (pcf) or ( )	110.4
VOID RATIO	0.527
DEGREE OF SATURATION, S (%)	67.36

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.159	2.394
2	5.182	2.404
3	5.117	2.401
4	5.150	2.394
5	5.142	2.398
6	**XXXXX**	2.407
Average	5.150	2.400

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark grayish brown Silty SAND (SM)

TESTED BY: GD DATE: 8/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-02

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 5.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE	X	2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	X
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S219			
Mass of Container & Wet Specimen, M1 (g)	536.84			
Mass of Container & Dry Specimen, M2 (g)	458.34			
Mass of Container, M3 (g)	140.68			
WATER CONTENT, wn (%)	**24.71**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1074.94
Mass of Container, M5 (g)	438.36
Mass of Wet Specimen, M6 (g)	636.58
Specimen Diameter, D (in) or ( )	2.399
Specimen Length, L (in) or ( )	4.659
Specimen Area, A (in^2) or ( )	4.521
Specimen Volume, V (cm^3) or ( )	345.13
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	115.1
DRY UNIT WEIGHT, DUW (pcf) or ( )	92.3
VOID RATIO	0.826
DEGREE OF SATURATION, S (%)	80.82

	MEASURED DIMENSIONS	
	Length	Diameter
1	4.658	2.406
2	4.669	2.399
3	4.640	2.406
4	4.642	2.396
5	4.685	2.390
6	**XXXXX**	2.398
Average	4.659	2.399

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark olive gray Clayey SAND (SC)

TESTED BY: GD DATE: 8/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-03

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 5.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	X
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S215			
Mass of Container & Wet Specimen, M1 (g)	511.13			
Mass of Container & Dry Specimen, M2 (g)	430.58			
Mass of Container, M3 (g)	137.45			
WATER CONTENT, wn (%)	**27.48**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	817.76
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	817.76
Specimen Diameter, D (in) or ( )	2.405
Specimen Length, L (in) or ( )	5.651
Specimen Area, A (in^2) or ( )	4.542
Specimen Volume, V (cm^3) or ( )	420.59
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	121.4
DRY UNIT WEIGHT, DUW (pcf) or ( )	95.2
VOID RATIO	0.770
DEGREE OF SATURATION, S (%)	96.32

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.661	2.416
2	5.647	2.405
3	5.645	2.394
4	5.664	2.401
5	5.640	2.407
6	**XXXXX**	2.405
Average	5.651	2.405

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive gray Silty SAND (SM)

TESTED BY: GD DATE: 8/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-06

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 5.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	X
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S222			
Mass of Container & Wet Specimen, M1 (g)	503.86			
Mass of Container & Dry Specimen, M2 (g)	437.04			
Mass of Container, M3 (g)	140.49			
WATER CONTENT, wn (%)	**22.53**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	626.72
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	626.72
Specimen Diameter, D (in) or ( )	2.405
Specimen Length, L (in) or ( )	4.217
Specimen Area, A (in^2) or ( )	4.542
Specimen Volume, V (cm^3) or ( )	313.81
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	124.7
DRY UNIT WEIGHT, DUW (pcf) or ( )	101.7
VOID RATIO	0.657
DEGREE OF SATURATION, S (%)	92.66

	MEASURED DIMENSIONS	
	Length	Diameter
1	4.219	2.414
2	4.212	2.414
3	4.230	2.406
4	4.203	2.391
5	4.219	2.390
6	**XXXXX**	2.413
Average	4.217	2.405

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark grayish brown Silty SAND (SM)

TESTED BY: GD DATE: 8/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-01

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST		2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET	X	3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT	X	2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	X
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S29			
Mass of Container & Wet Specimen, M1 (g)	531.86			
Mass of Container & Dry Specimen, M2 (g)	452.44			
Mass of Container, M3 (g)	125.99			
WATER CONTENT, wn (%)	**24.33**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1065.97
Mass of Container, M5 (g)	210.56
Mass of Wet Specimen, M6 (g)	855.41
Specimen Diameter, D (in) or ( )	2.410
Specimen Length, L (in) or ( )	5.845
Specimen Area, A (in^2) or ( )	4.562
Specimen Volume, V (cm^3) or ( )	436.94
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	122.2
DRY UNIT WEIGHT, DUW (pcf) or ( )	98.3
VOID RATIO	0.715
DEGREE OF SATURATION, S (%)	91.91

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.849	2.392
2	5.862	2.413
3	5.839	2.421
4	5.840	2.395
5	5.836	2.419
6	**XXXXX**	2.420
Average	5.845	2.410

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive brown Poorly Graded SAND (SP)

TESTED BY: GD DATE: 5/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-02

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 5.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT	X	2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S217			
Mass of Container & Wet Specimen, M1 (g)	442.43			
Mass of Container & Dry Specimen, M2 (g)	427.01			
Mass of Container, M3 (g)	137.94			
WATER CONTENT, wn (%)	**5.33**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	716.37
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	716.37
Specimen Diameter, D (in) or ( )	2.397
Specimen Length, L (in) or ( )	5.954
Specimen Area, A (in^2) or ( )	4.514
Specimen Volume, V (cm^3) or ( )	440.44
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	101.5
DRY UNIT WEIGHT, DUW (pcf) or ( )	96.4
VOID RATIO	0.749
DEGREE OF SATURATION, S (%)	19.24

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.959	2.391
2	5.947	2.397
3	5.966	2.400
4	5.954	2.393
5	5.946	2.401
6	**XXXXX**	2.402
Average	5.954	2.397

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Very dark grayish brown Poorly Graded SAND with Silt (SP-SM)

TESTED BY: GD DATE: 5/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-04

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 15.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD	X			6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S224			
Mass of Container & Wet Specimen, M1 (g)	531.64			
Mass of Container & Dry Specimen, M2 (g)	472.74			
Mass of Container, M3 (g)	140.75			
WATER CONTENT, wn (%)	**17.74**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	758.01
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	758.01
Specimen Diameter, D (in) or ( )	2.396
Specimen Length, L (in) or ( )	4.980
Specimen Area, A (in^2) or ( )	4.509
Specimen Volume, V (cm^3) or ( )	367.92
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	128.6
DRY UNIT WEIGHT, DUW (pcf) or ( )	109.2
VOID RATIO	0.543
DEGREE OF SATURATION, S (%)	88.21

	MEASURED DIMENSIONS	
	Length	Diameter
1	4.972	2.394
2	4.976	2.395
3	4.981	2.396
4	4.974	2.401
5	4.995	2.397
6	**XXXXX**	2.393
Average	4.980	2.396

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Brown Sandstone

TESTED BY: GD DATE: 5/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-06

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 15.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	X
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S205			
Mass of Container & Wet Specimen, M1 (g)	566.94			
Mass of Container & Dry Specimen, M2 (g)	490.69			
Mass of Container, M3 (g)	139.34			
WATER CONTENT, wn (%)	**21.70**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	933.59
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	933.59
Specimen Diameter, D (in) or ( )	2.396
Specimen Length, L (in) or ( )	5.997
Specimen Area, A (in^2) or ( )	4.508
Specimen Volume, V (cm^3) or ( )	442.94
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	131.6
DRY UNIT WEIGHT, DUW (pcf) or ( )	108.1
VOID RATIO	0.559
DEGREE OF SATURATION, S (%)	104.81

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.995	2.389
2	5.998	2.393
3	5.997	2.401
4	5.997	2.393
5	5.996	2.396
6	**XXXXX**	2.402
Average	5.997	2.396

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark yellowish brown Silty SAND (SM)

TESTED BY: GD DATE: 5/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-07

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 5.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S221			
Mass of Container & Wet Specimen, M1 (g)	454.73			
Mass of Container & Dry Specimen, M2 (g)	432.55			
Mass of Container, M3 (g)	140.33			
WATER CONTENT, wn (%)	**7.59**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	776.77
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	776.77
Specimen Diameter, D (in) or ( )	2.394
Specimen Length, L (in) or ( )	5.906
Specimen Area, A (in^2) or ( )	4.500
Specimen Volume, V (cm^3) or ( )	435.52
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	111.3
DRY UNIT WEIGHT, DUW (pcf) or ( )	103.5
VOID RATIO	0.629
DEGREE OF SATURATION, S (%)	32.59

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.901	2.398
2	5.905	2.404
3	5.910	2.400
4	5.899	2.381
5	5.915	2.389
6	**XXXXX**	2.390
Average	5.906	2.394

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive brown Poorly Graded SAND (SP)

TESTED BY: GD DATE: 5/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-07

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST		2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET	X	3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S208			
Mass of Container & Wet Specimen, M1 (g)	574.44			
Mass of Container & Dry Specimen, M2 (g)	502.67			
Mass of Container, M3 (g)	146.59			
WATER CONTENT, wn (%)	**20.16**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	834.00
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	834.00
Specimen Diameter, D (in) or ( )	2.404
Specimen Length, L (in) or ( )	5.564
Specimen Area, A (in^2) or ( )	4.537
Specimen Volume, V (cm^3) or ( )	413.67
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	125.9
DRY UNIT WEIGHT, DUW (pcf) or ( )	104.7
VOID RATIO	0.609
DEGREE OF SATURATION, S (%)	89.34

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.558	2.398
2	5.551	2.405
3	5.585	2.412
4	5.564	2.393
5	5.561	2.402
6	**XXXXX**	2.411
Average	5.564	2.404

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Grayish brown Poorly Graded SAND (SP)

TESTED BY: GD DATE: 5/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-08

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY	X	1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST		2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	B63			
Mass of Container & Wet Specimen, M1 (g)	761.01			
Mass of Container & Dry Specimen, M2 (g)	716.37			
Mass of Container, M3 (g)	200.70			
WATER CONTENT, wn (%)	**8.66**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	923.47
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	923.47
Specimen Diameter, D (in) or ( )	2.378
Specimen Length, L (in) or ( )	5.916
Specimen Area, A (in^2) or ( )	4.441
Specimen Volume, V (cm^3) or ( )	430.60
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	133.9
DRY UNIT WEIGHT, DUW (pcf) or ( )	123.2
VOID RATIO	0.368
DEGREE OF SATURATION, S (%)	63.52

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.922	2.374
2	5.857	2.364
3	5.810	2.378
4	5.926	2.394
5	6.067	2.379
6	**XXXXX**	2.379
Average	5.916	2.378

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark yellowish brown Sandy, Lean CLAY (CL)

TESTED BY: ADC DATE: 6/12/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-11

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	FJ10			
Mass of Container & Wet Specimen, M1 (g)	621.60			
Mass of Container & Dry Specimen, M2 (g)	538.84			
Mass of Container, M3 (g)	111.28			
WATER CONTENT, wn (%)	**19.36**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	901.99
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	901.99
Specimen Diameter, D (in) or ( )	2.388
Specimen Length, L (in) or ( )	5.697
Specimen Area, A (in^2) or ( )	4.479
Specimen Volume, V (cm^3) or ( )	418.15
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	134.7
DRY UNIT WEIGHT, DUW (pcf) or ( )	112.8
VOID RATIO	0.494
DEGREE OF SATURATION, S (%)	105.80

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.861	2.386
2	5.807	2.386
3	5.905	2.386
4	5.848	2.384
5	5.062	2.393
6	**XXXXX**	2.394
Average	5.697	2.388

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive brown Sandy, Lean CLAY (CL)

TESTED BY: ADC DATE: 6/12/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-16

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S88			
Mass of Container & Wet Specimen, M1 (g)	607.07			
Mass of Container & Dry Specimen, M2 (g)	555.22			
Mass of Container, M3 (g)	113.09			
WATER CONTENT, wn (%)	**11.73**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	929.87
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	929.87
Specimen Diameter, D (in) or ( )	2.389
Specimen Length, L (in) or ( )	5.950
Specimen Area, A (in^2) or ( )	4.482
Specimen Volume, V (cm^3) or ( )	437.01
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	132.8
DRY UNIT WEIGHT, DUW (pcf) or ( )	118.9
VOID RATIO	0.418
DEGREE OF SATURATION, S (%)	75.80

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.973	2.381
2	5.967	2.382
3	5.966	2.382
4	5.879	2.394
5	5.966	2.395
6	**XXXXX**	2.399
Average	5.950	2.389

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark yellowish brown Clayey SAND (SC)

TESTED BY: ADC DATE: 6/12/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-16

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	B22			
Mass of Container & Wet Specimen, M1 (g)	950.01			
Mass of Container & Dry Specimen, M2 (g)	825.70			
Mass of Container, M3 (g)	200.64			
WATER CONTENT, wn (%)	**19.89**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	869.02
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	869.02
Specimen Diameter, D (in) or ( )	2.398
Specimen Length, L (in) or ( )	5.678
Specimen Area, A (in^2) or ( )	4.517
Specimen Volume, V (cm^3) or ( )	420.26
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	129.1
DRY UNIT WEIGHT, DUW (pcf) or ( )	107.7
VOID RATIO	0.565
DEGREE OF SATURATION, S (%)	94.97

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.665	2.398
2	5.692	2.398
3	5.659	2.413
4	5.687	2.388
5	5.685	2.396
6	**XXXXX**	2.396
Average	5.678	2.398

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Sandy, Lean CLAY (CL)

TESTED BY: ADC DATE: 6/12/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-17

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 5.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S3			
Mass of Container & Wet Specimen, M1 (g)	809.07			
Mass of Container & Dry Specimen, M2 (g)	723.53			
Mass of Container, M3 (g)	83.13			
WATER CONTENT, wn (%)	**13.36**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	914.07
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	914.07
Specimen Diameter, D (in) or ( )	2.382
Specimen Length, L (in) or ( )	5.974
Specimen Area, A (in^2) or ( )	4.456
Specimen Volume, V (cm^3) or ( )	436.18
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	130.8
DRY UNIT WEIGHT, DUW (pcf) or ( )	115.4
VOID RATIO	0.461
DEGREE OF SATURATION, S (%)	78.32

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.970	2.383
2	5.975	2.382
3	5.977	2.382
4	5.971	2.379
5	5.976	2.381
6	**XXXXX**	2.384
Average	5.974	2.382

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Clayey SAND (SC)

TESTED BY: ADC DATE: 6/12/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-17

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 15.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	B36			
Mass of Container & Wet Specimen, M1 (g)	1013.05			
Mass of Container & Dry Specimen, M2 (g)	903.60			
Mass of Container, M3 (g)	197.98			
WATER CONTENT, wn (%)	**15.51**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1187.25
Mass of Container, M5 (g)	254.16
Mass of Wet Specimen, M6 (g)	933.09
Specimen Diameter, D (in) or ( )	2.412
Specimen Length, L (in) or ( )	5.966
Specimen Area, A (in^2) or ( )	4.569
Specimen Volume, V (cm^3) or ( )	446.70
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	130.4
DRY UNIT WEIGHT, DUW (pcf) or ( )	112.9
VOID RATIO	0.493
DEGREE OF SATURATION, S (%)	84.94

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.968	2.412
2	5.960	2.413
3	5.967	2.412
4	5.964	2.411
5	5.970	2.414
6	**XXXXX**	2.410
Average	5.966	2.412

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive yellow Silty SAND (SM)

TESTED BY: ADC DATE: 6/12/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-18

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY	X	1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST		2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	B27			
Mass of Container & Wet Specimen, M1 (g)	779.48			
Mass of Container & Dry Specimen, M2 (g)	686.58			
Mass of Container, M3 (g)	200.49			
WATER CONTENT, wn (%)	**19.11**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	916.37
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	916.37
Specimen Diameter, D (in) or ( )	2.411
Specimen Length, L (in) or ( )	5.982
Specimen Area, A (in^2) or ( )	4.564
Specimen Volume, V (cm^3) or ( )	447.35
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	127.9
DRY UNIT WEIGHT, DUW (pcf) or ( )	107.4
VOID RATIO	0.570
DEGREE OF SATURATION, S (%)	90.53

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.981	2.407
2	5.981	2.401
3	5.989	2.399
4	5.984	2.417
5	5.975	2.420
6	**XXXXX**	2.419
Average	5.982	2.411

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Lean CLAY (CL)

TESTED BY: ADC DATE: 6/13/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-18

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY	X	1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST		2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S31			
Mass of Container & Wet Specimen, M1 (g)	627.15			
Mass of Container & Dry Specimen, M2 (g)	535.54			
Mass of Container, M3 (g)	98.21			
WATER CONTENT, wn (%)	**20.95**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	912.46
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	912.46
Specimen Diameter, D (in) or ( )	2.397
Specimen Length, L (in) or ( )	5.962
Specimen Area, A (in^2) or ( )	4.511
Specimen Volume, V (cm^3) or ( )	440.72
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	129.2
DRY UNIT WEIGHT, DUW (pcf) or ( )	106.9
VOID RATIO	0.577
DEGREE OF SATURATION, S (%)	97.97

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.961	2.391
2	5.961	2.390
3	5.966	2.394
4	5.959	2.404
5	5.965	2.401
6	**XXXXX**	2.399
Average	5.962	2.397

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Gray Lean CLAY with Sand (CL)

TESTED BY: ADC DATE: 6/13/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-19

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M62			
Mass of Container & Wet Specimen, M1 (g)	488.16			
Mass of Container & Dry Specimen, M2 (g)	441.00			
Mass of Container, M3 (g)	91.69			
WATER CONTENT, wn (%)	**13.50**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	834.22
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	834.22
Specimen Diameter, D (in) or ( )	2.390
Specimen Length, L (in) or ( )	5.446
Specimen Area, A (in^2) or ( )	4.487
Specimen Volume, V (cm^3) or ( )	400.46
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	130.0
DRY UNIT WEIGHT, DUW (pcf) or ( )	114.6
VOID RATIO	0.471
DEGREE OF SATURATION, S (%)	77.38

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.421	2.385
2	5.458	2.389
3	5.453	2.393
4	5.442	2.394
5	5.458	2.388
6	**XXXXX**	2.392
Average	5.446	2.390

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark yellowish brown Sandy SILT with Gravel (ML)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-20

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD	X			6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M5			
Mass of Container & Wet Specimen, M1 (g)	465.89			
Mass of Container & Dry Specimen, M2 (g)	407.05			
Mass of Container, M3 (g)	91.23			
WATER CONTENT, wn (%)	**18.63**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	830.75
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	830.75
Specimen Diameter, D (in) or ( )	2.395
Specimen Length, L (in) or ( )	5.850
Specimen Area, A (in^2) or ( )	4.506
Specimen Volume, V (cm^3) or ( )	432.00
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	120.1
DRY UNIT WEIGHT, DUW (pcf) or ( )	101.2
VOID RATIO	0.666
DEGREE OF SATURATION, S (%)	75.57

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.841	2.405
2	5.850	2.394
3	5.847	2.383
4	5.875	2.401
5	5.837	2.394
6	**XXXXX**	2.395
Average	5.850	2.395

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Lean CLAY (CL)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-20

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND					OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD	X			6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M6			
Mass of Container & Wet Specimen, M1 (g)	476.83			
Mass of Container & Dry Specimen, M2 (g)	415.88			
Mass of Container, M3 (g)	90.32			
WATER CONTENT, wn (%)	**18.72**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	750.24
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	750.24
Specimen Diameter, D (in) or ( )	2.384
Specimen Length, L (in) or ( )	5.546
Specimen Area, A (in^2) or ( )	4.462
Specimen Volume, V (cm^3) or ( )	405.48
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	115.5
DRY UNIT WEIGHT, DUW (pcf) or ( )	97.3
VOID RATIO	0.732
DEGREE OF SATURATION, S (%)	69.01

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.541	2.376
2	5.538	2.375
3	5.570	2.381
4	5.554	2.401
5	5.525	2.389
6	**XXXXX**	2.379
Average	5.546	2.384

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Elastic SILT (MH)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-21

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M91			
Mass of Container & Wet Specimen, M1 (g)	474.98			
Mass of Container & Dry Specimen, M2 (g)	457.33			
Mass of Container, M3 (g)	89.78			
WATER CONTENT, wn (%)	**4.80**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	986.28
Mass of Container, M5 (g)	250.18
Mass of Wet Specimen, M6 (g)	736.10
Specimen Diameter, D (in) or ( )	2.395
Specimen Length, L (in) or ( )	5.659
Specimen Area, A (in^2) or ( )	4.506
Specimen Volume, V (cm^3) or ( )	417.89
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	110.0
DRY UNIT WEIGHT, DUW (pcf) or ( )	104.9
VOID RATIO	0.606
DEGREE OF SATURATION, S (%)	21.38

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.645	2.380
2	5.651	2.389
3	5.682	2.407
4	5.673	2.391
5	5.644	2.400
6	**XXXXX**	2.405
Average	5.659	2.395

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Silty SAND (SM)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-21

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM		GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED	X	1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY	X					OTHER:		OTHER:	
6). HARD	X			6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M8			
Mass of Container & Wet Specimen, M1 (g)	441.38			
Mass of Container & Dry Specimen, M2 (g)	380.21			
Mass of Container, M3 (g)	89.37			
WATER CONTENT, wn (%)	**21.03**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1001.01
Mass of Container, M5 (g)	263.02
Mass of Wet Specimen, M6 (g)	737.99
Specimen Diameter, D (in) or ( )	2.394
Specimen Length, L (in) or ( )	5.748
Specimen Area, A (in^2) or ( )	4.501
Specimen Volume, V (cm^3) or ( )	423.92
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	108.7
DRY UNIT WEIGHT, DUW (pcf) or ( )	89.8
VOID RATIO	0.877
DEGREE OF SATURATION, S (%)	64.74

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.753	2.400
2	5.768	2.395
3	5.725	2.397
4	5.762	2.388
5	5.731	2.394
6	**XXXXX**	2.389
Average	5.748	2.394

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Grayish brown SILT with Sand (ML)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-22

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M1			
Mass of Container & Wet Specimen, M1 (g)	416.79			
Mass of Container & Dry Specimen, M2 (g)	386.00			
Mass of Container, M3 (g)	91.67			
WATER CONTENT, wn (%)	**10.46**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	967.29
Mass of Container, M5 (g)	205.15
Mass of Wet Specimen, M6 (g)	762.14
Specimen Diameter, D (in) or ( )	2.395
Specimen Length, L (in) or ( )	5.839
Specimen Area, A (in^2) or ( )	4.503
Specimen Volume, V (cm^3) or ( )	430.87
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	110.4
DRY UNIT WEIGHT, DUW (pcf) or ( )	100.0
VOID RATIO	0.686
DEGREE OF SATURATION, S (%)	41.17

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.828	2.382
2	5.808	2.383
3	5.873	2.412
4	5.840	2.387
5	5.845	2.394
6	**XXXXX**	2.409
Average	5.839	2.395

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Strong brown Silty SAND (SM)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-22

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M9			
Mass of Container & Wet Specimen, M1 (g)	510.29			
Mass of Container & Dry Specimen, M2 (g)	469.63			
Mass of Container, M3 (g)	89.70			
WATER CONTENT, wn (%)	**10.70**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	808.81
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	808.81
Specimen Diameter, D (in) or ( )	2.405
Specimen Length, L (in) or ( )	5.813
Specimen Area, A (in^2) or ( )	4.543
Specimen Volume, V (cm^3) or ( )	432.76
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	116.7
DRY UNIT WEIGHT, DUW (pcf) or ( )	105.4
VOID RATIO	0.599
DEGREE OF SATURATION, S (%)	48.22

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.793	2.403
2	5.857	2.405
3	5.785	2.407
4	5.831	2.403
5	5.801	2.404
6	**XXXXX**	2.408
Average	5.813	2.405

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Strong brown Silty SAND (SM)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-23

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M7			
Mass of Container & Wet Specimen, M1 (g)	434.86			
Mass of Container & Dry Specimen, M2 (g)	397.70			
Mass of Container, M3 (g)	91.00			
WATER CONTENT, wn (%)	**12.12**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1027.87
Mass of Container, M5 (g)	272.50
Mass of Wet Specimen, M6 (g)	755.37
Specimen Diameter, D (in) or ( )	2.366
Specimen Length, L (in) or ( )	5.691
Specimen Area, A (in^2) or ( )	4.396
Specimen Volume, V (cm^3) or ( )	409.95
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	115.0
DRY UNIT WEIGHT, DUW (pcf) or ( )	102.6
VOID RATIO	0.643
DEGREE OF SATURATION, S (%)	50.88

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.694	2.351
2	5.686	2.358
3	5.693	2.383
4	5.711	2.376
5	5.670	2.354
6	**XXXXX**	2.373
Average	5.691	2.366

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Strong brown Clayey SAND (SC)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-23

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M60			
Mass of Container & Wet Specimen, M1 (g)	500.34			
Mass of Container & Dry Specimen, M2 (g)	459.59			
Mass of Container, M3 (g)	91.37			
WATER CONTENT, wn (%)	**11.07**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	872.25
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	872.25
Specimen Diameter, D (in) or ( )	2.371
Specimen Length, L (in) or ( )	5.952
Specimen Area, A (in^2) or ( )	4.415
Specimen Volume, V (cm^3) or ( )	430.63
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	126.4
DRY UNIT WEIGHT, DUW (pcf) or ( )	113.8
VOID RATIO	0.481
DEGREE OF SATURATION, S (%)	62.18

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.956	2.364
2	5.938	2.359
3	5.951	2.379
4	5.957	2.376
5	5.957	2.373
6	**XXXXX**	2.375
Average	5.952	2.371

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Strong brown Silty SAND (SM)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-24

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M3			
Mass of Container & Wet Specimen, M1 (g)	459.80			
Mass of Container & Dry Specimen, M2 (g)	430.81			
Mass of Container, M3 (g)	89.90			
WATER CONTENT, wn (%)	**8.50**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

Moisture content only. Bag sample.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Strong brown Poorly Graded SAND with Silt (SP-SM)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-24

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M73			
Mass of Container & Wet Specimen, M1 (g)	399.80			
Mass of Container & Dry Specimen, M2 (g)	375.18			
Mass of Container, M3 (g)	108.66			
WATER CONTENT, wn (%)	**9.24**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

Moisture content only. Bag sample.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Strong brown Silty SAND (SM)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-25

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S216			
Mass of Container & Wet Specimen, M1 (g)	546.03			
Mass of Container & Dry Specimen, M2 (g)	505.32			
Mass of Container, M3 (g)	148.62			
WATER CONTENT, wn (%)	**11.41**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	793.00
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	793.00
Specimen Diameter, D (in) or ( )	2.401
Specimen Length, L (in) or ( )	5.604
Specimen Area, A (in^2) or ( )	4.527
Specimen Volume, V (cm^3) or ( )	415.72
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	119.1
DRY UNIT WEIGHT, DUW (pcf) or ( )	106.9
VOID RATIO	0.577
DEGREE OF SATURATION, S (%)	53.41

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.597	2.398
2	5.574	2.394
3	5.613	2.412
4	5.643	2.404
5	5.592	2.394
6	**XXXXX**	2.403
Average	5.604	2.401

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Silty SAND (SM)

TESTED BY: GD DATE: 8/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-25

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	X
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	B72			
Mass of Container & Wet Specimen, M1 (g)	549.19			
Mass of Container & Dry Specimen, M2 (g)	517.60			
Mass of Container, M3 (g)	200.28			
WATER CONTENT, wn (%)	**9.96**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

No liner. Bag sample. Moisture content only.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark yellowish brown Silty SAND (SM)

TESTED BY: GD DATE: 8/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-29

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	X
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	C4			
Mass of Container & Wet Specimen, M1 (g)	429.26			
Mass of Container & Dry Specimen, M2 (g)	402.84			
Mass of Container, M3 (g)	71.88			
WATER CONTENT, wn (%)	**7.98**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	746.67
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	746.67
Specimen Diameter, D (in) or ( )	2.413
Specimen Length, L (in) or ( )	5.949
Specimen Area, A (in^2) or ( )	4.574
Specimen Volume, V (cm^3) or ( )	445.90
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	104.5
DRY UNIT WEIGHT, DUW (pcf) or ( )	96.8
VOID RATIO	0.741
DEGREE OF SATURATION, S (%)	29.08

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.933	2.399
2	5.949	2.416
3	5.959	2.426
4	5.962	2.412
5	5.944	2.411
6	**XXXXX**	2.415
Average	5.949	2.413

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Strong brown Silty SAND (SM)

TESTED BY: GD DATE: 8/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-29

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M7			
Mass of Container & Wet Specimen, M1 (g)	425.14			
Mass of Container & Dry Specimen, M2 (g)	376.02			
Mass of Container, M3 (g)	91.00			
WATER CONTENT, wn (%)	**17.23**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

No unit weight conducted as only bag sample. Moisture content only.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown SILT with Sand (ML)

TESTED BY: GD DATE: 8/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-30

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM		GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED	X	1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE	X	2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M60			
Mass of Container & Wet Specimen, M1 (g)	442.68			
Mass of Container & Dry Specimen, M2 (g)	412.43			
Mass of Container, M3 (g)	91.37			
WATER CONTENT, wn (%)	**9.42**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	548.23
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	548.23
Specimen Diameter, D (in) or ( )	2.385
Specimen Length, L (in) or ( )	4.468
Specimen Area, A (in^2) or ( )	4.467
Specimen Volume, V (cm^3) or ( )	327.08
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	104.6
DRY UNIT WEIGHT, DUW (pcf) or ( )	95.6
VOID RATIO	0.763
DEGREE OF SATURATION, S (%)	33.36

	MEASURED DIMENSIONS	
	Length	Diameter
1	4.479	2.391
2	4.435	2.378
3	4.499	2.372
4	4.440	2.395
5	4.486	2.389
6	**XXXXX**	2.385
Average	4.468	2.385

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Silty SAND with Gravel (SM)

TESTED BY: GD DATE: 8/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-30

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD	X			6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M3			
Mass of Container & Wet Specimen, M1 (g)	530.89			
Mass of Container & Dry Specimen, M2 (g)	474.80			
Mass of Container, M3 (g)	89.90			
WATER CONTENT, wn (%)	**14.57**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

horizontally stratified broken sandstone

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	663.75
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	663.75
Specimen Diameter, D (in) or ( )	2.386
Specimen Length, L (in) or ( )	5.339
Specimen Area, A (in^2) or ( )	4.471
Specimen Volume, V (cm^3) or ( )	391.18
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	105.9
DRY UNIT WEIGHT, DUW (pcf) or ( )	92.5
VOID RATIO	0.823
DEGREE OF SATURATION, S (%)	47.80

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.340	2.378
2	5.351	2.395
3	5.303	2.372
4	5.371	2.390
5	5.329	2.390
6	**XXXXX**	2.391
Average	5.339	2.386

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Silty SAND (SM)

TESTED BY: GD DATE: 8/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-34

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	B9			
Mass of Container & Wet Specimen, M1 (g)	1004.77			
Mass of Container & Dry Specimen, M2 (g)	929.10			
Mass of Container, M3 (g)	199.74			
WATER CONTENT, wn (%)	**10.37**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	802.01
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	802.01
Specimen Diameter, D (in) or ( )	2.375
Specimen Length, L (in) or ( )	5.842
Specimen Area, A (in^2) or ( )	4.430
Specimen Volume, V (cm^3) or ( )	424.04
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	118.1
DRY UNIT WEIGHT, DUW (pcf) or ( )	107.0
VOID RATIO	0.576
DEGREE OF SATURATION, S (%)	48.66

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.834	2.380
2	5.847	2.378
3	5.861	2.377
4	5.821	2.368
5	5.846	2.372
6	**XXXXX**	2.374
Average	5.842	2.375

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive brown Silty SAND (SM)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-35

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M66			
Mass of Container & Wet Specimen, M1 (g)	555.74			
Mass of Container & Dry Specimen, M2 (g)	469.07			
Mass of Container, M3 (g)	101.66			
WATER CONTENT, wn (%)	**23.59**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	842.00
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	842.00
Specimen Diameter, D (in) or ( )	2.395
Specimen Length, L (in) or ( )	5.891
Specimen Area, A (in^2) or ( )	4.503
Specimen Volume, V (cm^3) or ( )	434.75
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	120.9
DRY UNIT WEIGHT, DUW (pcf) or ( )	97.8
VOID RATIO	0.723
DEGREE OF SATURATION, S (%)	88.10

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.897	2.403
2	5.895	2.394
3	5.888	2.392
4	5.906	2.396
5	5.871	2.388
6	**XXXXX**	2.394
Average	5.891	2.395

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Grayish brown Elastic SILT (MH)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-35

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)	X	4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M67			
Mass of Container & Wet Specimen, M1 (g)	448.90			
Mass of Container & Dry Specimen, M2 (g)	386.09			
Mass of Container, M3 (g)	110.42			
WATER CONTENT, wn (%)	**22.78**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

Moisture content only. Bag sample.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Lean CLAY with Sand (CL)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-38

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S221			
Mass of Container & Wet Specimen, M1 (g)	595.10			
Mass of Container & Dry Specimen, M2 (g)	537.33			
Mass of Container, M3 (g)	140.33			
WATER CONTENT, wn (%)	**14.55**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	813.35
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	813.35
Specimen Diameter, D (in) or ( )	2.389
Specimen Length, L (in) or ( )	5.764
Specimen Area, A (in^2) or ( )	4.481
Specimen Volume, V (cm^3) or ( )	423.25
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	120.0
DRY UNIT WEIGHT, DUW (pcf) or ( )	104.7
VOID RATIO	0.609
DEGREE OF SATURATION, S (%)	64.46

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.774	2.407
2	5.767	2.405
3	5.736	2.383
4	5.771	2.370
5	5.770	2.383
6	**XXXXX**	2.384
Average	5.764	2.389

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Silty SAND (SM)

TESTED BY: GD DATE: 7/21/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-38

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE	X	3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S218			
Mass of Container & Wet Specimen, M1 (g)	487.76			
Mass of Container & Dry Specimen, M2 (g)	424.72			
Mass of Container, M3 (g)	140.43			
WATER CONTENT, wn (%)	**22.17**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Sandy SILT (ML)

TESTED BY: GD DATE: 7/21/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-40

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S212			
Mass of Container & Wet Specimen, M1 (g)	549.81			
Mass of Container & Dry Specimen, M2 (g)	499.64			
Mass of Container, M3 (g)	137.50			
WATER CONTENT, wn (%)	**13.85**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	811.39
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	811.39
Specimen Diameter, D (in) or ( )	2.384
Specimen Length, L (in) or ( )	5.988
Specimen Area, A (in^2) or ( )	4.464
Specimen Volume, V (cm^3) or ( )	438.04
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	115.6
DRY UNIT WEIGHT, DUW (pcf) or ( )	101.6
VOID RATIO	0.660
DEGREE OF SATURATION, S (%)	56.71

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.986	2.383
2	5.991	2.388
3	5.984	2.381
4	5.989	2.390
5	5.992	2.375
6	**XXXXX**	2.387
Average	5.988	2.384

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Sandy SILT (ML)

TESTED BY: GD DATE: 7/21/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-40

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE	X	3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S224			
Mass of Container & Wet Specimen, M1 (g)	279.08			
Mass of Container & Dry Specimen, M2 (g)	262.94			
Mass of Container, M3 (g)	140.74			
WATER CONTENT, wn (%)	**13.21**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

Moisture content only. Bag sample.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	#VALUE!
VOID RATIO	#VALUE!
DEGREE OF SATURATION, S (%)	#VALUE!

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Sandy SILT (ML)

TESTED BY: GD DATE: 7/21/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-41

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM		GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND					OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S303			
Mass of Container & Wet Specimen, M1 (g)	441.53			
Mass of Container & Dry Specimen, M2 (g)	401.58			
Mass of Container, M3 (g)	143.28			
WATER CONTENT, wn (%)	**15.47**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

Horizontal layers of yellowish brown silt and grayish brown clay.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1103.58
Mass of Container, M5 (g)	386.60
Mass of Wet Specimen, M6 (g)	716.98
Specimen Diameter, D (in) or ( )	2.388
Specimen Length, L (in) or ( )	5.530
Specimen Area, A (in^2) or ( )	4.478
Specimen Volume, V (cm^3) or ( )	405.78
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	110.3
DRY UNIT WEIGHT, DUW (pcf) or ( )	95.5
VOID RATIO	0.764
DEGREE OF SATURATION, S (%)	54.63

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.521	2.370
2	5.530	2.387
3	5.542	2.375
4	5.531	2.394
5	5.528	2.402
6	**XXXXX**	2.398
Average	5.530	2.388

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown to grayish brown SILT and CLAY layers (CL/ML)

TESTED BY: GD DATE: 7/21/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-41

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE	X	3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S213			
Mass of Container & Wet Specimen, M1 (g)	362.37			
Mass of Container & Dry Specimen, M2 (g)	349.21			
Mass of Container, M3 (g)	137.51			
WATER CONTENT, wn (%)	**6.22**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

Moisture content only. Bag sample.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Silty SAND (SM)

TESTED BY: GD DATE: 7/21/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-43

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM		GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)	X	4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S301			
Mass of Container & Wet Specimen, M1 (g)	510.25			
Mass of Container & Dry Specimen, M2 (g)	471.72			
Mass of Container, M3 (g)	143.60			
WATER CONTENT, wn (%)	**11.74**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1069.23
Mass of Container, M5 (g)	272.55
Mass of Wet Specimen, M6 (g)	796.68
Specimen Diameter, D (in) or ( )	2.369
Specimen Length, L (in) or ( )	5.664
Specimen Area, A (in^2) or ( )	4.408
Specimen Volume, V (cm^3) or ( )	409.19
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	121.5
DRY UNIT WEIGHT, DUW (pcf) or ( )	108.8
VOID RATIO	0.550
DEGREE OF SATURATION, S (%)	57.69

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.672	2.367
2	5.666	2.371
3	5.659	2.359
4	5.653	2.377
5	5.671	2.374
6	**XXXXX**	2.367
Average	5.664	2.369

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Grayish brown to yellowish brown Clayey, Silty SAND (SC-SM)

TESTED BY: GD DATE: 7/21/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-43

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S202			
Mass of Container & Wet Specimen, M1 (g)	522.96			
Mass of Container & Dry Specimen, M2 (g)	477.23			
Mass of Container, M3 (g)	138.66			
WATER CONTENT, wn (%)	**13.51**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

Pockets of clay material.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1139.58
Mass of Container, M5 (g)	385.08
Mass of Wet Specimen, M6 (g)	754.50
Specimen Diameter, D (in) or ( )	2.384
Specimen Length, L (in) or ( )	5.557
Specimen Area, A (in^2) or ( )	4.465
Specimen Volume, V (cm^3) or ( )	406.61
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	115.8
DRY UNIT WEIGHT, DUW (pcf) or ( )	102.1
VOID RATIO	0.652
DEGREE OF SATURATION, S (%)	55.97

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.553	2.387
2	5.564	2.379
3	5.544	2.386
4	5.559	2.390
5	5.566	2.382
6	**XXXXX**	2.382
Average	5.557	2.384

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light yellowish brown Sandy SILT (ML)

TESTED BY: GD DATE: 7/21/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-44

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S216			
Mass of Container & Wet Specimen, M1 (g)	371.96			
Mass of Container & Dry Specimen, M2 (g)	333.47			
Mass of Container, M3 (g)	148.62			
WATER CONTENT, wn (%)	**20.82**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	743.74
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	743.74
Specimen Diameter, D (in) or ( )	2.386
Specimen Length, L (in) or ( )	5.766
Specimen Area, A (in^2) or ( )	4.472
Specimen Volume, V (cm^3) or ( )	422.52
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	109.9
DRY UNIT WEIGHT, DUW (pcf) or ( )	90.9
VOID RATIO	0.853
DEGREE OF SATURATION, S (%)	65.89

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.780	2.385
2	5.749	2.395
3	5.766	2.389
4	5.761	2.385
5	5.773	2.375
6	**XXXXX**	2.388
Average	5.766	2.386

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Clayey SILT (ML)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-46

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM		GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED	X	2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S205			
Mass of Container & Wet Specimen, M1 (g)	464.98			
Mass of Container & Dry Specimen, M2 (g)	416.56			
Mass of Container, M3 (g)	139.35			
WATER CONTENT, wn (%)	**17.47**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	833.71
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	833.71
Specimen Diameter, D (in) or ( )	2.376
Specimen Length, L (in) or ( )	5.898
Specimen Area, A (in^2) or ( )	4.432
Specimen Volume, V (cm^3) or ( )	428.33
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	121.5
DRY UNIT WEIGHT, DUW (pcf) or ( )	103.4
VOID RATIO	0.629
DEGREE OF SATURATION, S (%)	74.92

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.906	2.385
2	5.908	2.386
3	5.887	2.385
4	5.905	2.375
5	5.882	2.368
6	**XXXXX**	2.354
Average	5.898	2.376

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark olive brown to light olive brown Sandy SILT (ML)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-46

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT	X	2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	B40			
Mass of Container & Wet Specimen, M1 (g)	672.92			
Mass of Container & Dry Specimen, M2 (g)	584.30			
Mass of Container, M3 (g)	198.40			
WATER CONTENT, wn (%)	**22.96**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1075.15
Mass of Container, M5 (g)	273.16
Mass of Wet Specimen, M6 (g)	801.99
Specimen Diameter, D (in) or ( )	2.390
Specimen Length, L (in) or ( )	5.555
Specimen Area, A (in^2) or ( )	4.487
Specimen Volume, V (cm^3) or ( )	408.43
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	122.6
DRY UNIT WEIGHT, DUW (pcf) or ( )	99.7
VOID RATIO	0.691
DEGREE OF SATURATION, S (%)	89.76

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.543	2.378
2	5.547	2.395
3	5.558	2.381
4	5.560	2.399
5	5.566	2.383
6	**XXXXX**	2.405
Average	5.555	2.390

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark yellowish brown Sandy, Lean CLAY (CL)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-47

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD	X			6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S203			
Mass of Container & Wet Specimen, M1 (g)	466.89			
Mass of Container & Dry Specimen, M2 (g)	416.57			
Mass of Container, M3 (g)	147.94			
WATER CONTENT, wn (%)	**18.73**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1024.18
Mass of Container, M5 (g)	272.90
Mass of Wet Specimen, M6 (g)	751.28
Specimen Diameter, D (in) or ( )	2.385
Specimen Length, L (in) or ( )	5.606
Specimen Area, A (in^2) or ( )	4.468
Specimen Volume, V (cm^3) or ( )	410.43
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	114.3
DRY UNIT WEIGHT, DUW (pcf) or ( )	96.2
VOID RATIO	0.751
DEGREE OF SATURATION, S (%)	67.32

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.599	2.391
2	5.630	2.377
3	5.593	2.386
4	5.607	2.386
5	5.602	2.379
6	**XXXXX**	2.391
Average	5.606	2.385

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown SILT (ML)

TESTED BY: GD DATE: 7/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-48

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT	X	2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S306			
Mass of Container & Wet Specimen, M1 (g)	516.02			
Mass of Container & Dry Specimen, M2 (g)	486.33			
Mass of Container, M3 (g)	145.10			
WATER CONTENT, wn (%)	**8.70**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	736.76
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	736.76
Specimen Diameter, D (in) or ( )	2.376
Specimen Length, L (in) or ( )	5.988
Specimen Area, A (in^2) or ( )	4.433
Specimen Volume, V (cm^3) or ( )	435.02
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	105.7
DRY UNIT WEIGHT, DUW (pcf) or ( )	97.3
VOID RATIO	0.733
DEGREE OF SATURATION, S (%)	32.05

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.989	2.374
2	5.989	2.378
3	5.991	2.365
4	5.988	2.375
5	5.983	2.388
6	**XXXXX**	2.375
Average	5.988	2.376

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Poorly Graded SAND (SP)

TESTED BY: GD DATE: 7/25/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-48

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S215			
Mass of Container & Wet Specimen, M1 (g)	512.65			
Mass of Container & Dry Specimen, M2 (g)	457.10			
Mass of Container, M3 (g)	137.49			
WATER CONTENT, wn (%)	**17.38**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

Moisture content only. Bag sample.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Sandy SILT (ML)

TESTED BY: GD DATE: 7/25/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-49

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM		GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED	X	1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X			strong brown mottled		3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY					with grayish brown		4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S219			
Mass of Container & Wet Specimen, M1 (g)	479.55			
Mass of Container & Dry Specimen, M2 (g)	437.94			
Mass of Container, M3 (g)	140.70			
WATER CONTENT, wn (%)	**14.00**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	739.94
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	739.94
Specimen Diameter, D (in) or ( )	2.378
Specimen Length, L (in) or ( )	5.709
Specimen Area, A (in^2) or ( )	4.440
Specimen Volume, V (cm^3) or ( )	415.42
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	111.2
DRY UNIT WEIGHT, DUW (pcf) or ( )	97.5
VOID RATIO	0.728
DEGREE OF SATURATION, S (%)	51.92

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.713	2.386
2	5.715	2.377
3	5.707	2.370
4	5.711	2.365
5	5.701	2.383
6	**XXXXX**	2.385
Average	5.709	2.378

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Strong brown Silty SAND (SM)

TESTED BY: GD DATE: 7/25/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-50

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M66			
Mass of Container & Wet Specimen, M1 (g)	654.27			
Mass of Container & Dry Specimen, M2 (g)	548.87			
Mass of Container, M3 (g)	101.64			
WATER CONTENT, wn (%)	**23.57**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	905.33
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	905.33
Specimen Diameter, D (in) or ( )	2.391
Specimen Length, L (in) or ( )	5.976
Specimen Area, A (in^2) or ( )	4.488
Specimen Volume, V (cm^3) or ( )	439.54
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	128.6
DRY UNIT WEIGHT, DUW (pcf) or ( )	104.1
VOID RATIO	0.620
DEGREE OF SATURATION, S (%)	102.67

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.978	2.389
2	5.964	2.383
3	5.984	2.397
4	5.975	2.390
5	5.980	2.390
6	**XXXXX**	2.394
Average	5.976	2.391

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive brown Lean CLAY with Sand and Gravel (SL)

TESTED BY: GD DATE: 8/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-50

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE	X	2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S101			
Mass of Container & Wet Specimen, M1 (g)	455.75			
Mass of Container & Dry Specimen, M2 (g)	396.54			
Mass of Container, M3 (g)	95.31			
WATER CONTENT, wn (%)	**19.66**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

horzontally fractured layered siltstone

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	653.96
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	653.96
Specimen Diameter, D (in) or ( )	2.402
Specimen Length, L (in) or ( )	5.103
Specimen Area, A (in^2) or ( )	4.531
Specimen Volume, V (cm^3) or ( )	378.88
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	107.8
DRY UNIT WEIGHT, DUW (pcf) or ( )	90.1
VOID RATIO	0.872
DEGREE OF SATURATION, S (%)	60.88

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.112	2.395
2	5.085	2.410
3	5.118	2.418
4	5.094	2.389
5	5.106	2.397
6	**XXXXX**	2.402
Average	5.103	2.402

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light brownih gray SILT (ML)

TESTED BY: GD DATE: 8/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-52

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S217			
Mass of Container & Wet Specimen, M1 (g)	549.78			
Mass of Container & Dry Specimen, M2 (g)	485.04			
Mass of Container, M3 (g)	137.96			
WATER CONTENT, wn (%)	**18.65**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

Moisture content only. Bag sample.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Sandy SILT (ML)

TESTED BY: GD DATE: 7/25/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-52

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 15.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	B64			
Mass of Container & Wet Specimen, M1 (g)	685.21			
Mass of Container & Dry Specimen, M2 (g)	606.69			
Mass of Container, M3 (g)	200.61			
WATER CONTENT, wn (%)	**19.34**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

Moisture content only. Bag sample.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Sandy SILT (ML)

TESTED BY: GD DATE: 7/25/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 0 Boring No.: PS-3

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 5.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S38			
Mass of Container & Wet Specimen, M1 (g)	483.98			
Mass of Container & Dry Specimen, M2 (g)	438.92			
Mass of Container, M3 (g)	123.86			
WATER CONTENT, wn (%)	**14.30**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	771.32
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	771.32
Specimen Diameter, D (in) or ( )	2.409
Specimen Length, L (in) or ( )	5.984
Specimen Area, A (in^2) or ( )	4.557
Specimen Volume, V (cm^3) or ( )	446.86
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	107.8
DRY UNIT WEIGHT, DUW (pcf) or ( )	94.3
VOID RATIO	0.788
DEGREE OF SATURATION, S (%)	49.01

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.991	2.411
2	5.984	2.412
3	5.996	2.414
4	5.990	2.401
5	5.957	2.405
6	**XXXXX**	2.410
Average	5.984	2.409

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive brown Silty SAND (SM)

TESTED BY: ADC DATE: 6/9/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 0 Boring No.: PS-3

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 15.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S8			
Mass of Container & Wet Specimen, M1 (g)	561.41			
Mass of Container & Dry Specimen, M2 (g)	473.42			
Mass of Container, M3 (g)	115.21			
WATER CONTENT, wn (%)	**24.56**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	840.42
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	840.42
Specimen Diameter, D (in) or ( )	2.421
Specimen Length, L (in) or ( )	5.876
Specimen Area, A (in^2) or ( )	4.602
Specimen Volume, V (cm^3) or ( )	443.08
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	118.4
DRY UNIT WEIGHT, DUW (pcf) or ( )	95.1
VOID RATIO	0.773
DEGREE OF SATURATION, S (%)	85.78

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.863	2.405
2	5.901	2.432
3	5.851	2.427
4	5.890	2.400
5	5.875	2.433
6	**XXXXX**	2.426
Average	5.876	2.421

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Poorly Graded SAND (SP)

TESTED BY: ADC DATE: 6/9/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 0 Boring No.: PS-3

Project Name: Pure Water Sample No.: 7

Project Engineer: SF Depth (ft): 40.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S9			
Mass of Container & Wet Specimen, M1 (g)	530.45			
Mass of Container & Dry Specimen, M2 (g)	419.69			
Mass of Container, M3 (g)	87.90			
WATER CONTENT, wn (%)	**33.38**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	857.65
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	857.65
Specimen Diameter, D (in) or ( )	2.422
Specimen Length, L (in) or ( )	5.948
Specimen Area, A (in^2) or ( )	4.608
Specimen Volume, V (cm^3) or ( )	449.16
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	119.2
DRY UNIT WEIGHT, DUW (pcf) or ( )	89.4
VOID RATIO	0.886
DEGREE OF SATURATION, S (%)	101.72

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.858	2.421
2	5.956	2.421
3	5.946	2.427
4	5.994	2.422
5	5.984	2.423
6	**XXXXX**	2.420
Average	5.948	2.422

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Greenish black Sandy SILT (ML)

TESTED BY: ADC DATE: 6/9/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-01

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY	X	1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST		2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S203			
Mass of Container & Wet Specimen, M1 (g)	555.94			
Mass of Container & Dry Specimen, M2 (g)	514.83			
Mass of Container, M3 (g)	147.95			
WATER CONTENT, wn (%)	**11.21**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	713.59
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	713.59
Specimen Diameter, D (in) or ( )	2.379
Specimen Length, L (in) or ( )	6.033
Specimen Area, A (in^2) or ( )	4.445
Specimen Volume, V (cm^3) or ( )	439.45
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	101.4
DRY UNIT WEIGHT, DUW (pcf) or ( )	91.2
VOID RATIO	0.849
DEGREE OF SATURATION, S (%)	35.63

	MEASURED DIMENSIONS	
	Length	Diameter
1	6.032	2.378
2	6.031	2.370
3	6.032	2.383
4	6.034	2.380
5	6.036	2.384
6	**XXXXX**	2.379
Average	6.033	2.379

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Very dark brown Silty SAND (SM)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-02

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 7.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S220			
Mass of Container & Wet Specimen, M1 (g)	768.78			
Mass of Container & Dry Specimen, M2 (g)	671.95			
Mass of Container, M3 (g)	140.53			
WATER CONTENT, wn (%)	**18.22**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	846.11
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	846.11
Specimen Diameter, D (in) or ( )	2.382
Specimen Length, L (in) or ( )	5.917
Specimen Area, A (in^2) or ( )	4.457
Specimen Volume, V (cm^3) or ( )	432.14
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	122.2
DRY UNIT WEIGHT, DUW (pcf) or ( )	103.4
VOID RATIO	0.630
DEGREE OF SATURATION, S (%)	78.06

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.986	2.381
2	5.858	2.381
3	5.913	2.387
4	5.948	2.377
5	5.879	2.384
6	**XXXXX**	2.383
Average	5.917	2.382

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Very dark brown Sandy SILT (ML)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-02

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 15.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE	X	3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S210			
Mass of Container & Wet Specimen, M1 (g)	682.76			
Mass of Container & Dry Specimen, M2 (g)	584.65			
Mass of Container, M3 (g)	147.23			
WATER CONTENT, wn (%)	**22.43**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

No unit weight due to excessive disturbance.

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	
Mass of Container, M5 (g)	
Mass of Wet Specimen, M6 (g)	
Specimen Diameter, D (in) or ( )	
Specimen Length, L (in) or ( )	
Specimen Area, A (in^2) or ( )	
Specimen Volume, V (cm^3) or ( )	
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	
DRY UNIT WEIGHT, DUW (pcf) or ( )	
VOID RATIO	
DEGREE OF SATURATION, S (%)	

	MEASURED DIMENSIONS	
	Length	Diameter
1		
2		
3		
4		
5		
6	**XXXXX**	
Average		

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive Poorly Graded SAND with Silt (SP-SM)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-03

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	X
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M3			
Mass of Container & Wet Specimen, M1 (g)	886.87			
Mass of Container & Dry Specimen, M2 (g)	724.07			
Mass of Container, M3 (g)	89.90			
WATER CONTENT, wn (%)	**25.67**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	849.61
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	849.61
Specimen Diameter, D (in) or ( )	2.404
Specimen Length, L (in) or ( )	5.981
Specimen Area, A (in^2) or ( )	4.537
Specimen Volume, V (cm^3) or ( )	444.66
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	119.3
DRY UNIT WEIGHT, DUW (pcf) or ( )	94.9
VOID RATIO	0.776
DEGREE OF SATURATION, S (%)	89.34

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.971	2.402
2	5.978	2.393
3	5.978	2.393
4	5.984	2.407
5	5.992	2.413
6	**XXXXX**	2.413
Average	5.981	2.404

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark olive brown Silty SAND (SM)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-06

Project Name: Pure Water Sample No.: 3b

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE		0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT	X	1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S21			
Mass of Container & Wet Specimen, M1 (g)	878.87			
Mass of Container & Dry Specimen, M2 (g)	846.00			
Mass of Container, M3 (g)	104.82			
WATER CONTENT, wn (%)	**4.43**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

Rock approximately > 2.5" diameter x 2" high

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1209.18
Mass of Container, M5 (g)	278.77
Mass of Wet Specimen, M6 (g)	930.41
Specimen Diameter, D (in) or ( )	2.398
Specimen Length, L (in) or ( )	5.906
Specimen Area, A (in^2) or ( )	4.516
Specimen Volume, V (cm^3) or ( )	437.13
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	132.9
DRY UNIT WEIGHT, DUW (pcf) or ( )	127.2
VOID RATIO	0.325
DEGREE OF SATURATION, S (%)	36.87

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.741	2.392
2	5.992	2.400
3	6.015	2.395
4	5.944	2.404
5	5.840	2.410
6	**XXXXX**	2.387
Average	5.906	2.398

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive gray Clayey SAND (SC)

TESTED BY: ADC DATE: 6/13/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-06

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD	X			6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	S41			
Mass of Container & Wet Specimen, M1 (g)	680.29			
Mass of Container & Dry Specimen, M2 (g)	600.39			
Mass of Container, M3 (g)	82.88			
WATER CONTENT, wn (%)	**15.44**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	972.46
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	972.46
Specimen Diameter, D (in) or ( )	2.394
Specimen Length, L (in) or ( )	5.963
Specimen Area, A (in^2) or ( )	4.500
Specimen Volume, V (cm^3) or ( )	439.73
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	138.1
DRY UNIT WEIGHT, DUW (pcf) or ( )	119.6
VOID RATIO	0.409
DEGREE OF SATURATION, S (%)	101.82

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.969	2.395
2	5.945	2.392
3	5.964	2.392
4	5.971	2.397
5	5.966	2.394
6	**XXXXX**	2.392
Average	5.963	2.394

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive brown to dark yellowish brown Sandy, Lean CLAY (CL)

TESTED BY: ADC DATE: 6/13/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 0 Boring No.: WM-07

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 15.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM		GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS		1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED	X	2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	C8			
Mass of Container & Wet Specimen, M1 (g)	680.03			
Mass of Container & Dry Specimen, M2 (g)	581.89			
Mass of Container, M3 (g)	71.56			
WATER CONTENT, wn (%)	**19.23**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

some oxidized seams

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	907.93
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	907.93
Specimen Diameter, D (in) or ( )	2.387
Specimen Length, L (in) or ( )	5.959
Specimen Area, A (in^2) or ( )	4.473
Specimen Volume, V (cm^3) or ( )	436.83
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	129.8
DRY UNIT WEIGHT, DUW (pcf) or ( )	108.8
VOID RATIO	0.549
DEGREE OF SATURATION, S (%)	94.60

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.966	2.377
2	5.948	2.389
3	5.962	2.381
4	5.962	2.386
5	5.959	2.396
6	**XXXXX**	2.390
Average	5.959	2.387

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Gray to dark grayish brown Lean CLAY with Sand (CL)

TESTED BY: ADC DATE: 6/13/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-10

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M62			
Mass of Container & Wet Specimen, M1 (g)	780.17			
Mass of Container & Dry Specimen, M2 (g)	700.90			
Mass of Container, M3 (g)	91.69			
WATER CONTENT, wn (%)	**13.01**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	873.70
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	873.70
Specimen Diameter, D (in) or ( )	2.384
Specimen Length, L (in) or ( )	5.959
Specimen Area, A (in^2) or ( )	4.464
Specimen Volume, V (cm^3) or ( )	435.90
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	125.1
DRY UNIT WEIGHT, DUW (pcf) or ( )	110.7
VOID RATIO	0.522
DEGREE OF SATURATION, S (%)	67.25

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.950	2.381
2	5.951	2.382
3	5.982	2.386
4	5.924	2.381
5	5.989	2.390
6	**XXXXX**	2.384
Average	5.959	2.384

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark brown to reddish brown Clayey SAND (SC)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-11

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	M9			
Mass of Container & Wet Specimen, M1 (g)	755.40			
Mass of Container & Dry Specimen, M2 (g)	675.48			
Mass of Container, M3 (g)	89.74			
WATER CONTENT, wn (%)	**13.64**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	923.49
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	923.49
Specimen Diameter, D (in) or ( )	2.386
Specimen Length, L (in) or ( )	5.974
Specimen Area, A (in^2) or ( )	4.471
Specimen Volume, V (cm^3) or ( )	437.64
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	131.7
DRY UNIT WEIGHT, DUW (pcf) or ( )	115.9
VOID RATIO	0.454
DEGREE OF SATURATION, S (%)	81.12

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.982	2.388
2	5.940	2.382
3	5.980	2.390
4	5.982	2.383
5	5.985	2.383
6	**XXXXX**	2.389
Average	5.974	2.386

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Dark yellowish brown Clayey SAND (SC)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-11

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)	X	3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF	X	4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	N5			
Mass of Container & Wet Specimen, M1 (g)	606.00			
Mass of Container & Dry Specimen, M2 (g)	510.49			
Mass of Container, M3 (g)	104.63			
WATER CONTENT, wn (%)	**23.53**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	909.02
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	909.02
Specimen Diameter, D (in) or ( )	2.387
Specimen Length, L (in) or ( )	5.936
Specimen Area, A (in^2) or ( )	4.473
Specimen Volume, V (cm^3) or ( )	435.09
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	130.4
DRY UNIT WEIGHT, DUW (pcf) or ( )	105.6
VOID RATIO	0.596
DEGREE OF SATURATION, S (%)	106.53

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.986	2.380
2	5.894	2.383
3	5.917	2.382
4	5.973	2.394
5	5.908	2.388
6	**XXXXX**	2.392
Average	5.936	2.387

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive Lean CLAY with Sand (CL)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-16

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND		X			OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT							3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY	X						4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF		3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF	X	5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	X2			
Mass of Container & Wet Specimen, M1 (g)	894.84			
Mass of Container & Dry Specimen, M2 (g)	807.50			
Mass of Container, M3 (g)	147.90			
WATER CONTENT, wn (%)	**13.24**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	964.09
Mass of Container, M5 (g)	0.00
Mass of Wet Specimen, M6 (g)	964.09
Specimen Diameter, D (in) or ( )	2.392
Specimen Length, L (in) or ( )	5.998
Specimen Area, A (in^2) or ( )	4.495
Specimen Volume, V (cm^3) or ( )	441.84
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	136.2
DRY UNIT WEIGHT, DUW (pcf) or ( )	120.3
VOID RATIO	0.401
DEGREE OF SATURATION, S (%)	89.09

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.989	2.380
2	6.004	2.379
3	5.999	2.382
4	6.002	2.404
5	5.998	2.407
6	**XXXXX**	2.402
Average	5.998	2.392

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Yellowish brown Sandy, Lean CLAY (CL)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-16

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM	X	6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE		7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)	X	1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	
2). SOFT		2). LOW (PI = 1 to 10))		2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	X
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	X9			
Mass of Container & Wet Specimen, M1 (g)	1057.04			
Mass of Container & Dry Specimen, M2 (g)	926.20			
Mass of Container, M3 (g)	134.45			
WATER CONTENT, wn (%)	**16.53**			

Circle Approximate Max. Grain Size in "Sample"	3"	1-1/2"	3/4"	3/8"	#4	#10	<#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1210.38
Mass of Container, M5 (g)	280.49
Mass of Wet Specimen, M6 (g)	929.89
Specimen Diameter, D (in) or ( )	2.388
Specimen Length, L (in) or ( )	5.854
Specimen Area, A (in^2) or ( )	4.479
Specimen Volume, V (cm^3) or ( )	429.68
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	135.1
DRY UNIT WEIGHT, DUW (pcf) or ( )	115.9
VOID RATIO	0.454
DEGREE OF SATURATION, S (%)	98.33

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.942	2.381
2	5.746	2.382
3	5.955	2.387
4	5.831	2.388
5	5.798	2.392
6	**XXXXX**	2.398
Average	5.854	2.388

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Olive Poorly Graded SAND with Silt (SP-SM)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-22

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY		1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST	X	2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND					OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT	X						3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY		X					4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	X3			
Mass of Container & Wet Specimen, M1 (g)	997.00			
Mass of Container & Dry Specimen, M2 (g)	858.00			
Mass of Container, M3 (g)	138.05			
WATER CONTENT, wn (%)	**19.31**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1075.57
Mass of Container, M5 (g)	209.88
Mass of Wet Specimen, M6 (g)	865.69
Specimen Diameter, D (in) or ( )	2.411
Specimen Length, L (in) or ( )	5.921
Specimen Area, A (in^2) or ( )	4.565
Specimen Volume, V (cm^3) or ( )	442.95
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	122.0
DRY UNIT WEIGHT, DUW (pcf) or ( )	102.3
VOID RATIO	0.648
DEGREE OF SATURATION, S (%)	80.42

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.967	2.412
2	5.910	2.410
3	5.954	2.407
4	5.828	2.414
5	5.948	2.412
6	**XXXXX**	2.410
Average	5.921	2.411

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Brownish yellow Sandy, Clayey SILT (CL-ML)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

WATER CONTENT, UNIT WEIGHT, AND VISUAL DESCRIPTION

ASTM D2216, D7263, D2488

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-24

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

TYPE OF SAMPLE		VISUAL SIGNS OF DISTURBANCE (1)		SOIL COMPONENT	Major	Minor	WATER CONTENT ADJECTIVES		COLOR		GRADATION		SHAPE OF GRAINS	
1). BULK		1). NONE	X	0). BOULDERS (>12")			1). DRY	X	1). UNIFORM	X	GRAVEL		1). ANGULAR	
2). SPT		2). SLIGHT		1). COBBLES (>3")			2). MOIST		2). SPOTTED		1). COARSE		2). SUBANGULAR	X
3). CALIFORNIA SLEEVE	X	3). MODERATE		2). GRAVEL			3). WET		3). STREAKED		2). FINE		3). ROUNDED	
4). CORE		4). EXCESSIVE		3). SAND	X				OTHER:		SAND		4). SUBROUNDED	
5). RINGS				4). SILT		X					3). COARSE		5). FLAT	
6). THIN WALL TUBE				5). CLAY							4). MEDIUM		6). ELONGATED	
7). RECONSTITUTED				6). ORGANIC							5). FINE	X	7). FLAT & ELONG.	
				7). PEAT										
				OTHER:										

CONSISTENCY (MANUAL)		PLASTICITY ADJECTIVES		STRUCTURE		ORGANIC APPEARANCE		ORGANIC ODOR		HCl REACTION		MICA CONTENT	
1). VERY SOFT		1). NON-PLASTIC (PI = 0)		1). HOMOGENEOUS	X	1). NONE	X	1). NONE	X	1). NOT TESTED	X	1). NONE	X
2). SOFT		2). LOW (PI = 1 to 10))	X	2). STRATIFIED		2). FIBROUS		2).ORGANIC		2). NONE		2). LOW	
3). MED. STIFF	X	3). MEDIUM (PI >10 to 20)		3). FISSURED		3).DECOMPOSED		3). FUEL		3). WEAK		3). MEDIUM	
4). STIFF		4). HIGH (PI >20 to 40)		4). SLICKENSIDED		OTHER:				4).STRONG		4). HIGH	
5). VERY STIFF		5). VERY PLASTIC (PI >40)		5). BLOCKY						OTHER:		OTHER:	
6). HARD				6). POROUS									
				7). CEMENTED									
				8). FRIABLE									

AS-RECEIVED WATER CONTENT (OVEN DRIED)	Average	Sub-Specimen / Sub-Layer		
Container No.	SNA1			
Mass of Container & Wet Specimen, M1 (g)	923.94			
Mass of Container & Dry Specimen, M2 (g)	894.10			
Mass of Container, M3 (g)	145.67			
WATER CONTENT, wn (%)	**3.99**			

Circle Approximate Max. Grain Size in "Sample" 3" 1-1/2" 3/4" 3/8" #4 #10 <#10

Remarks

UNIT WEIGHT

Container No.	
Mass of Container and Wet Specimen, M4 (g)	1065.06
Mass of Container, M5 (g)	131.44
Mass of Wet Specimen, M6 (g)	933.62
Specimen Diameter, D (in) or ( )	2.412
Specimen Length, L (in) or ( )	5.626
Specimen Area, A (in^2) or ( )	4.568
Specimen Volume, V (cm^3) or ( )	421.12
assumed Specific Gravity, Gs	2.70
WET UNIT WEIGHT, WUW (pcf) or ( )	138.4
DRY UNIT WEIGHT, DUW (pcf) or ( )	133.1
VOID RATIO	0.266
DEGREE OF SATURATION, S (%)	40.40

	MEASURED DIMENSIONS	
	Length	Diameter
1	5.515	2.410
2	5.620	2.408
3	5.532	2.409
4	5.795	2.414
5	5.667	2.412
6	**XXXXX**	2.417
Average	5.626	2.412

This Excel spreadsheet is used to verify calculations.

w or wn = ((M1 - M2) / (M2 - M3)) * 100

WUW = (M6,g) / (V,cm^3) * (62.43, lb/ft^3 DUW = WUW / (1 + (w / 100))

S = (DUW * w * Gs) / ((Gs * Unit Weight or Density of Water) - DUW)

Unit Weight or Density of Water (20° C) = 62.32 pcf or 0.9982 g/cm^3

Specimen Color and Description: Light olive brown Silty SAND (SM)

TESTED BY: ADC DATE: 6/19/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-01

Project Name: Pure Water Sample No.: 4a

Project Engineer: SF Depth (ft): 15.0

Visual Description: Dark yellowish brown Clayey SAND (SC)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x				
Yes		**By:**		Mortar & Pestle	
				Pulverizer	
				Hand	
				Other	

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	LF3
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	325.09
Container Number		LF3	LF3	Dry, M2 (g)	305.44
Mass of Container and Dry Soil, (g)		305.44	268.89	Cont.,M3 (g)	205.15
Mass of Container, (g)		205.15	205.15	**Water Content (%)**	**19.59**
Dry Soil, Ws (g)		100.29	63.74		

SIEVING RESULTS % error: 0.06

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	26.07		74.0
#60 / 60			
#100 / 40	49		51.1
#140 / 30			
#200 / 20	62.85		37.3
Pan	63.78	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	37.3	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-01

Project Name: Pure Water Sample No.: 7

Project Engineer: SF Depth (ft): 30.0

Visual Description: Dark olive gray Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample	x		Thin-Walled Tube	x
Calif. Sample			Engr. Test Specimen's WC	c

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No x

Yes

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	L19
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	747.61
Container Number		L19	L19	Dry, M2 (g)	614.13
Mass of Container and Dry Soil, (g)		614.13	552.32	Cont.,M3 (g)	134.87
Mass of Container, (g)		134.87	134.9	**Water Content (%)**	**27.85**
Dry Soil, Ws (g)		479.26	417.42		

SIEVING RESULTS

% error: 0.04

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	58.34		87.8
#60 / 60			
#100 / 40	329.17		31.3
#140 / 30			
#200 / 20	412.6		13.9
Pan	417.27	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	13.9	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-02

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

Visual Description: Very dark gray Poorly Graded SAND with Silt (SP-SM)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x				
Yes		**By:**		Mortar & Pestle	Hand
				Pulverizer	Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B59
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	721.76
Container Number		B59	B59	Dry, M2 (g)	549.9
Mass of Container and Dry Soil, (g)		549.9	513.44	Cont.,M3 (g)	200.13
Mass of Container, (g)		200.13	200.18	**Water Content (%)**	**49.14**
Dry Soil, Ws (g)		349.77	313.26		

SIEVING RESULTS % error: 0.03

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	25.62		92.7
#60 / 60			
#100 / 40	240.01		31.4
#140 / 30			
#200 / 20	308.21		11.9
Pan	313.34	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	11.9	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: [ ] No [x] Yes Amount Adjective: medium

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-03

Project Name: Pure Water Sample No.: 7

Project Engineer: SF Depth (ft): 30.0

Visual Description: Dark gray Clayey SAND (SC)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No [x] Yes [ ] **By:** [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B96
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	713.97
Container Number		B96	B96	Dry, M2 (g)	584.22
Mass of Container and Dry Soil, (g)		584.22	427.6	Cont.,M3 (g)	204.67
Mass of Container, (g)		204.67	204.72	**Water Content (%)**	**34.19**
Dry Soil, Ws (g)		379.55	222.88		

SIEVING RESULTS % error: 0.04

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	15.89		95.8
#60 / 60			
#100 / 40	163.67		56.9
#140 / 30			
#200 / 20	219.14		42.3
Pan	222.8	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	42.3	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: [ ] No [x] Yes Amount Adjective: medium

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-06

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 0~5

Visual Description: Dark grayish brown Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample	x		Other ___		Sieves (1) - whole sample used
SPT Sample			Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

	Whole sample used
	See Bulk Sample Processing Form

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x				
Yes		**By:**		Mortar & Pestle	
				Pulverizer	
				Hand	
				Other	

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B55
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	806.97
Container Number		B55	B55	Dry, M2 (g)	742
Mass of Container and Dry Soil, (g)		742	533.41	Cont.,M3 (g)	197.9
Mass of Container, (g)		197.9	197.96	**Water Content (%)**	**11.94**
Dry Soil, Ws (g)		544.1	335.45		

SIEVING RESULTS % error: 0.03

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	113.13		79.2
#60 / 60			
#100 / 40	258.38		52.5
#140 / 30			
#200 / 20	331.91		39.0
Pan	335.34	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	39.0	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No ___ Yes Amount Adjective: ___

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: DS-06

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 15.0

Visual Description: Dark grayish brown Poorly Graded SAND with Silt (SP-SM)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

Washing:

No x

Yes

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B10
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	789.84
Container Number		B10	B10	Dry, M2 (g)	650.79
Mass of Container and Dry Soil, (g)		650.79	618.75	Cont.,M3 (g)	197.98
Mass of Container, (g)		197.98	198.01	**Water Content (%)**	**30.71**
Dry Soil, Ws (g)		452.81	420.74		

SIEVING RESULTS

% error: 0.02

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	19.34		95.7
#60 / 60			
#100 / 40	346.71		23.4
#140 / 30			
#200 / 20	416.9		7.9
Pan	420.64	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	7.9	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-01

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 0-5

Visual Description: Olive brown Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample	x		Other ___		Sieves (1) - whole sample used
SPT Sample			Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

	Whole sample used
	See Bulk Sample Processing Form

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: Mortar & Pestle ( ) Hand ( ) Pulverizer ( ) Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B38
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	794.35
Container Number		B38	B38	Dry, M2 (g)	735.41
Mass of Container and Dry Soil, (g)		735.41	575.58	Cont.,M3 (g)	200.34
Mass of Container, (g)		200.34	200.34	**Water Content (%)**	**11.02**
Dry Soil, Ws (g)		535.07	375.24		

SIEVING RESULTS % error: 0.08

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	49.36		90.8
#60 / 60			
#100 / 40	252.7		52.8
#140 / 30			
#200 / 20	368.57		31.1
Pan	374.94	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	31.1	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No ( ) Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 05/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-01

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

Visual Description: Dark gray Poorly Graded SAND with Silt (SP-SM)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x				
Yes		**By:**		Mortar & Pestle	Hand
				Pulverizer	Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B62
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	427.75
Container Number		B62	B62	Dry, M2 (g)	386.41
Mass of Container and Dry Soil, (g)		386.41	376.45	Cont.,M3 (g)	200.38
Mass of Container, (g)		200.38	200.38	**Water Content (%)**	**22.22**
Dry Soil, Ws (g)		186.03	176.07		

SIEVING RESULTS % error: 0.02

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	66.53		64.2
#60 / 60			
#100 / 40	162.94		12.4
#140 / 30			
#200 / 20	175.59		5.6
Pan	176.03	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	5.6	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 05/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-02

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 15.0

Visual Description: Dark gray Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x				
Yes		**By:**		Mortar & Pestle	
				Pulverizer	
				Hand	
				Other	

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B68
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	597.16
Container Number		B68	B68	Dry, M2 (g)	506.7
Mass of Container and Dry Soil, (g)		506.7	472.41	Cont.,M3 (g)	200.19
Mass of Container, (g)		200.19	200.19	**Water Content (%)**	**29.51**
Dry Soil, Ws (g)		306.51	272.22		

SIEVING RESULTS % error: 0.10

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	30.16		90.2
#60 / 60			
#100 / 40	219.54		28.4
#140 / 30			
#200 / 20	269.53		12.1
Pan	271.96	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	12.1	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: [ ] No [x] Yes Amount Adjective: high

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 05/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-03

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 5.0

Visual Description: Olive brown Poorly Graded SAND with Silt (SP-SM)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No [x] Yes [ ] **By:** [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B35
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	456.66
Container Number		B35	B35	Dry, M2 (g)	448.51
Mass of Container and Dry Soil, (g)		448.51	422.15	Cont.,M3 (g)	198.11
Mass of Container, (g)		198.11	198.11	**Water Content (%)**	**3.25**
Dry Soil, Ws (g)		250.4	224.04		

SIEVING RESULTS % error: 0.08

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	26.42		89.4
#60 / 60			
#100 / 40	190.68		23.8
#140 / 30			
#200 / 20	223.01		10.9
Pan	223.86	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	10.9	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: [ ] No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 05/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-04

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 10.0

Visual Description: Strong brown Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample	x		Thin-Walled Tube	
Calif. Sample			Engr. Test Specimen's WC	

Whole sample used

See Bulk Sample Processing Form

Selection Method:

x Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: Mortar & Pestle; Hand; Pulverizer; Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B57
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	393.24
Container Number		B57	B57	Dry, M2 (g)	378.2
Mass of Container and Dry Soil, (g)		378.2	311.51	Cont.,M3 (g)	200.54
Mass of Container, (g)		200.54	200.54	**Water Content (%)**	**8.47**
Dry Soil, Ws (g)		177.66	110.97		

SIEVING RESULTS

% error: 0.01

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	58.78		66.9
#60 / 60			
#100 / 40	85.1		52.1
#140 / 30			
#200 / 20	109.45		38.4
Pan	110.96	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES

% GRAVEL

% SAND

% FINES 38.4

D60 XXXXX D85 XXXXX

D30 XXXXX D15 XXXXX

D10 XXXXX D50 XXXXX

Cu = XXXXX Cc = XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: No Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 05/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-06

Project Name: Pure Water Sample No.: 5

Project Engineer: SF Depth (ft): 18.5

Visual Description: Yellowish brown Well Graded SAND with Gravel (SW)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample	x		Thin-Walled Tube	
Calif. Sample			Engr. Test Specimen's WC	

Whole sample used

See Bulk Sample Processing Form

Selection Method:

x Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: Mortar & Pestle; Hand; Pulverizer; Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B83
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	798.98
Container Number		B83	B83	Dry, M2 (g)	704.15
Mass of Container and Dry Soil, (g)		704.15	701.04	Cont.,M3 (g)	205.44
Mass of Container, (g)		205.44	205.44	**Water Content (%)**	**19.02**
Dry Soil, Ws (g)		498.71	495.6		

SIEVING RESULTS % error: 0.03

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	453.85		9.0
#60 / 60			
#100 / 40	492.36		1.3
#140 / 30			
#200 / 20	495.38		0.7
Pan	495.46	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	0.7	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: No Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 05/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-07

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 0-5

Visual Description: Dark yellowish brown Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample	x		Other ___		Sieves (1) - whole sample used
SPT Sample			Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

	Whole sample used
	See Bulk Sample Processing Form

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: Mortar & Pestle ( ) Hand ( ) Pulverizer ( ) Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B56
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	655.56
Container Number		B56	B56	Dry, M2 (g)	595.33
Mass of Container and Dry Soil, (g)		595.33	421.66	Cont.,M3 (g)	197.66
Mass of Container, (g)		197.66	197.66	**Water Content (%)**	**15.15**
Dry Soil, Ws (g)		397.67	224		

SIEVING RESULTS % error: 0.00

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	47.08		88.2
#60 / 60			
#100 / 40	135.28		66.0
#140 / 30			
#200 / 20	219.16		44.9
Pan	223.99	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	44.9	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: ( ) No ( ) Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 05/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-07

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

Visual Description: Light olive brown Poorly Graded SAND (SP)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample	x		Thin-Walled Tube	
Calif. Sample			Engr. Test Specimen's WC	

Whole sample used

See Bulk Sample Processing Form

Selection Method:

x Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: Mortar & Pestle; Hand; Pulverizer; Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B73
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	819.65
Container Number		B73	B73	Dry, M2 (g)	712.83
Mass of Container and Dry Soil, (g)		712.83	689.48	Cont.,M3 (g)	200.86
Mass of Container, (g)		200.86	200.86	**Water Content (%)**	**20.86**
Dry Soil, Ws (g)		511.97	488.62		

SIEVING RESULTS

% error: 0.02

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	170.9		66.6
#60 / 60			
#100 / 40	458.78		10.4
#140 / 30			
#200 / 20	487.61		4.8
Pan	488.54	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	4.8	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: No Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 05/23/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-18

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

Visual Description: Light olive brown Lean CLAY (CL)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample			Thin-Walled Tube	x
Calif. Sample	x		Engr. Test Specimen's WC	c

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No x

Yes

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B27
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	779.48
Container Number		B27	B27	Dry, M2 (g)	686.58
Mass of Container and Dry Soil, (g)		686.58	234.88	Cont.,M3 (g)	200.49
Mass of Container, (g)		200.49	200.49	**Water Content (%)**	**19.11**
Dry Soil, Ws (g)		486.09	34.39		

SIEVING RESULTS

% error: 0.23

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	0.96		99.8
#60 / 60			
#100 / 40	4.83		99.0
#140 / 30			
#200 / 20	33.04		93.2
Pan	34.31	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	93.2	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: ADC DATE 06/13/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-24

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 5.0

Visual Description: Strong brown Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample	x		Thin-Walled Tube	
Calif. Sample			Engr. Test Specimen's WC	

Whole sample used

See Bulk Sample Processing Form

Selection Method:

x Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: Mortar & Pestle Hand; Pulverizer Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B50
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	412.11
Container Number		B50	B50	Dry, M2 (g)	399.88
Mass of Container and Dry Soil, (g)		399.88	359.62	Cont.,M3 (g)	200.37
Mass of Container, (g)		200.37	200.37	**Water Content (%)**	**6.13**
Dry Soil, Ws (g)		199.51	159.25		

SIEVING RESULTS

% error: 0.15

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	61.49		69.2
#60 / 60			
#100 / 40	146.37		26.6
#140 / 30			
#200 / 20	158.59		20.5
Pan	159.01	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	20.5	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 07/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-25

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 0~5

Visual Description: Strong brown Clayey SAND (SC)

SPECIMEN: Tested From:

Bulk Sample	x		Other ___		Sieves (1) - whole sample used
SPT Sample			Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x					
Yes		**By:**		Mortar & Pestle		Hand
				Pulverizer		Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B7
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	654.63
Container Number		B7	B7	Dry, M2 (g)	612.13
Mass of Container and Dry Soil, (g)		612.13	488.21	Cont.,M3 (g)	198.1
Mass of Container, (g)		198.1	198.19	**Water Content (%)**	**10.26**
Dry Soil, Ws (g)		414.03	290.02		

SIEVING RESULTS % error: 0.01

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	164.63		60.2
#60 / 60			
#100 / 40	265		36.0
#140 / 30			
#200 / 20	289.1		30.2
Pan	289.98	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	30.2	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/17/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-27

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 5.0

Visual Description: Light yellowish brown CLAY with Sand (CL)

SPECIMEN: Tested From:

Bulk Sample		Other ____		Sieves (1) - whole sample used
SPT Sample	x	Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample		Engr. Test Specimen's WC	c	Method

Whole sample used

See Bulk Sample Processing Form

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: Mortar & Pestle; Hand; Pulverizer; Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B98
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	715.27
Container Number		B98	B98	Dry, M2 (g)	628.73
Mass of Container and Dry Soil, (g)		628.73	301.83	Cont.,M3 (g)	203.42
Mass of Container, (g)		203.42	203.5	**Water Content (%)**	**20.35**
Dry Soil, Ws (g)		425.31	98.33		

SIEVING RESULTS % error: 0.17

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	40.47		90.5
#60 / 60			
#100 / 40	55.22		87.0
#140 / 30			
#200 / 20	94.03		77.9
Pan	98.5	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	77.9	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No ; Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-32

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

Visual Description: Light olive brown Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample			Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample	x		Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B36
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	665.95
Container Number		B36	B36	Dry, M2 (g)	600.81
Mass of Container and Dry Soil, (g)		600.81	492.75	Cont.,M3 (g)	197.98
Mass of Container, (g)		197.98	198.06	**Water Content (%)**	**16.17**
Dry Soil, Ws (g)		402.83	294.69		

SIEVING RESULTS % error: 0.08

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	17.97		95.5
#60 / 60			
#100 / 40	219.71		45.5
#140 / 30			
#200 / 20	291.39		27.7
Pan	294.93	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	27.7	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-41

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 0~5

Visual Description: Light olive brown Sandy SILT (ML)

SPECIMEN: Tested From:

Bulk Sample	x		Other ___		Sieves (1) - whole sample used
SPT Sample			Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

Selection Method:

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x
Yes	

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B1
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	640.99
Container Number		B1	B1	Dry, M2 (g)	574.06
Mass of Container and Dry Soil, (g)		574.06	370.06	Cont.,M3 (g)	200.05
Mass of Container, (g)		200.05	200.05	**Water Content (%)**	**17.90**
Dry Soil, Ws (g)		374.01	170.01		

SIEVING RESULTS % error: 0.02

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	20.41		94.5
#60 / 60			
#100 / 40	58.66		84.3
#140 / 30			
#200 / 20	167.59		55.2
Pan	169.98	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	55.2	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: ADC DATE 07/20/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-45

Project Name: Pure Water Sample No.: 3

Project Engineer: SF Depth (ft): 10.0

Visual Description: Light olive brown Silty CLAY (CL)

SPECIMEN: Tested From:

Bulk Sample			Other ___	
SPT Sample			Thin-Walled Tube	x
Calif. Sample	x		Engr. Test Specimen's WC	c

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received [x]
Air Dried [ ]
Oven-Dried [ ]

Test Method (D1140)

Method A [x] not dispersed
Method B [ ] is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No [x]
Yes [ ] **By:** [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B68
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	648.35
Container Number		B68	B68	Dry, M2 (g)	572.66
Mass of Container and Dry Soil, (g)		572.66	213.21	Cont.,M3 (g)	200.17
Mass of Container, (g)		200.17	200.2	**Water Content (%)**	**20.32**
Dry Soil, Ws (g)		372.49	13.01		

SIEVING RESULTS % error: 0.54

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	1.13		99.7
#60 / 60			
#100 / 40	2.04		99.5
#140 / 30			
#200 / 20	12.43		96.7
Pan	12.94	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES ____ D60 XXXXX D85 XXXXX

% GRAVEL ____ D30 XXXXX D15 XXXXX

% SAND ____ D10 XXXXX D50 XXXXX

% FINES 96.7 Cu = XXXXX Cc = XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: [x] No [ ] Yes Amount Adjective: ____

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 08/18/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-46

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 18.5

Visual Description: Dark yellowish brown Sandy, Lean CLAY (CL)

SPECIMEN: Tested From:

Bulk Sample		Other ___		Sieves (1) - whole sample used
SPT Sample		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample	x	Engr. Test Specimen's WC	c	Method

Whole sample used

See Bulk Sample Processing Form

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x				
Yes		**By:**		Mortar & Pestle	Hand
				Pulverizer	Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B40
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	672.92
Container Number		B40	B40	Dry, M2 (g)	584.3
Mass of Container and Dry Soil, (g)		584.3	337.85	Cont.,M3 (g)	198.4
Mass of Container, (g)		198.4	198.4	**Water Content (%)**	**22.96**
Dry Soil, Ws (g)		385.9	139.45		

SIEVING RESULTS % error: 0.07

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	8.13		97.9
#60 / 60			
#100 / 40	68.83		82.2
#140 / 30			
#200 / 20	136.36		64.7
Pan	139.35	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	64.7	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 07/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-47

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 5.0

Visual Description: Light olive brown Fat CLAY (CH)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample	x		Thin-Walled Tube	x
Calif. Sample			Engr. Test Specimen's WC	c

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No x

Yes

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B56
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	434.78
Container Number		B56	B56	Dry, M2 (g)	401.58
Mass of Container and Dry Soil, (g)		401.58	213.19	Cont.,M3 (g)	197.61
Mass of Container, (g)		197.61	197.61	**Water Content (%)**	**16.28**
Dry Soil, Ws (g)		203.97	15.58		

SIEVING RESULTS

% error: 0.13

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	3.49		98.3
#60 / 60			
#100 / 40	4.19		97.9
#140 / 30			
#200 / 20	15.07		92.6
Pan	15.6	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	92.6	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 07/24/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-49

Project Name: Pure Water Sample No.: 1

Project Engineer: SF Depth (ft): 0~5

Visual Description: Brownish yellow Silty SAND (SM)

SPECIMEN: Tested From: **Selection Method:**

Bulk Sample	x		Other ___		Sieves (1) - whole sample used
SPT Sample			Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

Whole sample used

See Bulk Sample Processing Form

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen: **Test Method (D1140)**

As-Received	x	Method A	x	not dispersed
Air Dried		Method B		is dispersed
Oven-Dried				

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x					
Yes		**By:**		Mortar & Pestle		Hand
				Pulverizer		Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B14
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	634.65
Container Number		B14	B14	Dry, M2 (g)	585.5
Mass of Container and Dry Soil, (g)		585.5	456.61	Cont.,M3 (g)	200.71
Mass of Container, (g)		200.71	200.71	**Water Content (%)**	**12.77**
Dry Soil, Ws (g)		384.79	255.9		

SIEVING RESULTS % error: 0.05

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	11.47		97.0
#60 / 60			
#100 / 40	201.48		47.6
#140 / 30			
#200 / 20	255.07		33.7
Pan	255.76	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	33.7	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No ___ Yes Amount Adjective: ___

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: ADC DATE 07/20/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: FM-52

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 15.0

Visual Description: Light olive brown Sandy SILT (ML)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

	No	Yes
	x	

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B64
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	685.21
Container Number		B64	B64	Dry, M2 (g)	606.69
Mass of Container and Dry Soil, (g)		606.69	330.42	Cont.,M3 (g)	200.61
Mass of Container, (g)		200.61	200.61	**Water Content (%)**	**19.34**
Dry Soil, Ws (g)		406.08	129.81		

SIEVING RESULTS % error: 0.24

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	13.26		96.7
#60 / 60			
#100 / 40	23.66		94.2
#140 / 30			
#200 / 20	125.46		69.1
Pan	129.5	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	69.1	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: GD DATE 07/25/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 1.01.05.20.00 Boring No.: PS-3

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

Visual Description: Light olive brown Poorly Graded SAND with Silt (SP-SM)

SPECIMEN: Tested From:

Bulk Sample		Other ___		Sieves (1) - whole sample used
SPT Sample	x	Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample		Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received [x]
Air Dried [ ]
Oven-Dried [ ]

Test Method (D1140)

Method A [x] not dispersed
Method B [ ] is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No [x]
Yes [ ] **By:** [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B40
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	517.29
Container Number		B40	B40	Dry, M2 (g)	434.8
Mass of Container and Dry Soil, (g)		434.8	420.14	Cont.,M3 (g)	198.41
Mass of Container, (g)		198.41	198.43	**Water Content (%)**	**34.90**
Dry Soil, Ws (g)		236.39	221.71		

SIEVING RESULTS

% error: 0.01

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	11.73		95.0
#60 / 60			
#100 / 40	190.74		19.3
#140 / 30			
#200 / 20	221.07		6.5
Pan	221.69	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES ____ D60 XXXXX D85 XXXXX

% GRAVEL ____ D30 XXXXX D15 XXXXX

% SAND ____ D10 XXXXX D50 XXXXX

% FINES 6.5 Cu = XXXXX Cc = XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

Mica Noted: [ ] No [x] Yes Amount Adjective: high

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: ADC DATE 06/09/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 1.01.05.20.00 Boring No.: PS-3

Project Name: Pure Water Sample No.: 4

Project Engineer: SF Depth (ft): 20.0

Visual Description: Olive gray Sandy SILT (ML)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample	x		Thin-Walled Tube	x
Calif. Sample			Engr. Test Specimen's WC	c

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No x

Yes

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B26
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	470.42
Container Number		B26	B26	Dry, M2 (g)	396.16
Mass of Container and Dry Soil, (g)		396.16	273.7	Cont.,M3 (g)	199.73
Mass of Container, (g)		199.73	199.75	**Water Content (%)**	**37.80**
Dry Soil, Ws (g)		196.43	73.95		

SIEVING RESULTS

% error: 0.18

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	0.47		99.8
#60 / 60			
#100 / 40	16.6		91.5
#140 / 30			
#200 / 20	70.9		63.9
Pan	73.82	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	63.9	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: [ ] No [x] Yes Amount Adjective: medium

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: ADC DATE 06/09/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 1.01.05.20.00 Boring No.: PS-3

Project Name: Pure Water Sample No.: 9

Project Engineer: SF Depth (ft): 50.0

Visual Description: Gray Poorly Graded SAND with Silt (SP-SM)

SPECIMEN: Tested From:

Bulk Sample			Other ___		Sieves (1) - whole sample used
SPT Sample	x		Thin-Walled Tube	x	Sieves (1) - partial sample used & selected by Method(s)
Calif. Sample			Engr. Test Specimen's WC	c	Method

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No	x				
Yes		**By:**		Mortar & Pestle	
				Pulverizer	
				Hand	
				Other	

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B15
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	551.72
Container Number		B15	B15	Dry, M2 (g)	475.97
Mass of Container and Dry Soil, (g)		475.97	450.56	Cont.,M3 (g)	200.68
Mass of Container, (g)		200.68	200.69	**Water Content (%)**	**27.52**
Dry Soil, Ws (g)		275.29	249.87		

SIEVING RESULTS % error: 0.03

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	44.6		83.8
#60 / 60			
#100 / 40	231.82		15.8
#140 / 30			
#200 / 20	249.55		9.4
Pan	249.8	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	9.4	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: [ ] No [x] Yes Amount Adjective: medium

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: ADC DATE 06/09/17 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-02

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 10.0

Visual Description: Olive Silty SAND (SM)

SPECIMEN: Tested From:

Bulk Sample			Other ___	
SPT Sample	x		Thin-Walled Tube	x
Calif. Sample			Engr. Test Specimen's WC	c

[ ] **Whole sample used**

[ ] **See Bulk Sample Processing Form**

Selection Method:

Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No x

Yes

By: [ ] Mortar & Pestle [ ] Hand [ ] Pulverizer [ ] Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	**Water Content** As Recieved	
				Container No.	B3
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	436.27
Container Number		B3	B3	Dry, M2 (g)	391.59
Mass of Container and Dry Soil, (g)		391.59	316.81	Cont.,M3 (g)	198.05
Mass of Container, (g)		198.05	198.08	**Water Content (%)**	**23.09**
Dry Soil, Ws (g)		193.54	118.73		

SIEVING RESULTS % error: 0.06

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	2.99		98.5
#60 / 60			
#100 / 40	98.74		49.0
#140 / 30			
#200 / 20	116.29		39.9
Pan	118.66	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	39.9	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: x No [ ] Yes Amount Adjective:

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: ADC DATE 06/19/15 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

GRADATION OF SOILS by Sieving using Soil Sieve Sizes & with Water Content

ASTM D1140 and D2216

Project Number: 60530732 Task Number: 2.01.05.20.00 Boring No.: WM-16

Project Name: Pure Water Sample No.: 2

Project Engineer: SF Depth (ft): 8.0

Visual Description: Yellowish brown Lean CLAY with Sand (CL)

SPECIMEN: Tested From:

Bulk Sample			Other ____	
SPT Sample	x		Thin-Walled Tube	x
Calif. Sample			Engr. Test Specimen's WC	c

Selection Method:

Sieves (1) - whole sample used

Sieves (1) - partial sample used & selected by Method(s)

Method

(a): Splitter; (use for dry soils or that which will segregate)

(b): Quartering; (use for dry soils or that which will segregate)

(c) : Representative scoop after mixing, or slice of intact sample. (use for moist soils or that which will not segregate)

Whole sample used

See Bulk Sample Processing Form

Preparation: Sample/Specimen:

As-Received	x
Air Dried	
Oven-Dried	

Test Method (D1140)

Method A	x	not dispersed
Method B		is dispersed

Oven-Dried Soil Broken Up Before Selecting Partial sample:

No x

Yes

By: Mortar & Pestle Hand

Pulverizer Other

Washing:

	No	Yes
Whole Specimen Washed on No. 200 sieve ?		x
Retained Fraction: 1st Split Washed ?		
Fine Fraction Washed on No. 200 sieve ?		

and Soil Soaked for: 5 hrs.

Water Content

MASS OF TEST SPECIMEN (g)	Total Test Specimen with Coarse Fraction	Partial or Whole Test Specimen	Soil Retained (after washing)	As Recieved	
				Container No.	B56
Min. sieve size in sieving sequence (3)	#N/A	# 200	+200	Wet, M1 (g)	665.37
Container Number		B56	B56	Dry, M2 (g)	604.45
Mass of Container and Dry Soil, (g)		604.45	302.49	Cont.,M3 (g)	197.62
Mass of Container, (g)		197.62	197.64	**Water Content (%)**	**14.97**
Dry Soil, Ws (g)		406.83	104.85		

SIEVING RESULTS

% error: 0.05

See (1)	Sieve No.	Cum. Mass Retained (g)	Total Specimen % Finer N'
	3 "		
	2 "		
	1 1/2"		
	1 "		
	3/4 "		
	1/2 "		
	3/8 "		
	4		
	Pan		XXXXXXXX

Req. Mass of Test Spec. for 1% (kg)
3"= 70
1 1/2"=10
3/4"= 1.1
3/8"= 0.25
#4 = 0.1
#10 = 0.1

Sieve No. / (2)	Cum. Mass Retained (g)	Partial Test Specimen	Total Specimen % Finer N'
3 "			
2 "			
1 1/2"			
1 "			
3/4 "			
1/2 "			
3/8 "			
#4 / 325			
#10 / 180			
#20 / 115			
#40 / 75	10.04		97.5
#60 / 60			
#100 / 40	53.98		86.7
#140 / 30			
#200 / 20	103.94		74.5
Pan	104.8	XXXXXXXX	XXXXXXXXXX

SUMMARY: Shape & Filter Parameters

% COBBLES		D60	XXXXX	D85	XXXXX
% GRAVEL		D30	XXXXX	D15	XXXXX
% SAND		D10	XXXXX	D50	XXXXX
% FINES	74.5	Cu =	XXXXX	Cc =	XXXXX

Cu = D60 / D10 Cc = D30^2 / (D60 * D10)

Mica Noted: No x Yes Amount Adjective: low

(1) X in box denotes sieve on which split was made

(2) Proposed allowable amount of soil retained on 8" dia. Sieve.

(3) Sieve size given, denotes min. sieve size used in the appropriate sieving sequence.

SET-UP BY: ADC DATE 06/19/15 CALCULATED BY: ADC CHECKED BY: ADC

SUBMITTED BY: A. D. Camacho

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	DS-01	DS-01	DS-01	DS-01	DS-01		DS-02	
Sample No.	2	5	8b	10	11		3a	
Depth (ft.)	5	20	35	45	50		15	
Container No.	S10	S203	S217	S204	S205		S302	
Mass of Container and Wet Specimen, M1 (g)	335.04	467.70	275.27	458.24	430.36		502.09	
Mass Container and Dry Specimen, M2 (g)	313.74	402.86	237.61	367.89	355.53		392.14	
Mass Container, M3 (g)	84.01	147.88	137.94	149.08	139.32		144.91	
Water Content, w (%)	9.3	25.4	37.8	41.3	34.6		44.5	
Unified Soil Classification Group Symbol (Visual)	SM	SM	CL	ML	ML		ML	

Boring No.	DS-03	DS-03	DS-03					
Sample No.	6a	9b	11a					
Depth (ft.)	25	40	50					
Container No.	S304	S308	S206					
Mass of Container and Wet Specimen, M1 (g)	560.94	455.03	676.79					
Mass Container and Dry Specimen, M2 (g)	477.04	360.30	527.01					
Mass Container, M3 (g)	144.68	145.06	139.91					
Water Content, w (%)	25.2	44	38.7					
Unified Soil Classification Group Symbol (Visual)	SM	CL-ML	ML					

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: GD Date 8/17/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	FM-08	FM-08	FM-10-1	FM-11	FM-14	FM-14	FM-14	FM-14
Sample No.	2	4	2	4	2a	2b	4a	4b/c
Depth (ft.)	5	15	5	15	5	5	15	15
Container No.	S7	S11	M1	M8	M6	M5	M7	M70
Mass of Container and Wet Specimen, M1 (g)	538.08	481.80	425.52	529.78	402.47	419.08	467.34	603.94
Mass Container and Dry Specimen, M2 (g)	488.09	420.44	376.48	427.68	384.97	372.79	418.55	532.39
Mass Container, M3 (g)	80.32	95.71	91.72	89.38	90.32	91.24	91.02	105.47
Water Content, w (%)	12.3	18.9	17.2	30.2	5.9	16.4	14.9	16.8
Unified Soil Classification Group Symbol (Visual)	SC	CL	CL	ML	SP	SC	SM	CL

Boring No.	FM-16	FM-17						
Sample No.	3	2						
Depth (ft.)	15	10						
Container No.	M89	M72						
Mass of Container and Wet Specimen, M1 (g)	713.17	708.82						
Mass Container and Dry Specimen, M2 (g)	647.42	618.18						
Mass Container, M3 (g)	109.50	108.58						
Water Content, w (%)	12.2	17.8						
Unified Soil Classification Group Symbol (Visual)	SM-ML	SM-ML						

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: ADC Date 6/12/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	FM-09	FM-09	FM-18	FM-18				
Sample No.	1	3	2	4				
Depth (ft.)	5	15	5	15				
Container No.	S12	S39	S19	S33				
Mass of Container and Wet Specimen, M1 (g)	549.43	383.19	641.91	586.22				
Mass Container and Dry Specimen, M2 (g)	513.35	375.62	571.02	512.63				
Mass Container, M3 (g)	83.55	113.44	102.54	110.13				
Water Content, w (%)	8.4	2.9	15.1	18.3				
Unified Soil Classification Group Symbol (Visual)	SM	SW	ML	ML				

Boring No.								
Sample No.								
Depth (ft.)								
Container No.								
Mass of Container and Wet Specimen, M1 (g)								
Mass Container and Dry Specimen, M2 (g)								
Mass Container, M3 (g)								
Water Content, w (%)								
Unified Soil Classification Group Symbol (Visual)								

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: ADC Date 6/13/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	FM-26	FM-27	FM-28	FM-28	FM-29	FM-45	FM-45	
Sample No.	3	4	1	3	1	2	4	
Depth (ft.)	15	15	5	15	0~5	5	15	
Container No.	S306	S309	S33	S34	S39	M9	M8	
Mass of Container and Wet Specimen, M1 (g)	522.52	484.00	348.02	427.14	521.13	445.50	504.52	
Mass Container and Dry Specimen, M2 (g)	463.55	430.22	330.46	382.49	493.40	386.97	437.09	
Mass Container, M3 (g)	145.08	143.28	110.10	117.99	113.42	89.73	89.38	
Water Content, w (%)	18.5	18.7	8	16.9	7.3	19.7	19.4	
Unified Soil Classification Group Symbol (Visual)	ML	ML	SM	ML	SM	ML	ML	

Boring No.								
Sample No.								
Depth (ft.)								
Container No.								
Mass of Container and Wet Specimen, M1 (g)								
Mass Container and Dry Specimen, M2 (g)								
Mass Container, M3 (g)								
Water Content, w (%)								
Unified Soil Classification Group Symbol (Visual)								

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: GD Date 8/18/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	FM-31	FM-31	FM-32	FM-32	FM-33	FM-33	FM-50	
Sample No.	2	4	1	3	3	7	1	
Depth (ft.)	5	15	5	15	7	15	0~5	
Container No.	M1	M91	M6	M67	M89	M72	M73	
Mass of Container and Wet Specimen, M1 (g)	582.45	473.05	438.15	480.39	417.72	475.72	639.34	
Mass Container and Dry Specimen, M2 (g)	508.57	412.52	384.75	424.27	371.64	426.68	588.57	
Mass Container, M3 (g)	91.70	89.78	90.32	110.41	109.49	108.61	108.67	
Water Content, w (%)	17.7	18.8	18.1	17.9	17.6	15.4	10.6	
Unified Soil Classification Group Symbol (Visual)	SC	CL	SM	CL	CL	CL	SM	

Boring No.								
Sample No.								
Depth (ft.)								
Container No.								
Mass of Container and Wet Specimen, M1 (g)								
Mass Container and Dry Specimen, M2 (g)								
Mass Container, M3 (g)								
Water Content, w (%)								
Unified Soil Classification Group Symbol (Visual)								

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: GD Date 8/18/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	FM-34	FM-34	FM-35					
Sample No.	3	4	2a,b					
Depth (ft.)	15	18.5	5					
Container No.	M70	M72	M89					
Mass of Container and Wet Specimen, M1 (g)	389.04	339.62	457.53					
Mass Container and Dry Specimen, M2 (g)	355.33	314.09	415.54					
Mass Container, M3 (g)	105.51	108.61	109.53					
Water Content, w (%)	13.5	12.4	13.7					
Unified Soil Classification Group Symbol (Visual)	SM	MH	SM					

Boring No.								
Sample No.								
Depth (ft.)								
Container No.								
Mass of Container and Wet Specimen, M1 (g)								
Mass Container and Dry Specimen, M2 (g)								
Mass Container, M3 (g)								
Water Content, w (%)								
Unified Soil Classification Group Symbol (Visual)								

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: GD Date 7/24/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	FM-36b	FM-36b	FM-44					
Sample No.	2	4	1a,b					
Depth (ft.)	5	15	5					
Container No.	S31	S209	S206					
Mass of Container and Wet Specimen, M1 (g)	230.25	406.37	339.80					
Mass Container and Dry Specimen, M2 (g)	220.73	386.37	318.10					
Mass Container, M3 (g)	98.24	146.53	139.92					
Water Content, w (%)	7.8	8.3	12.2					
Unified Soil Classification Group Symbol (Visual)	SC	SM	SC					

Boring No.								
Sample No.								
Depth (ft.)								
Container No.								
Mass of Container and Wet Specimen, M1 (g)								
Mass Container and Dry Specimen, M2 (g)								
Mass Container, M3 (g)								
Water Content, w (%)								
Unified Soil Classification Group Symbol (Visual)								

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: GD Date 7/21/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	FM-49	FM-49						
Sample No.	2	4						
Depth (ft.)	5	15						
Container No.	S304	S308						
Mass of Container and Wet Specimen, M1 (g)	406.85	381.02						
Mass Container and Dry Specimen, M2 (g)	367.03	365.12						
Mass Container, M3 (g)	144.65	145.10						
Water Content, w (%)	17.9	7.2						
Unified Soil Classification Group Symbol (Visual)	ML	SM						
Boring No.								
Sample No.								
Depth (ft.)								
Container No.								
Mass of Container and Wet Specimen, M1 (g)								
Mass Container and Dry Specimen, M2 (g)								
Mass Container, M3 (g)								
Water Content, w (%)								
Unified Soil Classification Group Symbol (Visual)								

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: GD Date 7/25/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 1.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	PS-3	PS-3	PS-3					
Sample No.	11a	12a	13					
Depth (ft.)	60	65	70					
Container No.	S30	C6	S6					
Mass of Container and Wet Specimen, M1 (g)	270.39	296.80	315.03					
Mass Container and Dry Specimen, M2 (g)	244.48	235.02	266.14					
Mass Container, M3 (g)	120.41	71.88	79.82					
Water Content, w (%)	20.9	37.9	26.2					
Unified Soil Classification Group Symbol (Visual)	SP	CH	ML					
Boring No.								
Sample No.								
Depth (ft.)								
Container No.								
Mass of Container and Wet Specimen, M1 (g)								
Mass Container and Dry Specimen, M2 (g)								
Mass Container, M3 (g)								
Water Content, w (%)								
Unified Soil Classification Group Symbol (Visual)								

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: ADC Date 6/9/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	WM-01	WM-01	WM-01	WM-03	WM-03	WM-11	WM-16	WM-21
Sample No.	2	4a	5	2a	5a	2	1	1
Depth (ft.)	5	15	18.5	5	18.5	6	6	5
Container No.	S2	S219	S300	S211	S222	M60	M66	M67
Mass of Container and Wet Specimen, M1 (g)	520.90	471.42	631.91	553.10	571.39	405.03	305.11	560.88
Mass Container and Dry Specimen, M2 (g)	489.39	424.74	527.61	483.36	499.04	376.26	299.96	494.58
Mass Container, M3 (g)	100.09	140.70	143.53	148.48	140.49	91.37	101.65	110.42
Water Content, w (%)	8.1	16.4	27.2	20.8	20.2	10.1	2.6	17.3
Unified Soil Classification Group Symbol (Visual)	SM	ML	SP	ML	SM	SC	SP-SM	SC

Boring No.	WM-21	WM-24						
Sample No.	3	2						
Depth (ft.)	15	5						
Container No.	M73	F110						
Mass of Container and Wet Specimen, M1 (g)	564.84	599.74						
Mass Container and Dry Specimen, M2 (g)	496.36	546.40						
Mass Container, M3 (g)	108.68	109.55						
Water Content, w (%)	17.7	12.2						
Unified Soil Classification Group Symbol (Visual)	SC	SM						

w = ((M1 - M2)/ (M2 - M3)) * 100

Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: ADC Date 6/19/2017

CALCULATED BY: ADC

CHECKED BY: ADC

LABORATORY WATER CONTENT: AS - RECEIVED CONDITION
ASTM D 2216

Project Number: 60530732 Task Number: 2.01.05.20.00

Project Name: Pure Water

Project Engineer: SF Test Method: B (0.1%)

Boring No.	WM-06	WM-08	WM-23	WM-23				
Sample No.	2	4a	1	3				
Depth (ft.)	5	15.5	5	15				
Container No.	S45	S34	S27	S32				
Mass of Container and Wet Specimen, M1 (g)	498.55	455.65	538.70	490.98				
Mass Container and Dry Specimen, M2 (g)	464.86	401.68	501.61	460.40				
Mass Container, M3 (g)	77.64	117.98	79.00	78.29				
Water Content, w (%)	8.7	19	8.8	8				
Unified Soil Classification Group Symbol (Visual)	SM	ML	CL	CL				

Boring No.								
Sample No.								
Depth (ft.)								
Container No.								
Mass of Container and Wet Specimen, M1 (g)								
Mass Container and Dry Specimen, M2 (g)								
Mass Container, M3 (g)								
Water Content, w (%)								
Unified Soil Classification Group Symbol (Visual)								

w = ((M1 - M2)/ (M2 - M3)) * 100

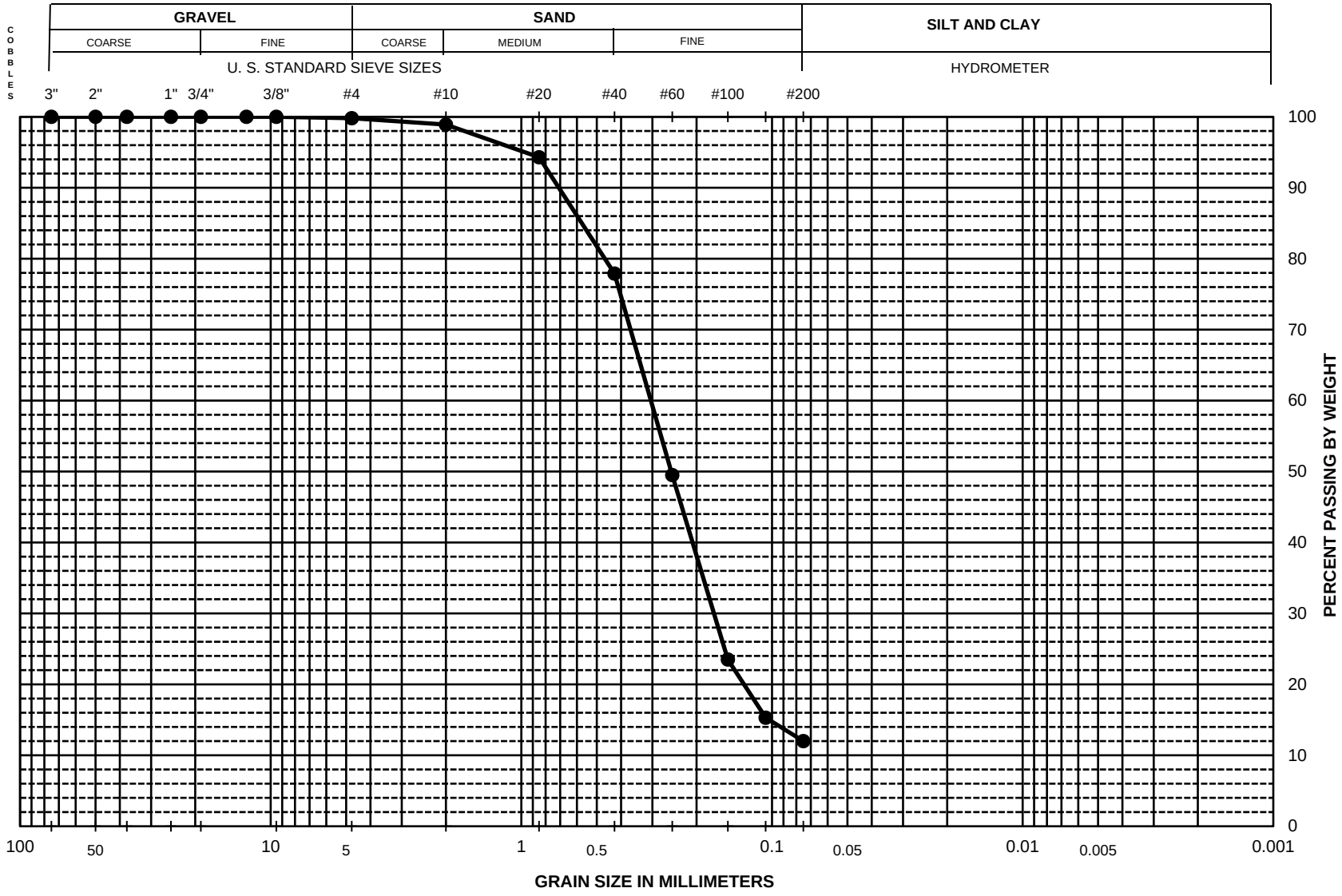
Recommended Minimum Mass of Moist Test Specimen in Accordance with ASTM D 2216			
Approximate Maximum Grain Size in Standard Sieve Size	Water Content Reported to ±0.1 %	Water Content Reported to ±1 %	
No. 10	20 g	To be representative not less than 20 g shall be used.	
No. 4	100 g	To be representative not less than 20 g shall be used.	
3/8-in.	500 g	50 g	
3/4-in.	2.5 kg	250 g	
1 1/2-in.	10 kg	1 kg	
3-in.	50 kg	5 kg	

TESTED BY: ADC Date 6/13/2017

CALCULATED BY: ADC

CHECKED BY: ADC

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.8
#10	2.00	98.9
#20	0.850	94.3
#40	0.425	77.9
#60	0.250	49.5
#100	0.150	23.5
#140	0.106	15.3
#200	0.075	12.0

Hydrometer Analysis

% Cobbles	---
% Gravel	0.2
% Sand	87.8
% Fines	12.0

D_{85}	0.574
D_{60}	0.304
D_{50}	0.252
D_{30}	0.170
D_{15}	0.103
D_{10}	---
C_u	----
C_c	-----

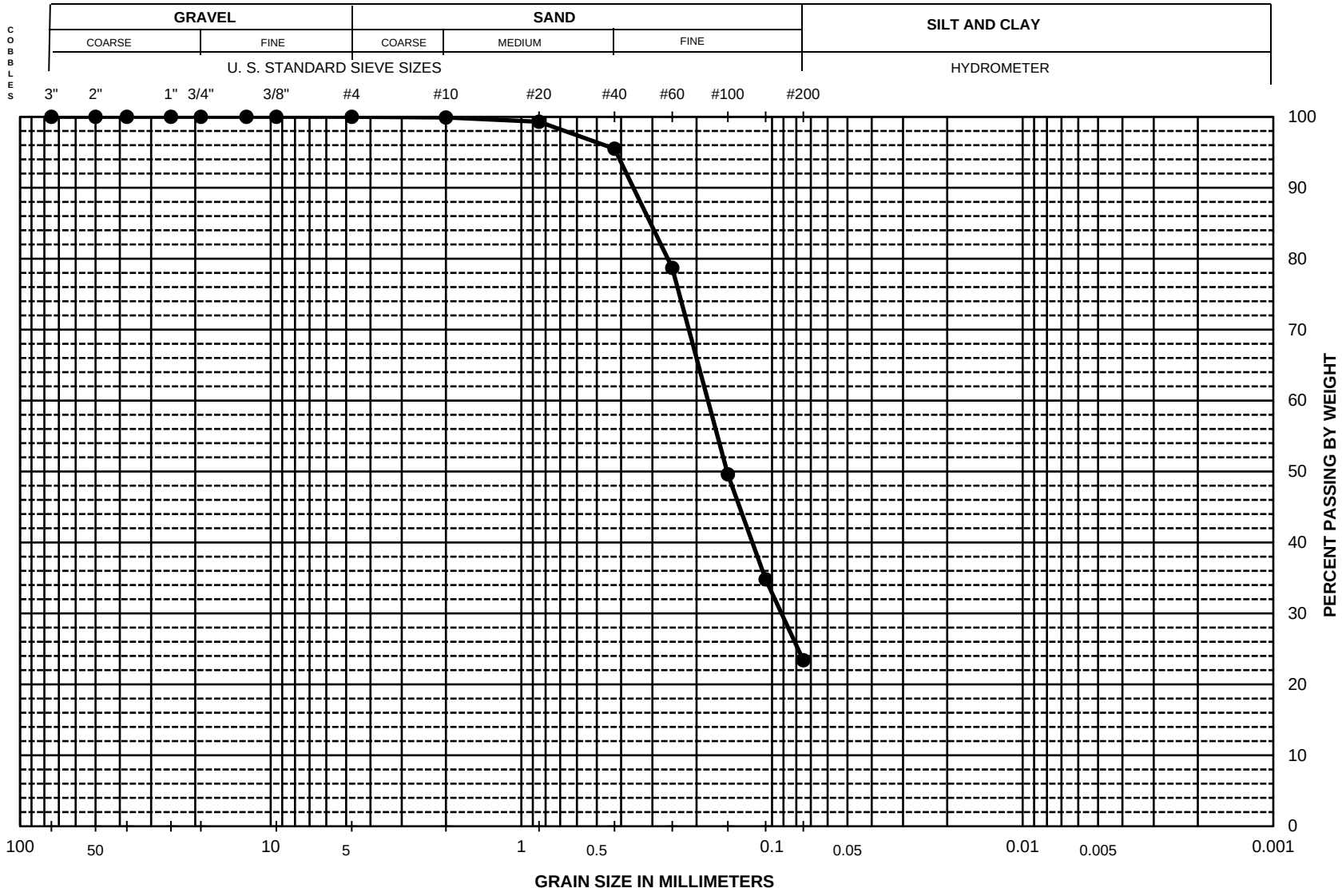
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
DS-03	4	15.0	I	32.6	---	---	---	**Dark olive gray Poorly Graded SAND with Silt (SP-SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	99.9
#20	0.850	99.3
#40	0.425	95.5
#60	0.250	78.7
#100	0.150	49.6
#140	0.106	34.8
#200	0.075	23.4

Hydrometer Analysis

% Cobbles	---
% Gravel	0.0
% Sand	76.6
% Fines	23.4

D_{85}	0.305
D_{60}	0.180
D_{50}	0.151
D_{30}	0.092
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

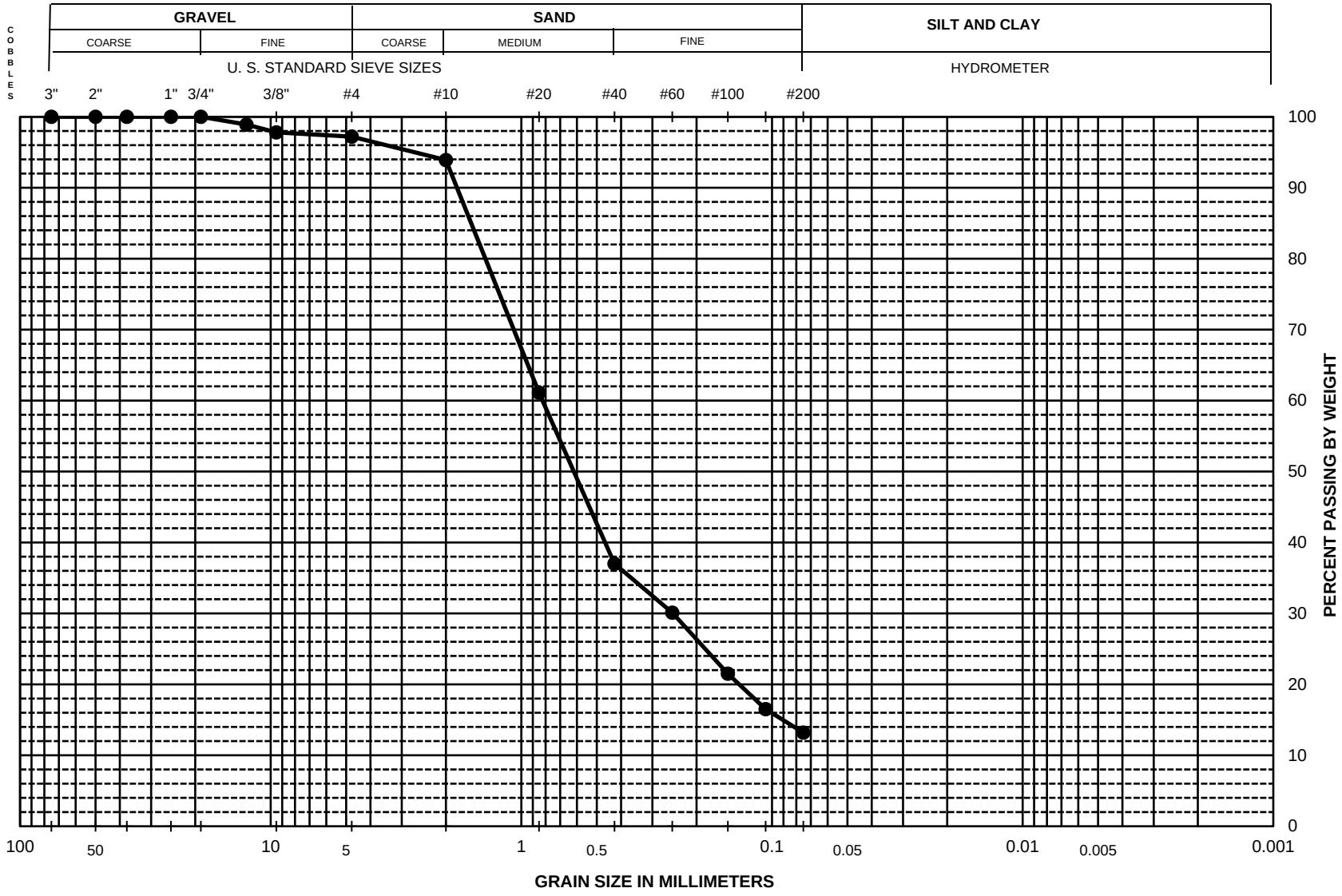
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-02	1	0-5	I	9.1	---	---	---	**Olive brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	98.9
3/8"	9.50	97.8
#4	4.75	97.2
#10	2.00	93.9
#20	0.850	61.1
#40	0.425	37.0
#60	0.250	30.1
#100	0.150	21.5
#140	0.106	16.5
#200	0.075	13.2

Hydrometer Analysis

% Cobbles	---
% Gravel	2.8
% Sand	84.0
% Fines	13.2

D_{85}	1.586
D_{60}	0.824
D_{50}	0.618
D_{30}	0.249
D_{15}	0.091
D_{10}	---
C_u	----
C_c	-----

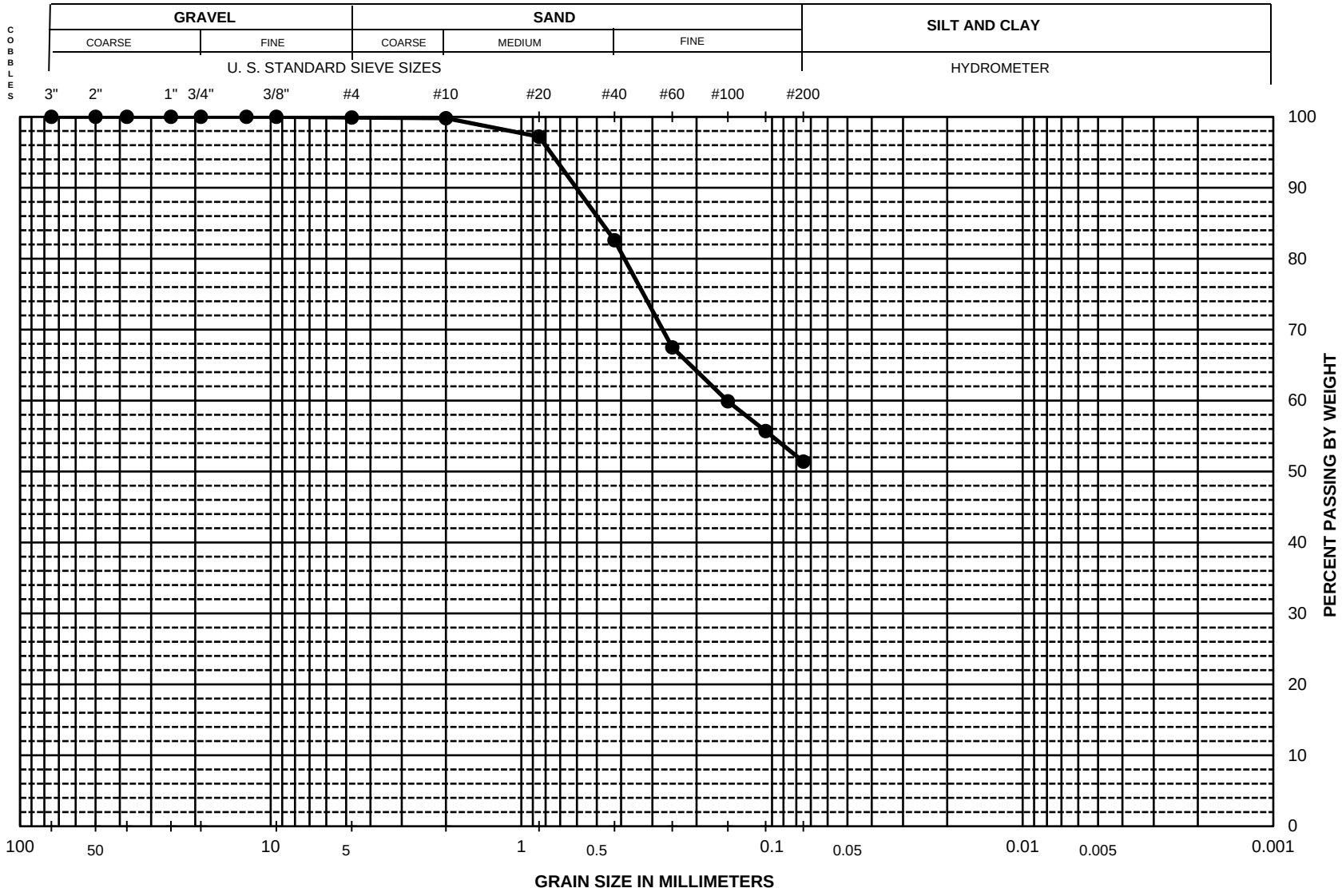
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-06	1	5.0	I	6.5	---	---	---	**Dark yellowish brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.9
#10	2.00	99.8
#20	0.850	97.2
#40	0.425	82.6
#60	0.250	67.5
#100	0.150	59.9
#140	0.106	55.7
#200	0.075	51.4

Hydrometer Analysis

% Cobbles	---
% Gravel	0.1
% Sand	48.5
% Fines	51.4

D_{85}	0.476
D_{60}	0.151
D_{50}	---
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

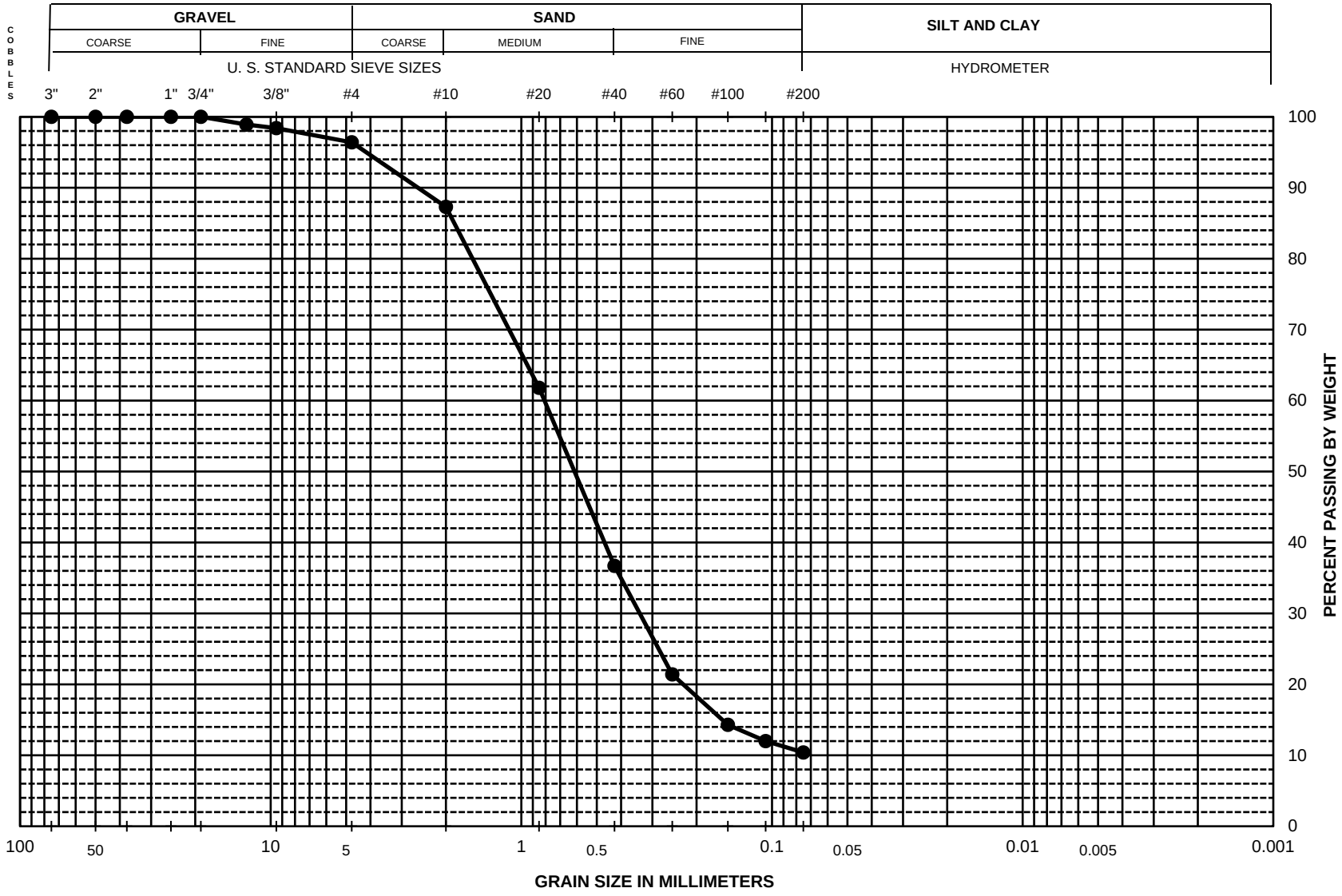
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-08	3	10.0	I	8.7	---	---	---	**Dark yellowish brown Sandy, Lean CLAY (CL)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	98.9
3/8"	9.50	98.4
#4	4.75	96.4
#10	2.00	87.3
#20	0.850	61.8
#40	0.425	36.7
#60	0.250	21.4
#100	0.150	14.3
#140	0.106	12.0
#200	0.075	10.4

Hydrometer Analysis

% Cobbles	---
% Gravel	3.6
% Sand	86.0
% Fines	10.4

D_{85}	1.851
D_{60}	0.809
D_{50}	0.614
D_{30}	0.337
D_{15}	0.158
D_{10}	---
C_u	----
C_c	-----

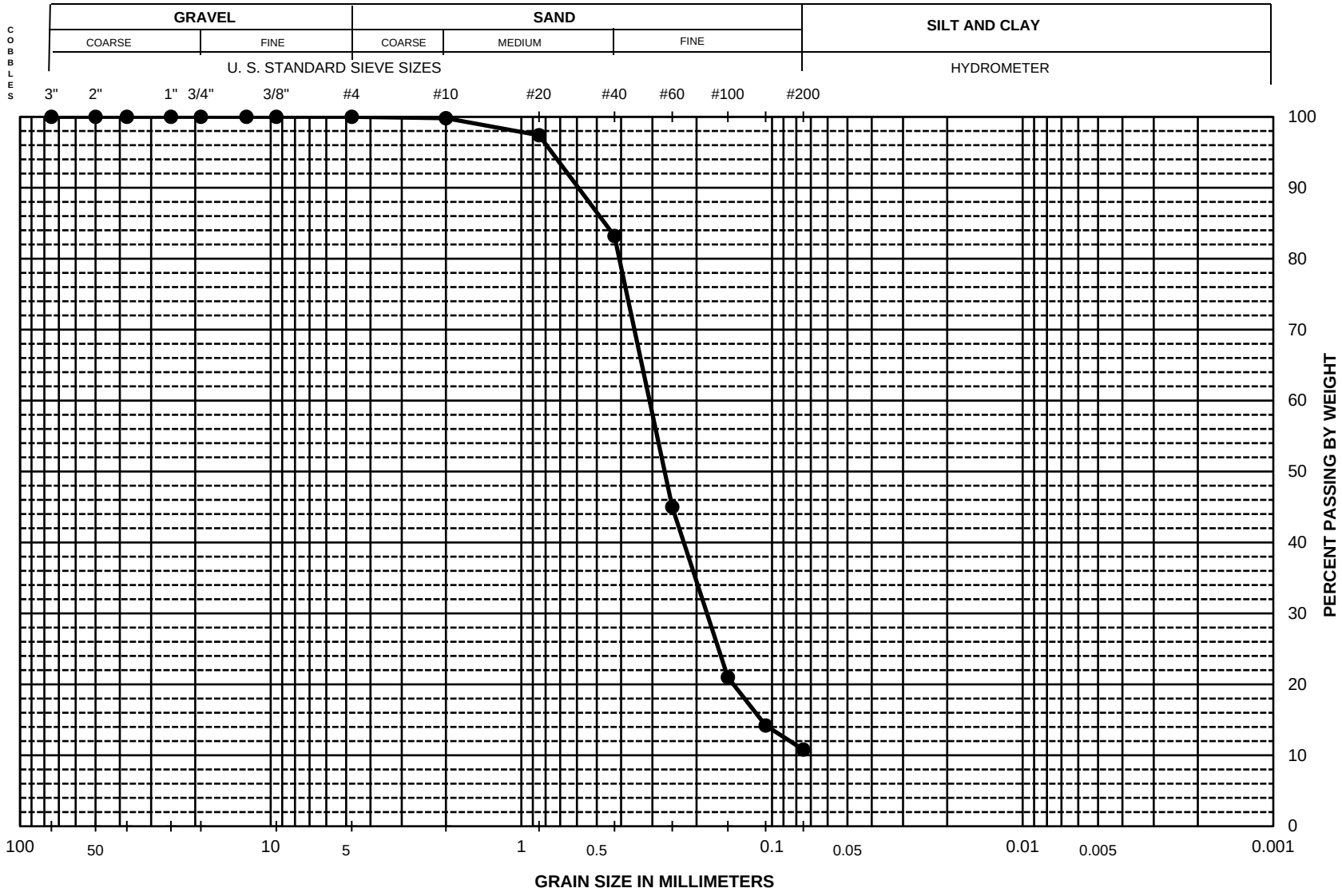
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-09	2	10.0	I	2.9	---	---	---	**Yellowish brown Poorly Graded SAND with Silt (SP-SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	99.8
#20	0.850	97.4
#40	0.425	83.2
#60	0.250	45.0
#100	0.150	21.0
#140	0.106	14.2
#200	0.075	10.8

Hydrometer Analysis

% Cobbles	---
% Gravel	0.0
% Sand	89.2
% Fines	10.8

D_{85}	0.464
D_{60}	0.308
D_{50}	0.268
D_{30}	0.182
D_{15}	0.110
D_{10}	---
C_u	----
C_c	-----

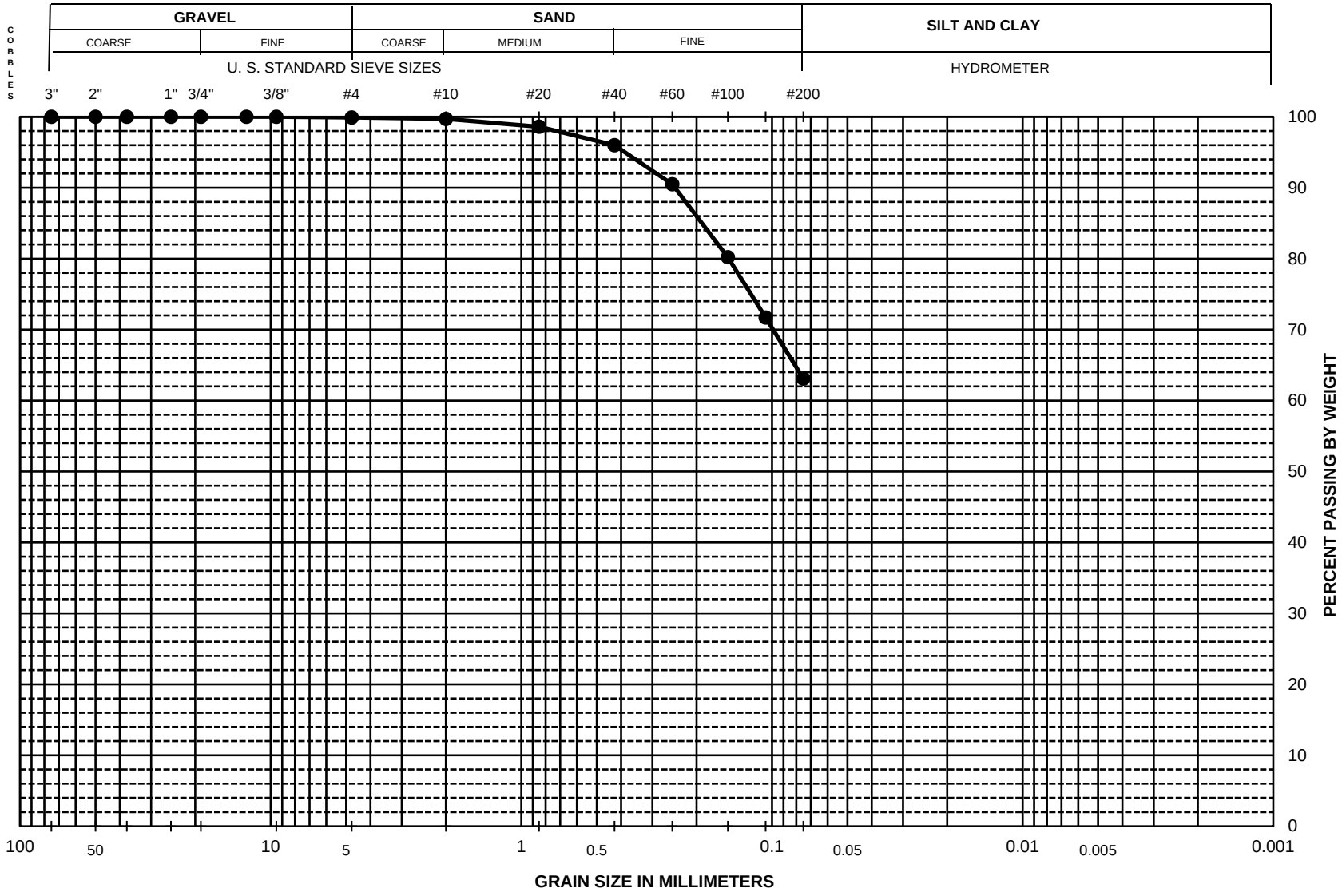
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-11	2	5.0	I	6.7	---	---	---	**Dark yellowish brown Poorly Graded SAND with Silt (SP-SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.9
#10	2.00	99.7
#20	0.850	98.6
#40	0.425	96.0
#60	0.250	90.5
#100	0.150	80.2
#140	0.106	71.7
#200	0.075	63.1
Hydrometer Analysis		

% Cobbles	---
% Gravel	0.1
% Sand	36.8
% Fines	63.1

D_{85}	0.190
D_{60}	---
D_{50}	---
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

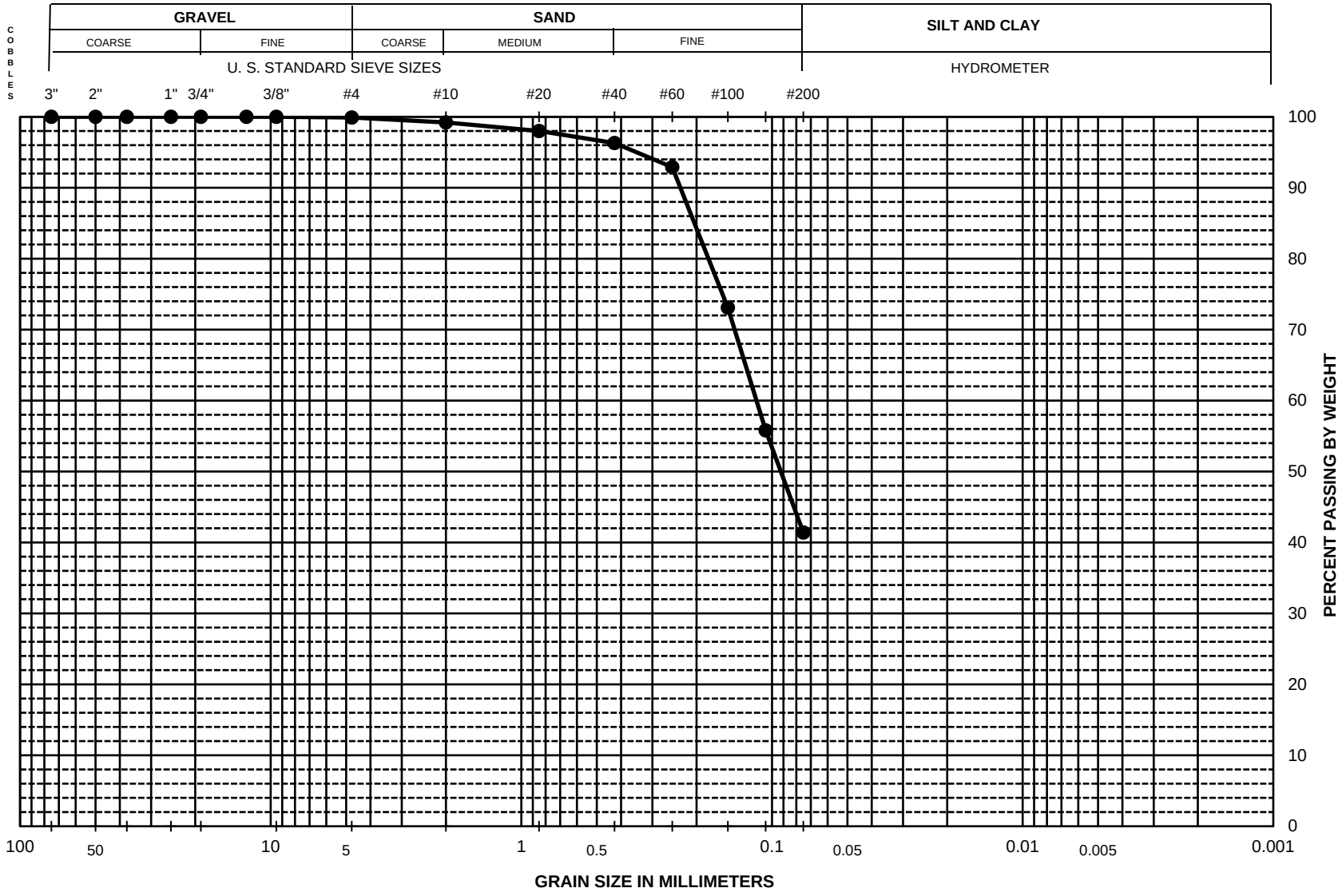
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-16	4	18.5	I	19.9	---	---	---	**Yellowish brown Sandy, Lean CLAY (CL)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.9
#10	2.00	99.2
#20	0.850	98.0
#40	0.425	96.3
#60	0.250	92.9
#100	0.150	73.1
#140	0.106	55.8
#200	0.075	41.4

Hydrometer Analysis

% Cobbles	---
% Gravel	0.1
% Sand	58.5
% Fines	41.4

D_{85}	0.204
D_{60}	0.115
D_{50}	0.092
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

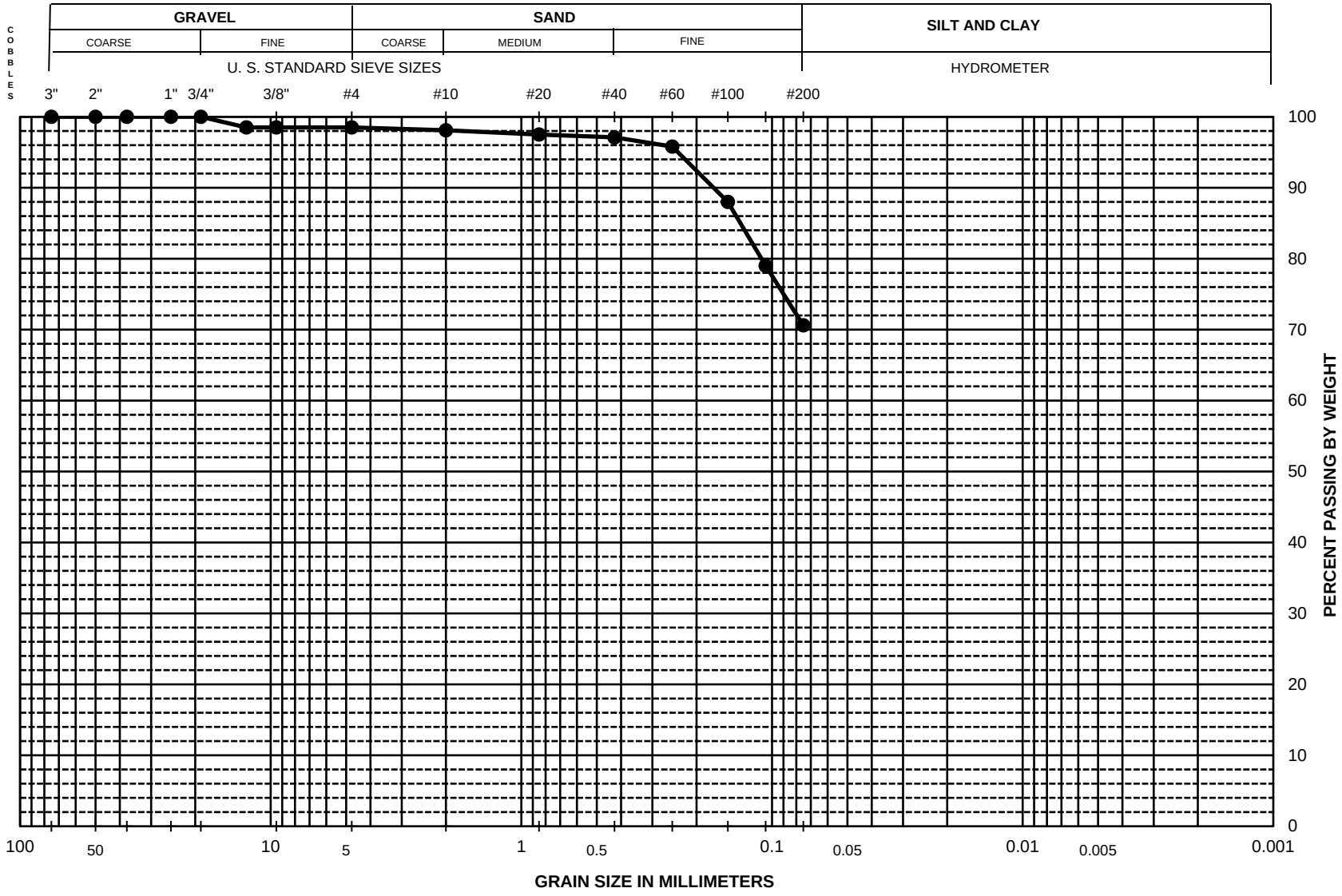
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-17	3	15.0	I	15.5	---	---	---	**Olive yellow Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	98.5
3/8"	9.50	98.5
#4	4.75	98.5
#10	2.00	98.1
#20	0.850	97.5
#40	0.425	97.1
#60	0.250	95.8
#100	0.150	88.0
#140	0.106	79.0
#200	0.075	70.6
Hydrometer Analysis		

% Cobbles	---
% Gravel	1.5
% Sand	27.9
% Fines	70.6

D_{85}	0.134
D_{60}	---
D_{50}	---
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

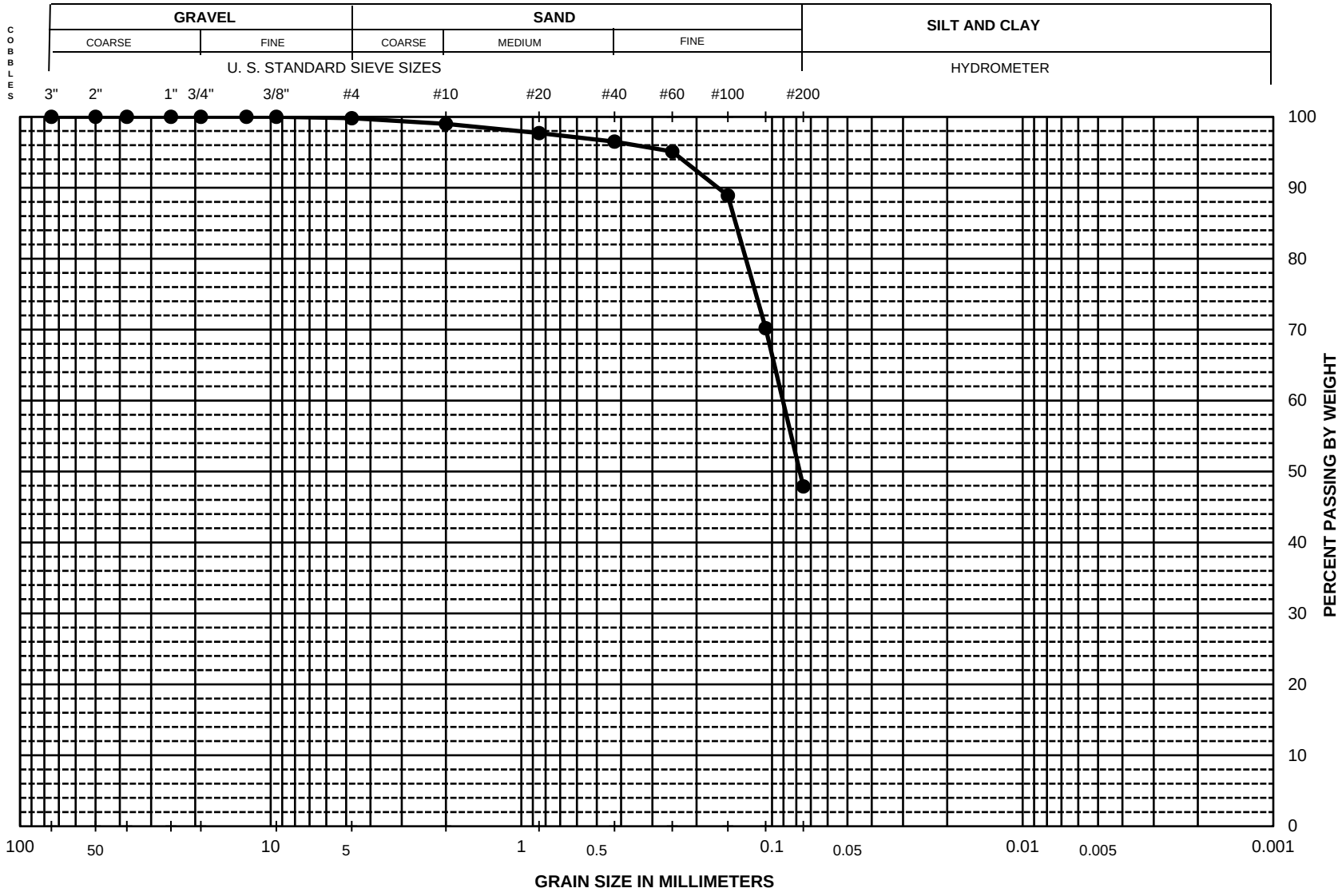
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-19	1	5.0	I	18.4	---	---	---	**Light olive brown SILT with Sand (ML)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.8
#10	2.00	99.0
#20	0.850	97.7
#40	0.425	96.5
#60	0.250	95.1
#100	0.150	88.9
#140	0.106	70.2
#200	0.075	47.9

Hydrometer Analysis

% Cobbles	---
% Gravel	0.2
% Sand	51.9
% Fines	47.9

D_{85}	0.140
D_{60}	0.090
D_{50}	0.077
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

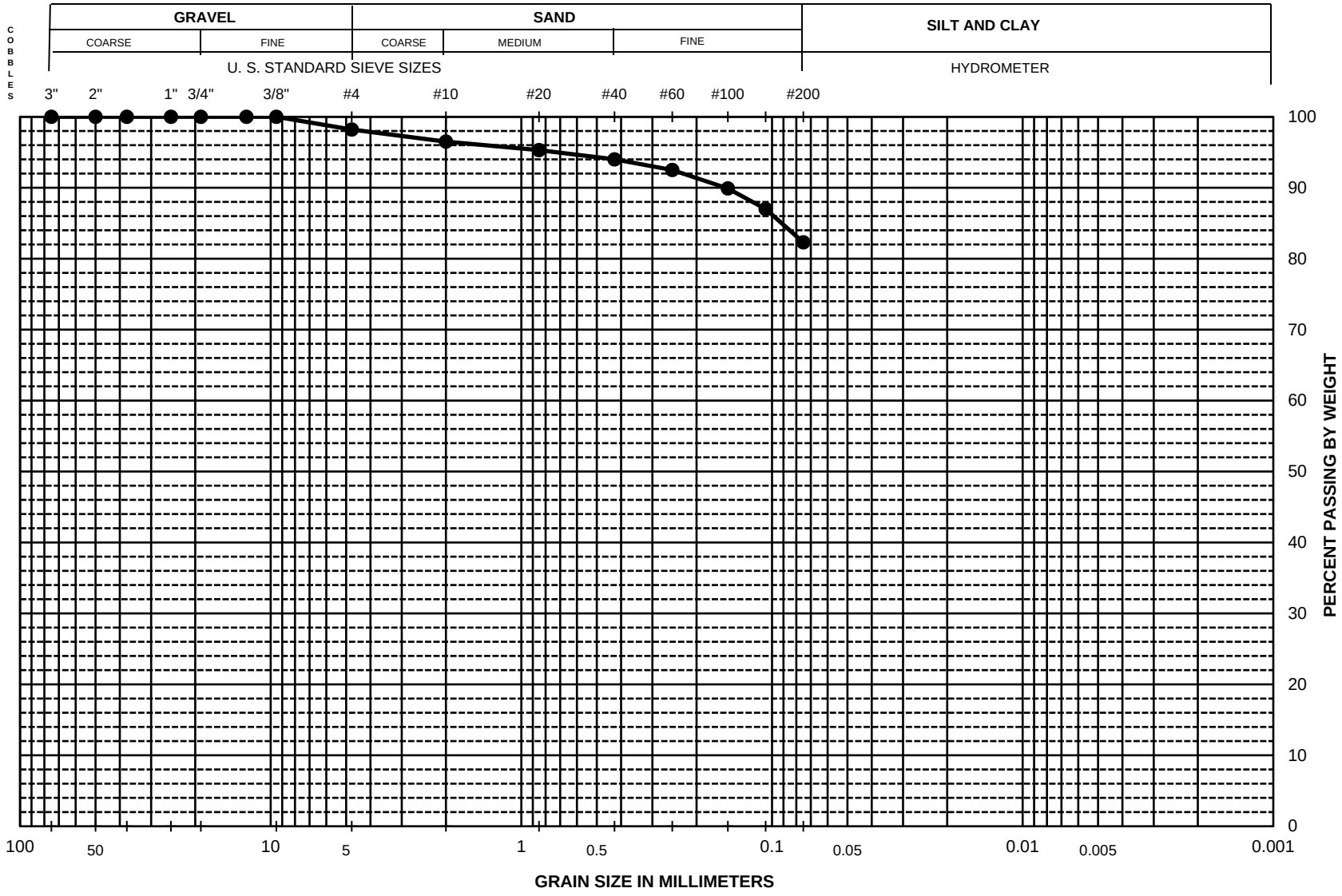
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-20	2	5.0	I	17.7	---	---	---	**Yellowish brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	98.2
#10	2.00	96.5
#20	0.850	95.3
#40	0.425	94.0
#60	0.250	92.5
#100	0.150	89.9
#140	0.106	87.0
#200	0.075	82.3

Hydrometer Analysis

% Cobbles	---
% Gravel	1.8
% Sand	15.9
% Fines	82.3

D_{85}	0.091
D_{60}	---
D_{50}	---
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

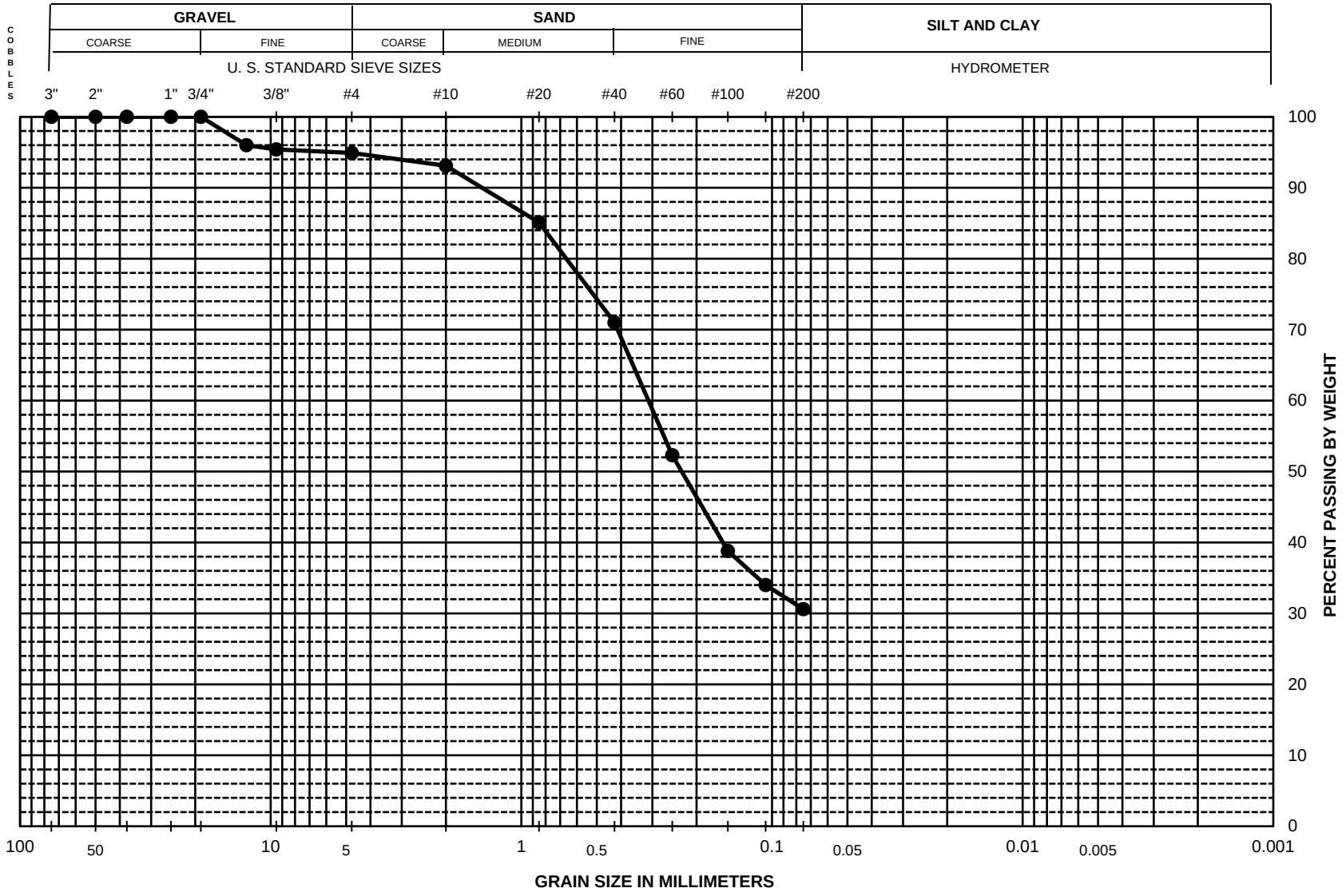
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-20	4	15.0	I	17.9	---	---	---	**Yellowish brown SILT with Sand (ML)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	96.0
3/8"	9.50	95.4
#4	4.75	94.9
#10	2.00	93.1
#20	0.850	85.1
#40	0.425	71.0
#60	0.250	52.3
#100	0.150	38.8
#140	0.106	34.0
#200	0.075	30.6
Hydrometer Analysis		

% Cobbles	---
% Gravel	5.1
% Sand	64.3
% Fines	30.6

D_{85}	0.846
D_{60}	0.311
D_{50}	0.229
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

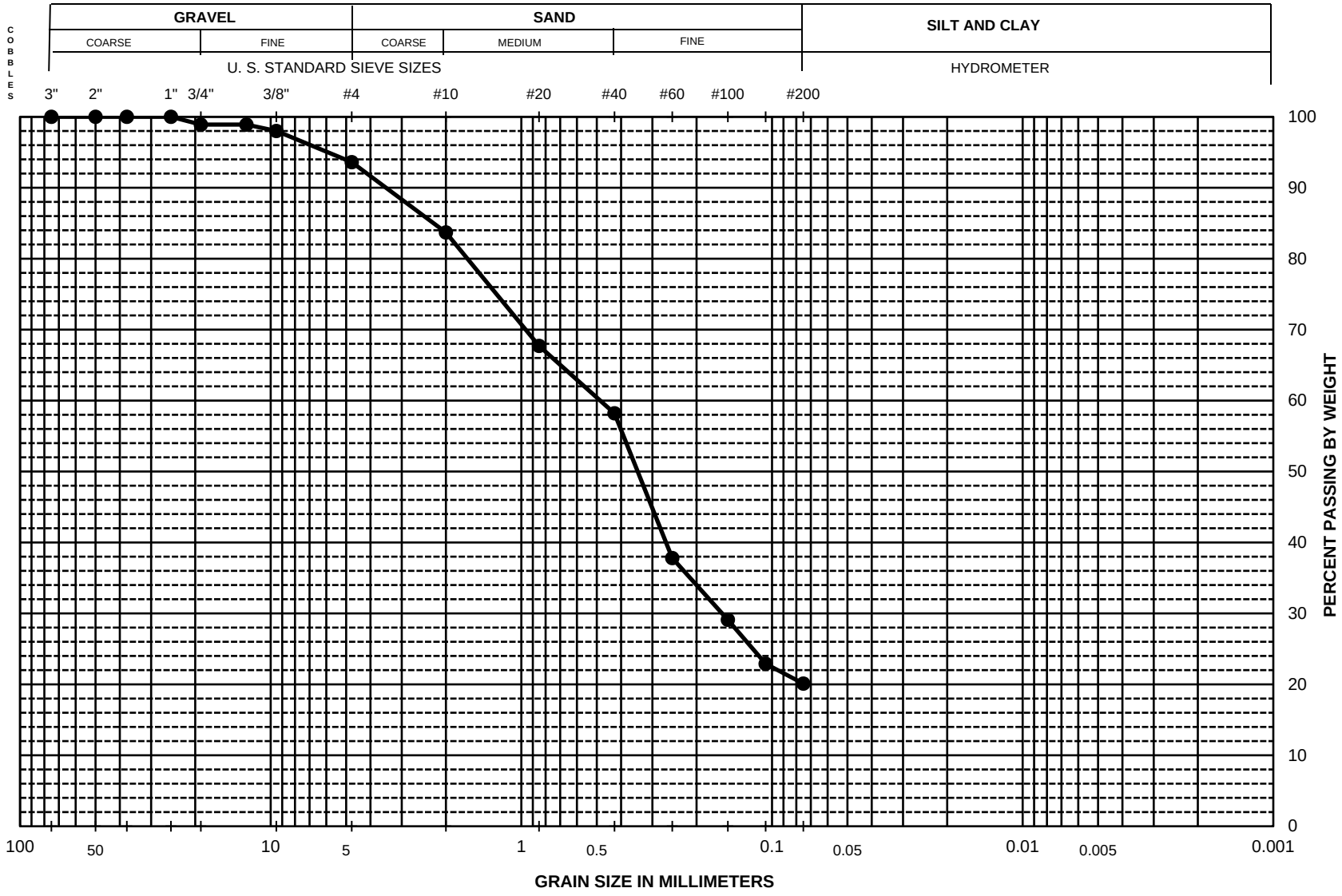
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-21	2	5.0	I	5.9	---	---	---	**Dark yellowish brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	98.9
1/2"	12.50	98.9
3/8"	9.50	98.0
#4	4.75	93.6
#10	2.00	83.7
#20	0.850	67.7
#40	0.425	58.2
#60	0.250	37.8
#100	0.150	29.1
#140	0.106	22.9
#200	0.075	20.1
Hydrometer Analysis		

% Cobbles	---
% Gravel	6.4
% Sand	73.5
% Fines	20.1

D_{85}	2.241
D_{60}	0.485
D_{50}	0.343
D_{30}	0.158
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

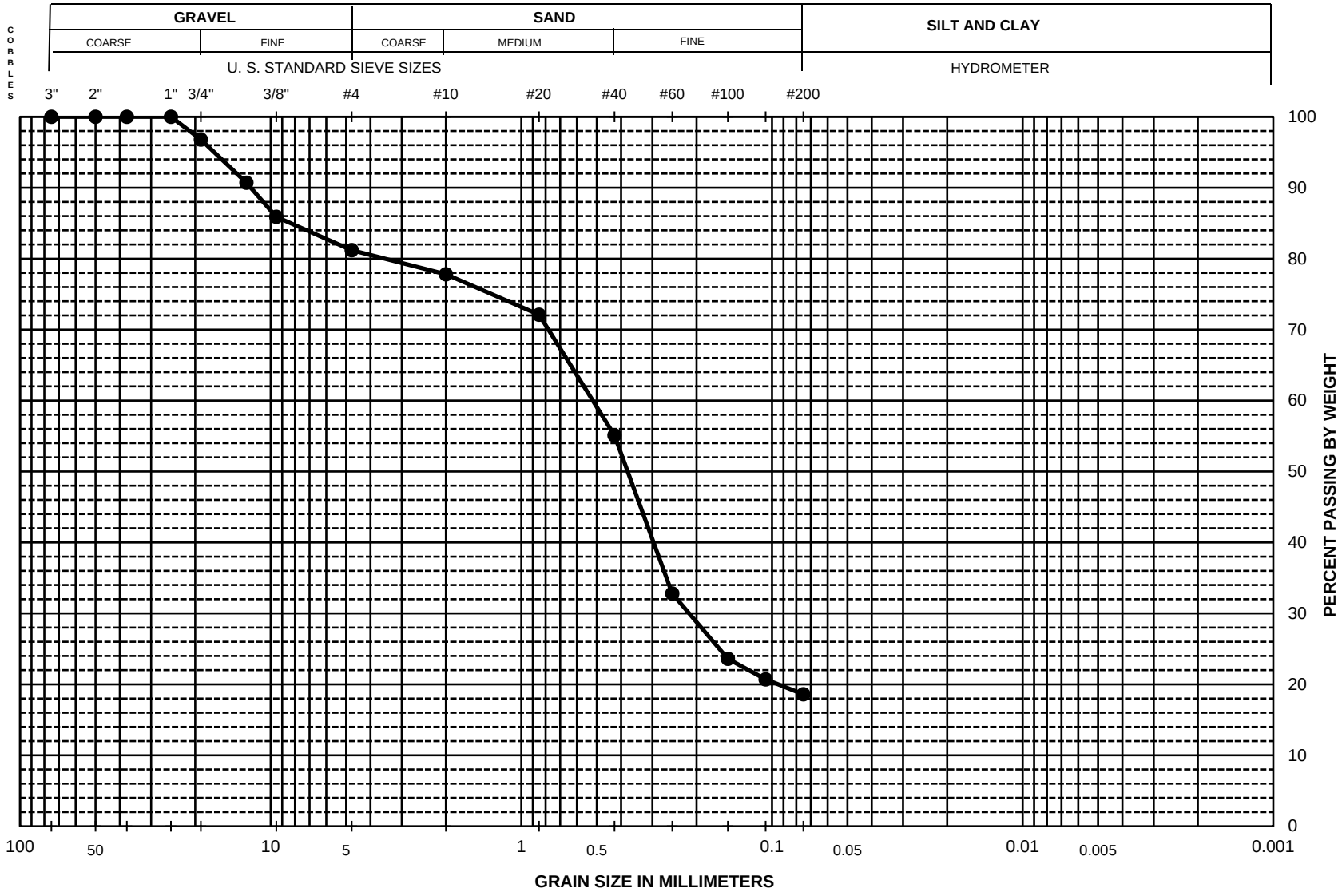
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-25	5	18.5	I	10.0	---	---	---	**Dark yellowish brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	96.8
1/2"	12.50	90.7
3/8"	9.50	85.9
#4	4.75	81.2
#10	2.00	77.8
#20	0.850	72.1
#40	0.425	55.1
#60	0.250	32.8
#100	0.150	23.6
#140	0.106	20.7
#200	0.075	18.6

Hydrometer Analysis

% Cobbles	---
% Gravel	18.8
% Sand	62.6
% Fines	18.6

D_{85}	8.319
D_{60}	0.519
D_{50}	0.376
D_{30}	0.214
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

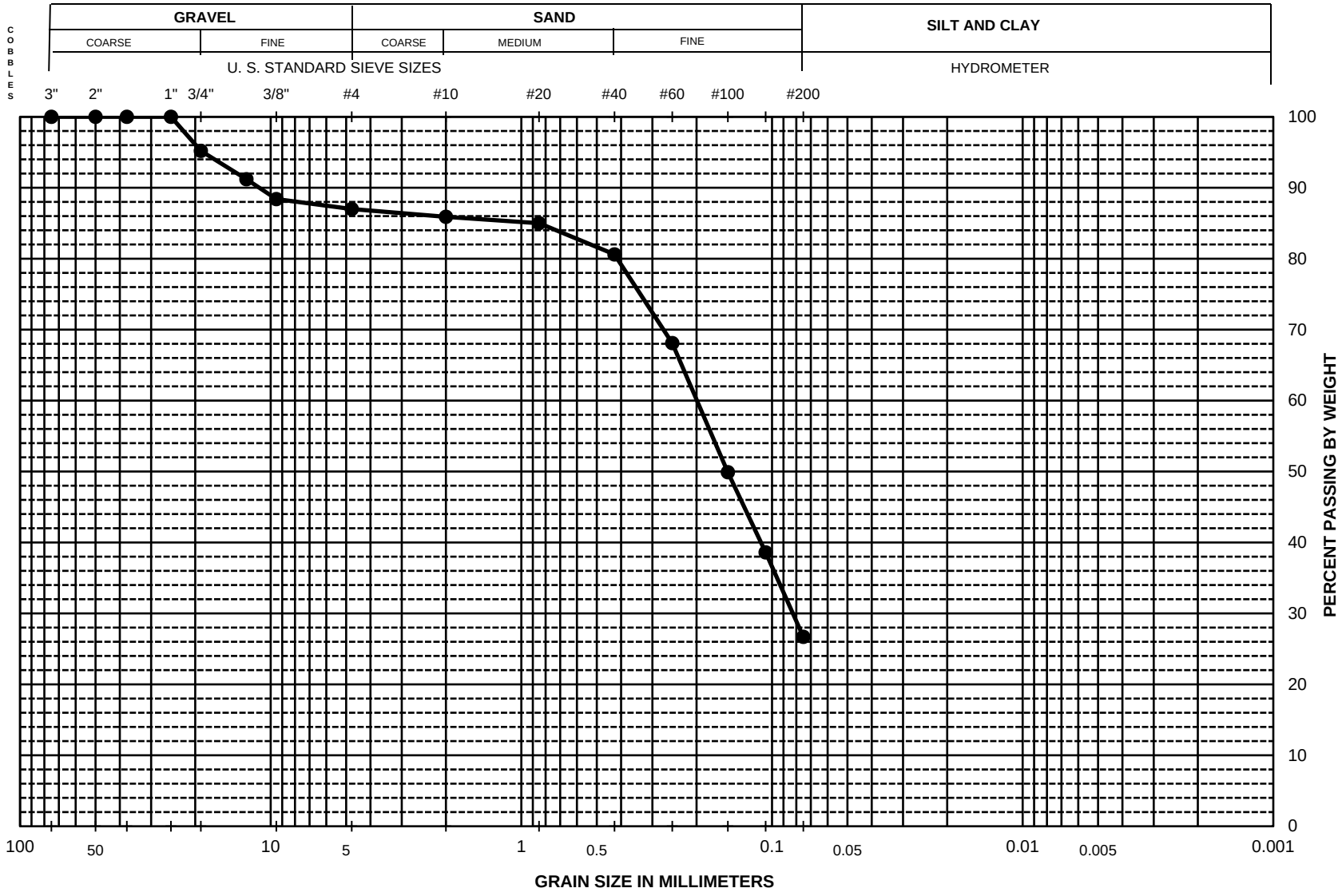
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-26	1	5.0	I	8.2	---	---	---	**Light olive brown Silty SAND with Gravel (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	95.2
1/2"	12.50	91.2
3/8"	9.50	88.4
#4	4.75	87.0
#10	2.00	85.9
#20	0.850	85.0
#40	0.425	80.6
#60	0.250	68.1
#100	0.150	49.9
#140	0.106	38.6
#200	0.075	26.7
Hydrometer Analysis		

% Cobbles	---
% Gravel	13.0
% Sand	60.3
% Fines	26.7

D_{85}	0.850
D_{60}	0.199
D_{50}	0.150
D_{30}	0.083
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

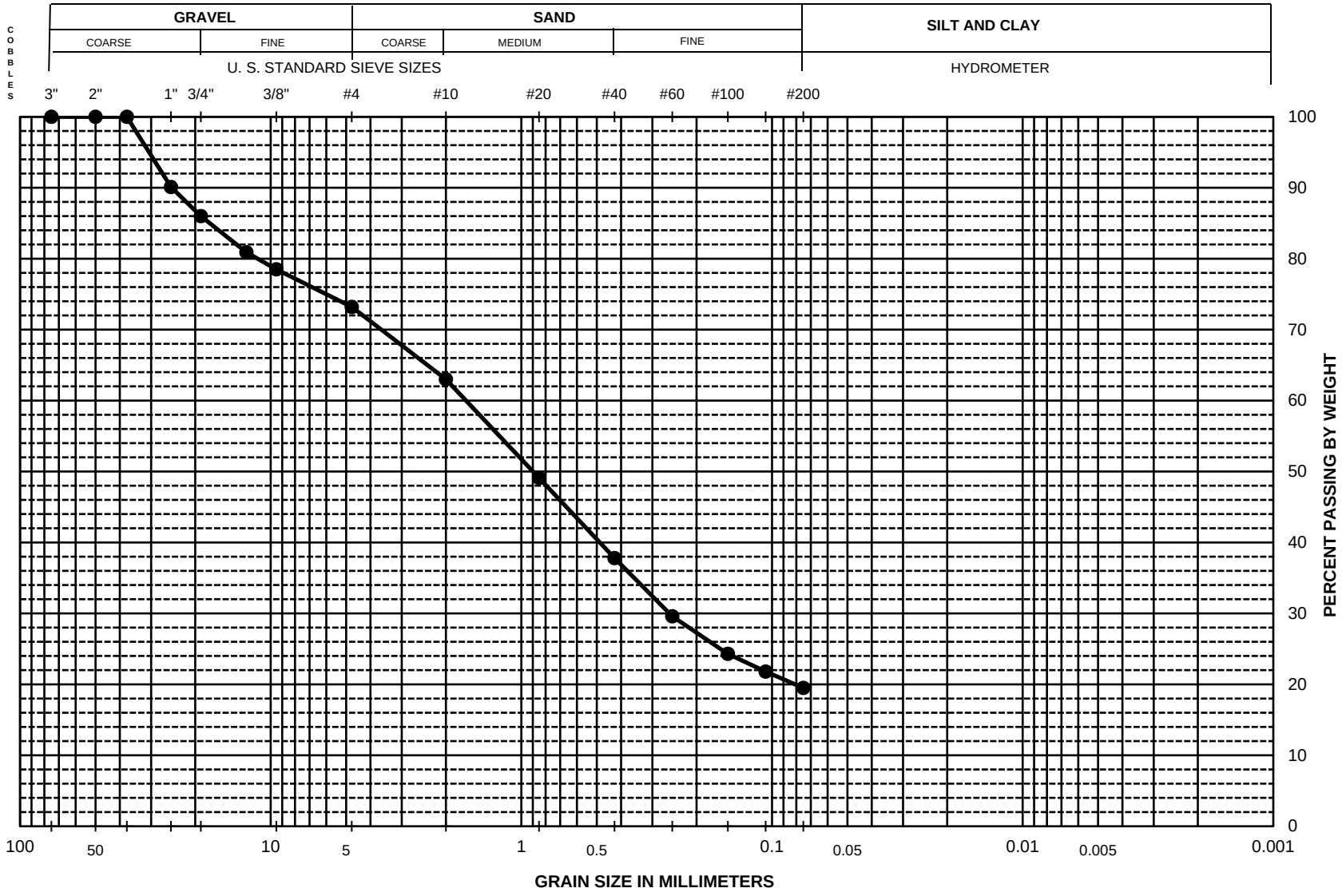
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
FM-34	2	10.0	I	10.4	---	---	---	**Olive brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	90.1
3/4"	19.00	86.0
1/2"	12.50	80.9
3/8"	9.50	78.5
#4	4.75	73.2
#10	2.00	63.0
#20	0.850	49.1
#40	0.425	37.8
#60	0.250	29.6
#100	0.150	24.3
#140	0.106	21.8
#200	0.075	19.5
Hydrometer Analysis		

% Cobbles	---
% Gravel	26.8
% Sand	53.7
% Fines	19.5

D_{85}	17.502
D_{60}	1.663
D_{50}	0.898
D_{30}	0.257
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

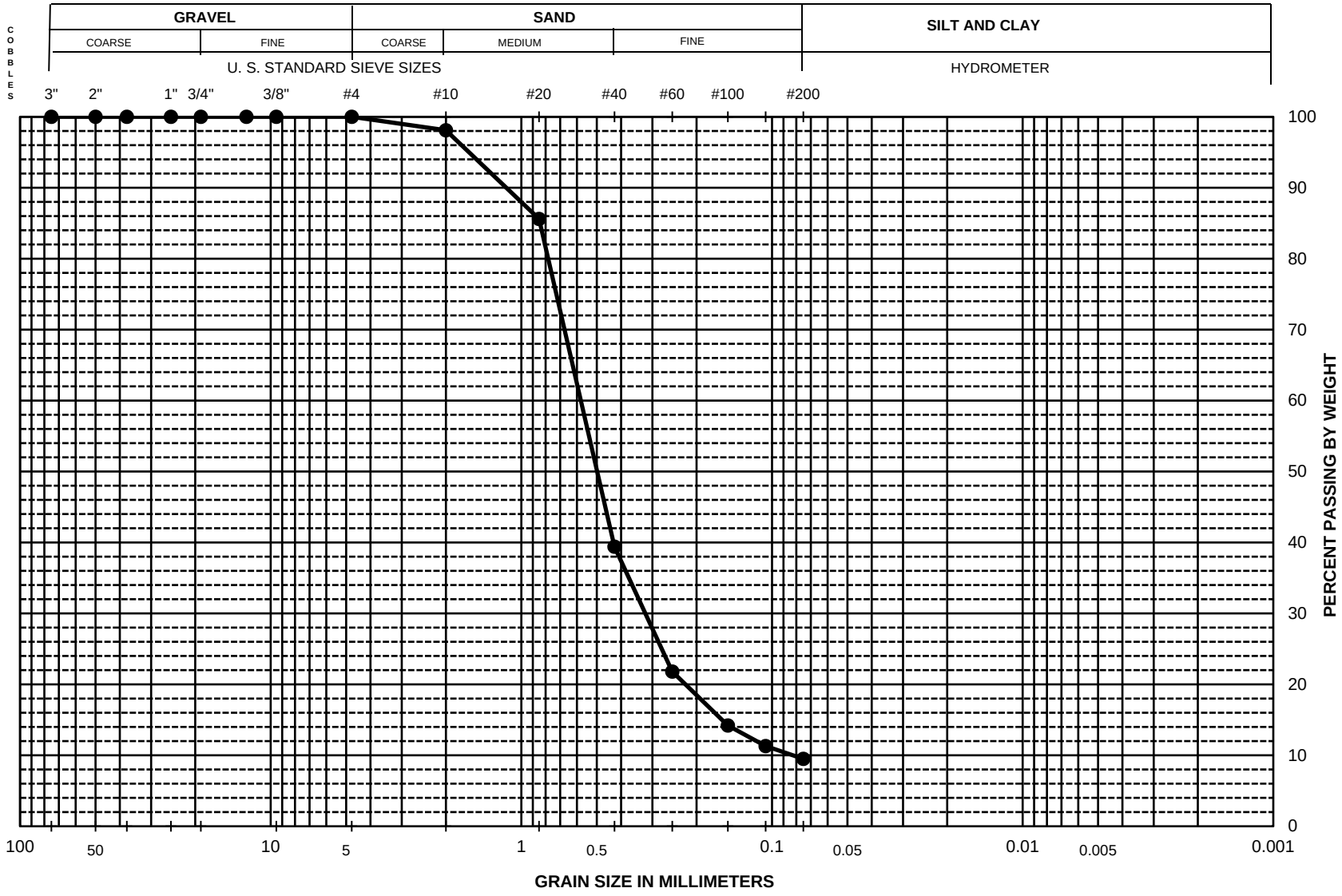
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-01	13	60.0	I	10.1	---	---	---	**Olive brown Silty SAND with Gravel (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	98.1
#20	0.850	85.6
#40	0.425	39.4
#60	0.250	21.8
#100	0.150	14.2
#140	0.106	11.3
#200	0.075	9.5

Hydrometer Analysis

% Cobbles	---
% Gravel	0.0
% Sand	90.5
% Fines	9.5

D_{85}	0.842
D_{60}	0.579
D_{50}	0.498
D_{30}	0.320
D_{15}	0.158
D_{10}	0.083
C_u	7.0
C_c	2.1

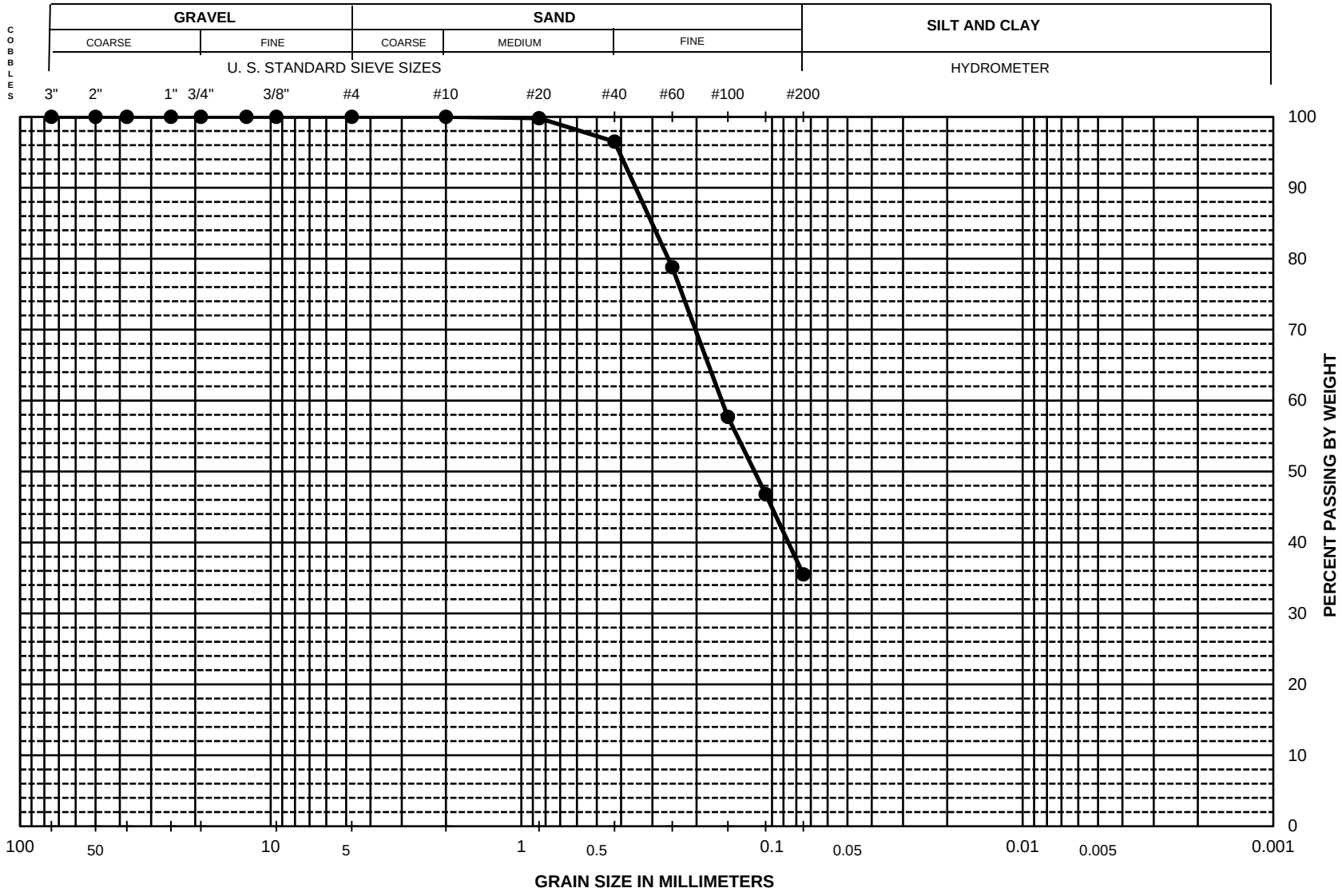
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-01	15	75.0	I	15.8	---	---	---	**Olive brown Well Graded SAND with Silt (SW-SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.8
#40	0.425	96.5
#60	0.250	78.8
#100	0.150	57.7
#140	0.106	46.8
#200	0.075	35.5

Hydrometer Analysis

% Cobbles	---
% Gravel	0.0
% Sand	64.5
% Fines	35.5

D_{85}	0.301
D_{60}	0.159
D_{50}	0.117
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

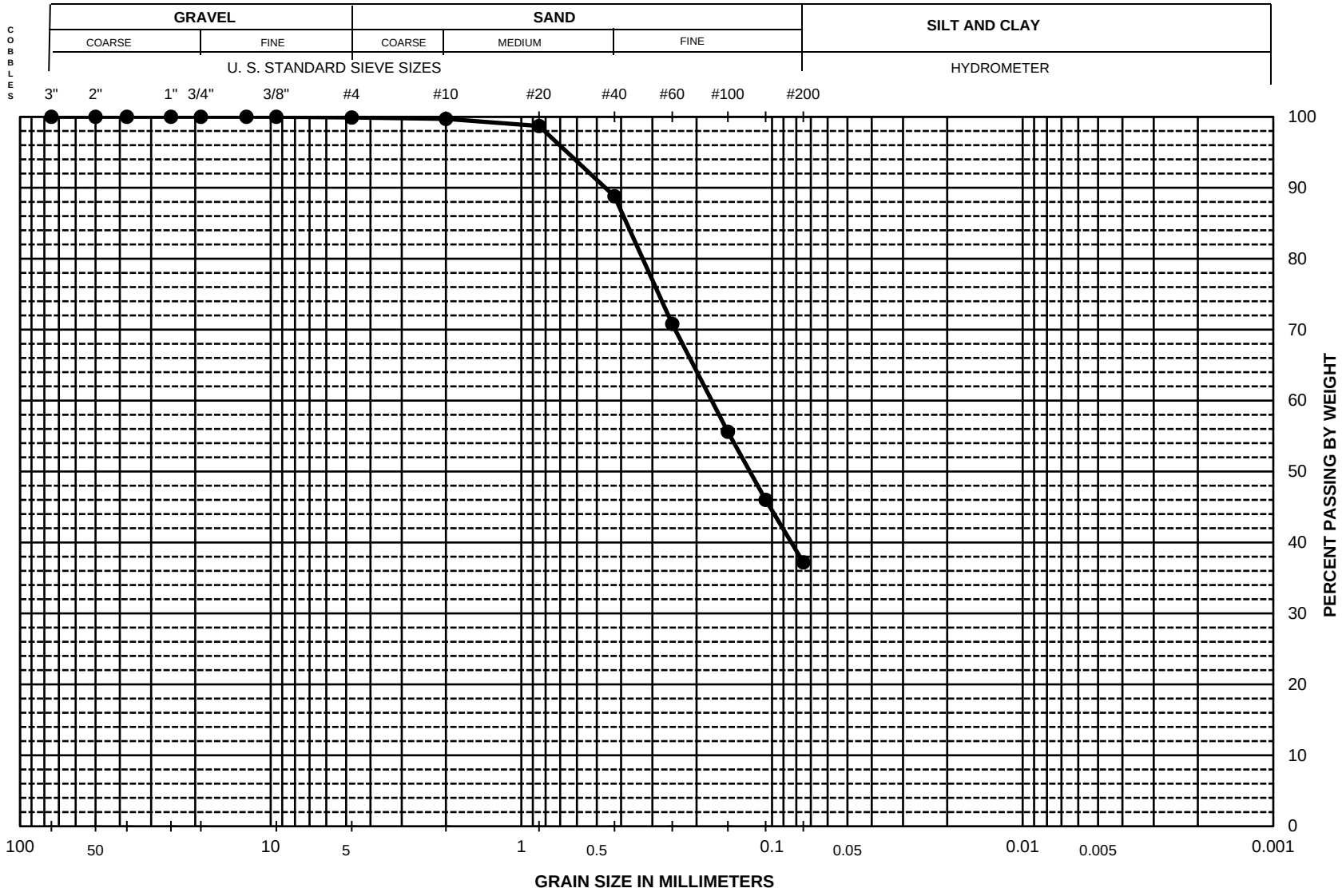
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-01	17	95.0	I	19.3	---	---	---	**Olive brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.9
#10	2.00	99.7
#20	0.850	98.7
#40	0.425	88.8
#60	0.250	70.8
#100	0.150	55.6
#140	0.106	46.0
#200	0.075	37.2

Hydrometer Analysis

% Cobbles	---
% Gravel	0.1
% Sand	62.7
% Fines	37.2

D_{85}	0.380
D_{60}	0.174
D_{50}	0.122
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

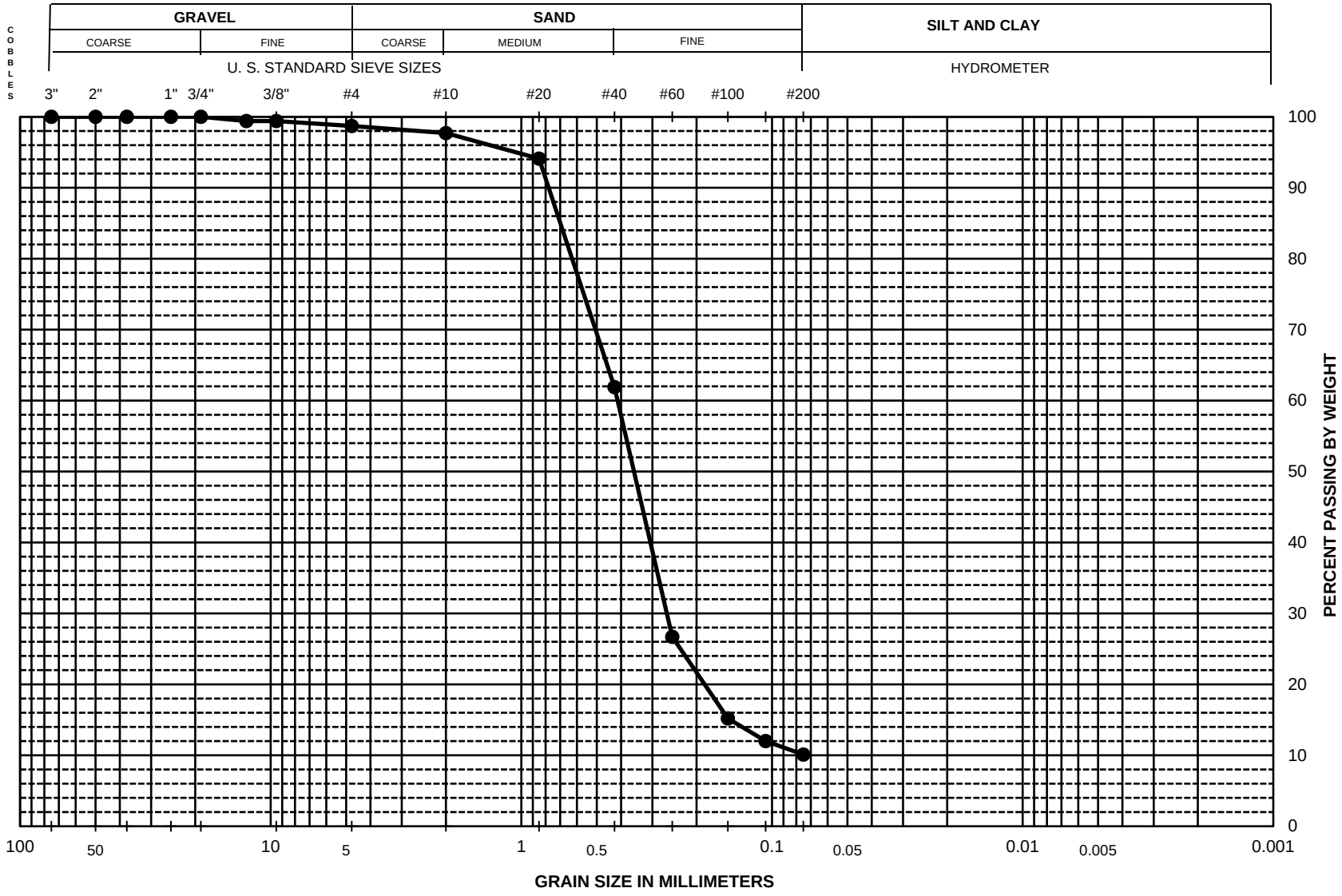
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-02	9	45.0	I	19.0	---	---	---	**Olive brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	99.4
3/8"	9.50	99.4
#4	4.75	98.7
#10	2.00	97.7
#20	0.850	94.1
#40	0.425	61.9
#60	0.250	26.7
#100	0.150	15.2
#140	0.106	12.0
#200	0.075	10.1

Hydrometer Analysis

% Cobbles	---
% Gravel	1.3
% Sand	88.6
% Fines	10.1

D_{85}	0.699
D_{60}	0.413
D_{50}	0.355
D_{30}	0.263
D_{15}	0.147
D_{10}	---
C_u	----
C_c	-----

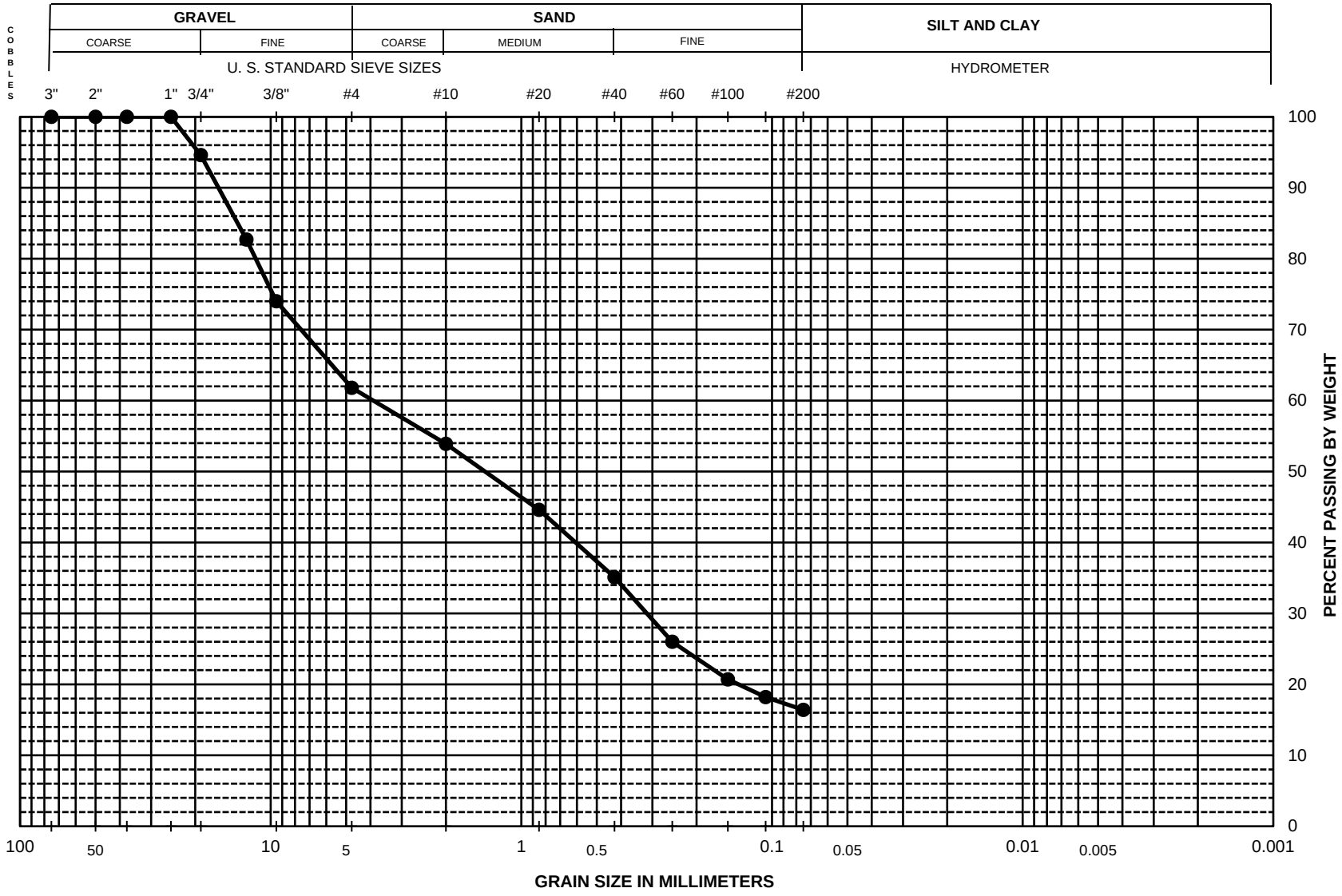
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-02	11	55.0	I	15.1	---	---	---	**Olive brown Poorly Graded SAND with Silt (SP-SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	94.6
1/2"	12.50	82.7
3/8"	9.50	74.0
#4	4.75	61.8
#10	2.00	53.9
#20	0.850	44.6
#40	0.425	35.1
#60	0.250	26.0
#100	0.150	20.7
#140	0.106	18.2
#200	0.075	16.4
Hydrometer Analysis		

% Cobbles	---
% Gravel	38.2
% Sand	45.4
% Fines	16.4

D_{85}	13.554
D_{60}	3.900
D_{50}	1.397
D_{30}	0.316
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

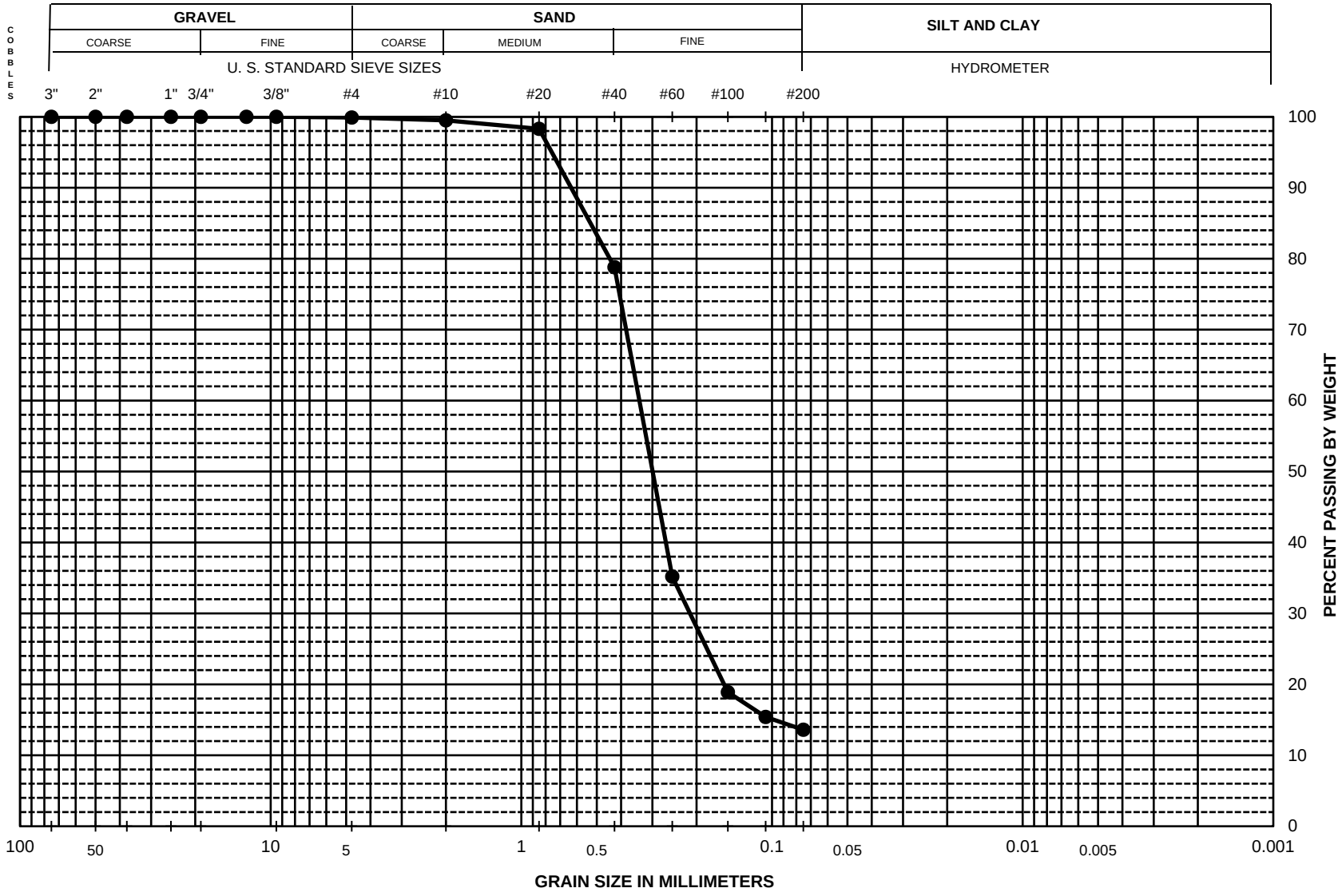
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-02	13	70.0	I	15.2	---	---	---	**Olive brown Clayey SAND with Gravel (SC)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.9
#10	2.00	99.5
#20	0.850	98.3
#40	0.425	78.8
#60	0.250	35.2
#100	0.150	18.9
#140	0.106	15.4
#200	0.075	13.6

Hydrometer Analysis

% Cobbles	---
% Gravel	0.1
% Sand	86.3
% Fines	13.6

D_{85}	0.530
D_{60}	0.338
D_{50}	0.299
D_{30}	0.212
D_{15}	0.098
D_{10}	---
C_u	----
C_c	-----

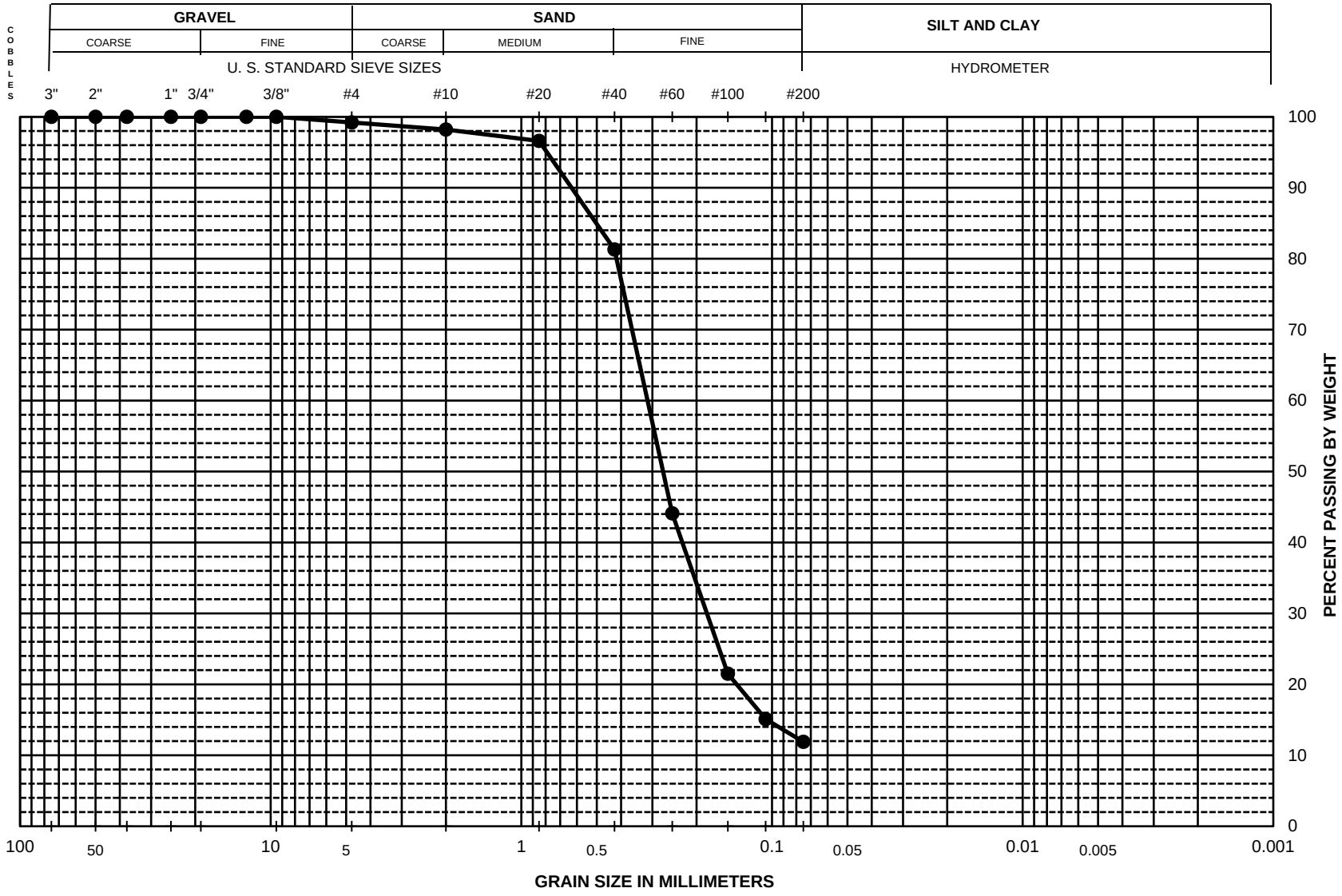
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-02	14	75.0	I	22.7	---	---	---	**Dark yellowish brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.2
#10	2.00	98.2
#20	0.850	96.6
#40	0.425	81.3
#60	0.250	44.1
#100	0.150	21.5
#140	0.106	15.1
#200	0.075	11.9

Hydrometer Analysis

% Cobbles	---
% Gravel	0.8
% Sand	87.3
% Fines	11.9

D_{85}	0.503
D_{60}	0.314
D_{50}	0.272
D_{30}	0.182
D_{15}	0.105
D_{10}	---
C_u	----
C_c	-----

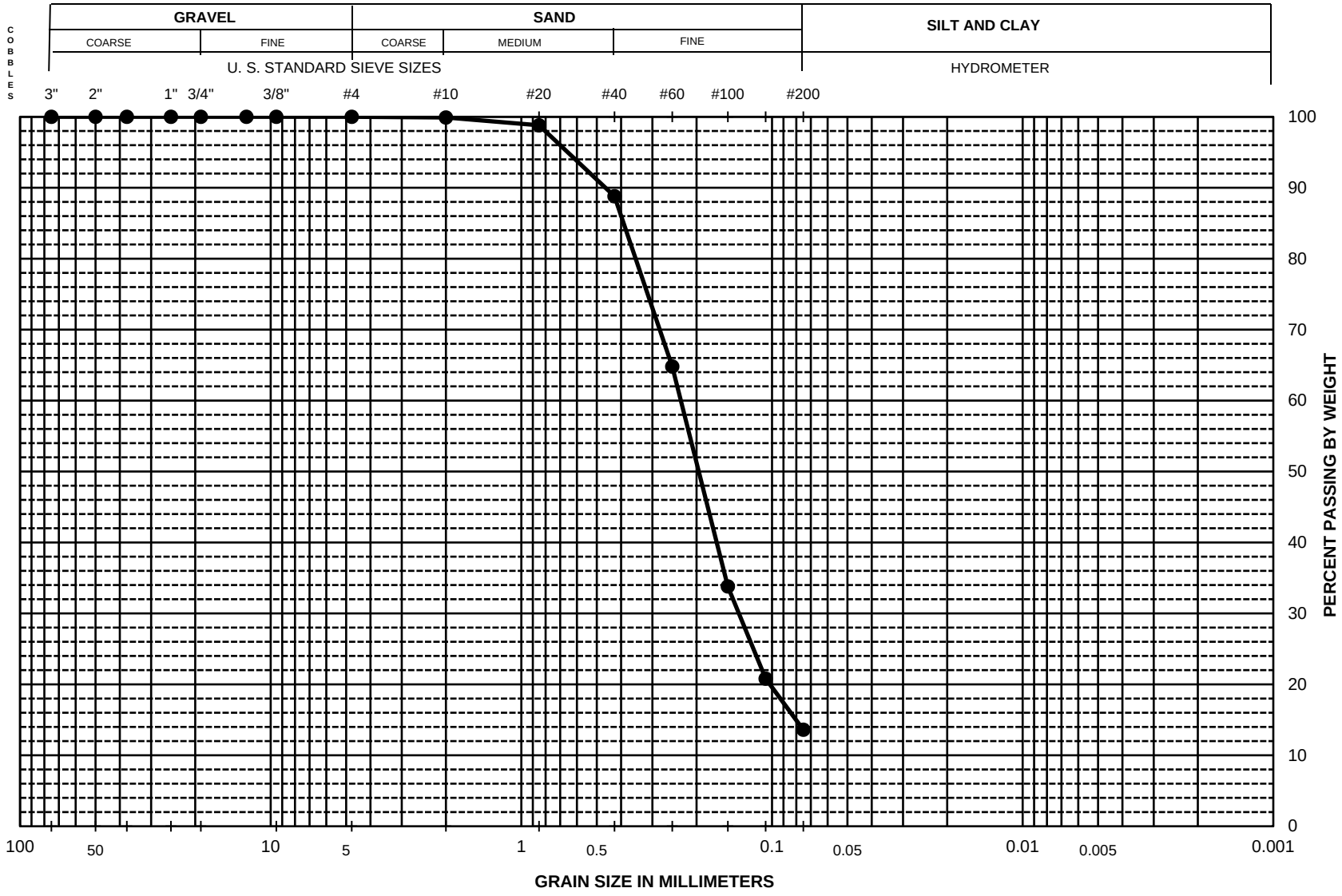
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-02	15	85.0	I	18.3	---	---	---	**Pale brown Poorly Graded SAND with Silt (SP-SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	99.9
#20	0.850	98.8
#40	0.425	88.8
#60	0.250	64.8
#100	0.150	33.8
#140	0.106	20.8
#200	0.075	13.6
Hydrometer Analysis		

% Cobbles	---
% Gravel	0.0
% Sand	86.4
% Fines	13.6

D_{85}	0.391
D_{60}	0.231
D_{50}	0.196
D_{30}	0.136
D_{15}	0.080
D_{10}	---
C_u	----
C_c	-----

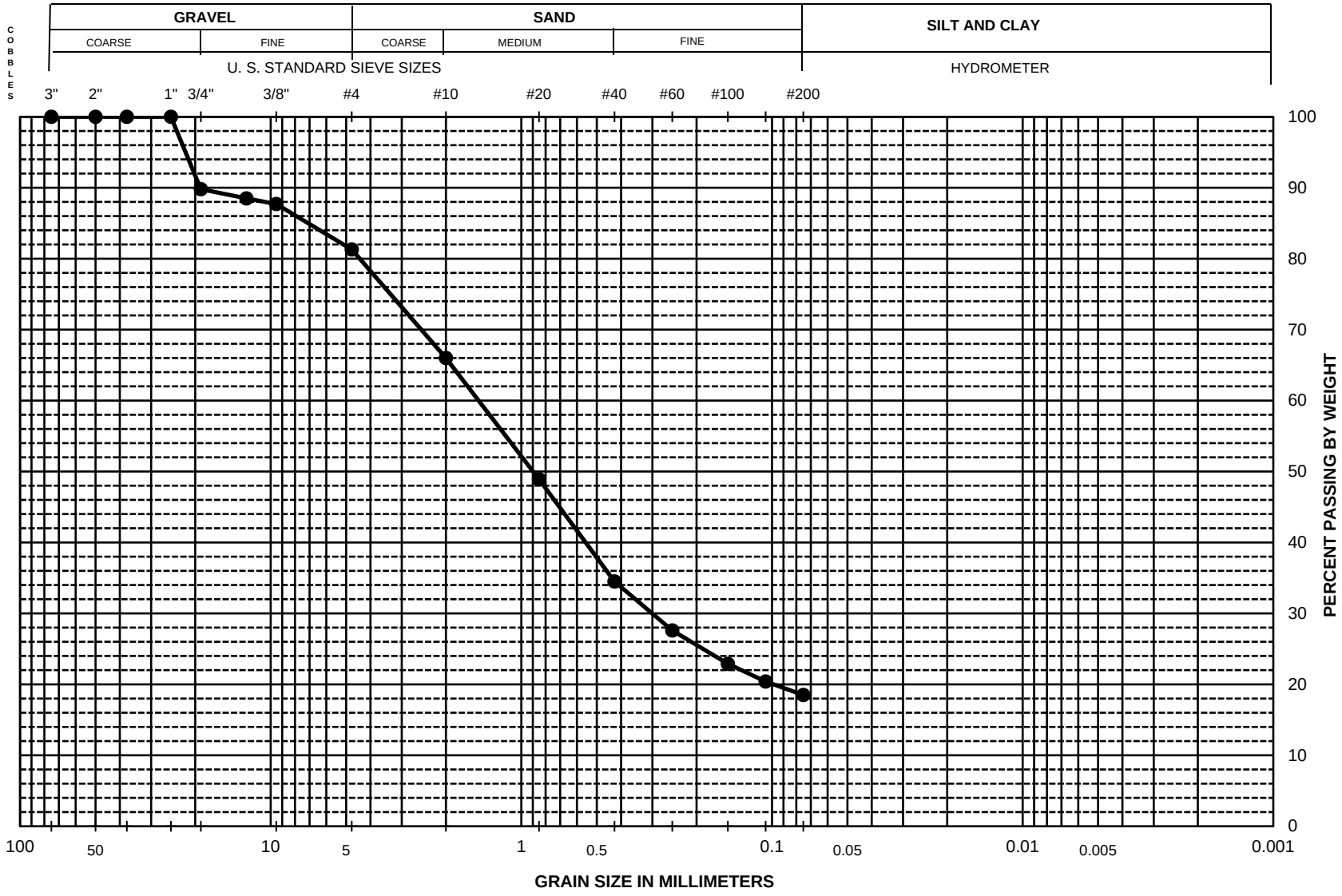
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
WM-03	1	0~5	I	6.8	---	---	---	**Light gray to light olive brown Silty SAND (SM)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	89.8
1/2"	12.50	88.5
3/8"	9.50	87.7
#4	4.75	81.3
#10	2.00	66.0
#20	0.850	48.9
#40	0.425	34.5
#60	0.250	27.6
#100	0.150	22.9
#140	0.106	20.4
#200	0.075	18.5
Hydrometer Analysis		

% Cobbles	---
% Gravel	18.7
% Sand	62.8
% Fines	18.5

D_{85}	7.091
D_{60}	1.481
D_{50}	0.898
D_{30}	0.301
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

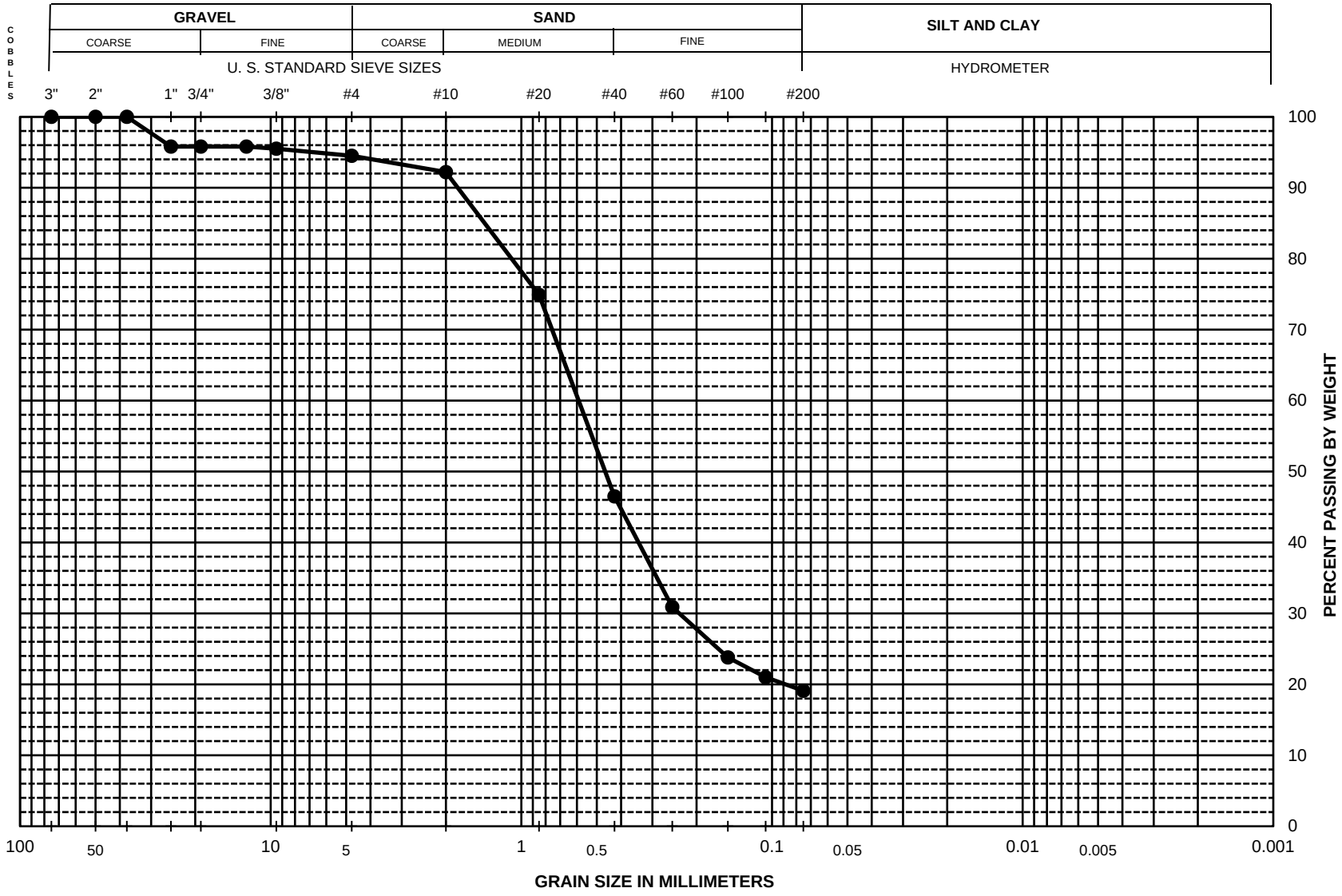
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
WM-07	2	10.0	I	8.7	36	24	---	**Olive brown Clayey SAND with Gravel (SC)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	95.8
3/4"	19.00	95.8
1/2"	12.50	95.8
3/8"	9.50	95.5
#4	4.75	94.5
#10	2.00	92.2
#20	0.850	74.9
#40	0.425	46.5
#60	0.250	30.9
#100	0.150	23.8
#140	0.106	21.0
#200	0.075	19.1
Hydrometer Analysis		

% Cobbles	---
% Gravel	5.5
% Sand	75.4
% Fines	19.1

D_{85}	1.401
D_{60}	0.591
D_{50}	0.463
D_{30}	0.234
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

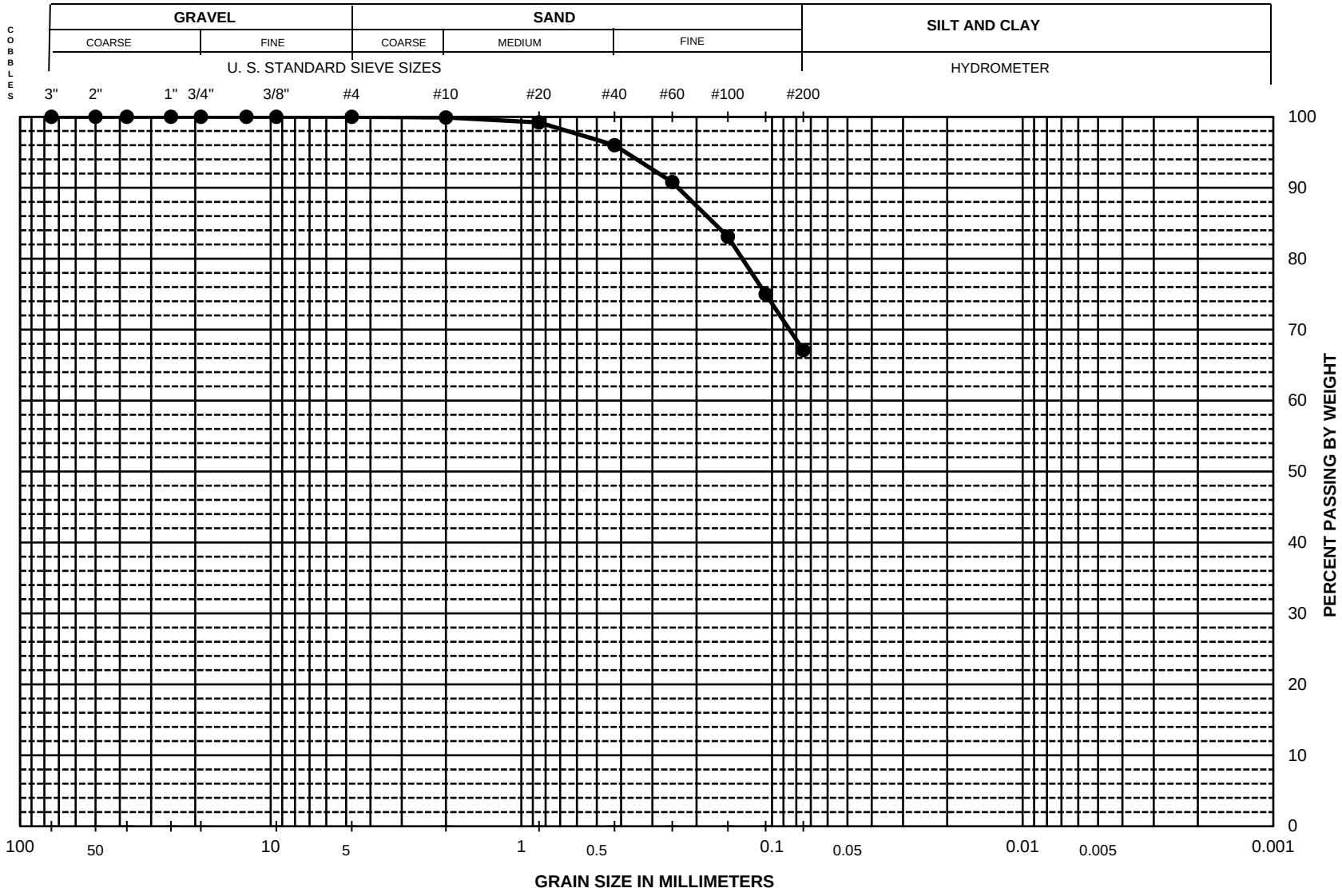
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
WM-08	3	12.5	I	10.6	45	30	---	**Strong brown Clayey SAND (SC)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	99.9
#20	0.850	99.2
#40	0.425	96.0
#60	0.250	90.8
#100	0.150	83.1
#140	0.106	75.0
#200	0.075	67.1
Hydrometer Analysis		

% Cobbles	---
% Gravel	0.0
% Sand	32.9
% Fines	67.1

D_{85}	0.170
D_{60}	---
D_{50}	---
D_{30}	---
D_{15}	---
D_{10}	---
C_u	----
C_c	-----

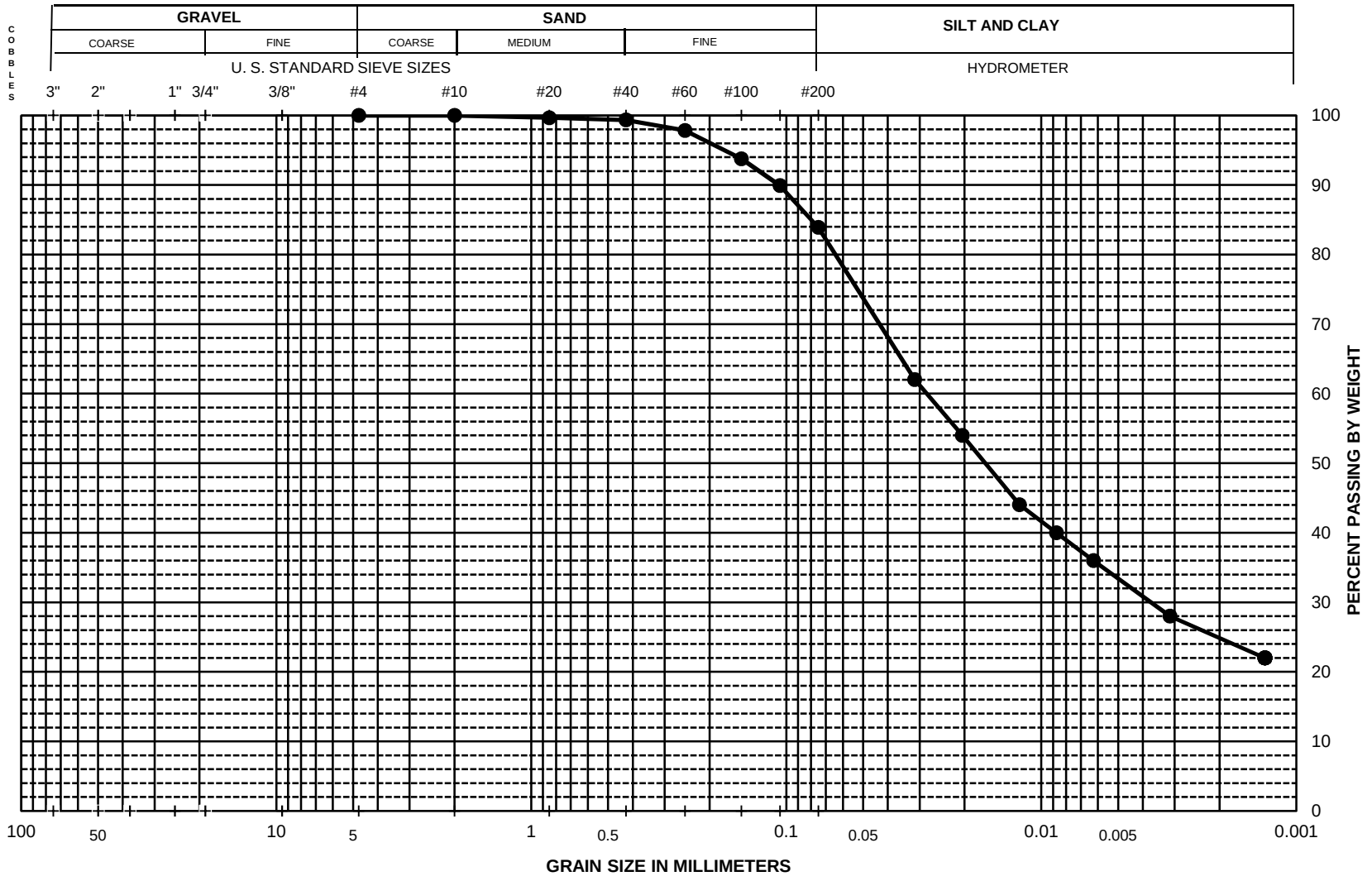
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
WM-23	2	10.0	I	8.2	---	---	---	**Strong brown Sandy, Lean CLAY (CL)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.7
#40	0.425	99.3
#60	0.250	97.8
#100	0.150	93.8
#140	0.106	89.9
#200	0.075	83.9
Hydrometer Analysis	0.0314	62.0
	0.0204	54.0
	0.0122	44.0
	0.0087	40.0
	0.0062	36.0
	0.0031	28.0
	0.0013	22.0
	0.0013	22.0
	0.0013	22.0
	0.0013	22.0

% Cobbles	--
% Gravel	0.0
% Sand	16.1
% Fines	83.9

D_{85}	0.6541
D_{60}	0.0281
D_{30}	0.0037
D_{15}	---
D_{10}	---
C_u	---
C_c	---

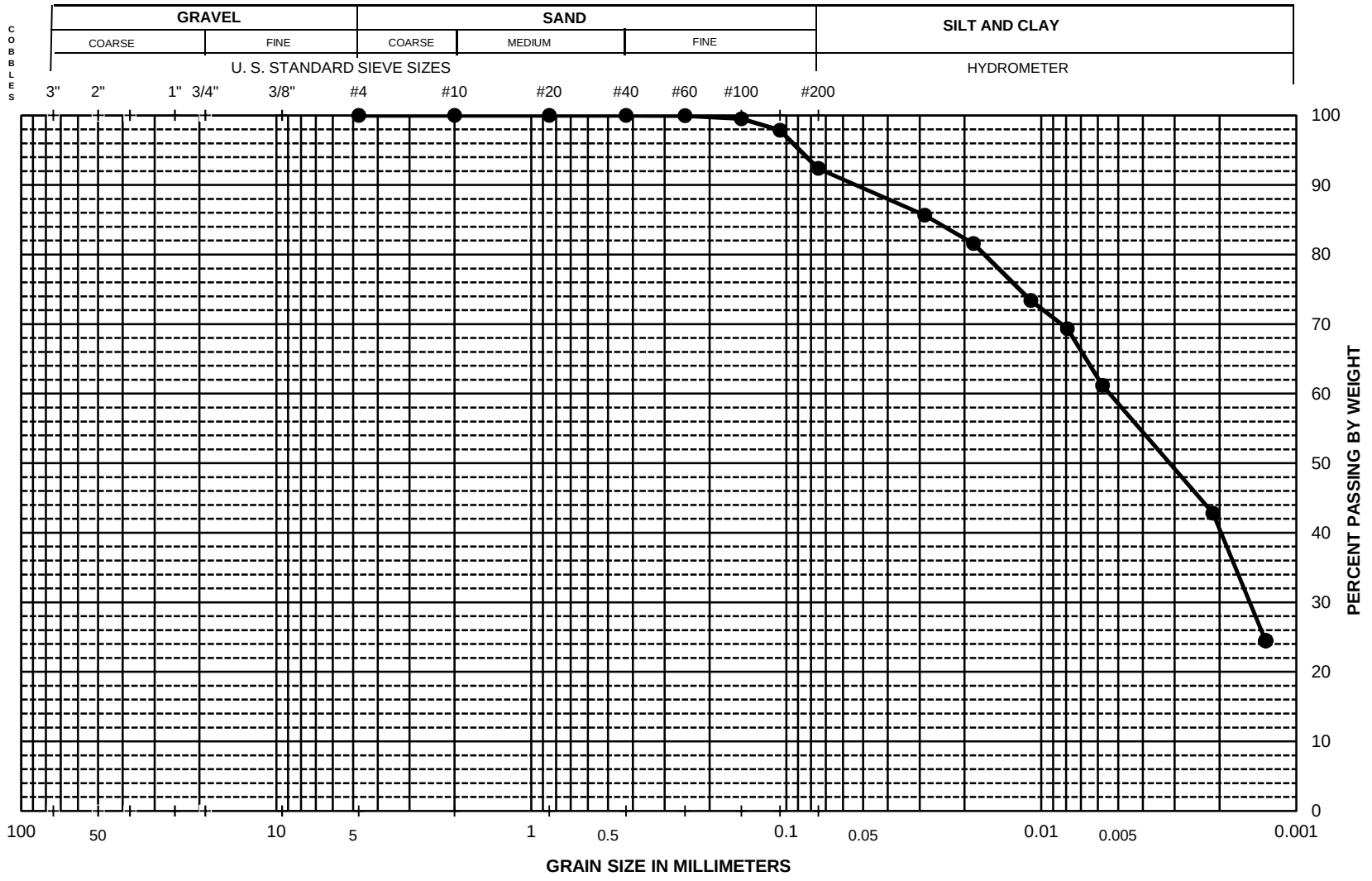
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-01	4	17.0	I	----	47	26	25	**Dark grayish brown CLAY with Sand (CL)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	100.0
#40	0.425	100.0
#60	0.250	100.0
#100	0.150	99.5
#140	0.106	97.9
#200	0.075	92.4
Hydrometer Analysis	0.0287	85.7
	0.0185	81.6
	0.0110	73.4
	0.0079	69.3
	0.0058	61.2
	0.0021	42.8
	0.0013	24.5
	0.0013	24.5
	0.0013	24.5
	0.0013	24.5

% Cobbles	--
% Gravel	0.0
% Sand	7.6
% Fines	92.4

D_{85}	0.0267
D_{60}	0.0054
D_{30}	0.0015
D_{15}	---
D_{10}	---
C_u	---
C_c	---

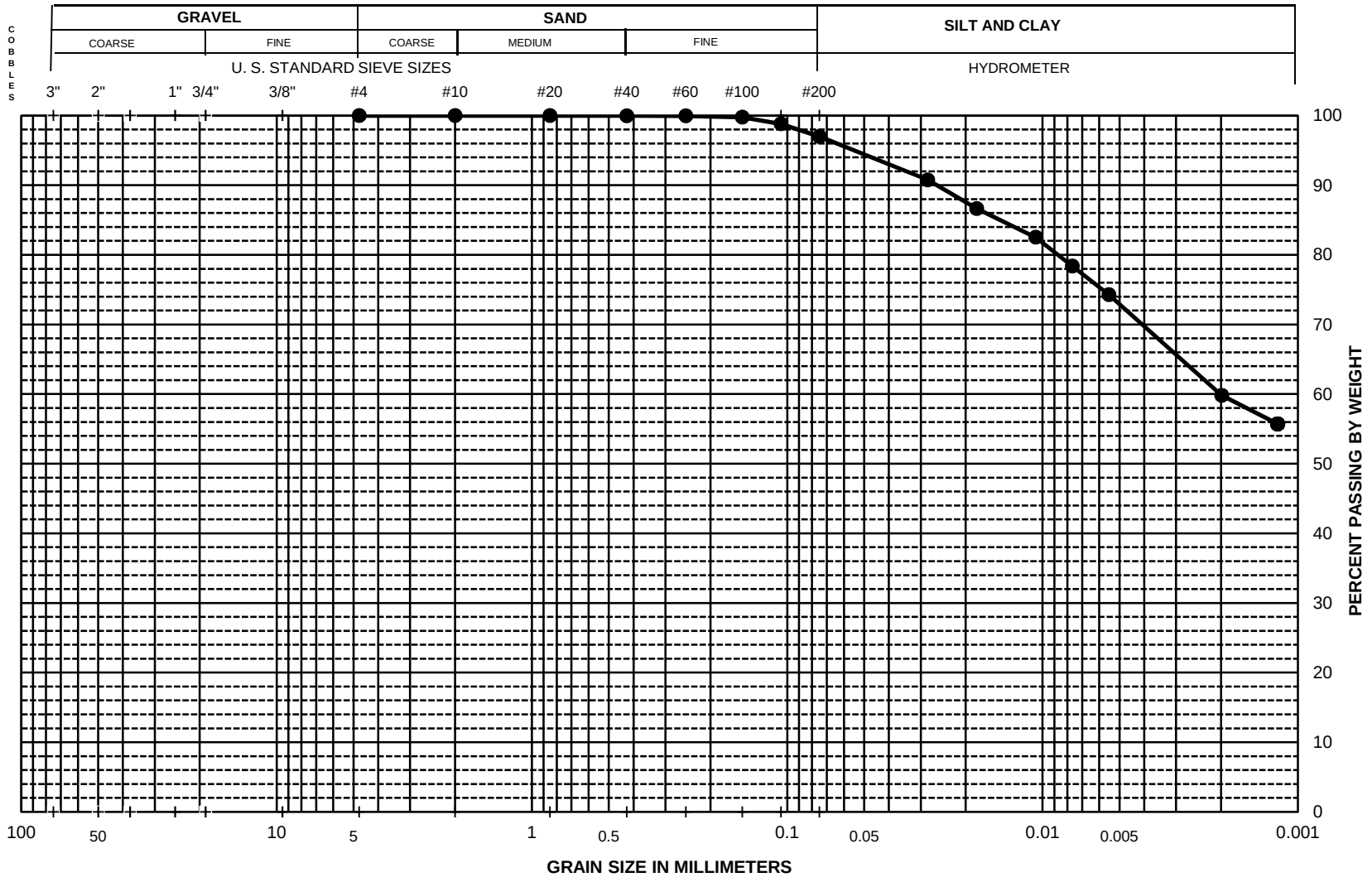
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-01	6	25.0			84	55	41	**Dark gray Fat CLAY (CH)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	100.0
#40	0.425	100.0
#60	0.250	100.0
#100	0.150	99.8
#140	0.106	98.8
#200	0.075	97.0
Hydrometer Analysis	0.0282	90.8
	0.0181	86.7
	0.0107	82.5
	0.0077	78.4
	0.0055	74.3
	0.0020	59.8
	0.0012	55.7
	0.0012	55.7
	0.0012	55.7
	0.0012	55.7

% Cobbles	--
% Gravel	0.0
% Sand	3.0
% Fines	97.0

D_{85}	0.0147
D_{60}	0.0020
D_{30}	---
D_{15}	---
D_{10}	---
C_u	---
C_c	---

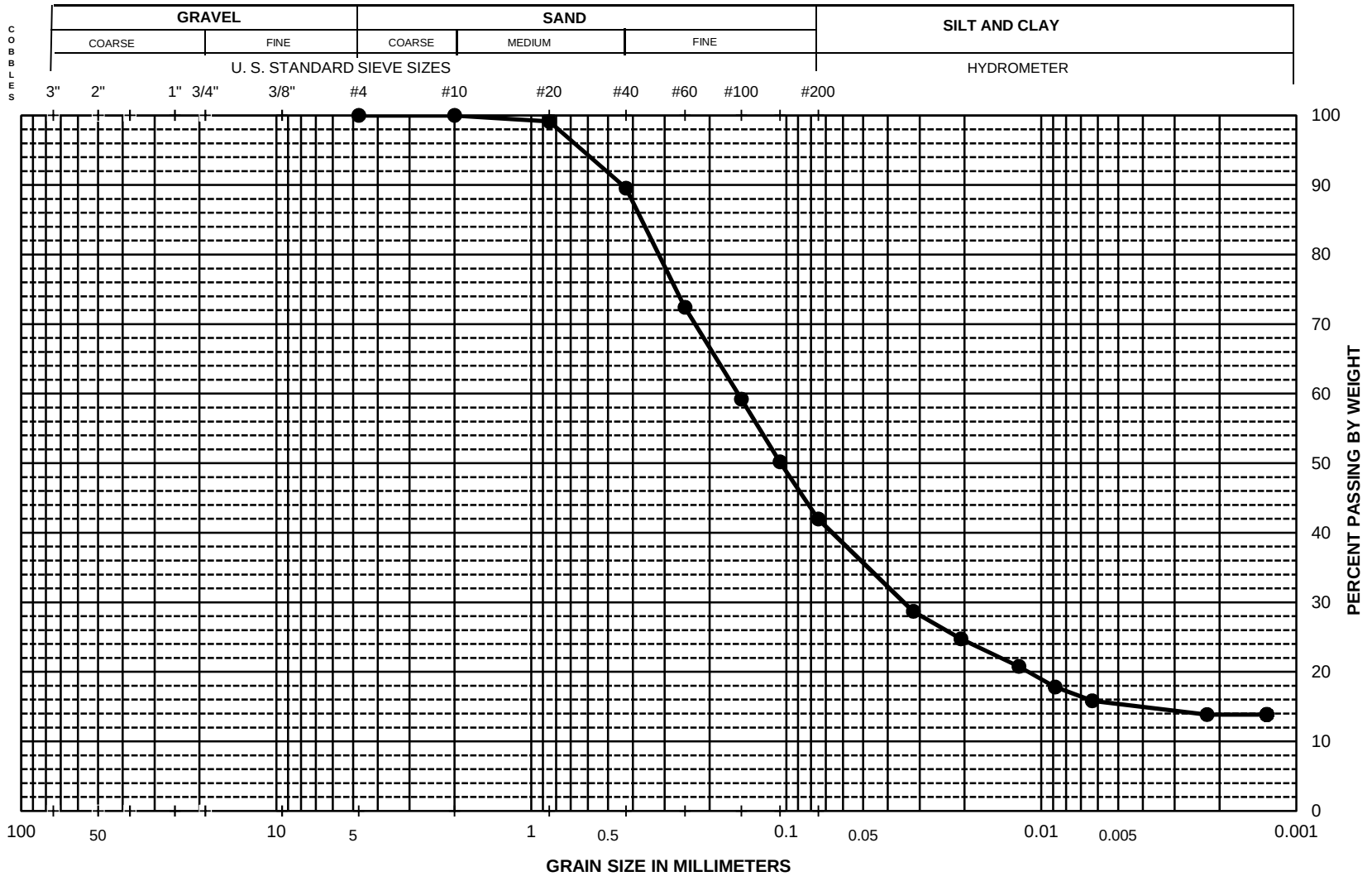
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-01	7	30.0	I	40.0	100	63	60	**Dark gray Fat CLAY (CH)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.1
#40	0.425	89.6
#60	0.250	72.4
#100	0.150	59.2
#140	0.106	50.2
#200	0.075	42.0
Hydrometer Analysis	0.0318	28.7
	0.0207	24.7
	0.0123	20.8
	0.0088	17.8
	0.0063	15.8
	0.0022	13.9
	0.0013	13.9
	0.0013	13.9
	0.0013	13.9
	0.0013	13.9

% Cobbles	--
% Gravel	0.0
% Sand	58.0
% Fines	42.0
D_{85}	1.6569
D_{60}	0.2864
D_{30}	0.0348
D_{15}	---
D_{10}	---
C_u	---
C_c	---

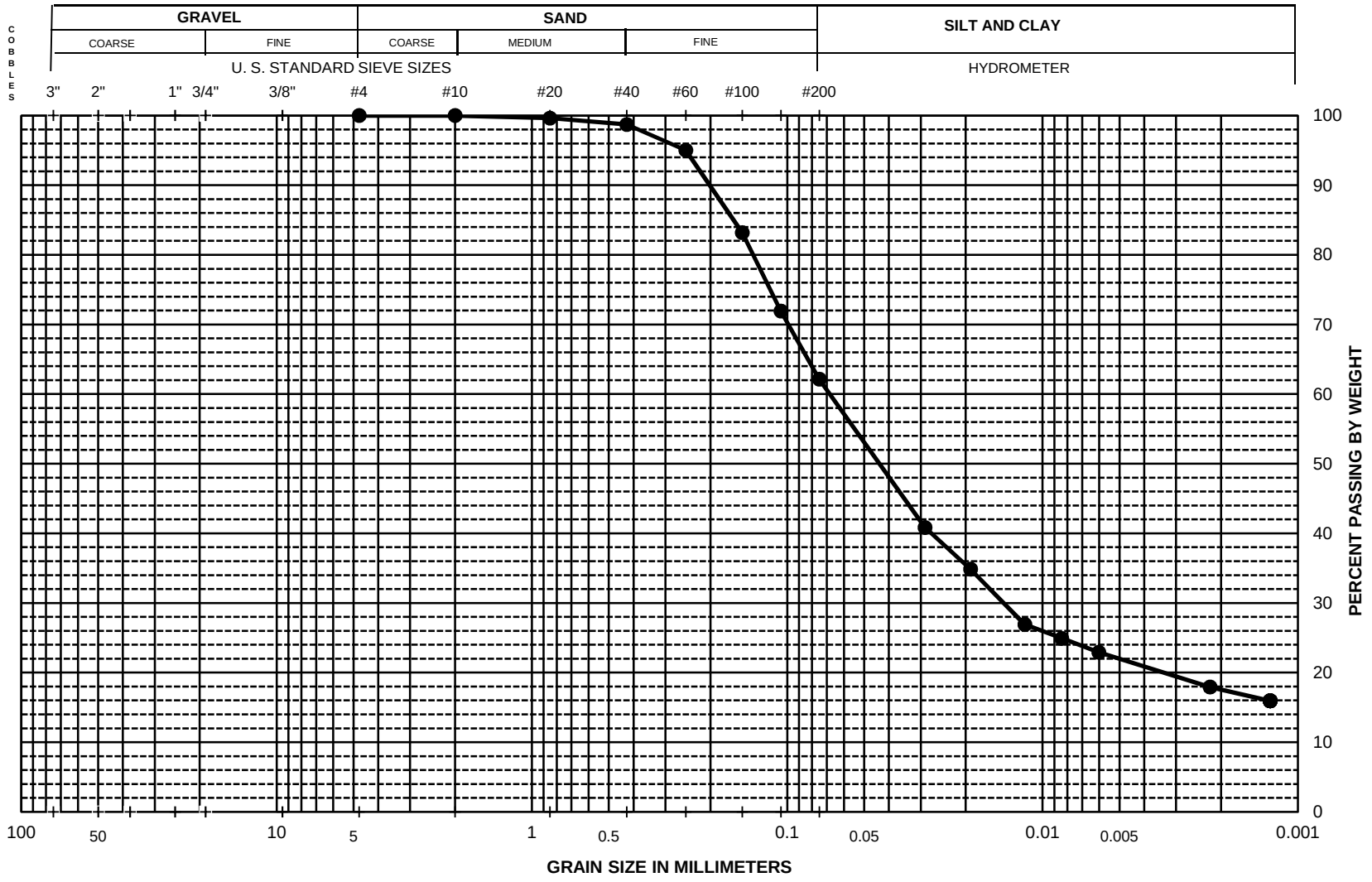
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-01	10	45.0	I	----	34	18	14	**Dark grayish brown Clayey SAND (SC)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.6
#40	0.425	98.7
#60	0.250	95.0
#100	0.150	83.2
#140	0.106	71.9
#200	0.075	62.1
Hydrometer Analysis	0.0289	40.8
	0.0192	34.9
	0.0117	26.9
	0.0084	24.9
	0.0060	22.9
	0.0022	17.9
	0.0013	15.9
	0.0013	15.9
	0.0013	15.9
	0.0013	15.9

% Cobbles	--
% Gravel	0.0
% Sand	37.9
% Fines	62.1

D_{85}	1.3022
D_{60}	0.1507
D_{30}	0.0142
D_{15}	---
D_{10}	---
C_u	---
C_c	---

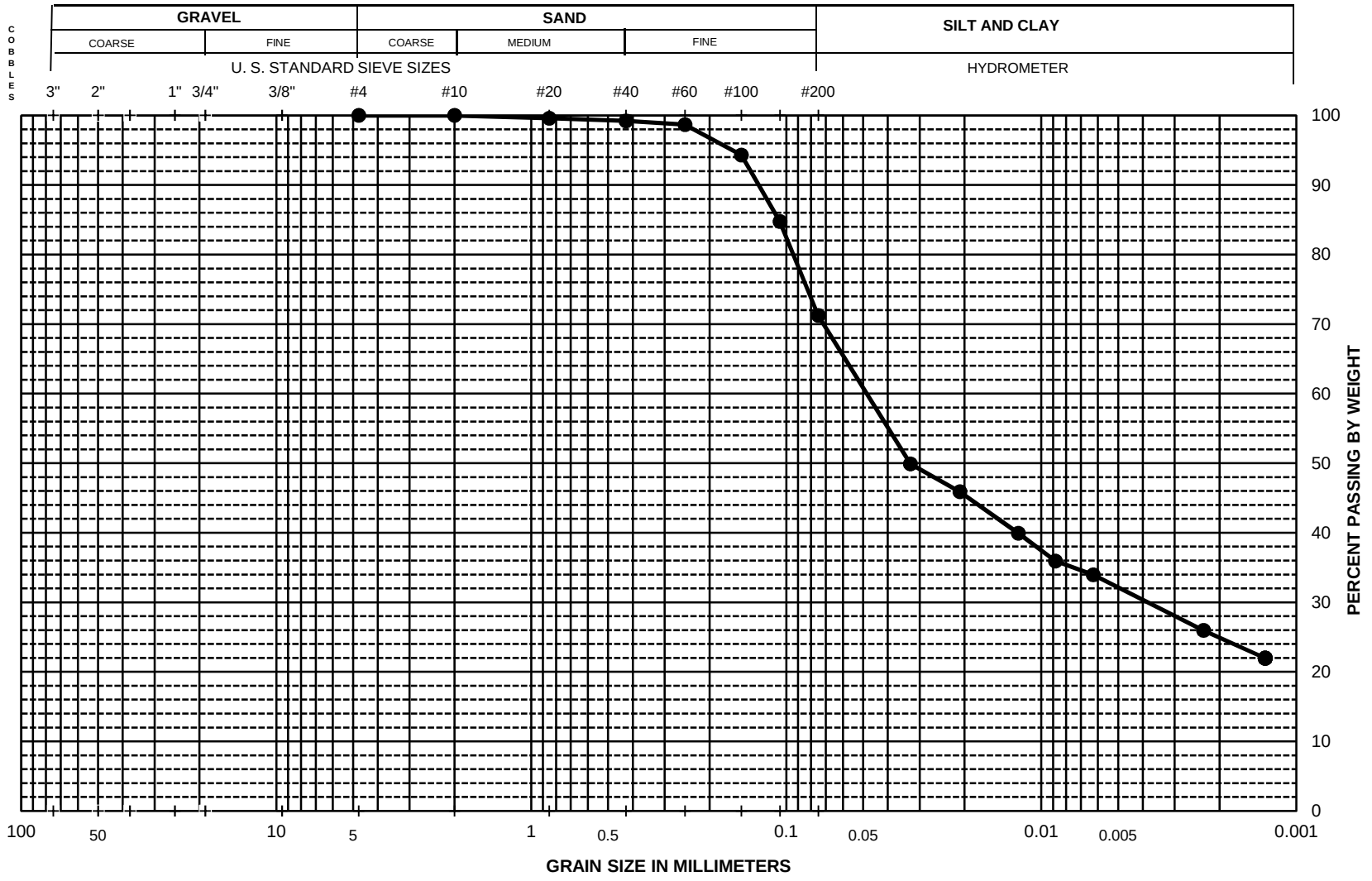
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-02	3	15.0			39	20	18	**Olive Brown Sandy Lean CLAY (CL)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.6
#40	0.425	99.2
#60	0.250	98.7
#100	0.150	94.3
#140	0.106	84.8
#200	0.075	71.3
Hydrometer Analysis	0.0326	49.9
	0.0209	45.9
	0.0123	39.9
	0.0088	35.9
	0.0063	33.9
	0.0023	26.0
	0.0013	22.0
	0.0013	22.0
	0.0013	22.0
	0.0013	22.0

% Cobbles	--
% Gravel	0.0
% Sand	28.7
% Fines	71.3

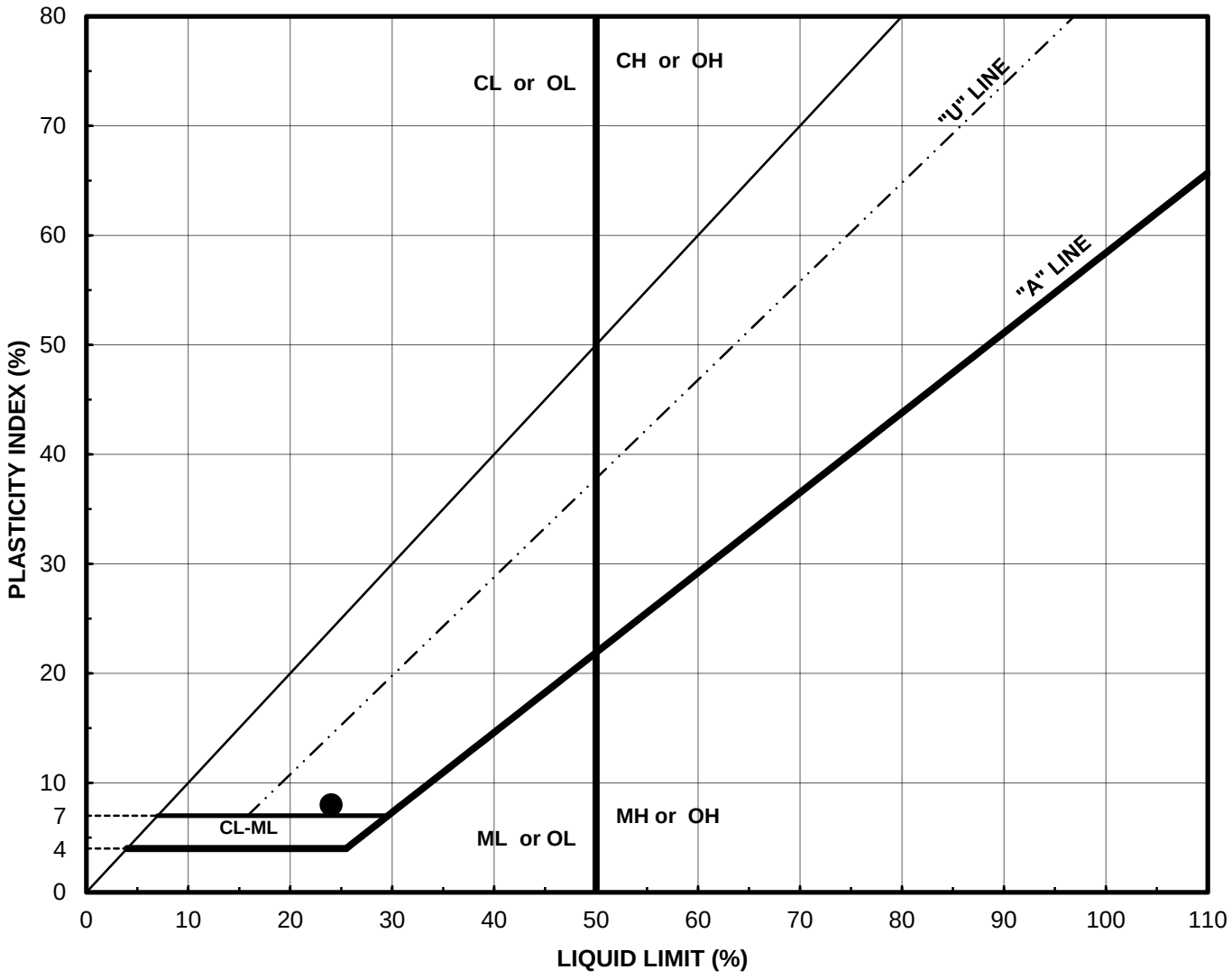
D_{85}	1.0687
D_{60}	0.0890
D_{30}	0.0038
D_{15}	---
D_{10}	---
C_u	---
C_c	---

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 mm	Description and Classification
TC-02	5	25.0			65	41	25	**Dark gray Fat CLAY (CH)**

PROJECT NAME: **Pure Water**

PROJECT NUMBER: **60530732**

PARTICLE-SIZE DISTRIBUTION CURVES

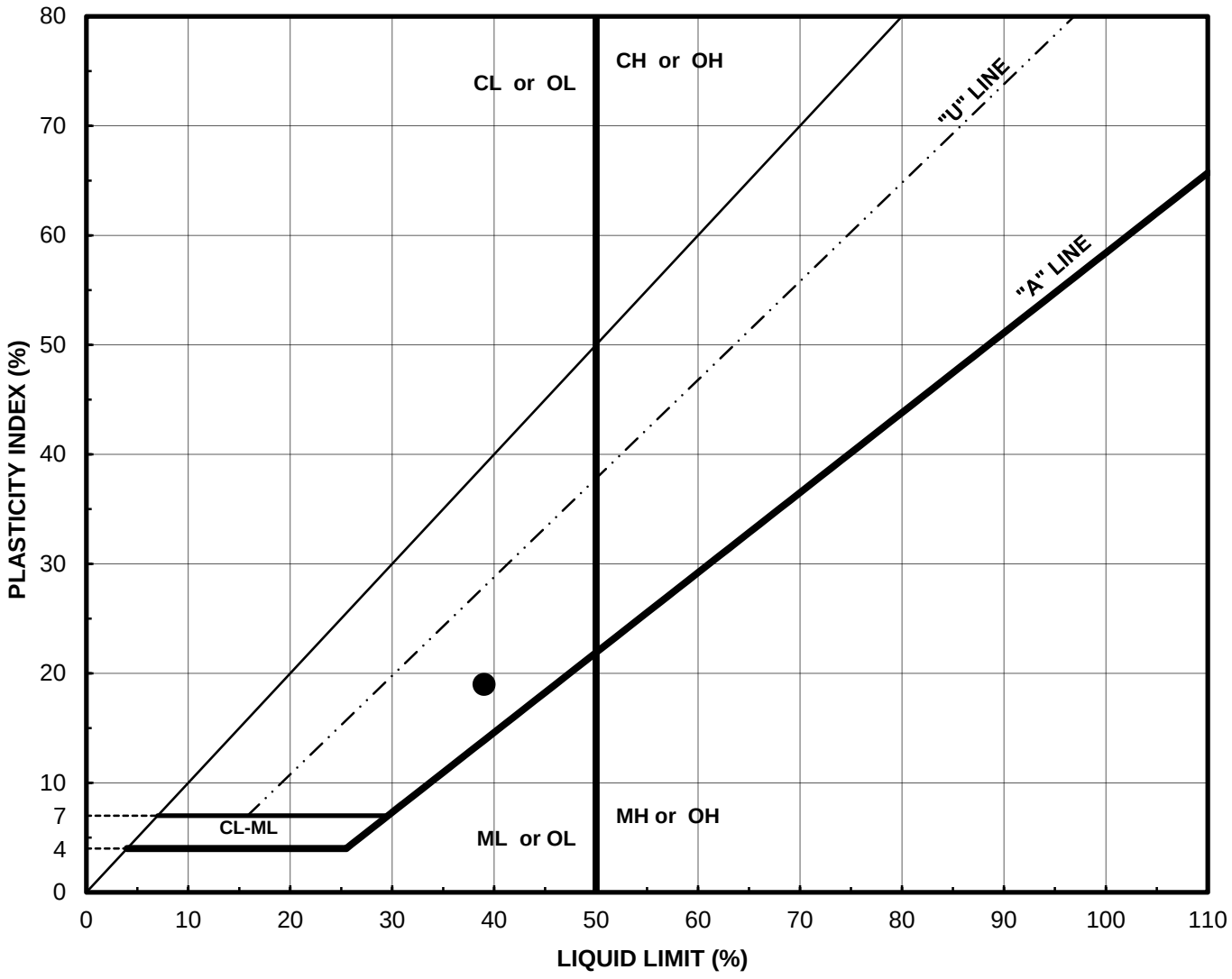


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
DS-01	4a	15.0	19.6	24	8	Dark yellowish brown Clayey SAND (SC)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

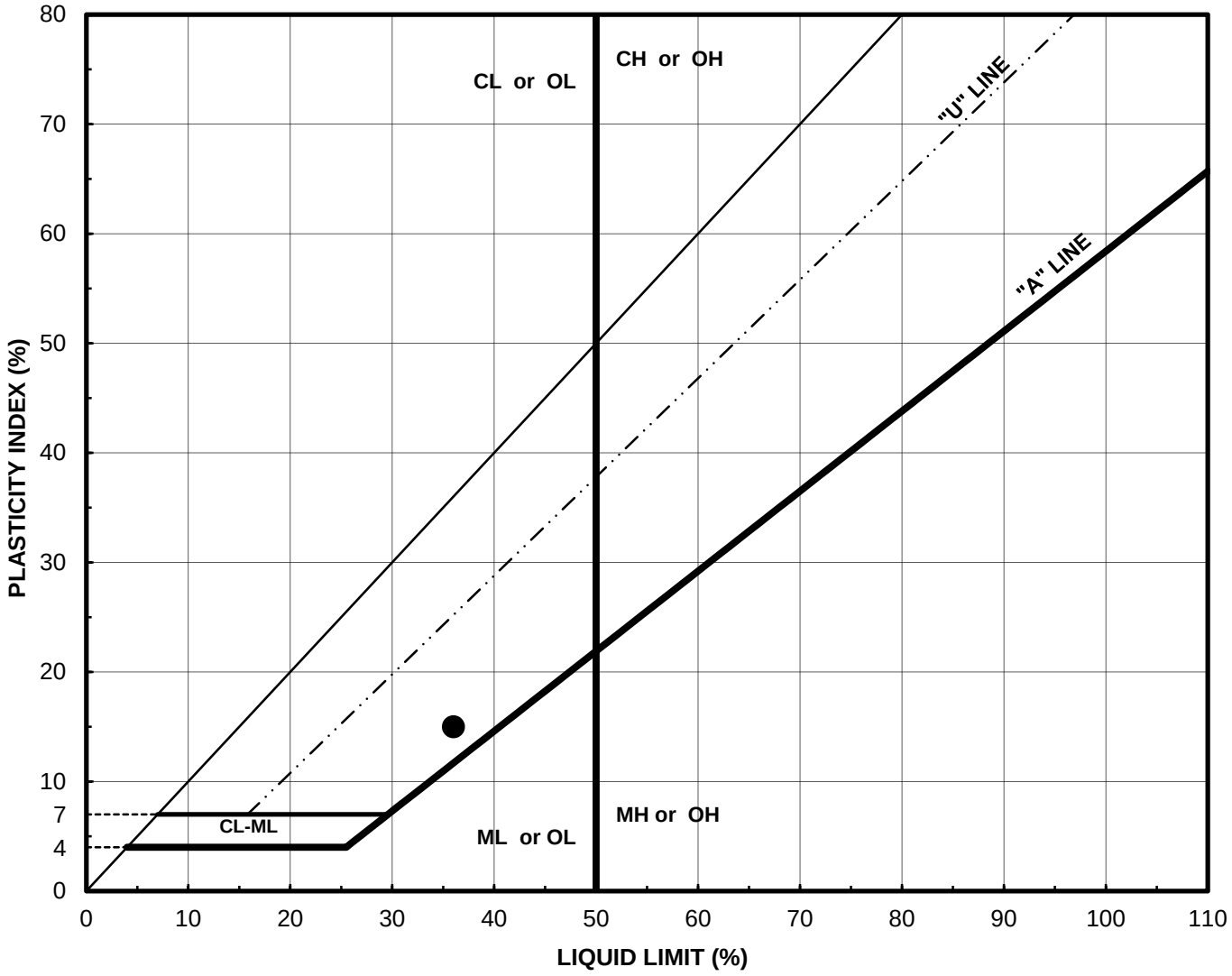


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
DS-01	8b	35.0	37.8	39	19	Gray Lean CLAY with Sand (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

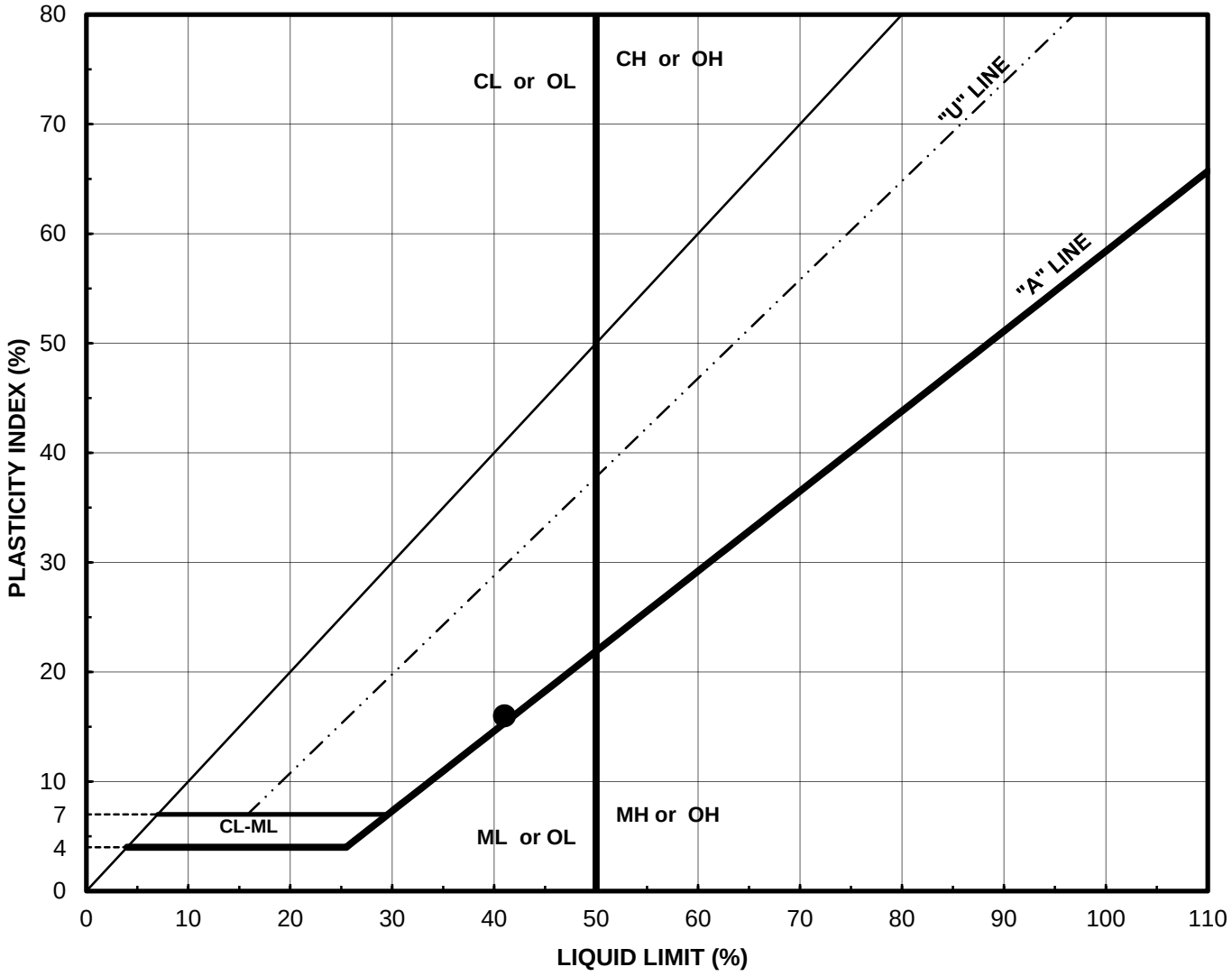


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
DS-03	7	30.0	34.2	36	15	Dark gray Clayey SAND (SC)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

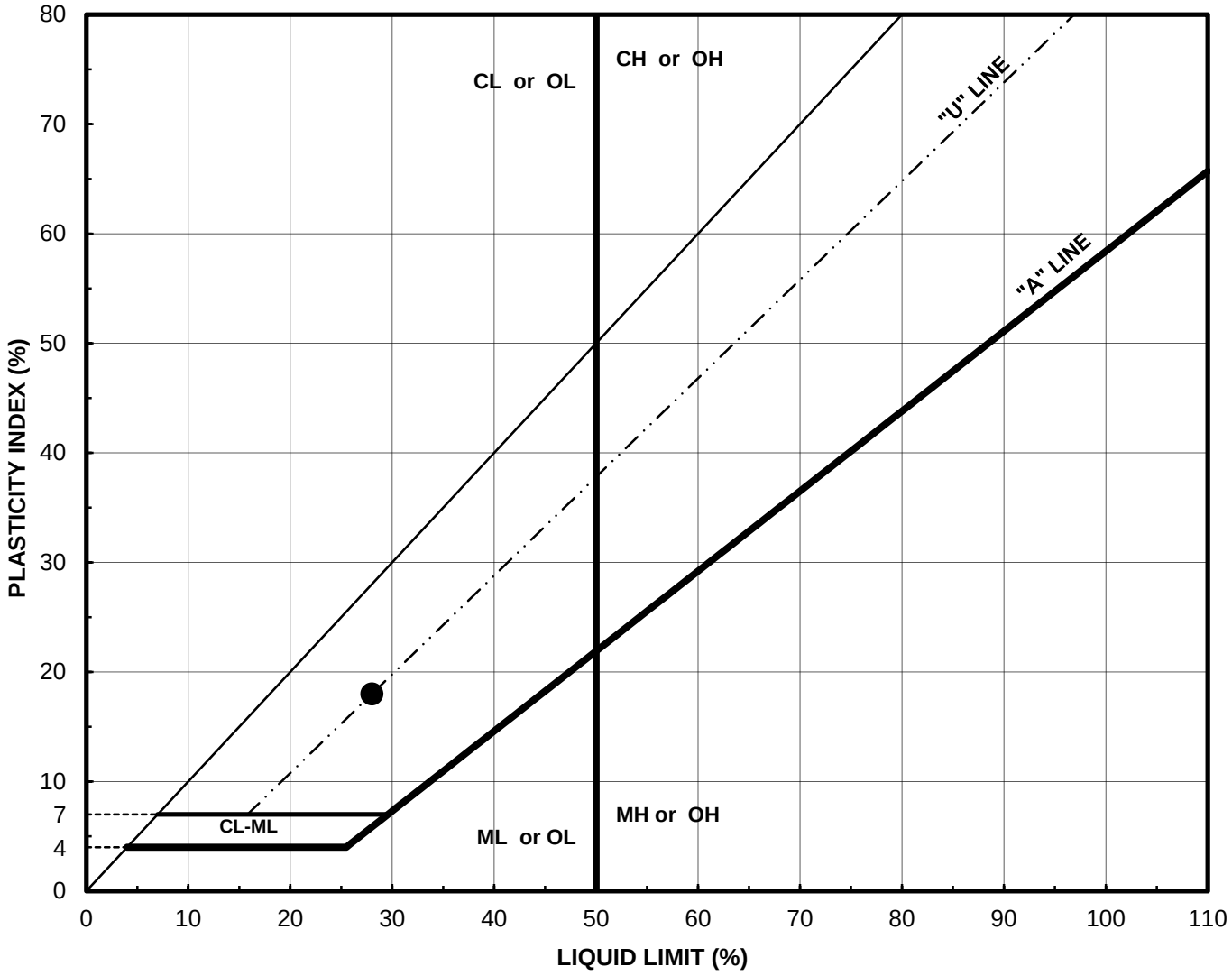


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
DS-06	7	30.0	35.7	41	16	Dark gray Sandy, Lean CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

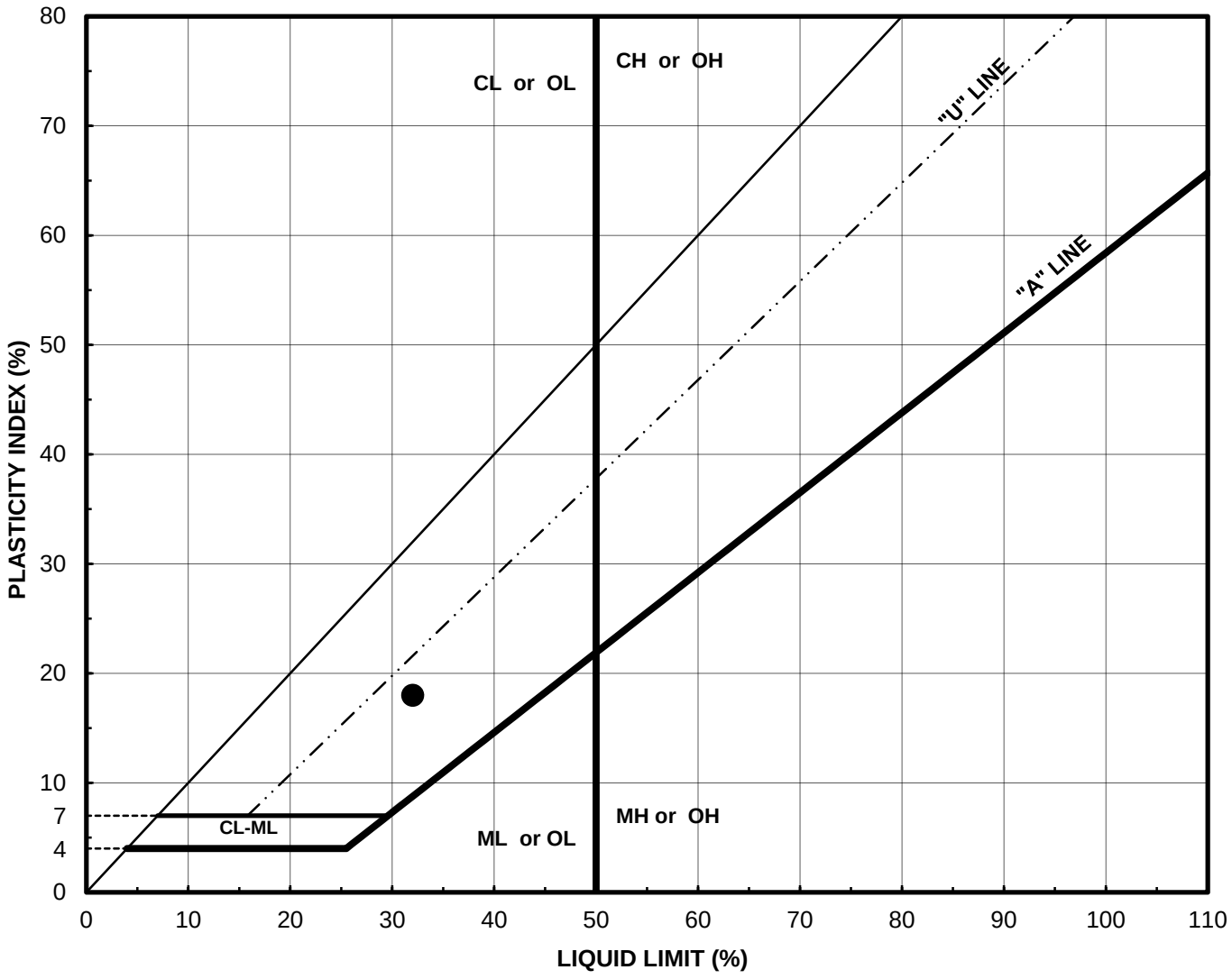


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-08	4	15.0	18.9	28	18	Light brown Lean CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

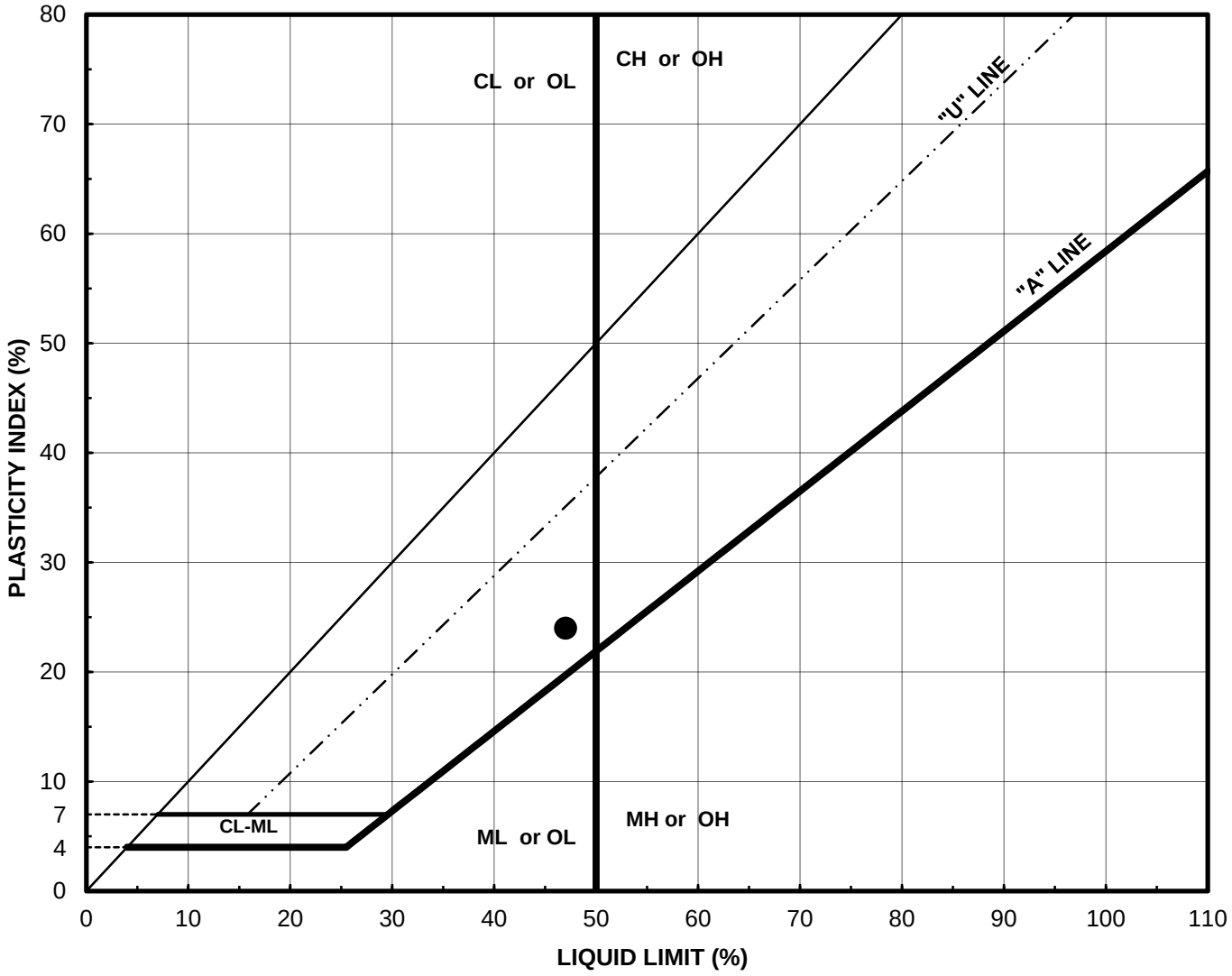


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-11	3	10.0	19.4	32	18	Olive brown Sandy, Lean CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

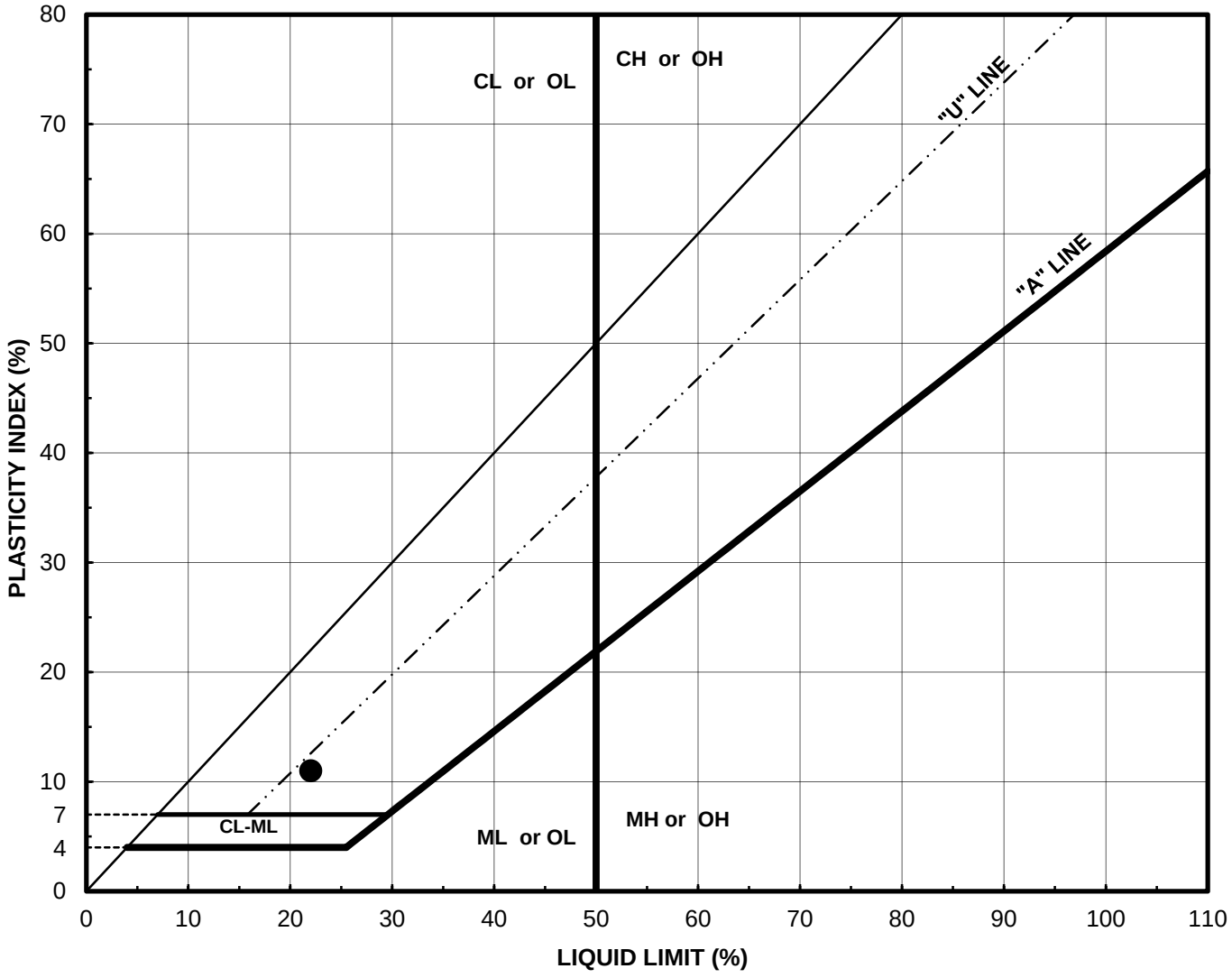


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-20	3	10.0	18.6	47	24	Yellowish brown Lean CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

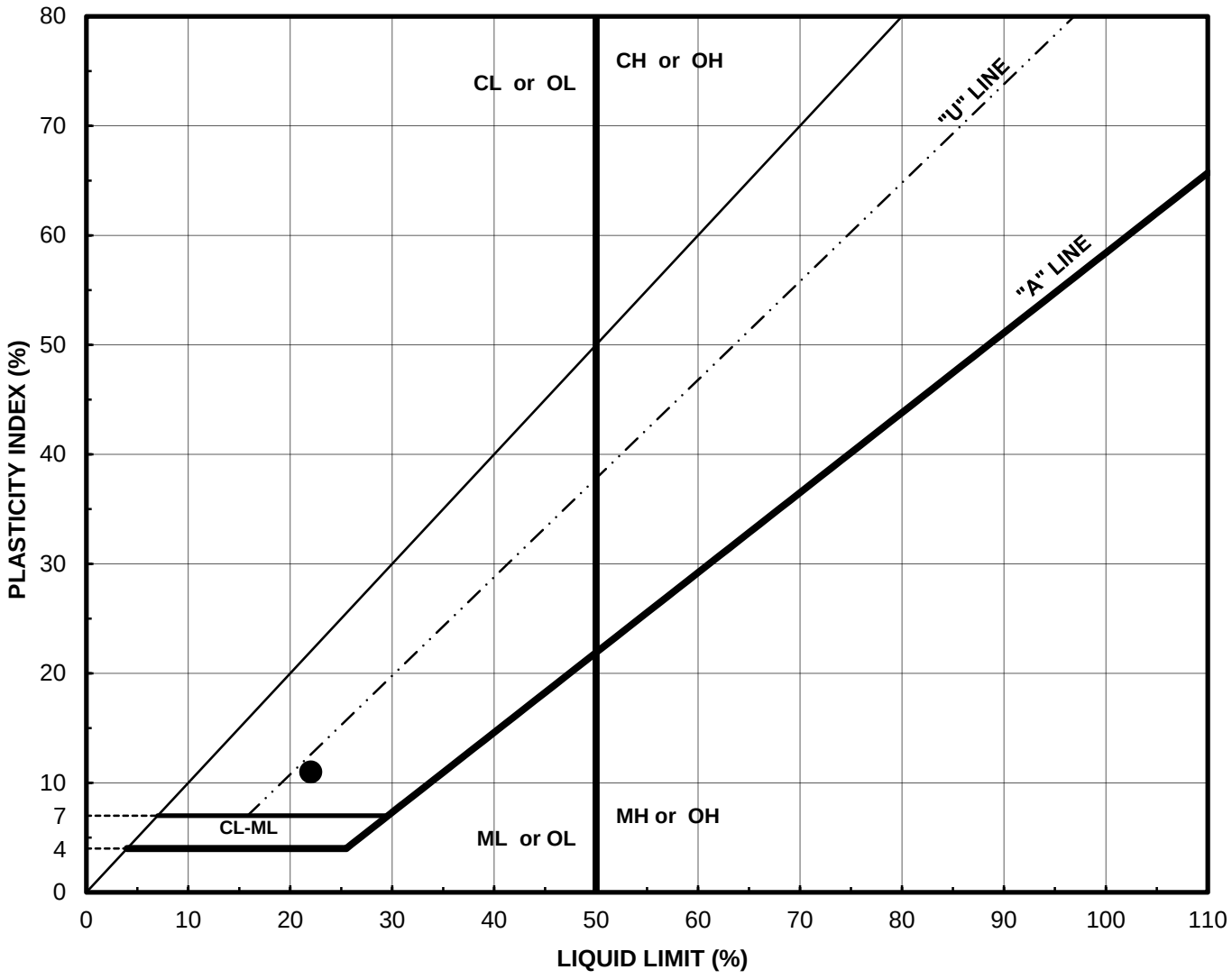


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-23	1	0~5	NA	22	11	Strong brown Lean CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

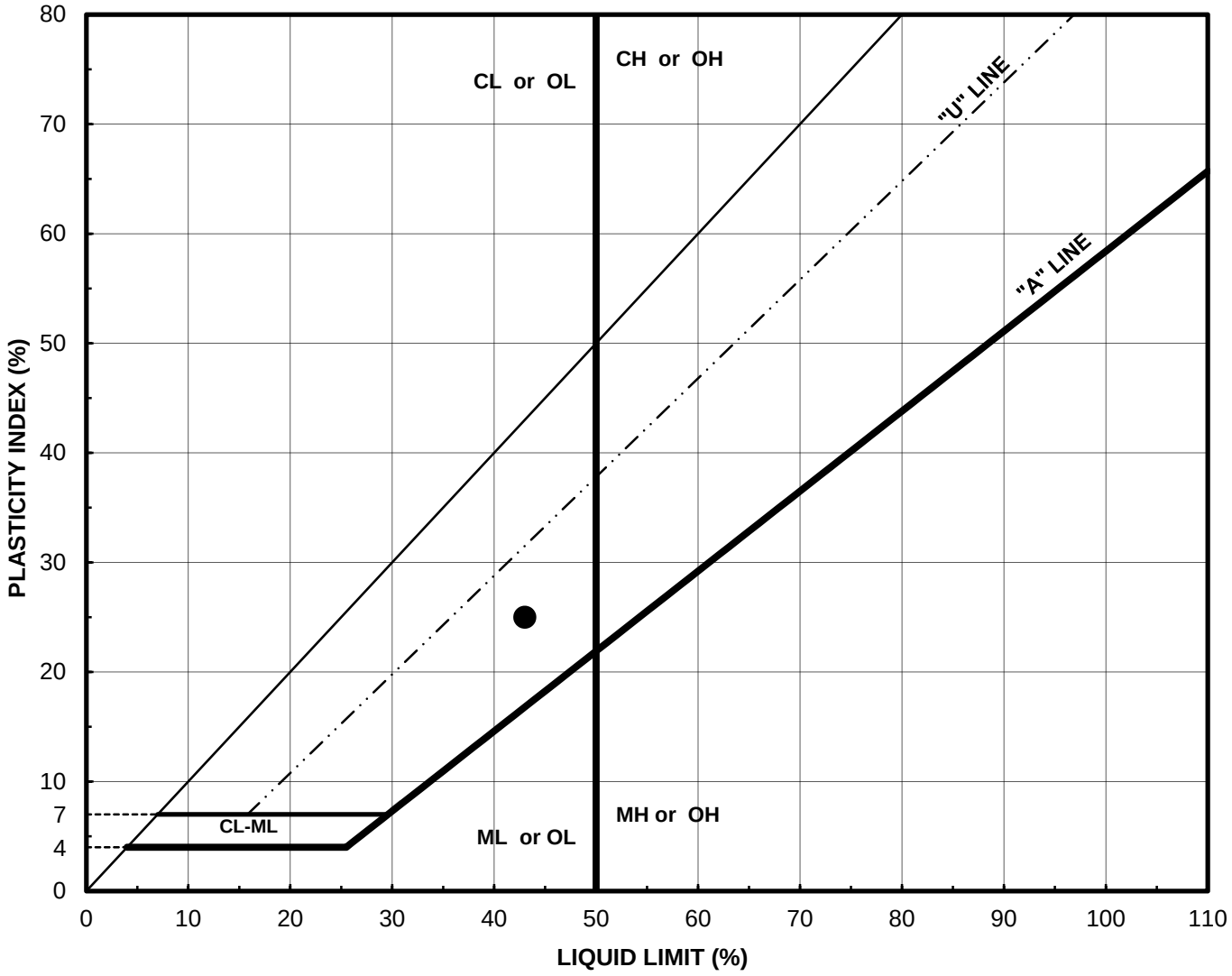


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-25	1	0-5	10.3	22	11	Strong brown Clayey SAND (SC)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

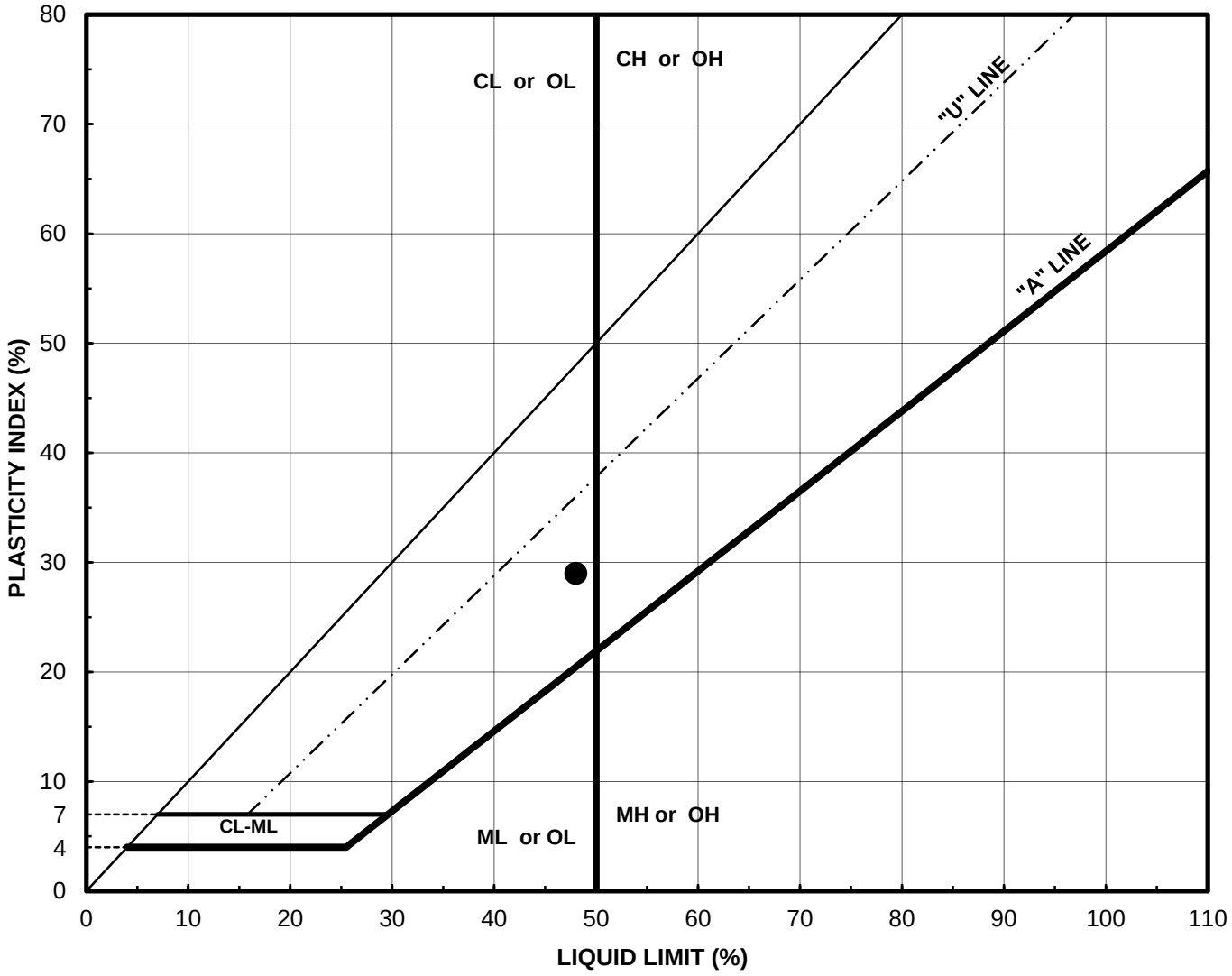


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-27	2	5.0	20.3	43	25	Light yellowish brown CLAY with Sand (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

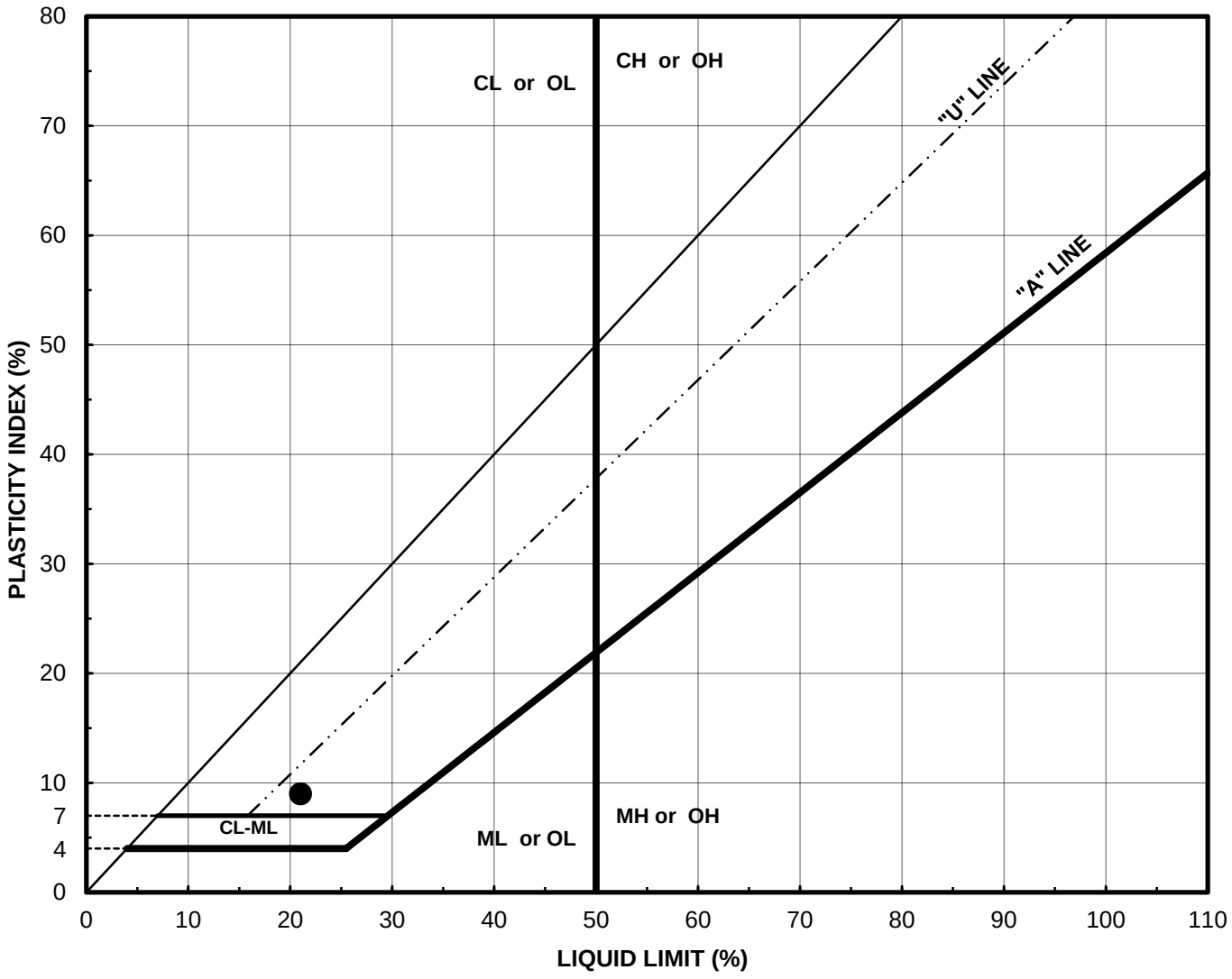


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-31	3	10.0	NA	48	29	Yellowish brown Silty CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

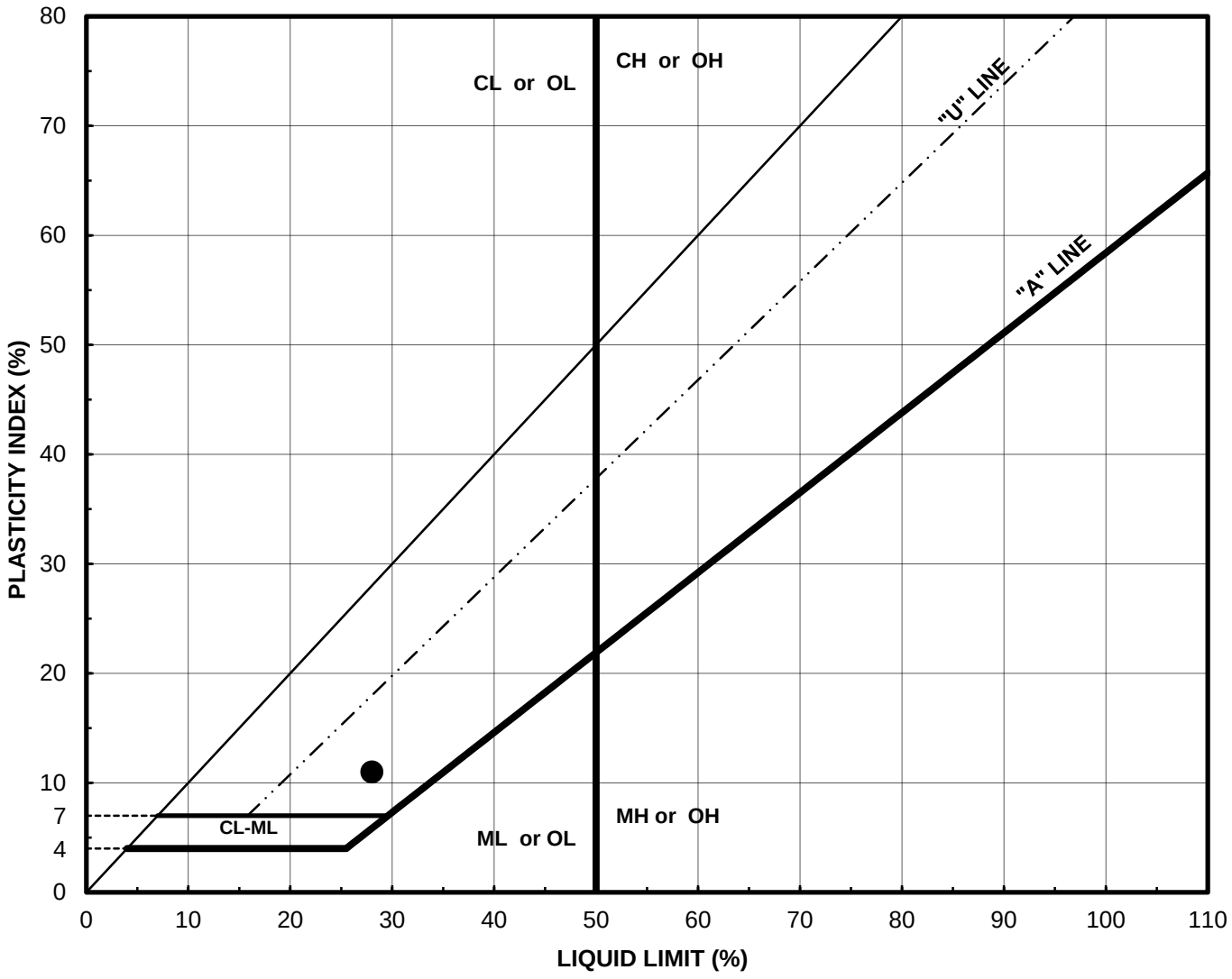


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-36b	2	5.0	7.8	21	9	Strong brown Clayey SAND (SC)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

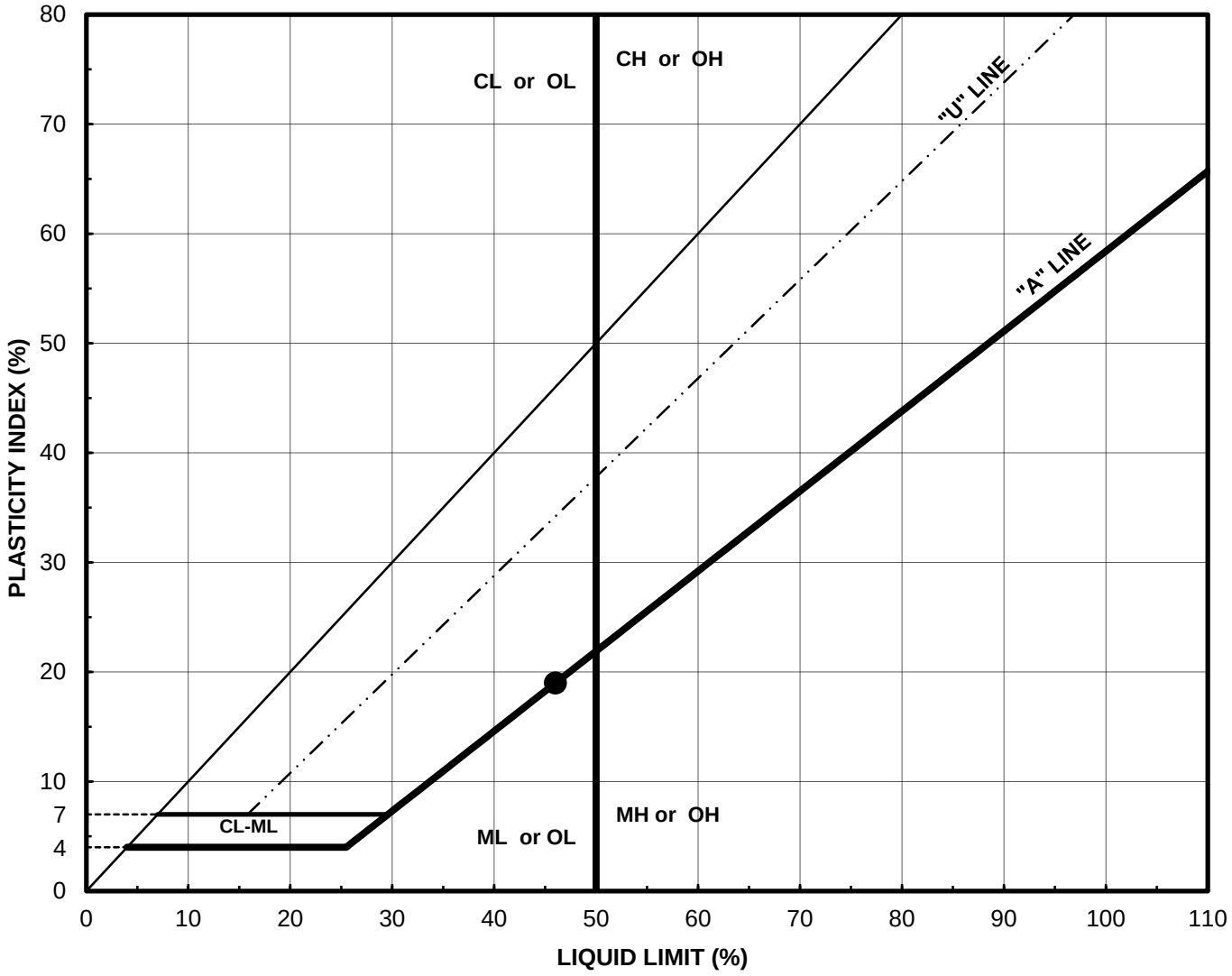


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-44	1	5.0	12.2	28	11	Yellowish brown Clayey SAND (SC)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

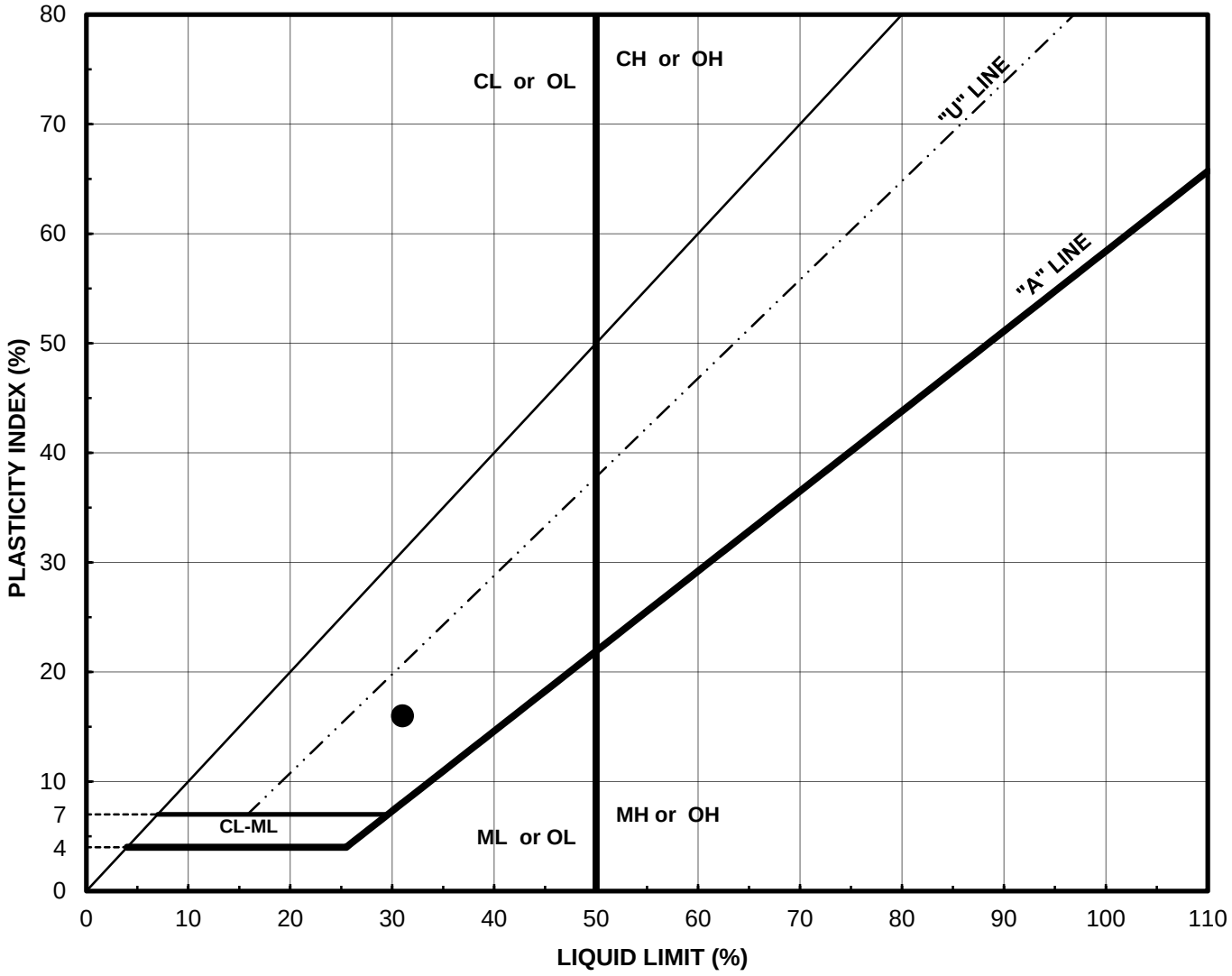


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-45	3	10.0	20.3	46	19	Light olive brown Silty CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

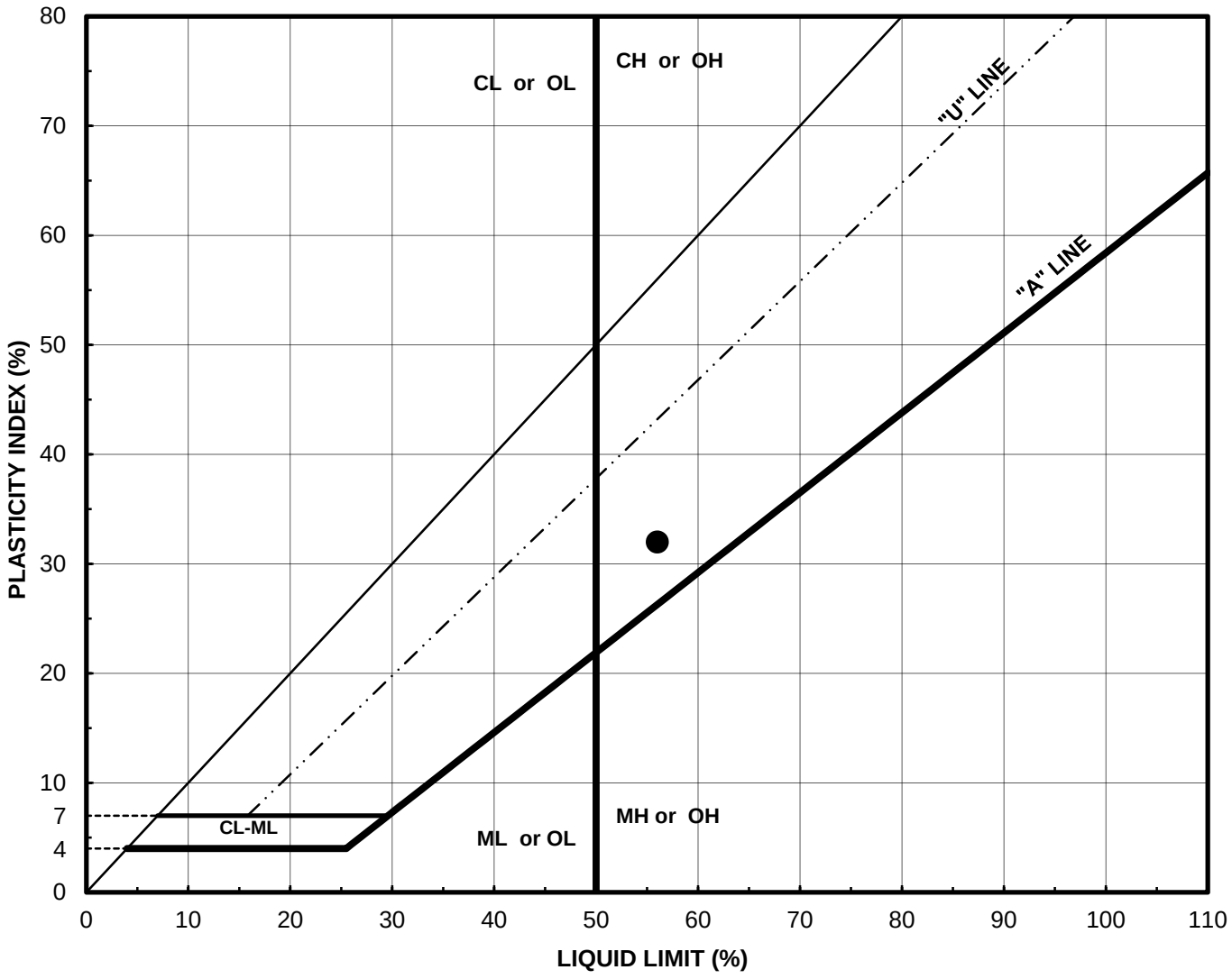


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-46	4	18.5	23.0	31	16	Dark yellowish brown Sandy, Lean CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

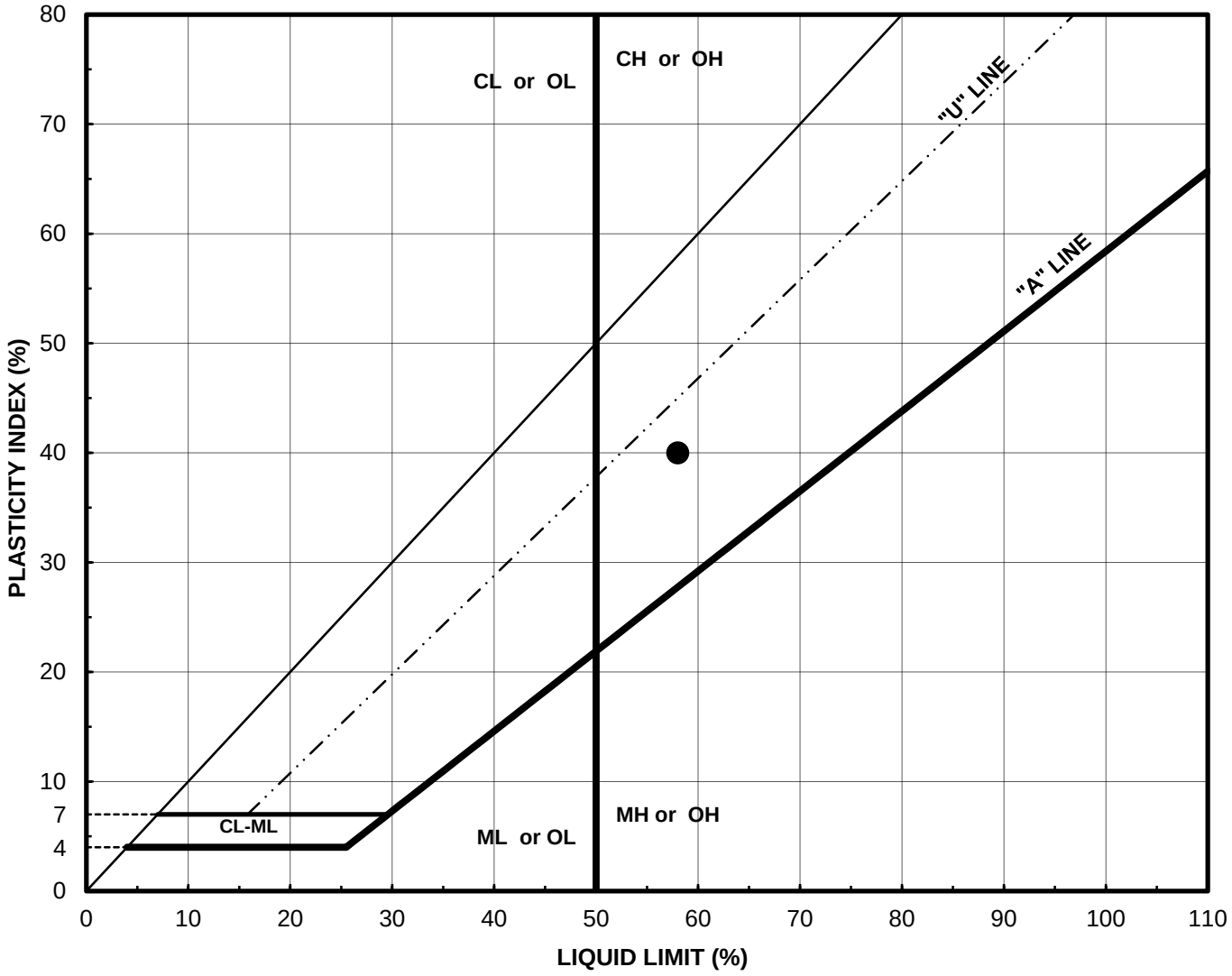


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
FM-47	2	5.0	16.3	56	32	Light olive brown Fat CLAY (CH)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

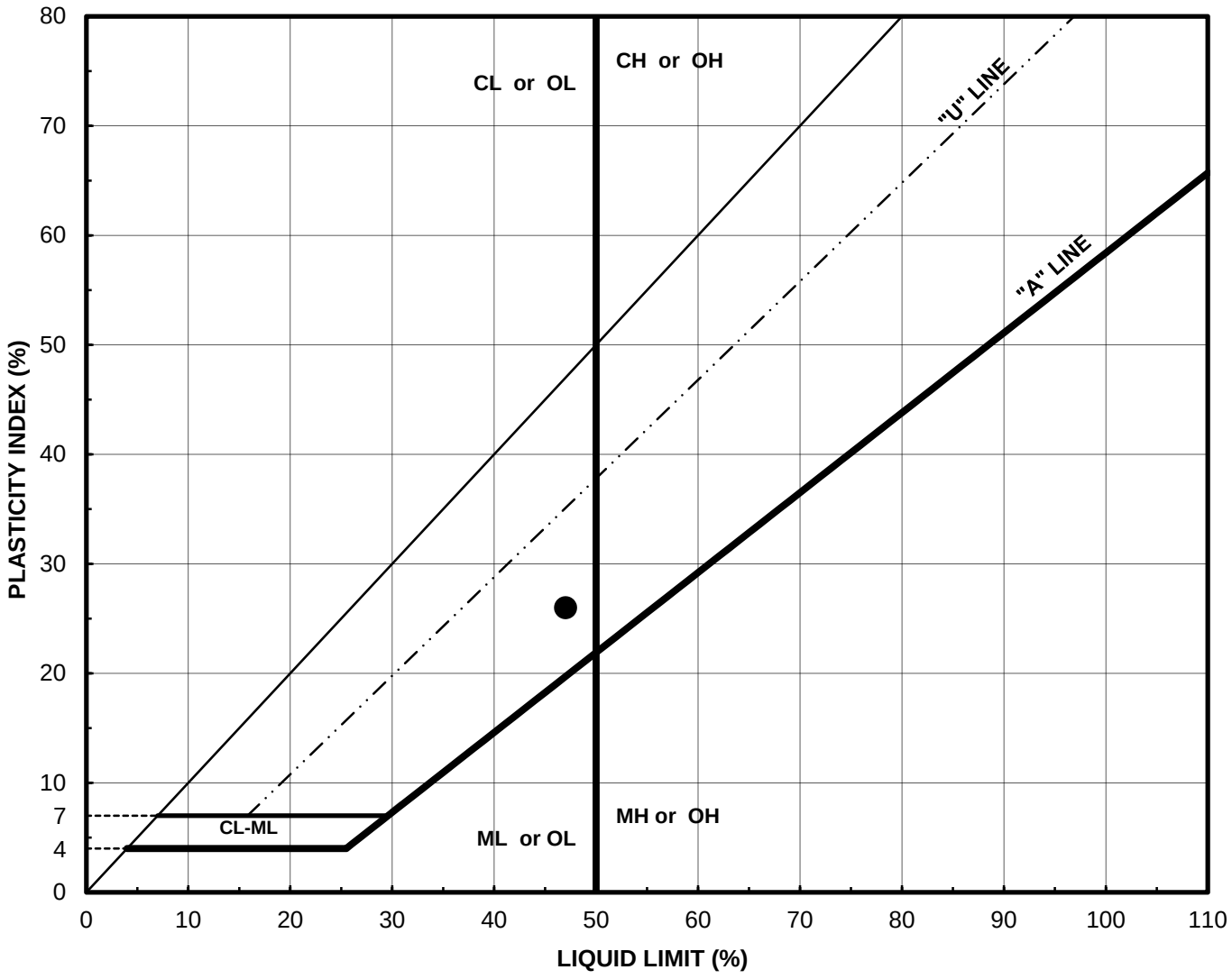


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
PS-3	12a	65.0	37.9	58	40	Dark gray Fat CLAY (CH)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

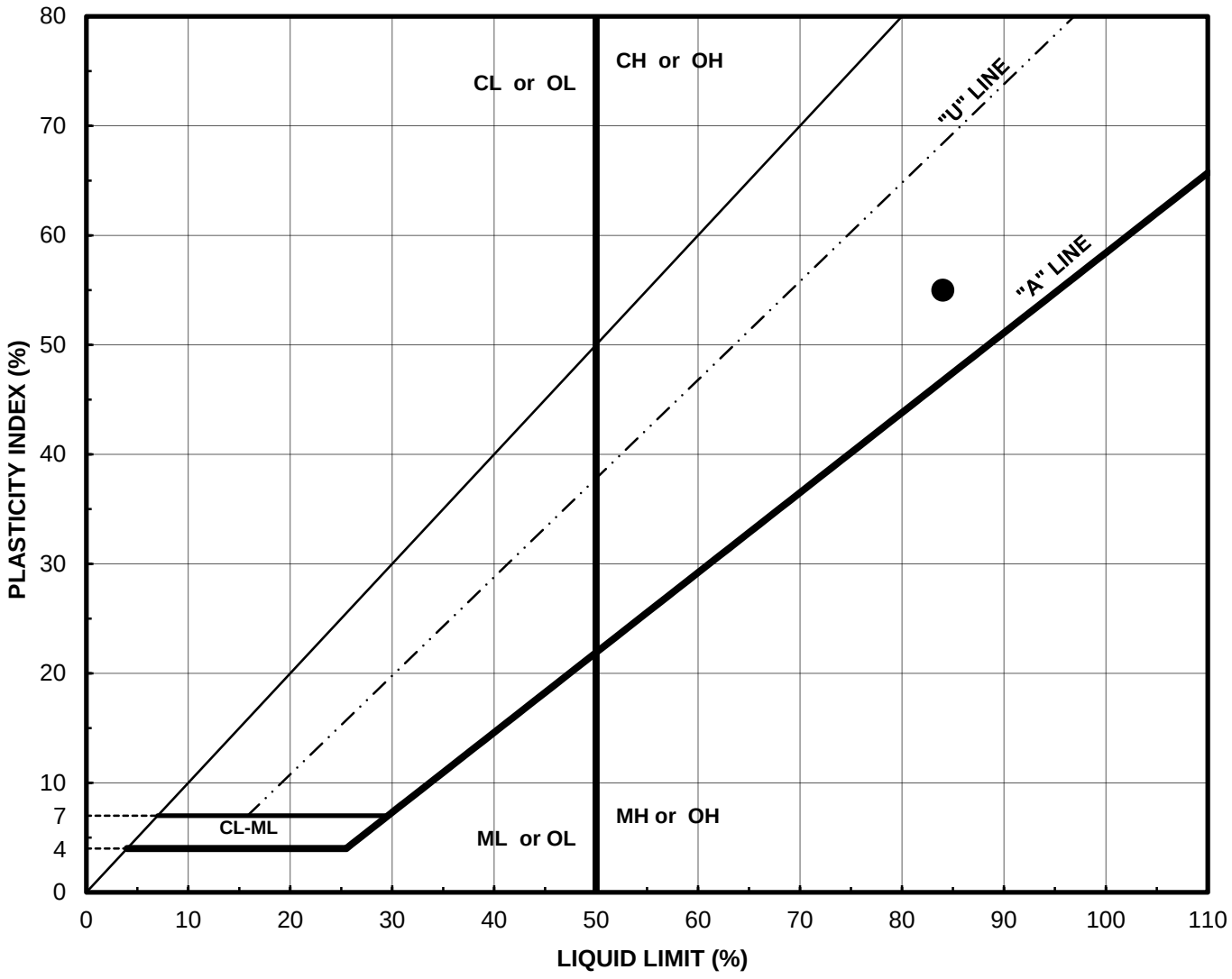


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
TC-01	4	17.0	NA	47	26	Dark grayish brown CLAY with Sand (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

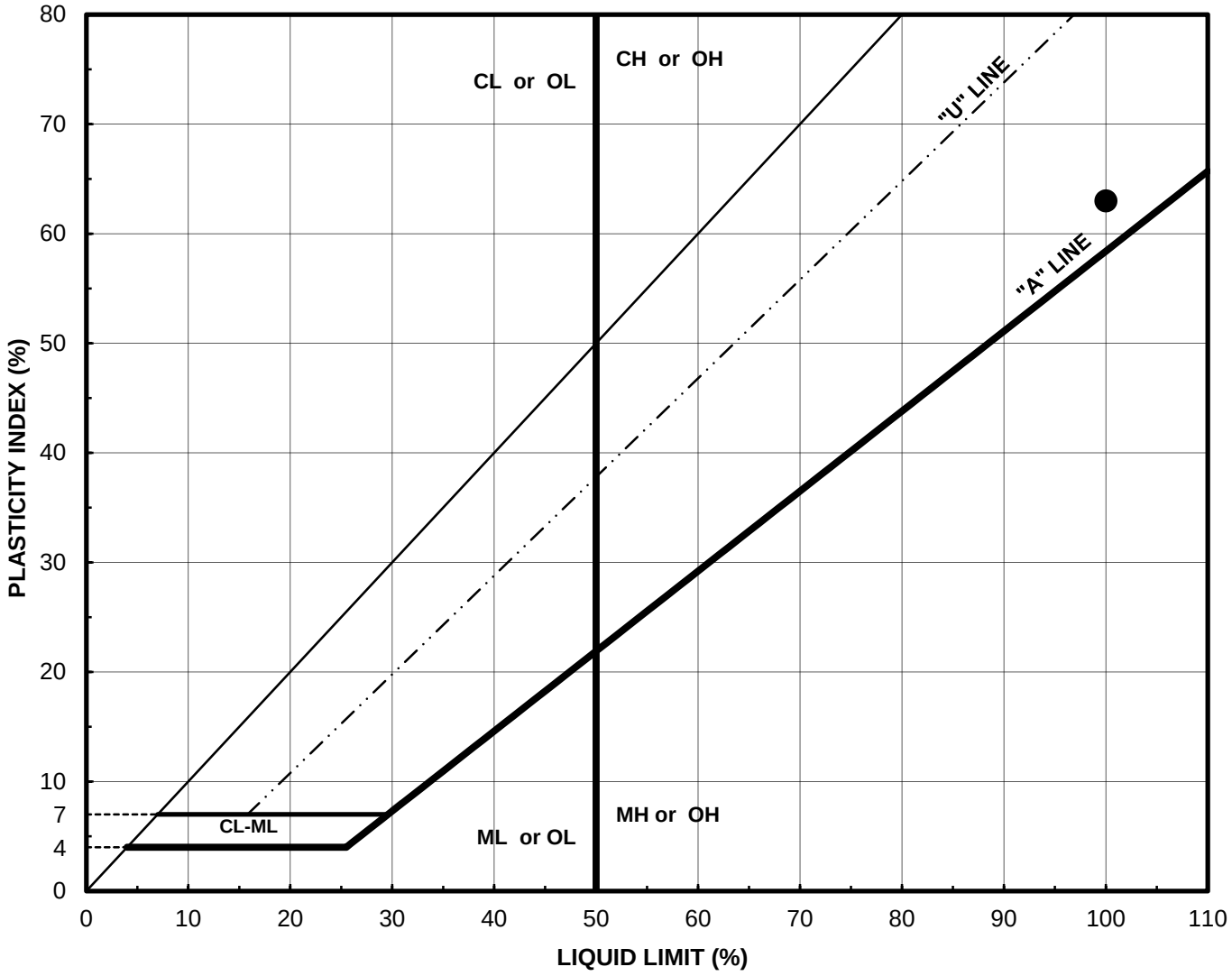


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
TC-01	6	25.0	----	84	55	Dark gray Fat CLAY (CH)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

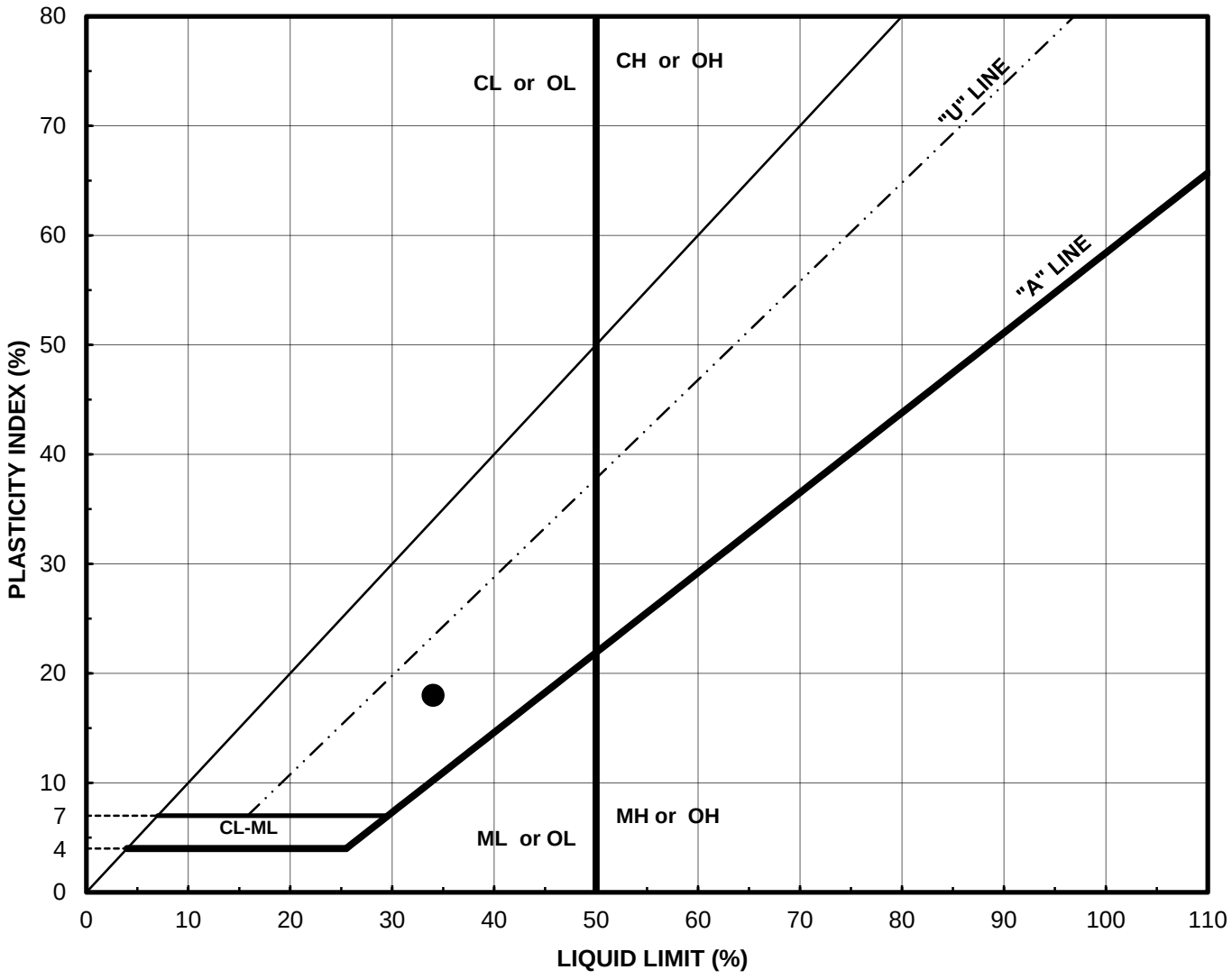


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
TC-01	7	30.0	40.0	100	63	Dark gray Fat CLAY (CH)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

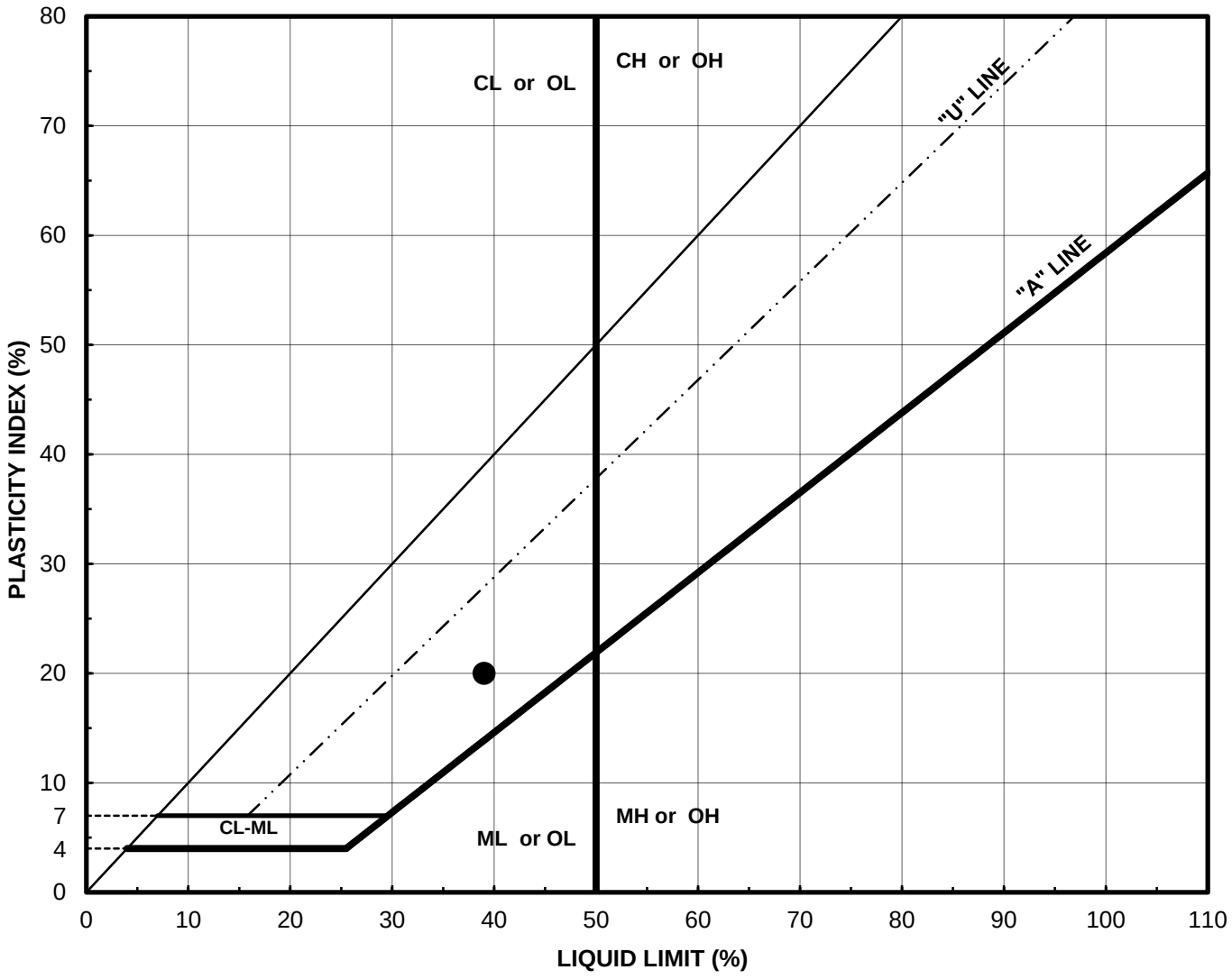


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
TC-01	10	45.0	NA	34	18	Dark grayish brown Clayey SAND (SC)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

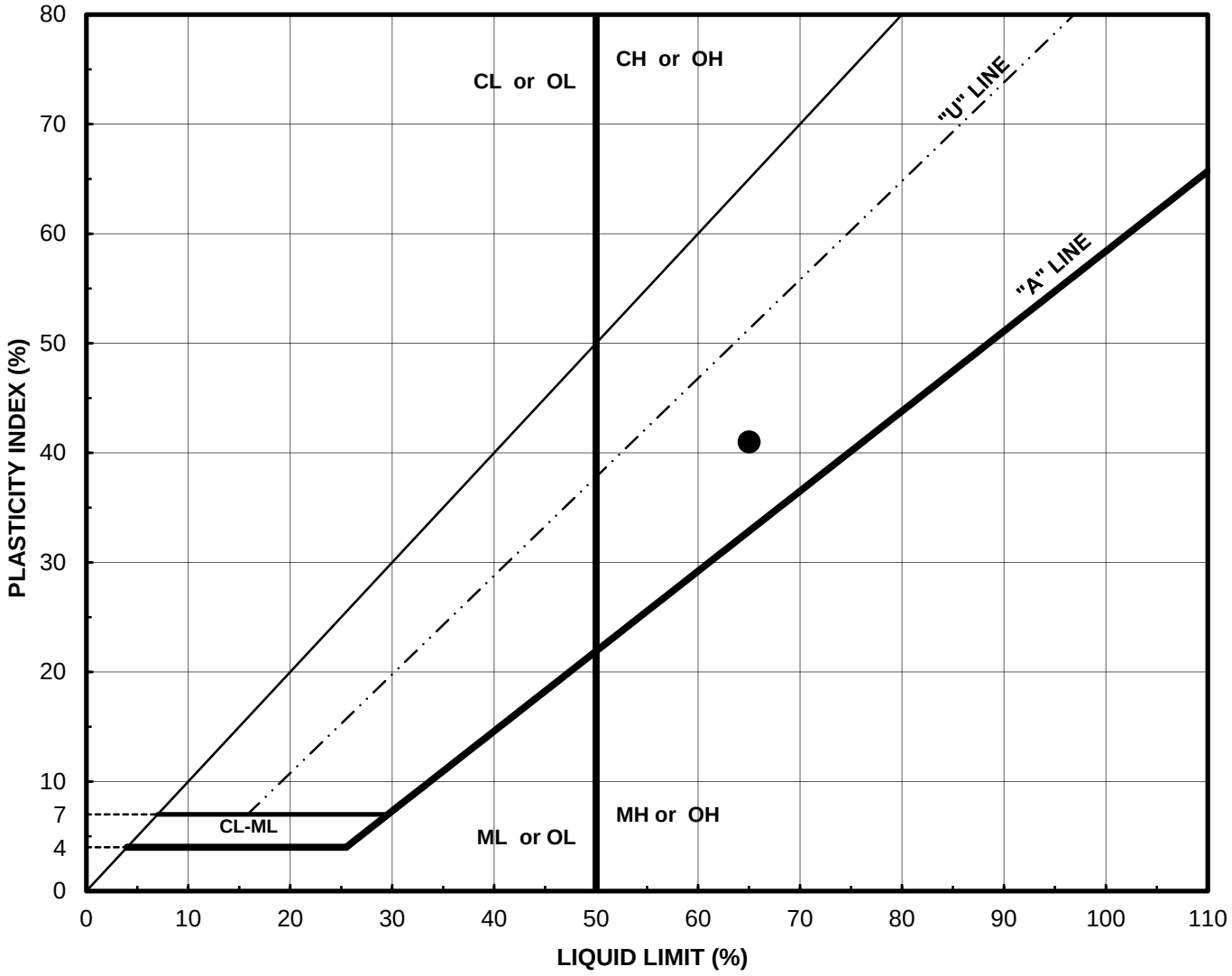


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
TC-02	3	15.0	----	39	20	Olive brown Sandy Lean CLAY (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

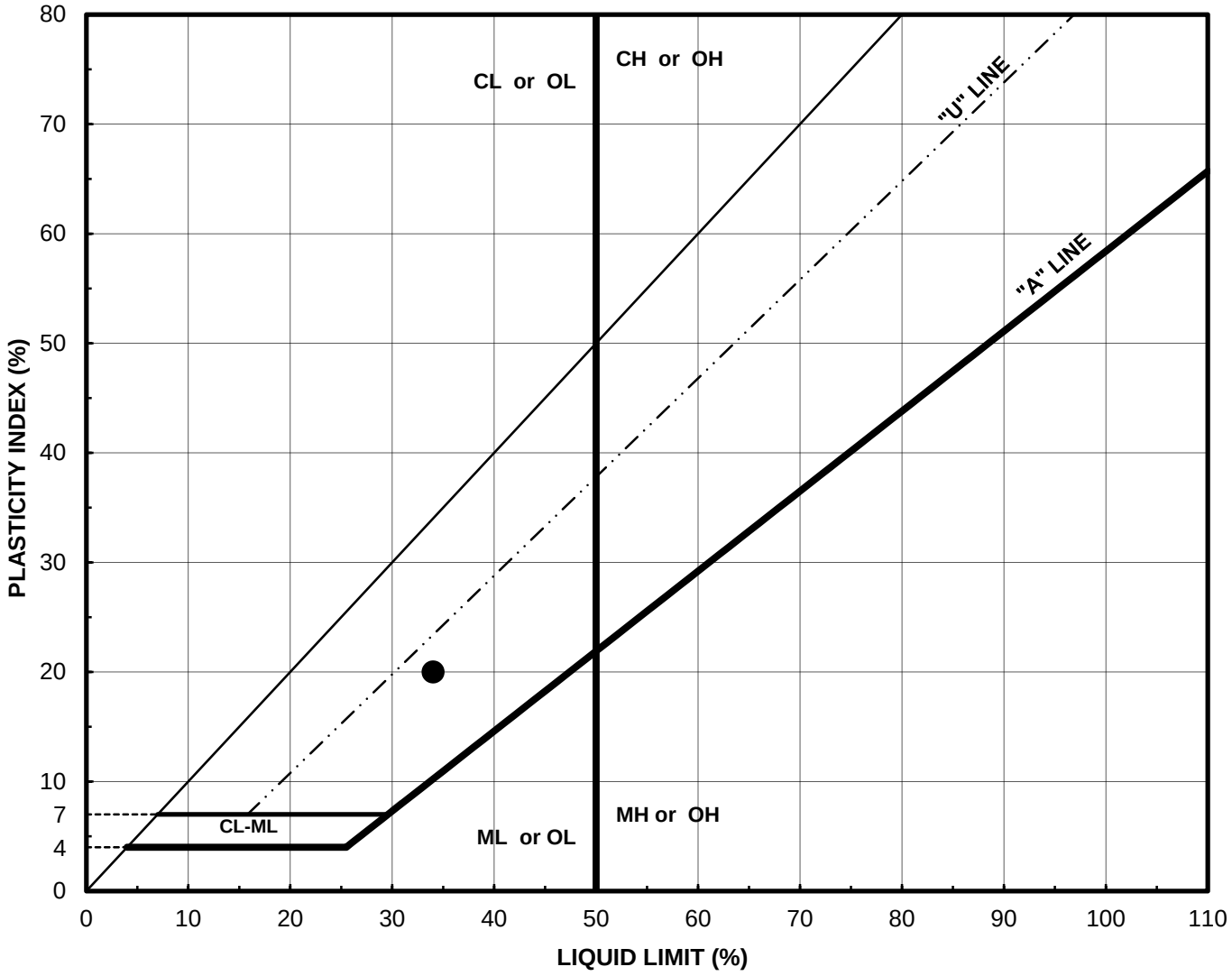


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
TC-02	5	25.0	----	65	41	Dark gray Fat CLAY (CH)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

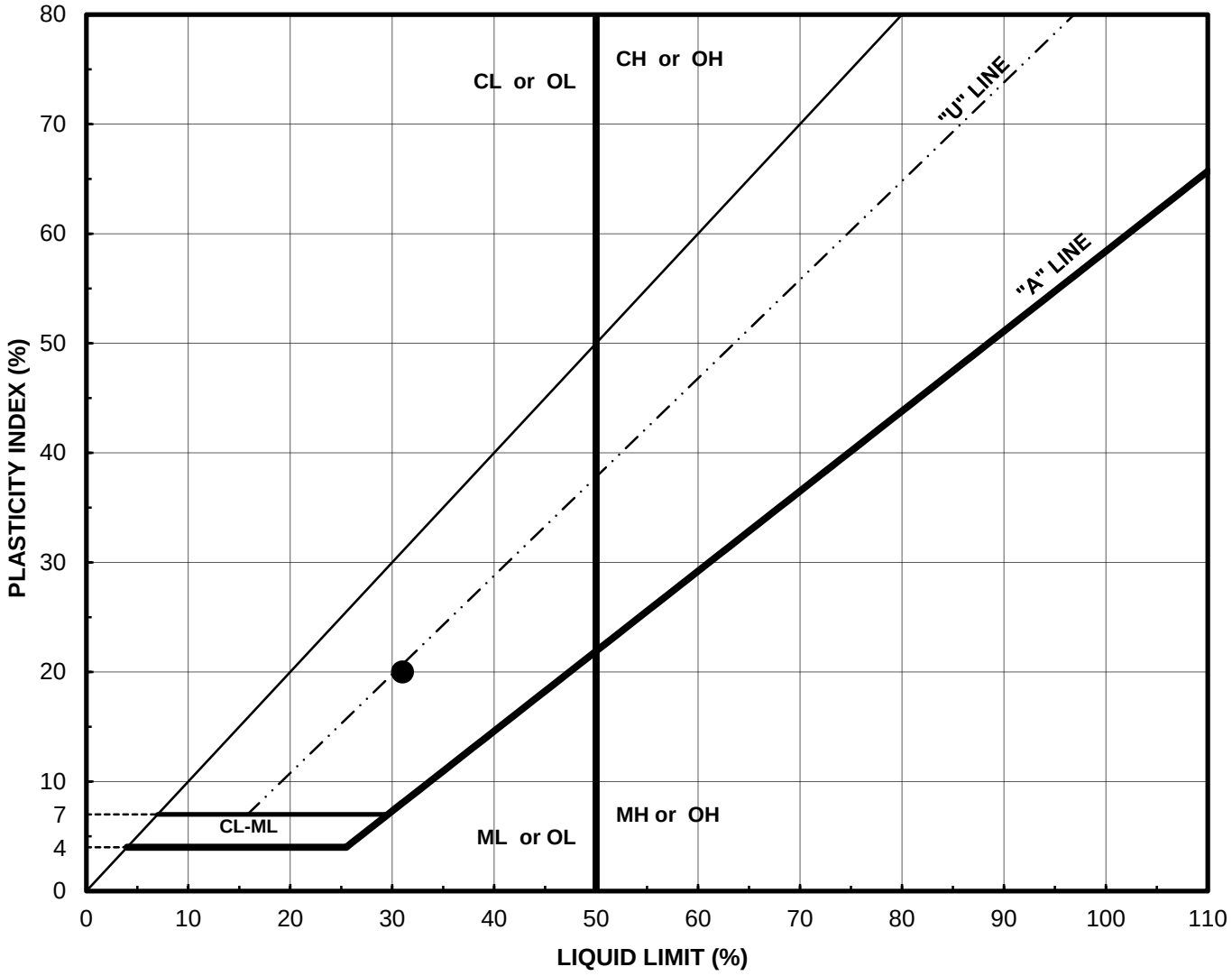


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
WM-01	1	0~5	----	34	20	Yellowish brown Clayey SAND (SC)

Project Name: **SR-210**

Project Number: **60512688**

PLASTICITY CHART

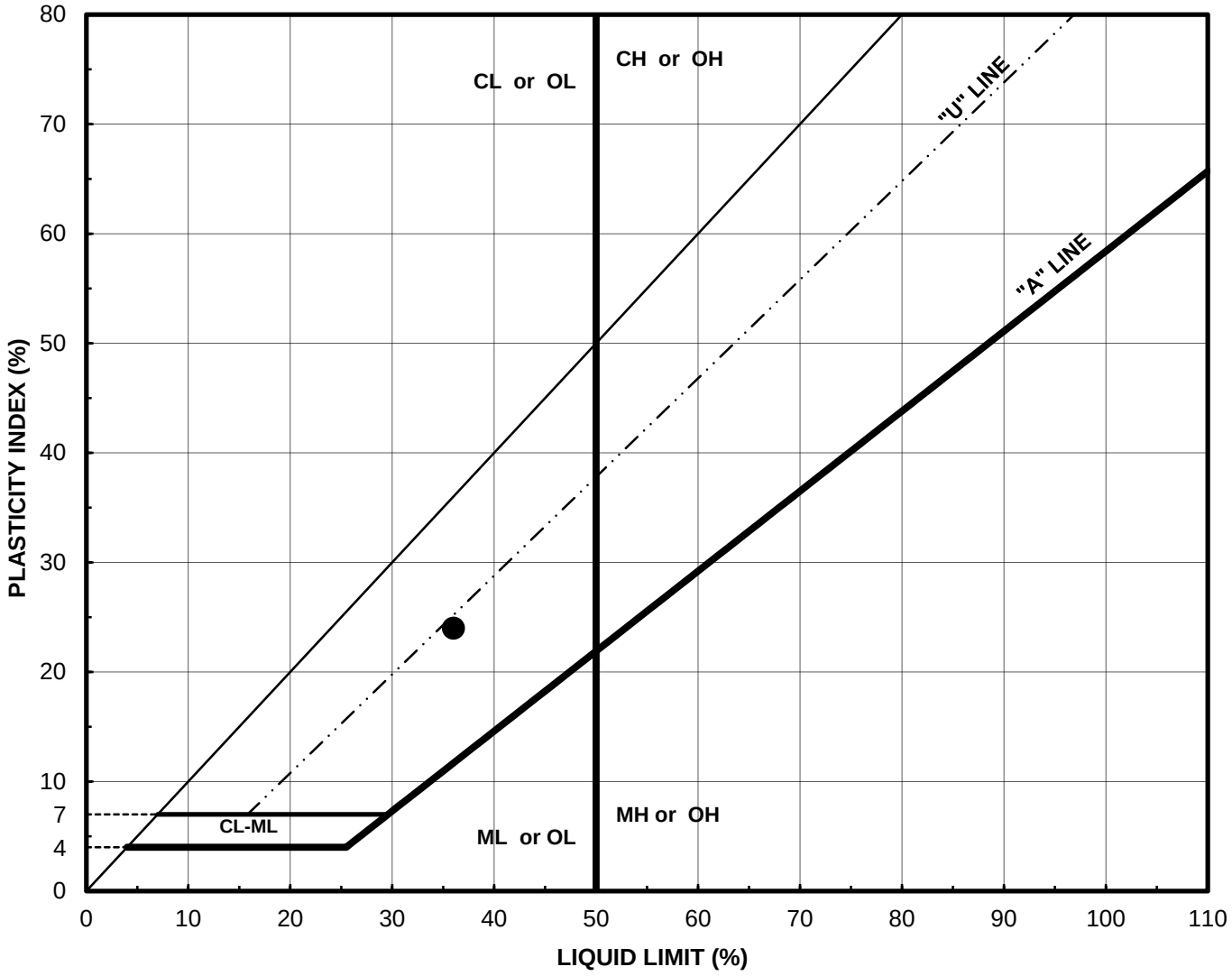


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
WM-06	1	0-5	NA	31	20	Dark yellowish brown Lean CLAY with Sand (CL)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

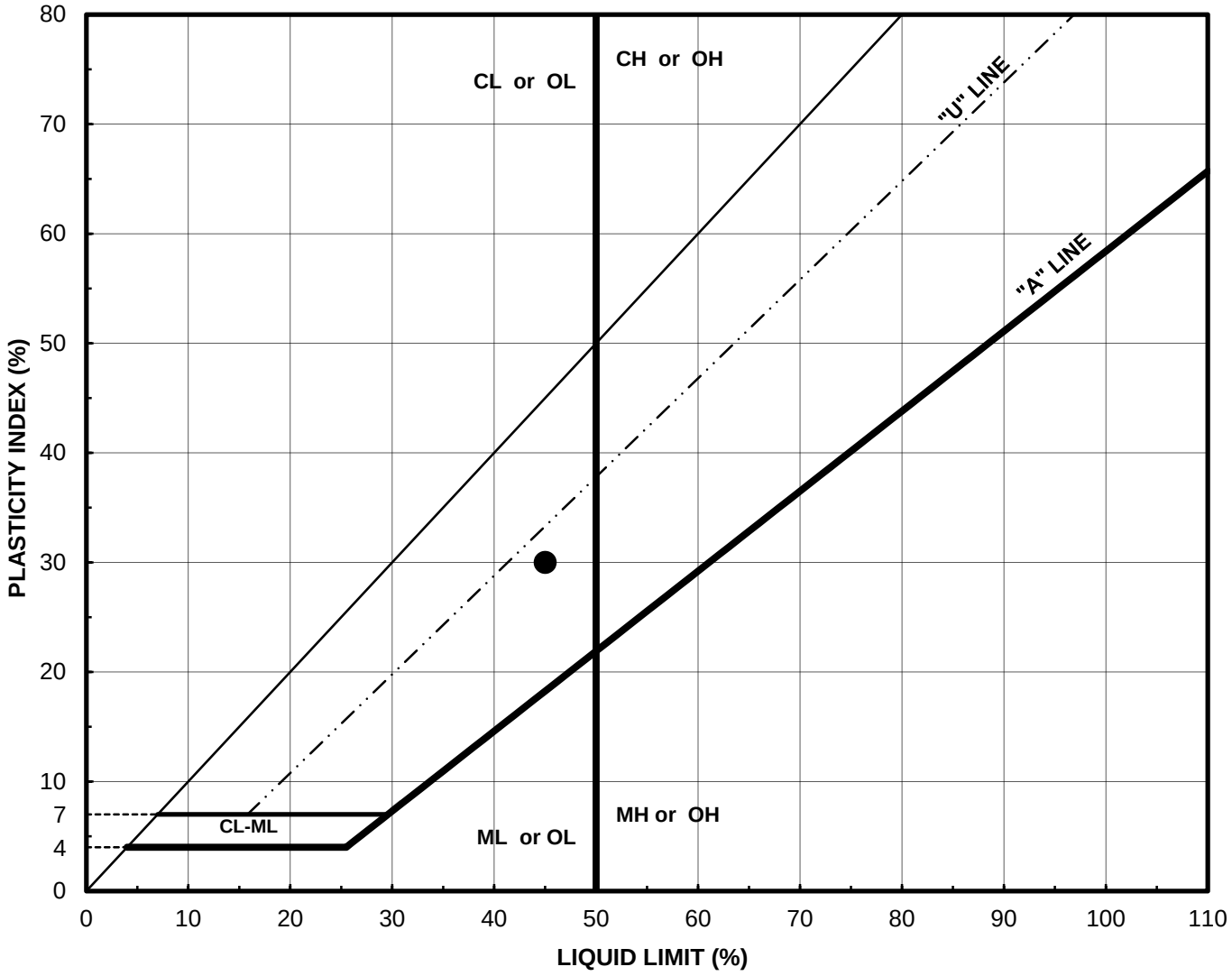


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
WM-07	2	10.0	8.7	36	24	Olive brown Clayey SAND with Gravel (SC)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

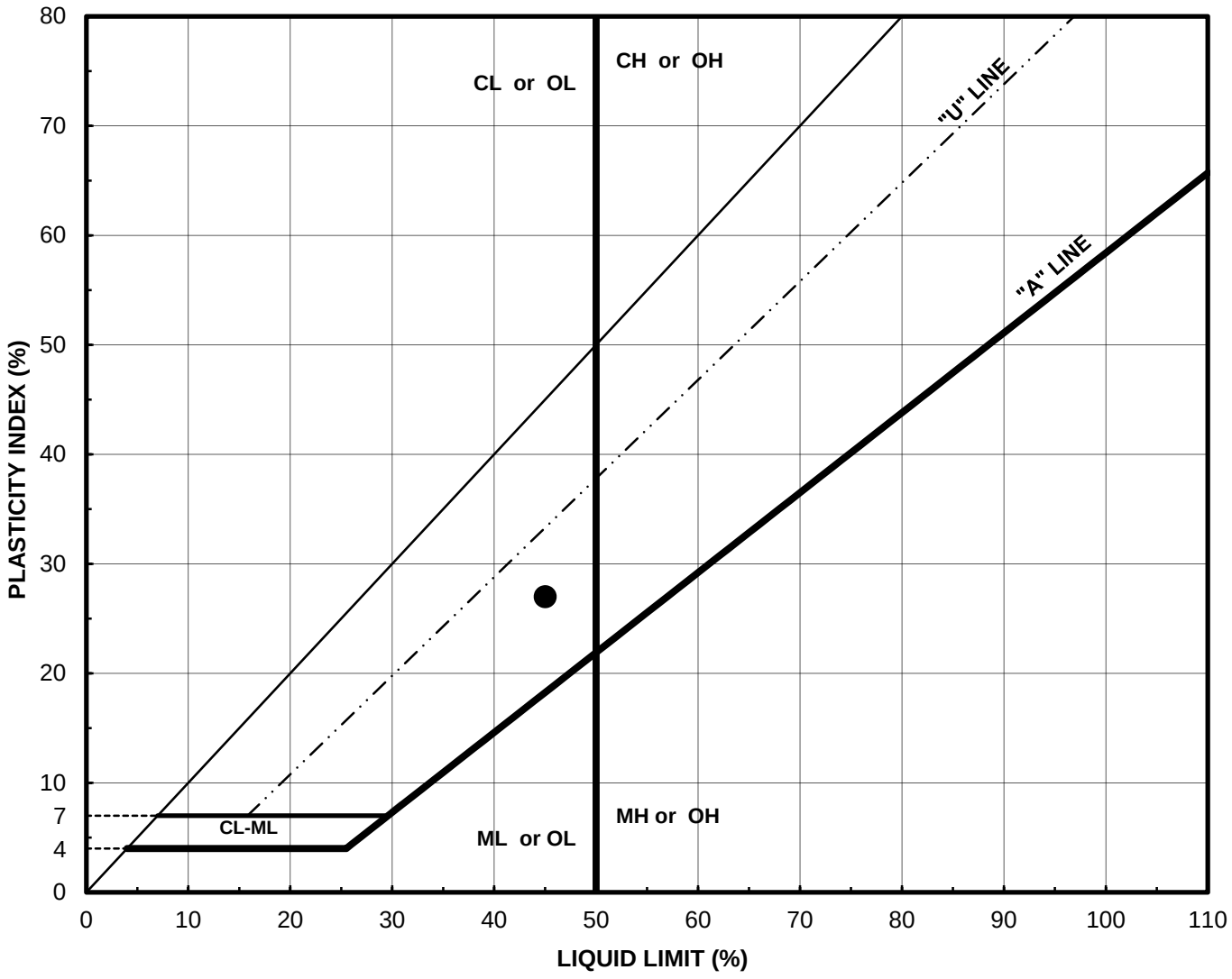


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
WM-08	3	12.5	10.6	45	30	Strong brown Clayey SAND (SC)

Project Name: **Pure Water**

Project Number: **60530732**

PLASTICITY CHART

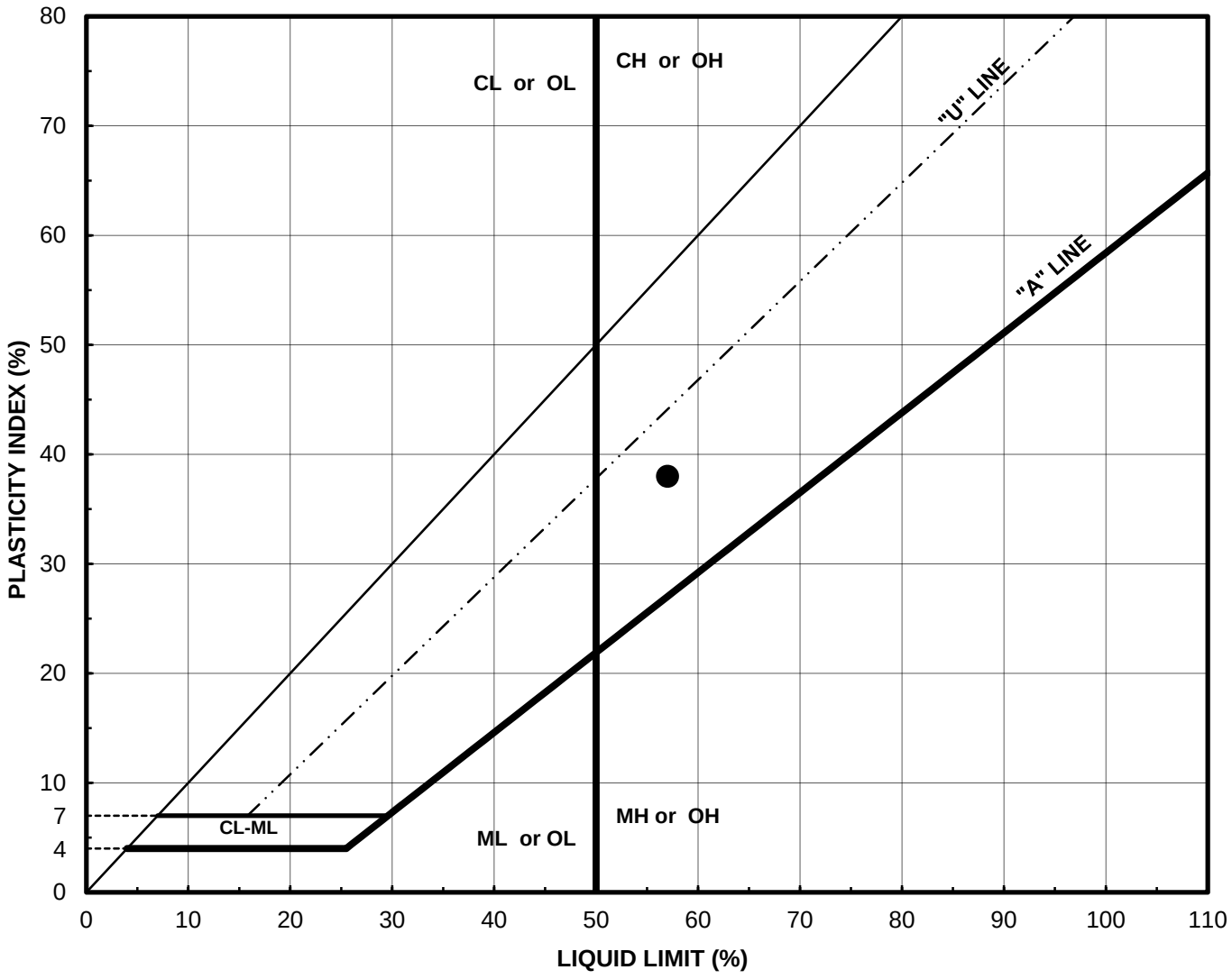


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
WM-11	5	18.5	23.5	45	27	Olive Lean CLAY with Sand (CL)

Project Name: **SR-210**

Project Number: **60512688**

PLASTICITY CHART

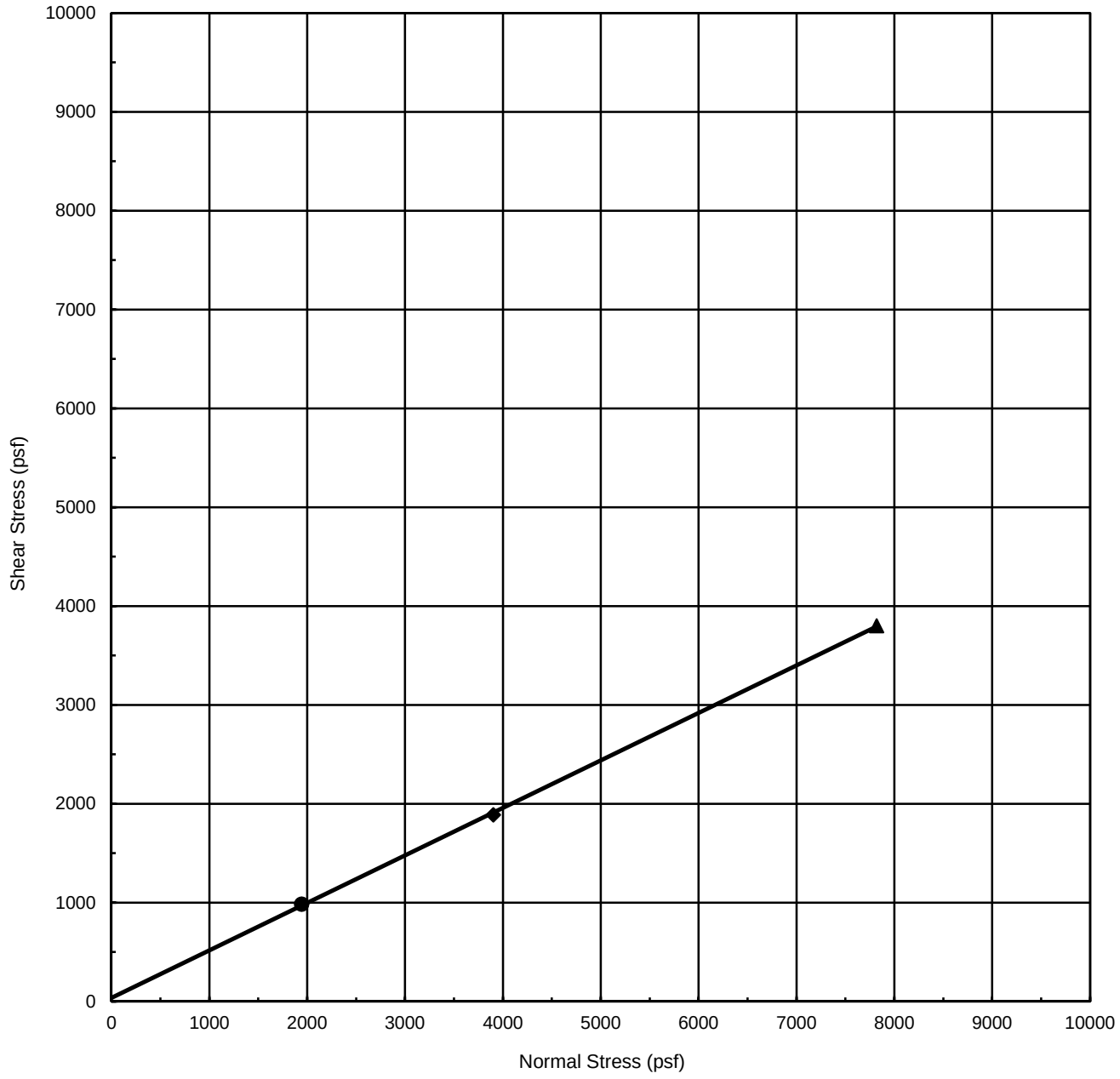


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
WM-24	4b	15.0	17.4	57	38	Light olive brown Fat CLAY (CH)

Project Name: **SR-210**

Project Number: **60512688**

PLASTICITY CHART



Peak Values are :	l	,solid trend line				Ultimate Values are:	m	,dashed trend line	
Exploration No.:	TC-01		Strength Intercept (C) :	35.3	psf	Peak	XXXXX	psf	Ultimate
Sample No.:	7			1.7	kPa		XXXXX	kPa	
Depth (ft | m)	30.0	9.1	Friction Angle (f) :	26	degree		XXXXX	degree	
Description:	**Dark gray Fat CLAY (CH)**					Shear rate :	0.0010 (in/min) ,	0.0025 (cm/min)	

SYMBOL		% Water Content	Total Unit Weight (pcf)	Total Unit Weight (kN/m^3)	Dry Unit Weight (pcf)	Dry Unit Weight (kN/m^3)	Normal Stress (psf)	Normal Stress (kPa)	Peak Stress (psf)	Peak Stress (kPa)	Ultimate Stress (psf)	Ultimate Stress (kPa)
Initial / Set up		40.0	111.2	17.5	79.4	12.5	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
pre-shear	l spec. 1	67.0	109.2	17.2	65.4	10.3	1943	93	984	47	XXXXX	XXXXX
	u spec. 2	36.7	126.3	19.8	92.4	14.5	3902	187	1888	90	XXXXX	XXXXX
	p spec. 3	24.5	132.7	20.9	106.6	16.8	7819	374	3800	182	XXXXX	XXXXX

AECOM

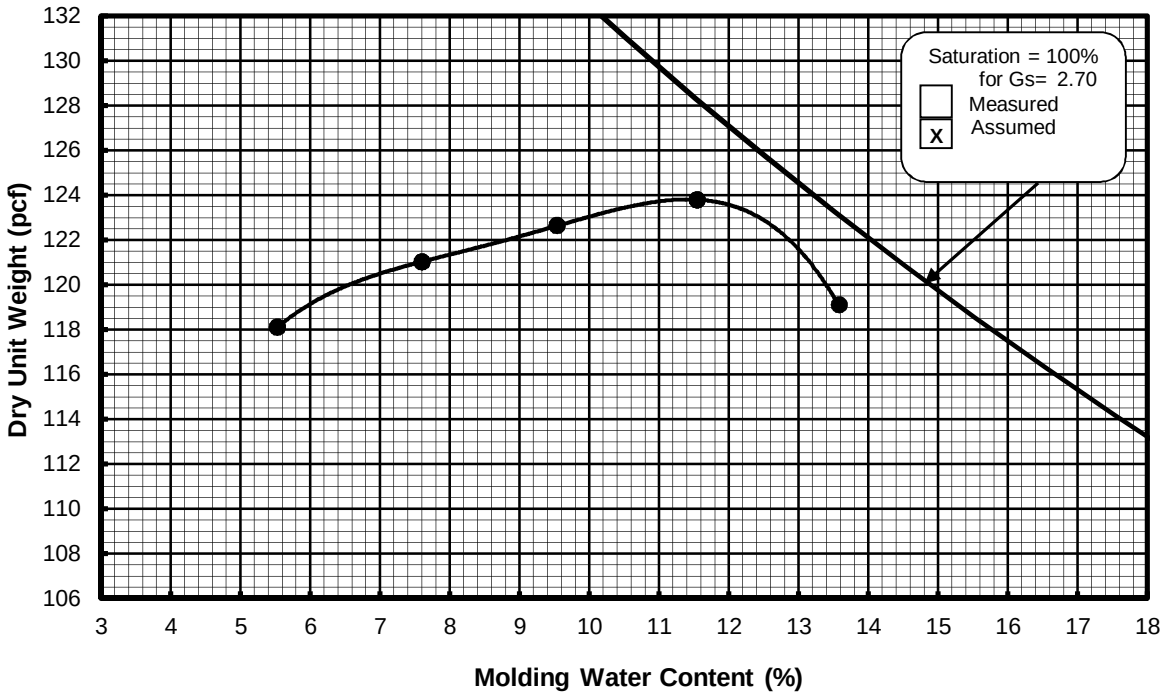
Pure Water

Project Number: 60530732
Test Date: 5/3/2017

DIRECT SHEAR TEST
ASTM D 3080

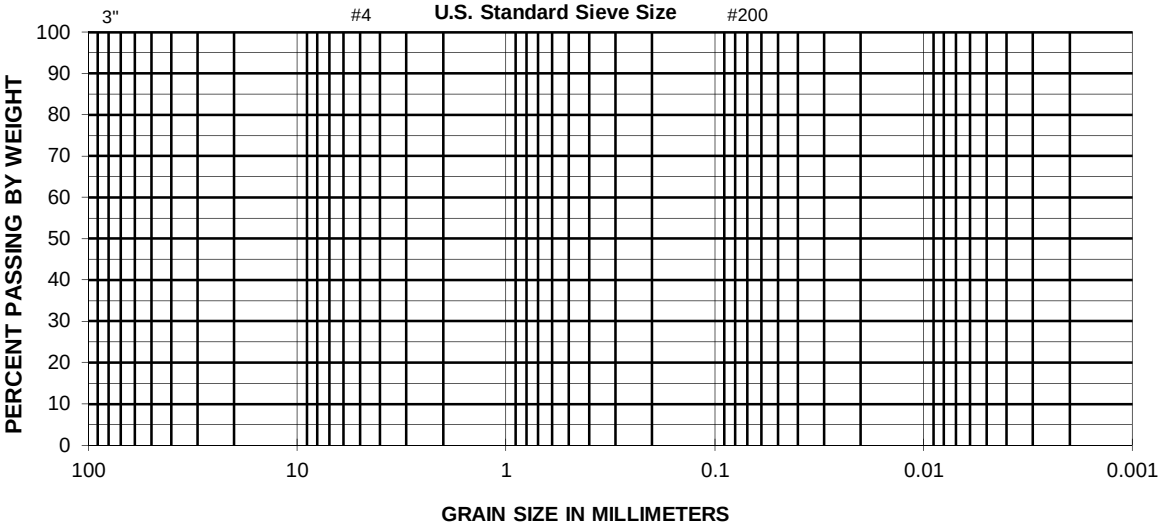
COMPACTION CURVE

Test Method: l ASTM D 1557 n ASTM D 698 u CA-DWR: S-10 m Other Effort
Compaction Procedure: Specimen Preparation Method: **Moist**



PARTICLE-SIZE DISTRIBUTION CURVE

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



NOTATION: l Representative of entire sample u Representative of compacted specimen n Representative of compacted specimen and entire sample

Boring Number	Sample Number	Depth (ft.)	Optimum WC (%)	Maximum DUW (pcf)	Description and/or Classification
FM-01	1	0~5	11.4	123.9	Olive brown Silty SAND (SM)

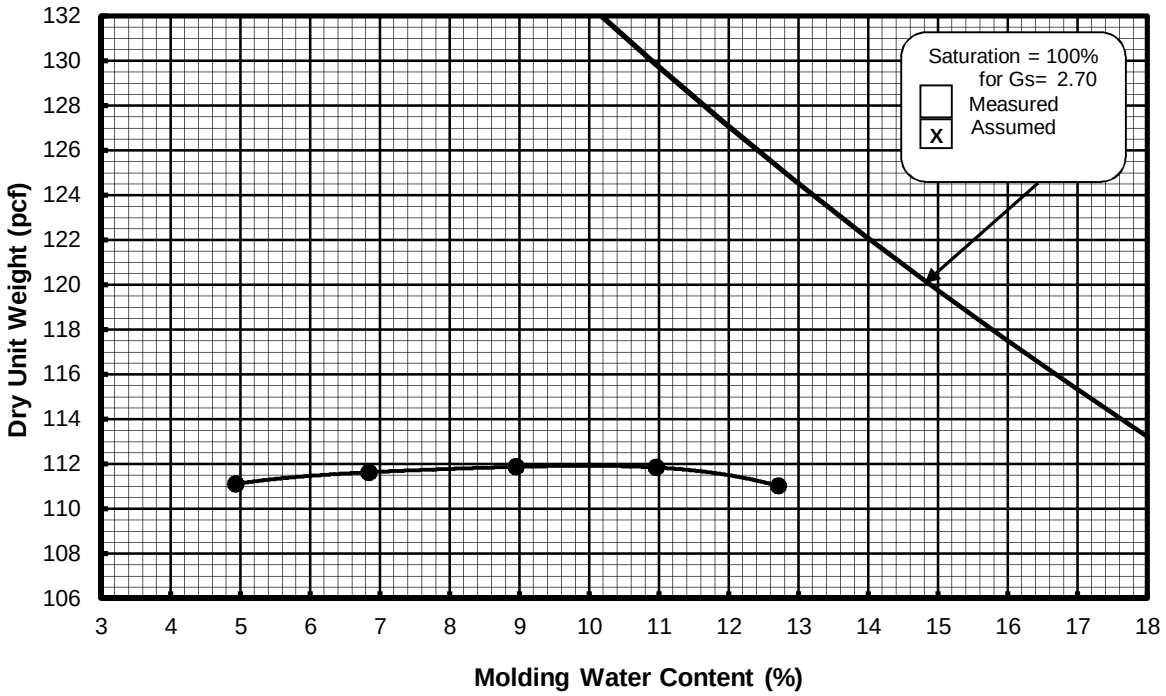
PROJECT NAME: Pure Water
PROJECT NUMBER: 60530732

COMPACTION AND INDEX PROPERTY DATA

SUBMITTED BY: A. D. Camacho

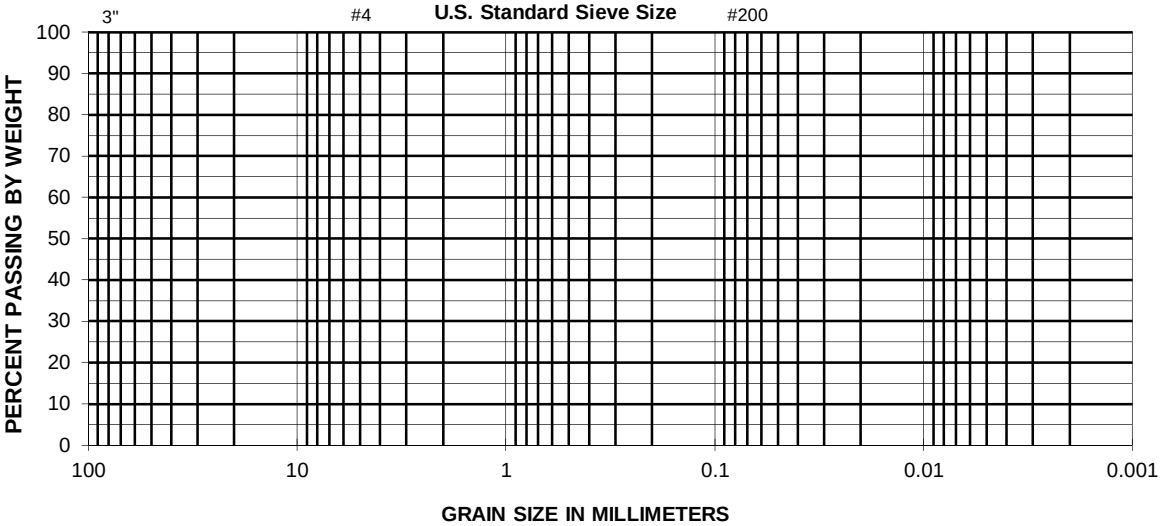
COMPACTION CURVE

Test Method: l ASTM D 1557 n ASTM D 698 u CA-DWR: S-10 m Other Effort
Compaction Procedure: Specimen Preparation Method: **Moist**



PARTICLE-SIZE DISTRIBUTION CURVE

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



NOTATION: l Representative of entire sample u Representative of compacted specimen n Representative of compacted specimen and entire sample

Boring Number	Sample Number	Depth (ft.)	Optimum WC (%)	Maximum DUW (pcf)	Description and/or Classification
FM-02	1	0~5	10.2	112.0	Olive brown Silty SAND (SM)

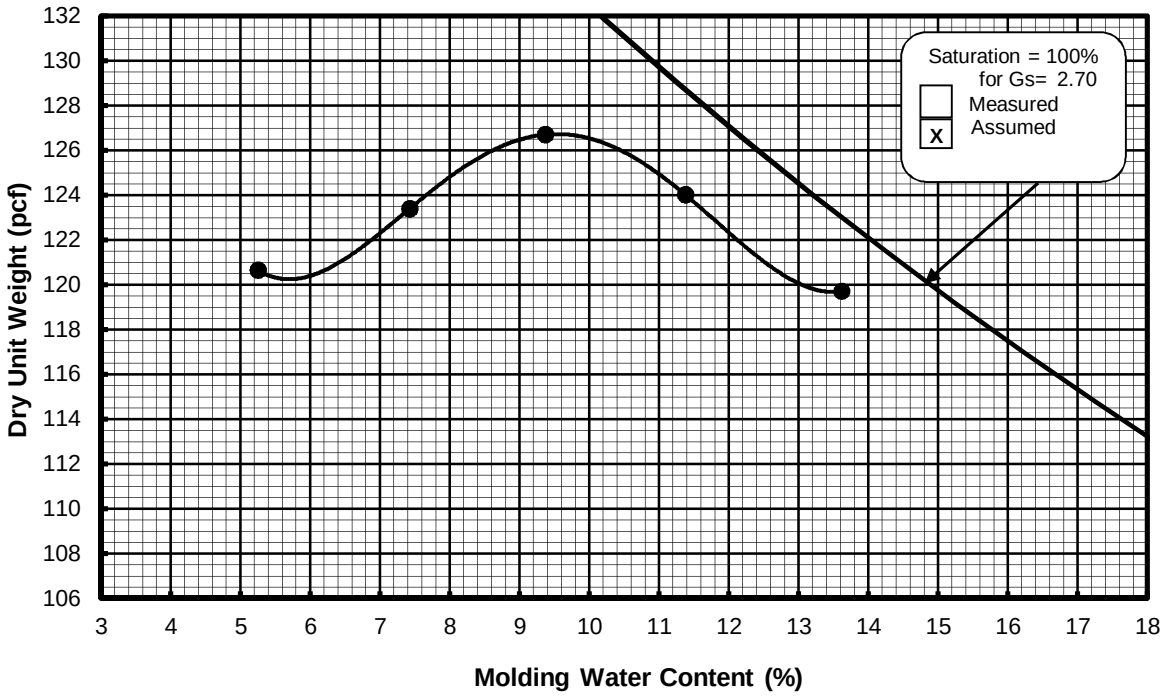
PROJECT NAME: Pure Water
PROJECT NUMBER: 60530732

COMPACTION AND INDEX PROPERTY DATA

SUBMITTED BY: A. D. Camacho

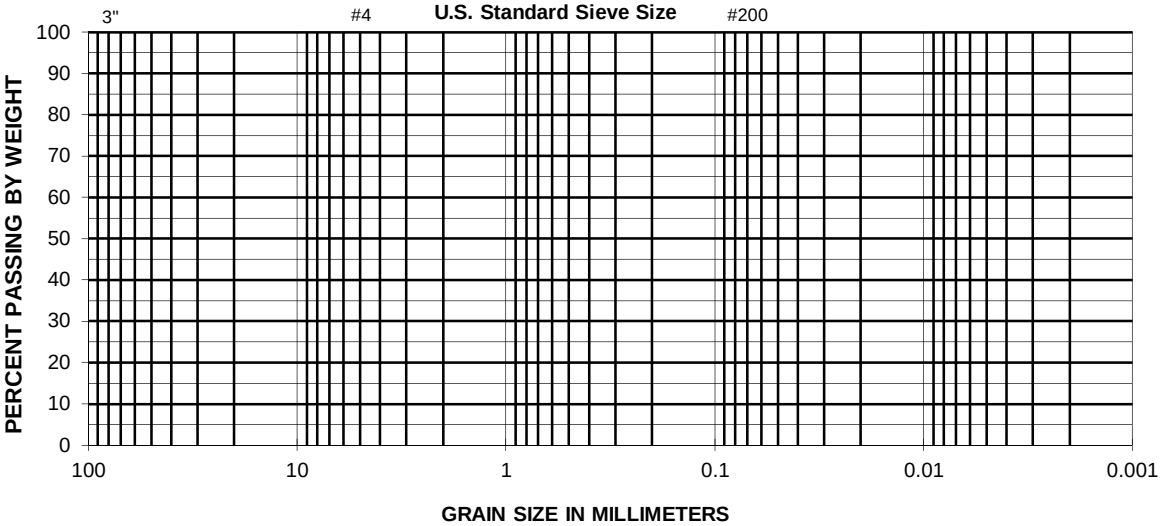
COMPACTION CURVE

Test Method: l ASTM D 1557 n ASTM D 698 u CA-DWR: S-10 m Other Effort
Compaction Procedure: Specimen Preparation Method: **Moist**



PARTICLE-SIZE DISTRIBUTION CURVE

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



NOTATION: l Representative of entire sample u Representative of compacted specimen n Representative of compacted specimen and entire sample

Boring Number	Sample Number	Depth (ft.)	Optimum WC (%)	Maximum DUW (pcf)	Description and/or Classification
FM-07	1	0~5	9.4	126.7	Dark yellowish brown Silty SAND (SM)

PROJECT NAME: Pure Water
PROJECT NUMBER: 60530732

COMPACTION AND INDEX PROPERTY DATA

SUBMITTED BY: A. D. Camacho

Table 1 - Laboratory Tests on Soil Samples

AECOM
Pure Water - City of San Diego
Your #60413030.29865969.00000, HDR Lab #17-0400LAB
22-Jun-17

Sample ID

			FM-01	FM-02	FM-03	FM-06	FM-08
Resistivity		**Units**					
as-received		ohm-cm	16,000	1,680	1,120	2,680	1,280
minimum		ohm-cm	5,600	1,400	1,080	2,680	600
pH			7.7	8.5	8.7	7.8	8.0
Electrical Conductivity		mS/cm	0.08	0.08	0.26	0.05	0.36
Chemical Analyses							
Cations							
calcium	Ca^{2+}	mg/kg	16	6.2	31	5.0	13
magnesium	Mg^{2+}	mg/kg	2.9	1.9	18	1.6	5.9
sodium	Na^{1+}	mg/kg	58	82	272	57	309
potassium	K^{1+}	mg/kg	21	9.3	102	5.3	38
Anions							
carbonate	CO_3^{2-}	mg/kg	14	ND	128	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	88	70	162	64	73
fluoride	F^{1-}	mg/kg	8.6	4.5	16	10	7.3
chloride	Cl^{1-}	mg/kg	16	37	27	17	19
sulfate	SO_4^{2-}	mg/kg	24	36	70	30	599
phosphate	PO_4^{3-}	mg/kg	ND	2.3	3.9	ND	ND
Other Tests							
ammonium	NH_4^{1+}	mg/kg	ND	ND	ND	ND	ND
nitrate	NO_3^{1-}	mg/kg	32	22	5.2	5.4	6.5
sulfide	S^{2-}	qual	na	na	na	na	na
Redox		mV	na	na	na	na	na

Minimum resistivity per CTM 643, Chlorides per CTM 422, Sulfates per CTM 417

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

Table 1 - Laboratory Tests on Soil Samples

AECOM
Pure Water - City of San Diego
Your #60413030.29865969.00000, HDR Lab #17-0400LAB
22-Jun-17

Sample ID

			FM-10-1	FM-14	FM-18	WM-06
Resistivity		**Units**				
as-received		ohm-cm	2,120	6,400	2,760	6,000
minimum		ohm-cm	1,280	1,600	1,280	1,120
pH			8.3	8.4	7.9	7.6
Electrical Conductivity		mS/cm	0.06	0.18	0.09	0.21
Chemical Analyses						
Cations						
calcium	Ca^{2+}	mg/kg	9.3	18	12	16
magnesium	Mg^{2+}	mg/kg	5.1	8.0	7.9	6.5
sodium	Na^{1+}	mg/kg	67	183	105	171
potassium	K^{1+}	mg/kg	7.1	17	12	92
Anions						
carbonate	CO_3^{2-}	mg/kg	ND	44	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	140	189	119	159
fluoride	F^{1-}	mg/kg	4.7	10	8.9	34
chloride	Cl^{1-}	mg/kg	13	29	29	111
sulfate	SO_4^{2-}	mg/kg	27	62	48	91
phosphate	PO_4^{3-}	mg/kg	2.5	ND	2.7	ND
Other Tests						
ammonium	NH_4^{1+}	mg/kg	ND	ND	ND	ND
nitrate	NO_3^{1-}	mg/kg	6.7	45	5.4	84
sulfide	S^{2-}	qual	na	na	na	na
Redox		mV	na	na	na	na

Minimum resistivity per CTM 643, Chlorides per CTM 422, Sulfates per CTM 417

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

Table 1 - Laboratory Tests on Soil Samples

AECOM
Pure Water City of San Diego
HDR Lab #17-0414LAB
29-Jun-17

Sample ID			WM-24 S-1 @ 0-5' SM	WM-11 S-1 @ 0-5' SM	WM-03 @-1 @ 0-5' SM
Resistivity		**Units**			
as-received		ohm-cm	3,440	6,400	44,000
saturated		ohm-cm	1,240	1,360	5,600
pH			7.7	8.7	8.5
Electrical Conductivity		mS/cm	0.11	0.22	0.06
Chemical Analyses					
Cations					
calcium	Ca^{2+}	mg/kg	39	16	38
magnesium	Mg^{2+}	mg/kg	12	34	12
sodium	Na^{1+}	mg/kg	94	246	39
potassium	K^{1+}	mg/kg	46	26	28
Anions					
carbonate	CO_3^{2-}	mg/kg	ND	35	ND
bicarbonate	HCO_3^{1-}	mg/kg	122	198	119
fluoride	F^{1-}	mg/kg	3.4	4.9	2.3
chloride	Cl^{1-}	mg/kg	27	84	3.7
sulfate	SO_4^{2-}	mg/kg	85	134	27
phosphate	PO_4^{3-}	mg/kg	6.6	2.4	6.7
Other Tests					
ammonium	NH_4^{1+}	mg/kg	ND	ND	ND
nitrate	NO_3^{1-}	mg/kg	26	17	37
sulfide	S^{2-}	qual	na	na	na
Redox		mV	na	na	na

Resistivity per ASTM G187, Cations per ASTM D6919, Anions per ASTM D4327, and Alkalinity per APHA 2320-B.
Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

431 West Baseline Road · Claremont, CA 91711
Phone: 909.962.5485 · Fax: 909.626.3316

Table 1 - Laboratory Tests on Soil Samples

AECOM
Pure Water - City of San Diego
HDR Lab #17-0507LAB
28-Jul-17

Sample ID			FM-20 @ 0-5 ft	FM-21 @ 0-5 ft	FM-35 @ 0-5 ft	FM-36b @ 0-5 ft	FM-38 @ 0-5 ft
Resistivity		**Units**					
as-received		ohm-cm	6,800	21,200	4,400	26,400	13,200
minimum		ohm-cm	2,120	1,120	1,400	1,080	1,240
pH			8.1	7.9	7.6	7.9	6.7
Electrical Conductivity		mS/cm	0.07	0.26	0.10	0.23	0.07
Chemical Analyses							
Cations							
calcium	Ca^{2+}	mg/kg	43	29	47	39	35
magnesium	Mg^{2+}	mg/kg	27	15	25	ND	14
sodium	Na^{1+}	mg/kg	92	246	123	231	75
potassium	K^{1+}	mg/kg	8.0	44	19	24	22
Anions							
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	95	302	82	229	15
fluoride	F^{1-}	mg/kg	20	7.7	10	12	3.3
chloride	Cl^{1-}	mg/kg	17	126	26	94	5.3
sulfate	SO_4^{2-}	mg/kg	33	146	109	148	92
phosphate	PO_4^{3-}	mg/kg	17	6.4	2.4	1.7	1.7
Other Tests							
ammonium	NH_4^{1+}	mg/kg	ND	ND	ND	ND	ND
nitrate	NO_3^{1-}	mg/kg	6.0	13	8.0	59	4.3
sulfide	S^{2-}	qual	na	na	na	na	na
Redox		mV	na	na	na	na	na

Minimum resistivity per CTM 643, Chlorides per CTM 422, Sulfates per CTM 417

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

Table 1 - Laboratory Tests on Soil Samples

AECOM
Pure Water - City of San Diego
HDR Lab #17-0507LAB
28-Jul-17

Sample ID			FM-41 @ 0-5 ft	FM-49 @ 0-5 ft	FM-52 @ 0-5 ft
Resistivity		**Units**			
as-received		ohm-cm	3,040	5,200	10,800
minimum		ohm-cm	480	880	1,280
pH			7.2	8.1	8.9
Electrical Conductivity		mS/cm	0.63	0.25	0.25
Chemical Analyses					
Cations					
calcium	Ca^{2+}	mg/kg	75	33	45
magnesium	Mg^{2+}	mg/kg	20	24	ND
sodium	Na^{1+}	mg/kg	456	271	260
potassium	K^{1+}	mg/kg	71	19	45
Anions					
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	122	98	433
fluoride	F^{1-}	mg/kg	16	36	37
chloride	Cl^{1-}	mg/kg	657	192	28
sulfate	SO_4^{2-}	mg/kg	288	138	227
phosphate	PO_4^{3-}	mg/kg	2.7	14	3.4
Other Tests					
ammonium	NH_4^{1+}	mg/kg	ND	ND	ND
nitrate	NO_3^{1-}	mg/kg	10	4.6	6.2
sulfide	S^{2-}	qual	na	na	na
Redox		mV	na	na	na

Minimum resistivity per CTM 643, Chlorides per CTM 422, Sulfates per CTM 417

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

Table 1 - Laboratory Tests on Soil Samples

AECOM
Pure Water - City of San Diego
HDR Lab #17-0562LAB
28-Aug-17

Sample ID			DS-01 @ 0-5 ft	FM-25 @ 0-5 ft	FM-29 @ 0-5 ft	FM-50 @ 0-5 ft
Resistivity		**Units**				
as-received		ohm-cm	13,600	14,800	14,400	7,200
minimum		ohm-cm	2,200	2,680	840	2,600
pH			7.6	7.3	7.1	7.3
Electrical Conductivity		mS/cm	0.09	0.11	0.29	0.12
Chemical Analyses						
Cations						
calcium	Ca^{2+}	mg/kg	ND	25	24	31
magnesium	Mg^{2+}	mg/kg	7.3	6.9	7.6	7.7
sodium	Na^{1+}	mg/kg	80	88	227	133
potassium	K^{1+}	mg/kg	7.8	8.5	10	17
Anions						
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	35
bicarbonate	HCO_3^{1-}	mg/kg	79	101	214	247
fluoride	F^{1-}	mg/kg	2.0	3.1	6.4	4.6
chloride	Cl^{1-}	mg/kg	25	5.5	121	4.0
sulfate	SO_4^{2-}	mg/kg	41	78	163	35
phosphate	PO_4^{3-}	mg/kg	ND	ND	ND	4.4
Other Tests						
ammonium	NH_4^{1+}	mg/kg	ND	ND	ND	ND
nitrate	NO_3^{1-}	mg/kg	5.2	4.6	4.5	4.8
sulfide	S^{2-}	qual	na	na	na	na
Redox		mV	na	na	na	na

Minimum resistivity per CTM 643, Chlorides per CTM 422, Sulfates per CTM 417

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

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APPENDIX C

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APPENDIX C – Groundwater Sampling

On March 31, 2017, AECOM personnel sampled the groundwater monitoring well PS-2. Depth to groundwater was measured using an electronic water level indicator and measured to the closest hundredth-inch from the top of the well casing. The well was purged by manually bailing using a disposal bailer using low flow purge techniques in accordance with the County of San Diego Department of Environmental Health Site Assessment and Mitigation (SAM) Manual guidelines. Field parameters including pH, temperature, and electric conductivity were regularly monitored during purging. Purging continued until measurements stabilized to generally within 10 percentof the previous reading. Field data was recorded on the sampling forms in our project files, and is available for review if requested.

One groundwater sample was collected using a disposal bailer and placed in unused, laboratory-supplied sample containers. The sample was stored in the field in a chilled cooler pending transport to a California Department of Health Services-Certified analytical laboratory, Eurofins Calscience, Inc., under proper chain-of-custody documentation.

The groundwater sample was analyzed for total petroleum hydrocarbons (TPH) extended range by EPA Modified Method 8015B, Title 22 metals including mercury by EPA Methods 6010B and 7470A, organochlorine pesticides (OCPs) by EPA Method 8081A, polychlorinated biphenyls (PCBs) by EPA Method 8082, semi-volatile organic compounds (SVOCs) by EPA Method 8270C, and volatile organic compounds (VOCs) by EPA Method 8260B.

Purged water generated during sampling was contained in one California Department of Transportation 55-gallon drum and transported to the project temporary storage facility on City property pending disposal evaluation.

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WORK ORDER NUMBER: 17-03-2408

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: AECOM

Client Project Name: Pure Water

Attention: Steve Fitzwilliam
401 West A Street
Suite 1200
San Diego, CA 92101-2421

Vikas Patel

Approved for release on 04/11/2017 by:
Vikas Patel
Project Manager

ResultLink

Email your PM

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Contents

Client Project Name: Pure Water
Work Order Number: 17-03-2408

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Work Order Narrative

Work Order: 17-03-2408 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 03/31/17. They were assigned to Work Order 17-03-2408.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

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QC Association Summary

Work Order: 17-03-2408 Page 1 of 1

Client Sample ID	Method Name	Type	Ext Name	Instrument	MS/MSD/SDP	LCS/LCSD
PS-2	EPA 6010B/7470A CAC Title 22 Metals		EPA 3010A Total	ICP 7300	170403SA5	170403LA5
PS-2	EPA 7470A Mercury		EPA 7470A Total	Mercury 07	170407SA2	170407LA2
PS-2	EPA 8015B (M) C6-C44		EPA 3510C	GC 47	*2	170404B02A
PS-2	EPA 8081A Organochlorine Pesticides		EPA 3510C	GC 44	*2	170404L03
PS-2	EPA 8082 PCB Aroclors		EPA 3510C	GC 66	*2	170404L04
PS-2	EPA 8260B Volatile Organics + Oxygenates		EPA 5030C	GC/MS V V	170404S011	170401L029
PS-2	EPA 8260B Volatile Organics + Oxygenates	R	EPA 5030C	GC/MS V V	170404S015	170404L033
PS-2	EPA 8270C Semi-Volatile Organics		EPA 3510C	GC/MS TT	*2	170403L04A

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2 = Limited sample received, no MS/MSD performed

R = Rerun

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Detections Summary

Client:	AECOM	Work Order:	17-03-2408
	401 West A Street, Suite 1200	Project Name:	Pure Water
	San Diego, CA 92101-2421	Received:	03/31/17
Attn:	Steve Fitzwilliam		Page 1 of 1

Client SampleID

Analyte	Result	Qualifiers	RL	Units	Method	Extraction
PS-2 (17-03-2408-1)						
Barium	0.142		0.0100	mg/L	EPA 6010B	EPA 3010A Total
Molybdenum	0.0287		0.0100	mg/L	EPA 6010B	EPA 3010A Total
C6-C44 Total	73		50	ug/L	EPA 8015B (M)	EPA 3510C
c-1,2-Dichloroethene	480		10	ug/L	EPA 8260B	EPA 5030C
t-1,2-Dichloroethene	2.6		1.0	ug/L	EPA 8260B	EPA 5030C

Subcontracted analyses, if any, are not included in this summary.

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* MDL is shown

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8015B (M)
Units: ug/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PS-2	**17-03-2408-1-G**	**03/31/17 09:25**	**Aqueous**	**GC 47**	**04/04/17**	**04/05/17 04:44**	**170404B02A**

Comment(s): - The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	DF	Qualifiers
C6	ND	50	1.00	
C7	ND	50	1.00	
C8	ND	50	1.00	
C9-C10	ND	50	1.00	
C11-C12	ND	50	1.00	
C13-C14	ND	50	1.00	
C15-C16	ND	50	1.00	
C17-C18	ND	50	1.00	
C19-C20	ND	50	1.00	
C21-C22	ND	50	1.00	
C23-C24	ND	50	1.00	
C25-C28	ND	50	1.00	
C29-C32	ND	50	1.00	
C33-C36	ND	50	1.00	
C37-C40	ND	50	1.00	
C41-C44	ND	50	1.00	
C6-C44 Total	73	50	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	106	68-140	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8015B (M)
Units: ug/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-472-642**	**N/A**	**Aqueous**	**GC 47**	**04/04/17**	**04/05/17 00:54**	**170404B02A**

Parameter	Result	RL	DF	Qualifiers
C6	ND	50	1.00	
C7	ND	50	1.00	
C8	ND	50	1.00	
C9-C10	ND	50	1.00	
C11-C12	ND	50	1.00	
C13-C14	ND	50	1.00	
C15-C16	ND	50	1.00	
C17-C18	ND	50	1.00	
C19-C20	ND	50	1.00	
C21-C22	ND	50	1.00	
C23-C24	ND	50	1.00	
C25-C28	ND	50	1.00	
C29-C32	ND	50	1.00	
C33-C36	ND	50	1.00	
C37-C40	ND	50	1.00	
C41-C44	ND	50	1.00	
C6-C44 Total	ND	50	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	91	68-140	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3010A Total
Method: EPA 6010B
Units: mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PS-2	**17-03-2408-1-F**	**03/31/17 09:25**	**Aqueous**	**ICP 7300**	**04/03/17**	**04/04/17 15:06**	**170403LA5**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	1.00	
Arsenic	ND	0.0100	1.00	
Barium	0.142	0.0100	1.00	
Beryllium	ND	0.0100	1.00	
Cadmium	ND	0.0100	1.00	
Chromium	ND	0.0100	1.00	
Cobalt	ND	0.0100	1.00	
Copper	ND	0.0100	1.00	
Lead	ND	0.0100	1.00	
Molybdenum	0.0287	0.0100	1.00	
Nickel	ND	0.0100	1.00	
Selenium	ND	0.0150	1.00	
Silver	ND	0.00500	1.00	
Thallium	ND	0.0150	1.00	
Vanadium	ND	0.0100	1.00	
Zinc	ND	0.0100	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3010A Total
Method: EPA 6010B
Units: mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**097-01-003-16394**	**N/A**	**Aqueous**	**ICP 7300**	**04/03/17**	**04/04/17 11:17**	**170403LA5**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	1.00	
Arsenic	ND	0.0100	1.00	
Barium	ND	0.0100	1.00	
Beryllium	ND	0.0100	1.00	
Cadmium	ND	0.0100	1.00	
Chromium	ND	0.0100	1.00	
Cobalt	ND	0.0100	1.00	
Copper	ND	0.0100	1.00	
Lead	ND	0.0100	1.00	
Molybdenum	ND	0.0100	1.00	
Nickel	ND	0.0100	1.00	
Selenium	ND	0.0150	1.00	
Silver	ND	0.00500	1.00	
Thallium	ND	0.0150	1.00	
Vanadium	ND	0.0100	1.00	
Zinc	ND	0.0100	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 7470A Total
Method: EPA 7470A
Units: mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PS-2	**17-03-2408-1-F**	**03/31/17 09:25**	**Aqueous**	**Mercury 07**	**04/07/17**	**04/07/17 14:53**	**170407LA2**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.000500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-04-008-8169**	**N/A**	**Aqueous**	**Mercury 07**	**04/07/17**	**04/07/17 14:48**	**170407LA2**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.000500	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8081A
Units: ug/L

Project: Pure Water

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PS-2	**17-03-2408-1-H**	**03/31/17 09:25**	**Aqueous**	**GC 44**	**04/04/17**	**04/07/17 08:02**	**170404L03**

Parameter	Result	RL	DF	Qualifiers
Alpha-BHC	ND	0.096	1.00	
Gamma-BHC	ND	0.096	1.00	
Beta-BHC	ND	0.096	1.00	
Heptachlor	ND	0.096	1.00	
Delta-BHC	ND	0.096	1.00	
Aldrin	ND	0.096	1.00	
Heptachlor Epoxide	ND	0.096	1.00	
Endosulfan I	ND	0.096	1.00	
Dieldrin	ND	0.096	1.00	
4,4'-DDE	ND	0.096	1.00	
Endrin	ND	0.096	1.00	
Endrin Aldehyde	ND	0.096	1.00	
4,4'-DDD	ND	0.096	1.00	
Endosulfan II	ND	0.096	1.00	
4,4'-DDT	ND	0.096	1.00	
Endosulfan Sulfate	ND	0.096	1.00	
Methoxychlor	ND	0.096	1.00	
Chlordane	ND	0.96	1.00	
Toxaphene	ND	1.9	1.00	
Endrin Ketone	ND	0.096	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	72	50-135	
2,4,5,6-Tetrachloro-m-Xylene	93	50-135	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8081A
Units: ug/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-529-949**	**N/A**	**Aqueous**	**GC 44**	**04/04/17**	**04/06/17 16:44**	**170404L03**

Parameter	Result	RL	DF	Qualifiers
Alpha-BHC	ND	0.10	1.00	
Gamma-BHC	ND	0.10	1.00	
Beta-BHC	ND	0.10	1.00	
Heptachlor	ND	0.10	1.00	
Delta-BHC	ND	0.10	1.00	
Aldrin	ND	0.10	1.00	
Heptachlor Epoxide	ND	0.10	1.00	
Endosulfan I	ND	0.10	1.00	
Dieldrin	ND	0.10	1.00	
4,4'-DDE	ND	0.10	1.00	
Endrin	ND	0.10	1.00	
Endrin Aldehyde	ND	0.10	1.00	
4,4'-DDD	ND	0.10	1.00	
Endosulfan II	ND	0.10	1.00	
4,4'-DDT	ND	0.10	1.00	
Endosulfan Sulfate	ND	0.10	1.00	
Methoxychlor	ND	0.10	1.00	
Chlordane	ND	1.0	1.00	
Toxaphene	ND	2.0	1.00	
Endrin Ketone	ND	0.10	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	79	50-135	
2,4,5,6-Tetrachloro-m-Xylene	85	50-135	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8082
Units: ug/L

Project: Pure Water

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PS-2	**17-03-2408-1-H**	**03/31/17 09:25**	**Aqueous**	**GC 66**	**04/04/17**	**04/06/17 14:33**	**170404L04**

Parameter	Result	RL	DF	Qualifiers
Aroclor-1016	ND	0.96	1.00	
Aroclor-1221	ND	0.96	1.00	
Aroclor-1232	ND	0.96	1.00	
Aroclor-1242	ND	0.96	1.00	
Aroclor-1248	ND	0.96	1.00	
Aroclor-1254	ND	0.96	1.00	
Aroclor-1260	ND	0.96	1.00	
Aroclor-1262	ND	0.96	1.00	
Aroclor-1268	ND	0.96	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	77	50-135	
2,4,5,6-Tetrachloro-m-Xylene	81	50-135	

Method Blank	099-12-533-1272	N/A	Aqueous	GC 66	04/04/17	04/06/17 13:40	170404L04

Parameter	Result	RL	DF	Qualifiers
Aroclor-1016	ND	1.0	1.00	
Aroclor-1221	ND	1.0	1.00	
Aroclor-1232	ND	1.0	1.00	
Aroclor-1242	ND	1.0	1.00	
Aroclor-1248	ND	1.0	1.00	
Aroclor-1254	ND	1.0	1.00	
Aroclor-1260	ND	1.0	1.00	
Aroclor-1262	ND	1.0	1.00	
Aroclor-1268	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Decachlorobiphenyl	73	50-135	
2,4,5,6-Tetrachloro-m-Xylene	72	50-135	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8270C
Units: ug/L

Project: Pure Water

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PS-2	**17-03-2408-1-I**	**03/31/17 09:25**	**Aqueous**	**GC/MS TT**	**04/03/17**	**04/04/17 20:53**	**170403L04A**

Parameter	Result	RL	DF	Qualifiers
Carbazole	ND	10	1.00	
Acenaphthene	ND	10	1.00	
Acenaphthylene	ND	10	1.00	
Aniline	ND	10	1.00	
Anthracene	ND	10	1.00	
Azobenzene	ND	10	1.00	
Benzidine	ND	50	1.00	
Benzo (a) Anthracene	ND	10	1.00	
Benzo (a) Pyrene	ND	10	1.00	
Benzo (b) Fluoranthene	ND	10	1.00	
Benzo (g,h,i) Perylene	ND	10	1.00	
Benzo (k) Fluoranthene	ND	10	1.00	
Benzoic Acid	ND	50	1.00	
Benzyl Alcohol	ND	10	1.00	
Bis(2-Chloroethoxy) Methane	ND	10	1.00	
Bis(2-Chloroethyl) Ether	ND	25	1.00	
Bis(2-Chloroisopropyl) Ether	ND	10	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	10	1.00	
4-Bromophenyl-Phenyl Ether	ND	10	1.00	
Butyl Benzyl Phthalate	ND	10	1.00	
4-Chloro-3-Methylphenol	ND	10	1.00	
4-Chloroaniline	ND	10	1.00	
2-Chloronaphthalene	ND	10	1.00	
2-Chlorophenol	ND	10	1.00	
4-Chlorophenyl-Phenyl Ether	ND	10	1.00	
Chrysene	ND	10	1.00	
Di-n-Butyl Phthalate	ND	10	1.00	
Di-n-Octyl Phthalate	ND	10	1.00	
Dibenz (a,h) Anthracene	ND	10	1.00	
Dibenzofuran	ND	10	1.00	
1,2-Dichlorobenzene	ND	10	1.00	
1,3-Dichlorobenzene	ND	10	1.00	
1,4-Dichlorobenzene	ND	10	1.00	
3,3'-Dichlorobenzidine	ND	25	1.00	
2,4-Dichlorophenol	ND	10	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8270C
Units: ug/L

Project: Pure Water

Parameter	Result	RL	DF	Qualifiers
Diethyl Phthalate	ND	10	1.00	
Dimethyl Phthalate	ND	10	1.00	
2,4-Dimethylphenol	ND	10	1.00	
4,6-Dinitro-2-Methylphenol	ND	50	1.00	
2,4-Dinitrophenol	ND	50	1.00	
2,4-Dinitrotoluene	ND	10	1.00	
2,6-Dinitrotoluene	ND	10	1.00	
Fluoranthene	ND	10	1.00	
Fluorene	ND	10	1.00	
Hexachloro-1,3-Butadiene	ND	10	1.00	
Hexachlorobenzene	ND	10	1.00	
Hexachlorocyclopentadiene	ND	25	1.00	
Hexachloroethane	ND	10	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	10	1.00	
Isophorone	ND	10	1.00	
2-Methylnaphthalene	ND	10	1.00	
1-Methylnaphthalene	ND	10	1.00	
2-Methylphenol	ND	10	1.00	
3/4-Methylphenol	ND	10	1.00	
N-Nitroso-di-n-propylamine	ND	10	1.00	
N-Nitrosodimethylamine	ND	10	1.00	
N-Nitrosodiphenylamine	ND	10	1.00	
Naphthalene	ND	10	1.00	
4-Nitroaniline	ND	10	1.00	
3-Nitroaniline	ND	10	1.00	
2-Nitroaniline	ND	10	1.00	
Nitrobenzene	ND	25	1.00	
4-Nitrophenol	ND	10	1.00	
2-Nitrophenol	ND	10	1.00	
Pentachlorophenol	ND	10	1.00	
Phenanthrene	ND	10	1.00	
Phenol	ND	10	1.00	
Pyrene	ND	10	1.00	
Pyridine	ND	10	1.00	
1,2,4-Trichlorobenzene	ND	10	1.00	
2,4,6-Trichlorophenol	ND	10	1.00	
2,4,5-Trichlorophenol	ND	10	1.00	
2,6-Dichlorophenol	ND	10	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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AECOM	Date Received:	03/31/17
401 West A Street, Suite 1200	Work Order:	17-03-2408
San Diego, CA 92101-2421	Preparation:	EPA 3510C
	Method:	EPA 8270C
	Units:	ug/L
Project: Pure Water		Page 3 of 6

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	75	33-120	
2-Fluorophenol	55	24-120	
Nitrobenzene-d5	88	38-120	
p-Terphenyl-d14	95	41-137	
Phenol-d6	37	16-120	
2,4,6-Tribromophenol	85	27-159	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8270C
Units: ug/L

Project: Pure Water

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**095-01-003-4354**	**N/A**	**Aqueous**	**GC/MS TT**	**04/03/17**	**04/04/17 17:04**	**170403L04A**

Parameter	Result	RL	DF	Qualifiers
Carbazole	ND	10	1.00	
Acenaphthene	ND	10	1.00	
Acenaphthylene	ND	10	1.00	
Aniline	ND	10	1.00	
Anthracene	ND	10	1.00	
Azobenzene	ND	10	1.00	
Benzidine	ND	50	1.00	
Benzo (a) Anthracene	ND	10	1.00	
Benzo (a) Pyrene	ND	10	1.00	
Benzo (b) Fluoranthene	ND	10	1.00	
Benzo (g,h,i) Perylene	ND	10	1.00	
Benzo (k) Fluoranthene	ND	10	1.00	
Benzoic Acid	ND	50	1.00	
Benzyl Alcohol	ND	10	1.00	
Bis(2-Chloroethoxy) Methane	ND	10	1.00	
Bis(2-Chloroethyl) Ether	ND	25	1.00	
Bis(2-Chloroisopropyl) Ether	ND	10	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	10	1.00	
4-Bromophenyl-Phenyl Ether	ND	10	1.00	
Butyl Benzyl Phthalate	ND	10	1.00	
4-Chloro-3-Methylphenol	ND	10	1.00	
4-Chloroaniline	ND	10	1.00	
2-Chloronaphthalene	ND	10	1.00	
2-Chlorophenol	ND	10	1.00	
4-Chlorophenyl-Phenyl Ether	ND	10	1.00	
Chrysene	ND	10	1.00	
Di-n-Butyl Phthalate	ND	10	1.00	
Di-n-Octyl Phthalate	ND	10	1.00	
Dibenz (a,h) Anthracene	ND	10	1.00	
Dibenzofuran	ND	10	1.00	
1,2-Dichlorobenzene	ND	10	1.00	
1,3-Dichlorobenzene	ND	10	1.00	
1,4-Dichlorobenzene	ND	10	1.00	
3,3'-Dichlorobenzidine	ND	25	1.00	
2,4-Dichlorophenol	ND	10	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8270C
Units: ug/L

Project: Pure Water

Parameter	Result	RL	DF	Qualifiers
Diethyl Phthalate	ND	10	1.00	
Dimethyl Phthalate	ND	10	1.00	
2,4-Dimethylphenol	ND	10	1.00	
4,6-Dinitro-2-Methylphenol	ND	50	1.00	
2,4-Dinitrophenol	ND	50	1.00	
2,4-Dinitrotoluene	ND	10	1.00	
2,6-Dinitrotoluene	ND	10	1.00	
Fluoranthene	ND	10	1.00	
Fluorene	ND	10	1.00	
Hexachloro-1,3-Butadiene	ND	10	1.00	
Hexachlorobenzene	ND	10	1.00	
Hexachlorocyclopentadiene	ND	25	1.00	
Hexachloroethane	ND	10	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	10	1.00	
Isophorone	ND	10	1.00	
2-Methylnaphthalene	ND	10	1.00	
1-Methylnaphthalene	ND	10	1.00	
2-Methylphenol	ND	10	1.00	
3/4-Methylphenol	ND	10	1.00	
N-Nitroso-di-n-propylamine	ND	10	1.00	
N-Nitrosodimethylamine	ND	10	1.00	
N-Nitrosodiphenylamine	ND	10	1.00	
Naphthalene	ND	10	1.00	
4-Nitroaniline	ND	10	1.00	
3-Nitroaniline	ND	10	1.00	
2-Nitroaniline	ND	10	1.00	
Nitrobenzene	ND	25	1.00	
4-Nitrophenol	ND	10	1.00	
2-Nitrophenol	ND	10	1.00	
Pentachlorophenol	ND	10	1.00	
Phenanthrene	ND	10	1.00	
Phenol	ND	10	1.00	
Pyrene	ND	10	1.00	
Pyridine	ND	10	1.00	
1,2,4-Trichlorobenzene	ND	10	1.00	
2,4,6-Trichlorophenol	ND	10	1.00	
2,4,5-Trichlorophenol	ND	10	1.00	
2,6-Dichlorophenol	ND	10	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM	Date Received:	03/31/17
401 West A Street, Suite 1200	Work Order:	17-03-2408
San Diego, CA 92101-2421	Preparation:	EPA 3510C
	Method:	EPA 8270C
	Units:	ug/L
Project: Pure Water		Page 6 of 6

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	80	33-120	
2-Fluorophenol	58	24-120	
Nitrobenzene-d5	88	38-120	
p-Terphenyl-d14	92	41-137	
Phenol-d6	37	16-120	
2,4,6-Tribromophenol	85	27-159	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PS-2	**17-03-2408-1-A**	**03/31/17 09:25**	**Aqueous**	**GC/MS V V**	**04/01/17**	**04/02/17 02:30**	**170401L029**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	5.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	2.6	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	
2,2-Dichloropropane	ND	1.0	1.00	
1,1-Dichloropropene	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/L

Project: Pure Water

Parameter	Result	RL	DF	Qualifiers
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	10	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	
Tert-Butyl Alcohol (TBA)	ND	10	1.00	
Diisopropyl Ether (DIPE)	ND	2.0	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	2.0	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	2.0	1.00	
Ethanol	ND	100	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	87	77-120	
Dibromofluoromethane	102	80-128	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM		Date Received:	03/31/17
401 West A Street, Suite 1200		Work Order:	17-03-2408
San Diego, CA 92101-2421		Preparation:	EPA 5030C
		Method:	EPA 8260B
		Units:	ug/L
Project: Pure Water			Page 3 of 6

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,2-Dichloroethane-d4	95	80-129	
Toluene-d8	98	80-120	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PS-2	**17-03-2408-1-B**	**03/31/17 09:25**	**Aqueous**	**GC/MS V V**	**04/04/17**	**04/04/17 18:55**	**170404L033**

Parameter	Result	RL	DF	Qualifiers
c-1,2-Dichloroethene	480	10	10.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	77-120	
Dibromofluoromethane	96	80-128	
1,2-Dichloroethane-d4	90	80-129	
Toluene-d8	97	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/L

Project: Pure Water

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-001-22836**	**N/A**	**Aqueous**	**GC/MS V V**	**04/01/17**	**04/01/17 23:26**	**170401L029**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	5.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	
2,2-Dichloropropane	ND	1.0	1.00	
1,1-Dichloropropene	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/L

Project: Pure Water

Parameter	Result	RL	DF	Qualifiers
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	10	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	
Tert-Butyl Alcohol (TBA)	ND	10	1.00	
Diisopropyl Ether (DIPE)	ND	2.0	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	2.0	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	2.0	1.00	
Ethanol	ND	100	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	88	77-120	
Dibromofluoromethane	105	80-128	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

AECOM	Date Received:	03/31/17
401 West A Street, Suite 1200	Work Order:	17-03-2408
San Diego, CA 92101-2421	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/L
Project: Pure Water		Page 6 of 6

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,2-Dichloroethane-d4	97	80-129	
Toluene-d8	97	80-120	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-001-22840**	**N/A**	**Aqueous**	**GC/MS V V**	**04/04/17**	**04/04/17 16:42**	**170404L033**

Parameter	Result	RL	DF	Qualifiers
c-1,2-Dichloroethene	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	77-120	
Dibromofluoromethane	99	80-128	
1,2-Dichloroethane-d4	93	80-129	
Toluene-d8	98	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3010A Total
Method: EPA 6010B
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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
17-03-2324-1	**Sample**	**Aqueous**	**ICP 7300**	**04/03/17**	**04/04/17 11:23**	**170403SA5**
17-03-2324-1	**Matrix Spike**	**Aqueous**	**ICP 7300**	**04/03/17**	**04/04/17 11:26**	**170403SA5**
17-03-2324-1	**Matrix Spike Duplicate**	**Aqueous**	**ICP 7300**	**04/03/17**	**04/04/17 11:27**	**170403SA5**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Antimony	ND	0.5000	0.4452	89	0.4258	85	72-132	4	0-10	
Arsenic	0.03963	0.5000	0.6080	114	0.5952	111	80-140	2	0-11	
Barium	0.3332	0.5000	0.8566	105	0.8613	106	87-123	1	0-6	
Beryllium	ND	0.5000	0.5616	112	0.5581	112	89-119	1	0-8	
Cadmium	ND	0.5000	0.5657	113	0.5645	113	82-124	0	0-7	
Chromium	0.01785	0.5000	0.5765	112	0.5756	112	86-122	0	0-8	
Cobalt	0.03281	0.5000	0.5703	107	0.5717	108	83-125	0	0-7	
Copper	0.05219	0.5000	0.6050	111	0.6069	111	78-126	0	0-7	
Lead	ND	0.5000	0.5604	112	0.5599	112	84-120	0	0-7	
Molybdenum	0.03162	0.5000	0.5434	102	0.5497	104	78-126	1	0-7	
Nickel	0.07863	0.5000	0.6144	107	0.6143	107	84-120	0	0-7	
Selenium	ND	0.5000	0.5550	111	0.5513	110	79-127	1	0-9	
Silver	ND	0.2500	0.04282	17	0.06243	25	86-128	37	0-7	3,4
Thallium	ND	0.5000	0.5242	105	0.5178	104	79-121	1	0-8	
Vanadium	0.04989	0.5000	0.5949	109	0.5976	110	88-118	0	0-7	
Zinc	0.1868	0.5000	0.7906	121	0.7848	120	89-131	1	0-8	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

AECOM		Date Received:	03/31/17
401 West A Street, Suite 1200		Work Order:	17-03-2408
San Diego, CA 92101-2421		Preparation:	EPA 7470A Total
		Method:	EPA 7470A
Project: Pure Water			Page 2 of 4

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PS-2	**Sample**	**Aqueous**	**Mercury 07**	**04/07/17**	**04/07/17 14:53**	**170407SA2**
PS-2	**Matrix Spike**	**Aqueous**	**Mercury 07**	**04/07/17**	**04/07/17 15:00**	**170407SA2**
PS-2	**Matrix Spike Duplicate**	**Aqueous**	**Mercury 07**	**04/07/17**	**04/07/17 15:02**	**170407SA2**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.01000	0.008469	85	0.008481	85	55-133	0	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 5030C
Method: EPA 8260B

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
17-03-2330-12	**Sample**	**Aqueous**	**GC/MS V V**	**04/04/17**	**04/04/17 17:09**	**170404S015**
17-03-2330-12	**Matrix Spike**	**Aqueous**	**GC/MS V V**	**04/04/17**	**04/04/17 18:02**	**170404S015**
17-03-2330-12	**Matrix Spike Duplicate**	**Aqueous**	**GC/MS V V**	**04/04/17**	**04/04/17 18:28**	**170404S015**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	ND	50.00	43.07	86	42.65	85	22-178	1	0-26	
Benzene	ND	50.00	50.48	101	49.74	99	70-130	1	0-20	
Bromobenzene	ND	50.00	51.72	103	50.31	101	70-130	3	0-20	
Bromochloromethane	ND	50.00	48.12	96	48.05	96	70-132	0	0-20	
Bromodichloromethane	ND	50.00	48.22	96	47.83	96	69-135	1	0-20	
Bromoform	ND	50.00	50.76	102	51.63	103	70-133	2	0-20	
Bromomethane	ND	50.00	34.41	69	30.94	62	11-167	11	0-32	
2-Butanone	ND	50.00	43.17	86	43.56	87	39-159	1	0-21	
n-Butylbenzene	ND	50.00	56.58	113	55.44	111	62-152	2	0-28	
sec-Butylbenzene	ND	50.00	54.91	110	54.28	109	70-143	1	0-24	
tert-Butylbenzene	ND	50.00	59.07	118	59.62	119	70-140	1	0-20	
Carbon Disulfide	ND	50.00	47.51	95	46.98	94	54-138	1	0-23	
Carbon Tetrachloride	ND	50.00	50.06	100	49.10	98	63-153	2	0-22	
Chlorobenzene	ND	50.00	51.54	103	50.88	102	70-130	1	0-20	
Chloroethane	ND	50.00	25.57	51	28.75	58	44-140	12	0-32	
Chloroform	ND	50.00	46.09	92	46.16	92	68-134	0	0-20	
Chloromethane	ND	50.00	39.63	79	39.37	79	20-158	1	0-40	
2-Chlorotoluene	ND	50.00	54.34	109	53.57	107	70-137	1	0-20	
4-Chlorotoluene	ND	50.00	53.35	107	53.27	107	70-130	0	0-20	
Dibromochloromethane	ND	50.00	50.35	101	49.40	99	70-133	2	0-20	
1,2-Dibromo-3-Chloropropane	ND	50.00	47.41	95	47.14	94	67-133	1	0-20	
1,2-Dibromoethane	ND	50.00	48.98	98	47.97	96	70-130	2	0-20	
Dibromomethane	ND	50.00	48.48	97	47.89	96	70-130	1	0-20	
1,2-Dichlorobenzene	ND	50.00	52.40	105	52.40	105	70-130	0	0-20	
1,3-Dichlorobenzene	ND	50.00	52.52	105	52.51	105	70-130	0	0-20	
1,4-Dichlorobenzene	ND	50.00	50.46	101	50.74	101	70-130	1	0-20	
Dichlorodifluoromethane	ND	50.00	54.78	110	54.85	110	10-190	0	0-40	
1,1-Dichloroethane	ND	50.00	49.43	99	49.17	98	64-130	1	0-20	
1,2-Dichloroethane	ND	50.00	46.48	93	46.13	92	69-135	1	0-20	
1,1-Dichloroethene	ND	50.00	50.23	100	49.63	99	51-153	1	0-21	
c-1,2-Dichloroethene	ND	50.00	50.51	101	50.54	101	56-146	0	0-20	
t-1,2-Dichloroethene	ND	50.00	51.52	103	51.48	103	68-134	0	0-20	
1,2-Dichloropropane	ND	50.00	50.85	102	50.66	101	70-130	0	0-20	
1,3-Dichloropropane	ND	50.00	47.18	94	46.51	93	70-130	1	0-20	
2,2-Dichloropropane	ND	50.00	49.39	99	48.08	96	37-169	3	0-23	

RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 5030C
Method: EPA 8260B

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
1,1-Dichloropropene	ND	50.00	49.79	100	50.00	100	66-132	0	0-20	
c-1,3-Dichloropropene	ND	50.00	46.44	93	46.63	93	67-139	0	0-20	
t-1,3-Dichloropropene	ND	50.00	47.93	96	46.94	94	58-136	2	0-20	
Ethylbenzene	ND	50.00	55.47	111	54.47	109	70-134	2	0-24	
2-Hexanone	ND	50.00	45.81	92	44.90	90	59-149	2	0-20	
Isopropylbenzene	ND	50.00	55.58	111	54.86	110	70-141	1	0-27	
p-Isopropyltoluene	ND	50.00	54.09	108	53.67	107	65-143	1	0-39	
Methylene Chloride	ND	50.00	46.66	93	46.20	92	69-130	1	0-21	
4-Methyl-2-Pentanone	ND	50.00	49.94	100	50.70	101	67-139	1	0-20	
Naphthalene	ND	50.00	52.40	105	56.25	112	61-139	7	0-20	
n-Propylbenzene	ND	50.00	55.67	111	54.91	110	70-140	1	0-24	
Styrene	ND	50.00	49.82	100	49.19	98	18-174	1	0-40	
1,1,1,2-Tetrachloroethane	ND	50.00	52.76	106	52.39	105	70-135	1	0-20	
1,1,2,2-Tetrachloroethane	ND	50.00	49.17	98	49.33	99	70-137	0	0-20	
Tetrachloroethene	ND	50.00	43.00	86	41.87	84	33-147	3	0-30	
Toluene	ND	50.00	52.95	106	52.56	105	70-130	1	0-20	
1,2,3-Trichlorobenzene	ND	50.00	51.57	103	53.93	108	64-142	4	0-22	
1,2,4-Trichlorobenzene	ND	50.00	53.37	107	54.47	109	60-144	2	0-24	
1,1,1-Trichloroethane	ND	50.00	48.35	97	48.20	96	68-140	0	0-20	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	50.00	55.46	111	55.10	110	21-190	1	0-40	
1,1,2-Trichloroethane	ND	50.00	47.75	95	46.82	94	70-130	2	0-20	
Trichloroethene	ND	50.00	50.06	100	49.75	99	42-156	1	0-20	
Trichlorofluoromethane	ND	50.00	48.41	97	54.90	110	54-162	13	0-30	
1,2,3-Trichloropropane	ND	50.00	47.13	94	46.23	92	67-130	2	0-20	
1,2,4-Trimethylbenzene	ND	50.00	53.64	107	53.64	107	70-133	0	0-20	
1,3,5-Trimethylbenzene	ND	50.00	54.93	110	53.91	108	70-139	2	0-20	
Vinyl Acetate	ND	50.00	46.24	92	45.74	91	10-190	1	0-40	
Vinyl Chloride	ND	50.00	35.35	71	34.87	70	59-137	1	0-20	
p/m-Xylene	ND	100.0	114.8	115	113.0	113	67-145	2	0-28	
o-Xylene	ND	50.00	53.79	108	53.56	107	70-142	0	0-31	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	47.38	95	48.06	96	69-130	1	0-20	
Tert-Butyl Alcohol (TBA)	ND	250.0	260.5	104	259.1	104	70-132	1	0-20	
Diisopropyl Ether (DIPE)	ND	50.00	50.22	100	50.52	101	56-140	1	0-25	
Ethyl-t-Butyl Ether (ETBE)	ND	50.00	48.21	96	48.62	97	61-133	1	0-20	
Tert-Amyl-Methyl Ether (TAME)	ND	50.00	48.05	96	48.28	97	69-130	0	0-20	
Ethanol	ND	500.0	567.4	113	626.6	125	65-137	10	0-21	

RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

AECOM	Date Received: 03/31/17
401 West A Street, Suite 1200	Work Order: 17-03-2408
San Diego, CA 92101-2421	Preparation: EPA 3510C
	Method: EPA 8015B (M)
Project: Pure Water	Page 1 of 10

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-472-642	**LCS**	**Aqueous**	**GC 47**	**04/04/17**	**04/05/17 01:15**	**170404B02A**
099-15-472-642	**LCSD**	**Aqueous**	**GC 47**	**04/04/17**	**04/05/17 01:37**	**170404B02A**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	2000	1837	92	1857	93	69-123	1	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

AECOM		Date Received:	03/31/17
401 West A Street, Suite 1200		Work Order:	17-03-2408
San Diego, CA 92101-2421		Preparation:	EPA 3010A Total
		Method:	EPA 6010B
Project: Pure Water			Page 2 of 10

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
097-01-003-16394	**LCS**	**Aqueous**	**ICP 7300**	**04/03/17**	**04/04/17 11:18**	**170403LA5**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Antimony	0.5000	0.4073	81	80-120	73-127	
Arsenic	0.5000	0.5149	103	80-120	73-127	
Barium	0.5000	0.5439	109	80-120	73-127	
Beryllium	0.5000	0.5097	102	80-120	73-127	
Cadmium	0.5000	0.5333	107	80-120	73-127	
Chromium	0.5000	0.5277	106	80-120	73-127	
Cobalt	0.5000	0.5422	108	80-120	73-127	
Copper	0.5000	0.5363	107	80-120	73-127	
Lead	0.5000	0.5638	113	80-120	73-127	
Molybdenum	0.5000	0.5070	101	80-120	73-127	
Nickel	0.5000	0.5467	109	80-120	73-127	
Selenium	0.5000	0.5244	105	80-120	73-127	
Silver	0.2500	0.2685	107	80-120	73-127	
Thallium	0.5000	0.5509	110	80-120	73-127	
Vanadium	0.5000	0.4988	100	80-120	73-127	
Zinc	0.5000	0.5414	108	80-120	73-127	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

AECOM		Date Received:	03/31/17
401 West A Street, Suite 1200		Work Order:	17-03-2408
San Diego, CA 92101-2421		Preparation:	EPA 7470A Total
		Method:	EPA 7470A
Project: Pure Water			Page 3 of 10

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-04-008-8169	**LCS**	**Aqueous**	**Mercury 07**	**04/07/17**	**04/07/17 14:51**	**170407LA2**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.01000	0.008900	89	80-120	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101-2421

Project: Pure Water

Date Received: 03/31/17
Work Order: 17-03-2408
Preparation: EPA 3510C
Method: EPA 8081A

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-529-949	**LCS**	**Aqueous**	**GC 44**	**04/04/17**	**04/06/17 16:16**	**170404L03**
099-12-529-949	**LCSD**	**Aqueous**	**GC 44**	**04/04/17**	**04/06/17 16:30**	**170404L03**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Alpha-BHC	0.5000	0.5388	108	0.5378	108	50-135	36-149	0	0-25	
Gamma-BHC	0.5000	0.5439	109	0.5437	109	50-135	36-149	0	0-25	
Beta-BHC	0.5000	0.5223	104	0.5213	104	50-135	36-149	0	0-25	
Heptachlor	0.5000	0.4943	99	0.4952	99	50-135	36-149	0	0-25	
Delta-BHC	0.5000	0.5661	113	0.5651	113	50-135	36-149	0	0-25	
Aldrin	0.5000	0.4450	89	0.4453	89	50-135	36-149	0	0-25	
Heptachlor Epoxide	0.5000	0.5427	109	0.5447	109	50-135	36-149	0	0-25	
Endosulfan I	0.5000	0.5496	110	0.5509	110	50-135	36-149	0	0-25	
Dieldrin	0.5000	0.5398	108	0.5413	108	50-135	36-149	0	0-25	
4,4'-DDE	0.5000	0.5415	108	0.5394	108	50-135	36-149	0	0-25	
Endrin	0.5000	0.5696	114	0.5704	114	50-135	36-149	0	0-25	
Endrin Aldehyde	0.5000	0.5256	105	0.5281	106	50-135	36-149	0	0-25	
4,4'-DDD	0.5000	0.5569	111	0.5595	112	50-135	36-149	0	0-25	
Endosulfan II	0.5000	0.5511	110	0.5531	111	50-135	36-149	0	0-25	
4,4'-DDT	0.5000	0.5476	110	0.5478	110	50-135	36-149	0	0-25	
Endosulfan Sulfate	0.5000	0.5313	106	0.5342	107	50-135	36-149	1	0-25	
Methoxychlor	0.5000	0.5210	104	0.5209	104	50-135	36-149	0	0-25	

Total number of LCS compounds: 17
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

AECOM	Date Received: 03/31/17
401 West A Street, Suite 1200	Work Order: 17-03-2408
San Diego, CA 92101-2421	Preparation: EPA 3510C
	Method: EPA 8082
Project: Pure Water	Page 5 of 10

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-533-1272	**LCS**	**Aqueous**	**GC 66**	**04/04/17**	**04/06/17 13:58**	**170404L04**
099-12-533-1272	**LCSD**	**Aqueous**	**GC 66**	**04/04/17**	**04/06/17 14:16**	**170404L04**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Aroclor-1016	2.000	2.030	102	2.040	102	50-135	0	0-25	
Aroclor-1260	2.000	1.930	96	1.960	98	50-135	2	0-25	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

AECOM		Date Received:	03/31/17
401 West A Street, Suite 1200		Work Order:	17-03-2408
San Diego, CA 92101-2421		Preparation:	EPA 3510C
		Method:	EPA 8270C
Project: Pure Water			Page 6 of 10

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-003-4354	**LCS**	**Aqueous**	**GC/MS TT**	**04/03/17**	**04/04/17 17:23**	**170403L04A**
095-01-003-4354	**LCSD**	**Aqueous**	**GC/MS TT**	**04/03/17**	**04/04/17 17:45**	**170403L04A**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acenaphthene	100.0	91.65	92	92.00	92	61-120	51-130	0	0-20	
Acenaphthylene	100.0	88.82	89	88.22	88	55-120	44-131	1	0-20	
Butyl Benzyl Phthalate	100.0	101.9	102	99.75	100	56-122	45-133	2	0-20	
4-Chloro-3-Methylphenol	100.0	90.68	91	94.69	95	52-120	41-131	4	0-20	
2-Chlorophenol	100.0	85.92	86	87.13	87	47-120	35-132	1	0-20	
1,4-Dichlorobenzene	100.0	53.90	54	53.41	53	36-120	22-134	1	0-20	
Dimethyl Phthalate	100.0	94.64	95	95.47	95	60-120	50-130	1	0-20	
2,4-Dinitrotoluene	100.0	99.86	100	100.9	101	61-121	51-131	1	0-20	
Fluorene	100.0	91.64	92	91.60	92	67-120	58-129	0	0-20	
N-Nitroso-di-n-propylamine	100.0	87.41	87	91.03	91	39-123	25-137	4	0-20	
Naphthalene	100.0	74.85	75	75.62	76	54-120	43-131	1	0-20	
4-Nitrophenol	100.0	45.00	45	44.53	45	14-120	0-138	1	0-20	
Pentachlorophenol	100.0	76.66	77	77.60	78	31-127	15-143	1	0-20	
Phenol	100.0	38.73	39	39.13	39	17-120	0-137	1	0-20	
Pyrene	100.0	94.56	95	93.34	93	58-124	47-135	1	0-20	
1,2,4-Trichlorobenzene	100.0	64.07	64	63.67	64	49-120	37-132	1	0-20	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

AECOM		Date Received:	03/31/17
401 West A Street, Suite 1200		Work Order:	17-03-2408
San Diego, CA 92101-2421		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: Pure Water			Page 7 of 10

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-001-22836	**LCS**	**Aqueous**	**GC/MS V V**	**04/01/17**	**04/01/17 22:33**	**170401L029**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Acetone	50.00	48.01	96	53-137	39-151	
Benzene	50.00	50.56	101	79-121	72-128	
Bromobenzene	50.00	53.15	106	80-120	73-127	
Bromochloromethane	50.00	51.00	102	80-122	73-129	
Bromodichloromethane	50.00	49.17	98	80-124	73-131	
Bromoform	50.00	51.74	103	73-127	64-136	
Bromomethane	50.00	44.31	89	50-150	33-167	
2-Butanone	50.00	46.98	94	60-126	49-137	
n-Butylbenzene	50.00	53.98	108	72-138	61-149	
sec-Butylbenzene	50.00	52.69	105	77-131	68-140	
tert-Butylbenzene	50.00	57.49	115	80-125	72-132	
Carbon Disulfide	50.00	47.81	96	50-150	33-167	
Carbon Tetrachloride	50.00	49.44	99	65-143	52-156	
Chlorobenzene	50.00	52.53	105	80-120	73-127	
Chloroethane	50.00	60.53	121	62-128	51-139	
Chloroform	50.00	47.03	94	80-120	73-127	
Chloromethane	50.00	54.80	110	43-133	28-148	
2-Chlorotoluene	50.00	54.60	109	80-121	73-128	
4-Chlorotoluene	50.00	51.81	104	80-120	73-127	
Dibromochloromethane	50.00	51.33	103	80-123	73-130	
1,2-Dibromo-3-Chloropropane	50.00	49.49	99	66-126	56-136	
1,2-Dibromoethane	50.00	51.63	103	80-120	73-127	
Dibromomethane	50.00	50.51	101	80-120	73-127	
1,2-Dichlorobenzene	50.00	52.12	104	80-120	73-127	
1,3-Dichlorobenzene	50.00	51.34	103	80-120	73-127	
1,4-Dichlorobenzene	50.00	49.51	99	80-120	73-127	
Dichlorodifluoromethane	50.00	73.69	147	50-150	33-167	
1,1-Dichloroethane	50.00	50.10	100	72-126	63-135	
1,2-Dichloroethane	50.00	47.68	95	76-120	69-127	
1,1-Dichloroethene	50.00	50.53	101	66-132	55-143	
c-1,2-Dichloroethene	50.00	51.32	103	78-120	71-127	
t-1,2-Dichloroethene	50.00	52.51	105	66-132	55-143	
1,2-Dichloropropane	50.00	50.94	102	80-120	73-127	
1,3-Dichloropropane	50.00	48.78	98	80-120	73-127	
2,2-Dichloropropane	50.00	38.07	76	50-150	33-167	
1,1-Dichloropropene	50.00	49.51	99	75-123	67-131	
c-1,3-Dichloropropene	50.00	45.46	91	77-131	68-140	
t-1,3-Dichloropropene	50.00	47.71	95	76-136	66-146	

RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

AECOM		Date Received:	03/31/17
401 West A Street, Suite 1200		Work Order:	17-03-2408
San Diego, CA 92101-2421		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: Pure Water			Page 8 of 10

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Ethylbenzene	50.00	55.79	112	80-120	73-127	
2-Hexanone	50.00	47.90	96	63-123	53-133	
Isopropylbenzene	50.00	55.26	111	80-128	72-136	
p-Isopropyltoluene	50.00	51.63	103	73-133	63-143	
Methylene Chloride	50.00	48.16	96	61-133	49-145	
4-Methyl-2-Pentanone	50.00	51.27	103	65-125	55-135	
Naphthalene	50.00	58.57	117	69-129	59-139	
n-Propylbenzene	50.00	56.05	112	80-128	72-136	
Styrene	50.00	51.12	102	80-126	72-134	
1,1,1,2-Tetrachloroethane	50.00	54.45	109	80-129	72-137	
1,1,2,2-Tetrachloroethane	50.00	49.44	99	74-122	66-130	
Tetrachloroethene	50.00	43.90	88	55-139	41-153	
Toluene	50.00	53.50	107	80-120	73-127	
1,2,3-Trichlorobenzene	50.00	54.69	109	72-132	62-142	
1,2,4-Trichlorobenzene	50.00	54.21	108	74-134	64-144	
1,1,1-Trichloroethane	50.00	47.97	96	76-124	68-132	
1,1,2-Trichloro-1,2,2-Trifluoroethane	50.00	54.35	109	54-150	38-166	
1,1,2-Trichloroethane	50.00	49.19	98	80-120	73-127	
Trichloroethene	50.00	51.24	102	79-121	72-128	
Trichlorofluoromethane	50.00	64.55	129	72-132	62-142	
1,2,3-Trichloropropane	50.00	48.69	97	75-123	67-131	
1,2,4-Trimethylbenzene	50.00	52.41	105	74-128	65-137	
1,3,5-Trimethylbenzene	50.00	55.79	112	77-131	68-140	
Vinyl Acetate	50.00	41.75	84	50-150	33-167	
Vinyl Chloride	50.00	45.09	90	63-129	52-140	
p/m-Xylene	100.0	114.4	114	80-122	73-129	
o-Xylene	50.00	54.69	109	80-128	72-136	
Methyl-t-Butyl Ether (MTBE)	50.00	49.14	98	69-123	60-132	
Tert-Butyl Alcohol (TBA)	250.0	282.4	113	80-124	73-131	
Diisopropyl Ether (DIPE)	50.00	51.36	103	79-121	72-128	
Ethyl-t-Butyl Ether (ETBE)	50.00	48.76	98	71-125	62-134	
Tert-Amyl-Methyl Ether (TAME)	50.00	48.26	97	70-124	61-133	
Ethanol	500.0	630.2	126	53-149	37-165	

Total number of LCS compounds: 71
Total number of ME compounds: 0
Total number of ME compounds allowed: 4
LCS ME CL validation result: Pass

RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

AECOM		Date Received:	03/31/17
401 West A Street, Suite 1200		Work Order:	17-03-2408
San Diego, CA 92101-2421		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: Pure Water			Page 9 of 10

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-001-22840	**LCS**	**Aqueous**	**GC/MS V V**	**04/04/17**	**04/04/17 15:49**	**170404L033**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Acetone	50.00	39.49	79	53-137	39-151	
Benzene	50.00	48.67	97	79-121	72-128	
Bromobenzene	50.00	51.74	103	80-120	73-127	
Bromochloromethane	50.00	48.55	97	80-122	73-129	
Bromodichloromethane	50.00	48.17	96	80-124	73-131	
Bromoform	50.00	54.54	109	73-127	64-136	
Bromomethane	50.00	49.96	100	50-150	33-167	
2-Butanone	50.00	45.84	92	60-126	49-137	
n-Butylbenzene	50.00	57.27	115	72-138	61-149	
sec-Butylbenzene	50.00	55.49	111	77-131	68-140	
tert-Butylbenzene	50.00	59.71	119	80-125	72-132	
Carbon Disulfide	50.00	40.41	81	50-150	33-167	
Carbon Tetrachloride	50.00	47.79	96	65-143	52-156	
Chlorobenzene	50.00	51.61	103	80-120	73-127	
Chloroethane	50.00	52.38	105	62-128	51-139	
Chloroform	50.00	44.65	89	80-120	73-127	
Chloromethane	50.00	48.90	98	43-133	28-148	
2-Chlorotoluene	50.00	53.70	107	80-121	73-128	
4-Chlorotoluene	50.00	54.27	109	80-120	73-127	
Dibromochloromethane	50.00	51.15	102	80-123	73-130	
1,2-Dibromo-3-Chloropropane	50.00	51.44	103	66-126	56-136	
1,2-Dibromoethane	50.00	50.48	101	80-120	73-127	
Dibromomethane	50.00	49.54	99	80-120	73-127	
1,2-Dichlorobenzene	50.00	53.47	107	80-120	73-127	
1,3-Dichlorobenzene	50.00	53.50	107	80-120	73-127	
1,4-Dichlorobenzene	50.00	51.10	102	80-120	73-127	
Dichlorodifluoromethane	50.00	70.73	141	50-150	33-167	
1,1-Dichloroethane	50.00	48.02	96	72-126	63-135	
1,2-Dichloroethane	50.00	46.77	94	76-120	69-127	
1,1-Dichloroethene	50.00	43.59	87	66-132	55-143	
c-1,2-Dichloroethene	50.00	50.08	100	78-120	71-127	
t-1,2-Dichloroethene	50.00	50.38	101	66-132	55-143	
1,2-Dichloropropane	50.00	50.17	100	80-120	73-127	
1,3-Dichloropropane	50.00	48.14	96	80-120	73-127	
2,2-Dichloropropane	50.00	46.98	94	50-150	33-167	
1,1-Dichloropropene	50.00	49.07	98	75-123	67-131	
c-1,3-Dichloropropene	50.00	48.81	98	77-131	68-140	
t-1,3-Dichloropropene	50.00	49.51	99	76-136	66-146	

RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

AECOM	Date Received:	03/31/17
401 West A Street, Suite 1200	Work Order:	17-03-2408
San Diego, CA 92101-2421	Preparation:	EPA 5030C
	Method:	EPA 8260B
Project: Pure Water		Page 10 of 10

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Ethylbenzene	50.00	54.83	110	80-120	73-127	
2-Hexanone	50.00	48.52	97	63-123	53-133	
Isopropylbenzene	50.00	54.76	110	80-128	72-136	
p-Isopropyltoluene	50.00	55.15	110	73-133	63-143	
Methylene Chloride	50.00	45.68	91	61-133	49-145	
4-Methyl-2-Pentanone	50.00	53.82	108	65-125	55-135	
Naphthalene	50.00	62.37	125	69-129	59-139	
n-Propylbenzene	50.00	54.38	109	80-128	72-136	
Styrene	50.00	49.69	99	80-126	72-134	
1,1,1,2-Tetrachloroethane	50.00	52.93	106	80-129	72-137	
1,1,2,2-Tetrachloroethane	50.00	50.13	100	74-122	66-130	
Tetrachloroethene	50.00	44.46	89	55-139	41-153	
Toluene	50.00	52.13	104	80-120	73-127	
1,2,3-Trichlorobenzene	50.00	58.44	117	72-132	62-142	
1,2,4-Trichlorobenzene	50.00	59.02	118	74-134	64-144	
1,1,1-Trichloroethane	50.00	46.88	94	76-124	68-132	
1,1,2-Trichloro-1,2,2-Trifluoroethane	50.00	44.77	90	54-150	38-166	
1,1,2-Trichloroethane	50.00	48.05	96	80-120	73-127	
Trichloroethene	50.00	51.04	102	79-121	72-128	
Trichlorofluoromethane	50.00	52.46	105	72-132	62-142	
1,2,3-Trichloropropane	50.00	48.42	97	75-123	67-131	
1,2,4-Trimethylbenzene	50.00	54.21	108	74-128	65-137	
1,3,5-Trimethylbenzene	50.00	54.45	109	77-131	68-140	
Vinyl Acetate	50.00	48.21	96	50-150	33-167	
Vinyl Chloride	50.00	34.94	70	63-129	52-140	
p/m-Xylene	100.0	112.1	112	80-122	73-129	
o-Xylene	50.00	53.60	107	80-128	72-136	
Methyl-t-Butyl Ether (MTBE)	50.00	49.63	99	69-123	60-132	
Tert-Butyl Alcohol (TBA)	250.0	276.6	111	80-124	73-131	
Diisopropyl Ether (DIPE)	50.00	50.74	101	79-121	72-128	
Ethyl-t-Butyl Ether (ETBE)	50.00	50.53	101	71-125	62-134	
Tert-Amyl-Methyl Ether (TAME)	50.00	50.87	102	70-124	61-133	
Ethanol	500.0	273.0	55	53-149	37-165	

Total number of LCS compounds: 71
Total number of ME compounds: 0
Total number of ME compounds allowed: 4
LCS ME CL validation result: Pass

RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 17-03-2408 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6010B	EPA 3010A Total	935	ICP 7300	1
EPA 7470A	EPA 7470A Total	868	Mercury 07	1
EPA 8015B (M)	EPA 3510C	972	GC 47	1
EPA 8081A	EPA 3510C	669	GC 44	1
EPA 8082	EPA 3510C	1028	GC 66	1
EPA 8260B	EPA 5030C	1073	GC/MS V V	2
EPA 8270C	EPA 3510C	923	GC/MS TT	1

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Glossary of Terms and Qualifiers

Work Order: 17-03-2408 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

CHAIN-OF-CUSTODY RECORD

WO NO. / LAB USE ONLY: **17-03-2408**

Date 3/31/17

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LABORATORY CLIENT: AECOM

ADDRESS: 4225 Executive Sq., Suite 1400

CITY: La Jolla STATE: CA ZIP: 92037

TEL: 858-210-9748 E-MAIL: adam.avakian@aecom.com

CLIENT PROJECT NAME / NO.: Pure Water Job → 60530732 Task → 1.01.05.20.00

PROJECT CONTACT: Steve Fitzwilliam

LAB CONTACT OR QUOTE NO:

GLOBAL ID:

LOG CODE:

SAMPLER(S): (PRINT) Adam Avakian

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):

☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☒ STANDARD

EDD

☐ COELT EDF ☐ OTHER

REQUESTED ANALYSES

Please check box or fill in blank as needed. Model Gallardo

SPECIAL INSTRUCTIONS:

Please email results to:

adam.avakian@aecom.com
david.schug@aecom.com
Steven.Fitzwilliam@aecom.com
lowell.woodbury@aecom.com

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	☐ TPH(g) ☐ GRO	☐ TPH(d) ☐ DRO	TPH ☐ C6-C36 ☐ C6-C44	TPH Extended Range 8015	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260) B	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081) OCP Pesticides	PCBs (8082) 8082A	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6
1	PS-2	3/31/17	0925	Water	~~10~~ 10	4	6					X		X			X	X	X		X	
2	Trip Blank				2																	

	Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date	Time
1		EGL	3/31/17	1415
2		DANNY L EGL	3/31/17	19:10
3				

2016-04-01-Revision

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WORK ORDER NUMBER: 17-03- 2408

SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: AECOM

DATE: 03 / 31 / 2017

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC3B (CF: 0.0°C); Temperature (w/o CF): 3.3 °C (w/ CF): 3.3 °C; ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☐ Air ☐ Filter Checked by: 671

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: 671

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: 1110

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑ 3/31/17 MC	☐	☐
☑ Sampling date (-2) ☐ Sampling time ☑ Matrix (-2) ☐ Number of containers			
☑ No analysis requested (-2) ☐ Not relinquished ☐ No relinquished date ☐ No relinquished time			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and in good condition	☑	☐	☐
Proper containers for analyses requested	☑	☐	☐
Sufficient volume/mass for analyses requested	☑	☐	☐
Samples received within holding time	☑	☐	☐
Aqueous samples for certain analyses received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation chemical(s) noted on COC and/or sample container	☑	☐	☐
Unpreserved aqueous sample(s) received for certain analyses			
☐ Volatile Organics ☐ Total Metals ☐ Dissolved Metals			
Container(s) for certain analysis free of headspace	☑	☐	☐
☑ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)			
☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE: (Trip Blank Lot Number: 170323B)

Aqueous: ☐ VOA ☑ VOA**h** ☐ VOA**na$_2$** ☐ 100PJ ☐ 100PJ**na$_2$** ☐ 125AGB ☐ 125AGB**h** ☐ 125AGB**p** ☐ 125PB

☐ 125PB**znna** ☐ 250AGB ☐ 250CGB ☐ 250CGB**s** ☐ 250PB ☑ 250PB**n** ☐ 500AGB ☑ 500AGJ ☐ 500AGJ**s**

☐ 500PB ☑ 1AGB ☐ 1AGB**na$_2$** ☐ 1AGB**s** ☐ 1PB ☐ 1PB**na** ☐ _____ ☐ _____ ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (_____) ☐ EnCores® (_____) ☐ TerraCores® (_____) ☐ _____

Air: ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ **Other Matrix** (_____): ☐ _____ ☐ _____

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO_3, **na** = NaOH, **na$_2$** = $Na_2S_2O_3$, **p** = H_3PO_4, Labeled/Checked by: 1110

s = H_2SO_4, **u** = ultra-pure, **x** = Na_2SO_3+$NaHSO_4.H_2O$, **znna** = Zn $(CH_3CO_2)_2$ + NaOH Reviewed by: 681

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APPENDIX D

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SEWER PLAN & PROFILE

WEST INFLUENT SEWER

FRIARS ROAD

STA 10+00.00
60" PLRCP
INV = 4.9± OUT
NEW DIVERSION STRUCTURE NO 1
SEE DWG C-11

STA 10+36.65
90° ELL
INV = -5.2± IN
INV = -6.2± OUT
NEW DIVERSION STRUCTURE NO 2
SEE DWG C-11

STA 11+00.00
RECEIVING PIT

PACIFIC HWY
EX BRIDGE
CLEARANCE = 14.0'
(FIELD VERIFY)

STA 13+49.98
MH/JACKING PIT

R/W SANDAG MCCT R/W
BRIDGE CLEARANCE
= 14.0'
(FIELD VERIFY)

STA 16+99.37
RECEIVING PIT

STA 20+13.17
JUNCTION STRUCTURE NO 1
72" IE = 13.0± IN
72" IE = 13.0± OUT
84" IE = 13.5± IN
78" IE = -6.5± OUT
SEE DWG C-10

EX LEVEE
EX GROUND

STA 21+81.21
MH/RECEIVING PIT

STA 22+10.08
66" PLRCP
SCREENING STRUCTURE
SEE DWG M-06

DS-6
DS-3

EX PAVEMENT

Fill

Alluvium

96"ø STEEL CASING

72" PLRCP @ -0.79%

72" PLRCP @ -0.79%

60" PLRCP @ -1.32%

INLET = 8.59

OUTLET = 8.69

EX 18" SD
IE = -15.4±

EX 18" SD
IE = UNKNOWN

EX 14" SEWER
IE = 1.4±

EX ABANDONED 66" INTERCEPTOR SEWER
IE = XXX REMOVE SECTIONS AS NECESSARY

104"ø STEEL CASING

84" PLRCP @ -0.29%

84" PLRCP @ -0.49%

OUTLET = 14.93

INLET = 14.83

SCALE
1"=40' HORIZ.
1"=4' VERT.

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00

APN 758-050-06 HUMA

ANNA AVENUE

ANNA AVE

EX 8" CI WTR

ROS 21436 ROS 21846

EX 20" GAS

EX OVERHEAD ELEC

EX 66" INTERCEPTOR SEWER

EX ELEC

PROTECT IN PLACE OR REPLACE IN-KIND

MH/JACKING PIT (60'X30')
STA 13+49.98

SCARIFIED BRUSH

JUNCTION STRUCTURE 66047 / HUMANE SOC
1/JACKING PIT (60'X30')
STA 19+13.17
SEE DWG C-10

MH/RECEIVING PIT (20')
STA 21+81.21

DIVERSION STRUCTURE NO 2
STA 10+36.65
SEE DWG C-11

RECEIVING PIT (20')
STA 11+00.00

EX 60" PLRCP SEWER

EX 72" PLRCP SEWER

EX BRIDGE SUPPORT

EX 14" SEWER

EX 18" SD

PROPOSED MCTC BRIDGE COLUMN SUPPORTS

EX BRIDGE SUPPORT

EX RAILROAD BRIDGE SUPPORT

RECEIVING PIT (20')
STA 16+99.37

72" PLRCP

EX 54" SD

ROW SHOWN ON ASSESSORS IS 55' EACH SIDE

84" PLRCP

EX COLUMN

78" EAST DIVERSION PLRCP SEWER
SEE DWG C-12

66" PLRCP SEWER
SEE DWG C-14

MTS TROLLEY BRIDGE

EX COLUMN

DIVERSION STRUCTURE NO 1
STA 10+00.00
SEE DWG C-11

HV-1001
EX
6.09

STA 104+89.08

Artificial fill (Qaf)
Alluvium (Qal)
Water Level Depth
Boring
Geological Contact
Groundwater Level

N W E S

0 40 80 120
SCALE 1"=40'

C-09

MORENA PUMP STATION AND CONVEYANCE SYSTEM
WEST DIVERSION INFLUENT SEWER
PLAN & PROFILE

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET OF 50 SHEETS

WATER WBS S-16027

APPROVED WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY LAILA NASRAWI PROJECT MANAGER

CHECKED BY DARIN SANCHEZ PROJECT ENGINEER

CCS27 COORDINATE

CCS83 COORDINATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

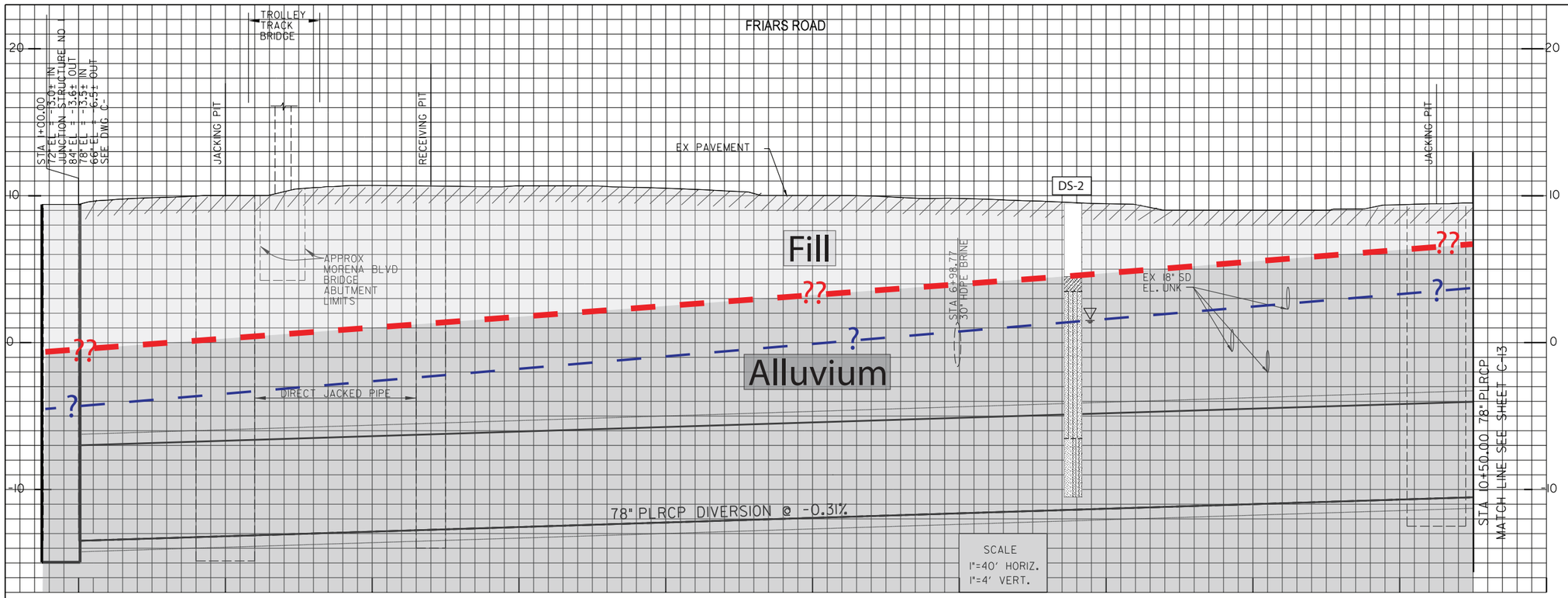
REGISTERED PROFESSIONAL ENGINEER — RAY H. FAKKOUSY — No. 49036 — Exp. 09/30/2019 — CIVIL — STATE OF CALIFORNIA

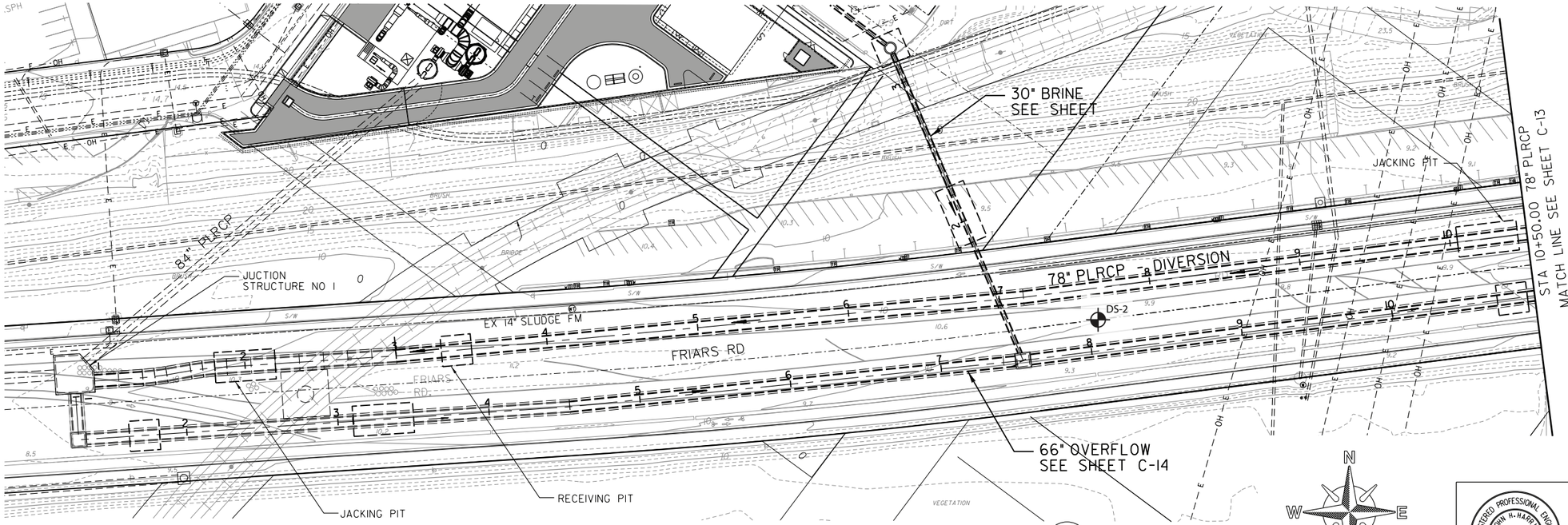
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-11-D

S:\Projects\San Diego-City of\Morena Pump Sta (AECOM-02-16)\900 CAD\Sheets\Civil\Microstation\C-09.dgn
22-AUG-2017 15:22 JDitch $PLTDRVS$ $PENTBLS$

NOT FOR CONSTRUCTION – 60% SUBMITTAL





NOTES:
1. FOR PIPE JOINT DETAIL SEE
2. FOR TYPICAL TRENCH DETAIL SEE

REFERENCE:
WATER:
SEWER:
STORM DRAIN:
GAS:
ELECTRIC:
CABLE TV:
TELEPHONE:
IMPROVEMENTS:
100' SCALE/FIELD BOOK:
THOMAS BROS.:
HGL:

RETIREMENTS:

C–12

MORENA PUMP STATION AND CONVEYANCE SYSTEM

EAST DIVERSION INFLUENT SEWERS 78" DIVERSION SEWER PLAN & PROFILE

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	MBI			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067– –D

REGISTERED PROFESSIONAL ENGINEER JOHN H. HARRIS No. 38217 Exp. 3/31/19 CIVIL STATE OF CALIFORNIA

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Blvd., San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

H:\PDATA\157879\CADD\Water\Dlv\MBI FRIARS RD DESIGN.dgn
22–AUG–2017 12:03 amanda.saour $PLTDRVS$ $PENTBLS$

60% SUBMITTAL

R/W
MORENA BLVD BRIDGE
R/W
FRIARS ROAD
PLACE IN JOINT TRENCH WITH 66" OVERFLOW PIPE
DS-1
EX PAVEMENT
RECEIVING PIT
STA 18+84.56
CONNECT TO DIVERSION STRUCTURE 3
66" EL = -7.36± OUT
78" EL = - IN
STA 18+63.14
10'X10' STRUCTURE
66" EL = -8± OUT
Fill
EX 16" WTR
EL UNKNOWN
Alluvium
APPROX MORENA BLVD BRIDGE ABUTMENT LIMITS
DIRECT JACKED PIPE
78" PLRCP @ 3.24%
EX 78" PLRCP NORTH MISSION INTERCEPTOR SEWER PIPE
78" PLRCP DIVERSION @ -0.31%
STA 10+50.00 78" PLRCP MATCH LINE SEE SHEET C-12
STA 18+63.14 IE -8.00 (OUT)
STA 18+71.4 IE -7.80 (IN)
STA 18+84.56 IE -7.36 (OUT)
MEET EX EL (IN)
20
10
0
-10
SCALE 1"=40' HORIZ. 1"=4' VERT.

Artificial fill (Qaf)
Alluvium (Qal)
Water Level Depth
Boring
Geological Contact
Groundwater Level

11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 11+00

REFERENCE:
WATER:
SEWER:
STORM DRAIN:
GAS:
ELECTRIC:
CABLE TV:
TELEPHONE:
IMPROVEMENTS:
100' SCALE/FIELD BOOK:
THOMAS BROS.:
HGL:

RETIREMENTS:

MORENA BLVD
ABANDON EX 66" PLRCP PIPE
MTDB BY DEED 99-0457570
NAPA ST
STA 10+50.00 78" PLRCP MATCH LINE SEE SHEET C-12
RECEIVING PIT
SEPARTE TRENCH
JOINT TRENCH
STA 18+63.14 10'x10' ANGLE STRUCTURE SEE DETAIL SHEETS C-18 THRU C-20
DIVERSION STRUCTURE 3 SEE ENLARGED PLAN SHEET C-17
EX 78" PLRCP NORTH MISSION INTERCEPTOR SEWER
EX 14" SLUDGE FM
78" PLRCP DIVERSION
DS-1
EX 16" AC WTR
EX 8" AC WTR
FRIARS RD
EX JUNCTION STRUCTURE
REROUTE 16" PVC WATER
EX 108" PLRCP NORTH METRO INTERCEPTOR SEWER
66" OVERFLOW SEE SHEET C-14
VEGETATION

NOTES:
1. FOR PIPE JOINT DETAIL SEE
2. FOR TYPICAL TRENCH DETAIL SEE

N W E S
0 40 80 120
SCALE 1"=40'

C-13

MORENA PUMP STATION AND CONVEYANCE SYSTEM
EAST DIVERSION INFLUENT SEWERS
78" DIVERSION SEWER
PLAN & PROFILE

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	MBI			

SUBMITTED BY LAILA NASRAWI PROJECT MANAGER
CHECKED BY DARIN SANCHEZ PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER JOHN H. HARRIS No. 38217 Exp. 3/31/19 CIVIL STATE OF CALIFORNIA

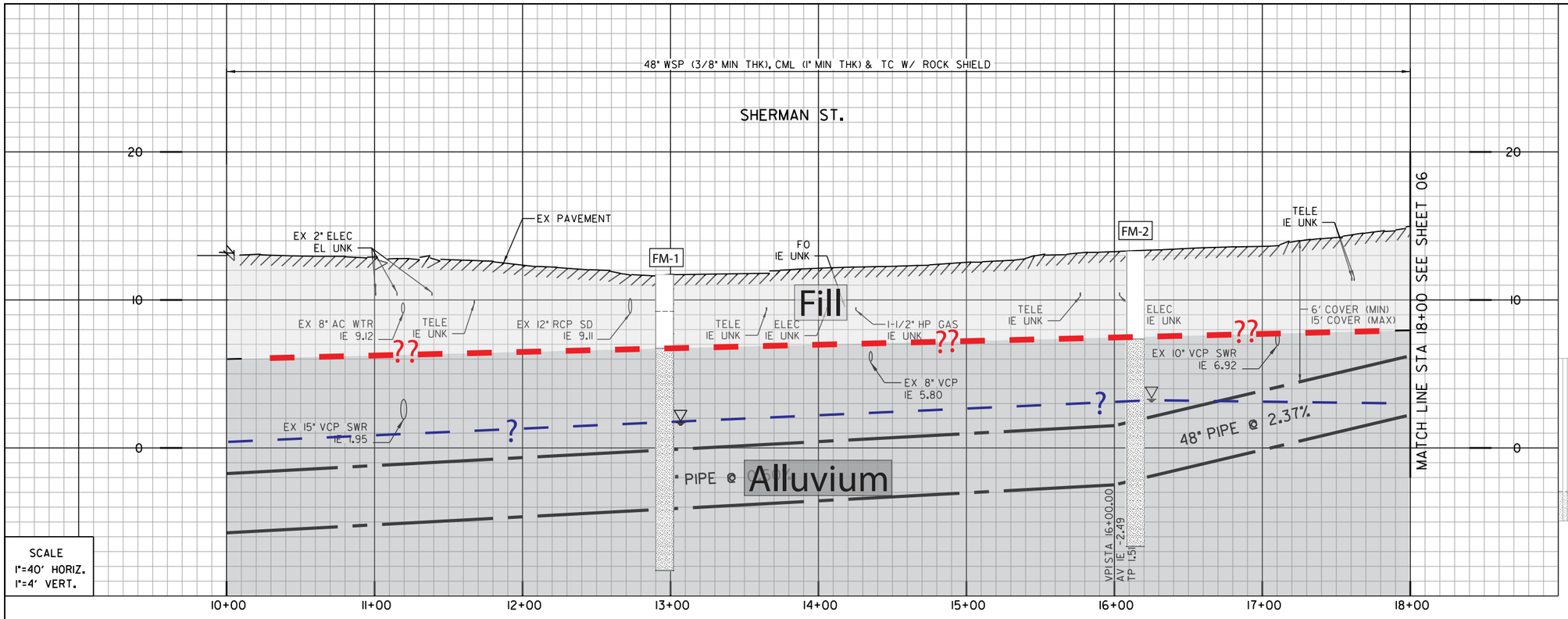
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067– –D

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Blvd., San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

H:\PDATA\157879\CADD\Water\Div\MBI FRIARS RD DESIGN.dgn
22-AUG-2017 11:09 amanda.saour $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA 10+00.00
PUMP STATION CONNECTION
SEE PACKAGE A FOR
CONTINUATION

2 (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA 10+07.00
1- 45° HPI BEND

3 (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA 10+18.41
1- 45° HPI BEND
BEGIN JOINT TRENCH
SEE TRENCH SECTION

4 (103)
BY CONTRACTOR
FURNISH AND INSTALL
STA 11+05.12
1- 45.15° HPI BEND

5 (104)
BY CONTRACTOR
FURNISH AND INSTALL
STA 11+40.88
1- 44.85° HPI BEND
END JOINT TRENCH

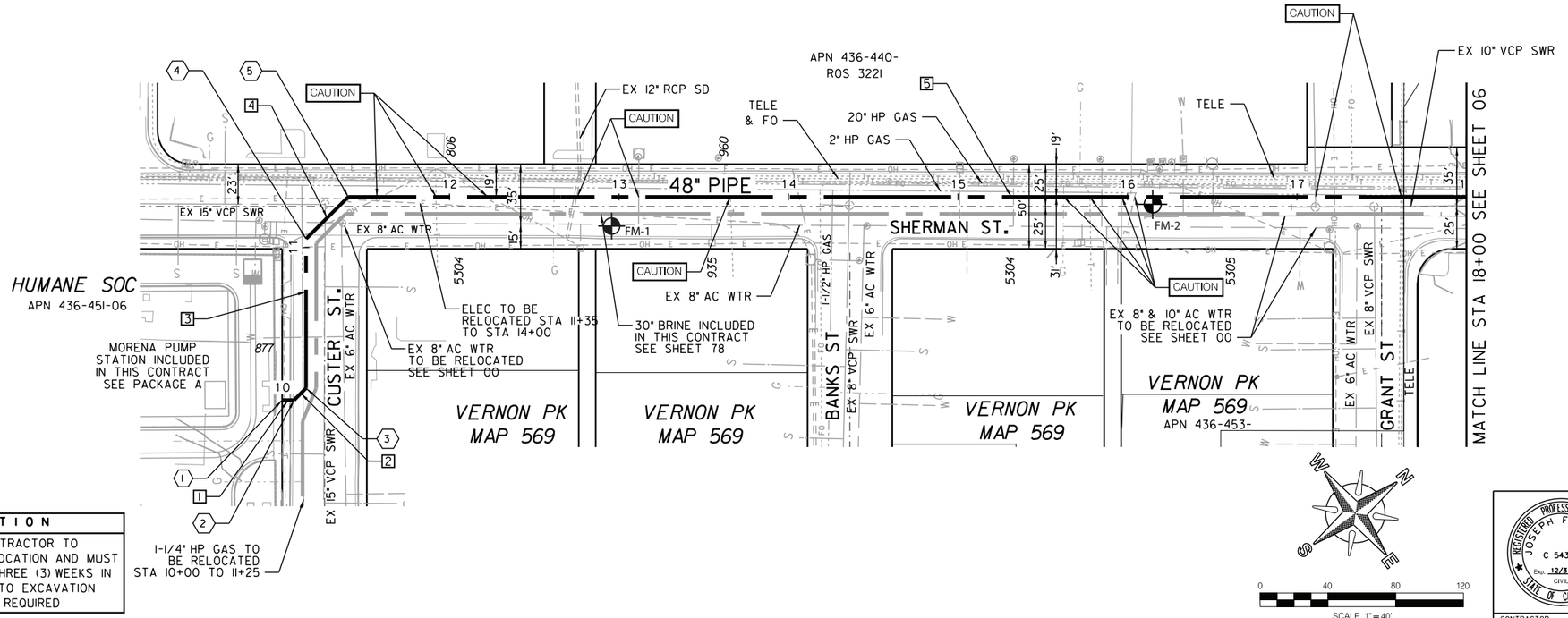
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ?? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	10616-L, 10620-L
SEWER:	9698-L, 10619-D
STORM DRAIN:	10617-6
GAS:	15787-118930, 15787-118935
ELECTRIC:,	15787-118930, 15787-118935
CABLE TV:	105-210
TELEPHONE:	BLR1969
IMPROVEMENTS:	10620-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 F3
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1858915.30	6269612.78	MPS PL
(101)	1858920.92	6269616.93	HPI BEND
(102)	1858932.21	6269615.24	HPI BEND
(103)	1858983.76	6269545.53	HPI BEND
(104)	1859019.14	6269540.32	HPI BEND
(105)			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N36° 29'00"E		7.00'	48" WSP (CML&TC)
2	N08° 31'00"W		10.00'	48" WSP (CML&TC)
3	N53° 31'00"W		88.13'	48" WSP (CML&TC)
4	N08° 22'03"W		35.17'	48" WSP (CML&TC)
5	N36° 29'00"E		659.71'	48" WSP (CML&TC)



CAUTION

20" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

I-1/4" HP GAS TO BE RELOCATED STA 10+00 TO 11+25

C-01

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 10+00 TO STA 18+00 SHERMAN ST.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 05 OF SHEETS

SEWER WBS B-15141

APPROVED WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY LAILA NASRAWI, PROJECT MANAGER
CHECKED BY DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-05-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

SHERMAN ST.

60% SUBMITTAL

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM01.dgn
9/1/2017 rothr1 $PLTDRVS$ $PENTBLS$

48" WSP (3/8" MIN THK), CML (1" MIN THK) & TC W/ ROCK SHIELD

SHERMAN ST | MORENA BOULEVARD | W MORENA BLVD

MATCH LINE STA 18+00 SEE SHEET 05

MATCH LINE STA 26+00 SEE SHEET 07

EX PAVEMENT

6" HP GAS IE UNK

ELEC IE UNK

EX FO IE UNK

16" PROP WTR IE 16.25

FM-3

FM-4

TELE IE UNK

ELEC UNK

6" HP GAS IE UNK

EX 20" HP GAS IE UNK

36" PROP WTR IE 12.17

12" HP GAS IE UNK

Fill

TOP OF 30" BRINE SEE SHEET 79

EX 24" RCP SD IE 16.63

6' COVER (MIN) 15' COVER (MAX)

48" PIPE @ 1.32%

48" PIPE @ 2.37%

48" PIPE @ 0.32%

Alluvium

Bay Point

VPI STA 19+00 IE 4.58 TP 8.58

TD = 20' bgs

VPI STA 22+00 IE 8.56 TP 12.56

18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00

30 20 10

SCALE 1"=40' HORIZ. 1"=4' VERT.

① 106
BY CONTRACTOR FURNISH AND INSTALL
STA 20+45.36
1- 31.87° HPI BEND
BEGIN JOINT TRENCH
SEE TRENCH SECTION

② 107
BY CONTRACTOR FURNISH AND INSTALL
STA 20+81.30
1- 45° HPI BEND

③ 108
BY CONTRACTOR FURNISH AND INSTALL
STA 20+90.44
1- 45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7104-L,10616-L-D
SEWER:	10437-D
STORM DRAIN:	7203-D
GAS:	15787-119840,15787-118945
ELECTRIC:	15787-119840,15787-118945
CABLE TV:	218-1710A
TELEPHONE:	UNI306BA, UNI308DC, BL01969
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 F3
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
106	1859745.71	6270077.62	HPI BEND
107	1859758.96	6270111.00	HPI BEND
108	1859767.38	6270114.63	HPI BEND
109	1860077.09	6269991.72	BC
110			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N36° 29'00"E		245.36'	48" WSP (CML&TC)
2	N68° 21'14"E		35.91'	48" WSP (CML&TC)
3	N23° 21'14"E		9.17'	48" WSP (CML&TC)
4	N21° 38'46"W		333.21'	48" WSP (CML&TC)
5	16° 27'20"	614'	175.81'	48" WSP (CML&TC)

SEE SHEET 05 MATCH LINE STA 18+00

EX 8" & 10" AC WTR RELOCATION SEE SHEET 00

PUEBLO LANDS MM 36 APN 436-460-

CAUTION

EX 10" AC WTR

EX 8" AC WTR

ELECTRICAL TO BE RELOCATED

R/W

SHERMAN ST

FM-3

2" HP GAS TO BE RELOCATED

20" HP GAS

ELEC, TELE & CATV

LINDE COMMENCIAL SUB MAP 6260 APN 436-290-LOT 1

36" WTR NOT IN THIS CONTRACT SEE PACKAGE C

16" WTR NOT IN THIS CONTRACT SEE PACKAGE C

LINDE SUB MAP 4979

109 BC

TELE

MATCH LINE STA 26+00 SEE SHEET 07

6" HP GAS

12" HP GAS

MORENA BLVD

EX 16" CI WTR

48" PIPE

FM-4

EX 8" VCP SWR

PUEBLO LANDS MM0036 LOT 300 855

NAPA ST

20" HP GAS

APN 436-290-LOT 2

ELEC, TELE & CATV

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 79

EX 24" RCP SD

PUEBLO LANDS MM 36

GUE SUB MAP 4722

SCALE 1"=40'

CAUTION

20" & 12" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-02

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 18+00 SHERMAN ST. TO STA 26+00 W. MORENA BLVD.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 06 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

SEWER WBS B-15141

SUBMITTED BY: LAILA NASRAWI PROJECT MANAGER

CHECKED BY: DARIN SANCHEZ PROJECT ENGINEER

000-0000 CCS27 COORDINATE

0000-0000 CCS83 COORDINATE

40067-06-D

SHERMAN STREET / WEST MORENA BOULEVARD

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM02.dgn

9/1/2017 rothr1 $PLTDRVS$ $PENTBLS$

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK) & TC W/ ROCK SHIELD

W. MORENA BLVD.

EX PAVEMENT

Fill

Bay Point

6" HP GAS
IE UNK

TELE
IE UNK

EX 16" CI WTR
IE 21.12

PROP 16" WTR
IE 22.60

EX 10" AC WTR
IE 22.23

EX 8" VCP SWR
IE 20.22

EX 8" VCP SWR
IE 22.27

TOP OF 30" BRINE
SEE SHEET 80

FO
IE UNK

ELEC
IE UNK

6' COVER (MIN)
15' COVER (MAX)

FO
IE UNK

ELEC
IE UNK

2" HP GAS
IE UNK

TELE
IE UNK

48" PIPE @ 1.06%

48" PIPE @ 1.32%

VP STA 33+00
AV IE 19.09
TP 23.09

VP STA 26+00
AV IE 9.83
TP 13.83

MATCH LINE STA 26+00 SEE SHEET 06

MATCH LINE STA 34+00 SEE SHEET 08

30
20
10

26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00

WEEKS ADD

SCALE
1"=40' HORIZ.
1"=4' VERT.

(1) (114)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 33+00.00
1- 6" COMBINATION REQUIRED
W/ AIR VALVE ODOR CONTROL BOX

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7321-L, 7322-L, 8322-L
SEWER:	1346-D
STORM DRAIN:	7203-D
GAS:	15780-118945, 15780-118945
ELECTRIC:	15780-118945
CABLE TV:	218-1707B, 218-1710A
TELEPHONE:	BL01969
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E3, 1268 F3
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(111)	1860410.68	6269672.63	EC
(112)	1860443.62	6269599.29	BC
(113)	1860553.57	6269412.03	EC
(114)			ARV

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	27° 42'24"	614'	296.91'	48" WSP (CML&TC)
2	N65° 48'33"W		80.39'	48" WSP (CML&TC)
3	12° 27'14"	1001'	217.58'	48" WSP (CML&TC)
4	N53° 21'19"W		205.12'	48" WSP (CML&TC)

CAUTION

12" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

WEEKS ADD
MAP 0123
LOTS 31-32

FO TO BE RELOCATED
STA 30+87.5 TO 49+00

36" WTR NOT IN
THIS CONTRACT
SEE PACKAGE C

EX 27" RCP SD

EX 8" VCP SWR

LINDE SUB
MAP 4979

EX 10" AC WTR

RAISED MEDIAN TO
BE REPLACED PER
SDSD SDG-112

MAP 4979

W. MORENA BLVD.

12" HP GAS

48" PIPE

NAPLES PL

EX 6" VCP SWR

2" HP GAS

ROS 13336

TELE, FO
& ELEC

BUENOS AVE.

EX 6" AC WTR

MATCH LINE STA 26+00 SEE SHEET 06

MATCH LINE STA 34+00 SEE SHEET 08

MORENA BLVD.

EX 6" AC WTR

1-1/2" HP GAS

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 80

ROS 21205

WEEKS ADD
MAP 123

GUE SUB
MAP 4722
LOT 285

16" WTR NOT IN
THIS CONTRACT
SEE PACKAGE C

6" HP GAS

CAUTION

0 40 80 120
SCALE 1" = 40'

C-03

MORENA PUMP STATION AND
CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 26+00 TO STA. 34+00 W. MORENA BLVD.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 07 OF SHEETS

SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA
FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

40067-07-D

60% SUBMITTAL

W. MORENA BLVD.

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM03.dgn

9/6/2017 rothr1 $PLTDRVS$ $PENTBLS$

48" WSP (3/8" MIN THK), CML (1" MIN THK) & TC W/ ROCK SHIELD

WEST MORENA BOULEVARD

MATCH LINE STA 34+00 SEE SHEET 07

MATCH LINE STA 42+00 SEE SHEET 09

TELE
IE UNK

TOP OF 30" BRINE
SEE SHEET 8

48" PIPE @ 1.05%

VPI STA 36+00
IE 15.92
TF 19.92

D-4

EX PAVEMENT

Fill

EX 8" AC WTR
IE 18.10

FM-6

ELEC
IE UNK

48" PIPE @ 2.07%

Bay Point

30
20
10

34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-4 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

RAISED MEDIAN TO BE REPLACED PER SDSD SDG-112

36" WTR NOT IN THIS CONTRACT SEE PACKAGE C

2" HP GAS

MAP 7418

TELE, FO & ELEC

CAUTION

RAISED MEDIAN TO BE REPLACED PER SDSD SDG-112

EX 10" AC WTR

W MORENA BLVD

D-4

12" HP GAS

48" PIPE

FM-6

EX 8" VCP SWR

EX 8" AC WTR

1-1/2" HP GAS

WEEKS ADD
MAP 123
(2)

EX 8" AC WTR

DORCAS ST

EX 8" VCP SWR

CATV

MAP 1505

EX 8" PVC SWR

FO TO BE RELOCATED
STA 30+87.5 TO 49+00

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 8I

SCALE 1"=40'

CAUTION

12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

REFERENCE:

WATER:	7321-L,15368-L
SEWER:	1342-D
STORM DRAIN:	
GAS:	15780-118950,15772-118955
ELECTRIC:	15780-118950
CABLE TV:	
TELEPHONE:	BL01969
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E3
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
115			
116			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N53° 21'19"W		800.00'	48" WSP (CML&TC)

C-04

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 34+00 TO STA 42+00 WEST MORENA BOULEVARD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 08 OF SHEETS

SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-08-D

WEST MORENA BOULEVARD

60% SUBMITTAL

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM04.dgn

9/2017 rothr1 $PLTDRVS$ $PENTBLS$

48" WSP (3/8" MIN THK), CML (1" MIN THK) & TC W/ ROCK SHIELD

WEST MORENA BOULEVARD

MATCH LINE STA 42+00 SEE SHEET 08

MATCH LINE STA 50+00 SEE SHEET 10

StTR-15-2 projected ~100' NE

StTR-14-4 projected ~80' NE

TPSS-1 projected ~90' NE

TC-01

EX PAVEMENT

EX 24" RCP SD IE 11.18

EX 10" AC WTR IE 10.87

EX 10" PVC SWR IE 4.07

EX 18" RCP SD IE UNK

EX 24" RCP SD IE 12.26

FO IE UNK

TELE IE UNK

ELEC IE UNK

6' COVER (MIN) 15' COVER (MAX)

EX 8" VCP SWR IE UNK

EX 27" RCP SD IE UNK

TOP OF 30" BRINE SEE SHEET 82

48" PIPE @ 1.16%

48" PIPE @ 0.14%

Fill

Alluvium

Bay Point

VPI STA 45+00.00

SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (118) BY CONTRACTOR FURNISH AND INSTALL
STA 48+95.66
I - 44.21° HPI BEND

2 (119) BY CONTRACTOR FURNISH AND INSTALL
STA 49+10.45
I - 44.74° HPI BEND

3 (120) BY CONTRACTOR FURNISH AND INSTALL
STA 49+55.25
I - 45° HPI BEND

4 (121) BY CONTRACTOR FURNISH AND INSTALL
STA 49+72.36
I - 33.40° HPI BEND

5 (121) BY CONTRACTOR FURNISH AND INSTALL
STA 50+00
I - AIR RELEASE VALVE

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	15368-D, 15934-D
SEWER:	30417-2-D,28217-D
STORM DRAIN:	3474-D
GAS:	15772-118955,15772-118950
ELECTRIC:	15772-118955
CABLE TV:	
TELEPHONE:	BL01968, 104-211
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E2, 1268 E3
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
117	1861161.31	6268595.04	BC
118	1861653.65	6268127.15	HPI BEND
119	1861668.00	6268129.80	HPI BEND
120	1861693.68	6268166.76	HPI BEND
121	1861710.52	6268169.79	HPI BEND
122			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N53° 21'19"W		13.13'	48" WSP (CML&TC)
2	19° 36'07"	1995'	682.52'	48" WSP (CML&TC)
3	N10° 27'54"E		14.60'	48" WSP (CML&TC)
4	N55° 12'17"E		45.00'	48" WSP (CML&TC)
5	N10° 12'17"E		17.11'	48" WSP (CML&TC)
6	N23° 11'32"W		27.64'	48" WSP (CML&TC)

MAP 7814

MAP 1505

ROS 10605

W MORENA BLVD

VEGA ST

TECOLOTE RD

12" HP GAS

EX 10" AC WTR

EX 10" PVC SWR

EX 24" RCP SD

EX 8" PVC SWR

EX 18" RCP SD

EX 72" PLRCP SWR

EX 8" PVC SWR (ABAND)

36" WTR NOT IN THIS CONTRACT SEE PACKAGE C

FO TO BE RELOCATED STA 30+87.50 TO 49+00

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 82

EX 8" VCP SWR

EX 27" RCP SWR

CAUTION

CAUTION

12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

SCALE 1" = 40'

C-05

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 42+00 TO STA 50+00 WEST MORENA BOULEVARD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 09 OF SHEETS

SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-09-D

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

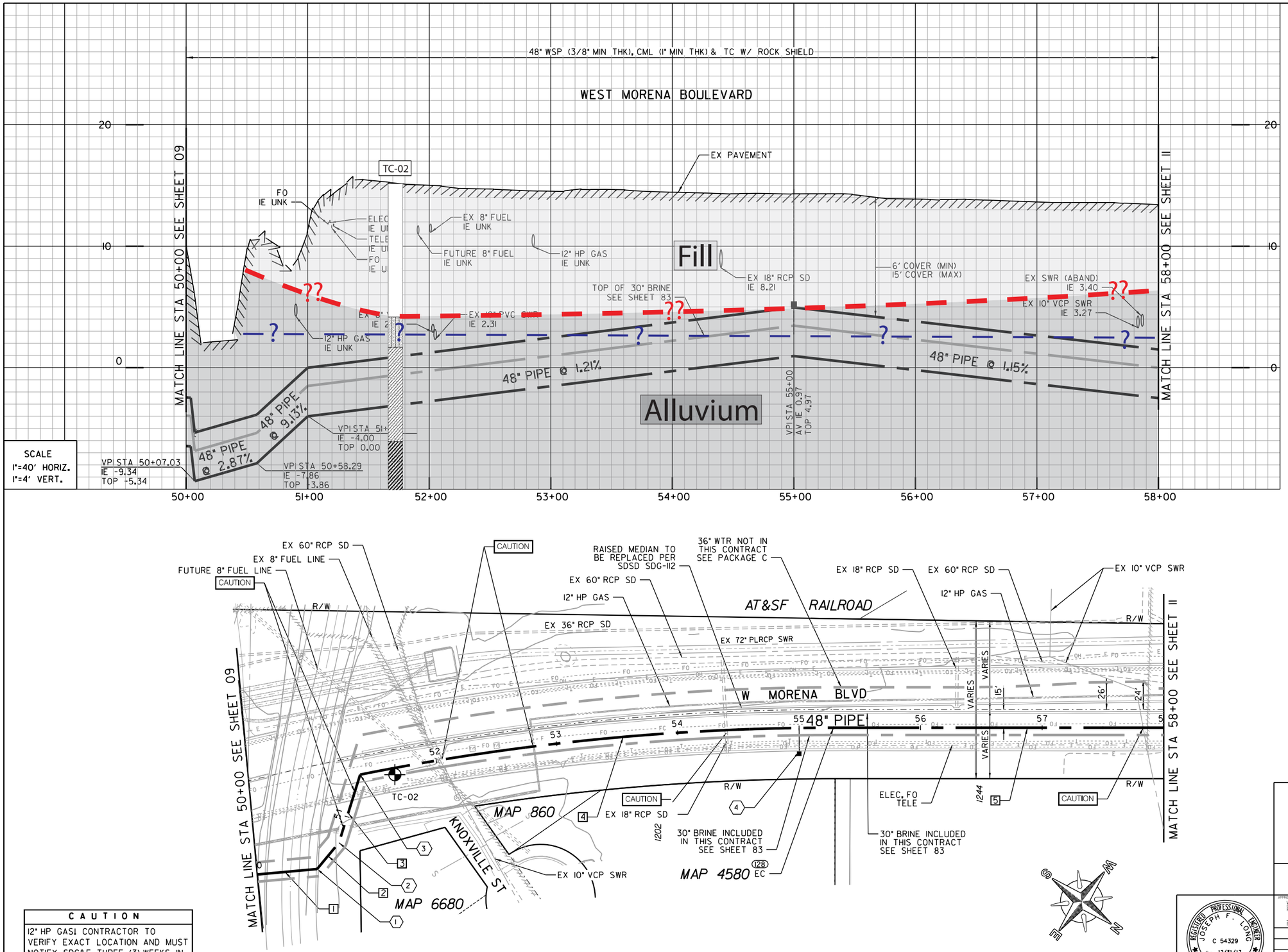
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

WEST MORENA BOULEVARD

60% SUBMITTAL

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM05.dgn

9/1/2017 rothr1 $PLTDRVSS$ $PENTBLSS$



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (124)
BY CONTRACTOR
FURNISH AND INSTALL
STA 50+49.47
1 - 45° HPI BEND

2 (125)
BY CONTRACTOR
FURNISH AND INSTALL
STA 50+77.57
1 - 22.50° HPI BEND

3 (126)
BY CONTRACTOR
FURNISH AND INSTALL
STA 51+36.30
1 - 61.52° HPI BEND

4 (XXX)
BY CONTRACTOR
FURNISH AND INSTALL
STA 55+00
1 - AIR RELEASE VALVE

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	
SEWER:	25119-D, 3502-D, 30777-D
STORM DRAIN:	9510-D, 3475-D
GAS:	15765-118960,15765-118965, 15772-118960
ELECTRIC:	15765-118960,15765-118965, 15772-118960
CABLE TV:	104-211,222-1704D
TELEPHONE:	
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E2
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(124)	1861781.39	6268139.42	HPI BEND
(125)	1861791.83	6268113.33	HPI BEND
(126)	1861791.12	6268054.60	HPI BEND
(127)	1862149.66	6267897.84	EC
(128)			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N23° 11'32"W		49.47'	48" WSP (CML&TC)
2	N68° 11'32"W		28.10'	48" WSP (CML&TC)
3	N89° 18'28"E		58.73'	48" WSP (CML&TC)
4	11° 18'48"	1985'	391.95'	48" WSP (CML&TC)
5	N17° 57'32"W		271.75'	48" WSP (CML&TC)

CAUTION

12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-06

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 50+00 TO STA 58+00 WEST MORENA BOULEVARD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 10 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

SEWER WBS B-15141
DESIGNED BY LAILA NASRAWI PROJECT MANAGER
CHECKED BY DARIN SANCHEZ PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-10-D

WEST MORENA BOULEVARD

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM06.dgn
9/2017 rothr1 $PLTDRVS$ $PENTBLS$

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1"THK MIN) & TC W/ ROCK SHIELD

WEST MORENA BOULEVARD

MORENA BLVD

MATCH LINE STA 58+00 SEE SHEET 10

MATCH LINE STA 66+00 SEE SHEET 12

FM-7

EX PAVEMENT

Fill

Alluvium

EX 36" RCP SD
IE 7.62

6' COVER
15' COVER

EX SWR
(ABAND)
IE 5.73

EX SWR
IE 4.49

EX 8" VCP SWR
IE 4.85

TOP OF DROP 30" BRINE
SEE BRINE SHEET C-70

TELE
IE UNK

EX 24" RCP SD
IE 6.20

EX 24" CI SWR
IE 4.00

EX 18" SD RCP
IE 6.44

FO
IE UNK

TELE
IE UNK

EX 12" AC WTR
IE 3.92

48" PIPE @ 1.17%

48" PIPE @ 0.58%

48" PIPE
@ 1.45%

VPI STA 60+00
IE -4.78
TP -0.78

VPI STA 65+50.00
AV IE -2.31
TOP 1.69

SCALE
1"=40' HORIZ.
1"=4' VERT.

58+00 59+00 60+00 61+00 62+00 63+00 64+00 65+00 66+00

36" WTR NOT IN
THIS CONTRACT
SEE PACKAGE C

RAISED MEDIAN TO
BE REPLACED PER
SDSD SDG-112

CATV
& FO

EX 72" PLRCP SWR

EX 24" VCP SWR
(ABAND)

12" HP GAS

EX 53" RCP SD

TELE, FO
& CATV

EX 12" AC WTR
(ENCASED)

TELE

AT&SF RAILROAD

R/W

VARIES

27'

15'

5'

18'

W MORENA BLVD

48" PIPE

FM-7

EX 36" RCP SD

FO TO BE RELOCATED
STA 54+00 TO 61+00

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 84

ELEC, FO
& TELE

EX 8" VCP SWR

EX 18" RCP SD

EX 24" RCP SD

CAUTION

LOT 256

MORENA BLVD

6" HP GAS

16" WTR NOT IN
THIS CONTRACT
SEE PACKAGE C

PUEBLO LANDS
MAP 4016, ROS 837

GTB-2

SCALE 1"=40'

CAUTION

6" & 12" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

(1) (130)
BY CONTRACTOR
FURNISH AND INSTALL
STA 64+49.32
I- 11.25° HPI BEND

(2) (131)
BY CONTRACTOR
FURNISH AND INSTALL
STA 65+00.57
I- 11.25° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	
SEWER:	11835-D, 7104-D, 6066-D
STORM DRAIN:	25119-D, 1343-D, 6066-D, 12215-D
GAS:	15765-118965,15765-118970, 15765-118975
ELECTRIC:	15765-118965,15765-118970, 15765-118975
CABLE TV:	222-1740D,104-212, UTR-0417-153
TELEPHONE:	BLP1967
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E2
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(130)	1863025.85	6267613.84	HPI BEND
(131)	1863070.59	6267588.83	HPI BEND
(132)			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N17° 57'32"W		649.32'	48" WSP (CML&TC)
2	N29° 13'08"W		51.26'	48" WSP (CML&TC)
3	N17° 57'32"W		99.43'	48" WSP (CML&TC)

C-07

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 58+00 TO STA 66+00 WEST MORENA BOULEVARD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 11 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

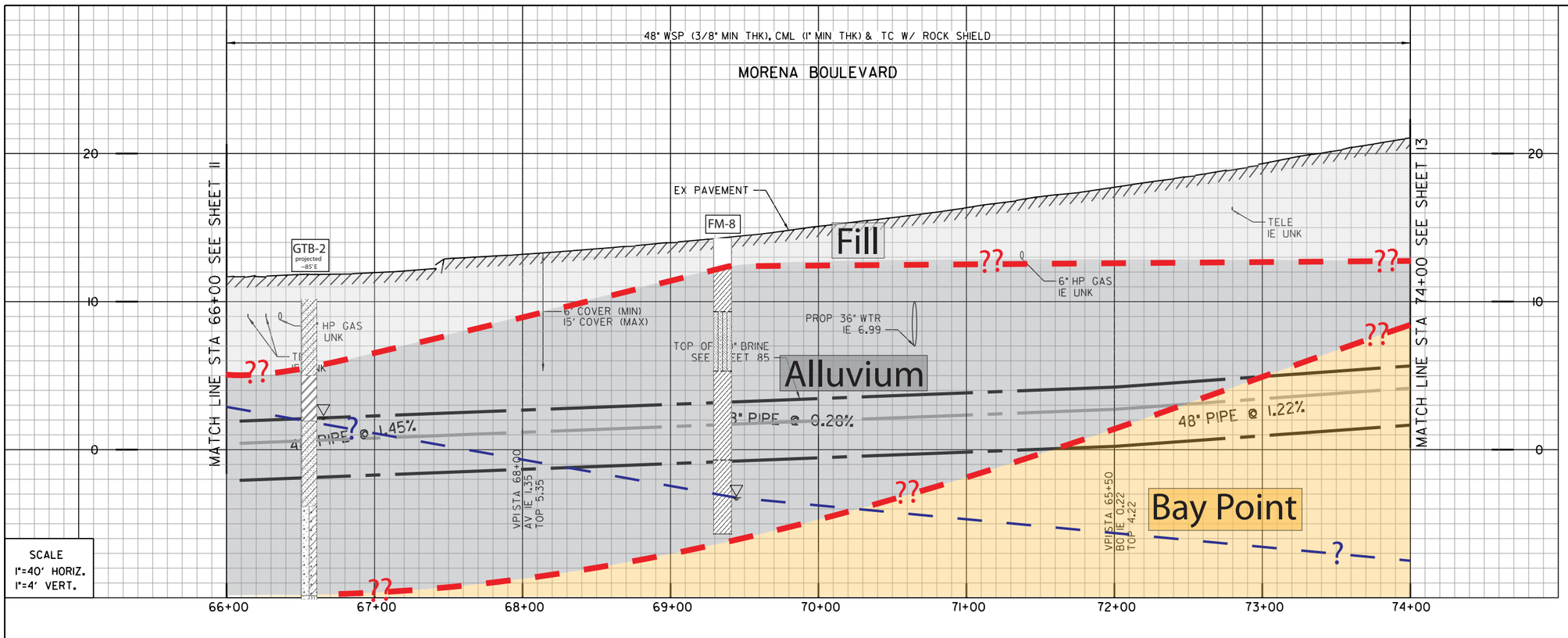
SEWER WBS B-15141
TECHNICIAN IN CHG: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-11-D

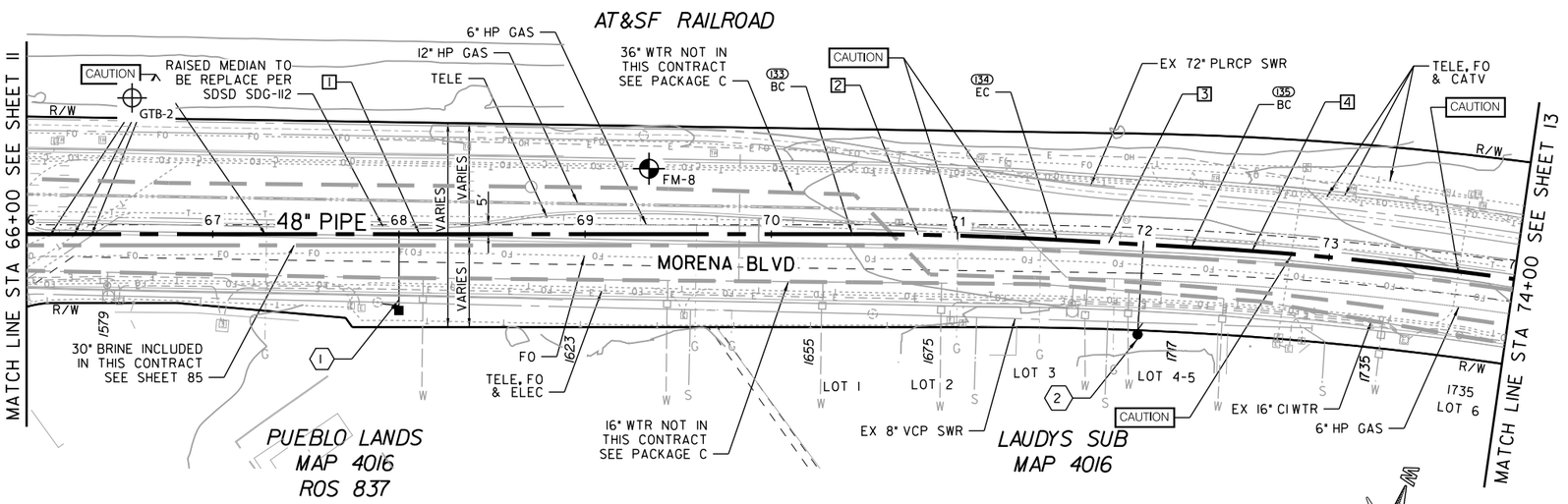
WEST MORENA BOULEVARD / MORENA BOULEVARD

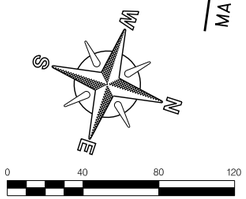
60% SUBMITTAL

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM07.dgn

9/1/2017 rothr1 $PLTDRVS$ $PENTBLS$







1 BY CONTRACTOR FURNISH AND INSTALL
STA 68+00
1- AIR RELEASE VALVE

2 BY CONTRACTOR FURNISH AND INSTALL
STA 72+00
1- BLOW OFF VALVE

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ?? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	6066-D
SEWER:	25119-D, 6066-D
STORM DRAIN:	
GAS:	15765-118980,15765-118985
ELECTRIC:	15765-118980,15765-118985
CABLE TV:	222-1704D, 104-212
TELEPHONE:	BLP1967, BL01967
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E2
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(133)	1863586.99	6267421.45	BC
(134)	1863692.54	6267390.41	EC
(135)	1863762.54	6267371.89	BC
(136)			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N17° 57'32"W		443.42'	48" WSP (CML&TC)
2	03° 08'35"	2006'	110.04'	48" WSP (CML&TC)
3	N14° 48'57"W		72.41'	48" WSP (CML&TC)
4	05° 00'40"	1991'	174.14'	48" WSP (CML&TC)

CAUTION

6" & 12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

C-08

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 66+00 TO STA 74+00 MORENA BOULEVARD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 12 OF SHEETS

SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-12-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM08.dgn
9/2017 rothr1 $PLTDRVS$ $PENTBLS$

60% SUBMITTAL

MORENA BOULEVARD

48" WSP (3/8" MIN THK), CML (1"MIN THK) & TC W/ ROCK SHIELD

MORENA BOULEVARD

EX PAVEMENT

FM-9

RW-1
projected
~70'E

MATCH LINE STA 74+00 SEE SHEET 12

MATCH LINE STA 82+00 SEE SHEET 14

Fill

Alluvium

6' COVER (MIN)
15' COVER (MAX)

TOP OF 30" BRINE
SEE SHEET 86

Bay Point

TELE
IE UNK

EX 18" RCP SD
IE 18.65

IE UNK

48" PIPE @ 0.73%

48" PIPE @ 1.00%

VP STA 81+00
AP IE 21
TP 6.11

30
20
10

74+00 75+00 76+00 77+00 78+00 79+00 80+00 81+00 82+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (140)
BY CONTRACTOR
FURNISH AND INSTALL
STA 81+52.10
1-22.5° HPI BEND

2 (141)
BY CONTRACTOR
FURNISH AND INSTALL
STA 81+62.55
1-22.5° HPI BEND

3 (XXX)
BY CONTRACTOR
FURNISH AND INSTALL
STA 81+00
1-AIR RELEASE VALVE

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	6066-D
SEWER:	2511 9-D, 1311-D
STORM DRAIN:	3477-D
GAS:	15765-118990,15765-118985
ELECTRIC:	15765-118990,15765-118985
CABLE TV:	104-212, 222-1704-B
TELEPHONE:	BL01967
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E1, 1268 E2
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(137)	1864431.40	6267312.07	EC
(138)	1864546.77	6267321.35	BC
(139)	1864624.12	6267330.60	EC
(140)	1864681.22	6267339.68	HPI BEND
(141)	1864691.38	6267337.25	HPI BEND
(142)			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	14° 24'24"	1991'	500.62'	48" WSP (CML&TC)
2	N04° 35'56"E		115.73'	48" WSP (CML&TC)
3	04° 26'08"	1006'	77.93'	48" WSP (CML&TC)
4	N09° 02'13"E		57.81'	48" WSP (CML&TC)
5	N13° 27'47"W		10.45'	48" WSP (CML&TC)
6	N09° 02'13"E		37.45'	48" WSP (CML&TC)

AT&SF RAILROAD

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 86

RAISED MEDIAN TO BE REPLACED PER SDSD SDG-112

EX 72" PLRCP SWR

12" HP GAS

R/W

FM-9

VARIES

9'

8'

MORENA BLVD

TELE

ELEC

EC (137)

EX 18" RCP SD

CAUTION

RW-1

BC (138)

12" HP GAS

EC (139)

R/W

48" PIPE

74 75 76 77 78 79 80 81

37'

MATCH LINE STA 74+00 SEE SHEET 12

MATCH LINE STA 82+00 SEE SHEET 14

VARIES

80'

1398

6" HP GAS

FO

4215

36" WTR NOT IN THIS CONTRACT SEE PACKAGE C

16" WTR NOT IN THIS CONTRACT SEE PACKAGE C

ELEC, FO & TELE

4103

EX 16" CIWTR

6" HP GAS

MAP 9416

ASHER ST

1801

1883

CAUTION

MAP 1568

R/W

CAUTION
6" & 12" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

N W E S

0 40 80 120

SCALE 1"=40'

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

C-09

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 74+00 TO STA 82+00 MORENA BOULEVARD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 13 OF SHEETS

SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE

0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-13-D

MORENA BOULEVARD

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM09.dgn

9/12/2017 rothr1 $PLTDRVS$ $PENTBLS$

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK) & TC W/ ROCK SHIELD

MORENA BOULEVARD

MATCH LINE STA 82+00 SEE SHEET 13

MATCH LINE STA 90+00 SEE SHEET 15

EX PAVEMENT

FM-10a

FM-10b

GTB-3
projected
~74'E

FM-11

ELEC
IE UNK

CATV
IE UNK

FO
IE UNK

18" RCP SD
IE 16.60

12" HP GAS
IE UNK

TELE
IE UNK

12" HP GAS
IE UNK

EX 6" WTR (ABAND)

6' COVER (MIN)
15' COVER (MAX)

Fill

Alluvium

Bay Point

48" PIPE @ 0.75%

48" PIPE @ 0.13%

48" PIPE @ 1.63%

VPI STA 84+00
IE 9.91
TP 13.91

VPI STA 85+50
AV IE 10.11
TP 14.11

PROP 30" VCP SWR
IE 3.39

EX 30" VCP SWR (ABAND)
IE 4.81

30
20
10

82+00 83+00 84+00 85+00 86+00 87+00 88+00 89+00 90+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

① 143
BY CONTRACTOR
FURNISH AND INSTALL
STA 85+28.89
1 - 45° HPI BEND
END JOINT TRENCH CONSTRUCTION

② 144
BY CONTRACTOR
FURNISH AND INSTALL
STA 85+57.17
1 - 45° HPI BEND

③ XXX
BY CONTRACTOR
FURNISH AND INSTALL
STA 85+57.17
1-AIR RELEASE VALVE

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7660-W, 3478-D
SEWER:	2511 9-D, 1311-D, 1149-D, 7288-D
STORM DRAIN:	3477-D, 3493-D
GAS:	15765-118990,15765-118995
ELECTRIC:	15765-118990,15765-118995
CABLE TV:	222-1704-B, 224-1704-D, 104-213
TELEPHONE:	BL01967
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E1
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
143	1865053.17	6267394.79	HPI BEND
144	1865076.07	6267378.18	HPI BEND
145			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N09° 02'13"E		328.89'	48" WSP (CML&TC)
2	N35° 57'47"W		28.28'	48" WSP (CML&TC)
3	N09° 02'13"E		442.83'	48" WSP (CML&TC)

AT&SF RAILROAD

RAISED MEDIAN TO BE REPLACED PER SDSD SDG-112

12" HP GAS

EX 24" RCP SD

FM-10B
FM-10A

PROP 30" VCP SWR

CAUTION

EX 72" PLRCP SWR

EX 30" VCP SWR

GTB-3

EX 10" CI WTR (ABAND)

48" PIPE

EX 12" HP GAS

MORENA BLVD

FM-11

LITTLEFIELD ST

ALLEY

6" HP GAS

CAUTION

EX 12" PVC WTR

EX 8" VCP SWR

36" WTR NOT IN THIS CONTRACT SEE PACKAGE C

16" WTR NOT IN THIS CONTRACT SEE PACKAGE C

FO, ELEC & TELE

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 87

2" HP GAS

EX 8" VCP SWR

MAP 1568

MAP 2209

MAP 2209

SCALE 1"=40'

CAUTION
6" & 12" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-10

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 82+00 TO STA 90+00 MORENA BOULEVARD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 14 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

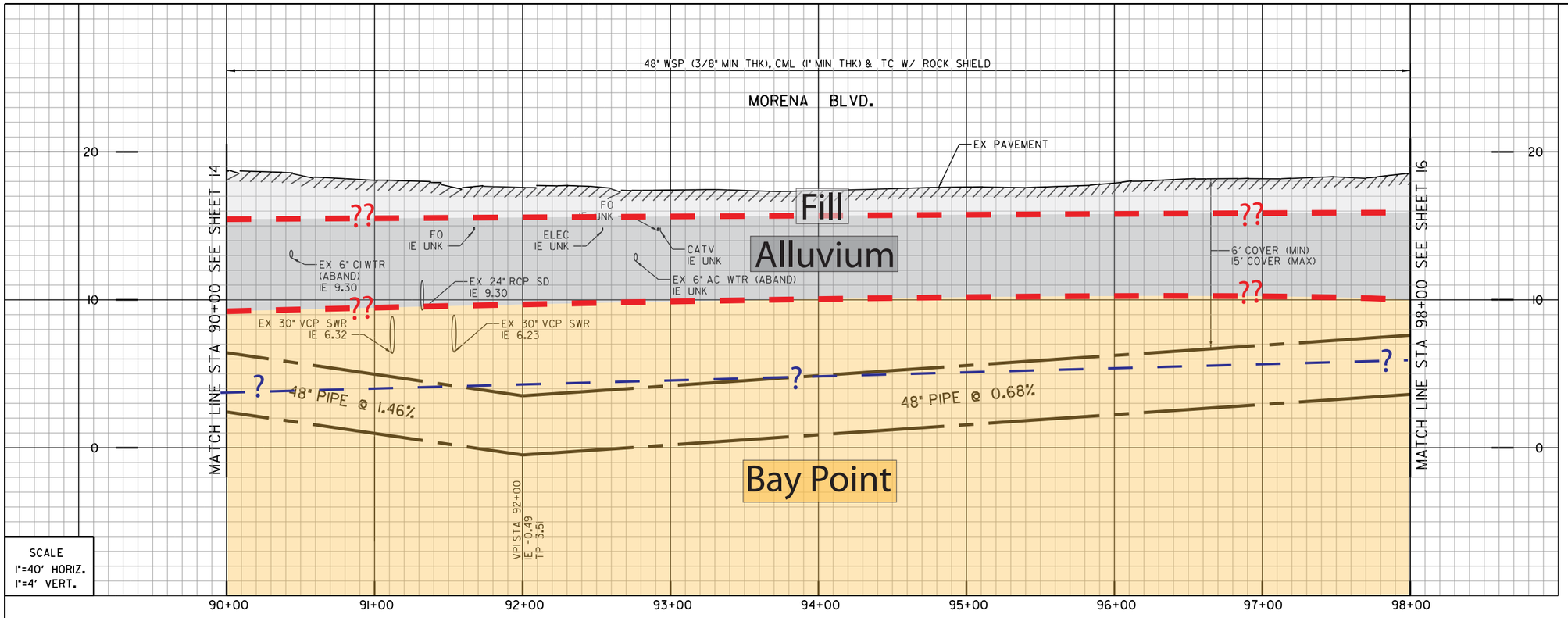
SEWER WBS B-15141
SUBMITTED BY: LAILA NASRAWI PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-14-D

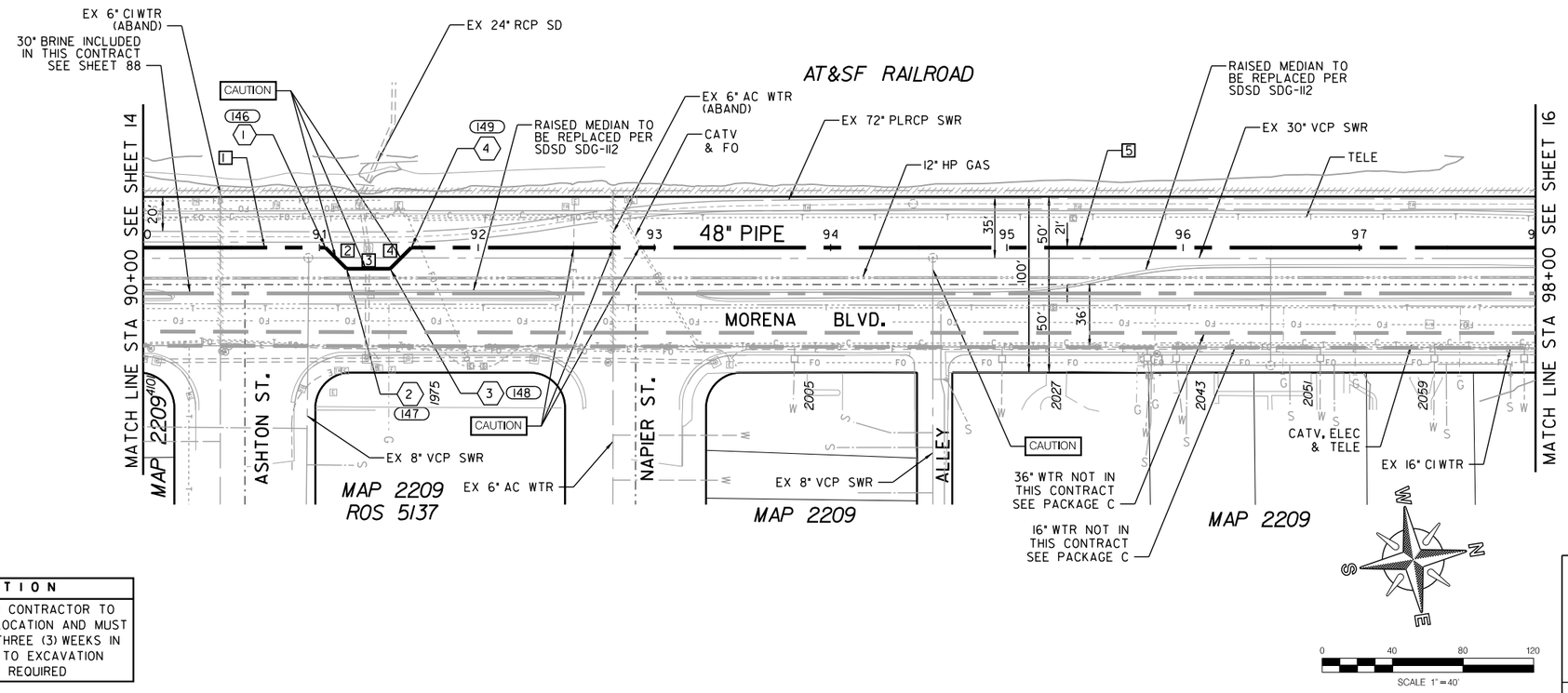
MORENA BOULEVARD

60% SUBMITTAL

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM10.dgn

9/1/2017 rothr1 $PLTDRVS$ $PENTBLS$





SCALE
1"=40' HORIZ.
1"=4' VERT.

CAUTION

6" & 12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

(1) (146)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 91+15.56
1 - 45° HPI BEND

(2) (147)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 91+32.34
1 - 45° HPI BEND

(3) (148)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 91+57.32
1 - 45° HPI BEND

(4) (149)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 91+74.12
1 - 45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7660-W
SEWER:	25119-D, 1311-D, 1149-D
STORM DRAIN:	3477-D, 3478-D
GAS:	15765-119000,15765-119005
ELECTRIC:	15765-119000,15765-119005
CABLE TV:	214-1704-B, 104-213
TELEPHONE:	BLN 1967, BLO 1967
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1268 E1
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(146)	1865615.49	6267463.97	HPI BEND
(147)	1865625.46	6267477.71	HPI BEND
(148)	1865649.89	6267481.59	HPI BEND
(149)	1865663.63	6267471.63	HPI BEND
(150)			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N09° 02'13"E		103.37'	48" WSP (CML&TC)
2	N54° 02'13"E		16.97'	48" WSP (CML&TC)
3	N09° 02'13"E		24.74	48" WSP (CML&TC)
4	N35° 57'47"W		16.97'	48" WSP (CML&TC)
5	N09° 02'13"E		637.95'	48" WSP (CML&TC)

C-11

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 90+00 TO STA. 98+00 MORENA BLVD.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 15 OF SHEETS

SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

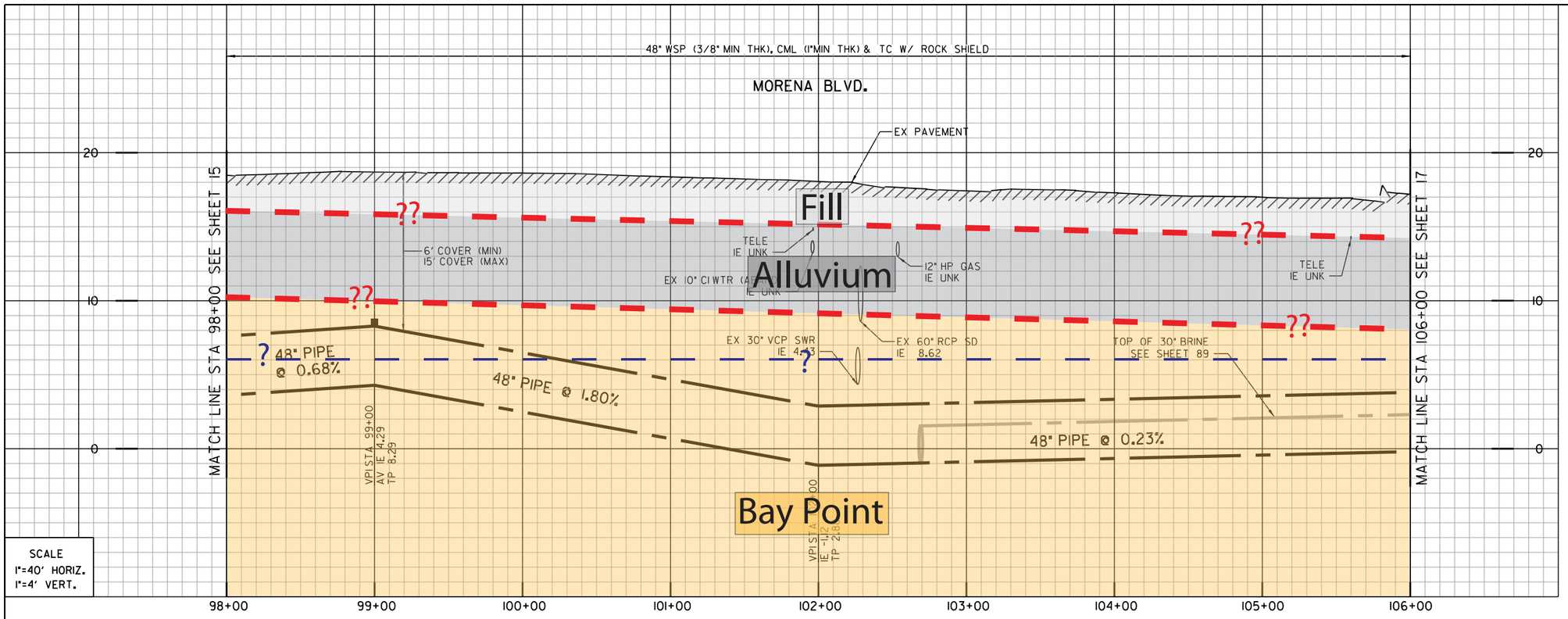
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

DESIGNED BY: LAILA NASRAWI, PROJECT MANAGER
DRAWN BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-15-D

MORENA BLVD.

60% SUBMITTAL

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM11.dgn
9/6/2017 rothr1 $PLTDRVS$ $PENTBLS$



SCALE
1"=40' HORIZ.
1"=4' VERTICAL

1 (151)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 102+11.65
1- 22.5° HPI BEND

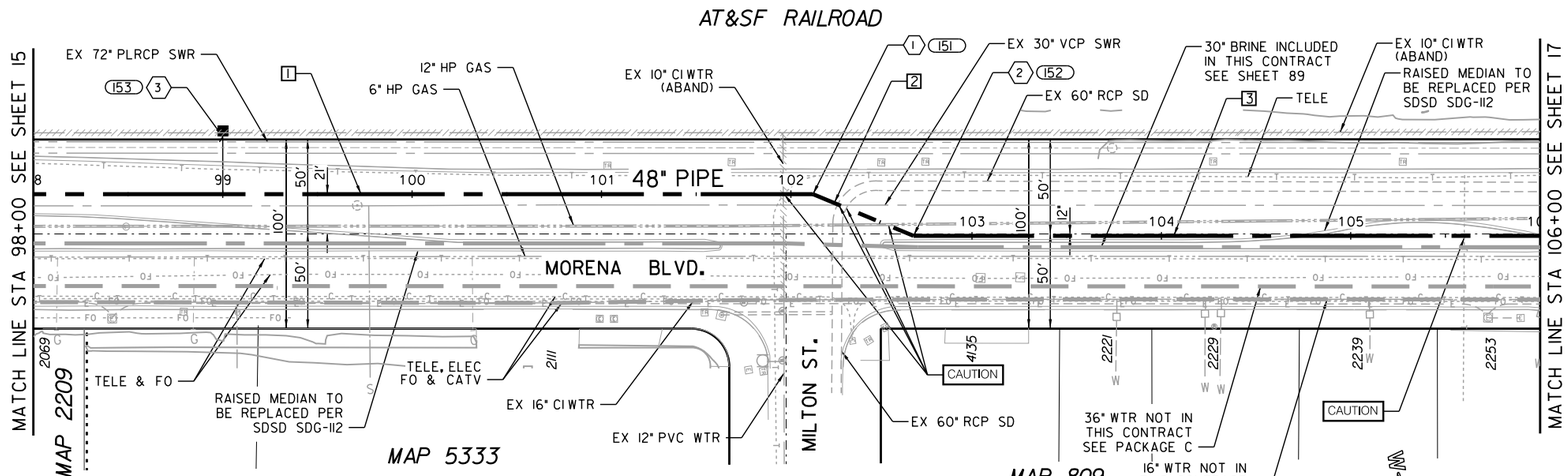
2 (152)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 102+69.14
1 - 22.5° HPI BEND
BEGIN JOINT TRENCH

3 (153)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 99+00
1- AIR RELEASE VALVE

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ?? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	34257-D
SEWER:	1150-D, 25119-D, 9355-L, 1310-D
STORM DRAIN:	9355-L
GAS:	15765-119005,15765-119010 15765-119015
ELECTRIC:	15765-119005,15765-119010 15765-119015
CABLE TV:	104-213, 226-1704-D
TELEPHONE:	BLN 1967
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1248 E7, 1268 E1
HGL:	

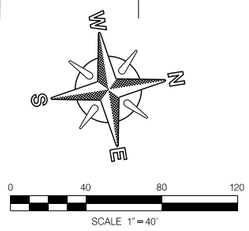


COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
151	1866700.20	6267636.49	HPI BEND
152	1866749.19	6267666.56	HPI BEND
153			ARV

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N09° 02'13"E		411.65'	48" WSP (CML&TC)
2	N31° 32'13"E		57.49'	48" WSP (CML&TC)
3	N09° 02'13"E		330.86'	48" WSP (CML&TC)

CAUTION

6" & 12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED



C-12

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 98+00 TO STA. 106+00 MORENA BLVD.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 16 OF SHEETS

SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-16-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

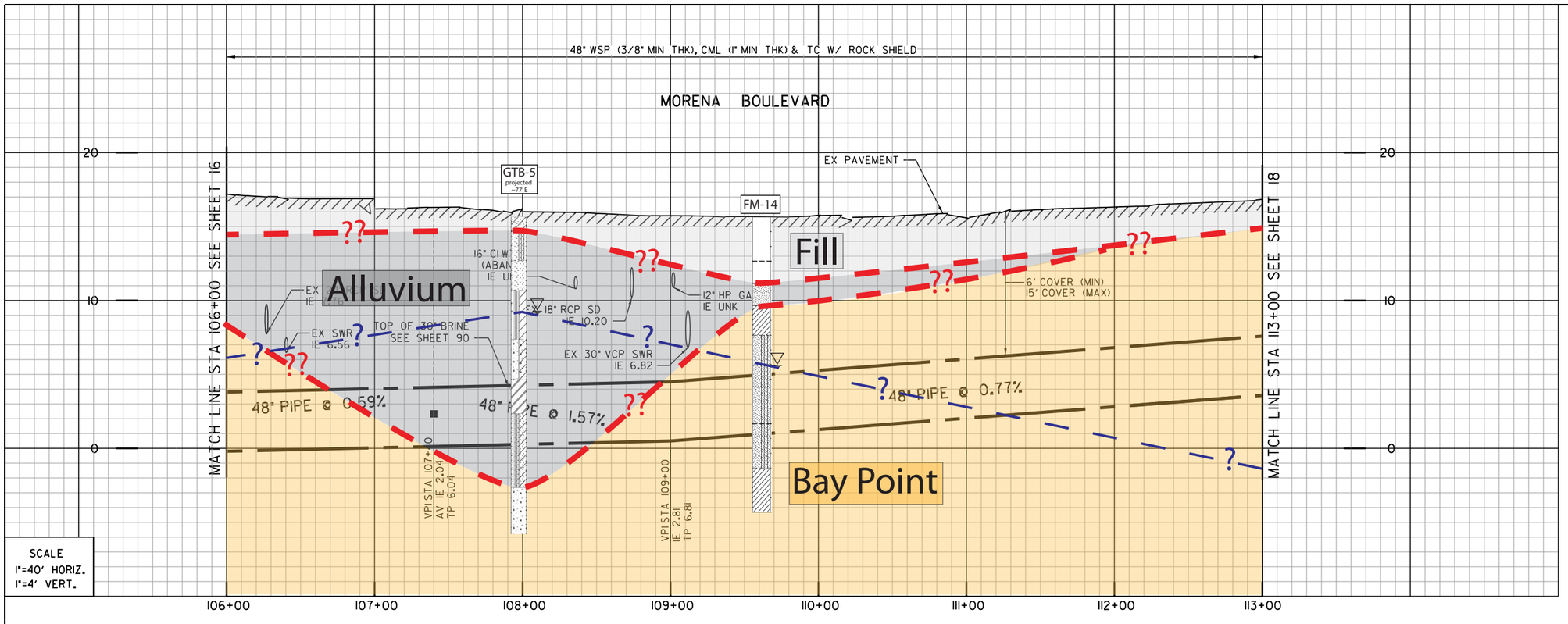
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

MORENA BLVD.

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM12.dgn

9/6/2017 rothr1 $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (151)
BY CONTRACTOR
FURNISH AND INSTALL
STA 108+84.78
1 - 22.5° HPI BEND

2 (152)
BY CONTRACTOR
FURNISH AND INSTALL
STA 109+15.89
1 - 22.5° HPI BEND
END JOINT TRENCH CONSTRUCTION

3 (XXX)
BY CONTRACTOR
FURNISH AND INSTALL
STA 107+40.00
1 - AIR RELEASE VALVE

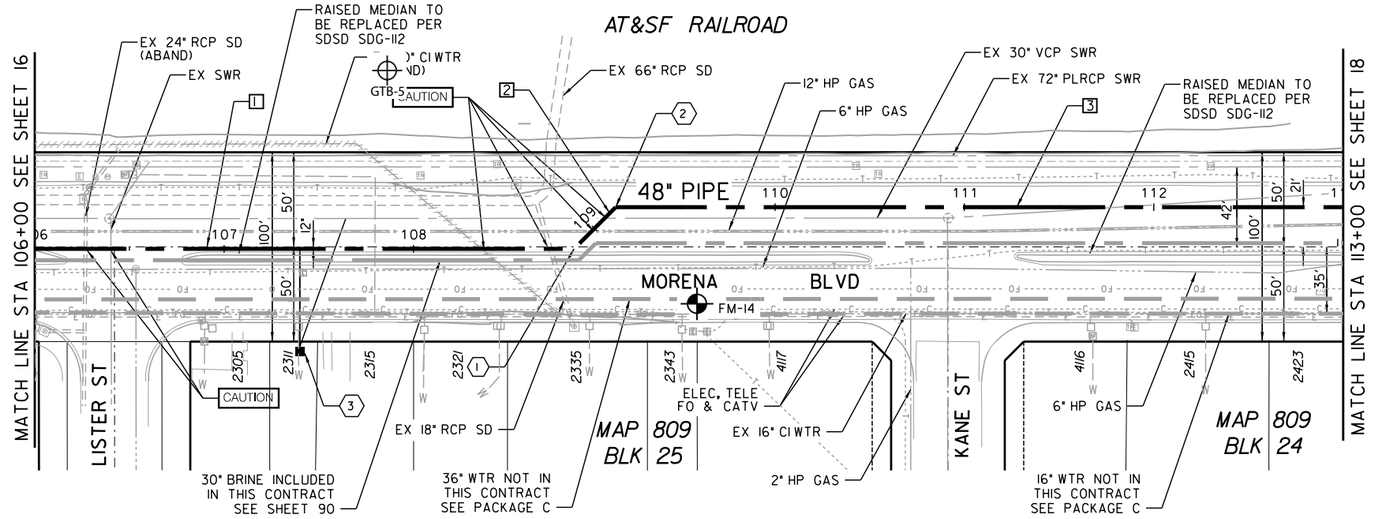
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

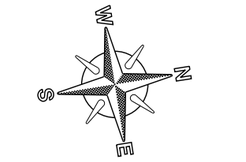
WATER:	5573-W, 7660-D
SEWER:	2511 9-L, 1151-D
STORM DRAIN:	3493-D, 9355-L
GAS:	15765-119020,15765-119015
ELECTRIC:	15765-119020,15765-119015
CABLE TV:	226-1704-D
TELEPHONE:	BLN 1967
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	1248 E7
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(151)	1867357.19	6267763.26	HPI BEND
(152)	1867382.37	6267744.99	HPI BEND
(153)			

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N09° 02'13"E		284.78'	48" WSP (CML&TC)
2	N35° 57'47"W		311.11'	48" WSP (CML&TC)
3	N09° 02'13"E		384.11'	48" WSP (CML&TC)



CAUTION
6" & 12" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED



0 40 80 120
SCALE 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

C-13

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA 106+00 TO STA 113+00 MORENA BOULEVARD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 17 OF SHEETS

SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE — PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

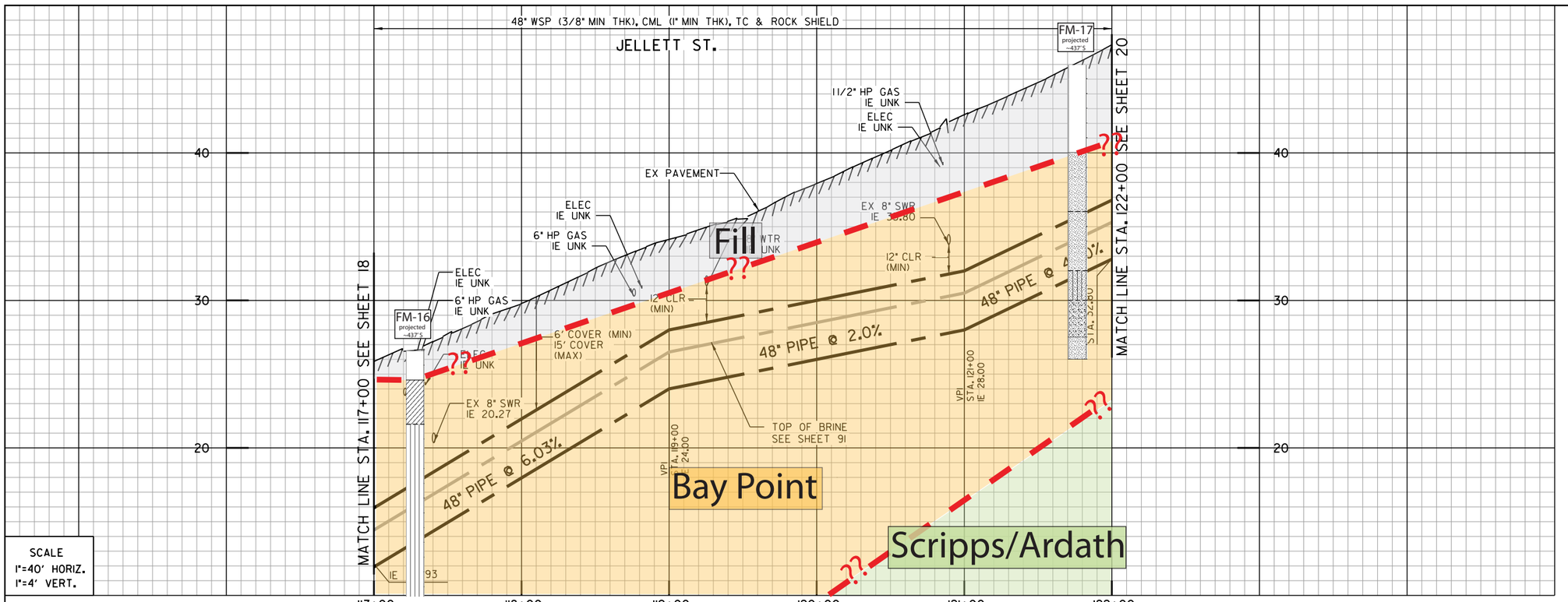
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-17-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

MORENA BOULEVARD

Q:\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM13.dgn
9/2017 rothr1 $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 117+14.16
1-45° HPI BEND

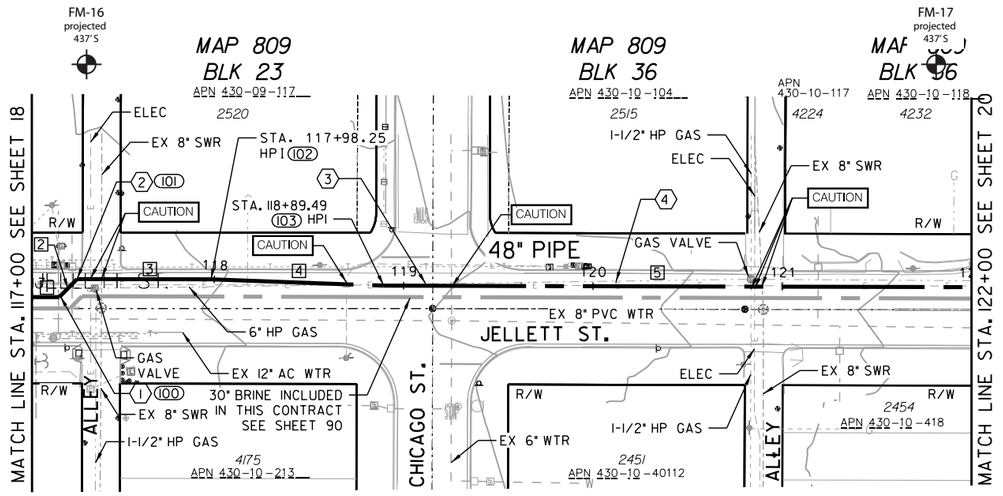
2 (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 117+27.50
1-45° HPI BEND

3
BY OTHERS
FURNISH AND INSTALL
APPROX. STA. 118+00 TO 120+50
6" HP GAS TO BE REMOVED AND REPLACED

4
BY OTHERS
FURNISH AND INSTALL
APPROX. STA. 118+00 TO 122+50
ELECTRICAL LINE TO BE REMOVED AND REPLACED

RETIREMENTS:

WATER:	5373-W
SEWER:	1313-D, 1310-D
STORM DRAIN:	NO INFO
GAS:	15765-119020, 15772-119020
ELECTRIC:	NO INFO
CABLE TV:	PB0407DC
TELEPHONE:	BLM969
IMPROVEMENTS:	
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

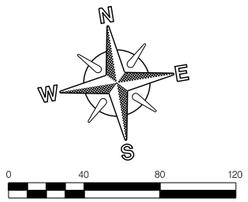


COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1867966.68	6268023.62	HPI BEND
(101)	1867974.64	6268034.32	HPI BEND
(102)	1867963.64	6268104.22	HPI
(103)	1867946.32	6268193.80	HPI

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	S81° 09'05" E	_____	14.16'	48" WSP (CML&TC)
2	N53° 19'54"E	_____	13.34'	48" WSP (CML&TC)
3	S81° 03'25" E	_____	70.76'	48" WSP (CML&TC)
4	S79° 03'25" E	_____	91.24'	48" WSP (CML&TC)
5	S81° 00'17" E	_____	310.50'	48" WSP (CML&TC)

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED



C-15

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 117+00 TO STA. 122+00 JELLETT STREET

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 19 OF __ SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

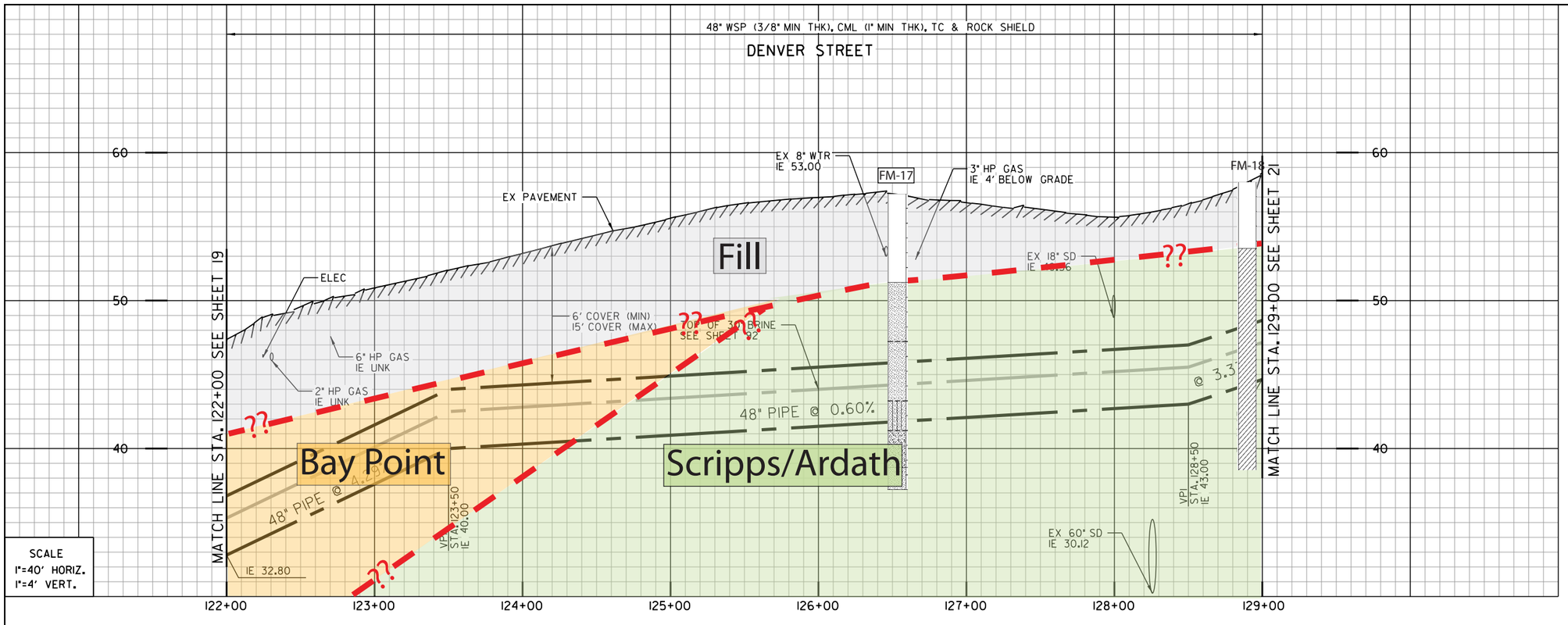
REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-19-D

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

JELLETT ST.

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

(1) (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 122+23.79
1 - 45° HPI BEND

(2) (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 122+68.03
1 - 45° HPI BEND

(3)
BY OTHERS
FURNISH AND INSTALL
APPROX. STA. 122+00 TO 125+05
2" HP GAS TO BE REMOVED AND REPLACED

(4)
BY OTHERS
FURNISH AND INSTALL
APPROX. STA. 126+50 TO 129+00
3" HP GAS TO BE REMOVED AND REPLACED

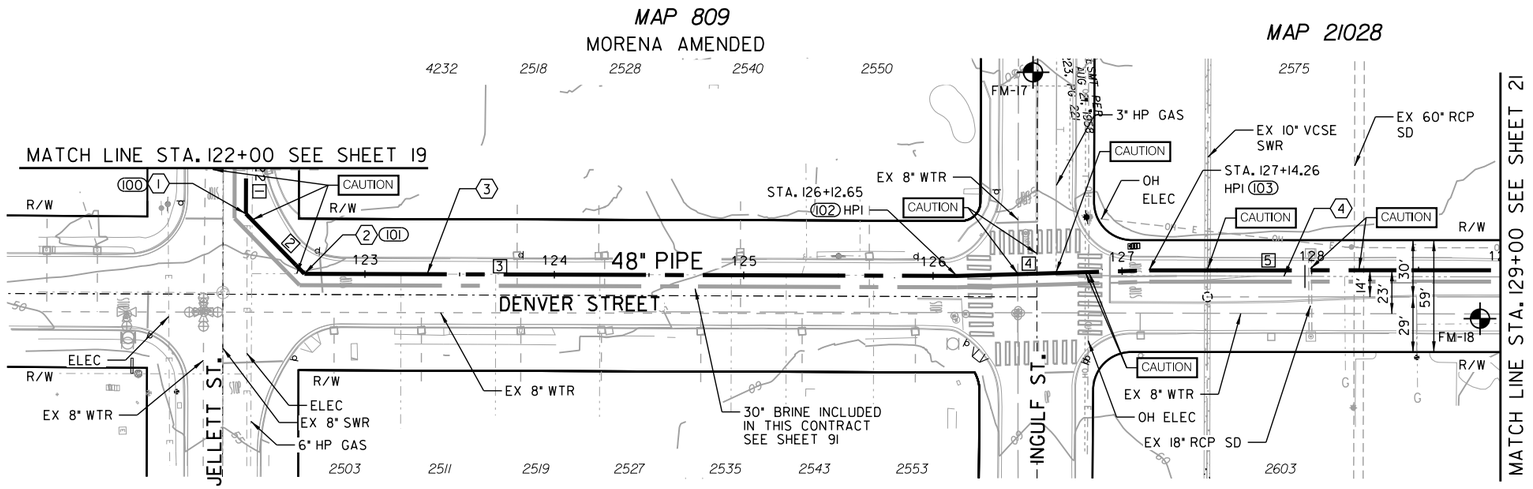
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- Boring
- Boring - AGE, 2017
- Boring - CWP, 1992
- Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	38935-06-D
SEWER:	9321-L, 9325-L, 5209-D, 20741-2-D
STORM DRAIN:	5476-AD, 5207-D, 5209-D, 5210-D, 20741-2-D
GAS:	15772-119025
ELECTRIC:	15772-119025
CATV TV:	BLM1969
TELEPHONE:	NO INFO
IMPROVEMENTS:	5209-D, 10043-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

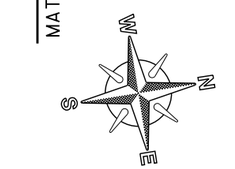
COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1867894.05	6268523.98	HPI BEND
(101)	1867919.66	6268560.06	HPI BEND
(102)	1868260.00	6268614.21	HPI
(103)	1868360.62	6268626.89	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	S81° 00'17" E		23.79'	48" WSP (CML&TC)
2	N54° 37'48"E		44.24'	48" WSP (CML&TC)
3	N9° 02'23"E		344.62'	48" WSP (CML&TC)
4	N7° 11'11"E		101.61'	48" WSP (CML&TC)
5	N8° 50'00"E		185.74	48" WSP (CML&TC)



CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED



0 40 80 120
SCALE 1"=40'

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

C-16

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 122+00 JELLETT ST. TO STA. 129+00 DENVER ST.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 20 OF SHEETS

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

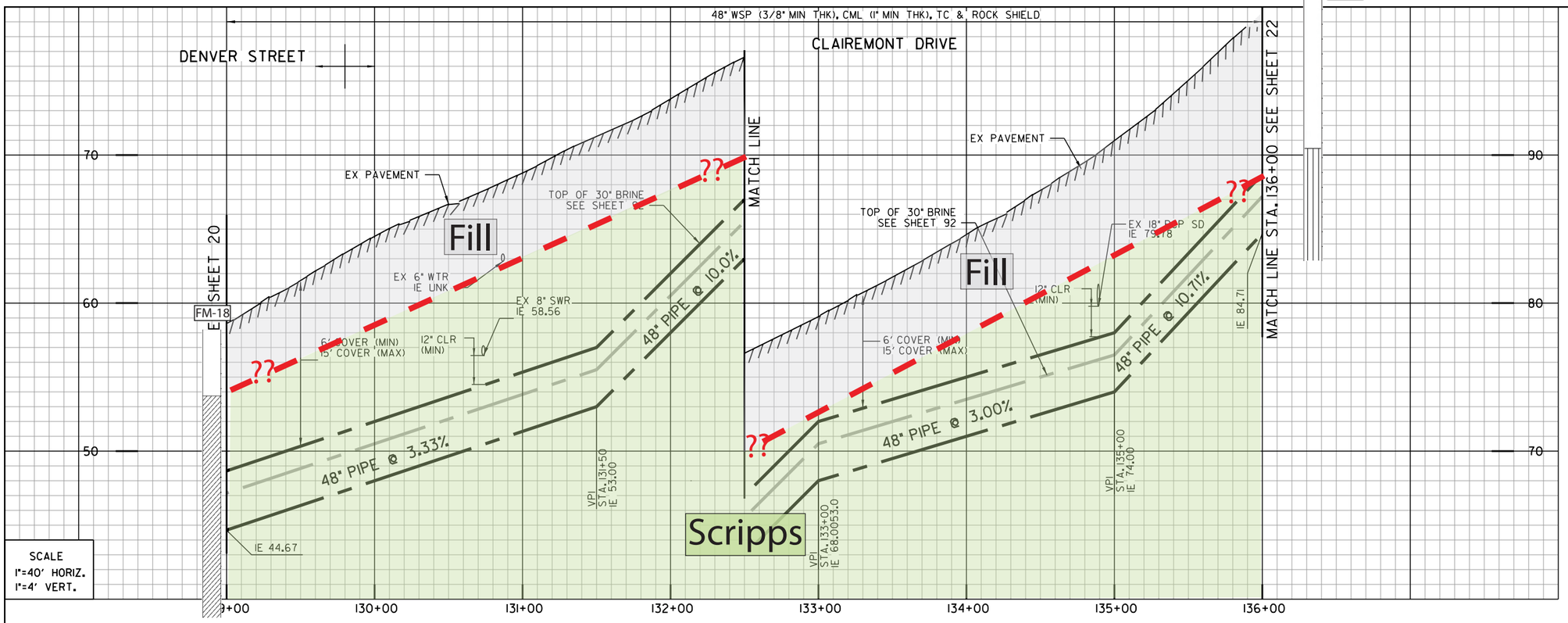
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

WATER WBS S-16027
SEWER WBS B-15141
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-20-D

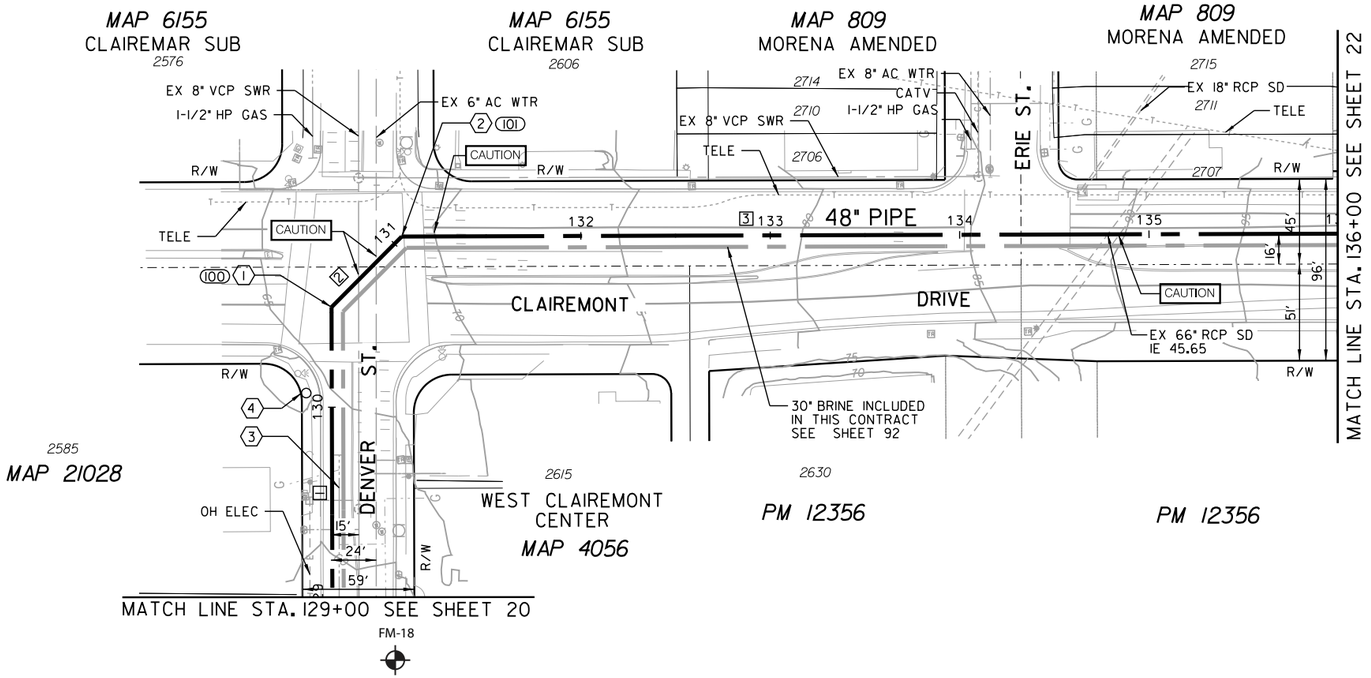
JELLETT ST./DENVER ST.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM16.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.



1 (100) BY CONTRACTOR FURNISH AND INSTALL
STA. 130+52.83
1 - 45° HPI BEND

2 (101) BY CONTRACTOR FURNISH AND INSTALL
STA. 131+05.43
1 - 45° HPI BEND

3 BY OTHERS FURNISH AND INSTALL
APPROX. STA. 129+00 TO 130+00
3" HP GAS TO BE REMOVED AND REPLACED

4 BY OTHERS FURNISH AND INSTALL
CATHODIC PROTECTION RECTIFIER

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-3 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	9321-L, 9325-L, 13236-2-D
STORM DRAIN:	10044-L
GAS:	1578-119030, 15772-119030
ELECTRIC:	1578-119030, 15772-119030
CABLE TV:	BLM1968
TELEPHONE:	1578-119030
IMPROVEMENTS:	13236-2-D, 10043-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1868695.34	6268678.91	HPI BEND
(101)	1868726.39	6268721.37	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N8° 50'00" E		152.83'	48" WSP (CML&TC)
2	N53° 50'00" E		52.60'	48" WSP (CML&TC)
3	S81° 10'00" E		494.57'	48" WSP (CML&TC)

C-17

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAN

STA. 129+00 DENVER ST. TO STA. 136+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 21 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESIGNED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-21-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

SCALE 1"=40'

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM17.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

CLAIREMONT DRIVE

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

MATCH LINE STA. 136+00 SEE SHEET 21

MATCH LINE STA. 144+00 SEE SHEET 23

EX PAVEMENT

TOP OF 30" BRINE SEE SHEET 93

FM-19

Fill

6' COVER (MIN) 15' COVER (MAX)

48" PIPE @ 10.71%

??

MATCH LINE

EX 6" WTR IE UNK

Scripps

FM-20

ELEC IE UNK

EX 8" WTR IE UNK

Lindavista

6" HP GAS EL UNK

48" PIPE @ 4.55%

VPI STA. 143+60 IE 165.00

IE 167.27

110 100 90 120 110 150 140 180 170 160

136+00 137+00 138+00 139+00 140+00 141+00 142+00 143+00 144+00

SCALE 1"=40' HORIZ. 1"=4' VERT.

Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
FM-1 Boring
H-7 Boring - AGE, 2017
D-3 Boring - CWP, 1992
GTB-1 Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	17087-2-D
SEWER:	8525-L, 8525B-L, 8528-L, 8529-L
STORM DRAIN:	10045-L
GAS:	15787-119030
ELECTRIC:	15787-119030
CABLE TV:	MAP 5
TELEPHONE:	BLM1969
IMPROVEMENTS:	10045-L, 17087-2-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 8555 MISSION BAY VIEW

MAP 8285 SERBIAN PLACE

ROS 11465

FRANKFORT ST.

CLAIREMONT DRIVE

GALVESTON ST.

PM 12356

PM 6201

PM 6201 BOUNDARY

MORENA AMENDED MAP 809

CATV

EX 8" AC WTR

TELE

EC

BC

HPI

EX 24" RCP SD

STA. 193+97.41 HPI

STA. 141+99.34 HPI

48" PIPE

EX 8" VCP SWR

EX 6" AC WTR

6" HP GAS

CATV, TELE & ELEC

30" BRINE IINCLUDED IN THIS CONTRACT SEE SHEET 93

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1868628.60	6269350.60	BC
101	1868668.31	6269602.38	EC
102	1868757.50	6269779.26	HPI
103	1868841.28	6269958.74	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	S81° 10'00" E		142.21'	48" WSP (CML&TC)
2	35° 35'30"	417'	259.04'	48" WSP (CML&TC)
3	N63° 14'30" E		198.10'	48" WSP (CML&TC)
4	N64° 58'39" E		198.07'	48" WSP (CML&TC)
5	N63° 14'30" E		2.59'	48" WSP (CML&TC)

C-18

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 136+00 TO STA. 144+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 22 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

WATER WBS S-16027
SEWER WBS B-15141
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-22-D

CLAIREMONT DRIVE

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM18.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

EX PAVEMENT

1-1/2" HP GAS IE UNK

EX CATV IE UNK

ELEC IE UNK

CATV IE UNK

EX 12" ABAND WTR IE UNK

EX 8" WTR IE UNK

6' COVER (MIN) 15' COVER (MAX)

EX 8" SWR IE 181.41

Fill

Lindavista

Scripps

48" PIPE @ 4.55%

MATCH LINE STA. 144+00 SEE SHEET 22

MATCH LINE

EX PAVEMENT

FM-21

EX 8" WTR IE UNK

CATV

TELE

EX 8" SWR IE 197.36

EX 8" SWR IE 195.14

EX 8" WTR IE UNK

48" PIPE @ 8.50%

VPI STA. 151+00 IE 207.00

EX 8" SWR IE 205.06

IE 212.89

VPI STA. 149+00 IE 190.00

MATCH LINE STA. 152+00 SEE SHEET 24

190 180 170 210 200 190

144+00 145+00 146+00 147+00 148+00 149+00 150+00 151+00 152+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

1 BY CONTRACTOR
FURNISH AND INSTALL
DEMOLISH AND REMOVE ABANDONED 12" WATER
APPROX. 75 LF

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-2 Boring
- H-2 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35034-2-D, 35034-9-D
SEWER:	11411-L, 8525-L, 8525B-L, 8528-L, 8529-L
STORM DRAIN:	NO INFO
GAS:	15787-119030
ELECTRIC:	15787-119030,15794-119035
CABLE TV:	NO INFO
TELEPHONE:	BLM1970
IMPROVEMENTS:	16889-2-D, 11411-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 2861
CLAIREMONT COURT

0 2809 2809 2812 2820 2815 2825

EX 8" VCP SWR
EX 8" AC WTR
CATV
TELE
R/W
CAUTION
ELEC
I-1/2" HP GAS
EX 8" PVC WTR
CLAIREMONT CT.
BOUNDARY R/W
100 BC
CATV, FO & ELEC
EC 101
102 BC
EDISON ST.
SEE SHEET 24
MATCH LINE STA. 144+00 SEE SHEET 22
MATCH LINE STA. 152+00
144 145 146 147 148 149
48" PIPE
EX 8" VCP SWR
EX 8" AC WTR
CLAIREMONT DRIVE
EX 6" HP GAS
151 3
EX 8" VCP SWR
2 150
FM-21
EX 12" PVC WTR
ABANDONED PRV 2921
2922
EX 12" AC WTR
30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 94
ELEC, CATV
2740
HARTFORD CT.
EX 8" AC WTR
I-1/2" HP GAS
2825
MAYBERRY TRACT
MAP 9591

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1869096.39	6270464.69	BC
101	1869147.25	6270536.76	EC
102	1869224.23	6270617.40	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N63° 14'30" E		564.06'	48" WSP (CML&TC)
2	16° 54'29"	300'	88.53'	48" WSP (CML&TC)
3	N46° 20'01" E		111.48'	48" WSP (CML&TC)
4	25° 35'21"	600'	35.95'	48" WSP (CML&TC)

N W E S
0 40 80 120
SCALE 1"=40'

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-19

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 144+00 TO STA. 152+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 23 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

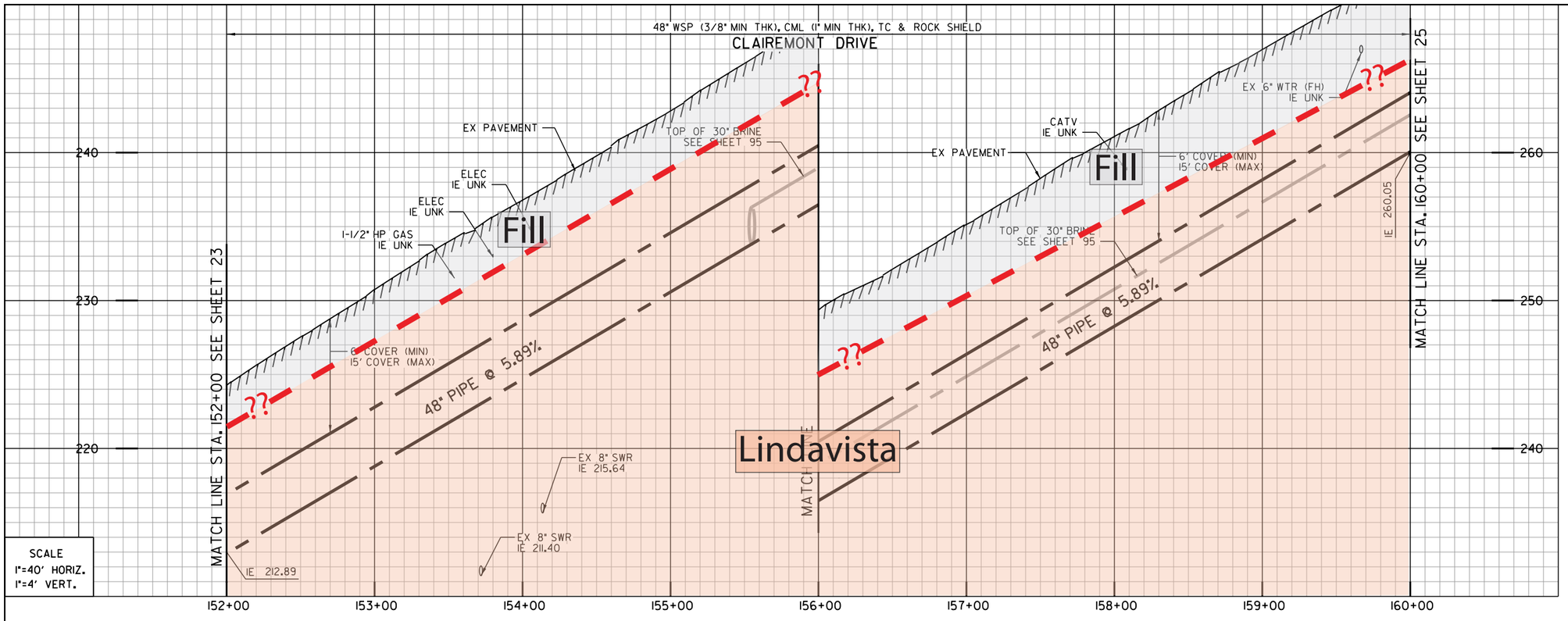
WATER WBS S-16027
SEWER WBS B-15141

SUBMITTED BY LAILA NASRAWI PROJECT MANAGER
CHECKED BY DARIN SANCHEZ PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-23-D

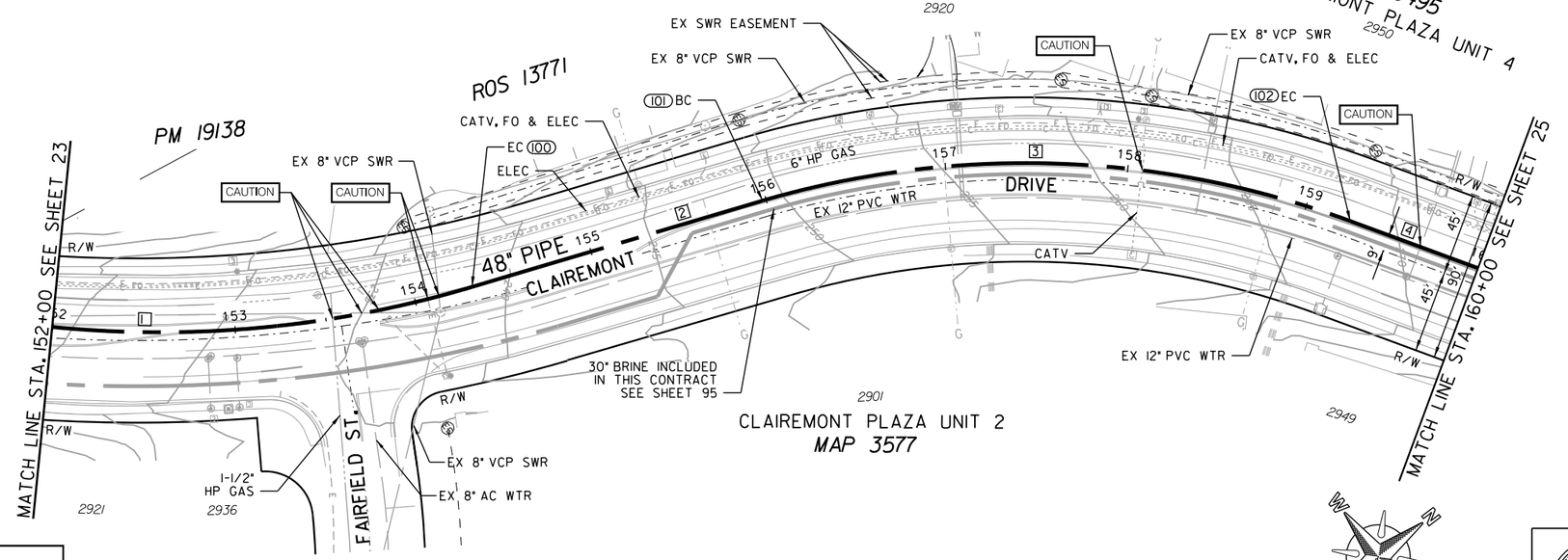
CLAIREMONT DRIVE

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM19.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.



CAUTION

6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35034-2-D, 35034-3-D
SEWER:	8784-L, 8525B-L, 8525-L, 8258-L, 8529-L, 12638-L
STORM DRAIN:	NO INFO
GAS:	15795-119035, 15795-119040
ELECTRIC:	15795-119035, 15802-19040
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1869445.73	6270764.23	EC
101	1869600.96	6270823.02	BC
102	1869850.22	6271026.83	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	25° 35'21"	600'	232.02'	48" WSP (CML&TC)
2	N20° 44'39" E		165.99'	48" WSP (CML&TC)
3	36° 30'00"	514'	327.44'	48" WSP (CML&TC)
4	N57° 31'24" E		74.55'	48" WSP (CML&TC)

C-20

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 152+00 TO STA. 160+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 24 OF SHEETS

SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE — PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

DESIGNED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-24-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

CLAIREMONT DR

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM20.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

FM-22

MATCH LINE STA. 160+00 SEE SHEET 24

MATCH LINE STA. 168+00 SEE SHEET 26

290 — 280 — 270

CATV IE UNK

ELEC IE UNK

EX PAVEMENT

EX 8" ABAND WTR IE

Fill

3" HP GAS IE UNK

12" CLR (MIN)

EX 18" RCP SD IE 282.43

ELEC IE UNK

IE 287.50

TOP OF 30" BRINE SEE SHEET 96

48" PIPE @ 3.27%

6' COVER (MIN) 15' COVER (MAX)

Lindavista

48" PIPE @ 5.98%

VPI STA 160+50 IE 263.00

IE 260.05

160+00 161+00 162+00 163+00 164+00 165+00 166+00 167+00 168+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35034-3-D, 35034-4-D
SEWER:	12639-L
STORM DRAIN:	10047-L
GAS:	15802-119040,15802-119045
ELECTRIC:	15802-19040
CABLE TV:	MAP 5 & 8
TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 3495
CLAIREMONT PLAZA UNIT 4

MAP 4541
CLAIREMONT PLAZA UNIT 4
RESUB NO. 1

MATCH LINE STA. 160+00 SEE SHEET 24

MATCH LINE STA. 168+00 SEE SHEET 26

2980 3010 3020 3030 3034

EX 8' WIDE SWR ESMT

CATV, FO & ELEC

EX 8" VCP SWR

6" HP GAS

12' WTR ESMT

EX 12' SDG&E ESMT

EX 8" WTR ABAND.

15' ESMT

8' SWR ESMT

12' SDG&E ESMT

CAUTION

100 BC

R/W

45' 90' 45'

19' 9'

161 162 1 163 48" PIPE 164 165 166 167 2

CLAIREMONT DRIVE

FM-22

EX 16" PVC WTR

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 96

EX 12" PVC WTR

EX 18" RCP SD

3" HP GAS

CATV

TELE

EX 8' WIDE UTILITY ESMT

BURGERNER BLVD.

EX 12" CIWTR

3005 3001 2995 2981 2965

CLAIREMONT PLAZA UNIT 2
MAP 3577

PM 11146

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1870172.44	6271533.06	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N57° 31'24" E		525.54'	48" WSP (CML&TC)
2	45° 34'51"	391'	274.46'	48" WSP (CML&TC)

CAUTION

6" HP GASI CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-21

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 160+00 TO STA. 168+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 25 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE

0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-25-D

CLAIREMONT DR

60% SUBMITTAL

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9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

MATCH LINE STA. 168+00 SEE SHEET 25

MATCH LINE STA. 176+00 SEE SHEET 27

EX PAVEMENT

Fill

TOP OF 30" BRINE SEE SHEET 97

48" PIPE @ 3.27%

IE 287.50

Lindavista

EX 12" SWR IE UNK

A.V.

@ 1.91%

VPI STA. 175+50 IE 312.00

IE 311.04

310

300

290

320

168+00 169+00 170+00 171+00 172+00 173+00 174+00 175+00 176+00

SCALE 1"=40' HORIZ. 1"=4' VERT.

Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
Boring
Boring - AGE, 2017
Boring - CWP, 1992
Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

MAP 4541
CLAIREMONT PLAZA UNIT 4 RESUB NO. 1

MAP 5258
CLAIREMONT PLAZA UNIT 5

EX 4' GENERAL UTILITY EASEMENT

CAUTION

6" HP GAS

EX 8" VCP SWR

6" HP GAS

A.V. VAULT

EX 8" VCP SWR

100 EC

101 BC

102

48" PIPE

EX 16" PVC WTR

CLAIREMONT DRIVE

FM-23

FO, TELE & ELEC

EX 30" STL WTR

EX 12" VCP SWR

TELE

EX 16" PVC WTR

10' UTILITY EASEMENT

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 97

EX 50' WTR EASEMENT

SUNSET COVE MAP 15418

3040 3050 3066 0 3076 3090 3095 3091 3005

R/W

45' 10' 20' 14' 57' 102'

15' 32' 175'

0 40 80 120

SCALE 1"=40'

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

CLAIREMONT PLAZA
MAP 3065

(1) (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 175+50
1-10" VACUUM RELIEF VALVE ASSY.
1-2" COMBINATION AIR/VACUUM VALVE ASSY.
W/ ODOR CONTROL VALVE
IN 8'X8' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL XX-XX

(2)
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MANHOLE

(3)
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

REFERENCE:

WATER:	35034-4-D, 35034-5-D
SEWER:	9478-L
STORM DRAIN:	NO INFO
GAS:	15810-119050,15810-119055
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	BLL1971
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
100	1870420.23	6271705.82	EC
101	1870955.34	6271819.08	BC
102	1871120.19	6271807.51	A.V.

PROPOSED PIPE DATA TABLE

NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	45° 34'51"	391'	36.59'	48" WSP (CML&TC)
2	N11° 58'19" E		546.99'	48" WSP (CML&TC)
3	45° 36'54"	300'	217.42'	48" WSP (CML&TC)

C-22

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 168+00 TO STA. 176+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 26 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-26-D

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

CLAIREMONT DR

60% SUBMITTAL

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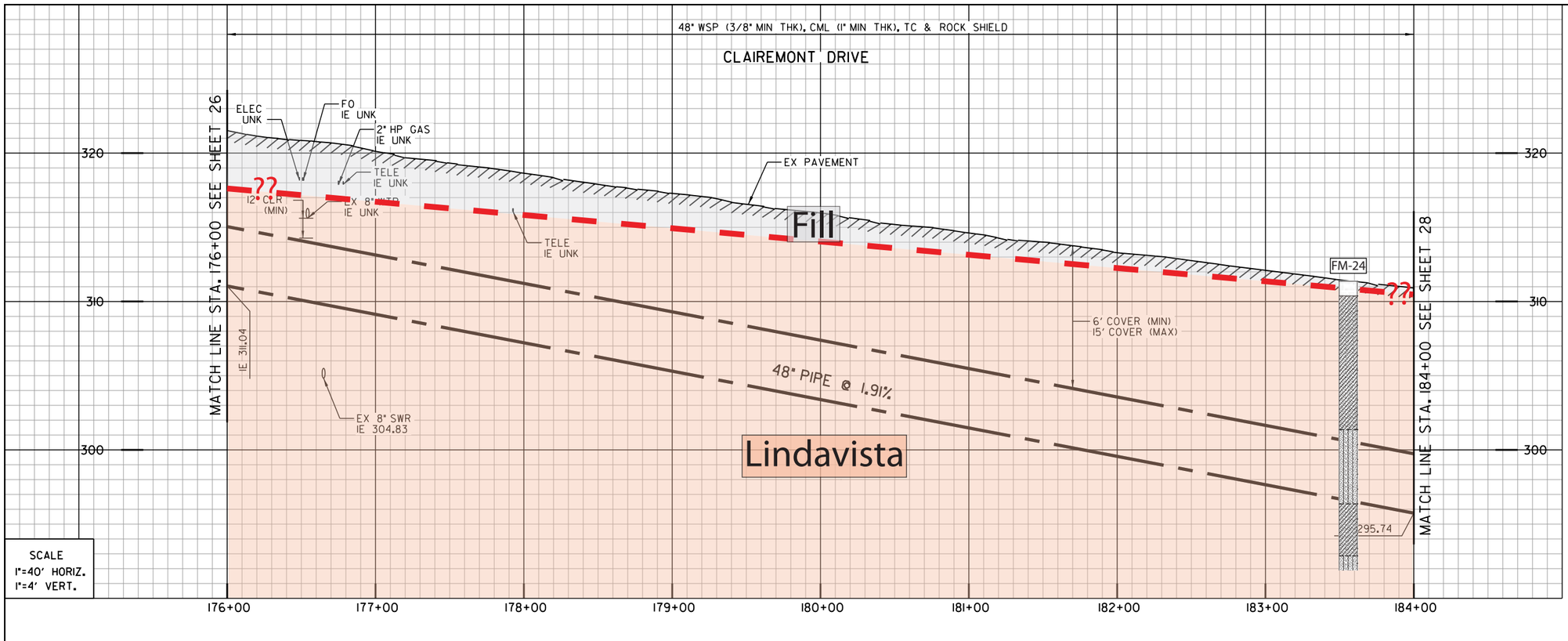
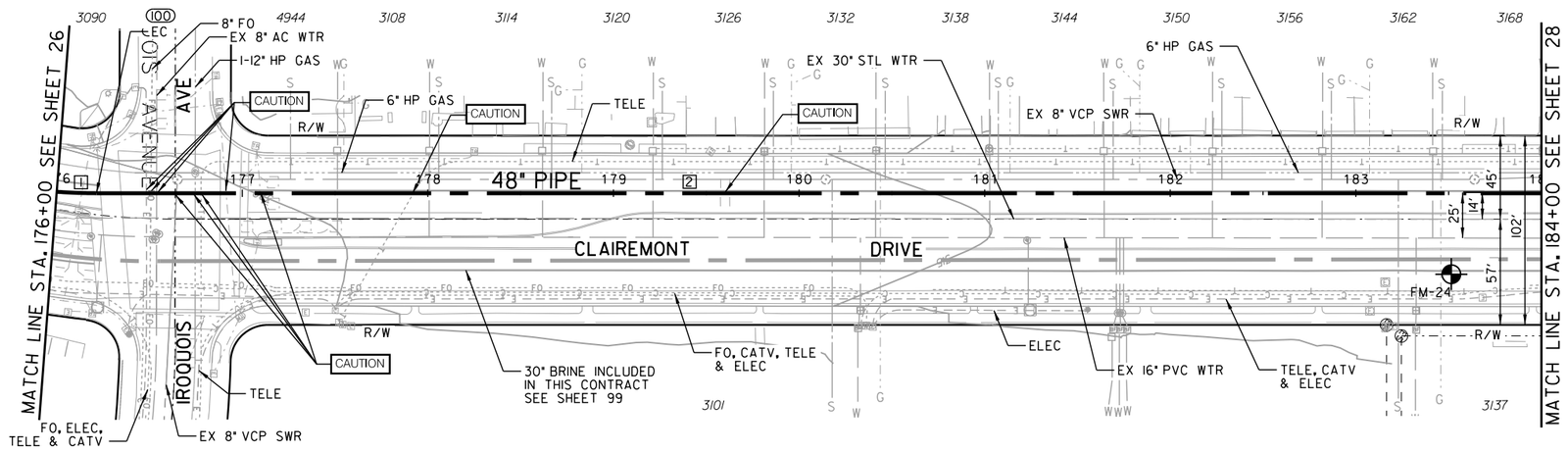
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



MAP 2845

CLAIREMONT UNIT 5



CLAIREMONT GARDEN

MAP 2947

REFERENCE:

WATER:	35033-2-D, 8524-L
SEWER:	9478-L, 9479-L
STORM DRAIN:	NO INFO
GAS:	15802-119055,15802-119060
ELECTRIC:	15802-19055
CABLE TV:	NO INFO
TELEPHONE:	BLK1971
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	187183.78	6271775.36	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	45° 36'54"	300'	21.42'	48" WSP (CML&TC)
2	N33° 38'35" W		778.58'	48" WSP (CML&TC)

CAUTION

6" HP GASI CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

SCALE 1"=40'

CLAIREMONT DRIVE

C-23

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 176+00 TO STA. 184+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 27 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

TECHNICAL REP. LAILA NASRAWI, PROJECT MANAGER
CHECKED BY DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-27-D

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9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

MATCH LINE STA. 184+00 SEE SHEET 27

MATCH LINE STA. 192+00 SEE SHEET 29

310

300

290

TELE
IE UNK

EX PAVEMENT

Fill

EX 2-18" SD
IE 302.48

TELE
IE UNK

EX 8" SWR
IE UNK

6' COVER (MIN)
15' COVER (MAX)

EX 8" WTR
IE UNK

Lindavista

48" PIPE @ 1.91%

48" PIPE @ 0.54%

IE 295.74

VPI
STA 187+00
IE 290.00

IE 287.28

184+00 185+00 186+00 187+00 188+00 189+00 190+00 191+00 192+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35033-3-D
SEWER:	9479-L
STORM DRAIN:	9954-L, 9479-L
GAS:	15795-119065
ELECTRIC:	15802-19065
CABLE TV:	NO INFO
TELEPHONE:	BLK1970
IMPROVEMENTS:	9954-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 2845

CLAIREMONT UNIT 5

3168 3174 3180 3186 3204 3212 3220 3228 3236 3244 3252 3260 4715

MATCH LINE STA. 184+00 SEE SHEET 27

MATCH LINE STA. 192+00 SEE SHEET 29

CAUTION

(100) BC

(101) EC

R/W

45'

102'

57'

14'

TELE

CAUTION

EX 8" VCP SWR

6" HP GAS

TELE

EX 8" VCP SWR

EX 8" AC WTR

1-1/2" HP GAS

R/W

BLACKFOOT AVE

1 185 2 186 187 188 48" PIPE 189 3 190 191

EX 30" STL WTR

14'

24'

7'

CLAIREMONT DRIVE

50'

R/W

EX 24" RCP SD

TELE & CATV

CAUTION

2-18" RCP SD

EX 18" RCP SD

TELE, ELECT & CATV

EX 8" AC WTR

CALLE NEIL

R/W

EX 8" VCP SWR

ELEC

EX 16" PVC WTR

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 99

ELEC

TELE

R/W

3137

4802

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1871939.14	6271272.68	BC
(101)	1872008.35	6271222.14	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N33° 38'35" W		128.76'	48" WSP (CML&TC)
2	4° 58'53"	986'	85.72'	48" WSP (CML&TC)
3	N38° 35'50" W		585.52'	48" WSP (CML&TC)

C-24

CAUTION

6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

CLAIREMONT GARDEN
MAP 2947

CLAIREMONT GARDEN
MAP 2947

0 40 80 120
SCALE 1" = 40'

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 184+00 TO STA. 192+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 28 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE

PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR — DATE STARTED

INSPECTOR — DATE COMPLETED

WATER WBS S-16027
SEWER WBS B-15141

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER

CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

000-0000 CCS27 COORDINATE

0000-0000 CCS83 COORDINATE

40067-28-D

CLAIREMONT DR

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM24.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

FM-25

EX PAVEMENT

Fill

EX WR UNK

12" CLR (MIN)

6' COVER (MIN)
15' COVER (MAX)

48" PIPE @ 0.54%

Lindavista

MATCH LINE STA. 192+00 SEE SHEET 28

MATCH LINE STA. 200+00 SEE SHEET 30

IE 287.28

IE 282.92

300

290

280

192+00 193+00 194+00 195+00 196+00 197+00 198+00 199+00 200+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35033-4-D
SEWER:	9480-L, 9971-L, 9766-L
STORM DRAIN:	NO INFO
GAS:	15795-119065,15795-119070
ELECTRIC:	15797-119070
CABLE TV:	NO INFO
TELEPHONE:	BLK1970
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 2845
CLAIREMONT UNIT 5

4716 3308 3314 3320 3326 3332 3338 3344 3350 3356 3362 3368 3374

MATCH LINE STA. 192+00 SEE SHEET 28

MATCH LINE STA. 200+00 SEE SHEET 30

EX 8" VCP SWR

CAUTION

CAUTION

EX 8" VCP SWR

6" HP GAS

TELE

R/W

45'

14'

101'

57'

192 193 194 195 48" PIPE 196 197 198 199 200

EX 30" STL WTR

EX 16" PVC WTR

CLAIREMONT DRIVE

FM-25

R/W

ELEC

CATV

TELE

EX 6" AC WTR

EX 8" VCP SWR

KNAPP ST

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 100

CATV & TELE

ELEC

3203-3239

3301

CLAIREMONT GARDEN
MAP 2947

CLAIREMONT GARDEN
MAP 2947

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N38° 35'50" W		800'	48" WSP (CML&TC)

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

SCALE 1"=40'

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

C-25

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 192+00 TO STA. 200+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 29 OF SHEETS

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE

PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR — DATE STARTED

INSPECTOR — DATE COMPLETED

WATER WBS S-16027
SEWER WBS B-15141

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER

CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

000-0000 CCS27 COORDINATE

0000-0000 CCS83 COORDINATE

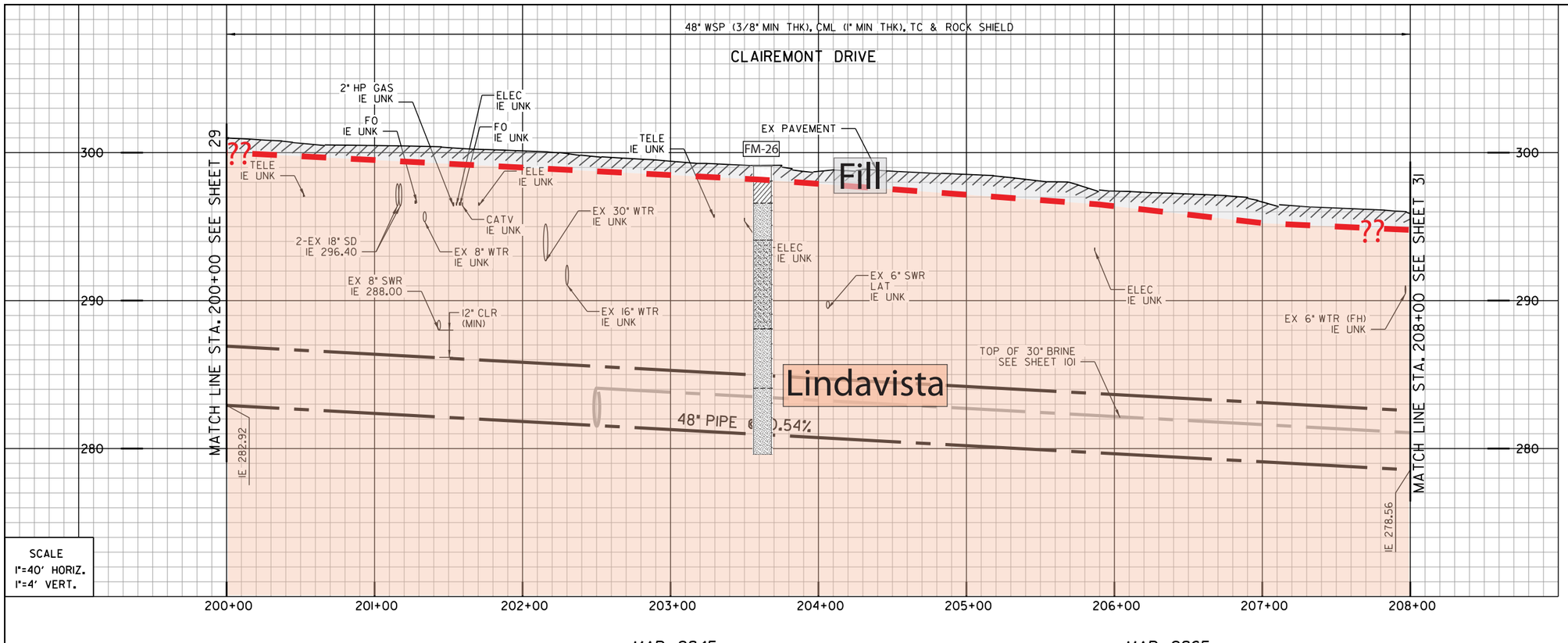
40067-29-D

CLAIREMONT DRIVE

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM25.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 201+95.52
1 - 45° HPI BEND

2 (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 202+50.18
1 - 45° HPI BEND

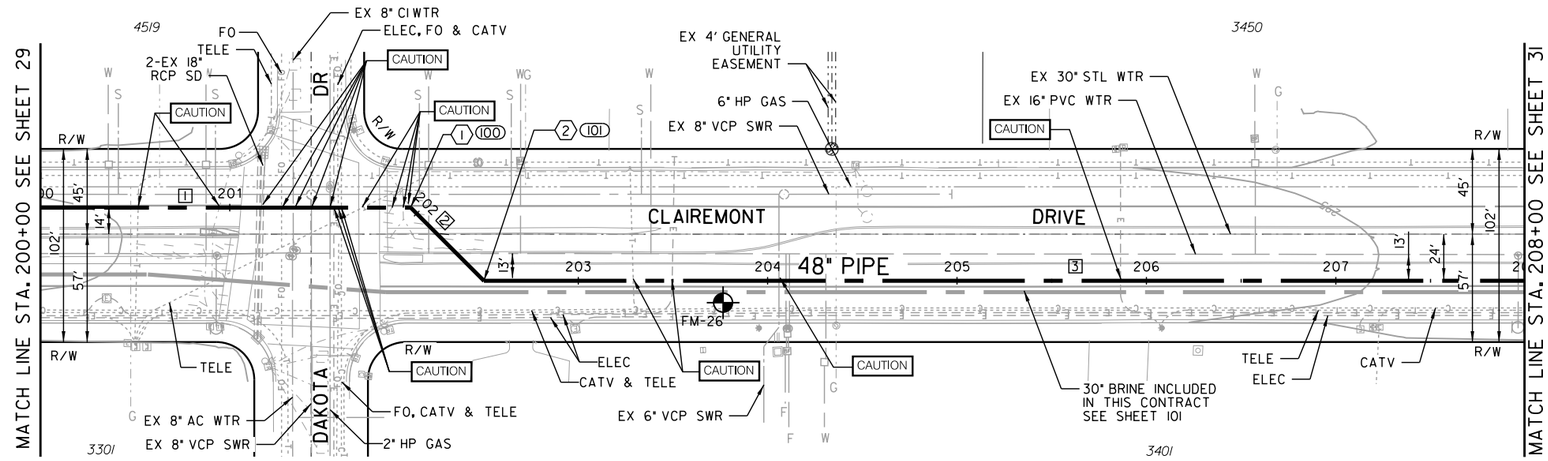
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35033-5-D, 35033-4-D, 9480-L
SEWER:	9478-L, 9766-L, 9486-L
STORM DRAIN:	9766-L, 9486-L
GAS:	15787-119075,15787-119095
ELECTRIC:	15787-119075,15787-119080
CABLE TV:	NO INFO
TELEPHONE:	BLJ1969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 2845
CLAIREMONT UNIT 5

MAP 2865
CLAIREMONT UNIT 6



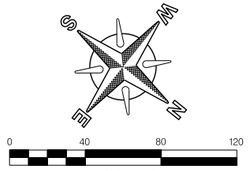
PUEBLO LANDS SUB. OF LOT 1207
MAP 842

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1873244.01	6270235.82	HPI BEND
(101)	1873298.34	6270241.91	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N38° 35'50" W		195.52'	48" WSP (CML&TC)
2	N 6° 24'10" E		54.66'	48" WSP (CML&TC)
3	N38° 35'50" W		549.82'	48" WSP (CML&TC)

CAUTION

6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED



C-26

MORENA PUMP STATION AND CONVEYANCE SYSTEM

CLAIREMONT DRIVE

STA. 200+00 TO STA. 208+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 30 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

TECHNICAL REP.: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-30-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

CLAIREMONT DRIVE

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM26.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

ELEC
IE UNK

EX PAVEMENT

FM-27

TELE
IE UNK

FO
IE UNK

CATV
IE UNK

TELE
IE UNK

Fill

6' COVER (MIN)
15' COVER (MAX)

TOP OF 30" BRINE
SEE SHEET 103

EX 30" SD
IE 282.30

12" CLR
(MIN)

B.O.

CATV
IE UNK

EX 6" WTR (FH)
IE UNK

48" PIPE @ 0.54%

48" PIPE @ 0.87%

Lindavista

IE 278.56

VPI
SAN
IE 276.00

IE 278.94

MATCH LINE STA. 208+00 SEE SHEET 30

MATCH LINE STA. 216+00 SEE SHEET 32

290
280
270

208+00 209+00 210+00 211+00 212+00 213+00 214+00 215+00 216+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 212+70
1- X" BLOW-OFF ASSY, LT
SEE DETAIL XX-XX

2
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MAIN

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35033-6-D, 35033-5-D
SEWER:	9641-L, 9753-AL
STORM DRAIN:	9641-L
GAS:	15787-119080
ELECTRIC:	15787-119080,15780-119085
CABLE TV:	29608-13-D
TELEPHONE:	BLJ1969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 2865

CLAIREMONT UNIT 6

3502 3536 3546 3556 4167

EX 8" SD EASEMENT

EX 30" RCP SD

EX 8" VC SWR

EX 8" VC SWR

6" HP GAS

EX 16" PVC WTR

CAUTION

R/W

BC
100

101
1
B.O.

EX 12" WTR

EX 30" STL WTR

FO & CATV

TELE

R/W

EX 8" VC SWR
2" HP GAS
CATV
TELE

EX 8" VC SWR

ABDND.
EX 8" VC SWR

RAPPAHANNOCK AVE.

CLAIREMONT DRIVE

45'
102'
57'
24'
13'

209 210 211 212 213 214 215 216

48" PIPE

M-27

2

CATV, TELE & ELEC

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 103

EX 30" STL WTR

CAUTION

CATV, TELE & ELEC

CAUTION

TELE

CAUTION

R/W

MATCH LINE STA. 208+00 SEE SHEET 30

MATCH LINE STA. 216+00 SEE SHEET 32

3401 0 3605

PUEBLO LANDS SUB. OF LOT 1207
MAP 842

0 40 80 120
SCALE 1" = 40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1874002.83	6269679.58	BC
101	1874096.23	6269612.52	B.O.

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N38° 35'50" W		351.59'	48" WSP (CML&TC)
2	32° 26'35"	975'	448.41'	48" WSP (CML&TC)

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

C-27

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 208+00 TO STA. 216+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 31 OF SHEETS

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

WATER WBS S-16027
SEWER WBS B-15141
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-31-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

CLAIREMONT DRIVE

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM27.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

MATCH LINE STA. 216+00 SEE SHEET 31

MATCH LINE STA. 224+00 SEE SHEET 33

EX PAVEMENT

Fill

EX 8" WTR
IE UNK

EX 16" WTR
IE 290.50

TOP OF 30" BRINE
SEE SHEET 103

48" PIPE @ 0.87%

@ 2.33%

Lindavista

IE 278.94

IE 287.33

VPI
STA. 223+00
IE 285.00

300
290
280

216+00 217+00 218+00 219+00 220+00 221+00 222+00 223+00 224+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

MAP 9788

MAP 2872

PM 7415

CLAIREMONT KEMPER CONDOS

CLAIREMONT UNIT 7

EX 15' SWR EASEMENT

EX 24' WTR EASEMENT

EX 8" AC WTR

1-1/4" HP GAS

STA. 219+83.53
(103) HPI

6" HP GAS

TELE

EX 8" VC SWR

EX 8" VC SWR

ABDND
EX 8" VC SWR

(100) EC

2 102

48" PIPE

CLAIREMONT DRIVE

EX 16" PVC WTR

CLAIREMONT DRIVE

R/W

45'

60'

19'

102'

42'

CAUTION

FO

1 101

FO, TELE & ELEC

TELE

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 103

3624 3650 3660 3670 3614 3605 3799

PUEBLO LANDS SUB. OF LOT 1207
MAP 842

CAUTION
6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

0 40 80 120
SCALE 1" = 40'

1 101
BY CONTRACTOR
FURNISH AND INSTALL
STA. 217+43.67
1 - 45° HPI BEND

2 102
BY CONTRACTOR
FURNISH AND INSTALL
STA. 217+83.20
1 - 45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35033-7-D
SEWER:	9753-AL
STORM DRAIN:	NO INFO
GAS:	15780-119090,15780-119095
ELECTRIC:	NO INFO
CABLE TV:	29608-13-D
TELEPHONE:	BLJ1969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1874504.87	6269468.18	EC
101	1874544.60	6269463.57	HPI BEND
102	1874569.15	6269432.58	HPI BEND
103	1874769.15	6269433.93	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	32° 26'35"	975'	103.67'	48" WSP (CML&TC)
2	N6° 36'49" W		40'	48" WSP (CML&TC)
3	N0° 23'11" E		39.53'	48" WSP (CML&TC)
4	N1° 18'01" E		416.80'	48" WSP (CML&TC)

C-28

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 216+00 TO STA. 224+00 AT CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 32 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

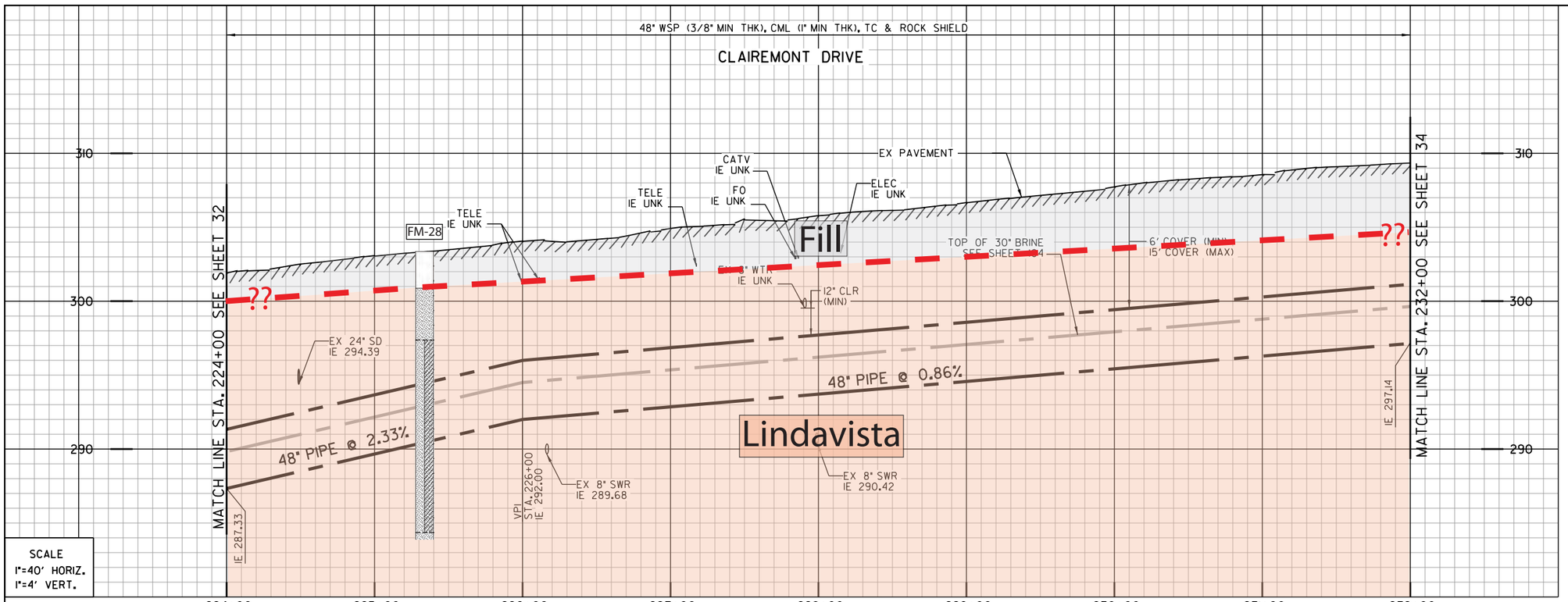
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-32-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

CLAIREMONT DR

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM28.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 226+09.08
1 - 45° HPI BEND

2 (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 226+27.47
1 - 45° HPI BEND

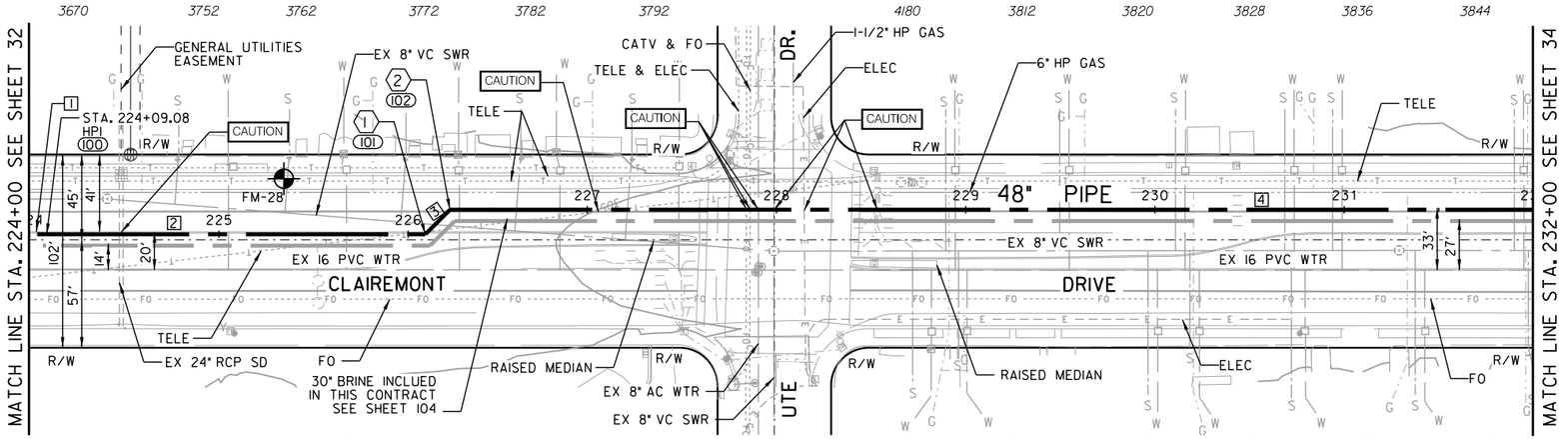
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35033-8-D
SEWER:	9753-AL
STORM DRAIN:	9753-AL
GAS:	15780-119095,15780-119100
ELECTRIC:	15780-119100
CABLE TV:	NO INFO
TELEPHONE:	BL11969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 2872
CLAIREMONT UNIT 7

MAP 2872
CLAIREMONT UNIT 7



PUEBLO LANDS SUB. OF LOT 1207
MAP 842

CLAIREMONT UNIT 7
MAP 2872

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1875194.92	6269443.60	HPI
(101)	1875394.89	6269447.11	HPI BEND
(102)	1875408.12	6269434.34	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N1° 18'01" E		9.09'	48" WSP (CML&TC)
2	N1° 00'22" E		200'	48" WSP (CML&TC)
3	N43° 59'38" W		18.38'	48" WSP (CML&TC)
4	N1° 00'22" E		572.54'	48" WSP (CML&TC)

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCEVATION SDG&E STANDBY REQUIRED

SCALE 1" = 40'

C-29

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 224+00 TO STA. 232+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 33 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESIGNED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

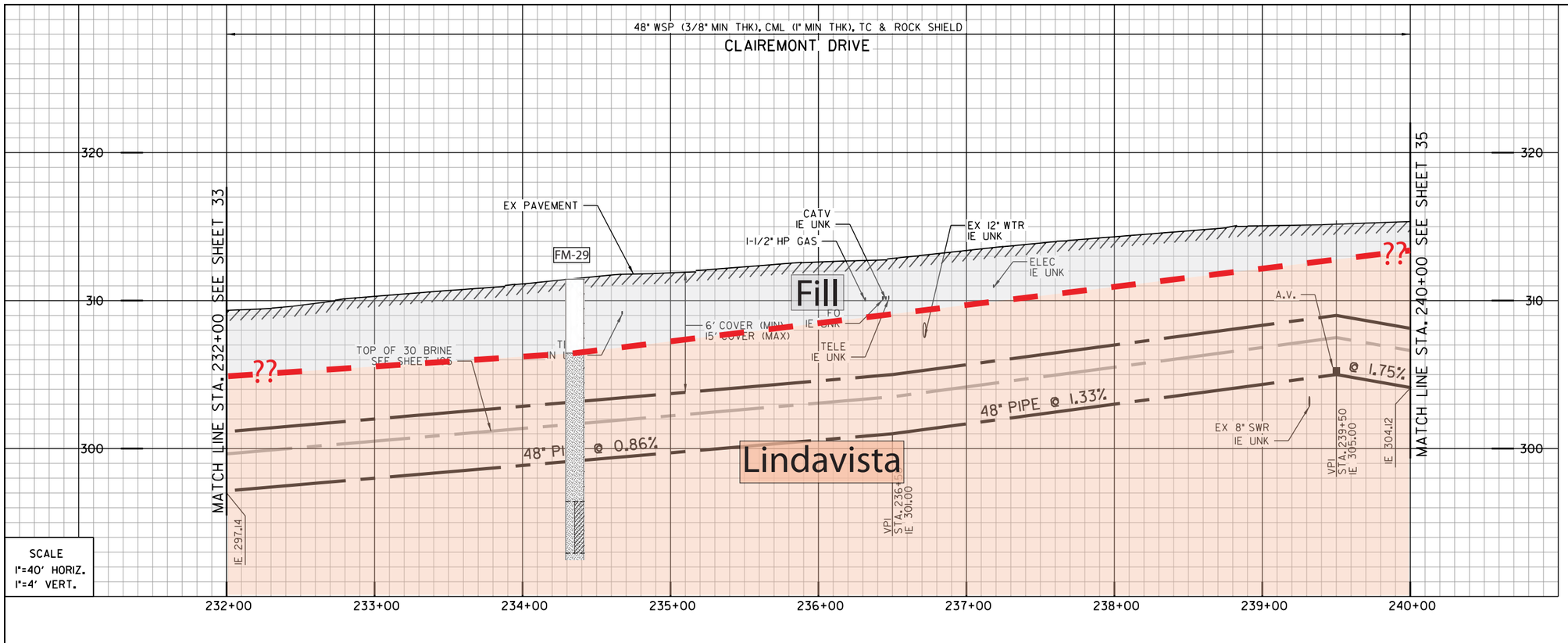
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-33-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

CLAIREMONT DRIVE

60% SUBMITTAL



① (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 239+50
1-3" VACUUM RELIEF VALVE ASSY.
1-2" COMBINATION AIR/VACUUM VALVE ASSY.
W/ ODOR CONTROL VALVE
IN 8'X8' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

②
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MANHOLE

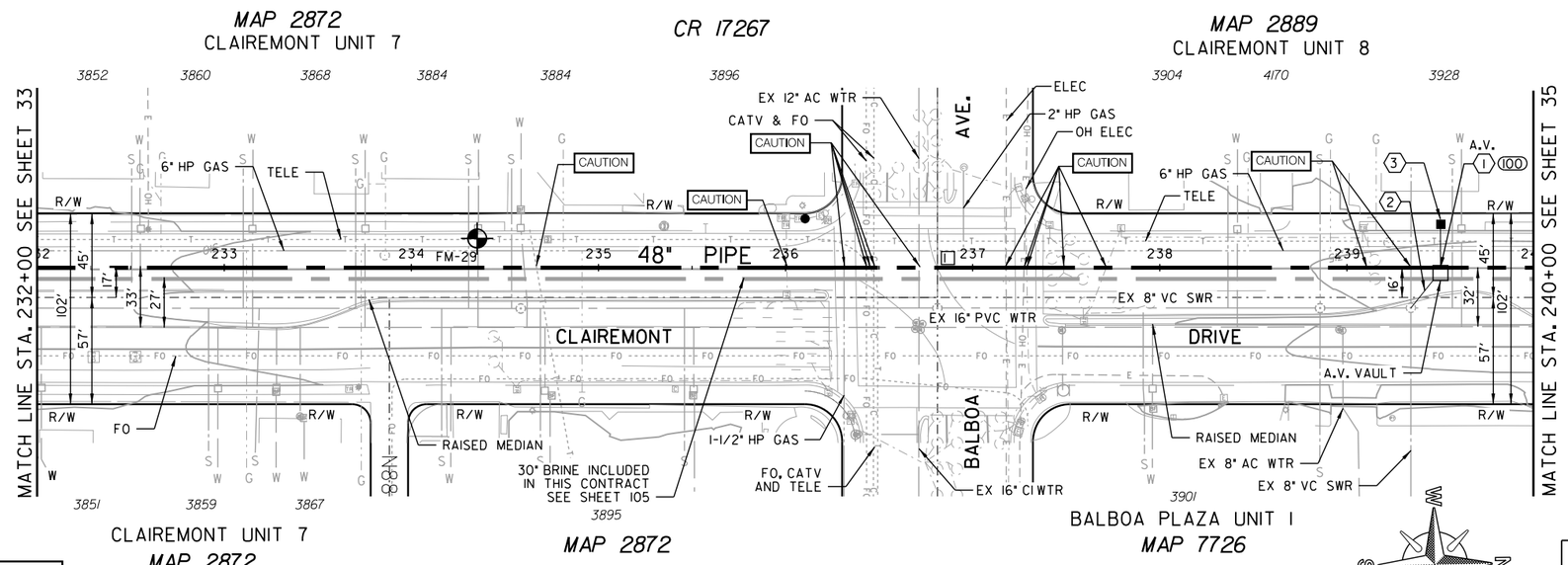
③
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

④
BY CONTRACTOR
FURNISH AND INSTALL
CATHODIC PROTECTION RECTIFIER

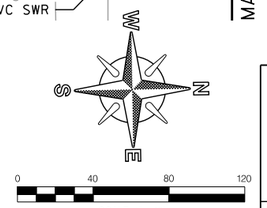
REFERENCE:

WATER:	35033-9-D, 35033-10-D
SEWER:	9844-L
STORM DRAIN:	NO INFO
GAS:	15780-119105,15780-119110
ELECTRIC:	15787-119105,15780-119115
CABLE TV:	NO INFO
TELEPHONE:	BL11969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- Boring
- Boring - AGE, 2017
- Boring - CWP, 1992
- Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)



CAUTION
6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1876730.44	6269457.83	A.V.

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N1° 00'22" E		800'	48" WSP (CML&TC)

C-30

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 232+00 TO STA. 240+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 34 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA
FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

TECHNICALLY RES: LAILA NASRAWI, PROJECT MANAGER
CHECKED: RIC: DARIN SANCHEZ, PROJECT ENGINEER
000-0000, CCS27 COORDINATE
0000-0000, CCS83 COORDINATE
40067-34-D

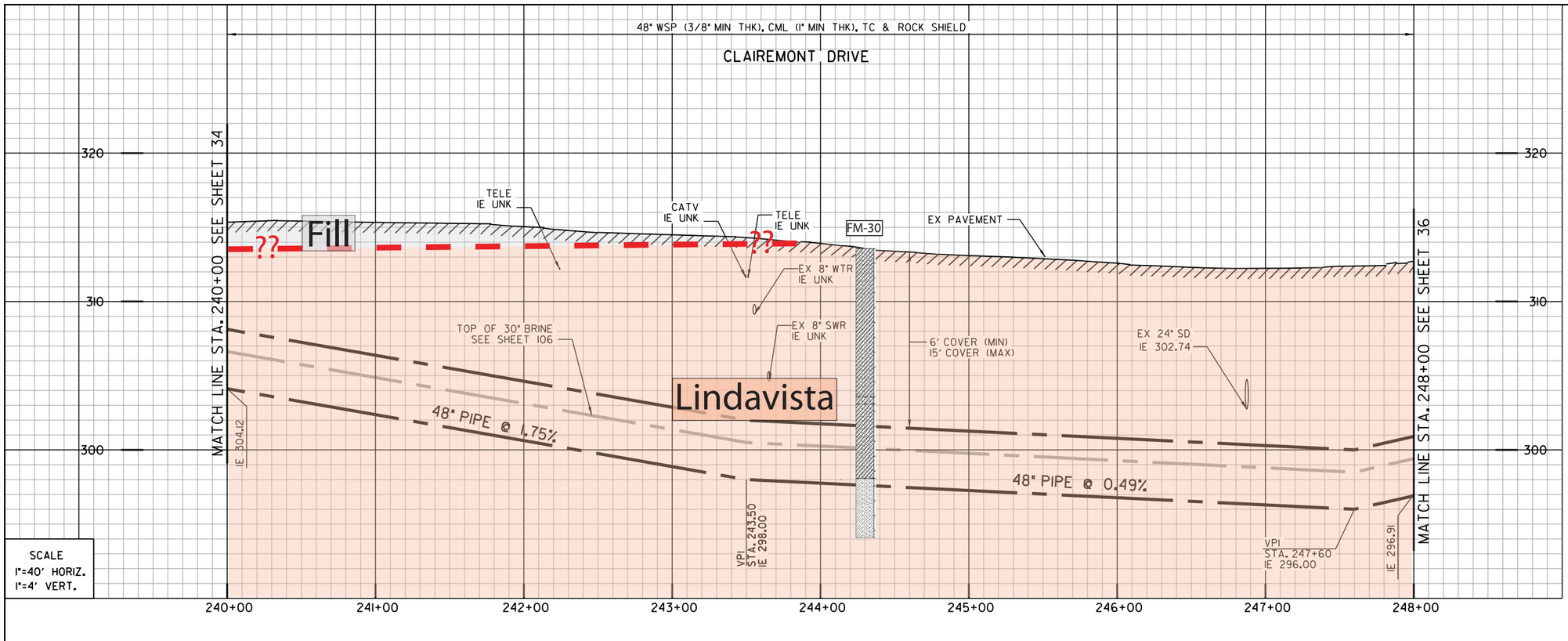
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM30.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

CLAIREMONT DRIVE

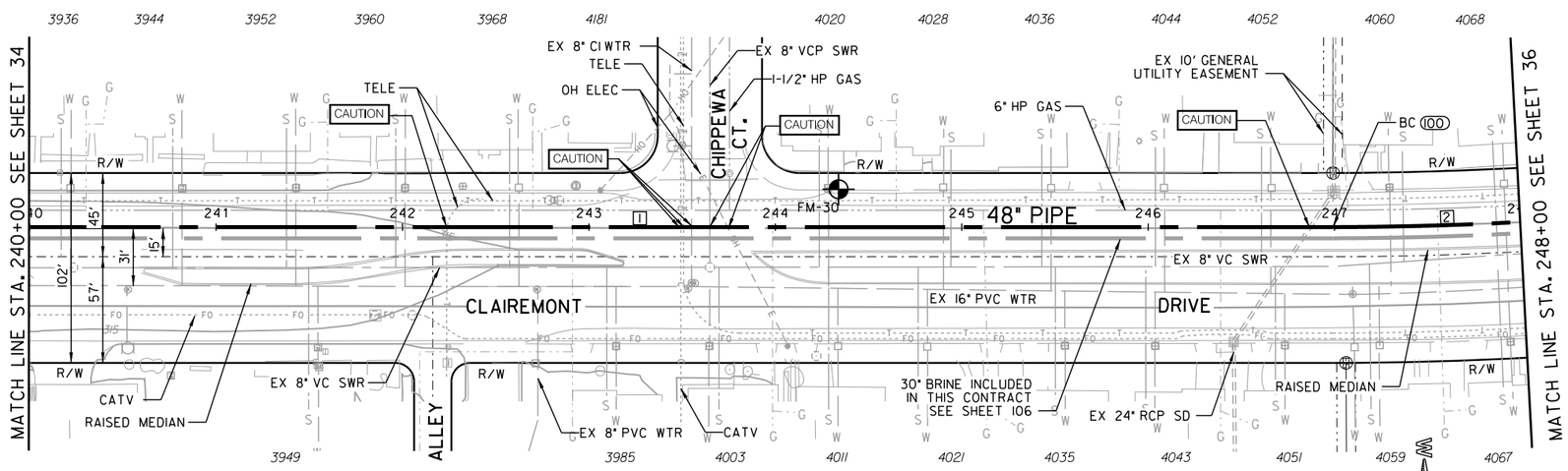


1 (103)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 247+60
1- BLOW OFF VALVE
SEE PIPING DETAIL

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35033-10-D
SEWER:	9844-L
STORM DRAIN:	9867-L
GAS:	15780-11911S
ELECTRIC:	15780-11911S
CABLE TV:	NO INFO
TELEPHONE:	BLH1969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1877479.48	6269470.72	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N1° 00'22" E		699.15'	48" WSP (CML&TC)
2	37° 00'22"	1984'	100.85'	48" WSP (CML&TC)

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

0 40 80 120
SCALE 1"=40'

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

C-31

MORENA PUMP STATION AND CONVEYANCE SYSTEM
SEWER FORCEMAIN
STA. 240+00 TO STA. 248+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 35 OF SHEETS

SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

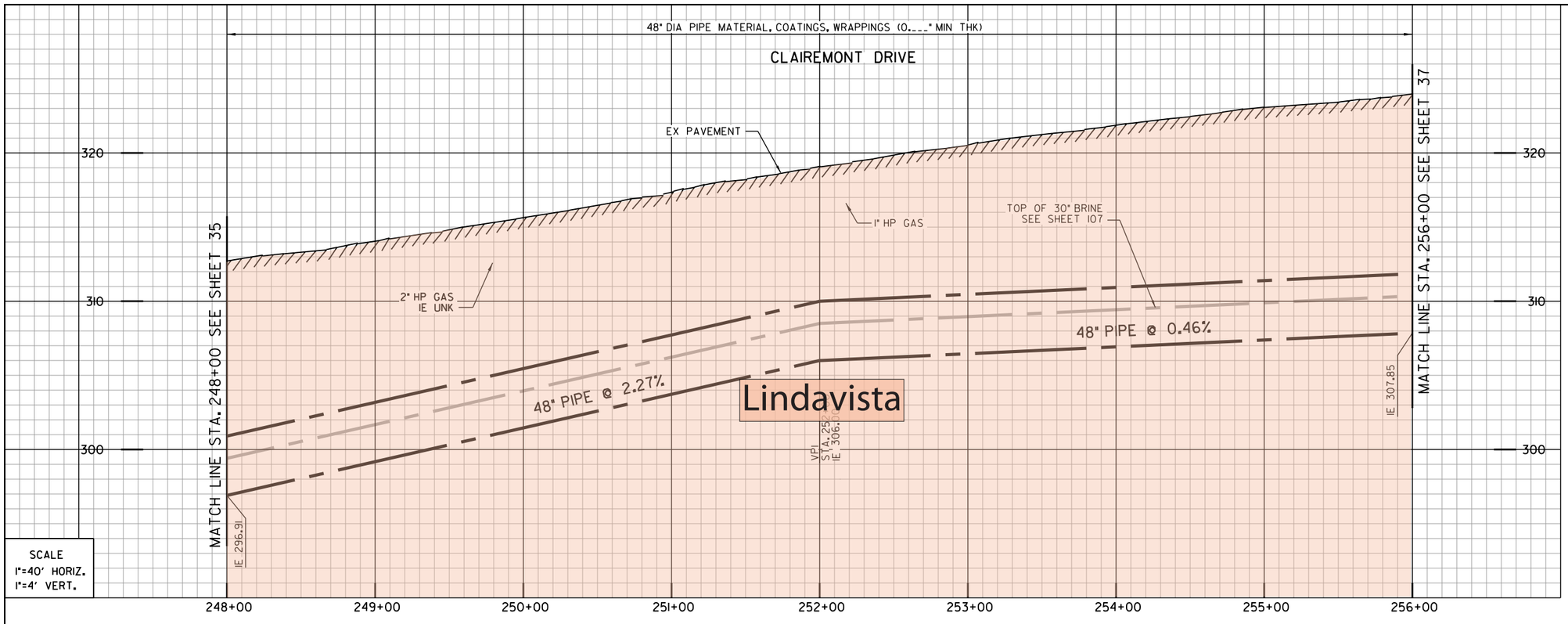
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

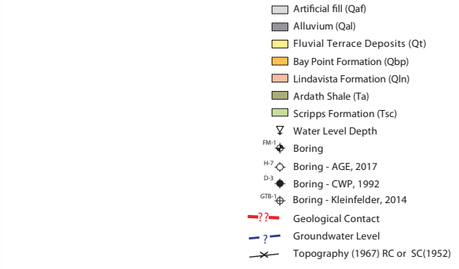
DESIGNED BY: LAILA NASRAWI PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-35-D

CLAIREMONT DRIVE

60% SUBMITTAL

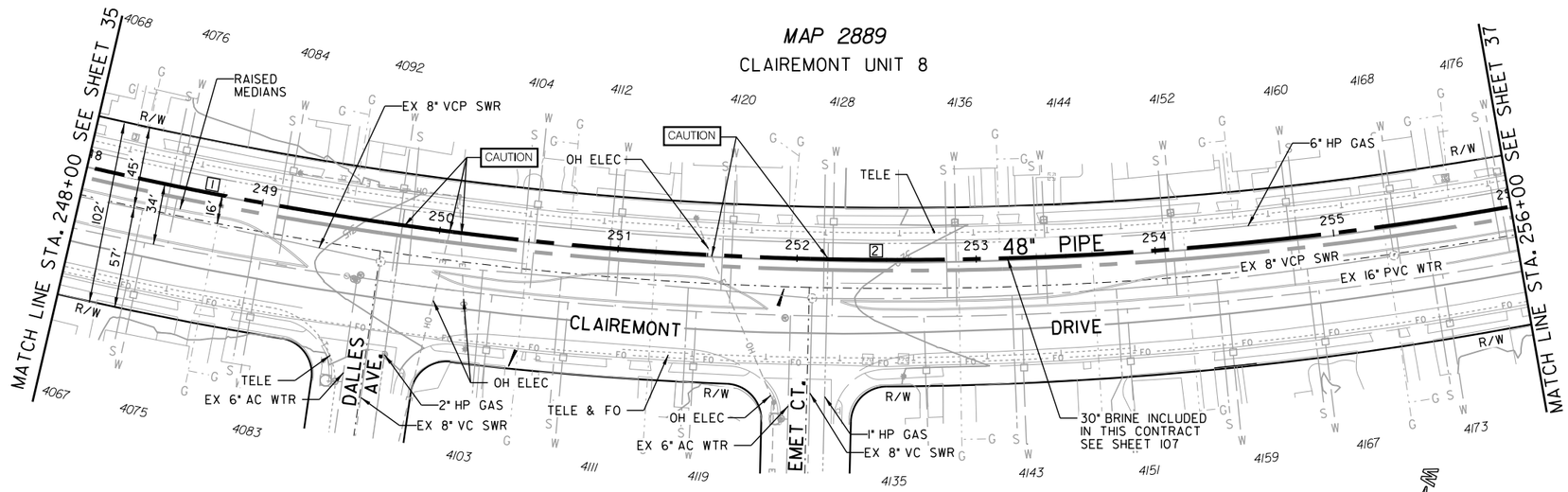
\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM31.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl





REFERENCE:

WATER:	35033-II-D
SEWER:	9844-L
STORM DRAIN:	NO INFO
GAS:	NO INFO
ELECTRIC:	15780-119125
CABLE TV:	NO INFO
TELEPHONE:	BLH1969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

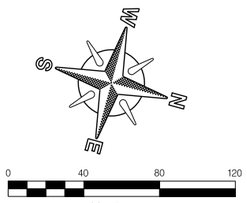


PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	37° 00'22"	1984'	800'	48" WSP (CML&TC)

CAUTION
6" HP GASI CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

CLAIREMONT UNIT 8
MAP 2889

CLAIREMONT UNIT 8
MAP 2889



C-32

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 248+00 TO STA. 256+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 36 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

DESIGNED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-36-D

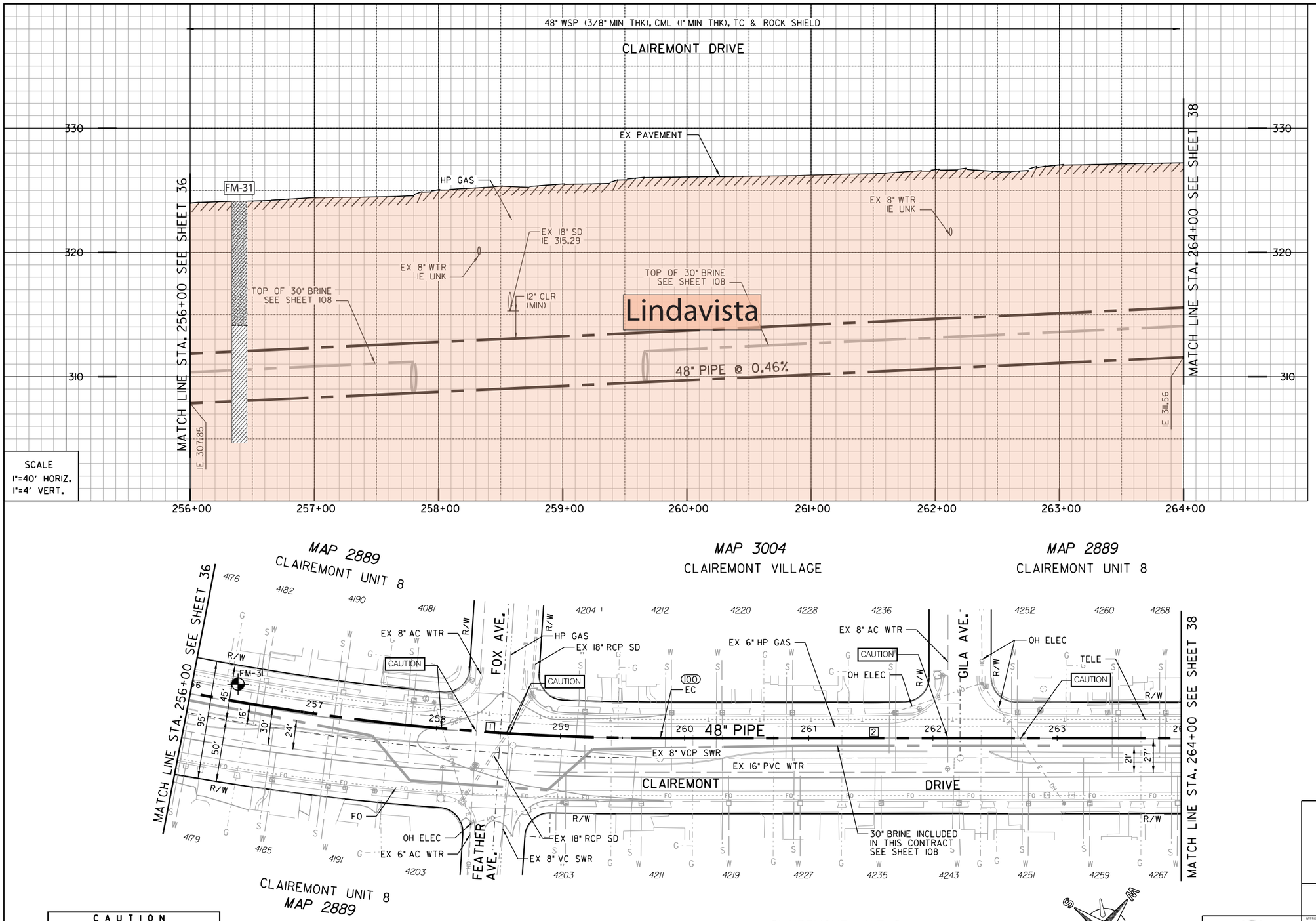
REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

CLAIREMONT DRIVE

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM32.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

REFERENCE:

WATER:	35033-12-D, 35033-13-D
SEWER:	9845-L
STORM DRAIN:	9855-L
GAS:	15780-119130
ELECTRIC:	15780-119125,15780-119130
CABLE TV:	NO INFO
TELEPHONE:	BLH1968
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1878680.32	6269091.60	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	37° 00'22"	1984'	380.46'	48" WSP (CML&TC)
2	N36° 00'09" W		419.54'	48" WSP (CML&TC)

CLAIREMONT DRIVE

C-33

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 256+00 TO STA. 264+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 37 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

TECHNICAL REP.: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-37-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM33.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), CMC & ROCK SHIELD

CLAIREMONT DRIVE

EX PAVEMENT

FM-32

EX 6" WTR
IE 324.50

EX 8" SWR
IE UNK

TELE
IE UNK

OF 30" BRINE
EE SHEET 109

Lindavista

48" PIPE @ 0.46%

IE 311.56

IE 315.27

MATCH LINE STA. 264+00 SEE SHEET 37

MATCH LINE STA. 272+00 SEE SHEET 39

330
320
310

264+00 265+00 266+00 267+00 268+00 269+00 270+00 271+00 272+00

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

SCALE
1"=40' HORIZ.
1"=4' VERT.

REFERENCE:

WATER:	35033-12-D,35033-13-D
SEWER:	9846-L, 9854-L, 9858-L
STORM DRAIN:	NO INFO
GAS:	15772-119130,15772-119135,15772-119140
ELECTRIC:	15772-119135
CABLE TV:	NO INFO
TELEPHONE:	BLH1968
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 2889
CLAIREMONT UNIT 8

MAP 2889
CLAIREMONT UNIT 8

MATCH LINE STA. 264+00 SEE SHEET 37

MATCH LINE STA. 272+00 SEE SHEET 39

4268 4276 4284 4290 4296 4304 4310 4316 4322 3980 4336 4342 4348

100 BC

TELE

6" HP GAS

CAUTION

EX 6" AC WTR
EX 8" VCP SWR

HAWATHA WAY

OH ELEC

FM-32

265 266 267 268 269 270 271

48" PIPE

90' 45' 15' 28' 45'

R/W

CLAIREMONT DRIVE

FEATHER AVE.

FO

OH ELEC
TELE
EX 6" AC WTR
EX 8" VCP SWR

EX 16" PVC WTR
EX 8" VCP SWR

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 109

8' GENERAL UTILITY ESMT

EX 8" VCP SWR

TELE

28' 45' 89' 44' 32'

4267 4275 4283 4291 4294 4307 4317 4323 4329 4335 4341 4347

CLAIREMONT UNIT 8
MAP 2889

CLAIREMONT UNIT 8
MAP 2889

S W N E

0 40 80 120
SCALE 1" = 40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1879171.19	6268734.93	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N36° 00'09" W		187.22'	48" WSP (CML&TC)
2	13° 20'13"	3015'	612.78'	48" WSP (CML&TC)

C-34

CAUTION

6" HP GASI CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 264+00 TO STA. 272+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 38 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

WATER WBS S-16027
SEWER WBS B-15141

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

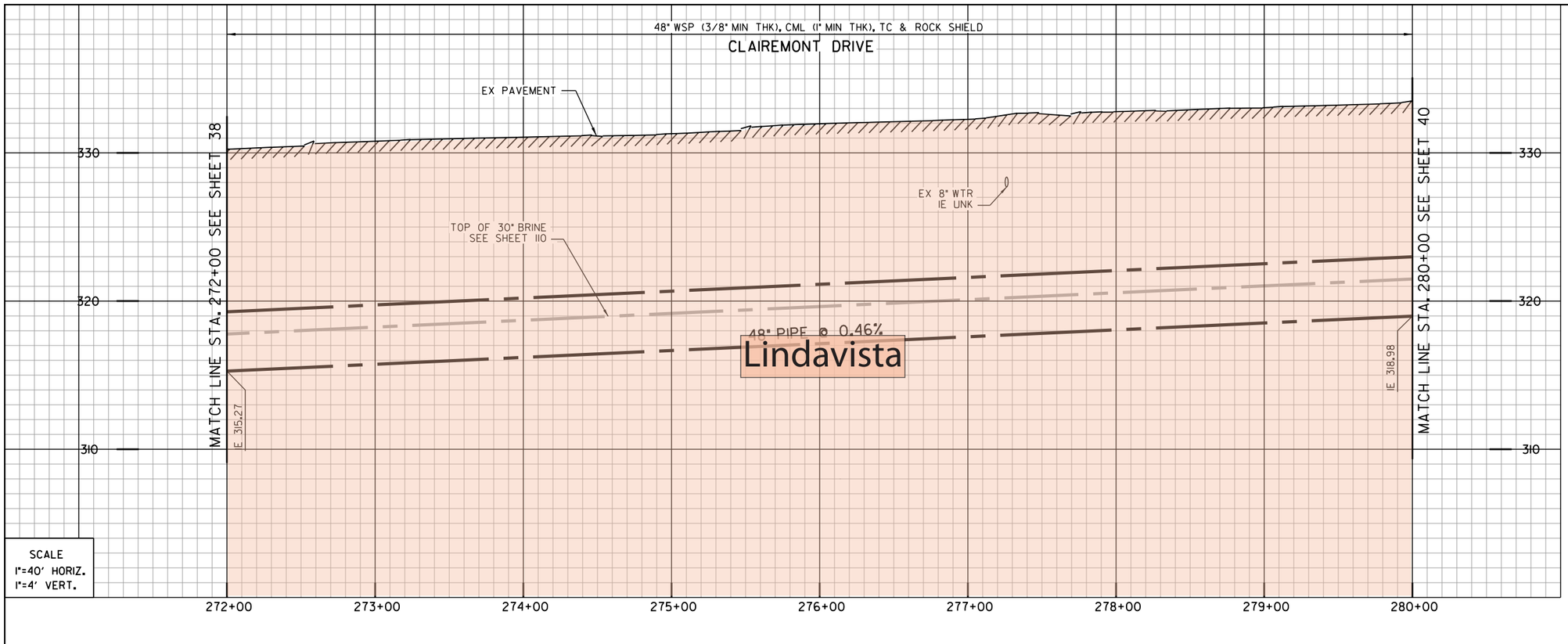
40067-38-D

CLAIREMONT DR

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM34.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

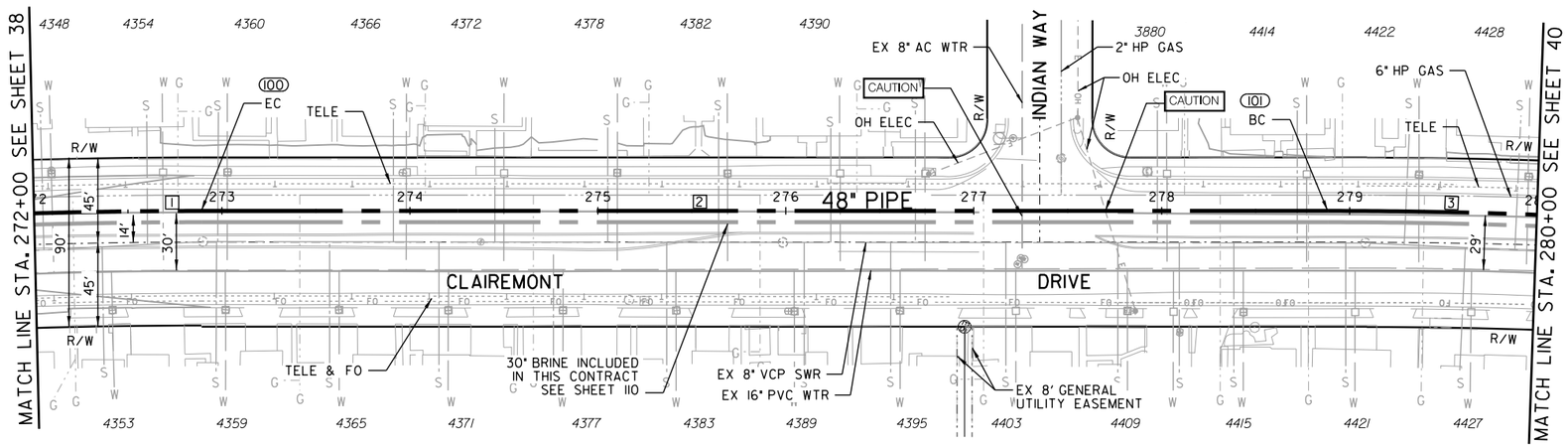
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35032-2-D, 35033-14-D
SEWER:	9847-L
STORM DRAIN:	NO INFO
GAS:	15772-119140, 15772-119145
ELECTRIC:	15772-119145
CABLE TV:	NO INFO
TELEPHONE:	BLG1968
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 2889
CLAIREMONT UNIT 8

MAP 2889
CLAIREMONT UNIT 8



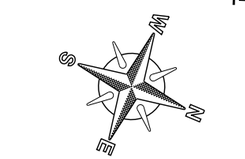
CLAIREMONT UNIT 8
MAP 2889

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1879781.41	6268391.48	EC
(101)	1880334.24	6268160.11	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	13° 20'13"	3015'	89.04'	48" WSP (CML&TC)
2	N22° 42'39" W		599.29'	48" WSP (CML&TC)
3	12° 39'10"	3012'	111.67'	48" WSP (CML&TC)

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED



0 40 80 120
SCALE 1"=40'

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

C-35

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 272+00 TO STA. 280+00 AT CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 39 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA, FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

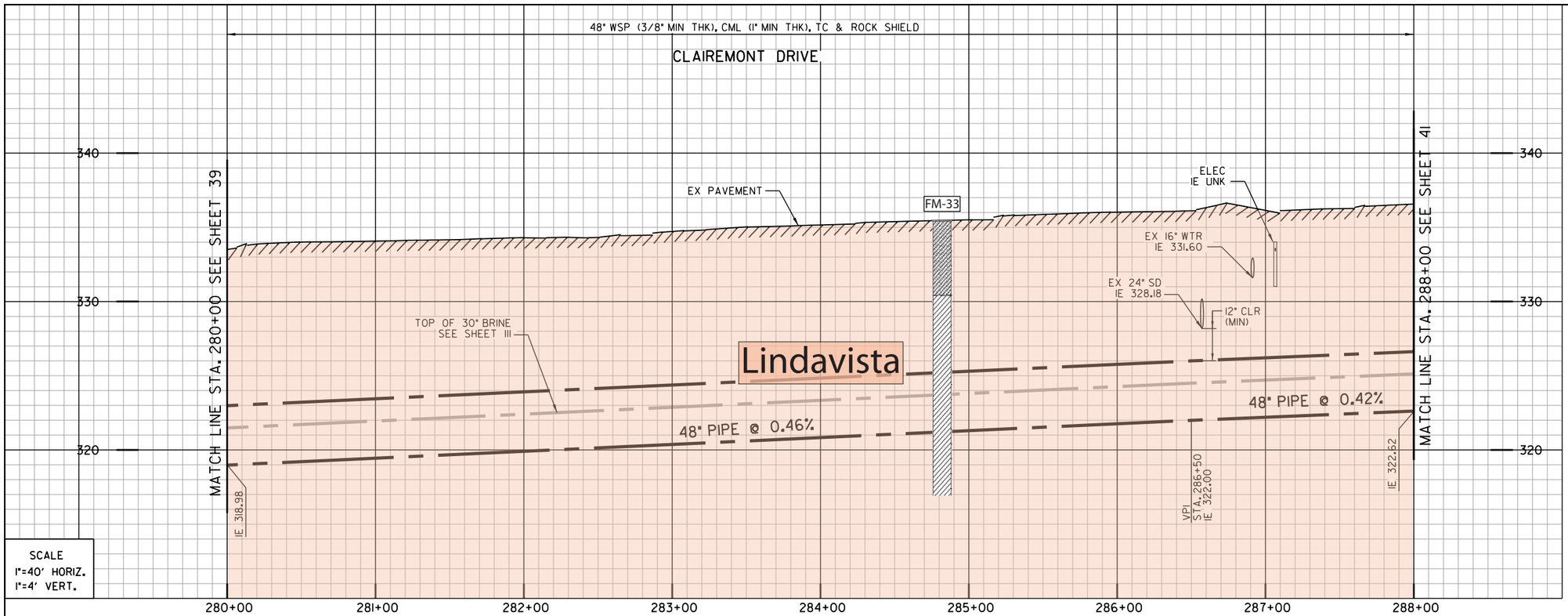
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

DESIGNED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-39-D

CLAIREMONT DRIVE

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM35.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 286+49.95
1 - 50° HPI BEND

2 (103)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 287+02.68
1 - 45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

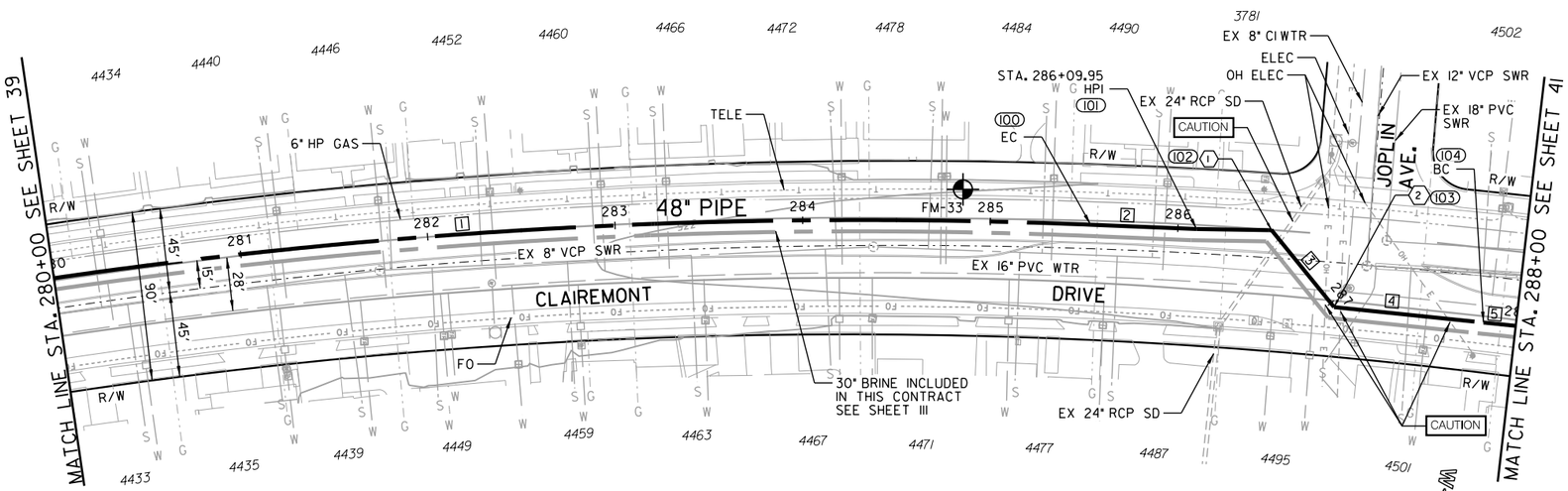
WATER:	35032-3-D
SEWER:	37841-5-D, 9860-L, 9847-L, 9848-L
STORM DRAIN:	9848-L
GAS:	15765-119150
ELECTRIC:	15765-119150
CABLE TV:	NO INFO
TELEPHONE:	BLF1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1880971.08	6267972.86	EC
(101)	1881026.69	6267963.00	HPI
(102)	1881065.89	6267955.04	HPI BEND
(103)	1881107.14	6267987.87	HPI BEND
(104)	1881186.63	6267978.84	BC

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	12° 39'10"	3012'	553.48'	48" WSP (CML&TC)
2	N10° 03'29" W		56.48'	48" WSP (CML&TC)
3	N11° 28'49" W		40'	48" WSP (CML&TC)
4	N38° 31'11" E		52.73'	48" WSP (CML&TC)
5	N6° 28'49" W		80'	48" WSP (CML&TC)
6	7° 33'28"	2000'	17.31'	48" WSP (CML&TC)

MAP 2889

CLAIREMONT UNIT 8



CLAIREMONT UNIT 8
MAP 2889

SCALE 1" = 40'

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

CLAIREMONT DRIVE

C-36

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 280+00 TO STA. 288+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 40 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-40-D

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM36.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

EX PAVEMENT

EX 6" WTR (FH)
IE UNK

TOP OF 30" BRINE
SEE SHEET 112

48" PIPE @ 0.42%

Lindavista

EX 12" SWR
IE 318.69

IE 322.62

IE 325.94

MATCH LINE STA. 288+00 SEE SHEET 40

MATCH LINE STA. 296+00 SEE SHEET 42

340 330 320

288+00 289+00 290+00 291+00 292+00 293+00 294+00 295+00 296+00

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

SCALE
1"=40' HORIZ.
1"=4' VERT.

REFERENCE:

WATER:	35032-3-D, 35032-4-D
SEWER:	9848-L, 9849-L, 37841-5-D, 37841-6-D
STORM DRAIN:	NO INFO
GAS:	15765-119165
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 3008

CLAIREMONT UNIT 15

2" HP GAS
TELE
EX 12" VCP SWR
EX 18" VCP SWR
EX 10" VCP SWR
EX 16" PVC WTR
STA. 291+54.57
HPI (101)
EC (100)
RAISED MEDIAN
R/W
CLAIREMONT DRIVE
48" PIPE
CAUTION
CAUTION
FO
EX 12" SWR
30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 112
45'
98'
88'
53'
14'
5'

MATCH LINE STA. 288+00 SEE SHEET 40

MATCH LINE STA. 296+00 SEE SHEET 42

289 290 291 292 293 294 295

4507 4508 4511 4514 4515 4520 4521 4526 4527 4530 4533 4538 4537 4543 4544 4549 4550 4555 4556 4561 4562 4565 4568 4569 4574 4580 0

CLAIREMONT UNIT 9

MAP 2902

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1881449.90	6267965.24	EC
(101)	1881557.97	6267966.78	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	7° 33'28"	2000'	246.50'	48" WSP (CML&TC)
2	N0° 48'59" E		108.08'	48" WSP (CML&TC)
3	N0° 48'20" E		445.43'	48" WSP (CML&TC)

CAUTION
6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

N E S W

0 40 80 120

SCALE 1"=40'

C-37

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 288+00 TO STA. 296+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 41 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

40067-41-D

CLAIREMONT DRIVE

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM37.dgn

9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

6" HP GAS
IE UNK

TELE
IE UNK

EX PAVEMENT

FM-34

TELE
IE UNK

EX 16" WTR
IE 337.33

EX 18" SD
IE 338.06

TELE
IE UNK

6' COVER (MIN)
15' COVER (MAX)

TOP OF 30" BRINE
SEE SHEET 113

EX 8" WTR
IE UNK

48" PIPE @ 0.42%

Lindavista

MATCH LINE STA. 296+00 SEE SHEET 41

MATCH LINE STA. 304+00 SEE SHEET 43

IE 325.94

IE 329.26

EX 18" SWR
IE 318.74

EX 8" SWR
IE 320.68

340
330
320

296+00 297+00 298+00 299+00 300+00 301+00 302+00 303+00 304+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

① (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 298+69.19
1-45° HPI BEND

② (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 299+34.71
1-45° HPI BEND

③
BY CONTRACTOR
FURNISH AND INSTALL
CATHODIC PROTECTION RECTIFIER

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35032-3-D, 35032-05-D
SEWER:	37841-06-D, 9850-L, 9851-L
STORM DRAIN:	13659-D
GAS:	15765-119165
ELECTRIC:	15765-119170
CABLE TV:	NO INFO
TELEPHONE:	BLF1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 3008
CLAIREMONT UNIT 15

MAP 3008
CLAIREMONT UNIT 15

6" HP GAS
EX 8" VCP SWR
EX 16" CI WTR
CAUTION
100 ①
CAUTION
RAISED MEDIAN
2" HP GAS
TELE
EX 18" PVC SWR
EX 16" PVC WTR
FM-34
3
TELE
EX 18" PVC SWR
EX 16" PVC WTR
6" HP GAS
MESA BLVD.
TELE
2 101
CAUTION
CAUTION
R/W
300
301
3 48" PIPE
02
303
EX 10" VCP SWR
CLAIREMONT
DRIVE
CLAIREMONT
TRAFFIC LOOP
EX 18" RCP SD
ELEC
TELE
30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 113
I-1/2" HP GAS
TELE
RAISED MEDIAN
EX 8" PVC WTR
FO
R/W
MATCH LINE STA. 296+00 SEE SHEET 41
MATCH LINE STA. 304+00 SEE SHEET 43
4586 4592 3766 4616 0 0 4622 4628
4577 3801 3802 4615

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1882272.51	6267976.83	HPI BEND
(101)	1882319.49	6267931.15	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N 0° 48'20" E		269.19'	48" WSP (CML&TC)
2	N44° 11'40"W		65.53'	48" WSP (CML&TC)
3	N 0° 48'20" E		465.29'	48" WSP (CML&TC)

C-38

CAUTION

6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

CLAIREMONT UNIT 9
MAP 2902

NORTH CLAIREMONT PLAZA (PM 1228)
MAP 3484

0 40 80 120
SCALE 1"=40'

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 296+00 TO STA. 304+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 42 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-42-D

CLAIREMONT DRIVE

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

MATCH LINE STA. 304+00 SEE SHEET 42

MATCH LINE STA. 312+00 SEE SHEET 44

EX PAVEMENT

Fill

Lindavista

TOP OF 30" BRINE
SEE SHEET 114

48" PIPE @ 0.42%

EX 8" WTR
IE UNK

FO
IE UNK

EX 8" SWR
IE 324.17

IE 329.26

IE 322.58

350

340

330

304+00 305+00 306+00 307+00 308+00 309+00 310+00 311+00 312+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

MAP 3008
CLAIREMONT UNIT 15

MAP 2943
CLAIREMONT MANOR UNIT 1

4634 4640 4646 4652 4658 4664 4670 4676 4682 4690 4704 4716

MATCH LINE STA. 304+00 SEE SHEET 42

MATCH LINE STA. 312+00 SEE SHEET 44

R/W

45'

16'

32'

102'

57'

2" HP GAS

STA. 307+42.71
(100) HPI

TELE

BC
(102)

EX 8" VCP SWR

EX 8" AC WTR

LAKEHURST AVE.

CAUTION

2" HP GAS

TELE

CLAIREMONT DRIVE

1 306 48" PIPE

305 307 308 309 310 311

ELEC

FO

EX 30" SD

EX 2" HP GAS

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 114

EX 8" VCP SWR

EX 8" AC WTR

FO

27'

12'

45'

99'

54'

NORTH CLAIREMONT PLAZA (PM 1228)
MAP 3484

0 40 80 120
SCALE 1"=40'

(1) BY CONTRACTOR
FURNISH AND INSTALL
STA. 307+87.08
I- 11" HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	9850-L, 9861-L, 10288-L
STORM DRAIN:	NO INFO
GAS:	15765-119170, 15765-119175, 15765-119175
ELECTRIC:	238-1707A
CABLE TV:	30064-3-D
TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1883127.41	6267942.51	HPI
(101)	1883171.78	6267942.96	HPI BEND
(102)	1883277.50	6267964.61	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N0° 48'20" E		342.71'	48" WSP (CML&TC)
2	N0° 34'39" E		44.37'	48" WSP (CML&TC)
3	N11° 34'39" E		107.92'	48" WSP (CML&TC)
4	45° 44'01"	1012'	305.00'	48" WSP (CML&TC)

C-39

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 304+00 TO STA. 312+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 43 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

40067-43-D

CLAIREMONT DRIVE

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM39.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT DRIVE

EX PAVEMENT

FM-35

Fill

6' COVER (MIN)
15' COVER (MAX)

TOP OF 30" BRINE
SEE SHEET

EX 8" SWR
IE 339.83

TELE
IE UNK

A.V.

48" PIPE @ 0.98%

48" PIPE @ 1.27%

@ 0.42%

Lindavista

IE 332.58

VPI
STA 313+00
IE 333.00

VPI
STA 318+50
IE 340.00

IE 338.53

MATCH LINE STA. 312+00 SEE SHEET 43

MATCH LINE STA. 320+00 SEE SHEET 45

350
340
330

312+00 313+00 314+00 315+00 316+00 317+00 318+00 319+00 320+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

① (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 318+50
1-3" VACUUM RELIEF VALVE ASSY.
1-2" COMBINATION AIR/VACUUM VALVE ASSY.
W/ ODOR CONTROL VALVE
IN 8'X8' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

②
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MANHOLE

③
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

REFERENCE:

WATER:	NO INFO
SEWER:	10288-L,10289-L
STORM DRAIN:	NO INFO
GAS:	15765-119180
ELECTRIC:	15742-119305
CABLE TV:	238-17074
TELEPHONE:	NO INFO
IMPROVEMENTS:	10288-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
Boring
Boring - AGE, 2017
Boring - CWP, 1992
Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

MAP 2943
CLAIREMONT MANOR UNIT 1

4816 4828 4840 4852 4864 4876 4888 4904
4804 4776 4764 4752 4740 4728 4807 4821

EX 8" VCP SWR
2" HP GAS
TELE
CAUTION
FM-35
48" PIPE
CLAIREMONT DRIVE
ELEC
FO
EX 8" AC WTR
A.V. VAULT
TELE
R/W
30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 115

MATCH LINE STA. 312+00 SEE SHEET 43

MATCH LINE STA. 320+00 SEE SHEET 45

NORTH CLAIREMONT PLAZA (PM 1228)
MAP 3484

SCALE 1" = 40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1883926.12	6268409.47	EC
101	1884005.62	6268533.37	A.V.

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	45° 44'01"	1012'	502.78'	48" WSP (CML&TC)
2	N 57° 18'41" E		297.22'	48" WSP (CML&TC)

C-40

MORENA PUMP STATION AND
CONVEYANCE SYSTEM
SEWER FORCEMAIN
STA. 312+00 TO STA. 320+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 44 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

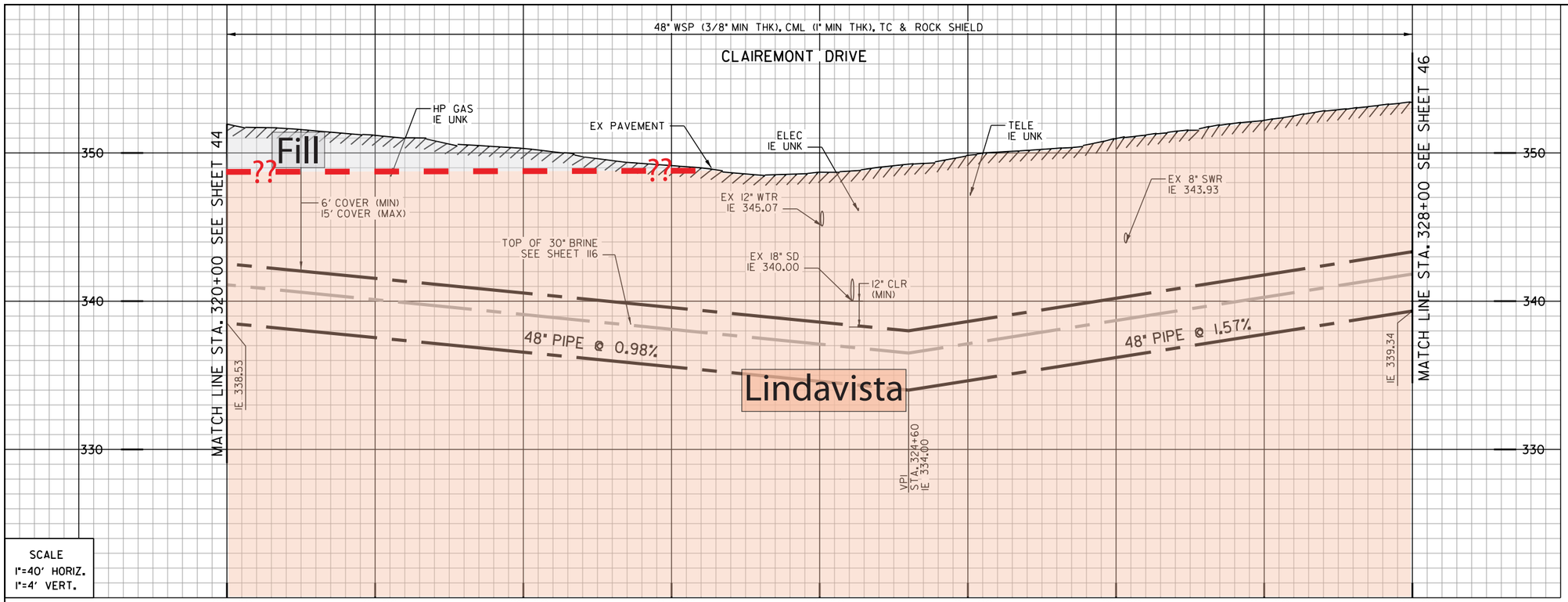
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-44-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

60% SUBMITTAL

CLAIREMONT DRIVE

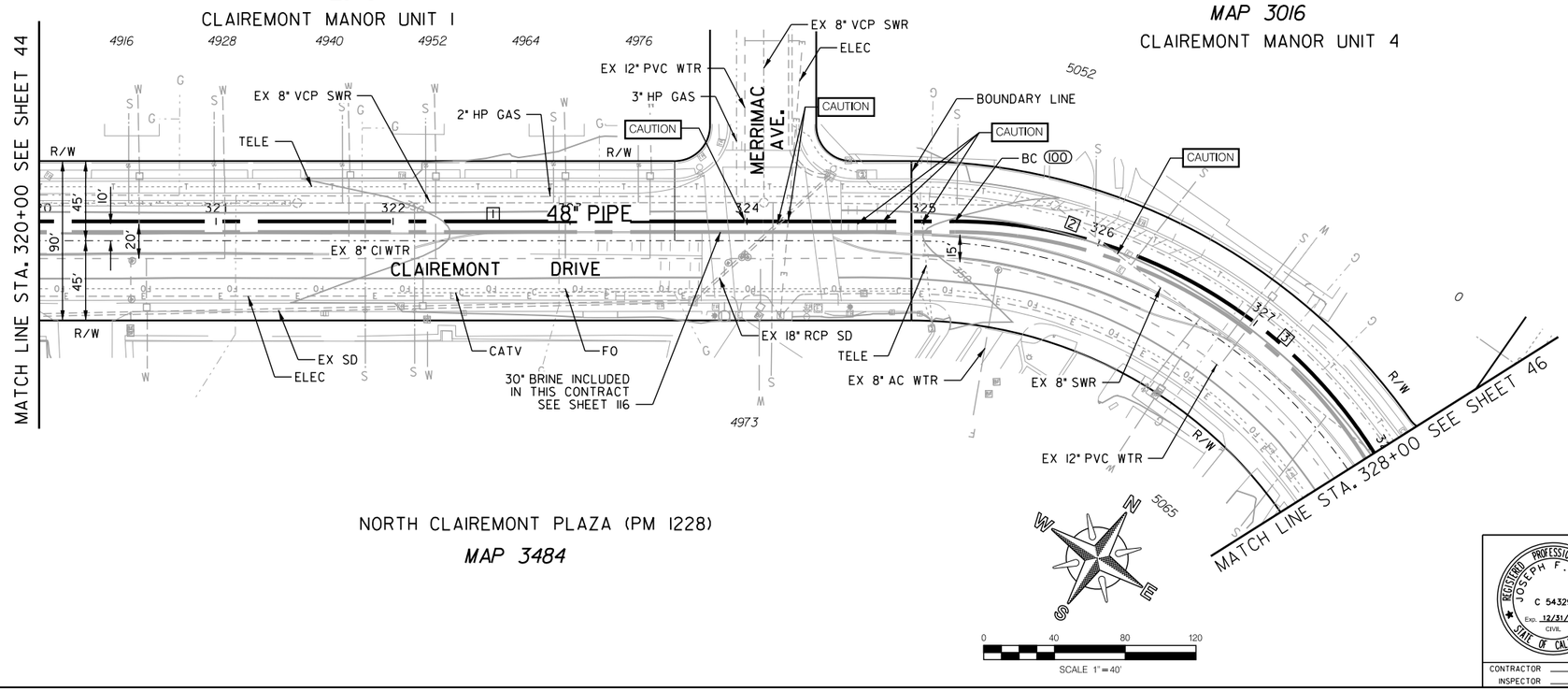
\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM40.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



SCALE
1"=40' HORIZ.
1"=4' VERT.

REFERENCE:

WATER:	35032-9-D, 35032-10-D
SEWER:	10289-L, 10556-L
STORM DRAIN:	10293-L
GAS:	15765-119185
ELECTRIC:	15789-119185
CABLE TV:	BLE1968
TELEPHONE:	NO INFO
IMPROVEMENTS:	10084-L, 10289-L, 10556-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



NORTH CLAIREMONT PLAZA (PM 1228)
MAP 3484

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1884366.11	6269095.13	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N57° 18'41" E		517.48'	48" WSP (CML&TC)
2	74° 14'05"	280'	282.52'	48" WSP (CML&TC)

C–41

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 320+00 TO STA. 328+00 CLAIREMONT DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 45 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

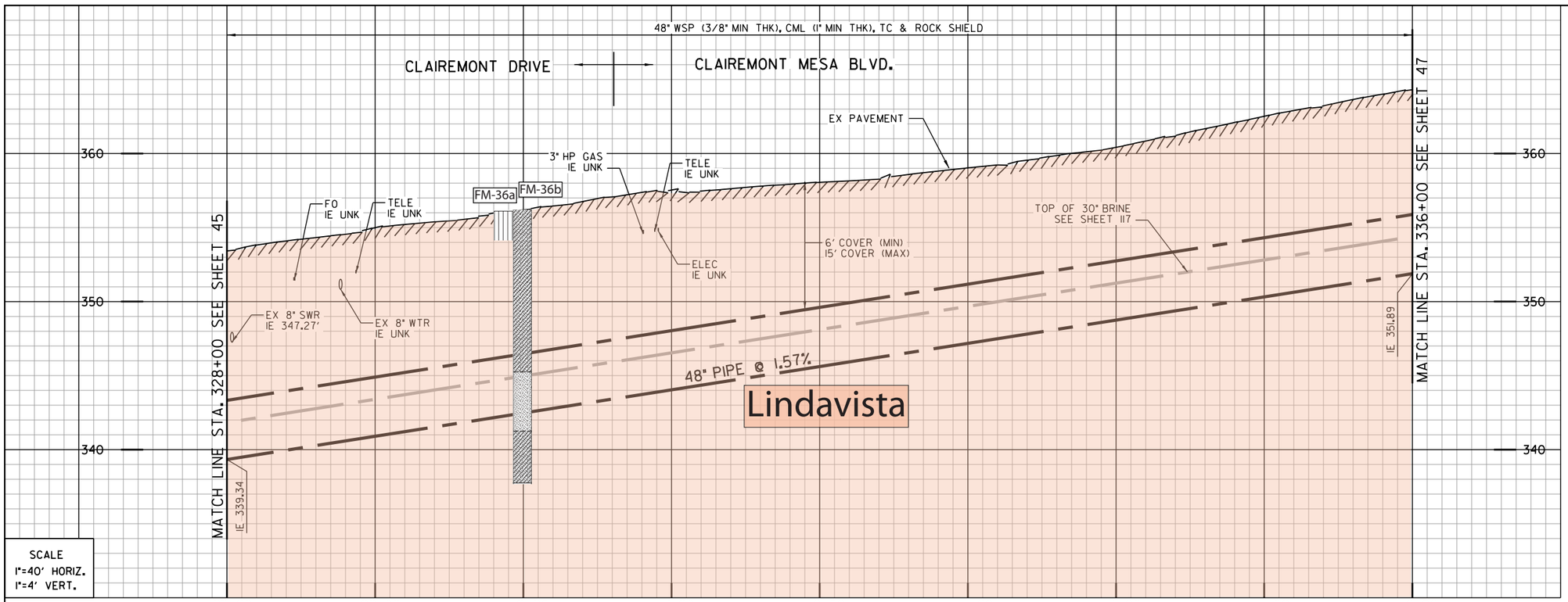
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067–45–D

CLAIREMONT DRIVE

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM41.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

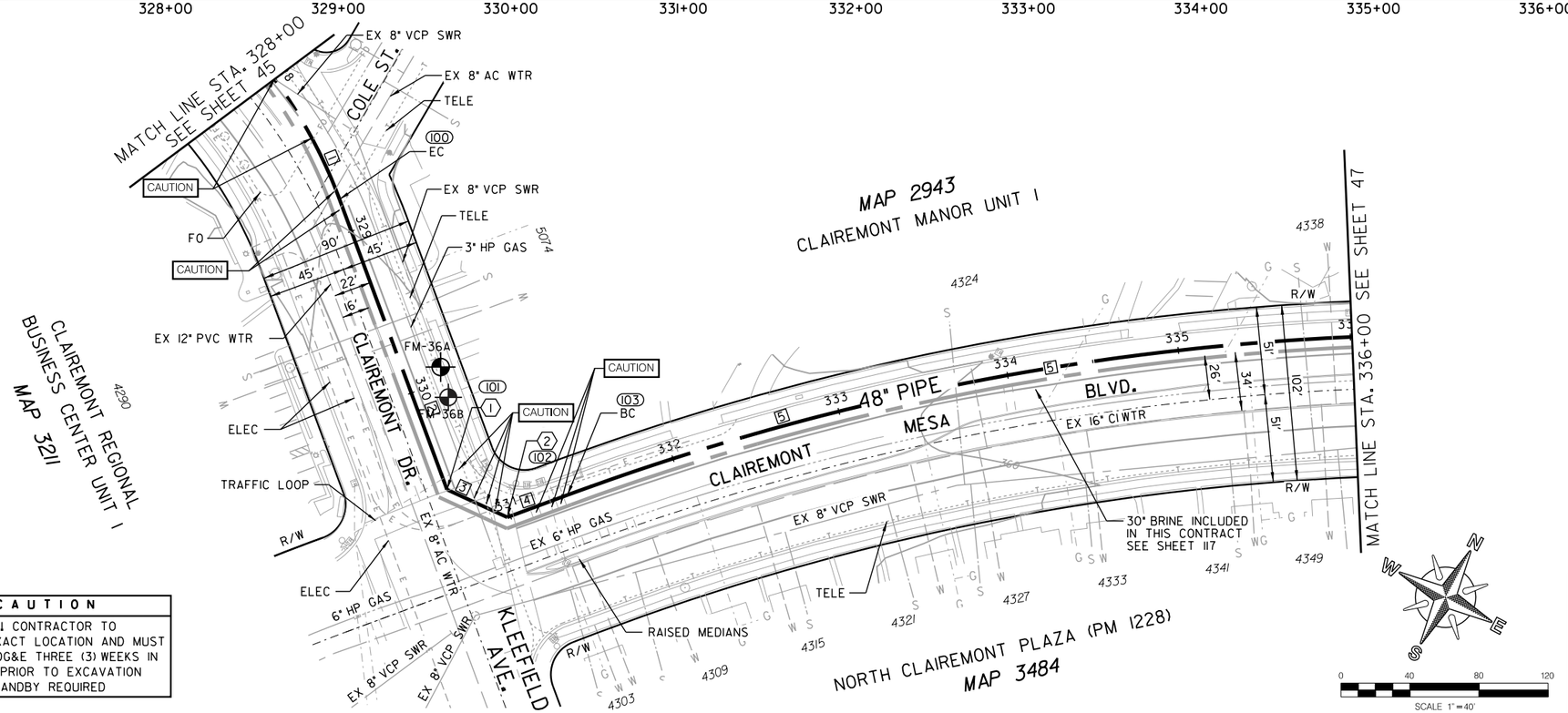
1 (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 330+59.69
1-45° HPI BEND

2 (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 330+98.14
1-45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	35032-8-D
SEWER:	10084-L, 10550-L, 10551-L, 10556-L,
STORM DRAIN:	NO INFO
GAS:	15787-119185
ELECTRIC:	15787-119185
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	10556-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1884340.02	6269432.06	EC
(101)	1884221.02	6269566.34	HPI BEND
(102)	1884223.34	6269604.73	HPI BEND
(103)	1884251.20	6269629.42	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
☐	74° 14'05"	280'	80.26'	48" WSP (CML&TC)
☐	S48° 27'14" E		179.43'	48" WSP (CML&TC)
☐	N86° 32'46" E		38.45'	48" WSP (CML&TC)
☐	N41° 32'46" E		37.23'	48" WSP (CML&TC)
☐	48° 57'57"	1050'	464.63'	48" WSP (CML&TC)

CAUTION

6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-42

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 328+00 AT CLAIREMONT DR. TO
STA. 336+00 AT CLAIREMONT MESA BLVD.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 46 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-46-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

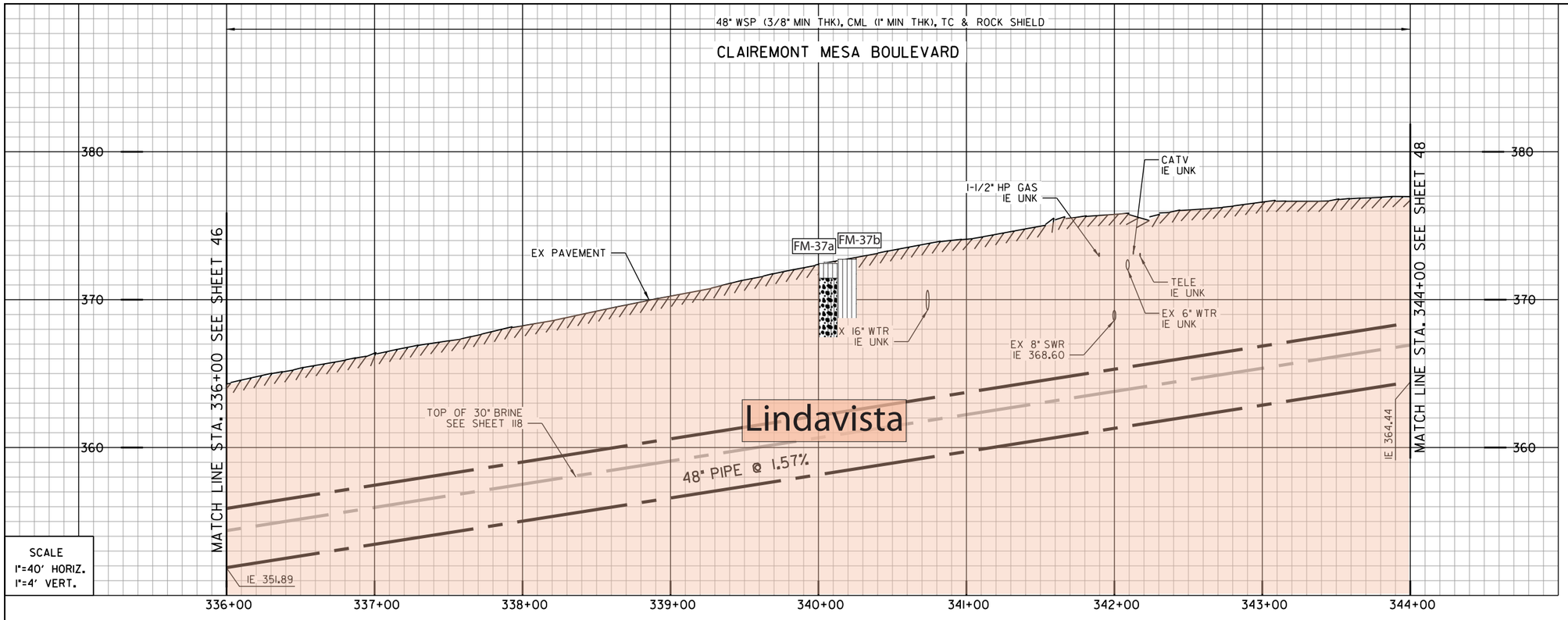
60% SUBMITTAL

CLAIREMONT DR. \ CLAIREMONT MESA BLVD.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM42.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT MESA BOULEVARD

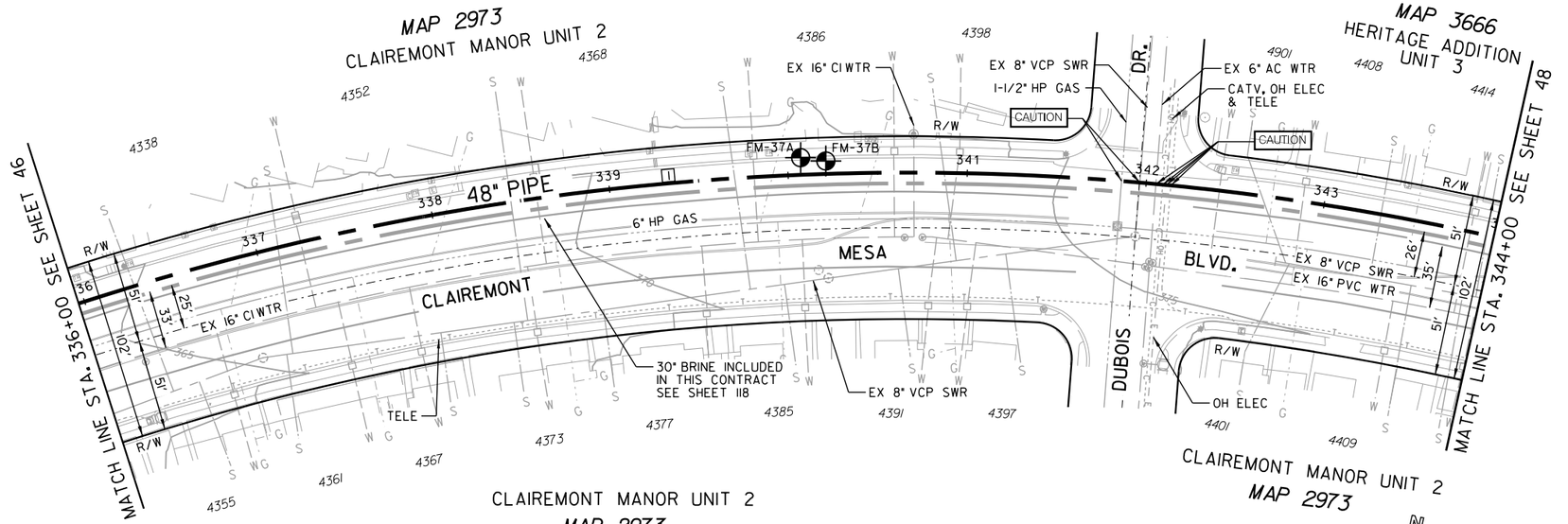


Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
FM-1 Boring
H-7 Boring - AGE, 2017
D-3 Boring - CWP, 1992
GTB-1 Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

SCALE
1"=40' HORIZ.
1"=4' VERT.

REFERENCE:

WATER:	NO INFO
SEWER:	10552-L, 10553-L, 10557-L
STORM DRAIN:	NO INFO
GAS:	15787-19190,15797-19185
ELECTRIC:	15795-19190
CABLE TV:	BLE1970
TELEPHONE:	NO INFO
IMPROVEMENTS:	10551-L, 10552-L, 10553-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	48° 57'57"	1505'	800'	48" WSP (CML&TC)

CAUTION
6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

N W E S

0 40 80 120
SCALE 1" = 40'

C-43

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 336+00 TO 344+00 CLAIREMONT MESA BLVD.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 47 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-47-D

60% SUBMITTAL

CLAIREMONT MESA BOULEVARD

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM43.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

CLAIREMONT MESA BLVD.

GENESEE AVE

MATCH LINE STA. 344+00 SEE SHEET 47

MATCH LINE STA. 352+00 SEE SHEET 49

380 / 370 / 360

EX PAVEMENT

A.V.

TOP OF 30" BRINE
SEE SHEET 121

@ 1.57%

IE 364.44

VPI
STA. 345+00
IE 366.00

6' COVER (MIN)
15' COVER (MAX)

Lindavista

48" PIPE @ 2.47%

CATV
IE UNK

FO
IE UNK

FM-38

EX 18" SD
IE 362.39

EX 24" SD
IE 361.57

EX
IE

SD
40

48" PIPE @ 10%

IE 357.44

VPI
STA. 350+58.41
IE 352.20

344+00 345+00 346+00 347+00 348+00 349+00 350+00 351+00 352+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 345+00
1-6" VACUUM RELIEF VALVE ASSY.
1-2" COMBINATION AIR/VACUUM VALVE ASSY.
W/ ODOR CONTROL VALVE
IN 8'X8' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

2 (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 350+58.14
1 - 45° HPI BEND

3 (103)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 350+99.60
1 - 45° HPI BEND

4
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MAIN

5
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

REFERENCE:

WATER:	NO INFO
SEWER:	10557-L, 10558-L
STORM DRAIN:	4426-D, 10558-L
GAS:	15787-119190
ELECTRIC:	15802-119190
CABLE TV:	NO. 238-1707A, BLE1970
TELEPHONE:	NO INFO
IMPROVEMENTS:	10558-L
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- Boring
- Boring - AGE, 2017
- Boring - CWP, 1992
- Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

MAP 2973
CLAIREMONT MANOR UNIT 2
APN 355-33

4420 4426 4434 4442 4450 4458 4466 4474 4498 4504

MATCH LINE STA. 344+00 SEE SHEET 47

MATCH LINE STA. 352+00 SEE SHEET 49

100 EC

R/W

345 346 347 348 349 350

48" PIPE

6" HP GAS

A.V. VAULT

102' 51' 31' 45' 51'

CLAIREMONT MESA BLVD.

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 121

EX 16" CI WTR

TELE

4415 4421 4427 4435 4439 4441 4455 4495

RAISED MEDIAN

EX 18" RCP SD

EX 8" VCP SWR

EX 18" RCP SD

EX 12" AC WTR

CAUTION

FM-38

FO

ELEC

TELE

CATV

EX 24" RCP SD

EX 8" VCP SWR

GAS

GENESEE AVE.

N W E S

0 40 80 120
SCALE 1"=40'

CLAIREMONT MANOR UNIT 2
MAP 2973

CLAIREMONT GENESEE
PLAZA UNIT 2
MAP 6094

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1884756.92	6270769.71	EC
101	1884756.15	6270848.14	A.V.
102	1884750.64	6271406.53	HPI BEND
103	1884779.47	6271435.94	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	48° 57'57"	1505'	21.56'	48" WSP (CML&TC)
2	S89° 26'05" E		626.85'	48" WSP (CML&TC)
3	N45° 33'55" E		41.19'	48" WSP (CML&TC)
4	N 0° 33'55" E		100.40'	48" WSP (CML&TC)

C-44

CAUTION
6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

MORENA PUMP STATION AND
CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 344+00 CLAIREMONT MESA BLVD. TO
STA. 352+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 48 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA
FOR CITY ENGINEER — DATE

PRINT NAME — RCE#

TECHNICALLY RES: LAILA NASRAWI, PROJECT MANAGER
CHECKED: RIC: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-48-D

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM44.dgn

9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

CLAIREMONT MESA BLVD./GENESS AVE.

48" WSP (3/8" MIN THK), CML (" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

MATCH LINE STA. 352+00 SEE SHEET 48

MATCH LINE STA. 360+00 SEE SHEET 50

380 / 370 / 360

ELEC IE UNK

CATV IE UNK

1-1/2" HP GAS IE UNK

EX PAVEMENT

TELE IE UNK

6' COVER (MIN) 15' COVER (MAX)

EX 8" AC WTR IE UNK

ELEC IE UNK

FO IE UNK

48" PIPE @ 3.70%

48" PIPE @ 0.20%

Lindavista

IE 357.44

VPI STA. 353+50.00 IE 363.00

EX 8" VCP SWR IE 357.63

IE 364.30

352+00 353+00 354+00 355+00 356+00 357+00 358+00 359+00 360+00

SCALE 1"=40' HORIZ. 1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	4681-D
SEWER:	4426-D, 4428-D, 4680-D, 4681-D
STORM DRAIN:	4426-L
GAS:	15802-11910, 15802-11919S
ELECTRIC:	15802-19040
CABLE TV:	NO INFO
TELEPHONE:	PB0812CC
IMPROVEMENTS:	4426-D, 4428-D, 4682-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 3666

HERITAGE ADDITION UNIT 3

APN 355-19

MATCH LINE STA. 352+00 SEE SHEET 48

ELEC

FO & ELEC

EX 8" AC WTR

CAUTION

CATV

EX 8" VCP SWR

1-1/2" HP GAS

CATV

100 BC

CAUTION

101 EC

RAISED MEDIAN

R/W

45'

90'

353

354 355 356 48" PIPE 357 358 359

102 BC

R/W

45'

90'

30'

16'

EX 18" SD

CONRAD CT.

GENESEE AVE.

EX 12" AC WTR

EX 12" VCP SEWER

RAISED MEDIAN

1-1/2" HP GAS

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 120

R/W

MATCH LINE STA. 360+00 SEE SHEET 50

4495 4501 4921 4931 4941 4951 4961 4971 4981 5001 5011 5021

4930 4940 4950 4960 4970 4980 5002 5012 5022 5032

APN 355-11

HERITAGE ADD. UNIT 1

MAP 3617

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1884955.90	6271437.68	BC
101	1885076.29	6271412.21	EC
102	1885522.94	6271209.05	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N 0° 33'55" E		76.07'	48" WSP (CML&TC)
2	25° 01'28"	284'	124.04'	48" WSP (CML&TC)
3	N24° 27'33" W		490.68'	48" WSP (CML&TC)
4	8° 01'40	1016'	109.24'	48" WSP (CML&TC)

GENESEE AVE.

C-45

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 352+00 TO STA. 360+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 49 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI PROJECT MANAGER

DESIGNED BY: DARIN SANCHEZ PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE

0000-0000 CCS83 COORDINATE

40067-49-D

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM45.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

2" HP GAS
IE UNK

EX 12" AC WTR
IE UNK

ELEC
IE UNK

A.V.

EX PAVEMENT

6' COVER (MIN)
15' COVER (MAX)

48" PIPE @ 0.20%

48" PIPE @ 3.0%

TOP OF 30" BRINE
SEE SHEET 123

MATCH LINE STA. 360+00 SEE SHEET 49

MATCH LINE STA. 368+00 SEE SHEET 51

IE 364.30

EX 8" VCP SWR
IE 359.49

VPI
STA. 363+50.00
IE 365.00

VPI
STA. 366+50.00
IE 356.00

IE 346.00

Lindavista

Fill

370

360

350

360+00 361+00 362+00 363+00 364+00 365+00 366+00 367+00 368+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
FM-1 Boring
H-7 Boring - AGE, 2017
D-3 Boring - CWP, 1992
GTB-1 Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

1 (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 364+64.05
1 - 45° HPI BEND

2 (103)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 365+16.38
1 - 45° HPI BEND
BEGIN JOINT TRENCH
SEE SECTION DETAIL

3 (104)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 363+50.00
1-3" VACUUM RELIEF VALVE ASSY.
1-2" COMBINATION AIR/VACUUM VALVE ASSY.
W/ ODOR CONTROL VALVE
IN 8'X8' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

4
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MANHOLE

5
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

REFERENCE:

WATER:	NO INFO
SEWER:	4428-D, 4680-D
STORM DRAIN:	NO INFO
GAS:	NO INFO
ELECTRIC:	15795-119200, 15802-119195
CABLE TV:	15795-119200, 15802-119195
TELEPHONE:	PB0612BD, PB0812CC
IMPROVEMENTS:	4428-D, 4680-D, 4682-D, 5100-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 3666
HERITAGE ADDITION UNIT 3
APN 355-19

MAP 3781
HERITAGE ADD. UNIT 4
APN 355-10

MATCH LINE STA. 360+00 SEE SHEET 49

MATCH LINE STA. 368+00 SEE SHEET 51

5032 5042 5052 5062 4490 4497 4496 4490 4482 4474

EC (100)
FO, CATV & ELEC
2" HP GAS
EX 12" AC WTR
CATV
EX 8" ENC VCP SWR
CAUTION
APPLETON ST.
2" HP GAS
ELEC
HPI (101)
STA. 362+81.30
FO & ELEC
FO
GENESEE AVE.
48" PIPE
A.V. VAULT
EX 12" VCP SWR
EX 12" AC WTR
RAISED MEDIAN
TELE
LEHRER DR.
EX 12" AC WTR
EX 8" VCP SWR
30" PIPE INCLUDED IN THIS CONTRACT SEE SHEETS 123
R/W
45'
90'
16'
30'
21'

361 362 363 364 365 366 367

5031 5041 5051 4501 5102 5110 5118 5126 5134 5142 5150

APN 355-19
HERITAGE ADD. UNIT 1
MAP 3617

APN 355-11
HERITAGE ADD. UNIT 4
MAP 3781

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1885656.22	6271159.36	EC
(101)	1885894.27	6271089.16	HPI
(102)	1886069.58	6271037.53	HPI BEND
(103)	1886115.53	6271062.57	HPI BEND
(104)	1885960.27	6271070.05	A.V.

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	8° 01'40	1016'	33.11'	48" WSP (CML&TC)
2	N16° 25'53" W		248.19'	48" WSP (CML&TC)
3	N16° 24'33" W		182.75'	48" WSP (CML&TC)
4	N28° 35'27" E		52.33'	48" WSP (CML&TC)
5	N16° 24'33" W		283.62'	48" WSP (CML&TC)

C-46

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 360+00 TO STA. 368+00 AT GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 50 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY LAILA NASRAWI PROJECT MANAGER
CHECKED BY DARIN SANCHEZ PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

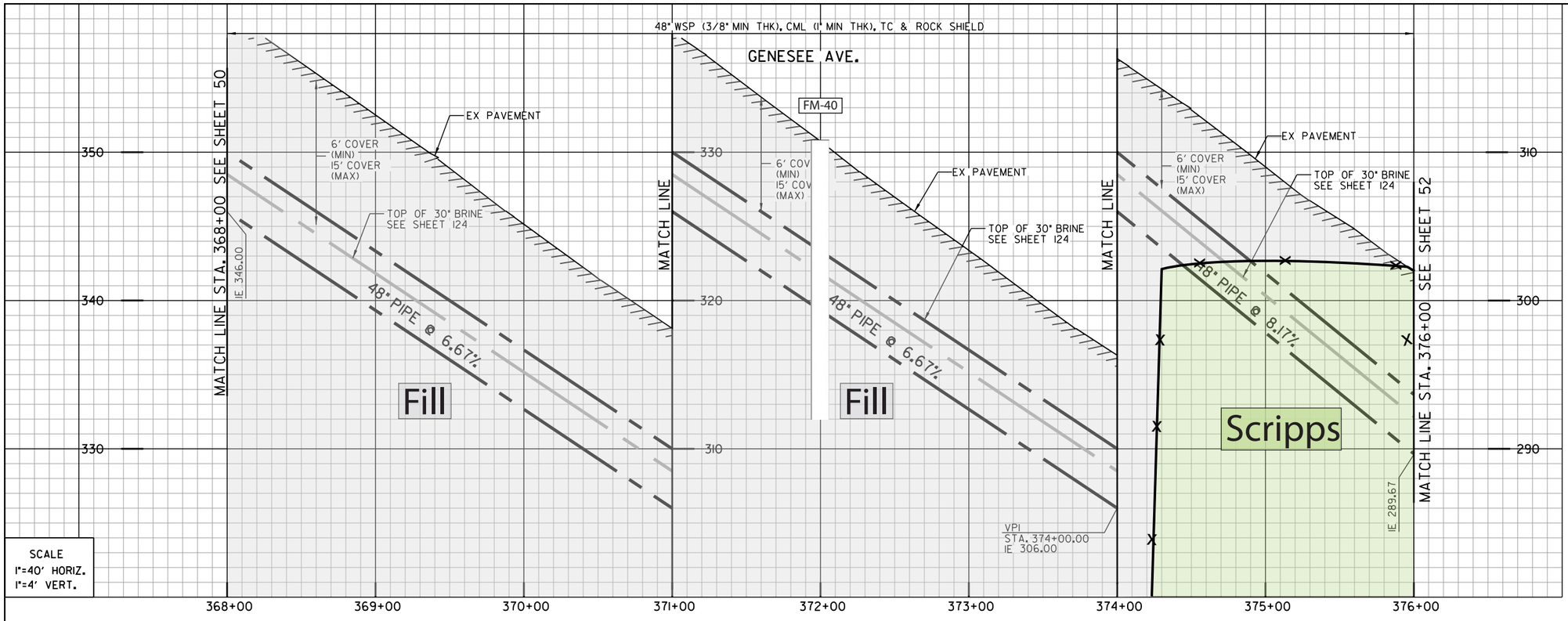
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

40067-50-D

GENESEE AVE.

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM46.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
FM-1 Boring
H-7 Boring - AGE, 2017
D-3 Boring - CWP, 1992
GTB-1 Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

REFERENCE:

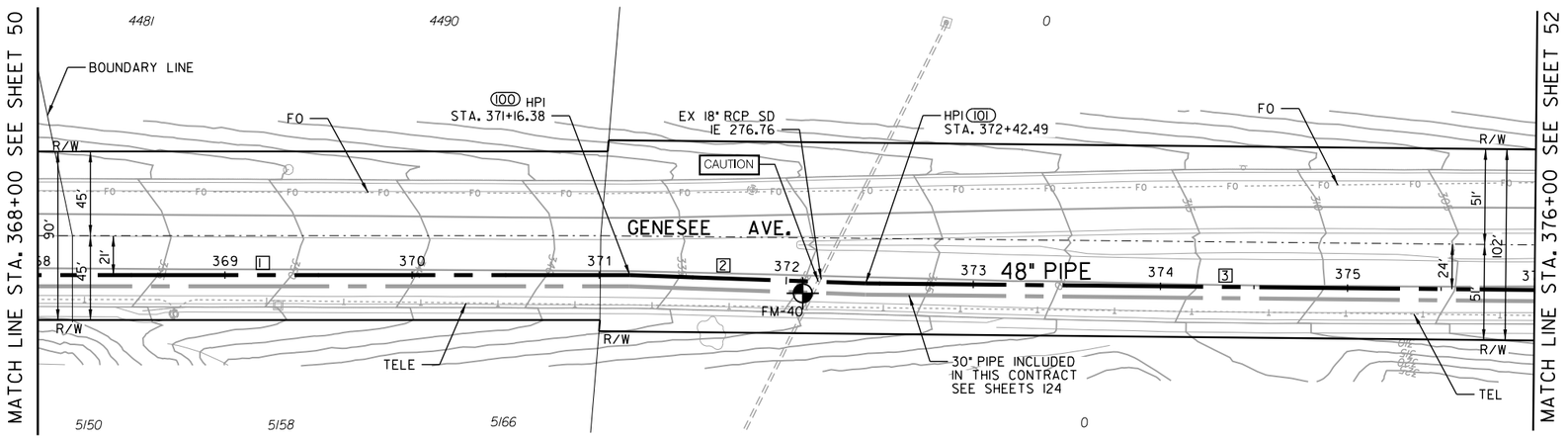
WATER:	NO INFO
SEWER:	NO INFO
STORM DRAIN:	11832-2-D
GAS:	NO INFO
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	PB0612BB, PB0612BD
IMPROVEMENTS:	11832-2-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 3925

HERITAGE ADD. UNIT 5

APN 355-09

PORTION P.L. LOT 1242



APN 355-19

HERITAGE ADD. UNIT 4

MAP 3781

HERITAGE ADD. UNIT 2

MAP 3816

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1886691.09	6270893.07	HPI
101	1886813.24	6270861.69	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N16° 24'33" W		316.38'	48" WSP (CML&TC)
2	N14° 24'33" W		126.12'	48" WSP (CML&TC)
3	N15° 50'32" W		357.51	48" WSP (CML&TC)

0 40 80 120
SCALE 1"=40'

GENESEE AVE.

C-47

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 368+00 TO STA. 376+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 51 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

WATER WBS	S-16027
SEWER WBS	B-15141
SUBMITTED BY	LAILA NASRAWI, PROJECT MANAGER
CHECKED BY	DARIN SANCHEZ, PROJECT ENGINEER
	000-0000 CCS27 COORDINATE
	0000-0000 CCS83 COORDINATE
	40067-51-D

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM47.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

MATCH LINE STA. 376+00 SEE SHEET 51

MATCH LINE STA. 384+00 SEE SHEET 53

MATCH LINE

TOP OF 30" BRINE SEE SHEET 125

EX 18" RCP SD IE 287.57

EX PAVEMENT

48" PIPE @ 8.1%

IE 289.67

6' COVER (MIN) 15' COVER (MAX)

Fill

VPI STA. 377+05.00 IE 281.50

48" PIPE @ 5.80%

Scripps

VPI STA. 379+50.00 IE 267.00

48" PIPE @ 7.33%

FM-41

EX 18" RCP SD IE 245.28

IE 234.67

Artificial fill (Qaf)	
Alluvium (Qal)	
Fluvial Terrace Deposits (Qt)	
Bay Point Formation (Qbp)	
Lindavista Formation (Qln)	
Ardath Shale (Ta)	
Scripps Formation (Tsc)	
Water Level Depth	
FM-1	Boring
H-7	Boring - AGE, 2017
D-3	Boring - CWP, 1992
GTB-1	Boring - Kleinfelder, 2014
???	Geological Contact
?	Groundwater Level
	Topography (1967) RC or SC(1952)

SCALE
1"=40' HORIZ.
1"=4' VERT.

REFERENCE:

WATER:	NO INFO
SEWER:	NO INFO
STORM DRAIN:	11832-7-D, 11862-2-D, 11862-3-D
GAS:	NO INFO
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	PB0614DC, PB0614DD
IMPROVEMENTS:	11862-2-D, 11862-3-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

PORTION P.L. LOT 1242

APN 355-030-02

CITY PARK PARK PORTION OF P.L. 1248 & 1249 MM 36

EX 18" RCP SD

BC (100) STA. 377+54.52

FO

CAUTION

GENESEE AVE.

48" PIPE

TELE

TEL

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 125

APN 355-030-02

HERITAGE ADD. UNIT 2

MAP 3816

JAMESTOWN POINT

MAP 8663

MAP

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1887305.50	6270722.00	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N15° 50'32" W		154.19'	48" WSP (CML&TC)
2	27° 14'56"	2024'	645.81'	48" WSP (CML&TC)

C-48

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 376+00 TO STA. 384+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 52 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE — PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE

0000-0000 CCS83 COORDINATE

40067-52-D

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

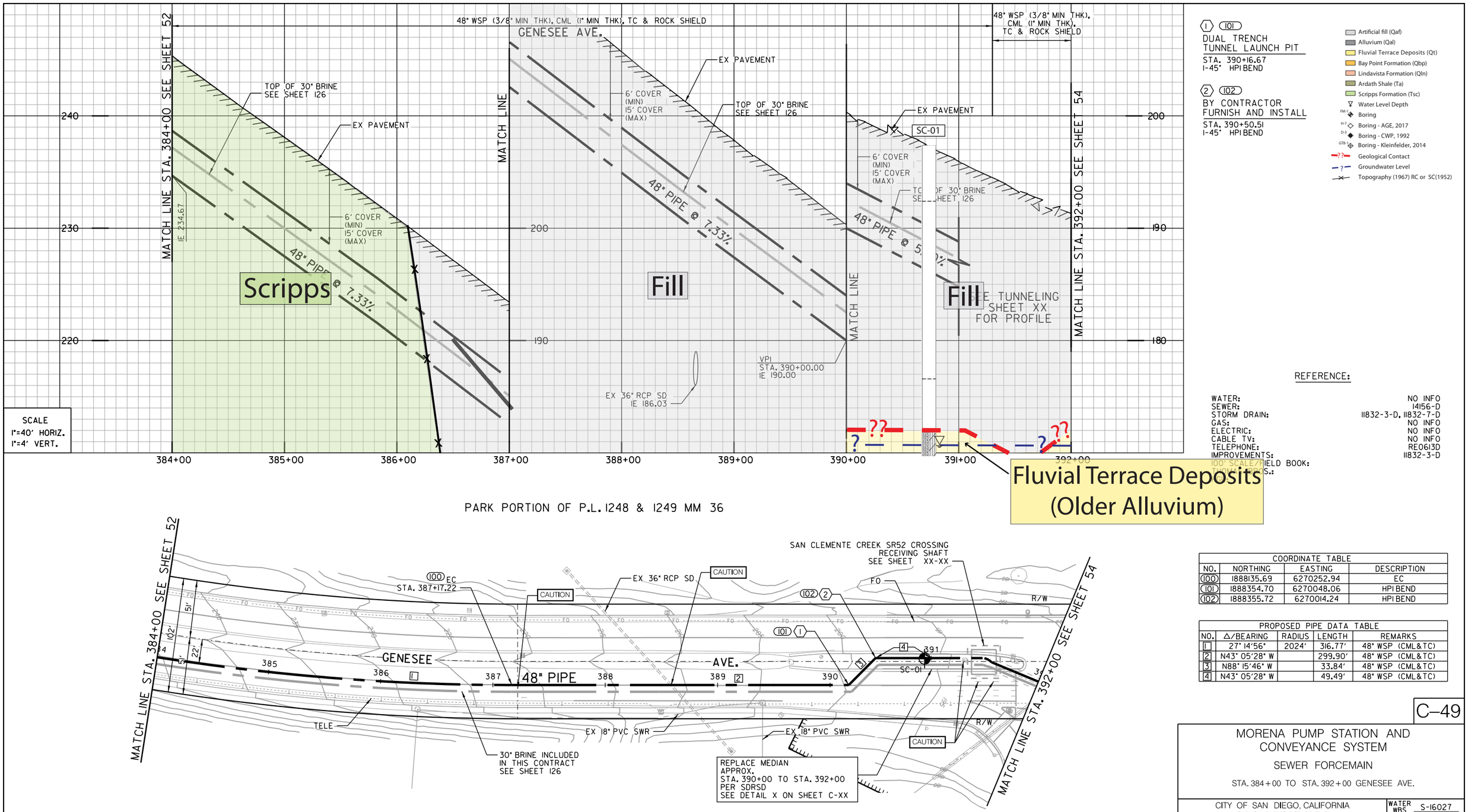
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

GENESEE AVE.

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM48.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



1 101 DUAL TRENCH TUNNEL LAUNCH PIT
STA. 390+16.67
I-45° HPI BEND

2 102 BY CONTRACTOR FURNISH AND INSTALL
STA. 390+50.51
I-45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	14156-D
STORM DRAIN:	11832-3-D, 11832-7-D
GAS:	NO INFO
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	RE0613D
IMPROVEMENTS:	11832-3-D
100' SCALE/FIELD BOOK:	
MONUMENTS:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1888135.69	6270252.94	EC
101	1888354.70	6270048.06	HPI BEND
102	1888355.72	6270014.24	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	27° 14'56"	2024'	316.77'	48" WSP (CML&TC)
2	N43° 05'28" W		299.90'	48" WSP (CML&TC)
3	N88° 15'46" W		33.84'	48" WSP (CML&TC)
4	N43° 05'28" W		49.49'	48" WSP (CML&TC)

GENESEE AVE.

C-49

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 384+00 TO STA. 392+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 53 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-53-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

MATCH LINE STA. 392+00 SEE SHEET 53

MATCH LINE STA. 400+00 SEE SHEET 55

170 — 160 — 150

190 — 180 — 170

TELE
IE UNK

EX GRADE

Fill

Fluvial Terrace Deposits
(Older Alluvium)

Scripps

Alluvium

Fill

Scripps

EX PAVEMENT

TELE
IE UNK

SC-03 SC-05 SC-04 SC-02

TOP OF " BRINE
SEE ET 127

EX 18" RCP SD
IE 178.41

EX 10" CH R
IE 172.69

6' COVE (MIN)
15' COVE (MAX)

EX 18" ENC SWD
IE 164.0

SEE TUNNELING XXX
FOR PR L XXX

48" PIPE @ 1.66%

VPI
STA. 39
IE 167.0

IE 162.85

48" PIPE @ 7.02%

IE 170.51

392+00 393+00 394+00 395+00 396+00 397+00 398+00 399+00 400+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

100
BY CONTRACTOR
FURNISH AND INSTALL
STA. 399+59.26
I- 28° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	13386-4-D, 13386-5-D
STORM DRAIN:	11832-4-D, 11832-8-D
GAS:	NO INFO
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	REO613A
IMPROVEMENTS:	11832-4-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

CITY PARK PARK PORTION
OF P.L. 1248 & 1249 MM 36

CITY PARK
PARK PORTION OF P.L. 1249 MM 36
APN 671-010-23

MATCH LINE STA. 392+00 SEE SHEET 53

MATCH LINE STA. 400+00 SEE SHEET 55

EX 18" RCP SD
EX 18" ENC SWR
FO
EX 18" RCP SD
EX 18" RCP SD
CAUTION
100
EX 10" SWR
R/W
EX BRIDGE
GENESEE
AVE.
51'
102'
51'
EX 16" RCP SD
EX 18" RCP SD
RAISED MEDIAN
TELE
SC-02
RAISED MEDIAN
393
394
395
397
398
399
42" PIPE
48" PIPE
SC-03
SC-05
SC-04
APN 671-010-23
STATE HIGHWAY 52
STATE HIGHWAY 52
SAN CLEMENTE CREEK
SR-52 CROSSING
LAUNCHING SHAFT
30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 127

REPLACE MEDIAN
APPROX.
STA. 399+00 TO STA. 400+00
PER SDRSD
SEE DETAIL X ON SHEET C-XX

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1888963.72	6269445.45	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N42° 46'59" W		40.74'	48" WSP (CML&TC)

GENESEE AVE.

C-50

MORENA PUMP STATION AND
CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 392+00 TO STA. 400+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 54 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

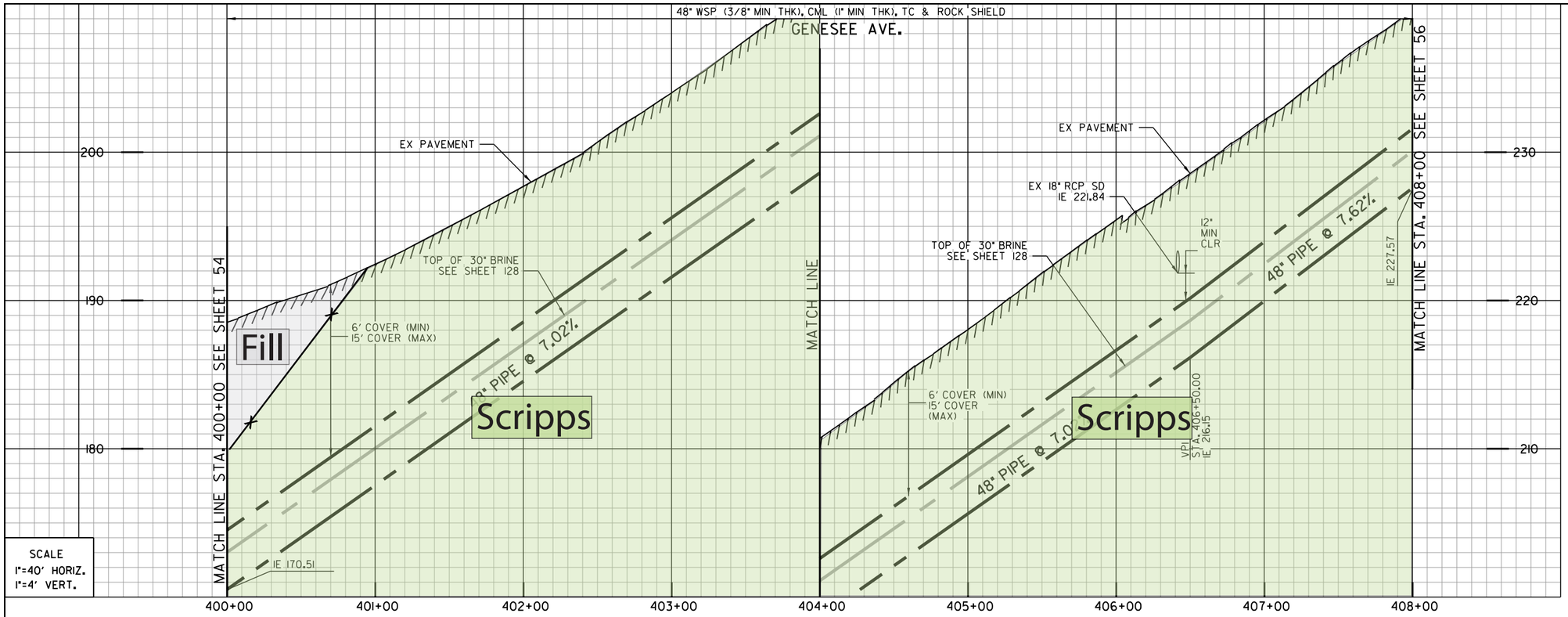
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

40067-54-D

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM50.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



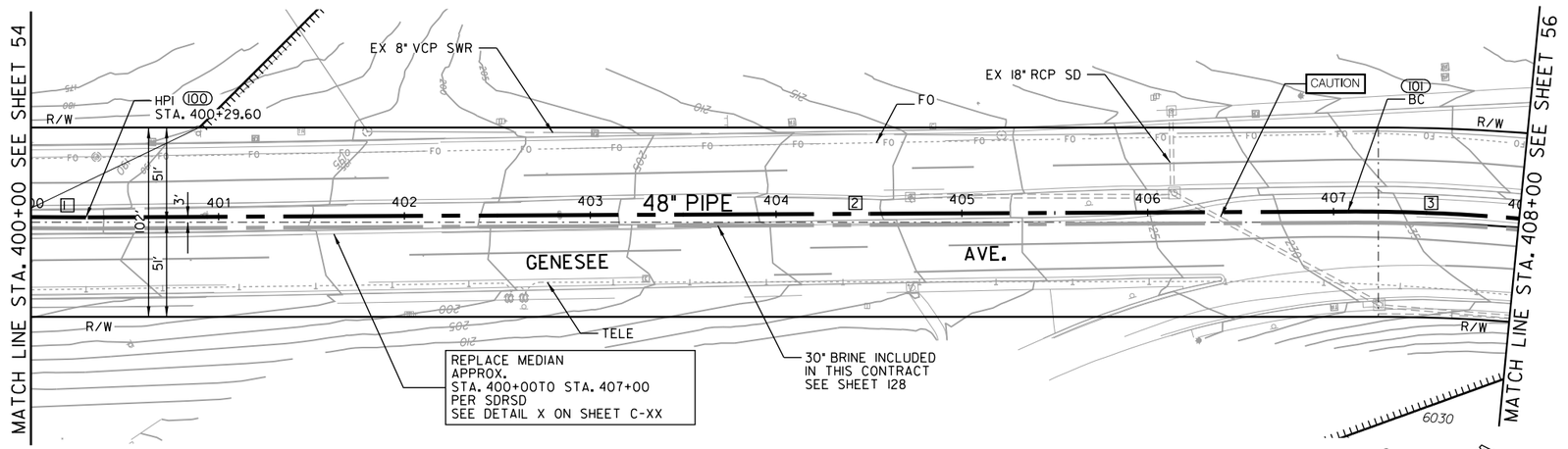
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	NO INFO
STORM DRAIN:	NO INFO
GAS:	NO INFO
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	RE0613A
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

CITY PARK
PARK PORTION OF P.L. 1249 MM 36
APN 671-010-23

STATE HIGHWAY 52



STATE HIGHWAY 52

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1889015.34	6269397.68	HPI
101	1889509.10	6268931.47	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N42° 46'59" W		29.60'	48" WSP (CML&TC)
2	N43° 21'22" W		678.13'	48" WSP (CML&TC)
3	49° 03'20"	1006'	92.27'	48" WSP (CML&TC)

C-51

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 400+00 TO STA. 408+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 55 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-55-D

GENESEE AVE.

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM51.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

EX PAVEMENT

EX 18" RCP SD
IE 249.91

TOP OF 30" BRINE
SEE SHEET 129

48" PIPE @ 3.50%

@ 9.33%

6' COVER (MIN)
15' COVER
(MAX)

48" PIPE @ 7.62%

VPI
STA. 409+50.00
IE 239.00

VPI
STA. 411+50.00
IE 246.00

MATCH LINE STA. 408+00 SEE SHEET 55

IE 227.57

Scripps

MATCH LINE

EX PAVEMENT

TOP OF 30" BRINE
SEE SHEET 129

6' COVER (MIN)
15' COVER
(MAX)

Fill

48" PIPE @ 9.33%

EX PAVEMENT

TOP OF 30" BRINE
SEE SHEET 129

Fill

6' COVER (MIN)
15' COVER
(MAX)

48" PIPE @ 7.00%

@ 9.33%

MATCH LINE

VPI
STA. 414+50.00
IE 274.[illegible]

Scripps

IE 284.50

MATCH LINE STA. 416+00 SEE SHEET 57

250 240 230 280 270 290 280 270

408+00 409+00 410+00 411+00 412+00 413+00 414+00 415+00 416+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	12875-10-D
STORM DRAIN:	11832-5-D, 11832-7-D, 12875-9-D
GAS:	15772-119245
ELECTRIC:	15772-119245
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	RE0411DB
100' SCALE/FIELD BOOK:	NO INFO
THOMAS BROS.:	
HGL:	

STATE HIGHWAY 52

EX 24" RCP SD

EX 8" VCP SWR

EX 18" RCP SD

EX 8" VCP SWR

FO

CAUTION

RAISED MEDIAN

48" PIPE

411 412 413 414 415

410

409

GENESEE AVE.

REPLACE MEDIAN
APPROX.
STA. 410+50 TO STA. 416+00
PER SDRSD
SEE DETAIL X ON SHEET C-XX

TELE

EX 18" RCP SD

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 129

ELEC

FO

EC
(100)

R/W

5'

4'

MATCH LINE STA. 408+00 SEE SHEET 55

MATCH LINE STA. 416+00 SEE SHEET 57

MAP 5819
UNIVERSITY PARK NORTH UNIT 1
APN 348-813-23
6169

6068 6080 6092 6108 6116 6124 6128

6056 6042 6030

APN 348-43
GENESEE VALE UNIT 2
MAP 5819

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1890299.66	6268661.90	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	49° 03'20"	1006'	769.04'	48" WSP (CML&TC)
2	N 6° 00'00" E		30.96'	48" WSP (CML&TC)

C-52

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 408+00 TO STA. 416+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 56 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

WATER WBS S-16027
SEWER WBS B-15141

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-56-D

GENESEE AVE.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM52.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

EX PAVEMENT

TOP OF 30" BRINE SEE SHEET 130

EX 8" AC WTR IE UNK

6' COVER (MIN) 15' COVER (MAX)

48" PIPE @ 5.00%

48" PIPE @ 7.00%

MATCH LINE STA. 416+00 SEE SHEET 56

VPI STA. 417+50.00 IE 295.00

IE 284.50

MATCH LINE

EX 18" RCP SD IE 313.61

EX 6" WTR (FH) IE UNK

12" CLR MIN

Scripps

VPI STA. 420+50.00 IE 310.00

EX PAVEMENT

TOP OF 30" BRINE SEE SHEET 130

6' COVER (MIN) 15' COVER (MAX)

48" PIPE @ 3.0%

FM-43

??

Fill

IE 320.50

MATCH LINE STA. 424+00 SEE SHEET 58

310 300 290 330 320 310

416+00 417+00 418+00 419+00 420+00 421+00 422+00 423+00 424+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

1 100
BY CONTRACTOR FURNISH AND INSTALL
STA. 416+09.04
1 - 45° HPI BEND

2 101
BY CONTRACTOR FURNISH AND INSTALL
STA. 416+41.57
1 - 45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	12875-8-D
STORM DRAIN:	11832-5-D, 11832-6-D, 11832-7-D, 12875-8-D
GAS:	15772-119245
ELECTRIC:	15772-119245
CABLE TV:	NO INFO
TELEPHONE:	RE041DB
IMPROVEMENTS:	11832-5-D, 12875-8-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 6020

UNIVERSITY PARK NORTH UNIT I

APN 348-813-24

6270

EX 8" AC WTR
EX 24" RCP SD
EX 8" VCP SWR
ELEC
EX 18" RCP SD
APRIL COURT
CAUTION
EX 24" RCP SD
EX 8" VCP SWR
FO
EX 18" RCP SD
2" HP GAS
CAUTION
EX 8" VCP SWR
EX 24" RCP SD
ELEC
BC 102
FO
EX 18" RCP SD IE 299.47
CAUTION
R/W
101
1
2
417
418
3
419
48" PIPE
420
421
422
4
423
20'
25'
102'
5'
51'
EX 10" AC WTR
GENESEE AVE.
FM-43
57.7'
11.3'
95'
20'
25'
MATCH LINE STA. 416+00 SEE SHEET 56
MATCH LINE STA. 424+00 SEE SHEET 58
1 100
3
TELE
ELEC
30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 130
RAISED MEDIAN
TELE

6132 6138 6144 6150 6156 6164 6172 6178 6184 6190 6196 4102

REPLACE MEDIAN
APPROX.
STA. 416+00 TO STA. 424+00
PER SDRSD
SEE DETAIL X ON SHEET C-XX

GENESEE VIEW UNIT I

MAP 5991

MAP 5737

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1890339.44	6268666.07	HPI BEND
101	1890364.72	6268645.60	HPI BEND
102	1890944.65	6268706.55	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N 6° 00'00" E		9.04'	48" WSP (CML&TC)
2	N39° 00'00" W		32.53'	48" WSP (CML&TC)
3	N 6° 00'00" E		583.13'	48" WSP (CML&TC)
4	19° 29'40"	980'	175.30'	48" WSP (CML&TC)

C-53

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 416+00 TO STA. 424+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 57 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

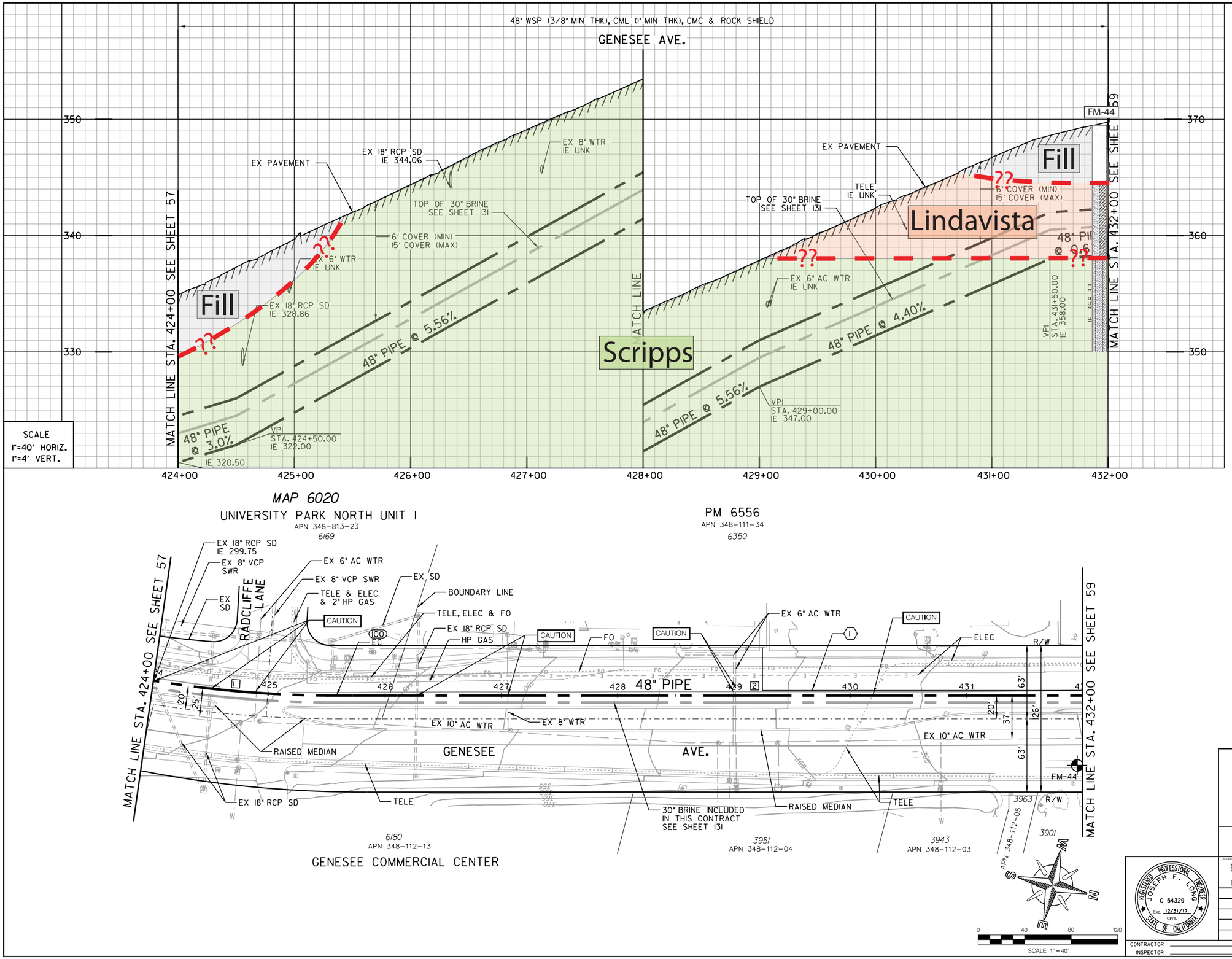
40067-57-D

GENESEE AVE.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM53.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



(1)
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MAIN

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTR-1 Boring - Kleinfelder, 2014
- ??— Geological Contact
- — ? — Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	9276-4-D, 11832-9-D, 212202-2-D
SEWER:	9276-4-D
STORM DRAIN:	12875-8-D
GAS:	15772-119255
ELECTRIC:	15772-119255
CABLE TV:	NO INFO
TELEPHONE:	RE0409BB, RE0409DD
IMPROVEMENTS:	11832-9-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1891275.77	6268684.87	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	19° 29'40"	980'	158.13'	48" WSP (CML&TC)
2	N13° 29'40" W		641.87'	48" WSP (CML&TC)

C-54

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 424+00 TO STA. 432+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 58 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

APPROVED: WENDY GAMBOA, FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

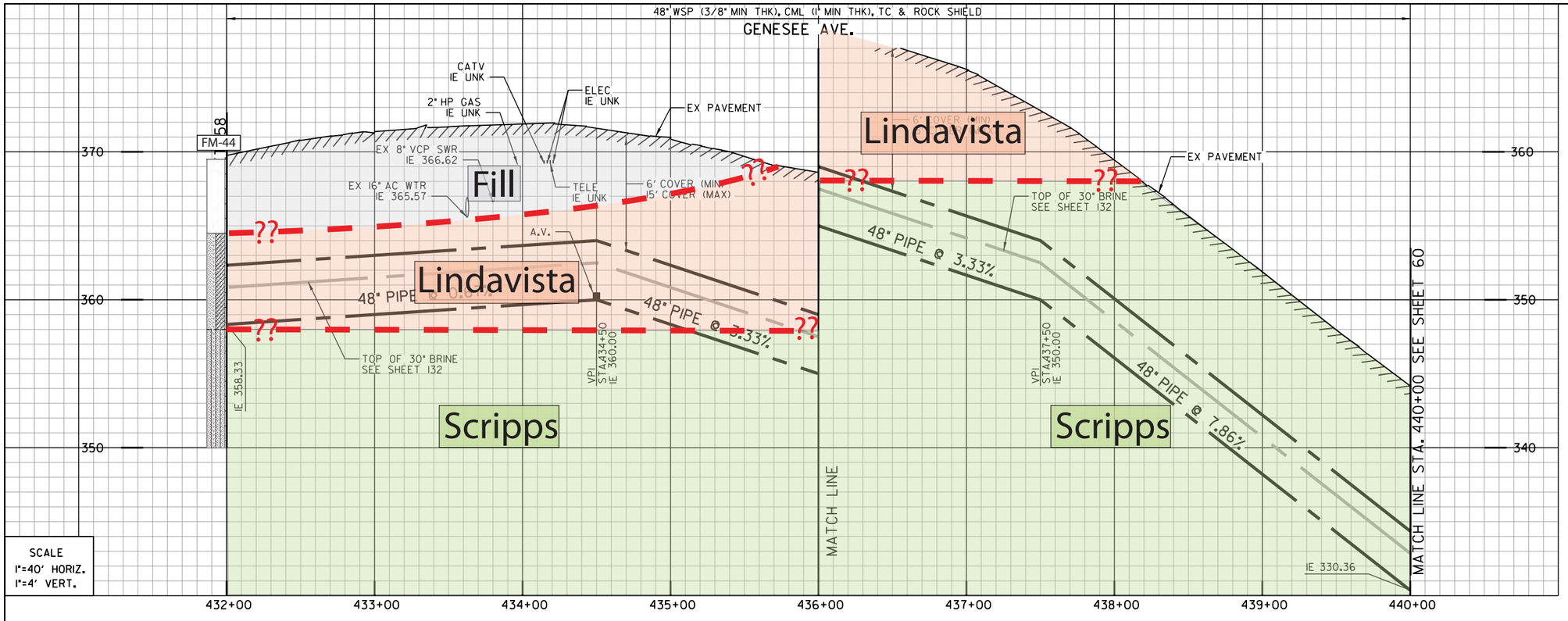
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-58-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

GENESEE AVE.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM54.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 434+50
1-3" VACUUM RELIEF VALVE ASSY.
1-2" COMBINATION AIR/VACUUM VALVE ASSY.
W/ ODOR CONTROL VALVE
IN 8'X8' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

2
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MAIN

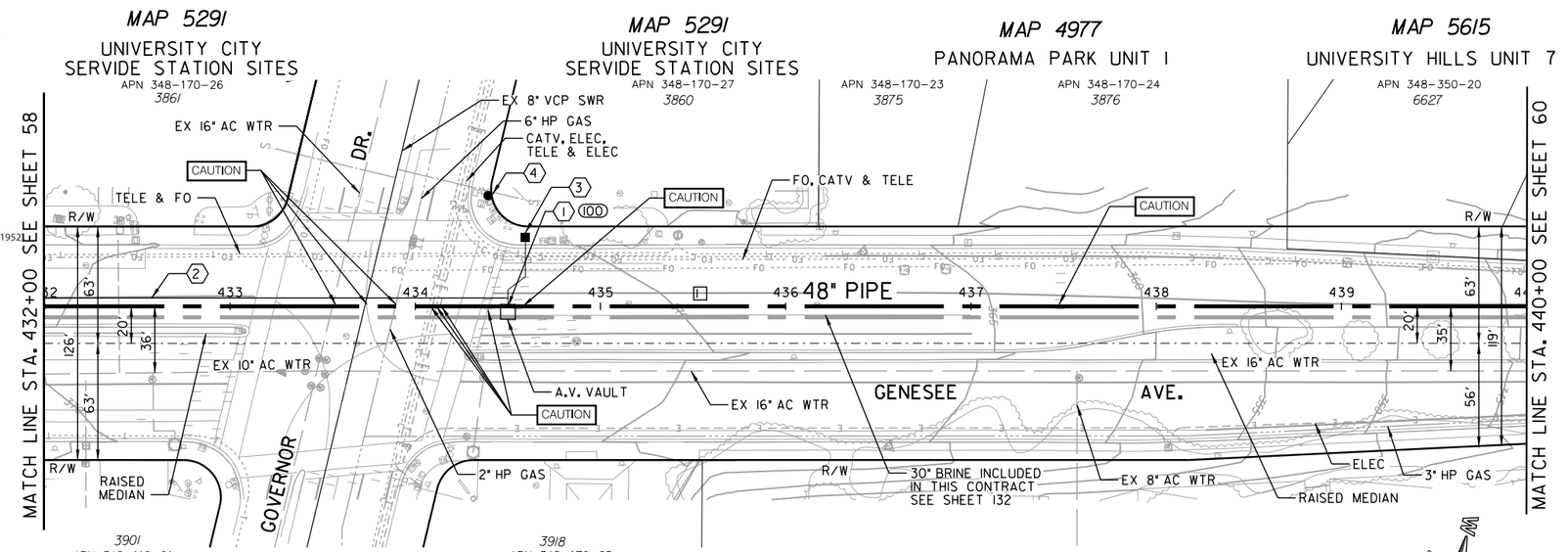
3
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

4
BY CONTRACTOR
FURNISH AND INSTALL
CATHODIC PROTECTION RECTIFIER

REFERENCE:

WATER:	9276-4-D, 11832-9-D, 212202-2-D
SEWER:	9276-4-D, 212202-2-D
STORM DRAIN:	NO INFO
GAS:	15772-119260, 15772-119265, 15772-119270
ELECTRIC:	15772-119260, 15772-119265,15772-119270
CABLE TV:	NO INFO
TELEPHONE:	RE0409DD
IMPROVEMENTS:	9276-4-D, 11832-9-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-14 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1892143.02	6268476.75	A.V.

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N13° 29'40" W		800'	48" WSP (CML&TC)

C-55

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 432+00 TO STA. 440+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 59 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

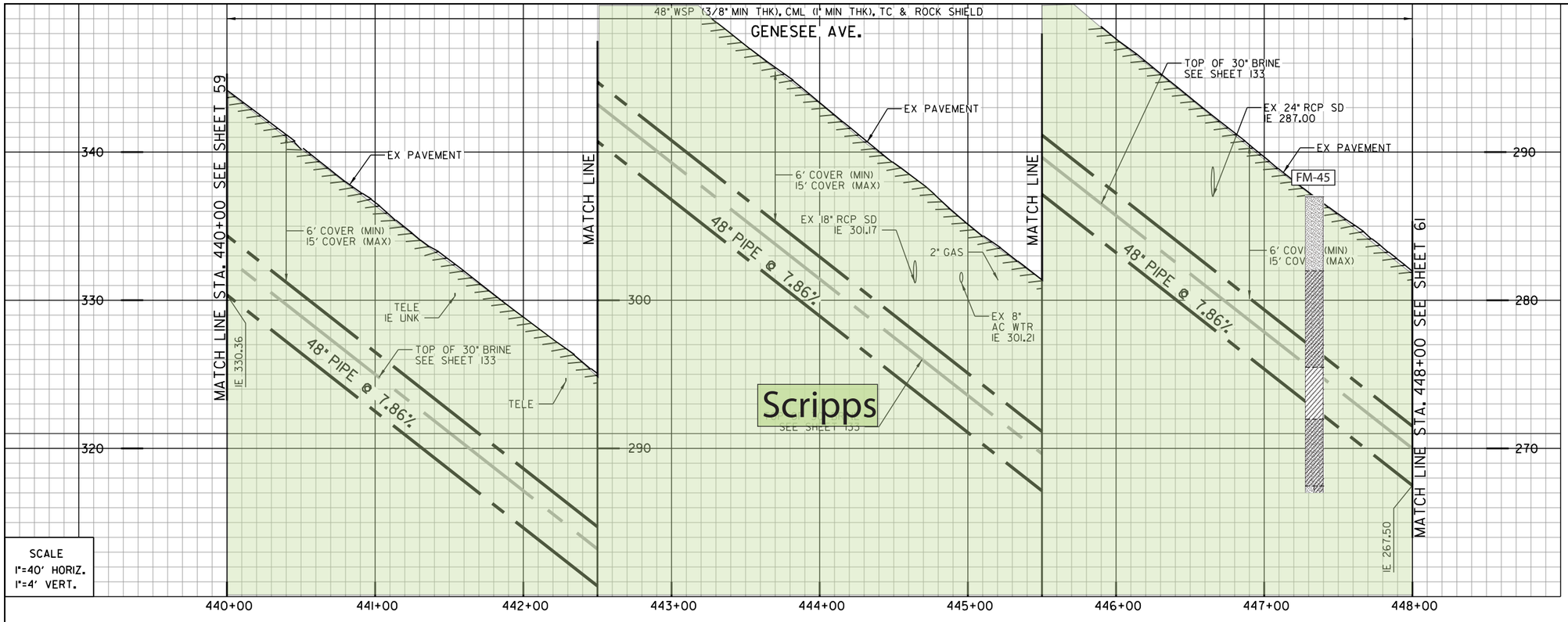
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-59-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — EXP. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

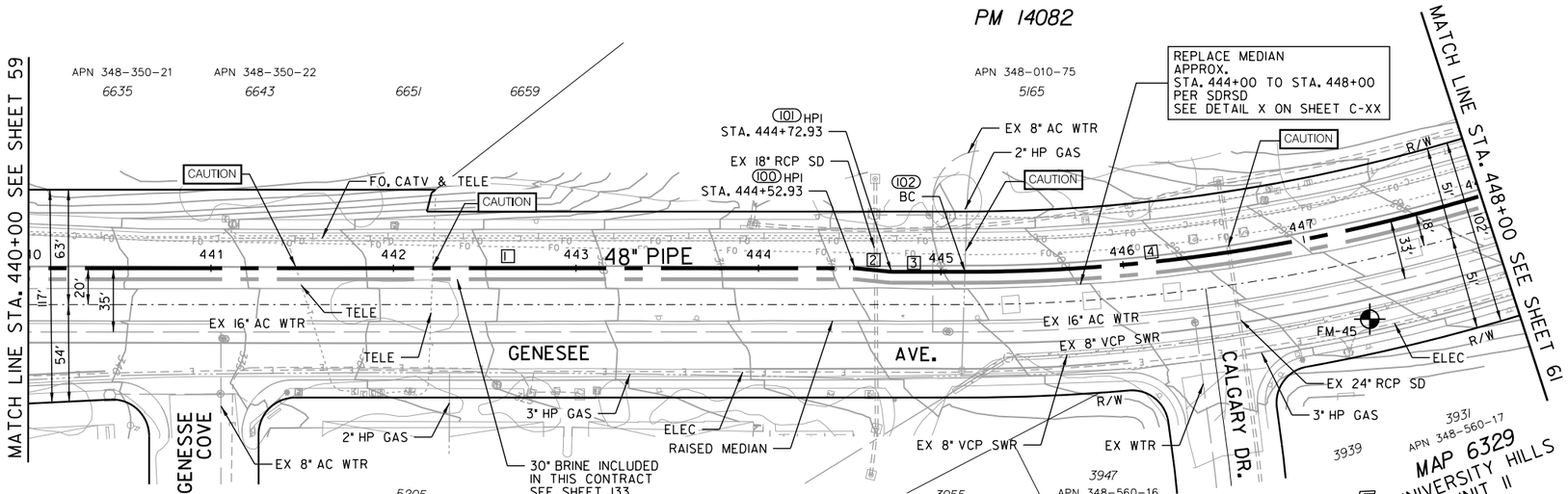
GENESEE AVE.

60% SUBMITTAL



REFERENCE:

WATER:	11897-15-D, 11897-16-D, 21989-4-D
SEWER:	21989-3-D
STORM DRAIN:	11897-3-D, 11897-4-D, 22075-2-D
GAS:	15772-119270, 15772-119275
ELECTRIC:	15772-119270, 15772-119275
CABLE TV:	NO INFO
TELEPHONE:	RE0409DD
IMPROVEMENTS:	21989-4-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1893118.26	6268242.71	HPI
(101)	1893138.07	6268239.97	HPI
(102)	1893176.96	6268230.64	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N13° 29'40" W		452.93'	48" WSP (CML&TC)
2	N7° 52'42" W		20'	48" WSP (CML&TC)
3	N13° 29'48" W		40'	48" WSP (CML&TC)
4	38° 22'04"	980'	287.07'	48" WSP (CML&TC)

C-56

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 440+00 TO STA. 448+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 60 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-60-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

GENESEE AVE.

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM56.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

MATCH LINE STA. 448+00 SEE SHEET 60

MATCH LINE STA. 456+00 SEE SHEET 62

MATCH LINE

EX PAVEMENT

6' COVER (MIN) 15' COVER (MAX)

IE 267.50

TOP OF 30" BRINE SEE SHEET 134

48" PIPE @ 5.00%

48" PIPE @ 6.90%

EX 8" VCP SWR IE 242.97

TELE IE UNK

EX 8" AC WTR IE UNK

EX 6 WTR (FH) IE UNK

VPI STA. 451+50.00 IE 240.00

VPI STA. 453+06.00 IE 232.50

12" MIN CLR

EX 24" RCP SD IE 229.23

EX 18" RCP SD IE 229.64

IE 211.80

Fill

Scripps

Scripps

Scripps

270

260

250

230

220

210

448+00

449+00

450+00

451+00

452+00

453+00

454+00

455+00

456+00

Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
FM-1 Boring
H-7 Boring - AGE, 2017
D-3 Boring - CWP, 1992
GTB-1 Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

SCALE
1"=40' HORIZ.
1"=4' VERT.

REFERENCE:

WATER:	11897-16-D
SEWER:	11897-21-D, 21989-3-D
STORM DRAIN:	11897-4-D, 11897-6-D, 22095-4-D
GAS:	15795-119275
ELECTRIC:	15765-119275, 15765-119280
CABLE TV:	NO INFO
TELEPHONE:	RE0407C
IMPROVEMENTS:	21989-4-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

PM 14082

PORTION PUEBLO LOT 1278

MATCH LINE STA. 448+00 SEE SHEET 60

MATCH LINE STA. 456+00 SEE SHEET 62

GENESEE AVE.

R/W

EX 24" RCP SD

TELE

FO

CATV

EX 8" VCP SWR

(101) HPI STA. 452+10.52

(100) EC

HPI (102) STA. 452+50.52

EX 18" RCP SD

EX 24" RCP SD

EX 8" AC WTR

CAUTION

FO, CATV & TELE

48" PIPE

EX 16" AC WTR

EX 8" PVC SWR

HP GAS

ELEC

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 134

EX 2" WTR

EX 4" WTR

EX 8" WTR

EX 8" VCP SWR

EX 24" RCP SD

RAISED MEDIAN

APN 348-010-75

LUIGI TERR

APN 348-560-21

UNIVERSITY HILLS UNIT II

MAP 6329

APN 348-010-59

UNIVERSITY CITY HIGH SCHOOL

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1893720.17	6267882.16	EC
(101)	1893744.87	6267850.70	HPI
(102)	1893765.64	6267816.52	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	38° 22'04"	980'	370.52'	48" WSP (CML&TC)
2	N51° 51'52" W		40'	48" WSP (CML&TC)
3	N58° 43'01" W		40'	48" WSP (CML&TC)
4	N51° 23'50" W		349.48'	48" WSP (CML&TC)

C-57

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 448+00 TO STA. 456+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 61 OF SHEETS

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

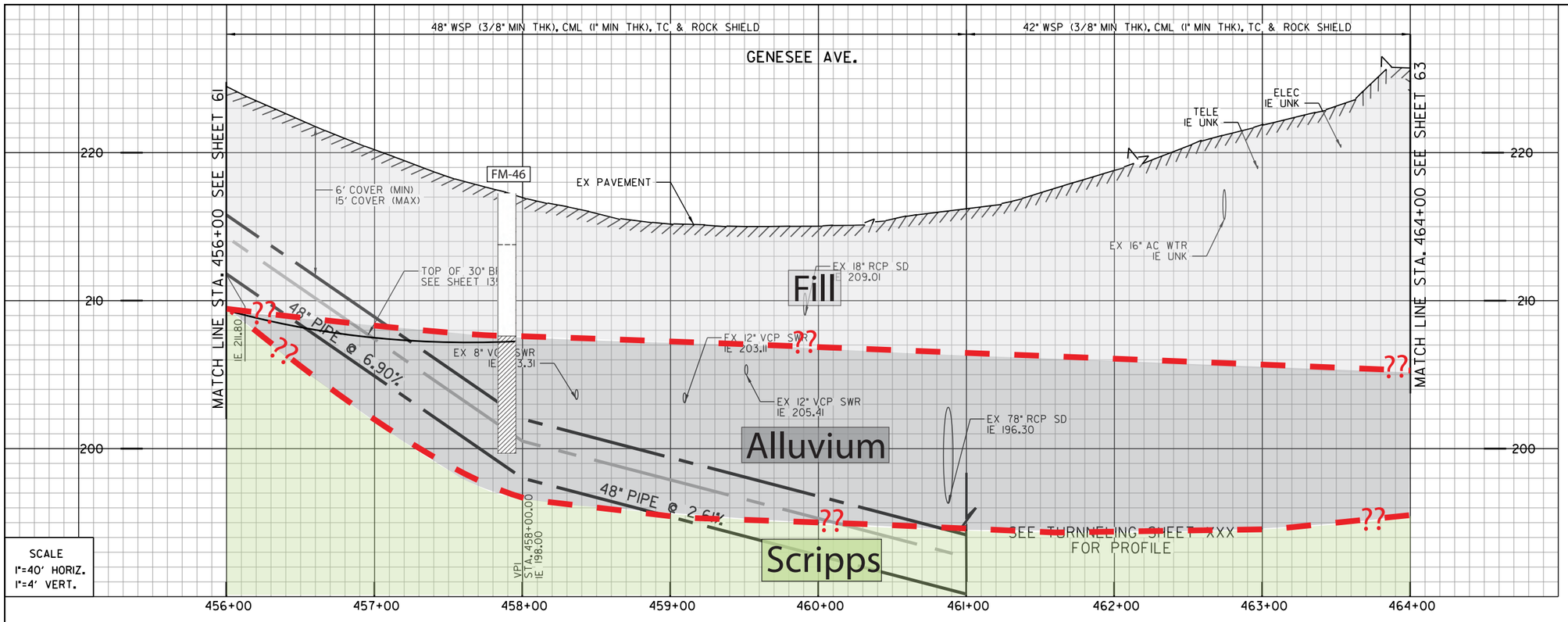
WATER WBS	S-16027
SEWER WBS	B-15141
SUBMITTED BY	LAILA NASRAWI, PROJECT MANAGER
CHECKED BY	DARIN SANCHEZ, PROJECT ENGINEER
	000-0000 CCS27 COORDINATE
	0000-0000 CCS83 COORDINATE
	40067-61-D

60% SUBMITTAL

GENESEE AVE.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM57.dgn

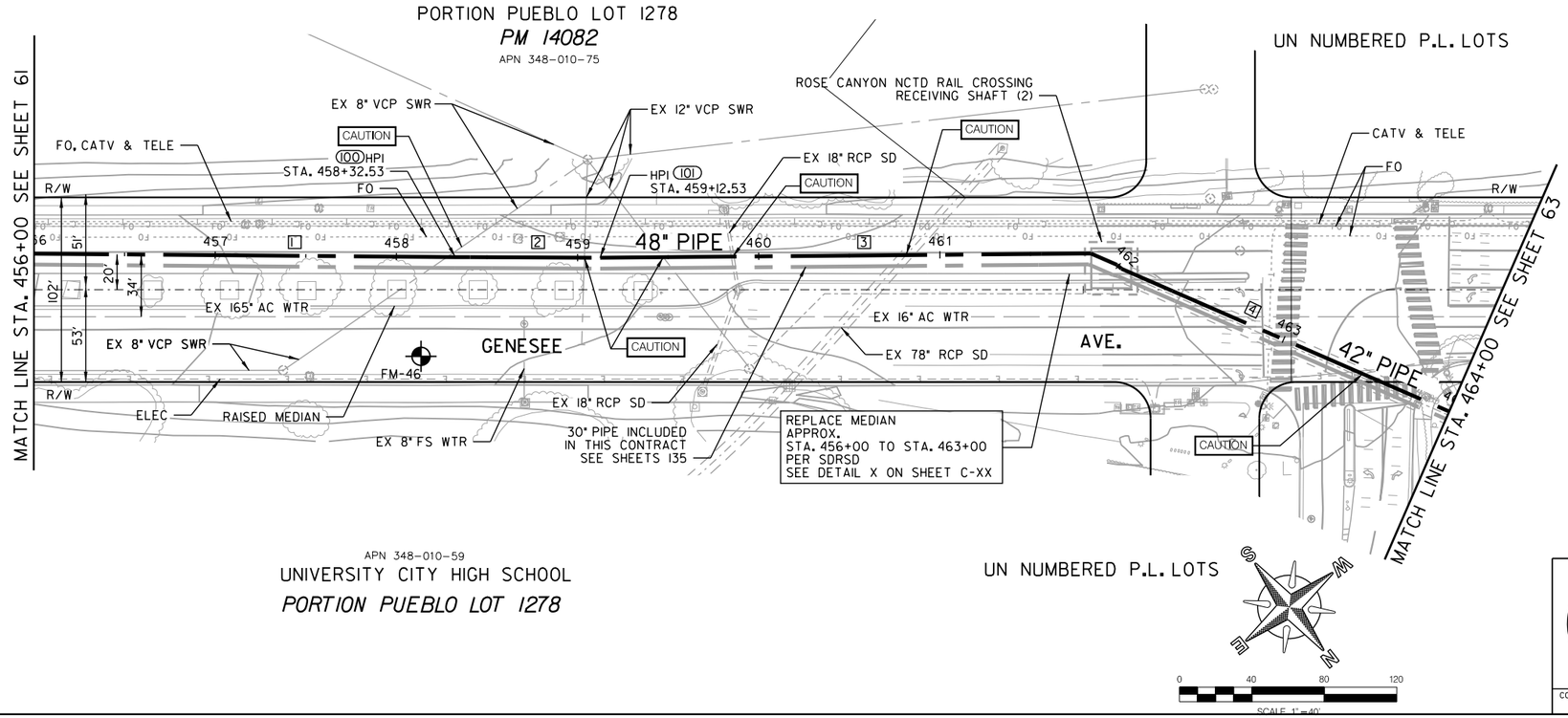
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



SCALE
1"=40' HORIZ.
1"=4' VERT.

REFERENCE:

WATER:	11897-17-D, 11897-18-D
SEWER:	11897-21-D, 26734-D
STORM DRAIN:	11897-5-D, 11897-6-D
GAS:	15802-11910, 15802-119195
ELECTRIC:	15757-119280, 15757-119285
CABLE TV:	NO INFO
TELEPHONE:	RE0407C, RE0207DB
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1894128.77	6267361.68	HPI
101	1894178.43	6267298.99	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N51° 23'50" W		232.53'	48" WSP (CML&TC)
2	N51° 36'46" W		80'	48" WSP (CML&TC)
3	N52° 21'30" W		187.47'	48" WSP (CML&TC)

C-58

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 456+00 TO STA. 464+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 62 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
APPROVED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-62-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

GENESEE AVE.

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM58.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

42" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

MATCH LINE STA. 464+00 SEE SHEET 62

MATCH LINE STA. 472+00 SEE SHEET 64

MATCH LINE

RC-01 projected 88' NE

RC-02

RC-03

RC-04 IE UNK

EX GRADE

EX PAVEMENT

Fill

Alluvium

Scripps

Fluvial Terrace Deposits (Older Alluvium)

EX 60" RCP SWR IE 179.82

EX 16" AC WTR IE 250.00

TELE IE UNK

TOP OF 30" BRINE SEE SHEET 136

6' CC 15' CC (MIN) (MAX)

48" @ 28% PE

IE 252.11

SEE SHEET XX-XX FOR PROFILE

210 200 190 230 220 260 250 240

464+00 465+00 466+00 467+00 468+00 469+00 470+00 471+00 472+00

SCALE 1"=40' HORIZ. 1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	11897-17-D, 11897-18-D
SEWER:	13644-54-D
STORM DRAIN:	11897-9-D
GAS:	NO INFO
ELECTRIC:	15757-119285
CABLE TV:	NO INFO
TELEPHONE:	RE0207DB
IMPROVEMENTS:	11897-9-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

UN NUMBERED P.L. LOTS

A.T. & S.F. RR

MAP 7026

GENESEE HIGHLANDS UNIT 2

APN 348-710-02

EX 60" PLP

FO, CATV & TELE

R/W

RC-01

GENESEE AVE.

EX 42" ENC VCP SWR

EX 10'X12' CONC TRIPLE BOX CULVERT SD

DRAIN EASEMENT

CAUTION

EX 1'X8' CULVERT

42" PIPE

AT & SF RAILROAD

EX 16" AC WTR

ELEC

TELE

FO, CATV & TELE

RAISED MEDIAN

EX 18" RCP SD

HPI (101) STA. 470+46.11

ROSE CANYON NCTD CROSSING RECEIVING SHAFT (I)

FO

BC (102)

471 48" PIPE

RC-02

EX 18" RCP SD

48" PIPE

RC-04

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET 136

TUNNELING CROSSING SEE XX-XX

REPLACE MEDIAN APPROX. STA. 470+00 TO STA. 472+00 PER SDRSD SEE DETAIL X ON SHEET C-XX

RC-03

HPI (100) STA. 467+58.42

ROSE CANYON NCTD RAIL CROSSING LAUNCHING SHAFT

7942

APN 345-172-08

NOBEL TERRACE UNIT 2

MAP 10462

SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1894850.40	6266812.68	HPI
(101)	1894824.37	6266526.17	HPI
(102)	1894926.30	6266430.96	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	S84° 48'32" W			48" WSP (CML&TC)
2	N43° 02'49" W			48" WSP (CML&TC)
3	24° 16'22"	2009'		48" WSP (CML&TC)

C-59

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 464+00 TO STA. 472+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 63 OF SHEETS

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

WATER WBS S-16027
SEWER WBS B-15141

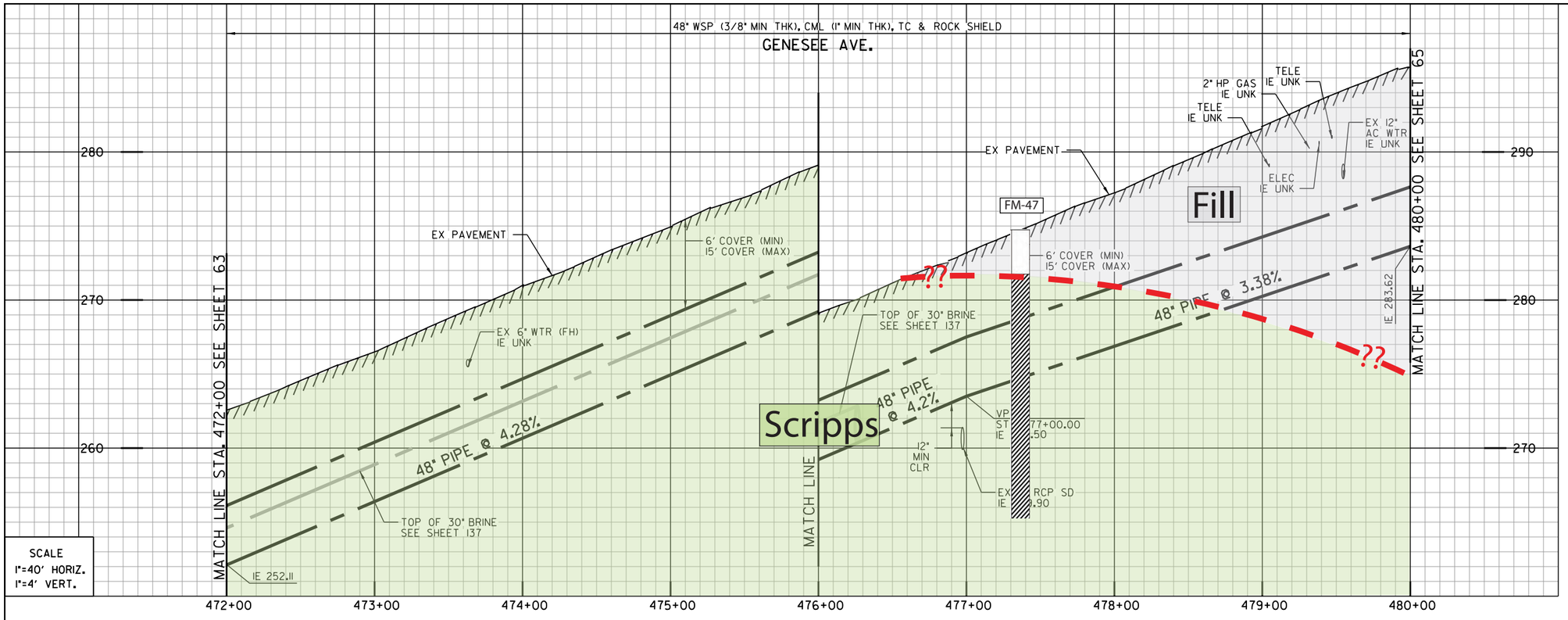
SUBMITTED BY LAILA NASRAWI PROJECT MANAGER
CHECKED BY DARIN SANCHEZ PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-63-D

GENESEE AVE.

60% SUBMITTAL

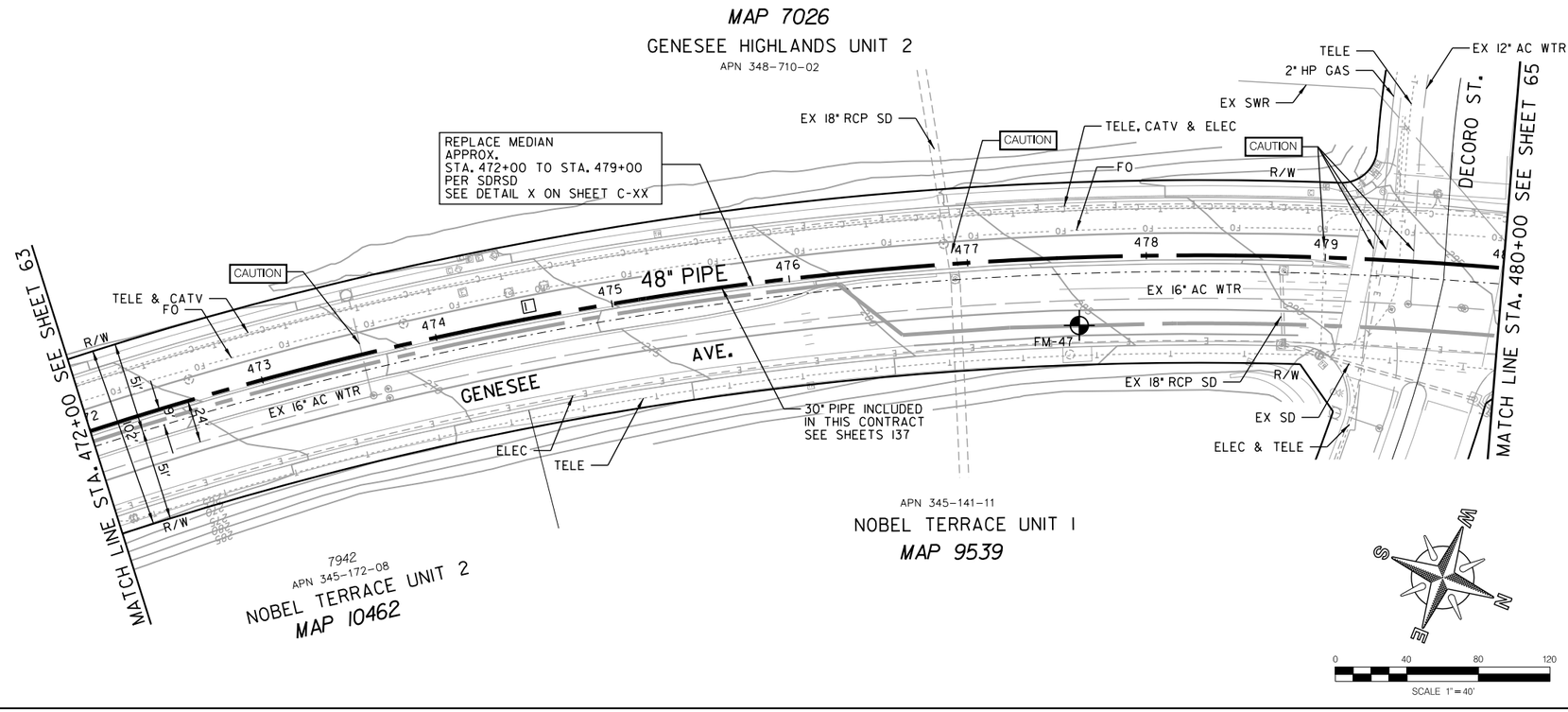
\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM59.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



REFERENCE:

WATER:	11897-18-D
SEWER:	NO INFO
STORM DRAIN:	NO INFO
GAS:	15750-119295
ELECTRIC:	15750-119295
CABLE TV:	NO INFO
TELEPHONE:	RE0207BA, RE205CD, RE205DC
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	24° 16'22"	2009'		48" WSP (CML&TC)

C-60

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 472+00 TO STA. 480+00 GENESEE AVE.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 64 OF SHEETS

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

WATER WBS	S-16027
SEWER WBS	B-15141
SUBMITTED BY	LAILA NASRAWI, PROJECT MANAGER
CHECKED BY	DARIN SANCHEZ, PROJECT ENGINEER
	000-0000 CCS27 COORDINATE
	0000-0000 CCS83 COORDINATE
	40067-64-D

60% SUBMITTAL

GENESEE AVE.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM60.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

EX 8" AC WTR
IE UNK

EX PAVEMENT

EX PAVEMENT

MATCH LINE STA. 480+00 SEE SHEET 64

MATCH LINE

MATCH LINE STA. 488+00 SEE SHEET 66

310

300

290

320

310

300

6' COVER (MIN)
15' COVER (MAX)

6' COVER (MIN)
15' COVER (MAX)

EX 18" RCP SD
IE 295.25

TOP OF 30" BRINE
SEE SHEET 138

TOP OF 3
SEE SH

Fill

Fill

Fill

Scripps

48" PIPE @ 3.38%

48" PIPE @ 1.60%

48" PIPE @ 6.29%

48" PIPE
@ 1.33%

VPI
STA. 481+00.00
IE 287.00

IE 283.63

VPI
STA. 483+50.00
IE 291.00

VPI
STA. 487+00.00
IE 313.00

IE 314.33

480+00 481+00 482+00 483+00 484+00 485+00 486+00 487+00 488+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	14556-2-D
STORM DRAIN:	14556-12-D, 22696-9-D
GAS:	15742-119305, 15750-119295, 15750-119300
ELECTRIC:	15742-119305, 15750-119295,15750-119300
CABLE TV:	238-1707A
TELEPHONE:	RE205CD
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

MAP 5648
4249

8148

HPI (100)
STA. 480+36.70

CATV, ELEC & 2" HP GAS

EX 12" VCP SWR

EX 18" RCP SD

CAUTION

CAUTION

CAUTION

EX 8" AC WTR

EX WTR

FO

TELE

EX 12" VCP SWR

FO

R/W

48" PIPE

GENESEE AVE.

EX 16" AC WTR

EX SD

EX 18" RCP SD

ELEC

TELE

R/W

REPLACE MEDIAN
APPROX.
STA. 483+00 TO STA. 488+00
PER SDRSD
SEE DETAIL X ON SHEET C-XX

30" PIPE INCLUDED
IN THIS CONTRACT
SEE SHEETS 138

8158
APN 345-141-09

NOBEL TERRACE UNIT 1
MAP 9539

0
APN 345-141-12

PM 14962

4337
APN 345-142-13

NOBEL TERRACE UNIT 7
MAP 10847

0 40 80 120
SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1895673.70	6266037.25	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	24° 16'22"	2009'	36.70'	48" WSP (CML&TC)
2	N15° 38'33" W		763.30'	48" WSP (CML&TC)

C-61

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 480+00 GENESEE AVE. TO STA. 488+00 NOBEL DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 65 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

40067-65-D

60% SUBMITTAL

GENESEE AVE. / NOBEL DR.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM61.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

GENESEE AVE.

NOBEL DR.

EX PAVEMENT

3" HP GAS
IE UNK

EX 12" AC WTR
IE 344.05

EX 8" PVC SWR
IE 338.68

6' COVER (MIN)
15' COVER (MAX)

TOP OF 30" BRINE
SEE SHEET 139

48" PIPE @ 0.70%

48" PIPE @ 3.7%

48" PIPE @ 1.33%

Scripps

Fill

??

??

4" HP GAS
IE UNK

FM-48
projected
55'W

CATV
IE UNK

ELEC
IE UNK

TELE
IE UNK

EX 16" AC WTR
IE UNK

EX 16" AC WTR
IE UNK

EX 18" RCP SD
IE 328.9

ELEC
E UNK

C SWR
322.08

EX 8" PVC SWR
IE 322.07

VPI
STA. 493+50.00
IE 330.00

IE 331.77

VPI
STA. 490+00.00
IE 317.00

IE 314.3

MATCH LINE STA. 488+00 SEE SHEET 65

MATCH LINE STA. 496+00 SEE SHEET 67

340
330
320

488+00 489+00 490+00 491+00 492+00 493+00 494+00 495+00 496+00

SCALE
1"=40' HORIZ.
1"=4' VERTICAL

(1) (103)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 489+37.27
I-45° HPI BEND

(2) (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 489+61.89
I- 45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	16773-13-D, 16773-14-D, 16773-16-D
SEWER:	16773-13-D, 16773-14-D, 16773-16-D
STORM DRAIN:	16773-13-D, 16773-14-D
GAS:	15802-11910, 15802-11919S
ELECTRIC:	15802-19040
CABLE TV:	NO INFO
TELEPHONE:	PB0812CC
IMPROVEMENTS:	16773-13-D, 16773-14-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

PM 6481
APN 345-090-54

FO
2" HP GAS
EX SD
ELEC & TELE

EX 16" AC WTR
EX 12" PVC SWR
EX SD

CAUTION
EX 18" RCP SD
CAUTION
CAUTION

BC (102)
TELE
EX 6" RW

REPLACE MEDIAN
APPROX.
STA. 493+00 TO STA. 495+40
PER SDRSD
SEE DETAIL X ON SHEET C-XX

EX 8" VCP SWR
EX 12" AC WTR

LOMBARD PL.

CAUTION

R/W

48" PIPE

EX 16" AC WTR

NOBEL DR.

EX 16" AC WTR

EX 8" VCP SWR

CAUTION

FO, CATV & ELEC
HP GAS

GENESEE AVE.

FM-48

ELEC
TELE

3" HP GAS

CATV & ELEC
4" HP GAS

EX 8" AC WTR

30" PIPE INCLUDED IN THIS
CONTRACT. SEE SHEETS 139

3" HP GAS

R/W

65'
63'
26'

MATCH LINE STA. 488+00 SEE SHEET 65

MATCH LINE STA. 496+00 SEE SHEET 67

APN 345-142-13
NOBEL TERRACE UNIT 7
MAP 10847

APN 345-142-09

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1896540.92	6265794.43	HPI BEND
(101)	1896562.37	6265806.49	HPI BEND
(102)	1896621.06	6266016.09	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N15° 38'33" W		137.27'	48" WSP (CML&TC)
2	N29° 21'27" E		24.61'	48" WSP (CML&TC)
3	N74° 21'27" E		217.66'	48" WSP (CML&TC)
4	61° 05'21"	1006'	420.46'	48" WSP (CML&TC)

N
W E
S

0 40 80 120
SCALE 1"=40'

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

C-62

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 488+00 GENESEE AVE. TO STA. 496+00 NOBEL DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 66 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

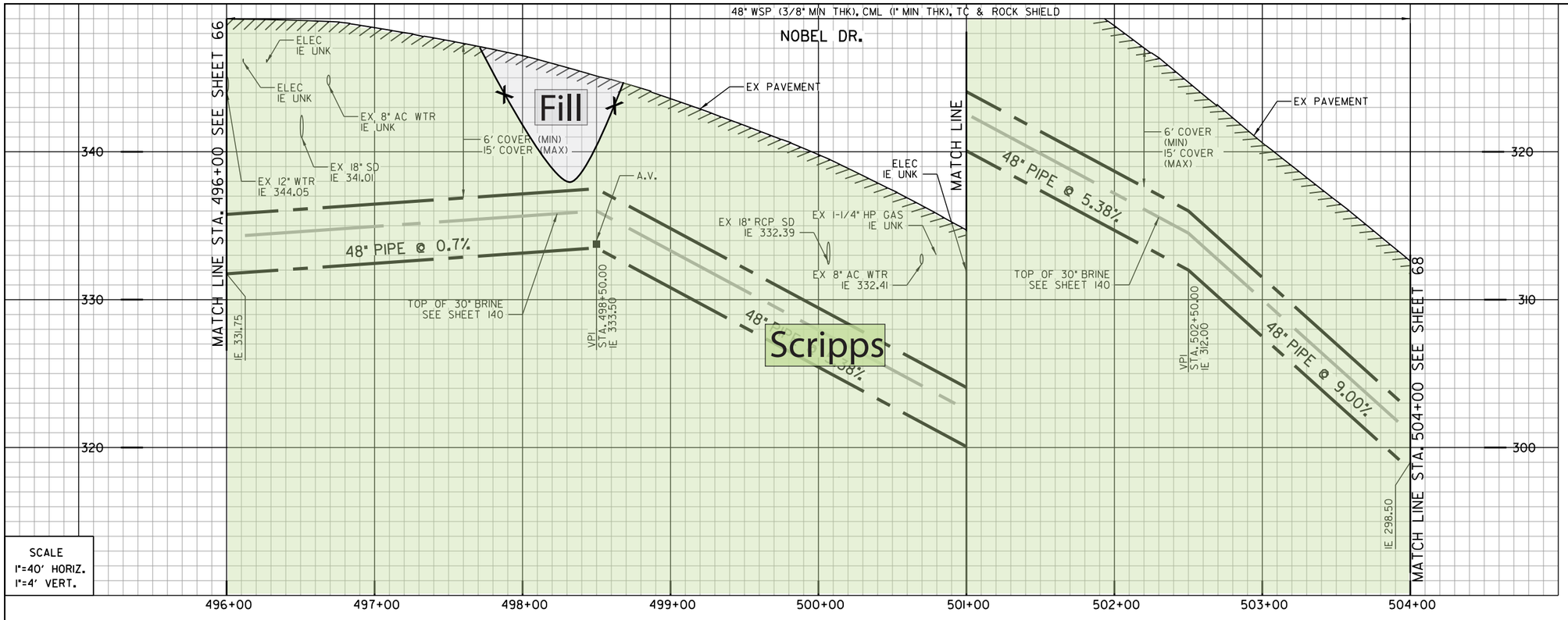
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

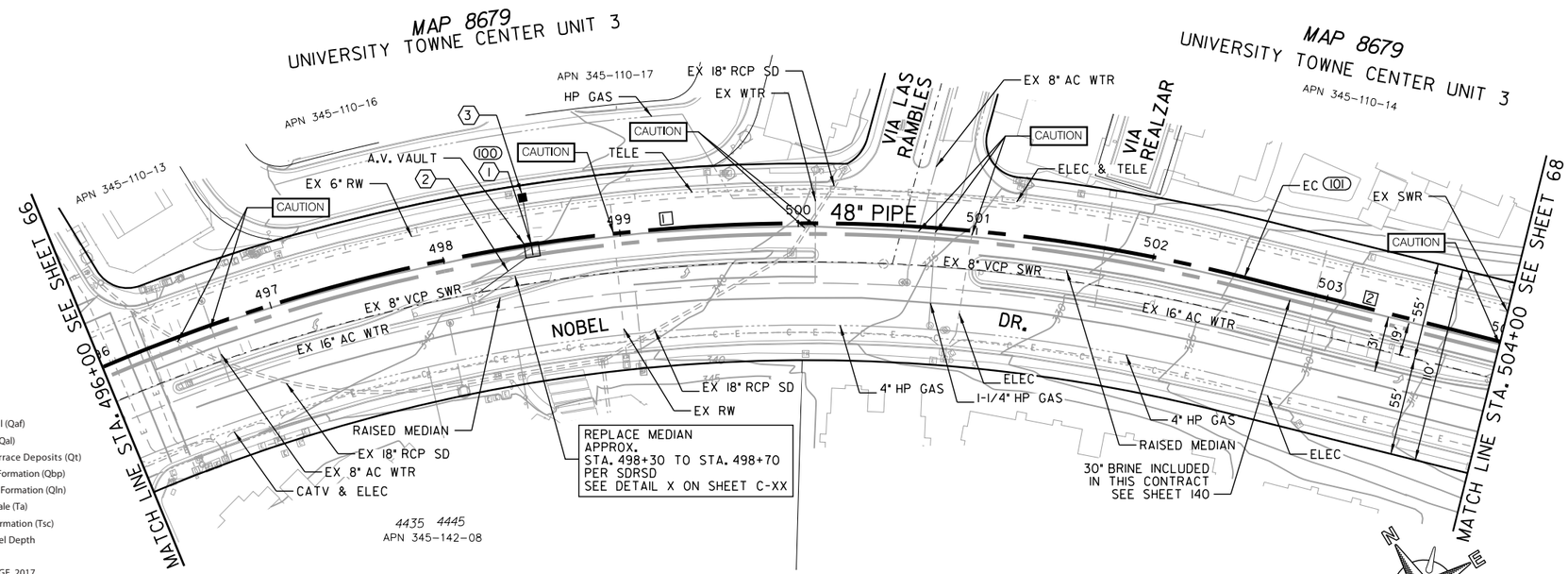
40067-66-D

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM62.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

GENESEE AVE. \ NOBEL DR.





Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
Boring
Boring - AGE, 2017
Boring - CWP, 1992
Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

(1) (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 498+50.00
1-3" VACUUM RELIEF VALVE ASSY &
1-2" COMBINATION AIR/VACUUM VALVE ASSY
W/ ODOR CONTROL VALVE
IN 8'X8' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

(2)
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MANHOLE

(3)
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

REFERENCE:

WATER:	16773-14-D, 16773-15-D
SEWER:	16773-14-D, 16773-15-D
STORM DRAIN:	16773-14-D, 16773-15-D
GAS:	15757-119305
ELECTRIC:	15742-119305, 15757-119300
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	16773-14-D, 16773-15-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1896581.45	6266673.01	A.V.
(101)	1896358.10	6267004.22	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	61° 05'21"	1006'	652.15'	48" WSP (CML&TC)
2	S44° 33'12" E		147.85'	48" WSP (CML&TC)

C-63

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 496+00 TO STA. 504+00 AT NOBEL DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 67 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE — PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-67-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

NOBEL DR.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM63.dgn
9/1/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

NOBEL DR. → TOWNE CENTRE DR.

MATCH LINE STA. 504+00 SEE SHEET 67

MATCH LINE STA. 512+00 SEE SHEET 69

EX 8" VCP SWR IE 304.46

EX 18" RCP SD IE 303.06

FM-49

EX 18" RCP SD IE 298.01

EX PAVEMENT

6' COVER (MIN) 15' COVER (MAX)

48" PIPE @ 9.0%

IE 298.50

VPI STA. 504+50.00 IE 294.00

EX 6" WTR (FH) IE UNK

TELE IE UNK

TOP OF 30" BRINE SEE SHEET 141

48" PIPE @ 7.60

Fill

Scripps

EX 18" RCP SD IE 283.69

EX 6" PVC RW IE 281.50

VPI STA. 507+00.00 IE 275.50

48" PIPE @ 4.00%

MATCH LINE

EX PAVEMENT

6' COVER (MIN) 15' COVER (MAX)

48" PIPE @ 4.00%

Fill

Scripps

TOP OF 30" BRINE SEE SHEET 141

48" PIPE @ 1.20%

VPI STA. 510+50.00 IE 261.00

IE 259.20

300 290 280 270 260

504+00 505+00 506+00 507+00 508+00 509+00 510+00 511+00 512+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

① 100
BY CONTRACTOR
FURNISH AND INSTALL
STA. 506+87.99
1 - 48" HPI BEND

② 101
BY CONTRACTOR
FURNISH AND INSTALL
STA. 507+23.64
1 - 45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	16773-11-D, 16773-12-D, 16773-15-D
REC WATER:	27987-33-D
SEWER:	16773-15-D, 16773-12-D, 16773-15-D, 24305-26-D
STORM DRAIN:	16773-11-D, 16773-12-D,16773-15-D
GAS:	15765-119305
ELECTRIC:	15757-119300, 15765-119300,15765-119305
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	18431-3-D, 24305-5-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1896107.10	6267251.33	HPI
101	1896048.59	6267310.92	HPI BEND
102	1896050.78	6267346.50	HPI BEND
103	1896073.26	6267366.37	BC
104	1896376.68	6267549.43	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	S44° 33'12" E		204.38'	48" WSP (CML&TC)
2	S45° 31'31" E		83.62'	48" WSP (CML&TC)
3	N86° 28'29" E		35.65'	48" WSP (CML&TC)
4	N41° 28'29" E		30'	48" WSP (CML&TC)
5	20° 55'08"	976'	356.34'	48" WSP (CML&TC)
6	N20° 38'41" E		90.02'	48" WSP (CML&TC)

MATCH LINE STA. 504+00 SEE SHEET 67

R/W 55' 10' 24' 55' R/W

EX 18" RCP SD

CAUTION

ELEC

4" HP GAS

REMOVE AND REPLACE RAISED MEDIAN

NOBEL DR.

EX 8" VCP SWR

EX 16" AC WTR

FM-49

EX 6" RW

EX 18" RCP SD

TELE

HPI (100) STA. 506+04.38

CAUTION

CAUTION

CAUTION

(101) 1

(102) 2

(103) BC

ELEC

EX 18" RCP SD

507

508

509

510

511

TOWNE CENTRE DR.

MAP 8679
UNIVERSITY TOWNE CENTER UNIT 3
APN 345-110-14

MAP 16100
UNIVERSITY TOWNE CENTER PHASE I
APN 345-090-28

(104) EC

48" PIPE

EX 8" VCP SWR

EX 16" AC WTR

EX 8" PVC SWR

ELEC

MATCH LINE STA. 512+00 SEE SHEET 69

R/W

30" PIPE INCLUDED IN THIS CONTRACT SEE SHEETS 141

APN 345-221-11
FIVE CREEKS (CONDO)
MAP 12234

4" HP GAS

EX 6" RW

ELEC

0 40 80 120
SCALE 1" = 40'

C-64

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 504+00 NOBEL DR. TO STA. 512+00 TOWNE CENTRE DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 68 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-68-D

60% SUBMITTAL

NOBEL DR. / TOWNE CENTRE DR.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM64.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

TOWNE CENTRE DR.

MATCH LINE STA. 512+00 SEE SHEET 68

MATCH LINE STA. 520+00 SEE SHEET 70

EX 30" RCP SD IE 264.26

EX PAVEMENT

Fill

B.O.

6' COVER (MIN) 15' COVER (MAX)

48" PIPE @ 2.80%

@ 1.20%

TOP OF 30" BRINE SEE SHEET 142

IE 259.20

VPI STA. 513+00.00 IE 258.00

MATCH LINE

Scripps

48" PIPE @ 4.75%

VPI STA. 515+50.00 IE 265.00

EX 6" WTR (FH) IE UNK

2" HP GAS IE UNK

EX 8" AC WTR IE 293.33

4" HP GAS IE UNK

FM-50

EX 8" VCP SWR IE 289.14

48" PIPE @ 4.75%

@ 8.55%

VPI STA. 519+50.00 IE 284.00

E 288.27

280

270

260

300

290

280

512+00

513+00

514+00

515+00

516+00

517+00

518+00

519+00

520+00

SCALE 1"=40' HORIZ. 1"=4' VERT.

1 (102) BY CONTRACTOR FURNISH AND INSTALL
STA. 515+79.75
1- 18" HPI BEND

2 (103) BY CONTRACTOR FURNISH AND INSTALL
STA. 516+16.18
1- 22.5° HPI BEND

3 (105) BY CONTRACTOR FURNISH AND INSTALL
STA. 513+00.00
1- 4" BLOW-OFF ASSY, LT
SEE DETAIL XX-XX

4 BY CONTRACTOR FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MAIN

5 BY CONTRACTOR FURNISH AND INSTALL
CATHDIC PROTECTION RECTIFIER

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	16773-10-D
RECYCLED WATER:	27987-34-D, 27987-35-D
SEWER:	16773-10-D
STORM DRAIN:	16773-11-D
GAS:	NO INFO
ELECTRIC:	15765-119310, 15765-119320
CABLE TV:	15765-119305, 15765-119315
TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
(100)	1896563.83	6267619.95	HPI
(101)	1896741.45	6267686.74	HPI
(102)	1896817.08	6267715.72	HPI BEND
(103)	1896845.41	6267738.63	HPI BEND
(104)	1896922.12	6267761.31	BC
(105)	1896554.55	6267616.45	A.V.

PROPOSED PIPE DATA TABLE

NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N20° 38'41" E		109.98'	48" WSP (CML&TC)
2	N20° 36'34" E		189.77'	48" WSP (CML&TC)
3	N20° 58'01" E		80'	48" WSP (CML&TC)
4	N38° 58'01" E		36.44'	48" WSP (CML&TC)
5	N16° 28'01" E		80'	48" WSP (CML&TC)
6	24° 20'57"	1486'	303.82'	48" WSP (CML&TC)

MAP 16100

UNIVERSITY TOWNE CENTER PHASE I

APN 345-090-28 | 8908 APN 345-100-48 | 8909 APN 345-100-49 | 8919 APN 345-100-50 | 4595 APN 345-100-56 | 8951 APN 345-100-01

EX 30" VCP SD

CAUTION

HPI (100) STA. 513+09.98

(101) HPI STA. 514+99.75

BC (104)

EX 8" VCP SWR

EX 8" AC WTR

4" HP GAS

EX 16" ACP WTR

EX 16" AC WTR

48" PIPE

FM-50

TOWNE CENTER DR.

RENAISSANCE AVE.

EX 6" RW

ELEC

2" HP GAS

RAISED MEDIAN

30" PIPE INCLUDED IN THIS CONTRACT SEE SHEET 142

EX 8" PVC SWR

EX 12" AC WTR

R/W

MATCH LINE STA. 512+00 SEE SHEET 68

MATCH LINE STA. 520+00 SEE SHEET 70

FIVE CREEKS

MAP 12234

SCALE 1"=40'

CAUTION

4" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-65

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 512+00 TO STA. 520+00 TOWNE CENTRE DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 69 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DRAWN BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

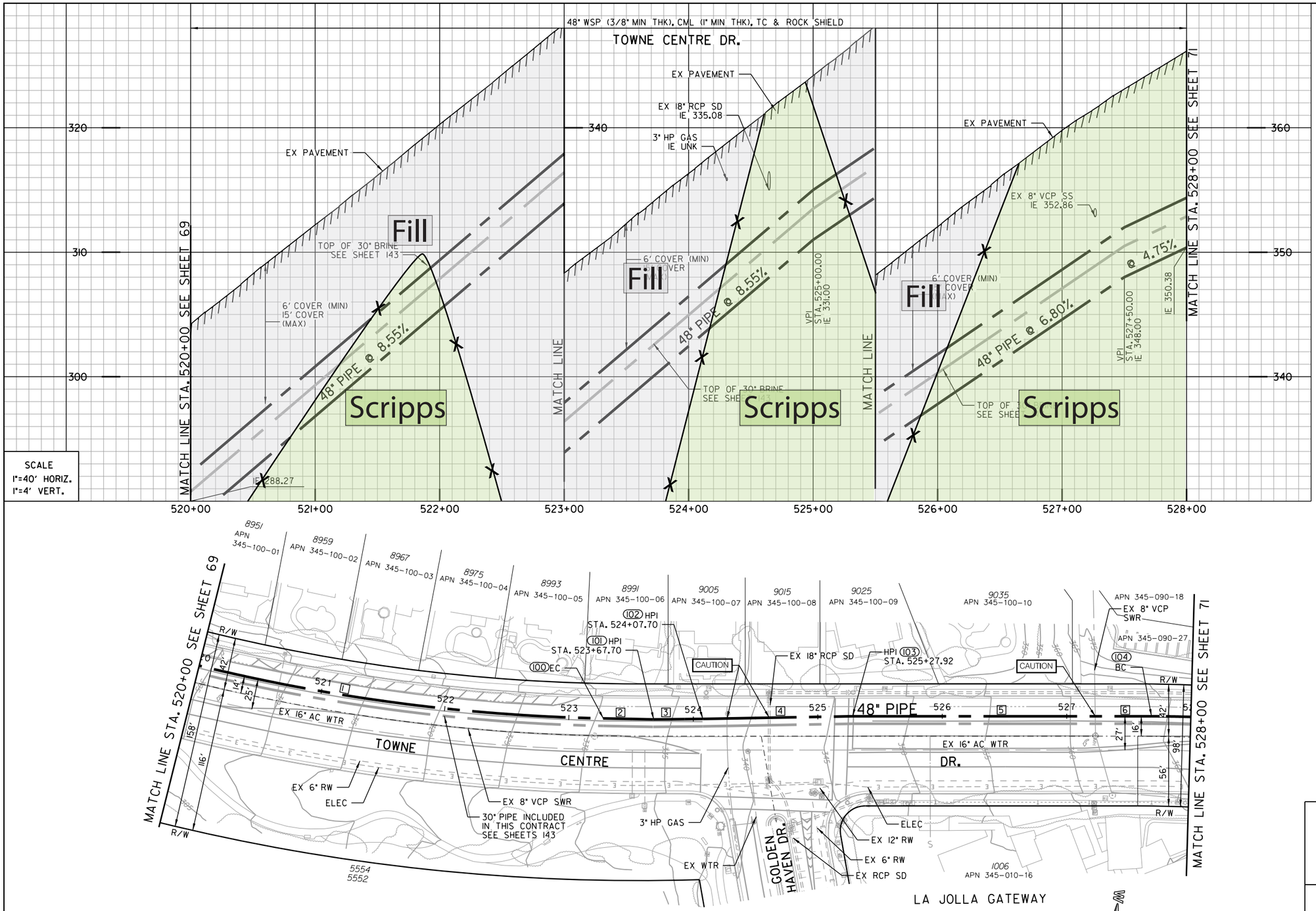
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

40067-69-D

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM65.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



FIVE CREEKS
MAP 12234

LA JOLLA GATEWAY
MAP 11038

SCALE 1" = 40'

REFERENCE:

WATER:	16773-9-D, 16773-10-D, 17045-3-D
RECYCLED WATER:	27987-36-D
SEWER:	16773-9-D, 16773-10-D, 17045-3-D
STORM DRAIN:	16773-9-D
GAS:	15765-119320, 15765-119325
ELECTRIC:	15765-119315, 15765-119320
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	16773-9-D, 16773-10-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1897547.18	6267807.72	EC
101	1897586.79	6267802.20	HPI
102	1897626.23	6267795.53	HPI
103	1897744.62	6267774.56	HPI
104	1897981.72	6267736.83	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	24° 20'57"	1486'	327.70'	48" WSP (CML&TC)
2	N7° 55'42" W		40'	48" WSP (CML&TC)
3	N9° 36'44" W		40'	48" WSP (CML&TC)
4	N10° 02'29" W		120.23'	48" WSP (CML&TC)
5	N9° 02'29" W		240.10'	48" WSP (CML&TC)
6	10° 30'50"	1016'	31.98'	48" WSP (CML&TC)

C-66

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 520+00 TO STA. 528+00 TOWNE CENTRE DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 70 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-70-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

TOWNE CENTRE DR.

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

TOWNE CENTRE DR.

EX PAVEMENT

FM-51b FM-51a

ELEC IE UNK

EX 6" WTR (FH) IE UNK

1-1/4" HP GAS IE UNK

EX 12" AC WTR IE 370.50

EX 6" PVC RW IE UNK

TOP OF 30" BRINE SEE SHEET 141

4" HP GAS IE UNK

Lindavista

Fill

Scripps

48" PIPE @ 4.75%

48" PIPE @ 0.90%

VPI STA. 531+50.00 IE 367.00

IE 350.38

IE 362.93

MATCH LINE STA. 528+00 SEE SHEET 70

MATCH LINE STA. 536+00 SEE SHEET 72

380 370 360

528+00 529+00 530+00 531+00 532+00 533+00 534+00 535+00 536+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-1 Boring - CWP, 1992
- GTR-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

PM 6481

APN 345-090-18
4577

APN 345-090-27

EX 12" AC WTR

100 EC

CAUTION

4" HP GAS

TOWN CENTER GATEWAY

ELEC

1 102

101 BC

FM-51B FM-51A

48" PIPE

R/W

EX 16" AC WTR

EX 12" RW

TOWNE CENTRE DR.

A.V. VAULT

RAISED MEDIAN

EX 8" VCP SWR

TELE

EX 6" FS WTR

EX 12" WTR

30" PIPE INCLUDED IN THIS CONTRACT SEE SHEETS 144

MATCH LINE STA. 528+00 SEE SHEET 70

MATCH LINE STA. 536+00 SEE SHEET 72

529 530 531 532 533 534 535

9001
APN 345-010-23
LA JOLLA GATEWAY
MAP 11038

9171
APN 345-010-16
LA JOLLA GATEWAY
MAP 11038

9191
APN 345-010-15
GATEWAY CENTER UNIT I
MAP 9884

SCALE 1"=40'

CAUTION
4" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

1 (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 531+50.00
1-3" VACUUM RELIEF VALVE ASSY &
1-2" COMBINATION AIR/VACUUM VALVE ASSY
W/ ODOR CONTROL VALVE
IN 7'X7' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

2
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MANHOLE

3
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

REFERENCE:

WATER:	16773-8-D
RECYCLED WATER:	27987-36-D
SEWER:	NO INFO
STORM DRAIN:	NO INFO
GAS:	15765-119330
ELECTRIC:	15765-119325, 15765-119330
CABLE TV:	NO INFO
TELEPHONE:	RE0403AD
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
100	1898167.49	6267724.55	EC
101	1898600.77	6267735.68	BC
102	1898362.96	6267729.57	A.V.

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	10° 30'50"	1016'	154.46'	48" WSP (CML&TC)
2	N1° 28'21" E		433.43'	48" WSP (CML&TC)
3	7° 56'45"	1982'	212.11'	48" WSP (CML&TC)

C-67

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 528+00 TO STA. 536+00 TOWNE CENTRE DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 71 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

40067-71-D

TOWNE CENTRE DR.

60% SUBMITTAL

48" WSP (3/8" MIN THK), CML (1" MIN THK), TC & ROCK SHIELD

TOWN CENTRE DR.

MATCH LINE STA. 539+00 SEE SHEET 71

MATCH LINE STA. 544+00 SEE SHEET 73

380 / 370 / 360

Fill

Lindavista

Scripps

EX PAVEMENT

6' COVER (MIN)
15' COVER (MAX)

TELE
IE UNK

EX 6" WTR (FH)
IE UNK

3" HP GAS
IE UNK

ELEC
IE UNK

FO
IE UNK

EX 16" AC WTR
IE 369.95

EX 18" RCP SD
IE UNK

EX I
IE 367.60

EX 10" PVC SWR
IE 365.77

IE 362.93

48" PIPE @ 0.90%

VPI
STA. 540+35.00
IE 359.00

CATV
IE UNK

EX 10" AC WTR
IE UNK

EX 6" AC WTR
IE UNK

EX 6" WTR (FH)
IE UNK

TELE
E UNK

3" HP GAS
IE UNK

A.V.

TOP OF 30" BRINE
SEE SHEET 145

@ 0.83%

48" PIPE @ 3.02%

VPI
STA. 543+50.00
IE 368.50

IE 368.08

536+00 / 537+00 / 538+00 / 539+00 / 540+00 / 541+00 / 542+00 / 543+00 / 544+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- Boring
- Boring - AGE, 2017
- Boring - CWP, 1992
- Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

PM 6481
APN 345-090-18

MAP 11506
EMBASSY SUITES HOTEL
APN 345-010-89
4550

MAP 10957
DEVONSHIRE WOODS
9260

MATCH LINE STA. 536+00 SEE SHEET 71

MATCH LINE STA. 544+00 SEE SHEET 73

EX 16" AC WTR

(101) HPI
STA. 539+25.89

CAUTION

EC
(100)

CATV

R/W

100'
49'
51'
25'
18'

EX 10" PVC SWR
FO, CATV & ELEC

EX 8" PVC SWR

EX 6" AC SERVICE

EX 10" AC SERVICE

(102) BC

ELEC

3" HP GAS

(103) EC

48" PIPE

537 / 538 / 539 / 540 / 541 / 542 / 543

TOWNE CENTRE DR.

EX 12" AC WTR

EX 12" RW

FO, CATV & TELE
RAISED MEDIAN

TELE

3" HP GAS

EX WTR

A.V. VAULT

4" HP GAS

EX 12" RW

CATV, ELEC & TELE

30" BRINE INCLUDED
IN THIS CONTRACT
SEE SHEET 145

4" HP GAS

TELE

EX 16" ACP WTR

LA JOLLA VILLAGE DR.

EX 18" RCP SD

ELEC

EX 10" VCP SWR

EX 10" PVC SWR

CATV

EX 12" AC WTR

EX 12" RW

A.V. VAULT

EX WTR

9191
APN 345-010-15

GATEWAY CENTER UNIT I

MAP 9884

4660
APN 345-012-18

LA JOLLA CENTRE

PM 21051
MAP 11227

9255
APN 345-012-16
PM 21051

SCALE 1"=40'

1 (104)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 543+50.00
1-3" VACUUM RELIEF VALVE ASSY.
1-2" COMBINATION AIR/VACUUM VALVE ASSY.
W/ODOR CONTROL VALVE
IN 8'X8' COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

2
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MAIN

3
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

REFERENCE:

WATER:	16773-7-D, 17848-2-D, 22656-5-D
RECYCLED WATER:	27987-37-D
SEWER:	20534-4-D, 21236-2-D, 21236-4-D, 22656-5-D
STORM DRAIN:	15798-3-D, 20534-4-D, 21236-2-D, 21236-4-D
GAS:	15765-119330, 15765-119345
ELECTRIC:	15765-119330, 15765-119335
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	17848-2-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
(100)	1898875.16	6267723.70	EC
(101)	1899136.62	6267694.04	HPI
(102)	1899363.85	6267668.17	BC
(103)	1899557.80	6267658.59	EC
(104)	1899558.88	6267658.61	A.V.

PROPOSED PIPE DATA TABLE

NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	7° 56'45"	1982'	62.76'	48" WSP (CML&TC)
2	N6° 28'24" W		263.14'	48" WSP (CML&TC)
3	N6° 29'38" W		228.71'	48" WSP (CML&TC)
4	7° 20'04"	1518'	194.32'	48" WSP (CML&TC)
5	N 0° 50'26" E		51.88'	48" WSP (CML&TC)

C-68

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 536+00 TO STA. 544+00 TOWNE CENTRE DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 72 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCSB3 COORDINATE

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

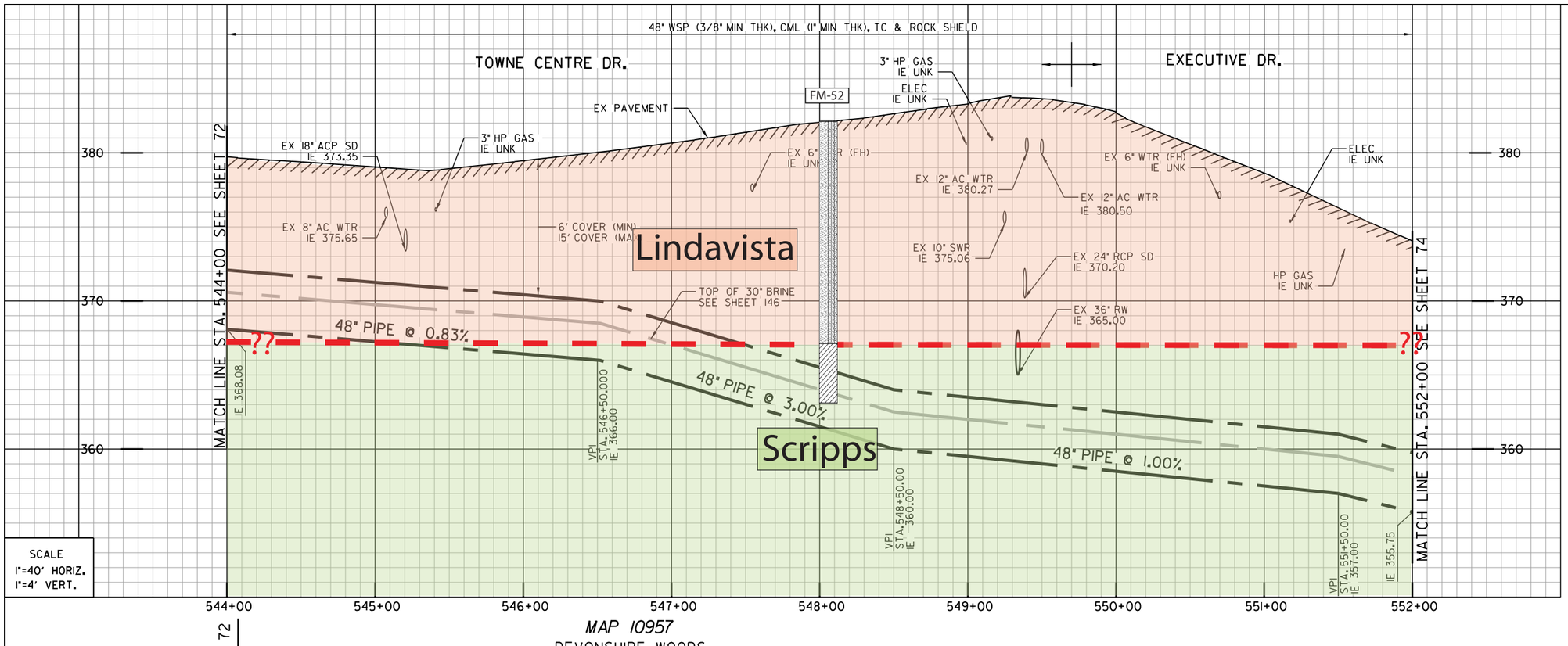
40067-72-D

TOWNE CENTRE DR.

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM68.dgn

9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



SCALE
1"=40' HORIZ.
1"=4' VERT.

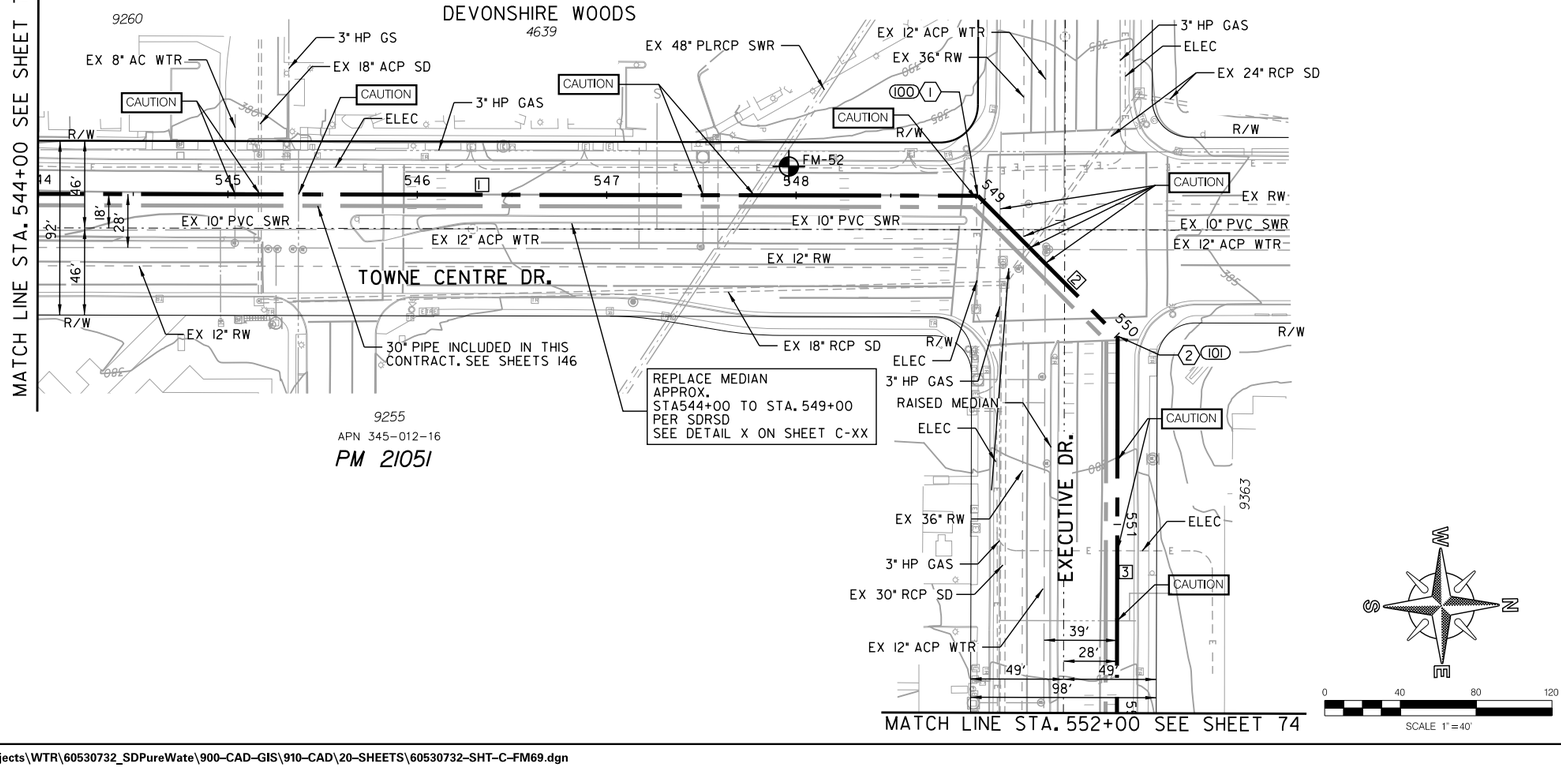
1 (100) BY CONTRACTOR FURNISH AND INSTALL
STA. 548+96.97
I- 45° HPI BEND

2 (101) BY CONTRACTOR FURNISH AND INSTALL
STA. 550+00.60
I- 45° HPI BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	21236-3-D, 22656-2-D, 22656-4-D, 22656-5-D
RECYCLED WATER:	27357-35-D
SEWER:	21236-3-D, 22656-2-D, 22656-5-D
STORM DRAIN:	22656-4-D, 22656-5-D
GAS:	15765-119340, 15765-119345
ELECTRIC:	15765-119340, 15765-119345
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	21236-3-D, 22656-2-D, 22656-5-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1900104.79	6267666.62	HPI BEND
(101)	1900177.68	6267741.68	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N 0° 50'26" E		495.97'	48" WSP (CML&TC)
2	N45° 50'26" E		104.63'	48" WSP (CML&TC)
3	S89° 09'34" E		199.40'	48" WSP (CML&TC)

C-69

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 544+00 TOWNE CENTRE DR. TO STA. 552+00 EXECUTIVE DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 73 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-73-D

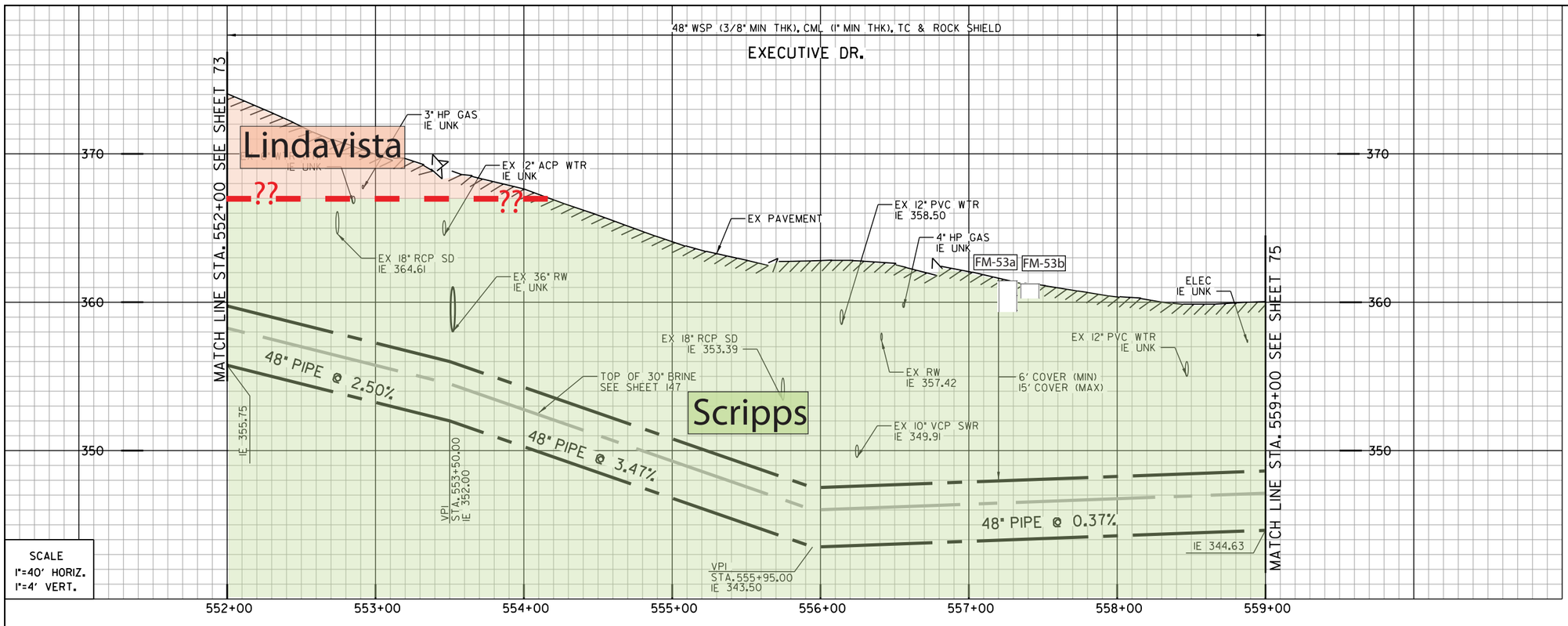
REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

TOWNE CENTRE DR./EXECUTIVE DR.

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM69.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (100) BY CONTRACTOR FURNISH AND INSTALL
STA. 553+07.76
I - 45° HPI BEND

2 (101) BY CONTRACTOR FURNISH AND INSTALL
STA. 553+61.09
I - 45° HPI BEND

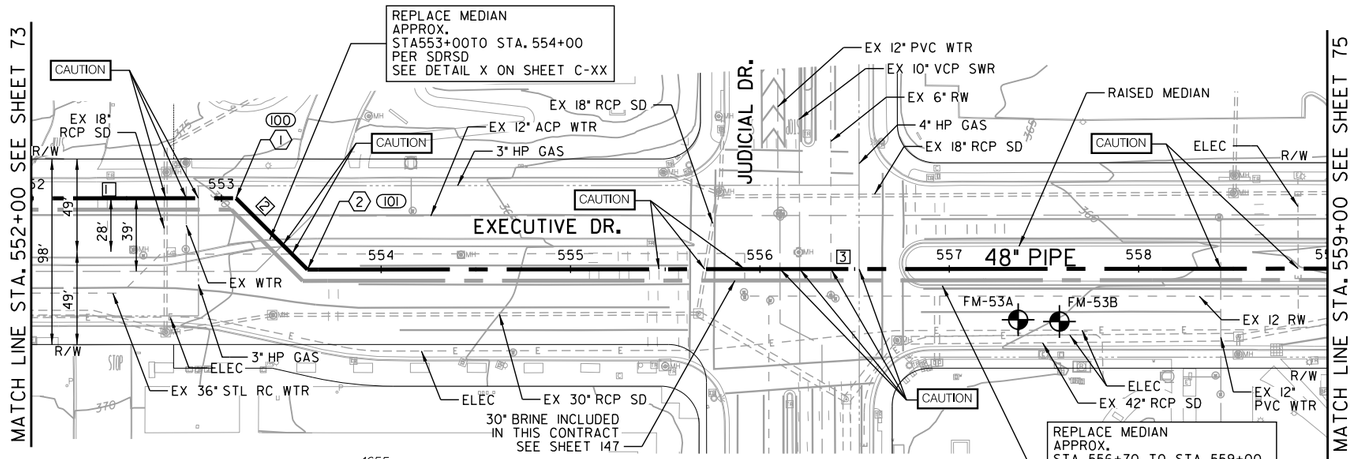
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	28669-4-D, 29284-4-D, 31400-20-D
RECYCLED WATER:	28669-3-D, 29284-4-D
SEWER:	NO INFO
STORM DRAIN:	22656-4-D, 28670-D, 31226-3-D, 31226-5-D, 31226-6-D
GAS:	15772-119340
ELECTRIC:	15772-119340
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	28669-4-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

PM 18159
APN 345-012-11
4690

MAP 15848
RESUB OF LA JOLLA COMMONS
APN 345-012-13
9381



4655
APN 345-012-20

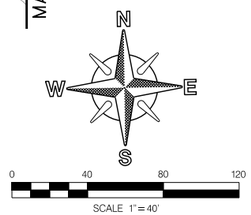
PM 21051

4707

RESUB OF LA JOLLA COMMONS

MAP 15848

CAUTION
4" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1900173.17	6268048.81	HPI BEND
(101)	1900134.91	6268085.97	HPI BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	S89° 09'34" E		107.76'	48" WSP (CML&TC)
2	S44° 09'34" E		53.33'	48" WSP (CML&TC)
3	S89° 09'34" E		538.91'	48" WSP (CML&TC)

C-70

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 552+00 TO STA. 559+00 EXECUTIVE DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 74 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 OCS27 COORDINATE
0000-0000 OCS83 COORDINATE

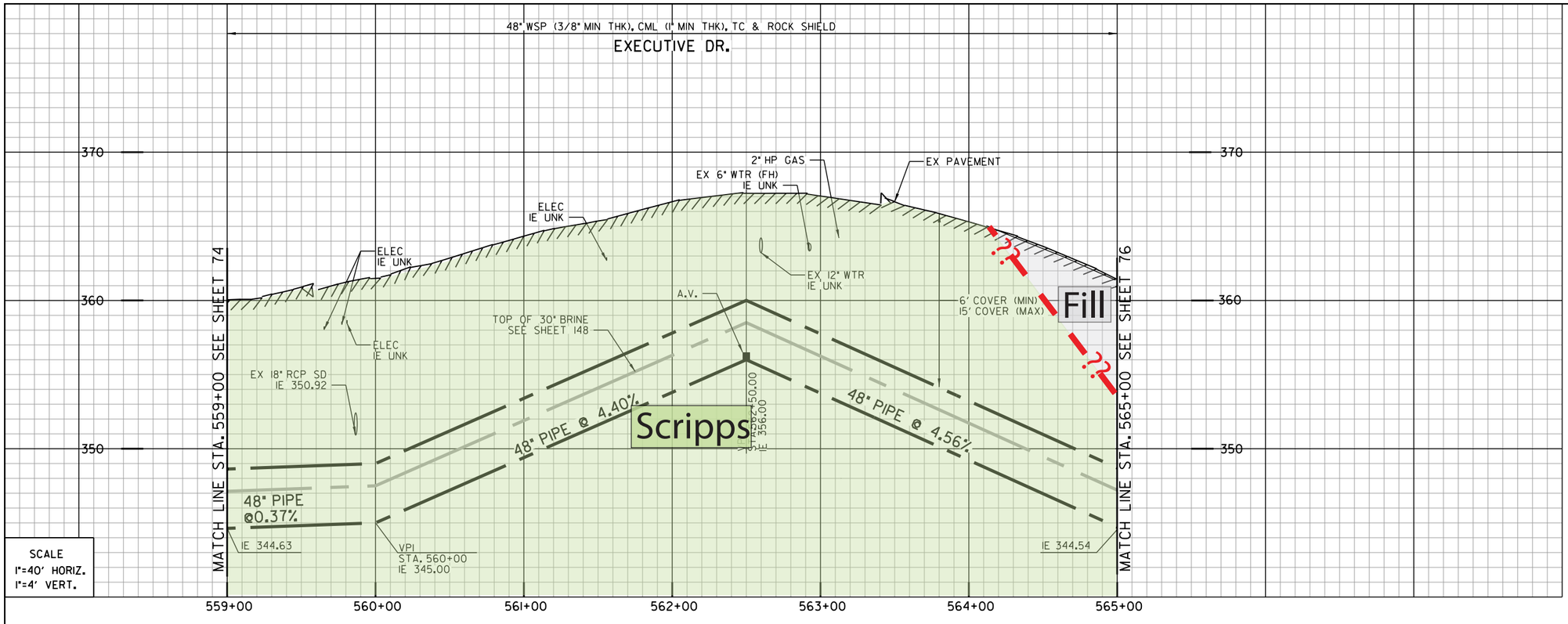
REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-74-D

EXECUTIVE DRIVE

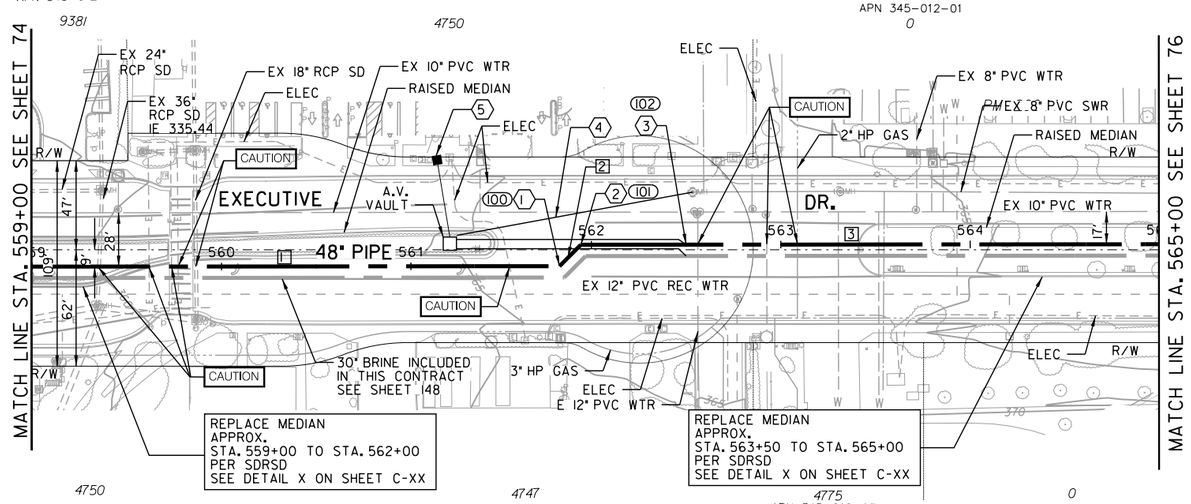
60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

MAP 15848
RESUB OF
LA JOLLA COMMONS
APN 345-012-13

PM 20044
APN 345-012-01



RESUB OF LA JOLLA COMMONS
MAP 15848

PM 17892
APN 345-012-03

PM 20044
APN 345-012-02

1 (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 561+78.48
1-45° HPI BEND

2 (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 561+94.47
1- 45° HPI BEND

3 (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA. 652+50.00
1-6" COMBINATION AIR/VACUUM VALVE ASSY
W/ ODOR CONTROL VALVE
IN 8'X8' VAULT COMBINED W/ BRINE VALVES, LT
SEE DETAIL C-XX

4
BY CONTRACTOR
FURNISH AND INSTALL
CONNECT 4" DRAIN TO SEWER MANHOLE

5
BY CONTRACTOR
FURNISH AND INSTALL
12" SIDEWALK VENT FOR VALVE VAULT
SEE DETAIL C-XX

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	31400-20-D, 33663-8-D
SEWER:	24220-D, 33663-8-D, 26843-D(TUNNEL)
STORM DRAIN:	24220-5-D, 31226-5-D, 33663-8-D
GAS:	15780-119340
ELECTRIC:	15772-119345, 15780-119340
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	33663-8-D
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1900122.92	6268903.27	HPI BEND
(101)	1900134.06	6268914.74	HPI BEND
(102)	1900133.24	6268970.26	A.V.

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	S89° 09'34" E		278.48'	48" WSP (CML&TC)
2	N45° 50'26" E		15.99'	48" WSP (CML&TC)
3	S89° 09'34" E		305.53'	48" WSP (CML&TC)

N
W E
S
0 40 80 120
SCALE 1"=40'

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

C-71

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 559+00 TO STA. 565+00 EXECUTIVE DR.

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 75 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

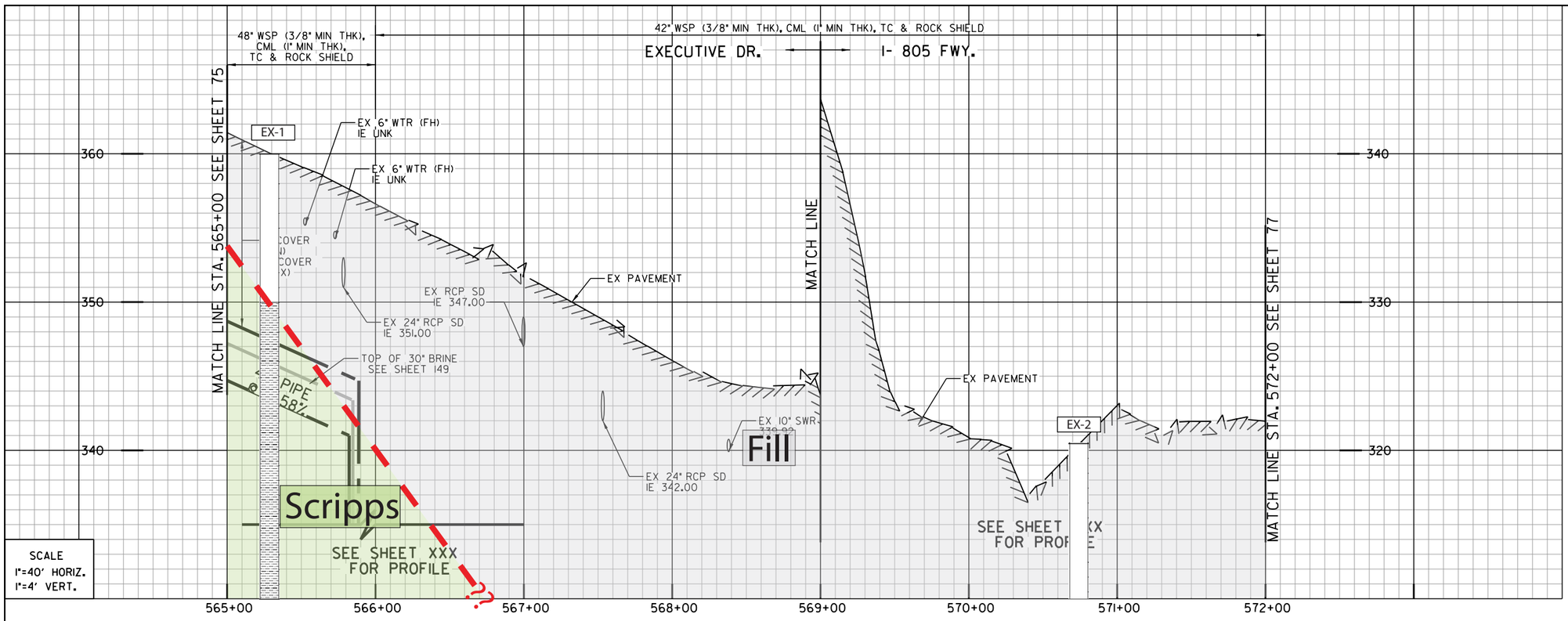
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 OCS27 COORDINATE
0000-0000 OCS83 COORDINATE
40067-75-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

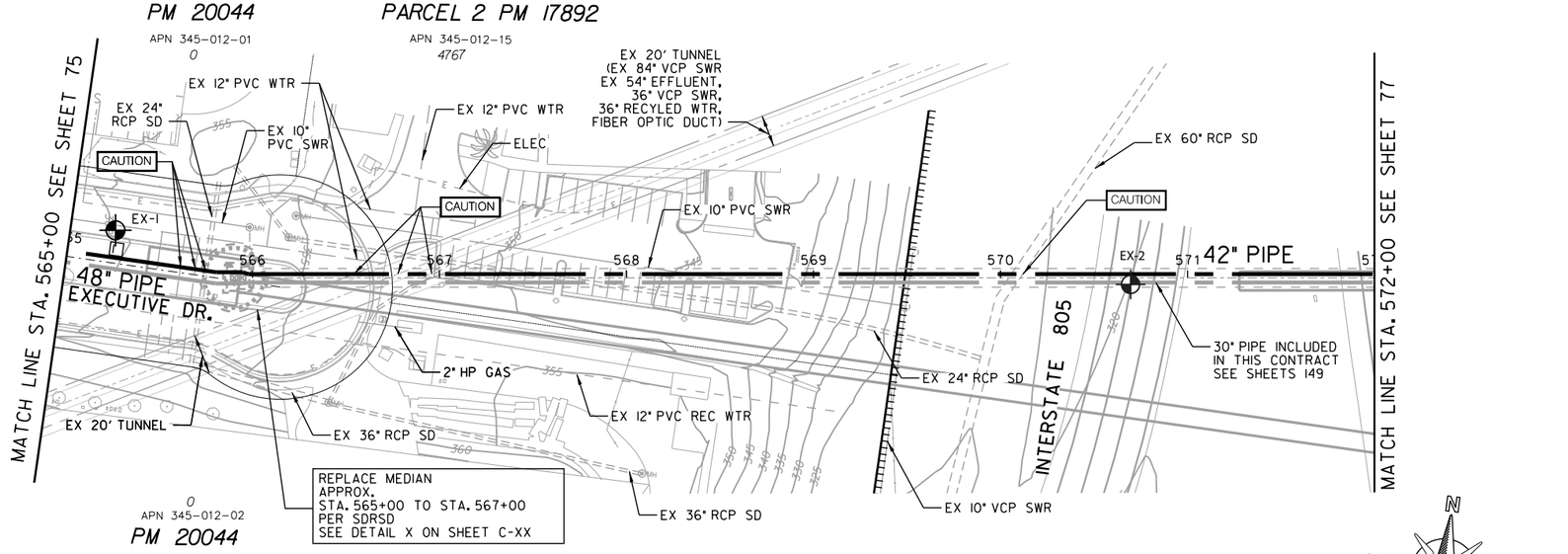
EXECUTIVE DRIVE

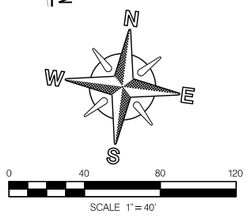
60% SUBMITTAL



REFERENCE:

WATER:	NO INFO
SEWER:	13011-5-D, 24220-5-D
STORM DRAIN:	24220-5-D
GAS:	NO INFO
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	





EXECUTIVE DR. \ INTERSTATE I-805

C-72

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 565+00 WESTERNLY OF I-805
TO STA. 572+00 EASTERNLY OF I-805

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 76 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

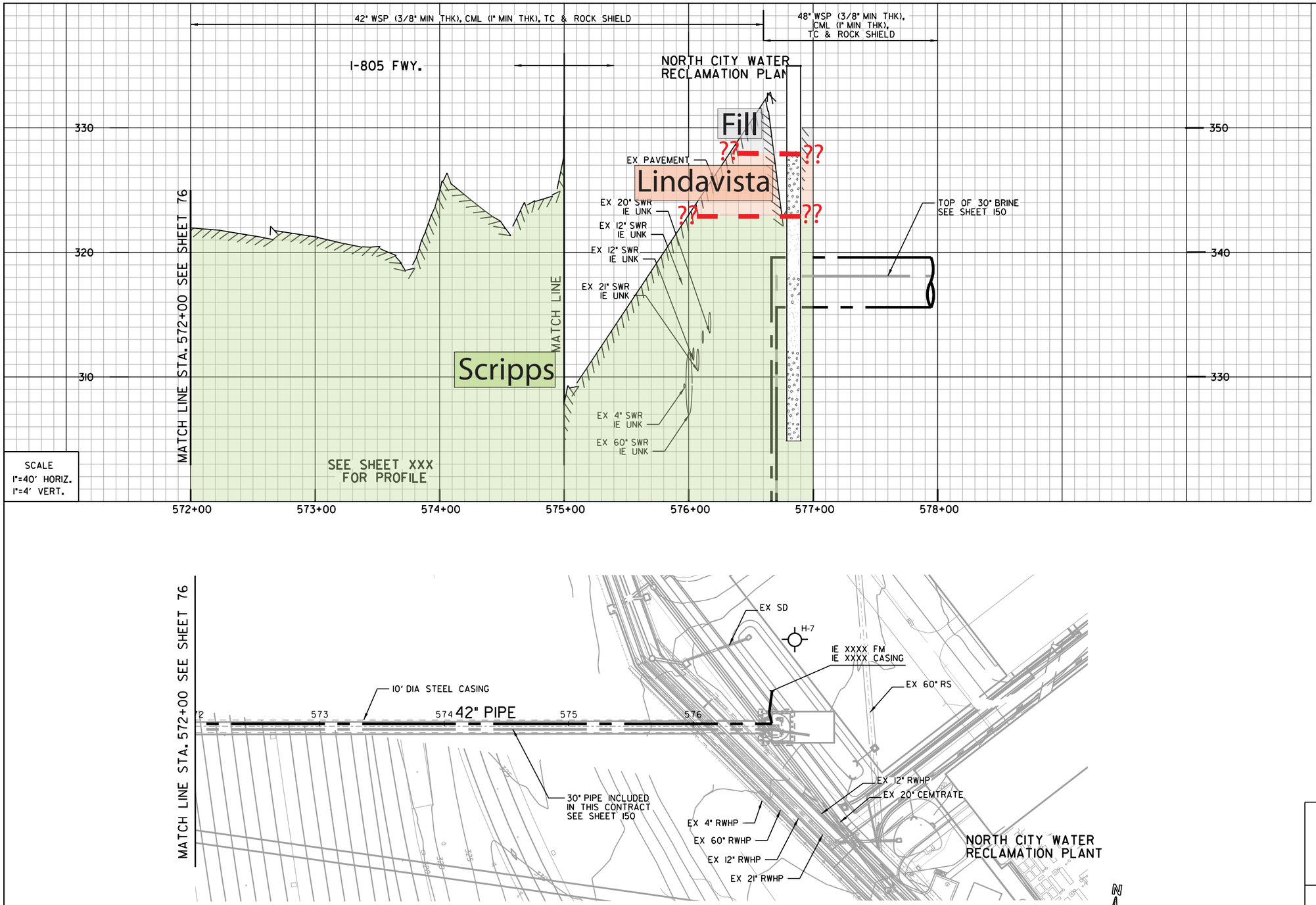
REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-76-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

60% SUBMITTAL

\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM72.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl



REFERENCE:

WATER:	NO INFO
SEWER:	13011-5-D, 24220-5-D, 26882-75-D
STORM DRAIN:	242220-5-D
GAS:	NO INFO
ELECTRIC:	NO INFO
CABLE TV:	NO INFO
TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

I-805 \ NCWRP

INTERSTATE I-

C-73

MORENA PUMP STATION AND CONVEYANCE SYSTEM

SEWER FORCEMAIN

STA. 572+00 EASTERLY OF I-805 TO STA. 576+93.21 NCWRP

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 77 OF SHEETS

WATER WBS S-16027
SEWER WBS B-15141

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

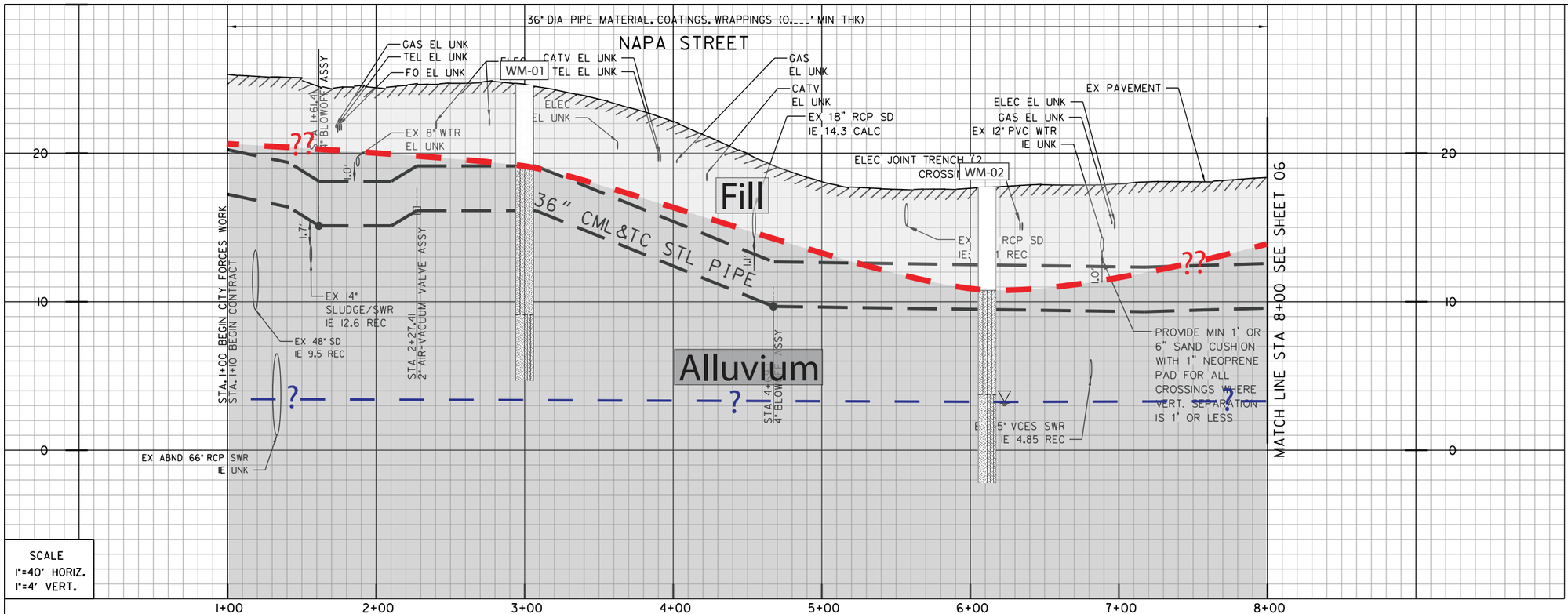
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-77-D

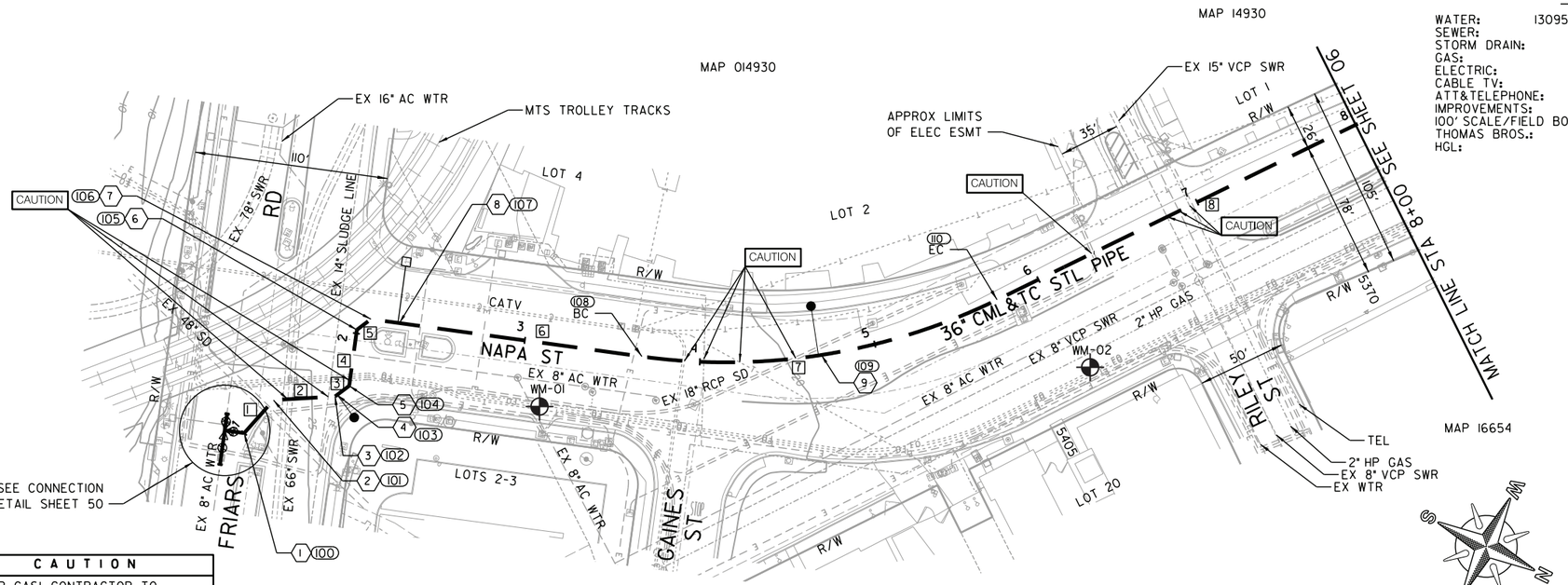
\\Orange.na.aecomnet.com\Orange\DCS\Projects\WTR\60530732_SDPureWate\900-CAD-GIS\910-CAD\20-SHEETS\60530732-SHT-C-FM73.dgn
9/11/2017 wangl10 FULL-BW with pen.pltcfg sd-full.tbl

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

CAUTION
2" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED



REFERENCE:

WATER:	13095-D, 12067-D, 33302-D, 27152-D
SEWER:	9702-L, 9707-L, 32973-D
STORM DRAIN:	13095-D
GAS:	15795-118930
ELECTRIC:	15802-118930, 15795-118935
CABLE TV:	105-210
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

① (100)
BY CONTRACTOR
FURNISH AND INSTALL
STA 1+00.00
1- POB

② (101)
BY CONTRACTOR
FURNISH AND INSTALL
STA 1+25.00
1- 45° HORIZ BEND

③ (102)
BY CONTRACTOR
FURNISH AND INSTALL
STA 1+60.00
1- 45° HORIZ BEND

④ (103)
BY CONTRACTOR
FURNISH AND INSTALL
STA 1+61.409
1- 4" B.O. ASSY

⑤ (104)
BY CONTRACTOR
FURNISH AND INSTALL
STA 1+70.00
1- 45° HORIZ BEND

⑥ (105)
BY CONTRACTOR
FURNISH AND INSTALL
STA 2+02.00
1- 45° HORIZ BEND

⑦ (106)
BY CONTRACTOR
FURNISH AND INSTALL
STA 2+12.00
1- 1-45° HORIZ BEND

⑧ (107)
BY CONTRACTOR
FURNISH AND INSTALL
STA 2+27.41
1- 2" AIR & VACUUM VALVE ASSY

⑨ (109)
BY CONTRACTOR
FURNISH AND INSTALL
STA 4+69.1
1- 4" B.O. ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-3 Boring - Kleinfelder, 2014
- ?? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(100)	1858898.79	6271156.46	POB
(101)	1858905.35	6271132.33	HPI
(102)	1858935.72	6271114.94	HPI
(103)	1858936.35	6271113.68	B.O. ASSY
(104)	1858940.18	6271105.99	HPI
(105)	1858930.00	6271075.65	HPI
(106)	1858934.46	6271066.70	HPI
(107)	1858934.46	6271066.69	ARV ASSY
(108)	1859081.41	6271017.40	BC
(109)	1859172.14	6270971.37	B.O. ASSY
(110)	1859247.42	6270899.11	EC

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N74° 47'38"W		25.0'	36" CML&TC STL
2	N29° 47'38"W		35.0'	36" CML&TC STL
3	N63° 32'38"W		10.0'	36" CML&TC STL
4	S71° 27'22"W		32.0'	36" CML&TC STL
5	N63° 32'38"W		10.0'	36" CML&TC STL
6	N18° 32'38"W		155.0'	36" CML&TC STL
7	33° 51'38"	350'	206.84'	36" CML&TC STL
8	N52° 24'17"W		226.16'	36" CML&TC STL

C-1

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 1+00 FRIARS RD TO STA 8+00 AT NAPA ST

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 05 OF 106 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
APPROVED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-05-D

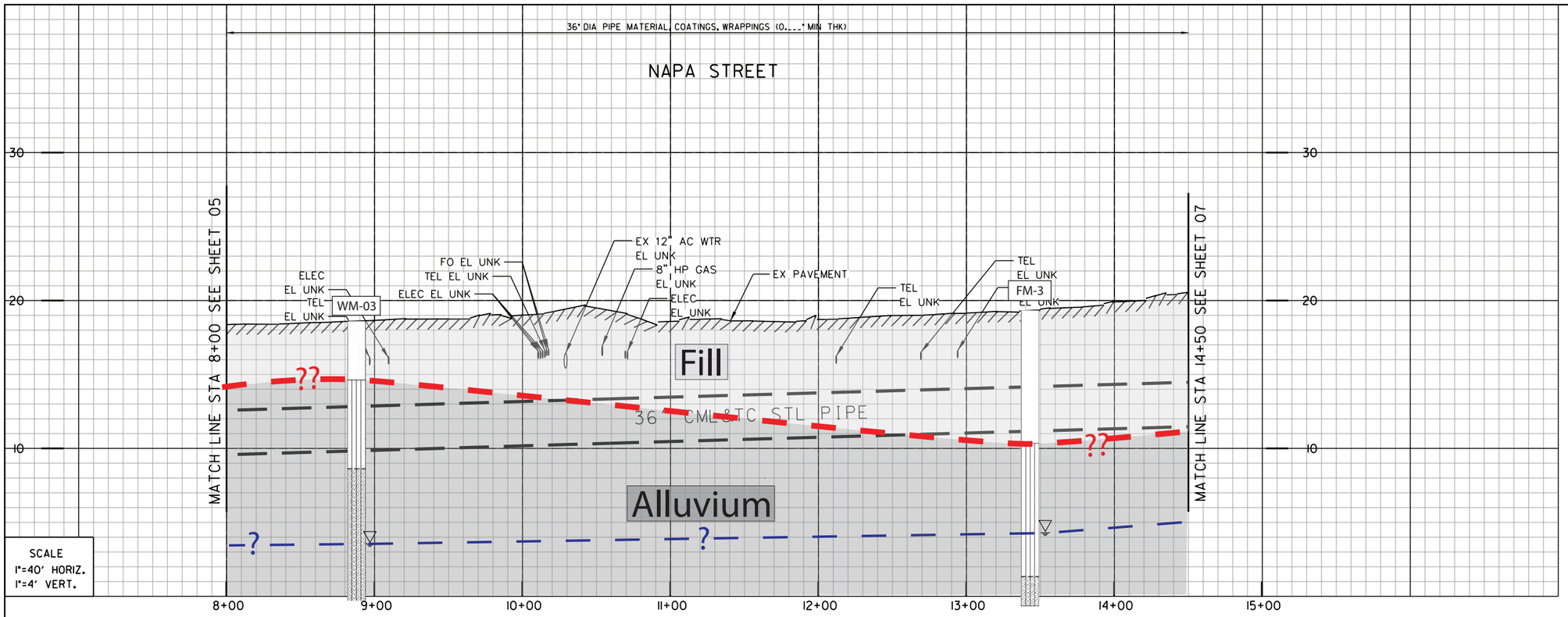
REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR1.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL

NAPA STREET



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (112) BY CONTRACTOR FURNISH AND INSTALL
STA 9+62.97
1 - 45° HORIZ BEND

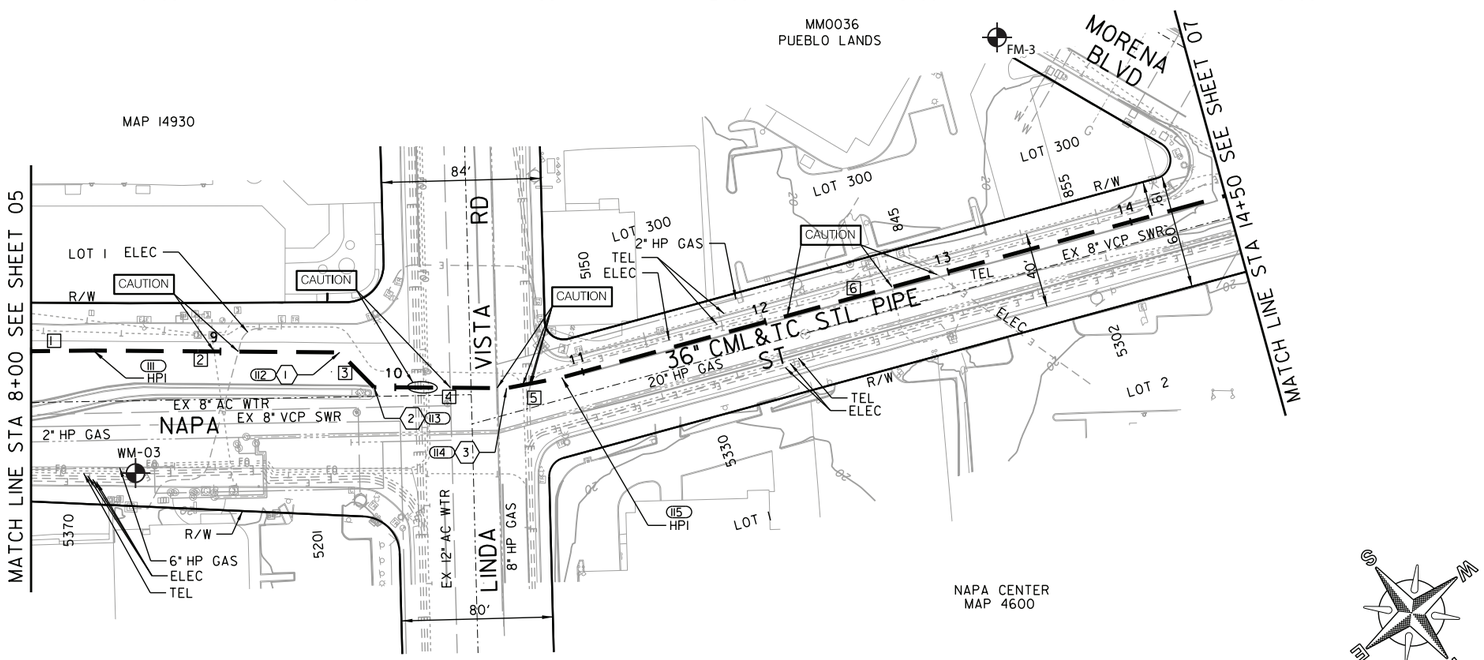
2 (113) BY CONTRACTOR FURNISH AND INSTALL
STA 9+88.82
1 - 45° HORIZ BEND

3 (114) BY CONTRACTOR FURNISH AND INSTALL
STA 10+62.44
1 - 11.25° HORIZ BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??— Geological Contact
- – ? – Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	14439-D
SEWER:	9707-L, 10437-D, 9702-L
STORM DRAIN:	NO INFO
GAS:	15795-118935, 15795-118940
ELECTRIC:	15795-118935, 15795-118940
CABLE TV:	105-210
ATT&TELEPHONE:	BL01970, unl308dd
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



CAUTION
20" & 8" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(111)	1859405.45	6270693.86	HPI
(112)	1859486.59	6270592.17	HPI
(113)	1859512.23	6270589.29	HPI
(114)	1859555.89	6270534.58	HPI
(115)	1859569.52	6270508.2	4.38° BEND

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N52° 24'17"W		32.89'	36" CML&TC STL
2	N51° 24'45"W		130.09'	36" CML&TC STL
3	N6° 24'45"W		25.8'	36" CML&TC STL
4	N51° 24'45"W		70.0'	36" CML&TC STL
5	N62° 39'45"W		29.69'	36" CML&TC STL
6	N67° 08'49"W		361.54'	36" CML&TC STL

C-2

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 8+00 TO STA 14+50 AT NAPA ST

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 06 OF 106 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-06-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

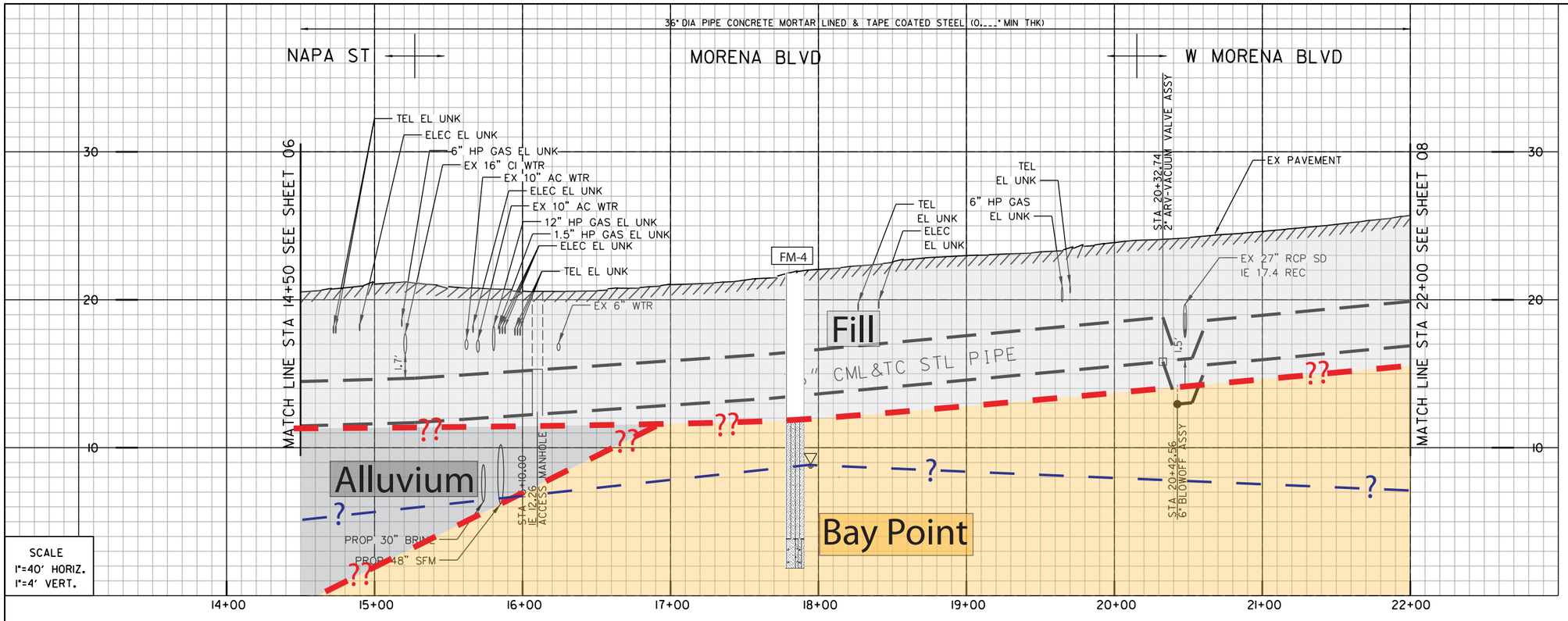
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

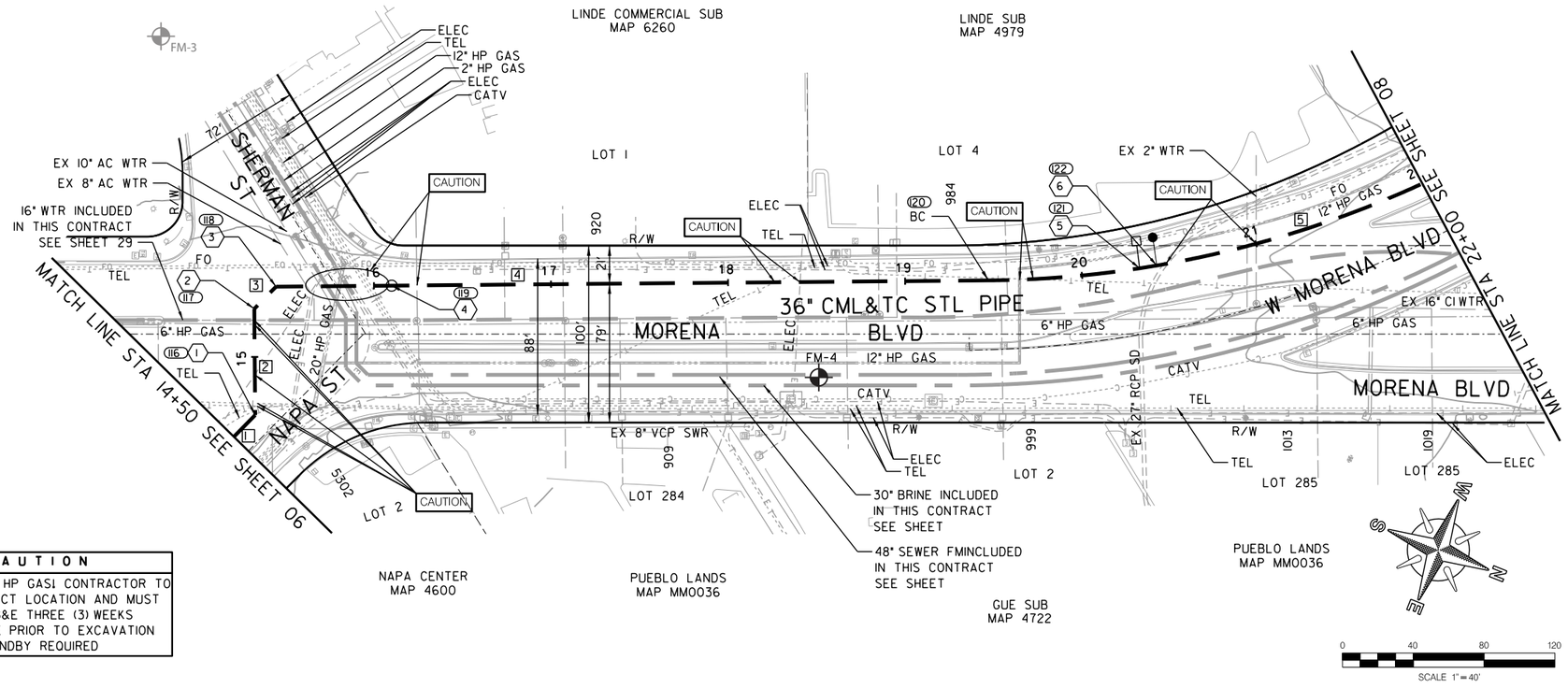
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

NAPA STREET

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR2.dgn
9/5/2017 raul.sierra $PLTDRVSS$ $PENTBLS$

60% SUBMITTAL





CAUTION

20",12" & 6" HP GASI CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

(1) (116)
BY CONTRACTOR
FURNISH AND INSTALL
STA 14+67.17
1- 45° HORIZ BEND

(2) (117)
BY CONTRACTOR
FURNISH AND INSTALL
STA 15+27.17
1- 45° HORIZ BEND

(3) (118)
BY CONTRACTOR
FURNISH AND INSTALL
STA 15+44.73
1- 45° HORIZ BEND

(4) (119)
BY CONTRACTOR
FURNISH AND INSTALL
STA 16+10.00
1- ACCESS MH

(5) (121)
BY CONTRACTOR
FURNISH AND INSTALL
STA 20+32.74
1- 4" AIR-VACUUM VALVE ASSY

(6) (122)
BY CONTRACTOR
FURNISH AND INSTALL
STA 20+42.56
1- 6" B.O. ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7104-W
SEWER:	10437-D
STORM DRAIN:	7203-D
GAS:	15787-118945
ELECTRIC:	15787-118940
CABLE TV:	218-1707, 218-1710
ATT&TELEPHONE:	BLQ1969, UNL3306BA
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
(116)	1859716.60	6270159.22	HPI
(117)	1859693.98	6270103.65	HPI
(118)	1859700.80	6270087.46	HPI
(119)	1859761.25	6270062.86	ACCESS MH
(120)	1860073.41	6269935.80	BC
(121)	1860150.23	6269897.94	ARV ASSY
(122)	1860158.67	6269892.91	B.O. ASSY

PROPOSED PIPE DATA TABLE

NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N67° 08'49"W		17.17'	36" CML&TC STL
2	N22° 08'49"W		60.0'	36" CML&TC STL
3	N67° 08'49"W		17.57''	36" CML&TC STL
4	N22° 08'49"W		402.29'	36" CML&TC STL
5	24° 09'27"	600'	252.97'	36" CML&TC STL

C-3

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 14+50 AT NAPA ST TO STA 22+00 AT W MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 07 OF 106 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

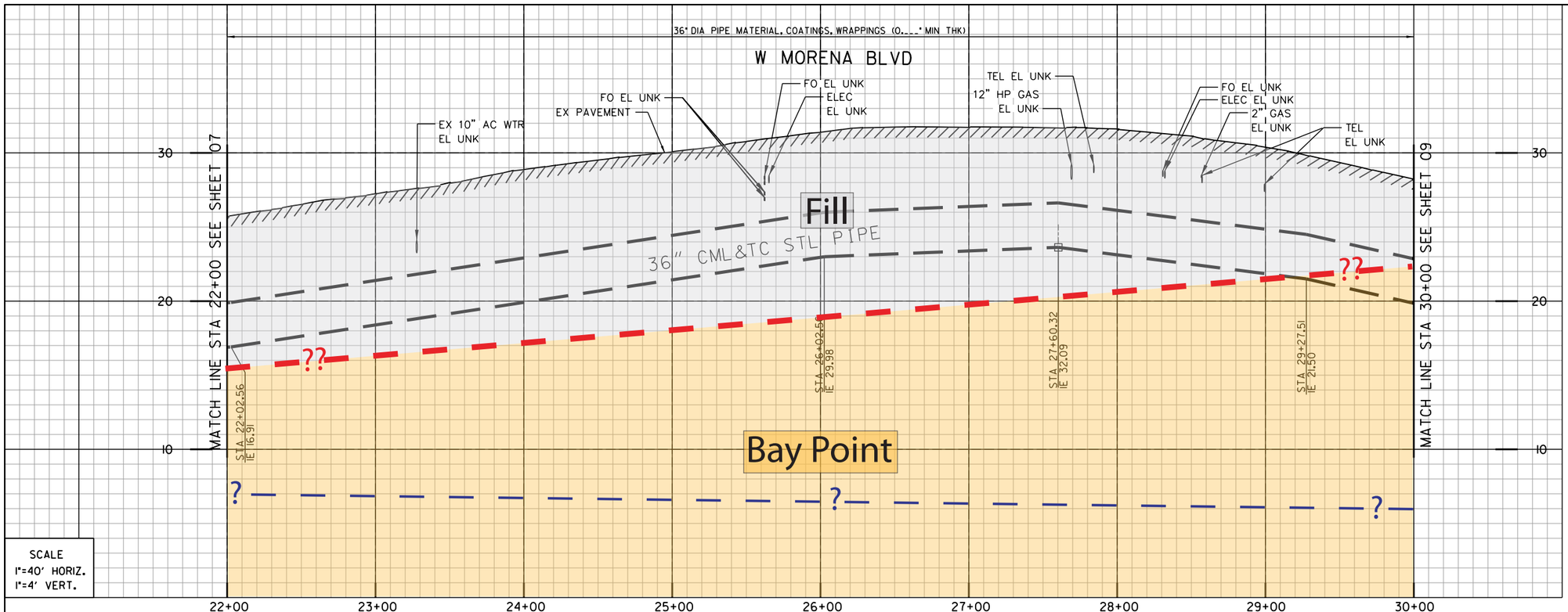
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-07-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

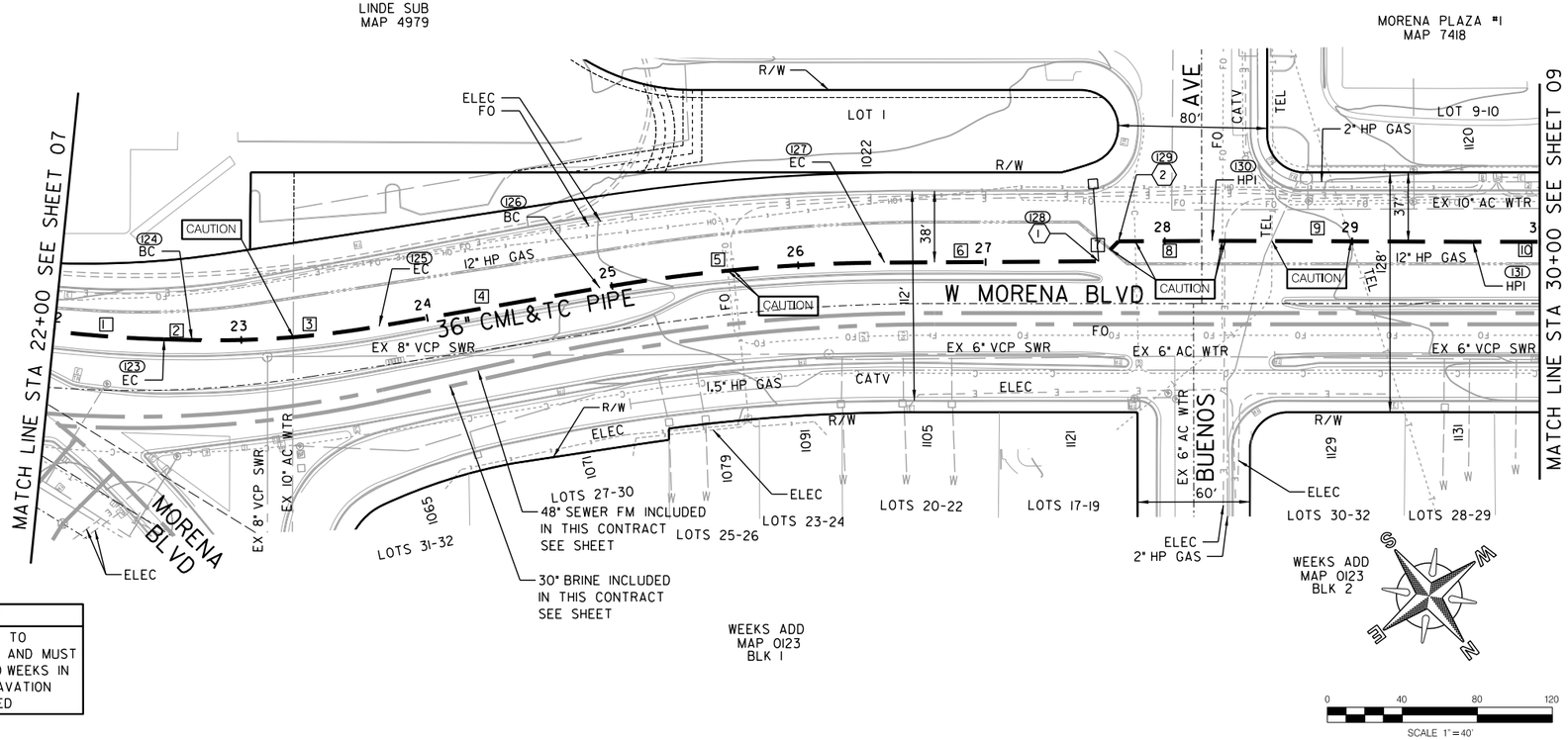
NAPA ST / MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR3.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.



CAUTION

12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

(1) (128)
BY CONTRACTOR
FURNISH AND INSTALL
STA 27+60.31
1 - 45° HORIZ BEND
1 - 2" AIR VACUUM VALVE ASSY

(2) (129)
BY CONTRACTOR
FURNISH AND INSTALL
STA 27+75.32
1 - 45° HORIZ BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ?? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7320-W, 7321-W, 7322-W
SEWER:	1346-D
STORM DRAIN:	NO INFO
GAS:	15780-118950, 15780-118945
ELECTRIC:	NO INFO
CABLE TV:	218-1710A
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
(123)	1860319.56	6269750.07	EC
(124)	1860328.69	6269738.42	BC
(125)	1860382.41	6269653.88	EC
(126)	1860436.28	6269547.24	BC
(127)	1860516.05	6269417.35	EC
(128)	1860583.68	6269325.29	HPI/ARV
(129)	1860581.42	6269310.46	HPI
(130)	1860611.02	6269270.17	HPI
(131)	1860694.45	6269158.92	HPI

PROPOSED PIPE DATA TABLE

NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	5° 37'21"	600'	58.88'	36" CML&TC STL
2	N51° 55'36"W		14.8'	36" CML&TC STL
3	11° 16'19"	510'	100.33'	36" CML&TC STL
4	N63° 11'55"W		119.47'	36" CML&TC STL
5	9° 30'14"	920'	152.60'	36" CML&TC STL
6	N53° 41'41"W		114.23'	36" CML&TC STL
7	S81° 18'19"W		15.00'	36" CML&TC STL
8	N53° 41'41"W		50.00'	36" CML&TC STL
9	N53° 08'11"W		139.06'	36" CML&TC STL
10	N53° 24'23"W		35.62'	36" CML&TC STL

C-4

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 22+00 TO STA 30+00 AT W MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 08 OF 106 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

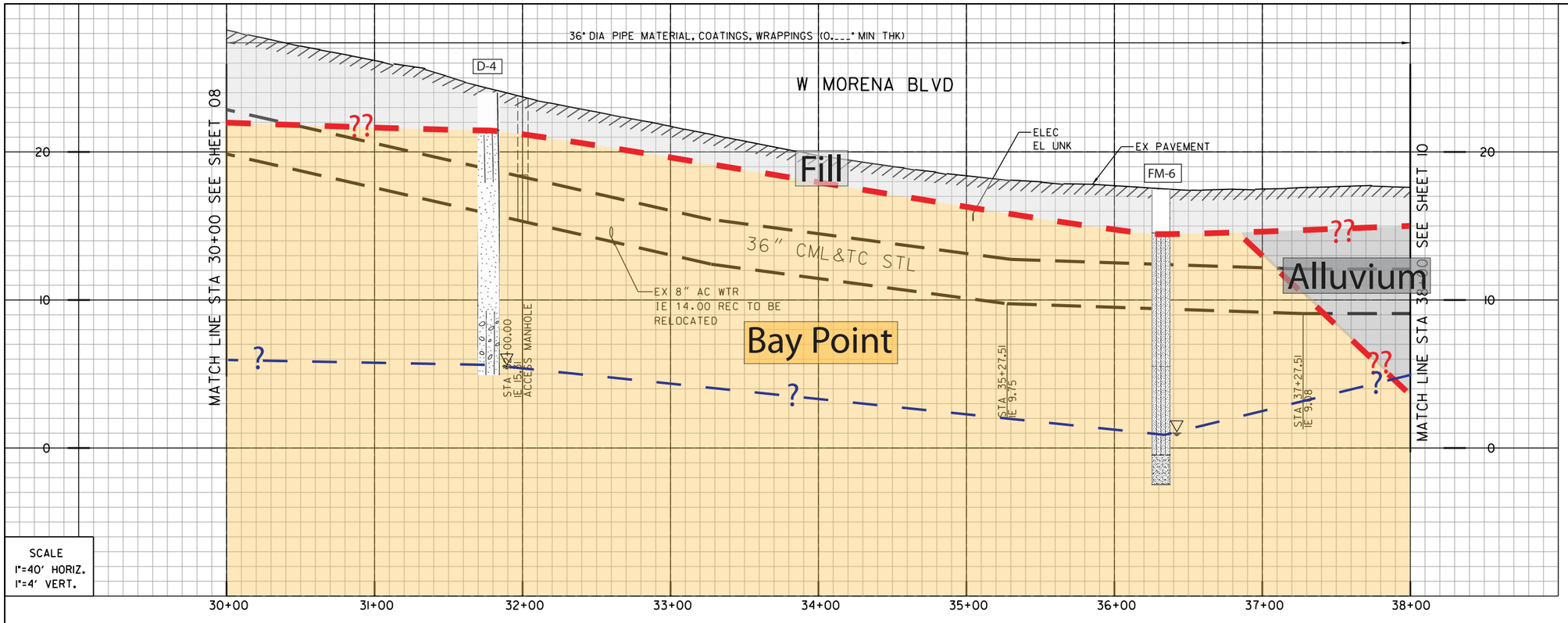
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-08-D

W MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR4.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (131)
BY CONTRACTOR
FURNISH AND INSTALL
STA 32+00.00
1- ACCESS MANHOLE

1 (136)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 39+20.98
1- 45° HORIZ BEND

2 (137)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 39+47.51
1- 4" BLOWOFF ASSY

3 (138)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 39+50.97
1- 45° HORIZ BEND

4 (141)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 40+92.79
1- 11.25° HORIZ BEND

5 (142)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 41+39.05
1- 22.5° HORIZ BEND

6 (143)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 43+93.73
1- 45° HORIZ BEND

7 (144)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 44+28.73
1- 45° HORIZ BEND

8 (145)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 44+73.73
1- 45° HORIZ BEND

9 (146)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 44+83.73
1- 4" BLOWOFF ASSY
1- 33.40° HORIZ BEND

10 (147)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 45+53.73
1- 45° HORIZ BEND

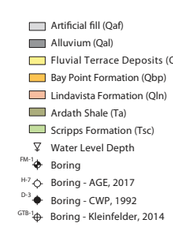
11 (148)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 45+75.73
1- 22.5° HORIZ BEND

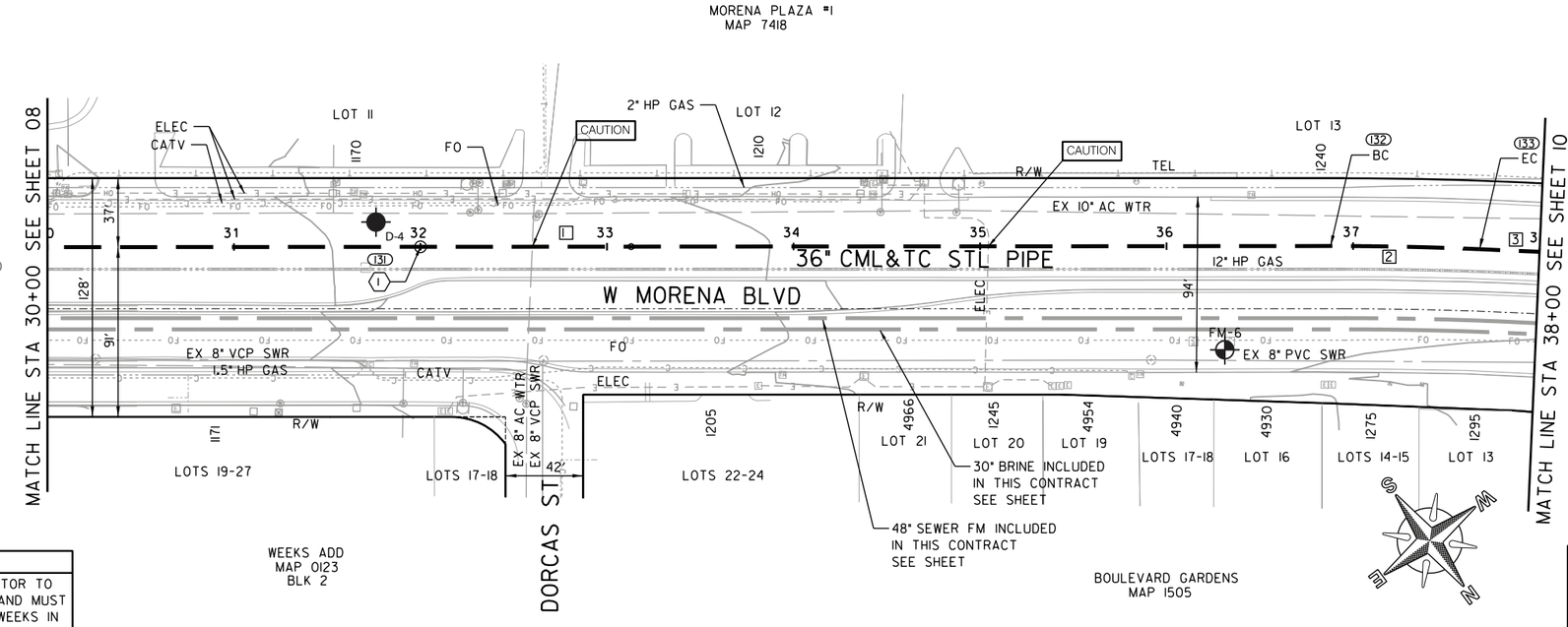
12 (149)•
BY CONTRACTOR
FURNISH AND INSTALL
STA 32+00.00
1- 2" AIR-VACCUM VALVE ASSY
1- 61.94° HORIZ BEND

•CONTRACTOR NOTES
CORRESPOND TO C-6

REFERENCE:

WATER:	7321-W, 15368-D
SEWER:	1346-D, 30417-D
STORM DRAIN:	NO INFO
GAS:	15772-118955
ELECTRIC:	15780-118950
CABLE TV:	NO INFO
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	





COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(131)	1860834.91	6268969.74	MANHOLE
(132)	1861125.79	6268577.97	BC
(133)	1861174.84	6268514.89	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N53° 24'23"W		687.95'	36" CML&TC STL
2	2° 32'38"	1800'	79.92'	36" CML&TC STL
3	N50° 51'46"W		32.14'	36" CML&TC STL

CAUTION

12" & 2" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-5

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 30+00 TO STA 38+00 AT W MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 09 OF 106 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-09-D

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

W MORENA BLVD

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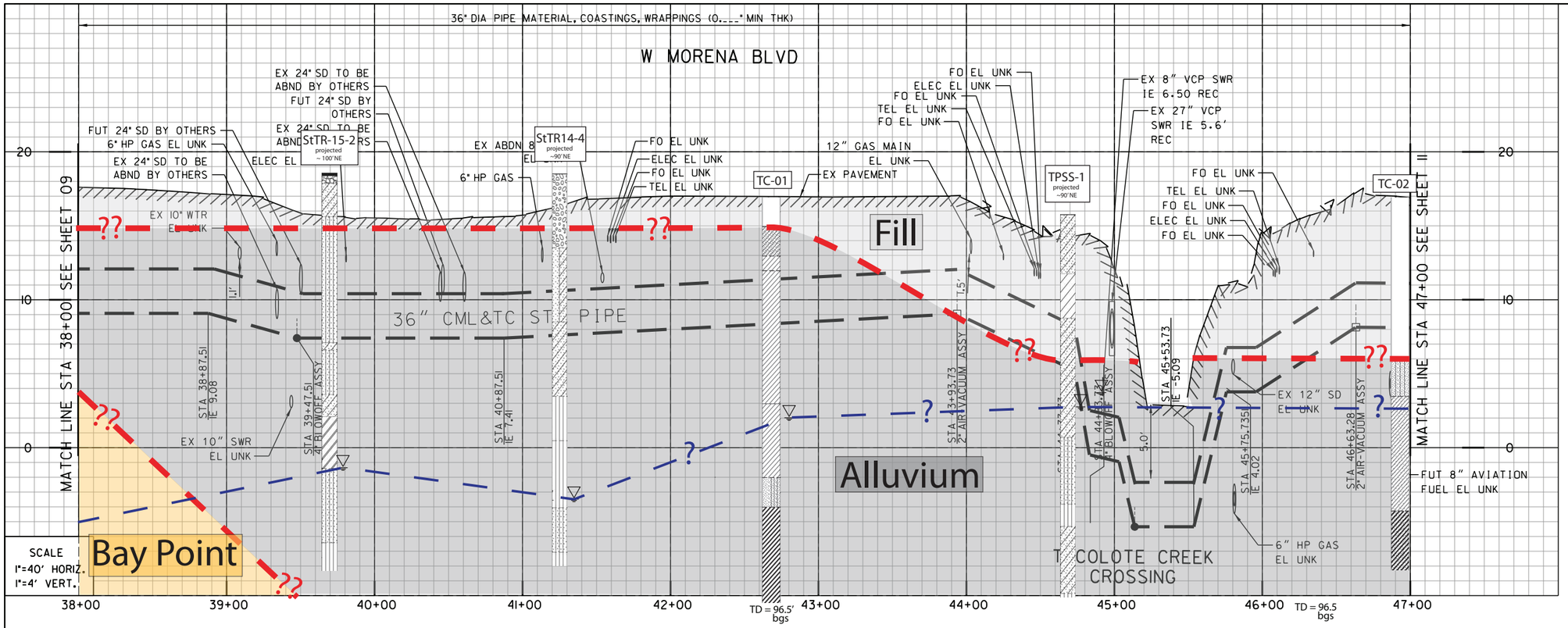
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



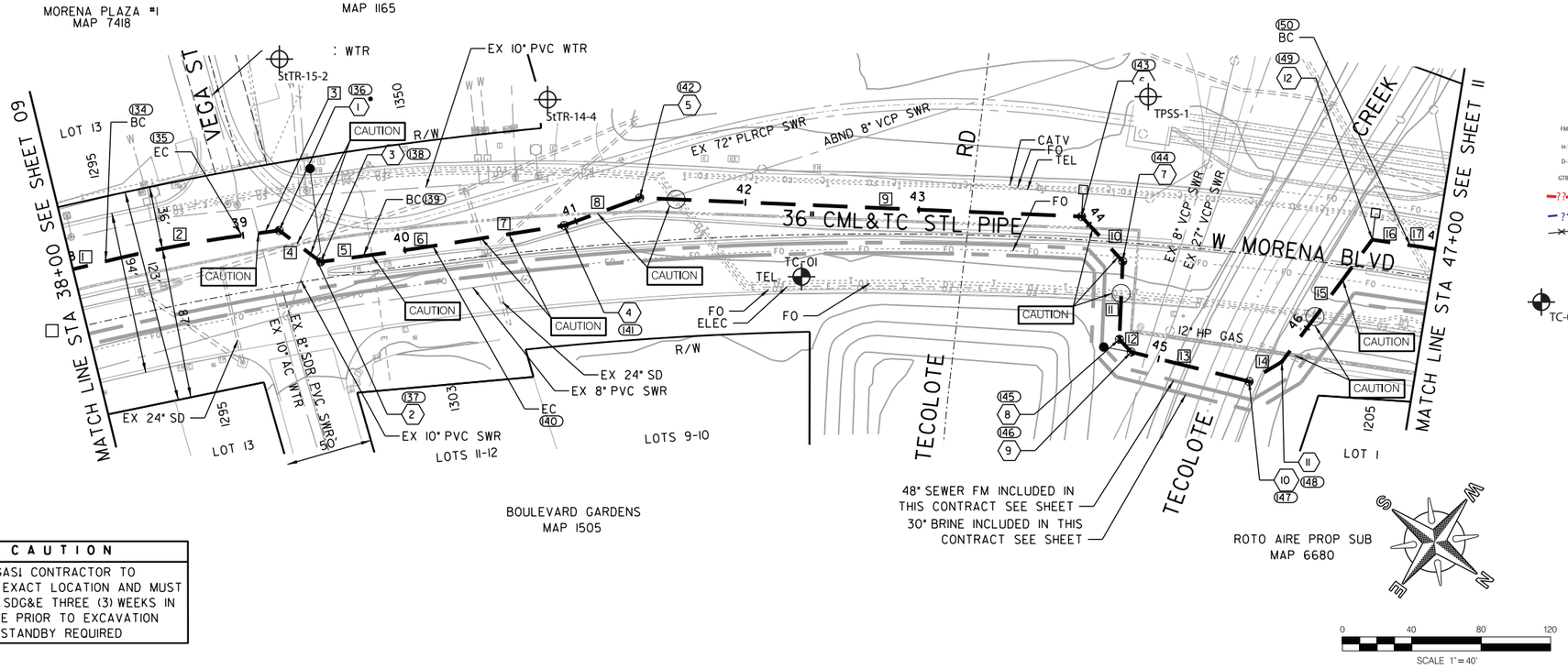
•SEE CONSTRUCTION NOTES ON SHEET C-5

REFERENCE:

WATER:	15934-D, 15368-D
SEWER:	30417-D, 28217-D, 25119-D, 3503-D, 1346-D, 1685I-D, 30417-D
STORM DRAIN:	NO INFO
GAS:	15772-118955, 15772-118960
ELECTRIC:	NO INFO
CABLE TV:	104-211,
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(134)	1861207.38	6268474.91	BC
(135)	1861260.89	6268415.62	EC
(136)	1861276.21	6268400.31	HPI
(137)	1861302.74	6268400.31	B.O.
(138)	1861306.21	6268400.31	HPI
(139)	1861323.75	6268382.78	BC
(140)	1861352.04	6268353.97	EC
(141)	1861405.23	6268298.80	HPI
(142)	1861430.23	6268259.87	HPI
(143)	1861639.37	6268114.54	HPI/ARV
(144)	1861673.82	6268120.74	HPI
(145)	1861699.50	6268157.69	HPI
(146)	1861709.34	6268159.46	HPI/B.O.
(147)	1861773.68	6268131.90	HPI
(148)	1861781.86	6268111.47	HPI
(149)	1861780.80	6268023.93	HPI
(150)	1861800.10	6268013.34	BC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N50° 51'46"W		19.4'	36" CML&TC STL
2	5° 52'09"	780'	79.9'	36" CML&TC STL
3	N44° 59'37"W		21.67'	36" CML&TC STL
4	N0° 00'23"W		30.0'	36" CML&TC STL
5	N44° 59'37"W		24.79'	36" CML&TC STL
6	1° 03'06"	2200'	40.37'	36" CML&TC STL
7	N46° 02'43"W		76.64'	36" CML&TC STL
8	N57° 17'43"W		46.27'	36" CML&TC STL
9	N34° 47'43"W		254.68'	36" CML&TC STL
10	N10° 12'17"E		35.0'	36" CML&TC STL
11	N55° 12'17"E		45.0'	36" CML&TC STL
12	N10° 12'17"E		10.0'	36" CML&TC STL
13	N23° 11'32"W		70.0'	36" CML&TC STL
14	N68° 11'32"W		22.0'	36" CML&TC STL
15	S89° 18'28"W		87.55'	36" CML&TC STL
16	N28° 45'05"W		22.01'	36" CML&TC STL
17	0° 25'16"	2000'	14.70'	36" CML&TC STL



- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- Boring
- Boring - AGE, 2017
- Boring - CWP, 1992
- Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

CAUTION

12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-6

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 38+00 TO STA 47+00 AT W MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 10 OF 106 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-10-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

W MORENA BLVD

60% SUBMITTAL

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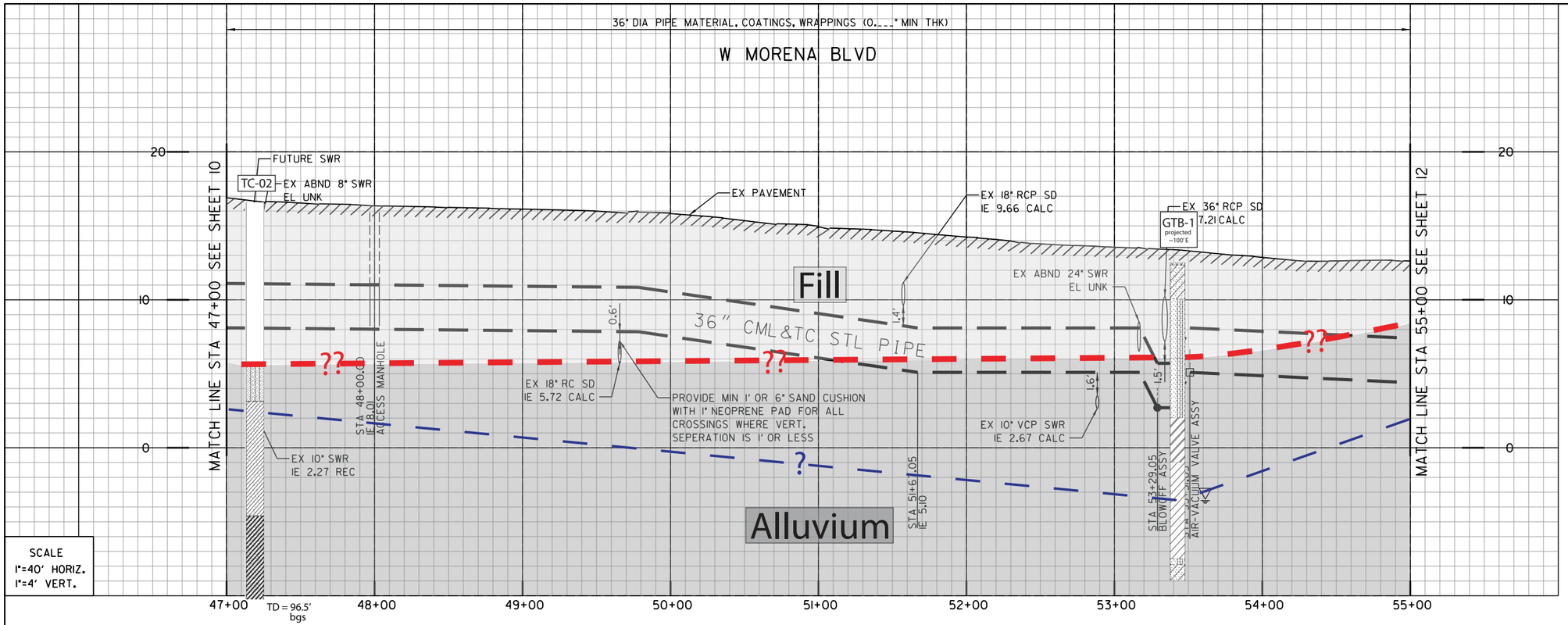
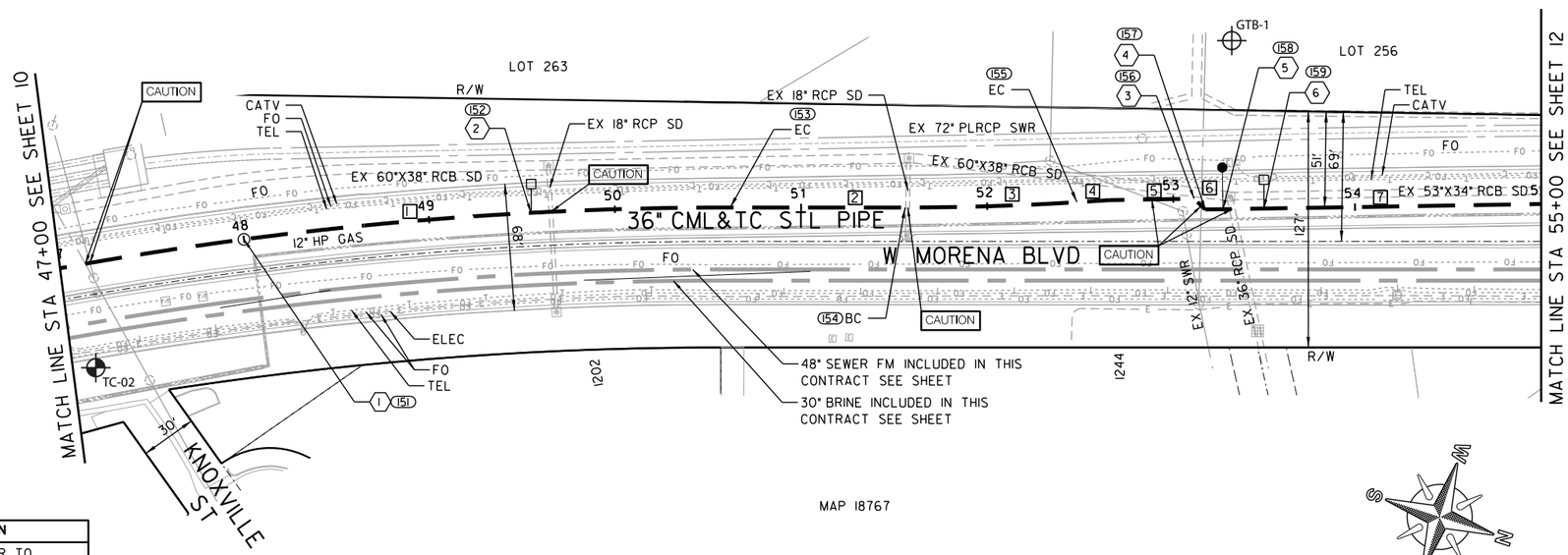
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$



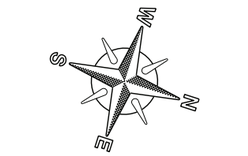
PUEBLO LANDS
MAP MM0036



MAP 18767

CAUTION

12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED



0 40 80 120
SCALE 1"=40'

① (151)
BY CONTRACTOR
FURNISH AND INSTALL
STA 48+00.00
1- ACCESS MANHOLE

② (152)
BY CONTRACTOR
FURNISH AND INSTALL
STA 49+55.05
1- 4" BLOWOFF ASSY

③ (156)
BY CONTRACTOR
FURNISH AND INSTALL
STA 53+11.20
1- 45° HORIZ BEND

④ (157)
BY CONTRACTOR
FURNISH AND INSTALL
STA 53+19.54
1- 45° HORIZ BEND

⑤ (158)
BY CONTRACTOR
FURNISH AND INSTALL
STA 53+29.05
1- 4" BLOWOFF ASSY

⑥ (159)
BY CONTRACTOR
FURNISH AND INSTALL
STA 53+51.05
1- 2" AIR-VACUUM VALVE ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	NO INFO
SEWER:	25119-D, 1689-D
STORM DRAIN:	25119-D, 9510-D
GAS:	15765-118965
ELECTRIC:	15765-118970
CABLE TV:	104-211, 222-1704
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
(151)	1861902.19	6267961.08	ACCESS MH
(152)	1862044.61	6267899.90	ARV
(153)	1862145.45	6267864.21	EC
(154)	1862234.69	6267835.28	BC
(155)	1862321.60	6267804.13	EC
(156)	1862338.37	6267797.53	HPI
(157)	1862380.95	6267782.95	HPI
(158)	1862397.43	6267783.54	B.O.
(159)	1862418.24	6267776.41	ARV

PROPOSED PIPE DATA TABLE

NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	10° 22'17"	2000'	362.03'	36" CML&TC STL
2	N17° 57'32"W		93.81'	36" CML&TC STL
3	3° 31'38"	1500'	92.34'	36" CML&TC STL
4	N21° 29'10"W		18.02'	36" CML&TC STL
5	N18° 54'04"W		45.00'	36" CML&TC STL
6	N26° 5'56"E		8.34'	36" CML&TC STL
7	N18° 54'04"W		180.46'	36" CML&TC STL

C-7

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 47+00 TO STA 55+00 AT W MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 11 OF 106 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

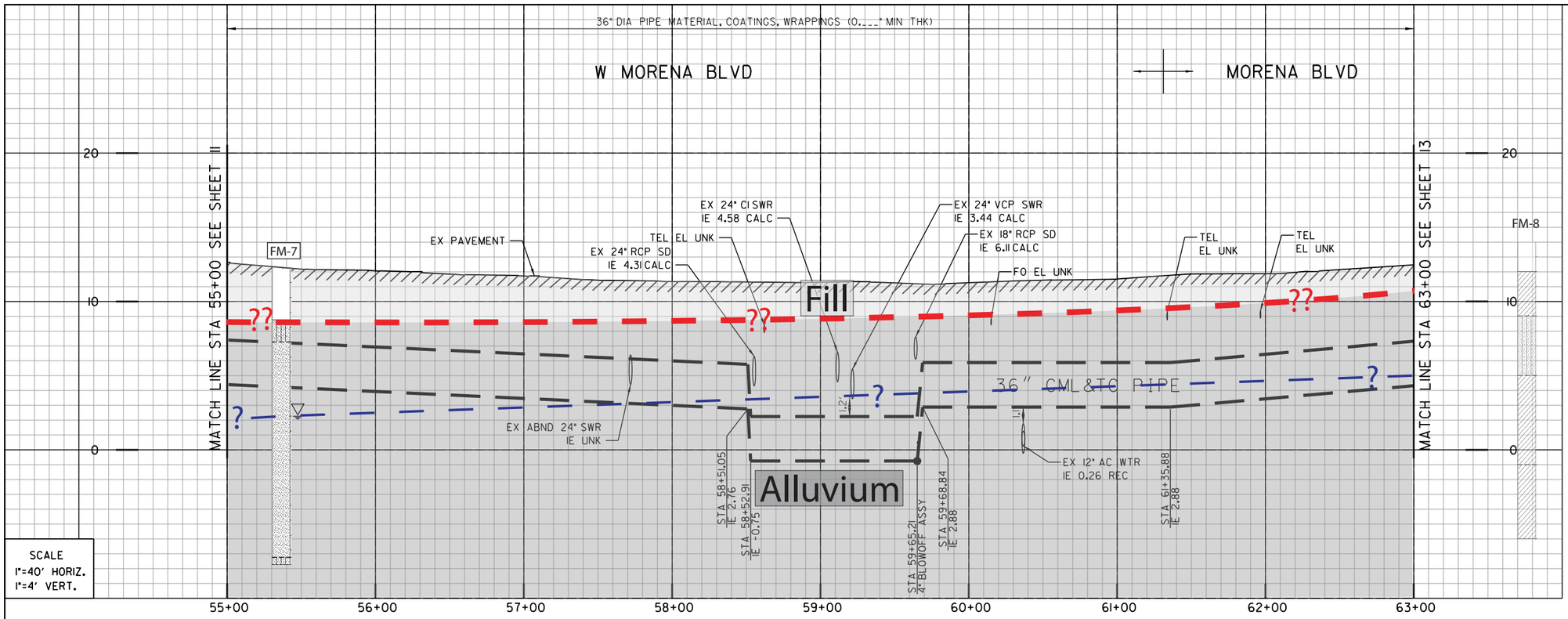
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

40067-11-D

60% SUBMITTAL

W MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR7.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$



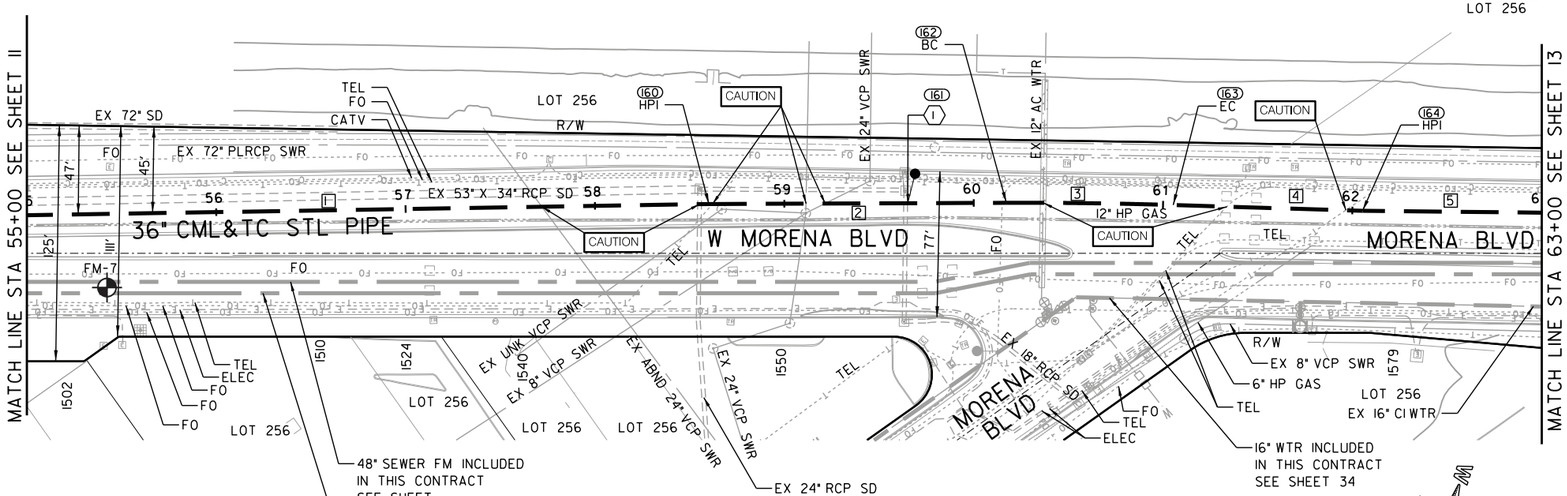
SCALE
1"=40' HORIZ.
1"=4' VERT.

(I) (161)
BY CONTRACTOR
FURNISH AND INSTALL
STA 59+65.18
1 - 4" BLOWOFF ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7760-W, 11835-D, 7104-D
SEWER:	25119-D, 1142-D, 1343-D
STORM DRAIN:	3475-D, 25119-D
GAS:	15765-11870, 15765-118965
ELECTRIC:	15765-118970
CABLE TV:	104-212, 222-1704
ATT&TELEPHONE:	BLPI967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(160)	1862899.91	6267611.49	HPI
(161)	1862999.67	6267578.71	B.O.
(162)	1863049.13	6267562.46	BC
(163)	1863133.33	6267536.39	EC
(164)	1863229.35	6267508.47	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N18° 54'4"W		360.17'	36" CML&TC STL
2	N18° 11'18"W		157.07'	36" CML&TC STL
3	1° 58'22"	2560'	88.15'	36" CML&TC STL
4	N16° 12'56"W		100.0'	36" CML&TC STL
5	N17° 22'01"W		94.62'	36" CML&TC STL

CAUTION

12" & 6" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

C-8

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 55+00 AT W MORENA BLVD TO
STA 63+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 12 OF 106 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

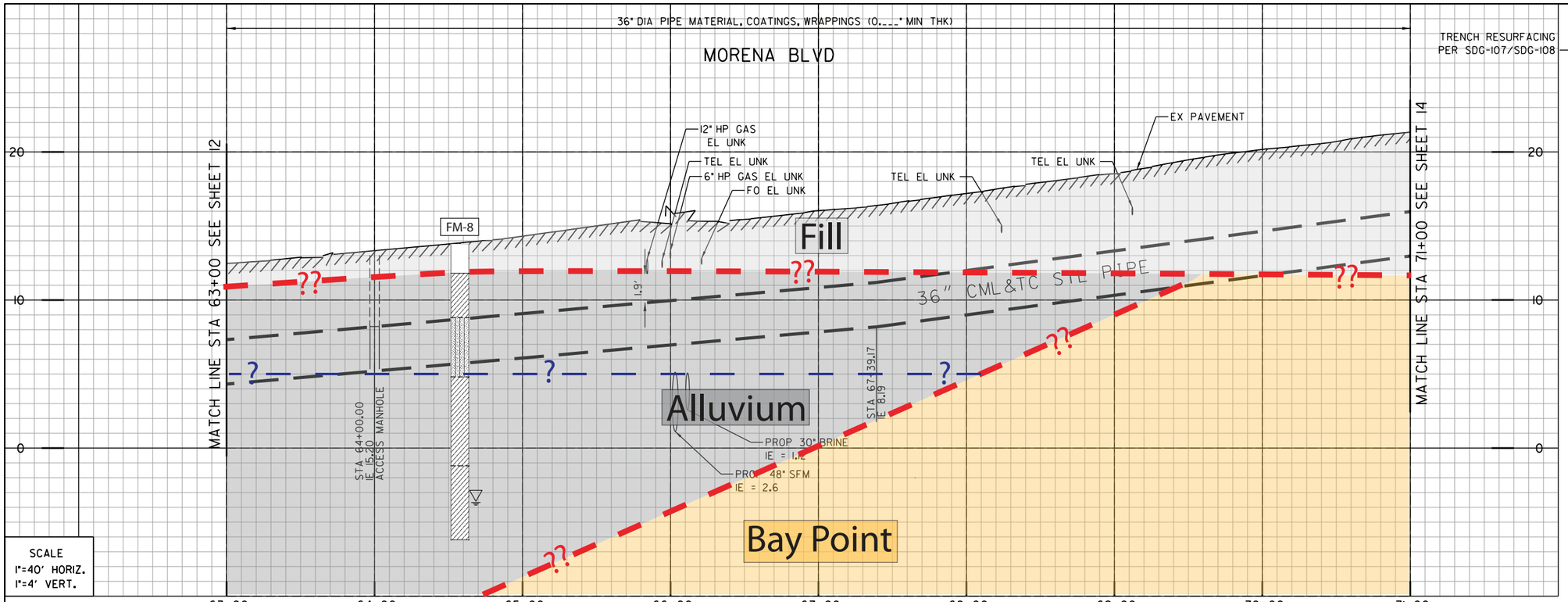
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

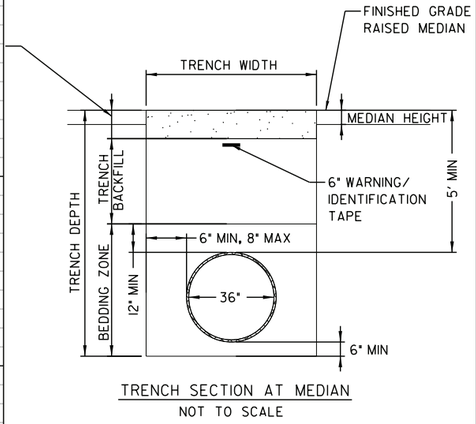
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-12-D

W MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR8.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL





TRENCH SECTION AT MEDIAN
NOT TO SCALE

SCALE
1"=40' HORIZ.
1"=4' VERT.

REFERENCE:

WATER:	7760-W
SEWER:	6066-D, 25119-D
STORM DRAIN:	NO INFO
GAS:	15765-11870
ELECTRIC:	15765-118975
CABLE TV:	222-1704
ATT&TELEPHONE:	BLP 1967, 104-212
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(165)	1863415.10	6267450.38	ACCESS MH
(166)	1863447.33	6267440.29	BC
(167)	1863485.64	6267428.73	EC
(168)	1863581.65	6267400.80	HPI
(169)	1863633.36	6267429.21	HPI
(170)	1863687.89	6267413.34	BC
(171)	1863870.55	6267370.88	EC
(172)	1863917.49	6267362.65	BC

(1) (165)
BY CONTRACTOR
FURNISH AND INSTALL
STA 64+00.00
1- ACCESS MANHOLE

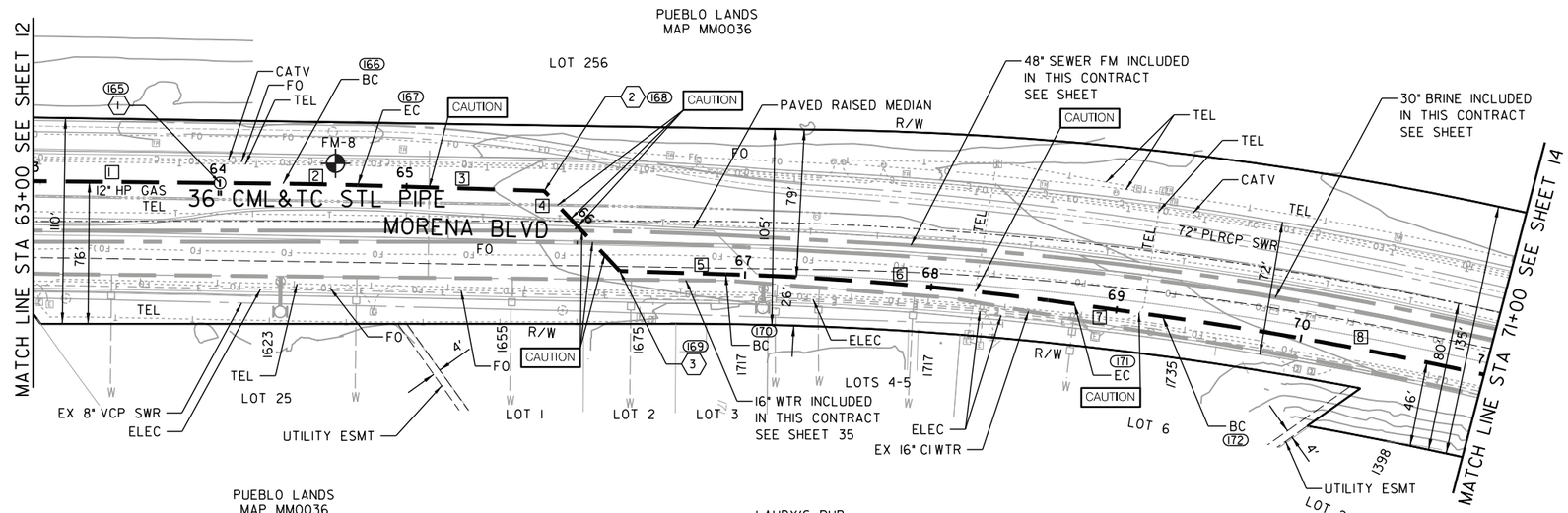
(2) (168)
BY CONTRACTOR
FURNISH AND INSTALL
STA 65+73.78
1- 45° HORIZ BEND

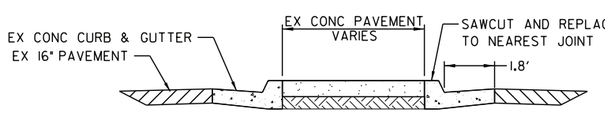
(3) (169)
BY CONTRACTOR
FURNISH AND INSTALL
STA 66+32.78
1- 45° HORIZ BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

CAUTION

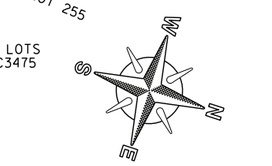
12" & 6" HP GASI CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED





CONCRETE MEDIAN
NOT TO SCALE

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N17° 22'1"W		133.78'	36" CML&TC STL
2	1° 8'47"	2000'	40.02'	36" CML&TC STL
3	N16° 13'14"W		99.99'	36" CML&TC STL
4	N28° 46'46"E		59.00'	36" CML&TC STL
5	N16° 13'14"W		56.78'	36" CML&TC STL
6	6° 16'06"	1715'	187.62'	36" CML&TC STL
7	N9° 57'9"W		47.66'	36" CML&TC STL
8	4° 33'41"	2200'	175.15'	36" CML&TC STL



C-9

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 63+00 TO STA 71+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 13 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

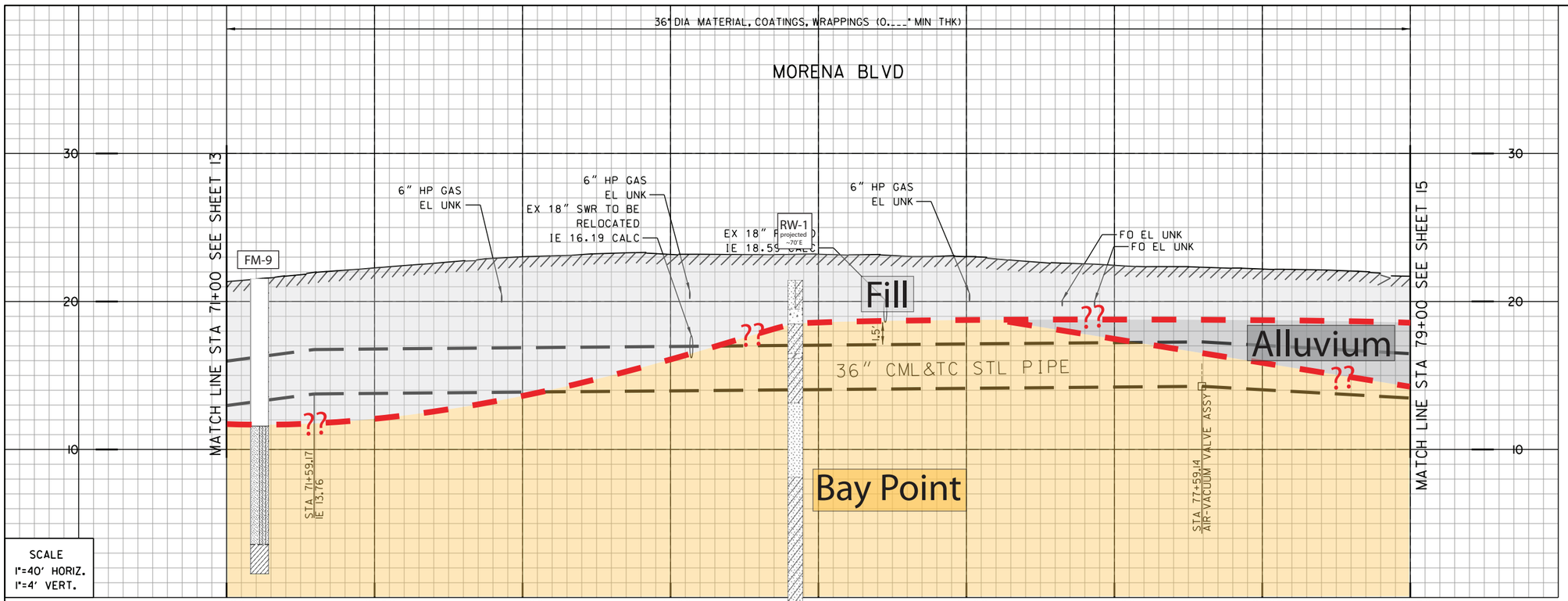
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-13-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

MORENA BLVD

60% SUBMITTAL

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR9.dgn
9/5/2017 raul.sierra $PLTDRVSS $PENTBLSS



SCALE
1"=40' HORIZ.
1"=4' VERT.

(1) (174)
BY CONTRACTOR
FURNISH AND INSTALL
STA 77+59.14
1- 2" AIR-VACUUM VALVE ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7660-W
SEWER:	24119-D
STORM DRAIN:	3477-D
GAS:	15765-11890
ELECTRIC:	15765-11890
CABLE TV:	222-1704, 104-213
ATT&TELEPHONE:	BLO 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(173)	1864632.00	6267355.08	EC
(174)	1864747.21	6267372.80	ARV
(175)	1864818.48	6267383.75	HPI

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	14° 07'50"	2200'	542.58'	36" CML&TC STL
2	N8° 44'23"E		188.67'	36" CML&TC STL
3	N9° 10'31"E		68.75'	36" CML&TC STL

PUEBLO LANDS
MAP MM0036

PUEBLO LANDS
MAP MM0036

LOT 255

EX 18"

RW-1

48" SEWER FM INCLUDED
IN THIS CONTRACT
SEE SHEET

CAUTION

(174) 1

(175) HPI

EX UNK SWR

CATV

R/W

FO

TEL

MORENA BLVD

ELEC

12" HP GAS

MATCH LINE STA 71+00 SEE SHEET 13

LOT 255

FM-9 FO

EX 72" RCP SWR

TEL

12" HP GAS

6" HP GAS

135'

96'

72'

28'

46'

72

73

74

75

76

77

78

36" CML&TC STL PIPE

R/W

EX 16" CI WTR
TO BE REPLACED

CAUTION

FO
TEL
ELEC

4103

CAUTION

EX SWR

LOT 1

4225

LOT 1

EX SWR

ASHER ST

50'

EC
(173)

CAUTION

1801

1813

1817

1845

16" WTR INCLUDED
IN THIS CONTRACT
SEE SHEET 36

EX 16" CI WTR

MATCH LINE STA 79+00 SEE SHEET 15

LOTS 15-17 LOTS 13-14 LOTS 11-12 LOTS 9-10 LOTS 5-8

SARN-SMITH SUBDIVION
MAP 7853

MORENA VISTA CONDOMINIMUMS
MAP 9416

ASHERS CLOVER LEAF TERRACE
MAP 1568
BLK 4

CAUTION
12" & 6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

0 40 80 120
SCALE 1"=40'

C-10

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 71+00 TO STA 79+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 14 OF 106 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

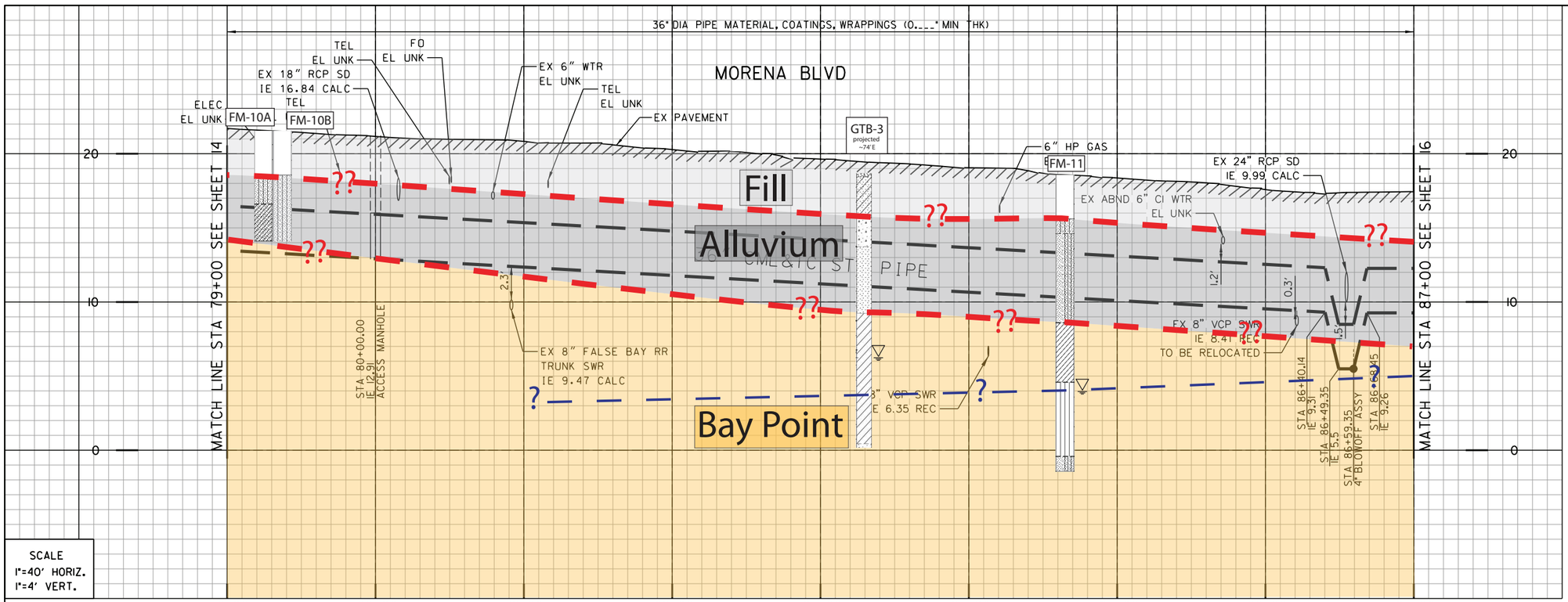
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
40067-14-D

MORENA BLVD

60% SUBMITTAL

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR10.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$



SCALE
1"=40' HORIZ.
1"=4' VERT.

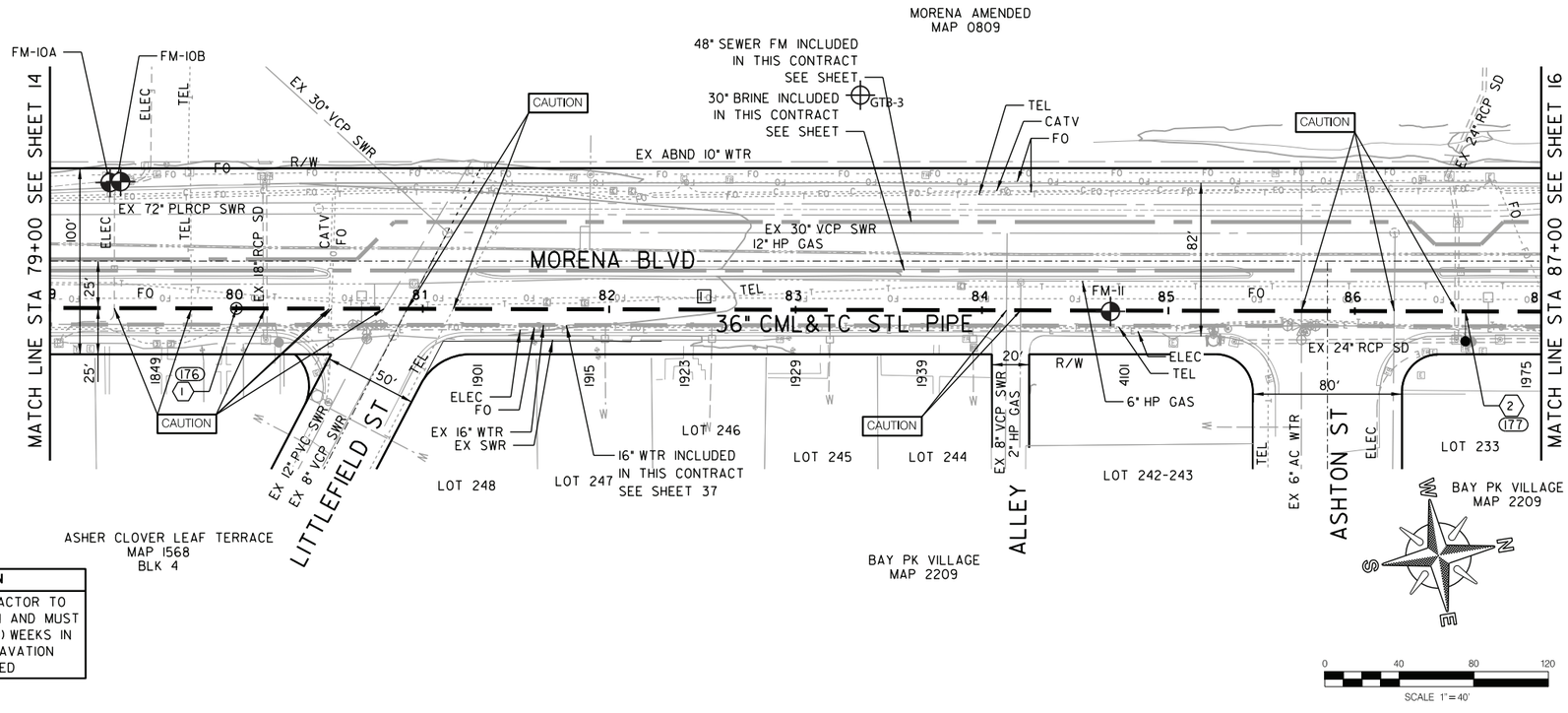
① 176
BY CONTRACTOR
FURNISH AND INSTALL
STA 80+00.00
1- ACCESS MANHOLE

② 177
BY CONTRACTOR
FURNISH AND INSTALL
STA 86+59.35
1- 4" BLOWOFF ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7660-W, 3493-D, 31594-D
SEWER:	25119-D, 1311-D, 1149-D, 36197, 7288-D
STORM DRAIN:	3477-D
GAS:	15765-118990
ELECTRIC:	15765-118990
CABLE TV:	104-213, 224-1704
ATT&TELEPHONE:	BLO 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
176	1864985.07	6267410.66	ACCESS MH
177	1865635.98	6267515.80	B.O.

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N9° 10'31"E		800.0'	36" CML&TC STL

CAUTION

12" & 6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

SCALE 1"=40'

C-11

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 79+00 TO STA 87+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 15 OF 106 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

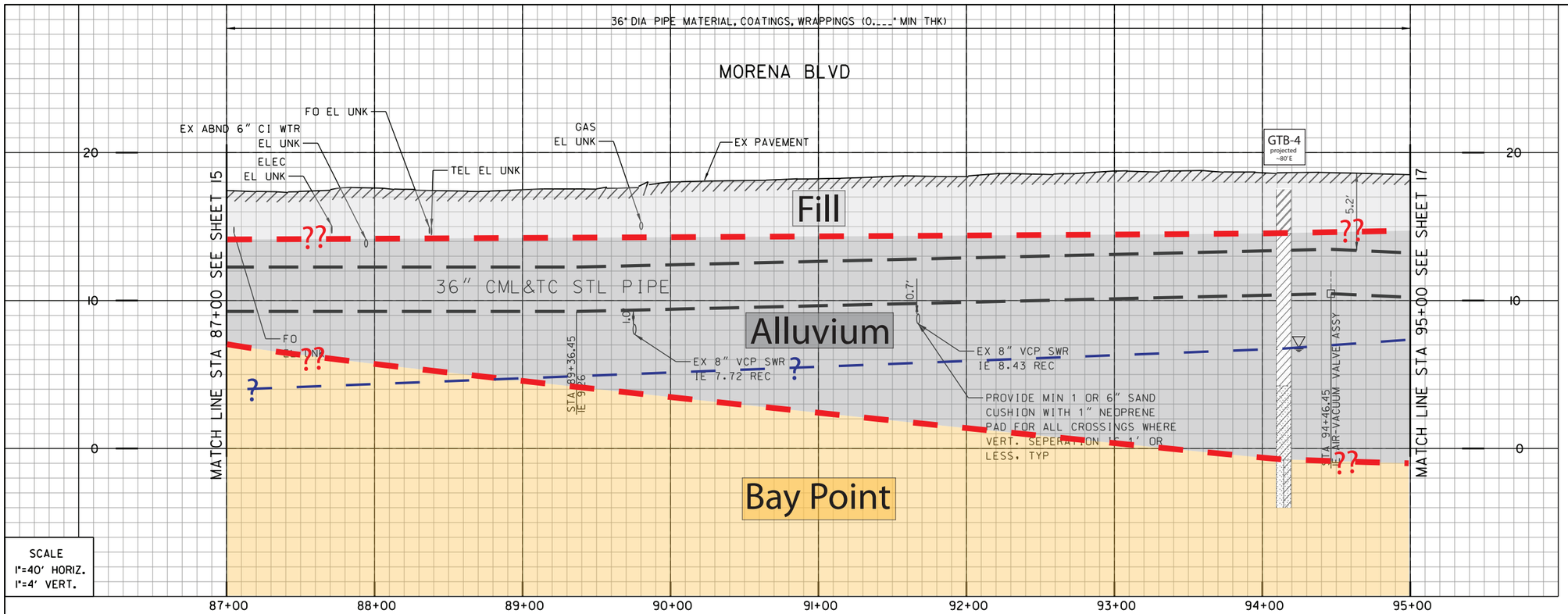
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
DESIGNED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED
40067-15-D

60% SUBMITTAL

MORENA BLVD

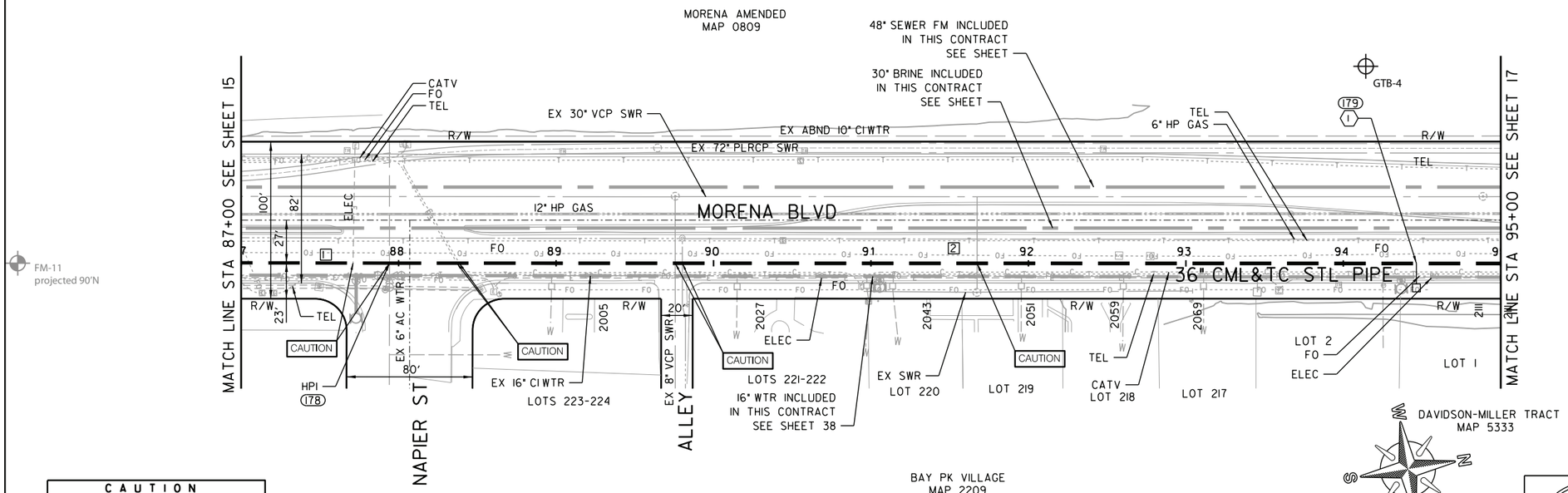
u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR11.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$



SCALE
1"=40' HORIZ.
1"=4' VERT.

(1) (179)
BY CONTRACTOR
FURNISH AND INSTALL
STA 94+46.45
1- 2" AIR-VACUUM VALVE ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)



REFERENCE:

WATER:	7660-W, 3493-D
SEWER:	7149-D, 1311-D, 7149-D, 25119-D
STORM DRAIN:	NO INFO
GAS:	15765-119010
ELECTRIC:	NO INFO
CABLE TV:	224-1704B, 104-213
ATT&TELEPHONE:	BLN 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(178)	1865769.16	6267537.31	HPI
(179)	1866413.23	6267639.97	ARV

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N9° 10'31"E		94.25'	36" CML&TC STL
2	N9° 03'22"E		705.75'	36" CML&TC STL

CAUTION
12" & 6" HP GAS1 CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

C-12

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 87+00 TO STA 95+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 16 OF 106 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED
40067-16-D

MORENA BLVD

60% SUBMITTAL

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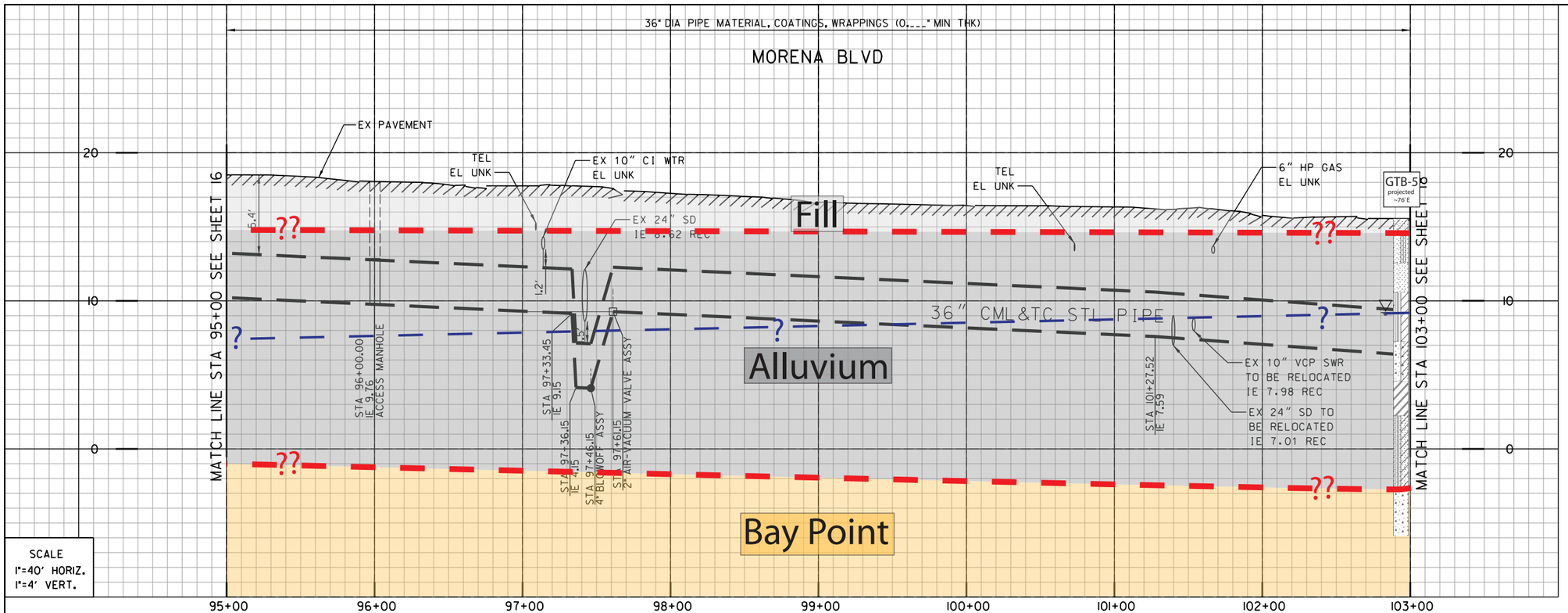
9/5/2017 raul.sierra $PLTDRVSS $PENTBLSS

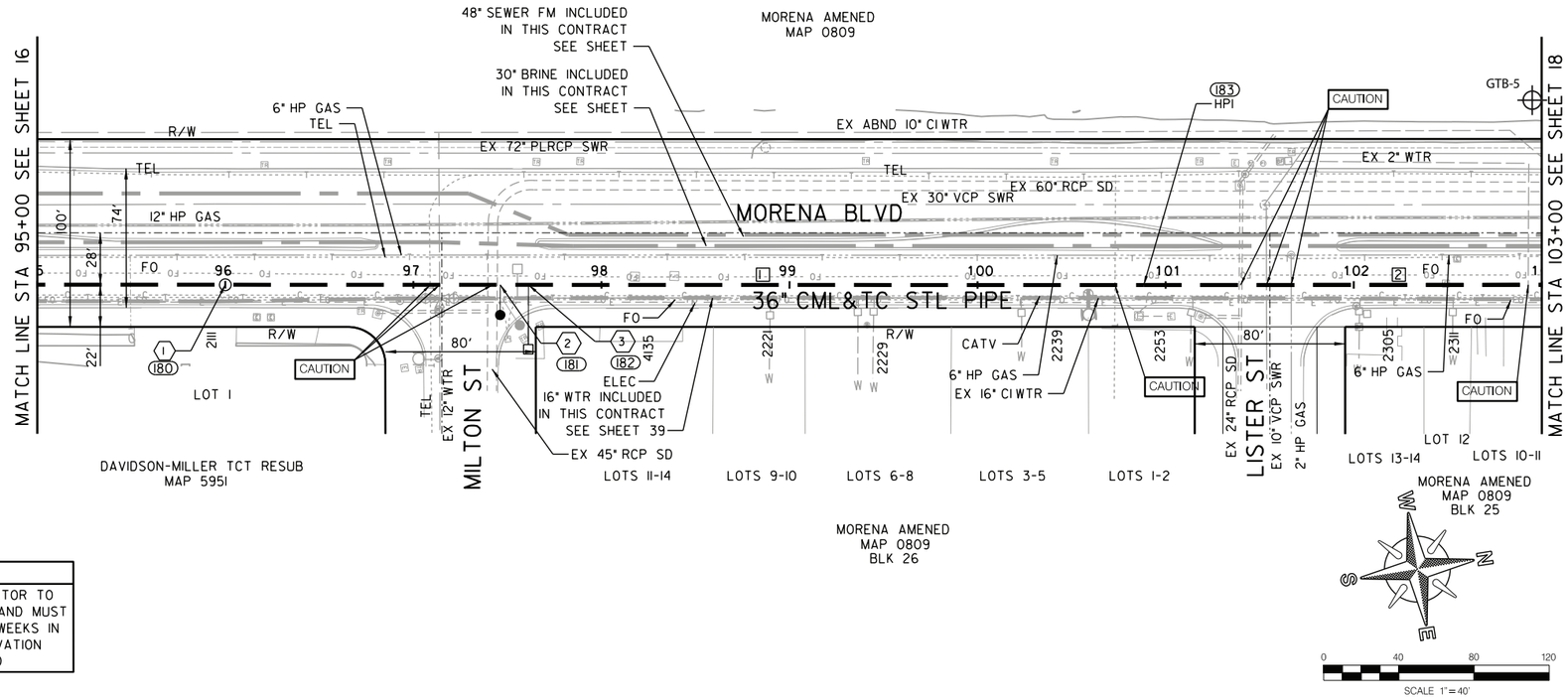


(180) BY CONTRACTOR FURNISH AND INSTALL
STA 96+00.00
1- ACCESS MANHOLE

(181) BY CONTRACTOR FURNISH AND INSTALL
STA 97+46.15
1- 4" BLOWOFF ASSY

(182) BY CONTRACTOR FURNISH AND INSTALL
STA 97+61.15
1- 2" AIR-VACUUM VALVE ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)



REFERENCE:

WATER:	7760-W, 34257-D
SEWER:	1150-D, 1151-D, 25119-D
STORM DRAIN:	9355-L, 3493-D
GAS:	15765-119010
ELECTRIC:	NO INFO
CABLE TV:	224-1704B
ATT&TELEPHONE:	BLN 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(180)	1866564.86	6267664.13	ACCESS MH
(181)	1866709.19	6267687.14	B.O.
(182)	1866724.00	6267689.50	ARV
(183)	1867047.17	6267741.01	HPI

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N9° 03'22"E		588.39'	36" CML&TC STL
2	N9° 00'16"E		211.61'	36" CML&TC STL

CAUTION

12" & 6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

C-13

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 95+00 TO STA 103+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 17 OF 106 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

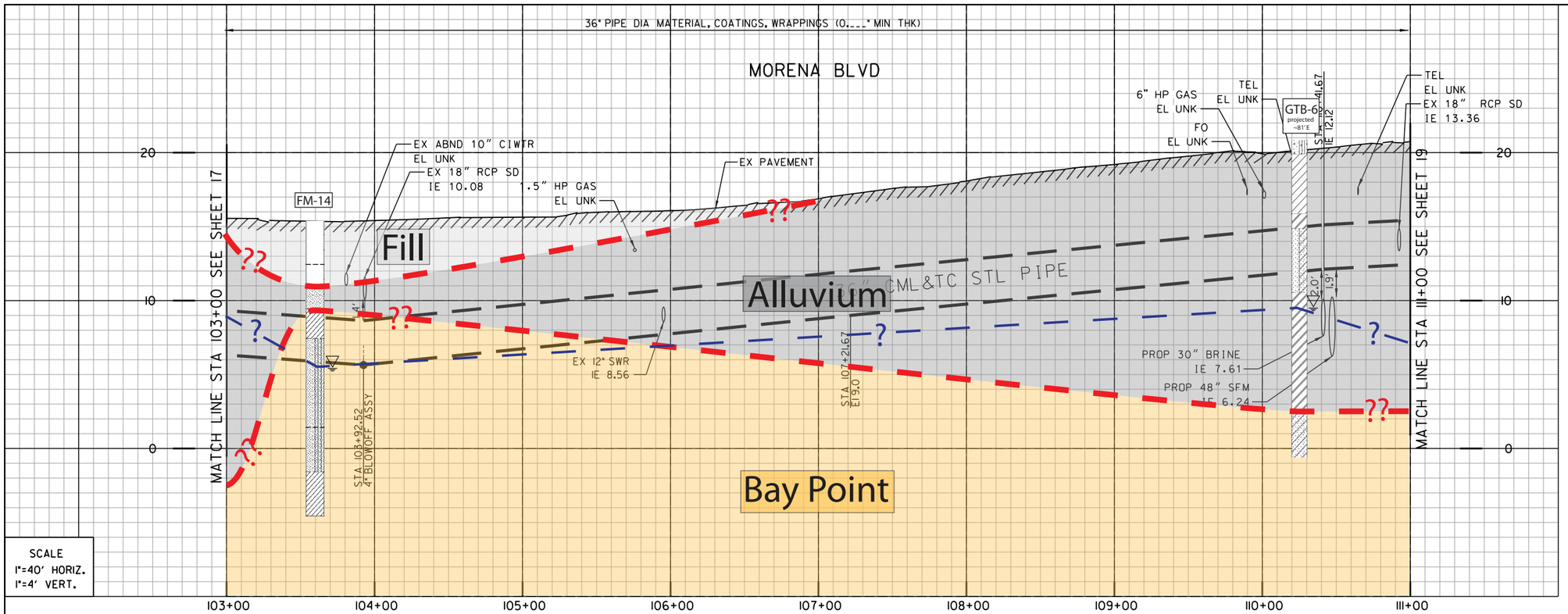
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-17-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR13.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (184)
BY CONTRACTOR
FURNISH AND INSTALL
STA 104+92.52
1- 4" BLOWOFF ASSY

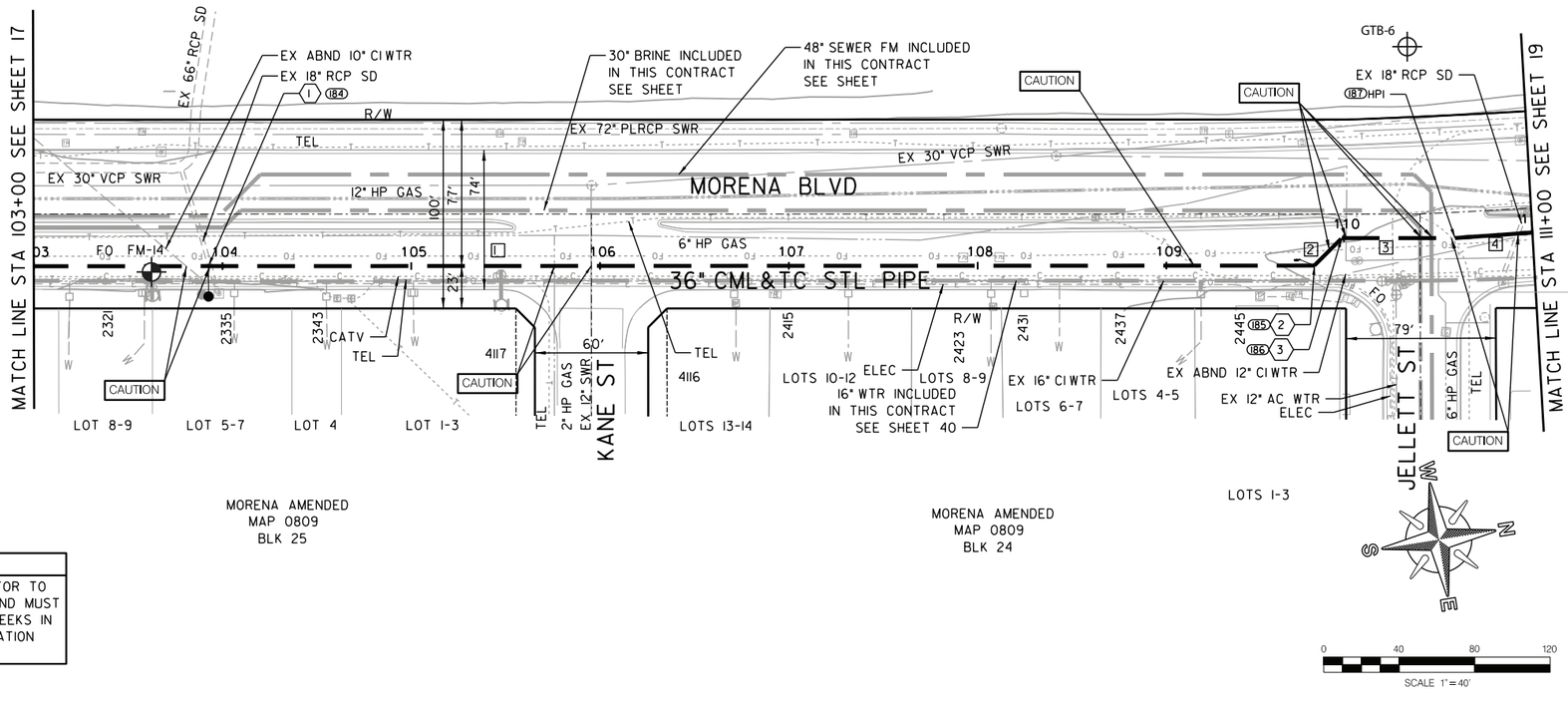
2 (185)
BY CONTRACTOR
FURNISH AND INSTALL
STA 110+83.30
1- 45° HORIZ BEND

3 (186)
BY CONTRACTOR
FURNISH AND INSTALL
STA 110+98.79
1- 45° HORIZ BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ?? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7660-W, 5373-W
SEWER:	1151-D, 25119-D
STORM DRAIN:	9355-L
GAS:	15765-119010
ELECTRIC:	NO INFO
CABLE TV:	226-1704B
ATT&TELEPHONE:	BLN 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(184)	1867446.31	6267804.32	B.O.
(185)	1867926.20	6267880.30	HPI
(186)	1867942.79	6267868.25	HPI
(187)	1868002.05	6267877.65	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N9° 00'16"E		678.39'	36" CML&TC STL
2	N35° 59'44"W		20.50'	36" CML&TC STL
3	N9° 00'16"E		60.00'	36" CML&TC STL
4	N4° 56'07"E		41.11'	36" CML&TC STL

CAUTION

12" & 6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

C-14

MORENA PUMP STATION AND CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 103+00 TO STA 111+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 18 OF 106 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

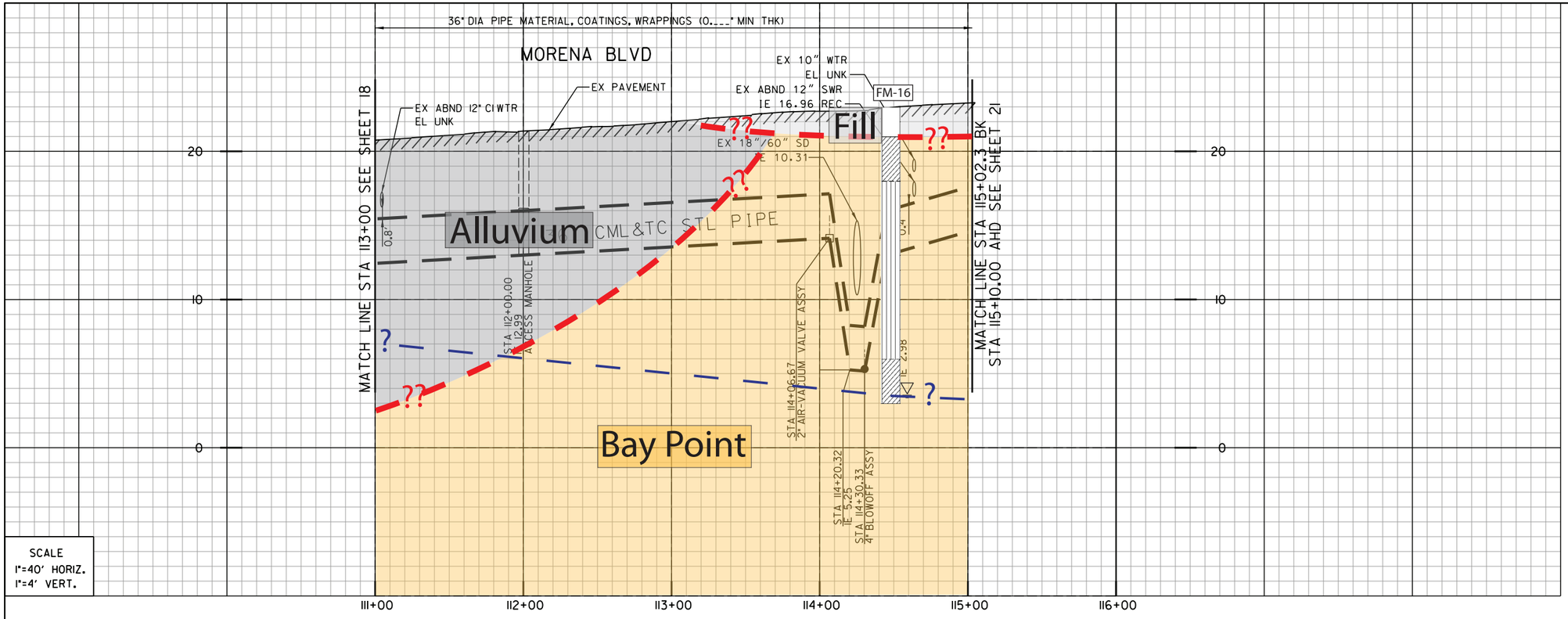
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-18-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

MORENA BLVD

60% SUBMITTAL

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR14.dgn
9/5/2017 raul.sierra $PLTDRVSS $PENTBLSS



SCALE
1"=40' HORIZ.
1"=4' VERT.

① (189)
BY CONTRACTOR
FURNISH AND INSTALL
STA 112+00
1- ACCESS MANHOLE

② (191)
BY CONTRACTOR
FURNISH AND INSTALL
STA 114+06.67
1- 2" AIR & VACCUM ASSY

③ (190)
BY CONTRACTOR
FURNISH AND INSTALL
STA 114+30.33
1- B.O. ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)

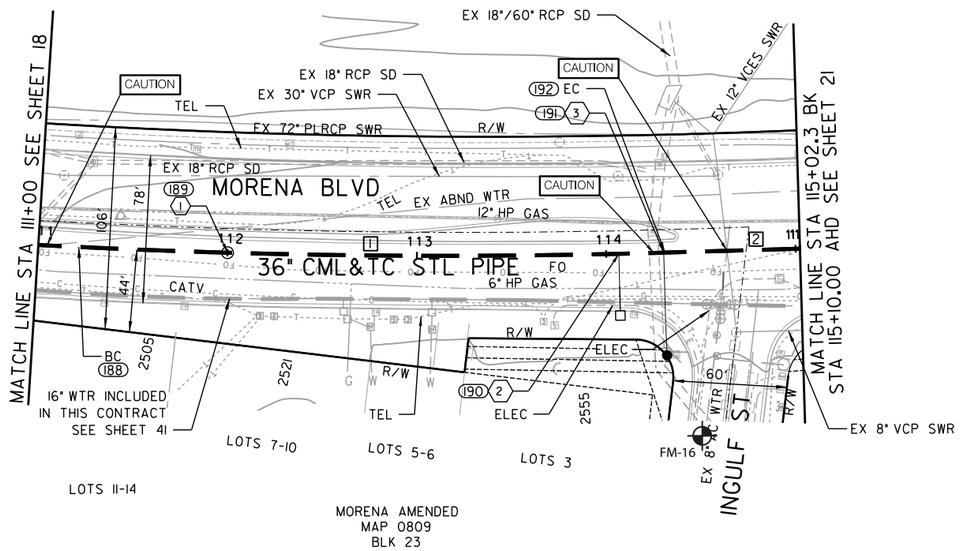
REFERENCE:

WATER:	5209-D, 7660-W
SEWER:	9321-L, 25119-D, 1151-D, 4242-D
STORM DRAIN:	5207-D, 3493-D, 3479-D
GAS:	15772-119025, 15765-119020
ELECTRIC:	15772-119025
CABLE TV:	226-1704B
ATT&TELEPHONE:	BLM 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(188)	1868064.21	6267883.01	BC
(189)	1868142.69	6267889.01	ACCESS MH
(190)	1868349.17	6267897.41	ARV
(191)	1868372.82	6267897.69	B.O.
(192)	1868373.44	6267897.69	EC

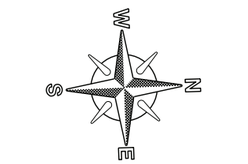
PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N4° 56'07"E		21.29'	36" CML&TC STL
2	4° 26'08"	4000	309.65'	36" CML&TC STL
3	N0° 29'59"E		71.37'	36" CML&TC STL

MORENA AMENDED
MAP 0809



MORENA AMENDED
MAP 0809
BLK 23

CAUTION
12" & 6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED



0 40 80 120
SCALE 1" = 40'

C-15

MORENA PUMP STATION AND
CONVEYANCE SYSTEM

36" WATER TRANSMISSION

STA 111+00 TO STA 115+20 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 19 OF 106 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-19-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-WTR15.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL

16" DIA PIPE MATERIAL, COATINGS, WRAPPINGS (0.___" MIN THK)

MORENA BLVD

ELEC
EL UNK

EX 12" AC WTR
EL UNK

FO
EL UNK

ELEC
EL UNK

EX PAVEMENT
TEL
EL UNK

6" GAS

ELEC
EL UNK

FM-3

8" GAS
EL UNK

Fill

16" PVC PIPE

Alluvium

STA 2+60.07
BLOWOFF ASSY

EX 18" SD
IE 13.31 MEAS

STA 5+00.50
ARV ASSY

PROVIDE MIN 1' OR
6" SAND CUSHION
WITH 1" NEOPRENE
PAD FOR ALL
CROSSINGS WITH
VERT. SEPERATION
IS 1' OR LESS, TYP

PROP 36" WTR
EL 11.6±

Bay Point

0.2'
0.7'
0.9'
0.8'

30
20
10

1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00

MATCH LINE STA 9+00 SEE SHEET 29

SCALE
1"=40' HORIZ.
1"=4' VERT.

VERNON PK
MAP 0569
BLK 3

LOTS 1, 30-34

5355

ELEC

FO

50' EX SWR

GRANT ST

PUEBLO LANDS
MM0036

FM-3

SHERMAN ST

8" AC WTR

10" AC WTR

48" SEWER FM NOT INCLUDED
IN THIS CONTRACT
SEE PACKAGE B

CAUTION

3 101

102 BC

103 4

100 1 2

20'

LOT 2

SWR ESMT

30'

ELEC

EX 16" CI WTR
TO BE ABND

ELEC ESMT

MORENA BLVD

LANDSCAPED
RAISED MEDIAN

PAVED RAISED
MEDIAN

TEL & FO

814

R/W

30" BRINE NOT INCLUDED
IN THIS CONTRACT
SEE PACKAGE B

47'

105'

82'

DETAIL A

8" GAS

6" GAS

BLVD

16" PVC PIPE

EC 105

106 7

CAUTION

TEL

ELEC 8" GAS

EX 12" AC WTR

18" RCP SD

104 5 6

LINDA VISTA RD

LOT 1

MAP 14930

R/W

30'

WATER & EMERGENCY
ACCESS ESMT

845

855

NAPA ST

LOT 300

36" WTR INCLUDED
IN THIS CONTRACT
SEE SHEET 07

16" PVC PIPE

12" AC PIPE

12" AC PIPE

EX 16" CI WTR
TO BE ABND

DETAIL A

VARIES 42' TO 2.5'

EX CONC CURB & GUTTER

EX PAVEMENT

EX CONC
VARIES

LANDSCAPED
MEDIAN VARIES

0.5'

1.4'

1.9'

CONCRETE MEDIAN
NOT TO SCALE

PUEBLO LANDS
MM0036

0 40 80 120
SCALE 1"=40'

CAUTION

8" & 6" HP GASI CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

RETIREMENTS:

16" CI - 800' - 1956

1 100
BY CITY FORCES
AHD OF CONTRACTOR

STA 1+00.00
CUT & PLUG:
EX 16" CI WTR
RECONNECT AFTER NEW
MAIN (PHASE I) HAS BEEN
ACCEPTED

2 100
BY CONTRACTOR
FURNISH AND INSTALL

STA 1+00.00
1 - POB

3 101
BY CONTRACTOR
FURNISH AND INSTALL

STA 1+29.77
1 - 45° HORIZ BEND

4 103
BY CONTRACTOR
FURNISH AND INSTALL

STA 2+60.07
1 - 4" B.O. ASSY

5 104
BY CITY FORCES
AHD OF CONTRACTOR

STA 3+54.63
CUT & PLUG:
EX 12" AC WTR, 10' RT
RECONNECT AFTER NEW
MAIN HAS BEEN ACCEPTED

6 104
BY CONTRACTOR
FURNISH AND INSTALL

STA 3+54.63
1 - 16" X 12" TEE (F)
2 - 16" BUTTERFLY VALVES
(F,MJ) BK, AHD
1 - 12" BUTTERFLY VALVE
(F,MJ) RT

7 106
BY CONTRACTOR
FURNISH AND INSTALL

STA 5+00.50
1 - 2" ARV ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??— Geological Contact
- ?— Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7104-W
SEWER:	10437-D
STORM DRAIN:	3472-D
GAS:	15795-118935, 115795-118940, 15787-119840
ELECTRIC:	15787-119840
CABLE TV:	NO INFO
ATT&TELEPHONE:	BLO 1970
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
100	1858962.16	6270298.08	POB
101	1858986.17	6270280.48	HPI
102	1859023.45	6270286.24	BC
103	1859115.67	6270293.37	B.O. ASSY
104	1859209.86	6270286.18	TEE
105	1859341.45	6270250.38	EC
106	1859350.01	6270246.98	ARV ASSY

PROPOSED PIPE DATA TABLE

NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N36° 13'38"W		29.77'	16" PVC
2	N8° 46'22"E		37.72'	16" PVC
3	30° 24'48"	610'	323.8	16" PVC
4	N21° 38'26"W		408.71'	16" PVC

C-24

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 1+00 TO STA 9+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 28 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
CIVIL
Exp. 12/31/17
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-28-D

MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR1.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL

16" DIA PIPE MATERIAL, COATINGS, WRAPPINGS (0.___" MIN THK)

MORENA BLVD

MATCH LINE STA 9+00 SEE SHEET 28

MATCH LINE STA 17+00 SEE SHEET 30

PROVIDE MIN 1' OR 6" SAND CUSHION WITH 1" NEOPRENE PAD FOR ALL CROSSINGS WHERE VERT. SEPERATION IS 1' OR LESS, TYP

ELEC EL UNK

EX 8" AC WTR TO BE ABND EL UNK

20" GAS EL UNK

EX 10" AC WTR TO BE ABND EL UNK

2" GAS EL UNK

ELEC EL UNK

TEL EL UNK

EX 6" WTR EL UNK

6" x 6" TEE

FM-4

ELEC EL UNK

EX PAVEMENT

12" HP GAS

EX 27" RCP SD
IE 17.45 CALC
TEL
EL UNK

EX 2" WTR
EL UNK

ELEC
EL UNK
CATV
EL UNK

ELEC
EL UNK
TEL
EL UNK

ELEC
EL UNK

EX UNK WTR
EL UNK

PROP 30" BRINE
IE XX.XX

PROP 48" SWR
IE XX.XX

Fill

Alluvium

Bay Point

STA 9+61.93 BLOWOFF ASSY

STA 12+81.39 ARV ASSY

STA 12+90.97 BLOWOFF ASSY

STA 13+55.73 ARV ASSY

STA 13+74.44 BLOWOFF ASSY

PROP 48" SWR
IE XX.XX

PROP 30" BRINE
IE XX.XX

PROP 12" WTR

9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

① (106) BY CONTRACTOR FURNISH AND INSTALL
STA 9+02.93
CONNECT TO EXISTING SHERMAN ST STUB

② (107) BY CONTRACTOR FURNISH AND INSTALL
STA 9+61.93
1- 4" B.O. ASSY

③ (108) BY CONTRACTOR FURNISH AND INSTALL
STA 9+65.87
1- 16" x 6" TEE (MJ,MJ,F)
1- 6" FH ASSY & MARKER

④ (110) BY CONTRACTOR FURNISH AND INSTALL
STA 12+81.39
1- 2" ARV ASSY

⑤ (112) BY CONTRACTOR FURNISH AND INSTALL
STA 12+86.52
1- 16" X 6" TEE (MJ,MJ,F)
1- 6" FH ASSY & MARKER

⑥ (113) BY CONTRACTOR FURNISH AND INSTALL
STA 12+90.97
1- 4" B.O. ASSY

⑦ (114) BY CONTRACTOR FURNISH AND INSTALL
STA 13+55.73
1- 2" ARV ASSY

⑧ (115) BY CONTRACTOR FURNISH AND INSTALL
STA 13+74.44
1- 4" B.O. ASSY

REFERENCE:

WATER:	7104-W, 7619-W, 7320-W
SEWER:	10437-D, 1346-7, 1342-D, 4874-B
STORM DRAIN:	7203-D,
GAS:	15787-119845, 15787-118940
ELECTRIC:	15787-119840, 15787-118945
CABLE TV:	218-1707-B
ATT&TELEPHONE:	BL01969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
(106)	1859778.91	6270076.81	B.O. ASSY
(107)	1859782.62	6270075.48	FH
(108)	1859784.97	6270074.41	HPI
(109)	1859982.08	6269994.50	HPI
(110)	1860045.12	6269969.52	BC
(111)	1860074.95	6269956.78	ARV ASSY
(112)	1860079.60	6269954.62	FH
(113)	1860083.63	6269952.72	B.O. ASSY
(114)	1860140.47	6269921.75	ARV ASSY
(115)	1860156.25	6269911.70	B.O. ASSY
(116)	1860168.45	6269903.46	EC
(117)	1860212.33	6269873.03	BC
(118)	1860367.47	6269813.46	EC

PROPOSED PIPE DATA TABLE

NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N21° 38'26"W		68.44'	16" PVC
2	N22° 04'07"W		212.70'	16" PVC
3	N21° 36'46"W		67.80'	16" PVC
4	13° 07'39"	612'	140.22'	16" PVC
5	N34° 44'25"W		53.39'	16" PVC
6	27° 28'01"	350'	167.79'	16" PVC
7	N7° 16'25"W		89.66'	16" PVC

C-25

SHERMAN ST

MORENA BLVD

DETAIL A

LINDE COMMERCIAL SUB
MAP 6260

LINDE SUB
MAP 4979

WEEKS ADD
MAP 0123
BLK 1 LOTS 31-32

WEEKS ADD
MAP 0123
BLK 1 LOTS 1-4

Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
FM-1 Boring
H-2 Boring - AGE, 2017
D-3 Boring - CWP, 1992
GTB-1 Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

CAUTION

EX 6" WTR

ELEC

920

LOT 1

10

11

12

13

LOT 4

984

R/W

6" HP GAS

16" PVC PIPE
MORENA BLVD

FM-4

12" HP GAS

2" HP GAS

42'

100'

58'

5320

LOT 2

NAPA CENTER
MAP 4600

LOTS 284 & 285

PUEBLO LANDS
MAP MM0036

909

999

1013

EX 27" RCP SD

LOT 285

PUEBLO LANDS
MAP MM0036

GUE SUB
MAP 4722

HPI

ELEC

CATV

TEL

48" SEWER FM INCLUDED IN THIS CONTRACT SEE PACKAGE B

30" BRINE INCLUDED IN THIS CONTRACT SEE PACKAGE B

36" WTR INCLUDED IN THIS CONTRACT SEE SHEET 07

FO

EC

BC

EX 27" RCP SD

EX 2" WTR

W MORENA BLVD

LOT 1

220

R/W

15

16

CAUTION

MORENA BLVD

EX 8" VCP

ELEC

MATCH LINE STA 17+00 SEE SHEET 30

RETIREMENTS:
16" CI - 770' - 1956

CAUTION

20",12" & 6" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

0 40 80 120
SCALE 1"=40'

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 9+00 TO STA 17+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 29 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-29-D

MORENA BLVD

60% SUBMITTAL

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR2.dgn

9/5/2017 raul.sierra $PLTDRVSS $PENTBLS$

16" DIA PIPE MATERIAL, COATINGS, WRAPPINGS (0.___" MIN THK)

MORENA BLVD

MATCH LINE STA 17+00 SEE SHEET 29

MATCH LINE STA 25+00 SEE SHEET 31

PROVIDE MIN 1' OR 6" SAND CUSHION WITH 1" NEOPRENE PAD FOR ALL CROSSINGS WHERE VERT. SEPERATION IS 1' OR LESS

1-1/4" HP GAS IE UNK

EX 6" AC WTR

EX 6" AC WTR

EX PAVEMENT

1-1/4" GAS IE UNK

4" GAS IE UNK

WM-06

EX UNK WTR TO BE ABND

EL UNK

ELEC EL UNK

2" GAS EL UNK

ELEC EL UNK

ELEC EL UNK

ELEC EL UNK

CATV EL UNK

Fill

16" x 6" TEE

16" PVC PIPE

16" x 6" TEE

FUTURE SD EL UNK

Bay Point

EX 8" VCP SWR IE 19.6 REC

STA 17+25.26 AIR VALVE ASSY

STA 18+09.79 BLOWOFF ASSY

EX 8" VCP SWR IE 19.6 REC

STA 22+12.84 AIR VALVE ASSY

FUTURE SD EL UNK

0.9' 0.8' 0.9' 1.0' 0.7' 1.1' 0.7' 0.6' 0.7'

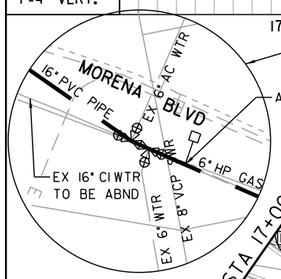
??

??

40 30 20

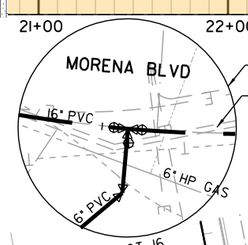
17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00

SCALE
1"=40' HORIZ.
1"=4' VERT.



DETAIL A

ARV



DETAIL B

FUTURE SD BY OTHERS

MATCH LINE STA 17+00 SEE SHEET 29

MATCH LINE STA 25+00 SEE SHEET 31

CUSHMAN AVE

BUENOS AVE

NAPLES PL

MORENA PL

MORENA BLVD

16" PVC PIPE

EX 8" VCP SWR

EX 6" AC WTR

EX WTR

6" HP GAS

ELEC

TEL

CATV

GAS

R/W

845

75'

60'

WEEKS ADD MAP 0123 BLK 1

WEEKS ADD MAP 0123 BLK 2

WEEKS ADD MAP 0123 BLK 3

LOTS 1-4

LOTS 2-4

LOTS 5-6

LOTS 7-12

LOTS 13-16

LOTS 31-32

LOTS 1-3

LOTS 4-5

LOTS 6-9

LOTS 10-12

LOT 16

LOTS 2-3

LOTS 4-6

LOTS 7-8

LOT 1

LOT 4

LOTS 5-6

LOTS 7-8

CAUTION

CAUTION

CAUTION

CAUTION

1076 1070 1090 1102 1112 1123 1129 1155 1156 1152

19 20 21 22 23 24

HPI

HPI

HPI

BC

EC

Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
Boring
Boring - AGE, 2017
Boring - CWP, 1992
Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

WM-06

CAUTION
6", 4" & 1.25" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

(8) (127)
BY CONTRACTOR
FURNISH AND INSTALL
STA 20+56.84
1 - 16" x 6" TEE (F)
2 - 16" GV (F,MJ) BK, AHD
1 - 6" GV (F,MJ) RT

(9) (129)
BY CONTRACTOR
FURNISH AND INSTALL
STA 22+12.84
1 - ARV ASSY

(10) (130)
BY CITY FORCES
AHD OF CONTRACTOR
STA 22+53.27
CUT & PLUG:
EX 6" AC WTR, 10• LT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

(11) (130)
BY CONTRACTOR
FURNISH AND INSTALL
STA 22+53.27
1 - 16" X 6" TEE (F)
2 - 16" BUTTERFLY VALVES (F,MJ) BK, AHD
1 - 6" BUTTERFLY VALVE (F,MJ) LT

0 40 80 120
SCALE 1"=40'

(1) (119)
BY CITY FORCES
AHD OF CONTRACTOR
STA 17+09.76
CUT & PLUG:
EX 6" AC WTR, 10'+- LT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

(2) (119)
BY CONTRACTOR
FURNISH AND INSTALL
STA 17+09.76
1 - 11.25° HORIZ BEND
1 - 16" X 6" TEE (F,MJ,F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 6" BFV (F,MJ) LT

(3) (120)
BY CITY FORCES
AHD OF CONTRACTOR
STA 17+14.77
CUT & PLUG:
EX 6" AC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

(4) (120)
BY CONTRACTOR
FURNISH AND INSTALL
STA 17+14.77
1 - 16" X 6" TEE (F,MJ,F)
1 - 16" BFV (F,MJ) BK, AHD
1 - 6" BFV (F,MJ) RT

(5) (121)
BY CONTRACTOR
FURNISH AND INSTALL
STA 17+25.26
1 - 2" ARV ASSY

(6) (122)
BY CONTRACTOR
FURNISH AND INSTALL
STA 17+83.34
1 - 16" x 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

(7) (124)
BY CONTRACTOR
FURNISH AND INSTALL
STA 18+09.79
1 - 4" B.O. ASSY

REFERENCE:

WATER:	7104-5, 7322-W
SEWER:	1342-D
STORM DRAIN:	NO INFO
GAS:	7104-5, 15787-118950
ELECTRIC:	15787-118950
CABLE TV:	NO INFO
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE

NO.	NORTHING	EASTING	DESCRIPTION
(119)	1860466.08	6269800.87	HPI
(120)	1860470.83	6269799.28	TEE
(121)	1860480.78	6269795.95	ARV ASSY
(122)	1860535.85	6269777.50	FH
(123)	1860553.0	6269771.75	HPI
(124)	1860560.76	6269768.62	BO ASSY
(125)	1860626.96	6269741.91	HPI
(126)	1860701.97	6269711.72	BC
(127)	1860784.12	6269664.97	TEE
(128)	1860855.17	6269593.19	EC
(129)	1860887.78	6269549.31	ARV ASSY
(130)	1860911.90	6269516.86	TEE

PROPOSED PIPE DATA TABLE

NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N7° 16'25"W		9.76'	16" PVC
2	N18° 31'25"W		91.67'	16" PVC
3	N21° 58'22"W		79.76'	16" PVC
4	N21° 55'23"W		80.85'	16" PVC
5	31° 18'04"	359'	196.14'	16" PVC
6	N53° 23'00"W		341.83'	16" PVC

C-26

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 17+00 TO STA 25+00 MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 30 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

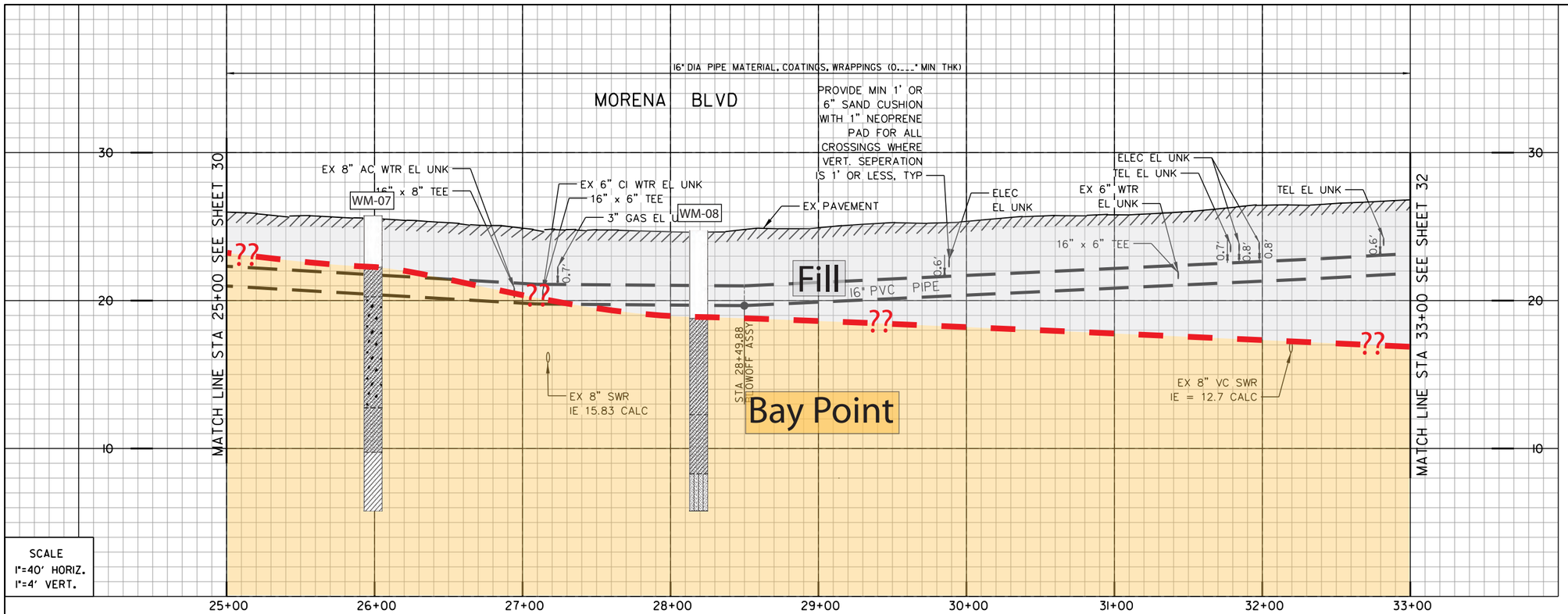
40067-30-D

MORENA BLVD

60% SUBMITTAL

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR3.dgn

9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$



1 (129) BY CITY FORCES AHD OF CONTRACTOR
STA 26+94.39
CUT & PLUG:
EX 8" WTR, 10'+- LT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

2 (129) BY CONTRACTOR FURNISH AND INSTALL
STA 26+94.39
1 - 16" X 8" TEE (F)
1 - 16" BFV (F,MJ) BK
1 - 8" BFV (F,MJ) LT

3 (130) BY CITY FORCES AHD OF CONTRACTOR
STA 27+13.73
CUT & PLUG:
EX 6" CI WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

4 (130) BY CONTRACTOR FURNISH AND INSTALL
STA 27+13.73
1 - 16" x 6" TEE (F)
1 - 16" BFV (F,MJ) BK
1 - 8" BFV (F,MJ) RT

5 (133) BY CONTRACTOR FURNISH AND INSTALL
STA 30+01.00
1 - 16" x 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

6 (135) BY CITY FORCES AHD OF CONTRACTOR
STA 31+43.14
CUT & PLUG:
EX 6" AC WTR, 10'+- LT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

7 (135) BY CONTRACTOR FURNISH AND INSTALL
STA 31+43.14
1 - 16" x 6" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 6" BFV (F,MJ) LT

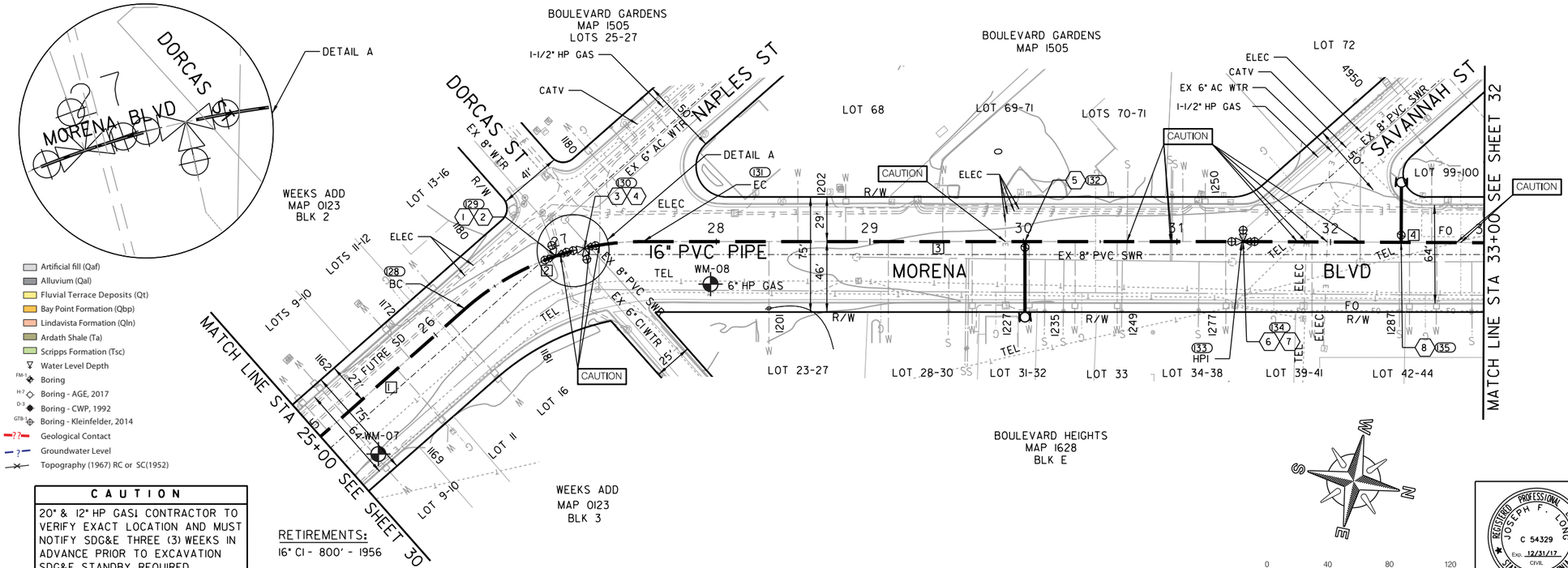
8 (136) BY CONTRACTOR FURNISH AND INSTALL
STA 32+46.04
1 - 16" x 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

REFERENCE:

WATER:	7104-4, 4408-L, 2570-L
SEWER:	7104-4, 30417-7
STORM DRAIN:	NO INFO
GAS:	7104-4, 15780-18960, 15780-118955
ELECTRIC:	15780-118955
CABLE TV:	NO INFO
ATT&TELEPHONE:	BLP 1969
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(128)	1861134.03	6269217.93	BC
(129)	1861184.66	6269172.15	TEE
(130)	1861201.77	6269163.17	TEE
(131)	1861238.26	6269151.14	EC
(132)	1861333.80	6269130.94	B.O. ASSY
(133)	1861481.66	6269099.68	FH
(134)	1861619.82	6269070.47	HPI
(135)	1861620.72	6269070.28	TEE
(136)	1861721.49	6269049.46	FH

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N53° 23'00"W		125.69'	16" PVC
2	41° 25'39"	175'	126.53'	16" PVC
3	N11° 56'17"W		389.99'	16" PVC
4	N11° 40'19"W		157.78'	16" PVC



Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
Boring
Boring - AGE, 2017
Boring - CWP, 1992
Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

CAUTION

20" & 12" HP GAS: CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

C-27

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 25+00 TO STA 33+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 31 OF 50 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-31-D

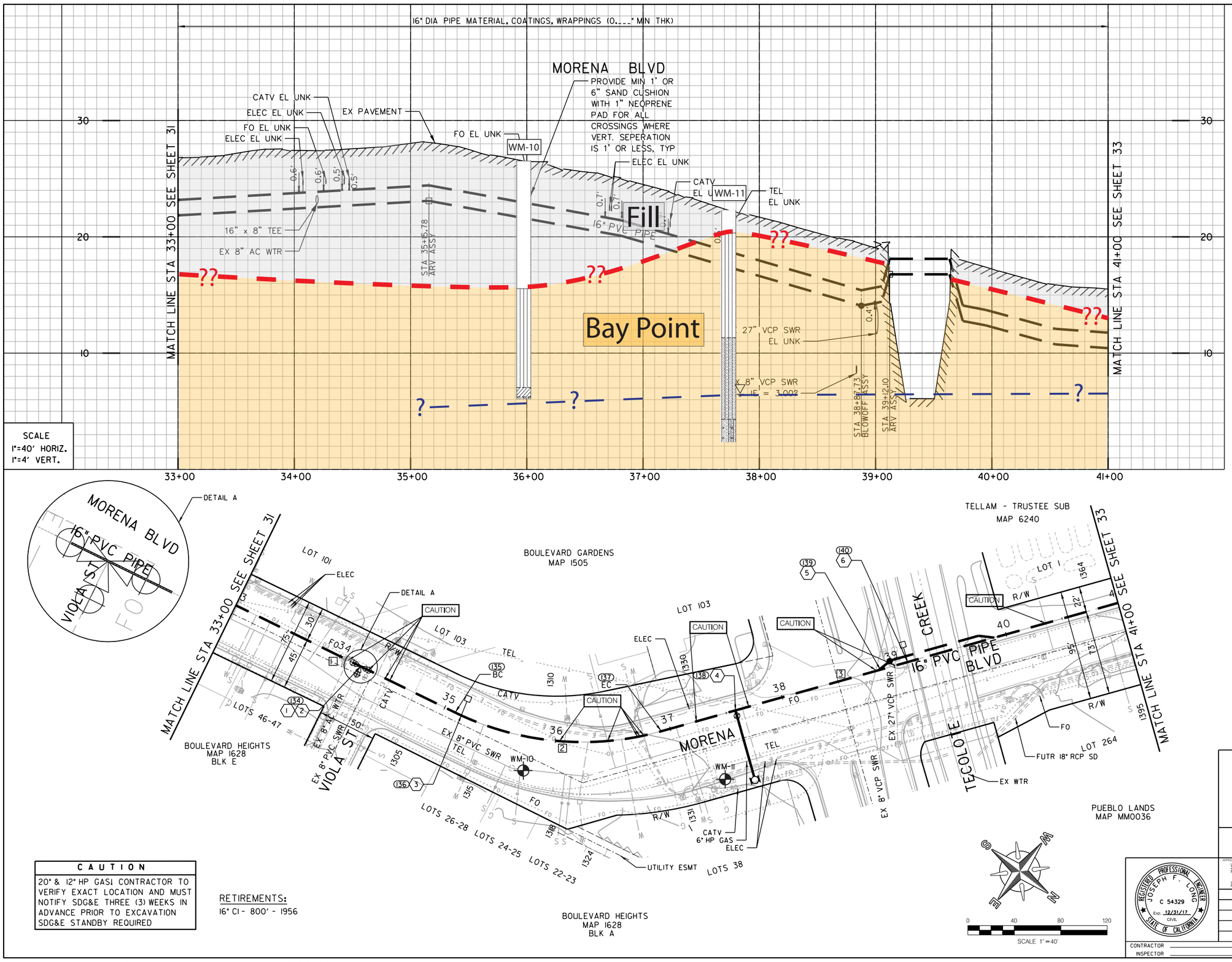
REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

MORENA BLVD

60% SUBMITTAL

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR4.dgn
9/5/2017 raul.sierra $PLTDRVSS $PENTBLSS



① (134)
BY CITY FORCES AHD OF CONTRACTOR
STA 34+19.55
CUT & PLUG:
EX 8" AC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

② (134)
BY CONTRACTOR FURNISH AND INSTALL
STA 34+19.55
1- 16" X 8" TEE (MJ,F,F)
1- 16" BFV (F,MJ) BK
1- 8" BFV (F,MJ) RT

③ (136)
BY CONTRACTOR FURNISH AND INSTALL
STA 35+15.78
1- 2" ARV ASSY

④ (138)
BY CONTRACTOR FURNISH AND INSTALL
STA 37+58.23
1- 16" X 6" (MJ,MJ,F)
1- 6" FH ASSY & MARKER

⑤ (139)
BY CONTRACTOR FURNISH AND INSTALL
STA 38+87.73
1- 4" B.O. ASSY

⑥ (140)
BY CONTRACTOR FURNISH AND INSTALL
STA 39+12.10
1- 2" ARV ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ??— Geological Contact
- — ? — Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	6451-W, 7104-3-W
SEWER:	25119-22, 7104-3, 1341, 3503-D, 1344-D, 16651-3-D
STORM DRAIN:	16661-D
GAS:	15772-118965, 15780-118960
ELECTRIC:	NO INFO
CABLE TV:	UTR 417-153
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(134)	1861891.42	6269014.36	TEE
(135)	1861979.91	6268996.08	BC
(136)	1861985.64	6268994.83	ARV ASSY
(137)	1862130.05	6268900.29	EC
(138)	1862169.53	6268847.12	FH
(139)	1862246.73	6268743.15	B.O. ASSY
(140)	1862261.26	6268723.58	ARV ASSY

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N11° 40'19"W		209.91'	16" PVC
2	41° 44'00"	250'	182.1'	16" PVC
3	N53° 24'19"W		407.99'	16" PVC

CAUTION
20" & 12" HP GAS! CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

C-28

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 33+00 TO STA 41+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 32 OF 50 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-32-D

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

MORENA BLVD

60% SUBMITTAL

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9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

16" DIA PIPE MATERIAL, COATINGS, WRAPPINGS (0.___" MIN THK)

MORENA BLVD

PROVIDE MIN 1' OR 6" SAND CUSHION WITH 1" NEOPRENE PAD FOR ALL CROSSINGS WHERE VERT. SEPERATION IS 1' OR LESS, TYP

EX ABND 12" AC WTR
EL UNK
EX 10" AC WTR
EL UNK
EX 12" PVC WTR
EL UNK
TEL EL UNK
2" GAS
EL UNK
ELEC EL UNK
TEL EL UNK
CATV
EL UNK
TEL
EL UNK
EX PAVEMENT
ELEC EL UNK
TEL EL UNK
ELEC
EL UNK
ELEC
EL UNK
TEL
EL UNK
TEL
EL UNK
FO
EL UNK
ELEC
EL UNK
CATV
EL UNK
EX 6" CI WTR
EL UNK
CATV
EL UNK

Fill

Alluvium

Bay Point

EX 24" RCP SD
IE 9.46 CALC

16" PVC PIPE

EX 8" PVC WTR
IE UNK

EX 10" VCP SWR
IE 5.12 CALC

EX 24" VCES SWR
IE

STA 42+67.30
BLOWOFF ASSY

STA 45+28.15
ARV ASSY

STA 45+48.19
BLOWOFF ASSY

STA 45+77.71
ARV ASSY

MATCH LINE STA 41+00 SEE SHEET 32

MATCH LINE STA 49+00 SEE SHEET 34

41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00

20 10 0

SCALE
1"=40' HORIZ.
1"=4' VERT.

(1) (140)
BY CITY FORCES
AHD OF CONTRACTOR
STA 42+23.00
CUT & PLUG:
EX 12" AC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

(2) (140)
BY CONTRACTOR
FURNISH AND INSTALL
STA 42+23.00
1 - 16" X 12" TEE (MJ,F,F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 12" BFV (F,MJ) RT

(3) (141)
BY CITY FORCES
AHD OF CONTRACTOR
STA 42+36.07
CUT & PLUG:
EX 10" AC WTR, 10'+- LT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

(4) (141)
BY CONTRACTOR
FURNISH AND INSTALL
STA 42+36.07
1 - 16" X 10" TEE (F,MJ,F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 10" BFV (F,MJ) LT

(5) (142)
BY CONTRACTOR
FURNISH AND INSTALL
STA 42+67.30
1 - 4" B.O. ASSY

(6) (143)
BY CONTRACTOR
FURNISH AND INSTALL
STA 44+95.33
1 - 16" X 6" TEE (MJ,MJ,F)
1 - FH ASSY & MARKER

(7) (145)
BY CITY FORCES
AHD OF CONTRACTOR
STA 45+15.92
CUT & PLUG:
EX 8" CI WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

(8) (145)
BY CONTRACTOR
FURNISH AND INSTALL
STA 45+15.92
1 - 16" X 8" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 8" BFV (F,MJ) RT

(9) (146)
BY CONTRACTOR
FURNISH AND INSTALL
STA 45+28.15
1 - 2" ARV ASSY

REFERENCE:

WATER:	7104-2, 2577-L, 31594-D, 31236-D, 9510-D
SEWER:	1343-D, 1345-D, 1689-D
STORM DRAIN:	6424-D, 16166-D
GAS:	7104-2, 15772-118970, 15772-118965
ELECTRIC:	15772-118970, UTR 417-153
CABLE TV:	BLP 1968
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(140)	1862446.60	6268473.97	TEE
(141)	1862454.39	6268463.47	TEE
(142)	1862473.01	6268438.40	B.O. ASSY
(143)	1862608.95	6268255.32	FH
(144)	1862621.23	6268238.79	TEE
(145)	1862619.74	6268240.79	HPI
(146)	1862628.55	6268229.00	ARV ASSY
(147)	1862640.54	6268212.94	B.O. ASSY
(148)	1862658.21	6268189.29	ARV ASSY
(149)	1862793.85	6268007.73	TEE

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N53° 24'19"W		413.43'	16" PVC
2	N53° 14'19"W		386.57'	16" PVC

C-29

DETAIL A

KNOXVILLE ST

16" PVC PIPE
MORENA BLVD

TELLAM-TRUSTEE SUB
MAP 6240

PUEBLO LANDS
MAP MM0036

SID'S SUB
MAP 7283

PUEBLO LANDS
MAP MM0036

PARCEL MAP NO 13992
MAP PM 13992

MATCH LINE STA 41+00 SEE SHEET 32

MATCH LINE STA 49+00 SEE SHEET 34

KNOXVILLE ST

LEHIGH ST

NASHVILLE ST

MORENA BLVD

LOT 1
LOT 256
LOT 1
LOT 256
LOT 256
LOT 17-18
LOTS 20-22
LOTS 18-19
LOTS 17
LOT 22
LOT 21
LOT 20
LOT 19

CAUTION
CAUTION
CAUTION

EX 10" VCP SWR
EX 10" AC WTR
EX 6" VCP SWR
EX 12" PVC WTR
EX 8" ELEC
EX ABND 12" AC WTR
6" HP GAS
EX 18" RCP SD
EX 24" RCP SD
EX 24" VCES SWR
EX 8" PVC WTR
CATV
1-1/2" HP GAS
6" HP GAS
1-1/2" HP GAS
EX 6" AC WTR

PARCEL MAP NO 03428
MAP MP03428

CORELLA TRACT
MAP 1571

CORELLA TRACT
MAP 1571
BLOCK 2

CORELLA TRACT
MAP 1571
BLK 3

Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
Boring
Boring - AGE, 2017
Boring - CWP, 1992
Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

0 40 80 120
SCALE 1"=40'

CAUTION
12" & 1-1/2" HP GAS CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

(10) (147)
BY CONTRACTOR
FURNISH AND INSTALL
STA 45+48.19
1 - B.O. ASSY

(11) (148)
BY CONTRACTOR
FURNISH AND INSTALL
STA 45+77.71
1 - ARV ASSY

(12) (149)
BY CITY FORCES
AHD OF CONTRACTOR
STA 48+04.35
CUT & PLUG:
EX 6" AC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

(13) (149)
BY CONTRACTOR
FURNISH AND INSTALL
STA 48+04.35
1 - ARV ASSY

REGISTERED PROFESSIONAL ENGINEER
JOSEPH F. LONG
C 54329
Exp. 12/31/17
CIVIL
STATE OF CALIFORNIA

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 41+00 TO STA 49+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 33 OF 50 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA
FOR CITY ENGINEER — DATE

PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

SUBMITTED BY: LAILA NASRAWI
PROJECT MANAGER

CHECKED BY: DARIN SANCHEZ
PROJECT ENGINEER

000-0000
CCS27 COORDINATE

0000-0000
CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-33-D

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR6.dgn
9/5/2017 raul.sierra $PLTDRVSS $PENTBLSS

60% SUBMITTAL

MORENA BLVD

16" DIA PIPE MATERIAL, COATINGS, WRAPPINGS (0.___" MIN THK)

MORENA BLVD

MATCH LINE STA 49+00 SEE SHEET 33

MATCH LINE STA 57+00 SEE SHEET 35

ELEC
EL UNK
TEL
EL UNK
ELEC
EL UNK
TEL
EL UNK
ELEC
EL UNK

TEL
EL UNK

FO
EL UNK
TEL
EL UNK

PROVIDE MIN 1" OR 6" SAND CUSHION WITH 1" NEOPRENE PAD FOR ALL CROSSING WHERE VERT. SEPERATION IS 1' OR LESS, TYP

EX PAVEMENT
EX 18" RCP SD
IE 7.85 REC

ELEC
EL UNK
TEL
EL UNK

TEL
EL UNK
FO
EL UNK
ELEC
EL UNK
FO
EL UNK

EX SD
IE 6.7+- CALC

TEL EL UNK

FO EL UNK

TEL EL UNK

GTB-2
projected
-85'E

FM-8

GAS
EL UNK

Fill

16" PVC PIPE

EX 12" AC WTR
EL UNK

16" x 12" TEE

16" x 8" TEE
EX 8" PVC WTR

EX 8" VCP SWR
EL UNK

EX 8" VC SWR
IE = 5.35 CALC

EX 24" VCP SWR
IE = 4.32 CALC

Alluvium

STA 52+65.
BLOWOFF AS

Bay Point

49+00 50+00 51+00 52+00 53+00 54+00 55+00 56+00 57+00

20
10
0

SCALE
1"=40' HORIZ.
1"=4' VERT.

① (150)
BY CITY FORCES
AHD OF CONTRACTOR

STA 50+96.33
CUT & PLUG:
EX 8" PVC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

② (150)
BY CONTRACTOR
FURNISH AND INSTALL

STA 50+96.33
1 - 16" X 8" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 8" BFV (F,MJ) RT

③ (151)
BY CONTRACTOR
FURNISH AND INSTALL

STA 52+65.95
1 - 4" B.O. ASSY

④ (152)
BY CITY FORCES
AHD OF CONTRACTOR

STA 52+99.80
CUT & PLUG:
EX 12" AC WTR, 10'+- LT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

⑤ (152)
BY CONTRACTOR
FURNISH AND INSTALL

STA 52+99.80
1 - 16" X 12" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 12" BFV (F,MJ) LT

⑥ (149)
BY CONTRACTOR
FURNISH AND INSTALL

STA 54+33.59
1 - 16" X 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

⑦ (152)
BY CONTRACTOR
FURNISH AND INSTALL

STA 56+93.58
1 - 16" X 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

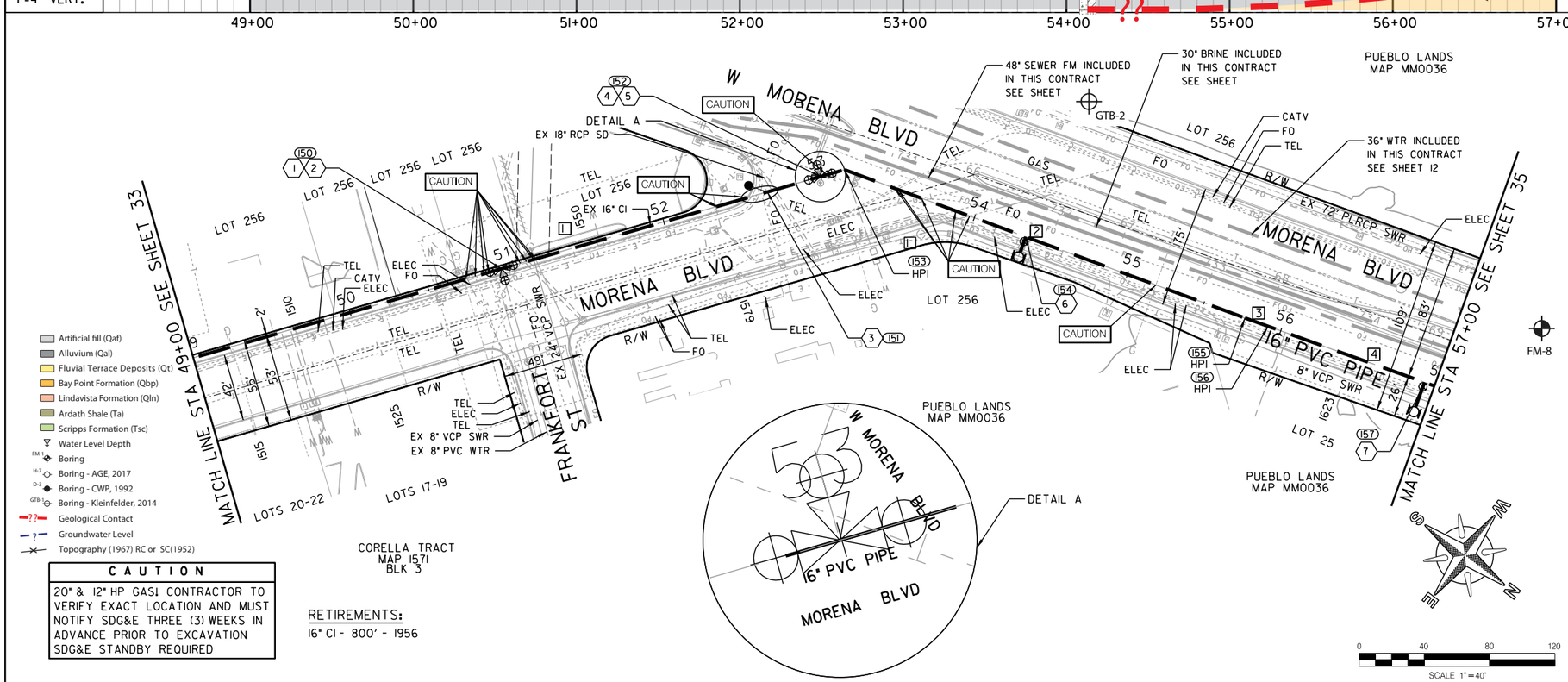
REFERENCE:

WATER:	11835-D, 7104-W, 6066-D, 7660-W, 31594-D
SEWER:	3465, 25119-D, 1343-D, 6066-D, 12215-D, 1345-D, 4608-3-D
STORM DRAIN:	10162-L, 3475-D
GAS:	15765-118970, 15765-118975
ELECTRIC:	15765-118970, 15765-118975
CABLE TV:	417-153
ATT&TELEPHONE:	BLN 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	NO INFO
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(146)	1863070.11	6267637.92	B.O. ASSY
(147)	1863090.37	6267610.81	TEE
(148)	1863099.53	6267598.54	HPI
(149)	1863212.95	6267564.26	FH
(150)	1863349.93	6267522.86	HPI
(151)	1863364.37	6267518.33	HPI
(152)	1863461.56	6267488.17	FH

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N53° 14'19"W		415.11'	16" PVC
2	N16° 49'04"W		261.59'	16" PVC
3	N17° 24'12"W		15.13'	16" PVC
4			108.17'	16" PVC

C-30



Artificial fill (Qaf)
Alluvium (Qal)
Fluvial Terrace Deposits (Qt)
Bay Point Formation (Qbp)
Lindavista Formation (Qln)
Ardath Shale (Ta)
Scripps Formation (Tsc)
Water Level Depth
Boring
Boring - AGE, 2017
Boring - CWP, 1992
Boring - Kleinfelder, 2014
Geological Contact
Groundwater Level
Topography (1967) RC or SC(1952)

CAUTION

20" & 12" HP GASI CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 49+00 TO STA 57+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 34 OF 50 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-34-D

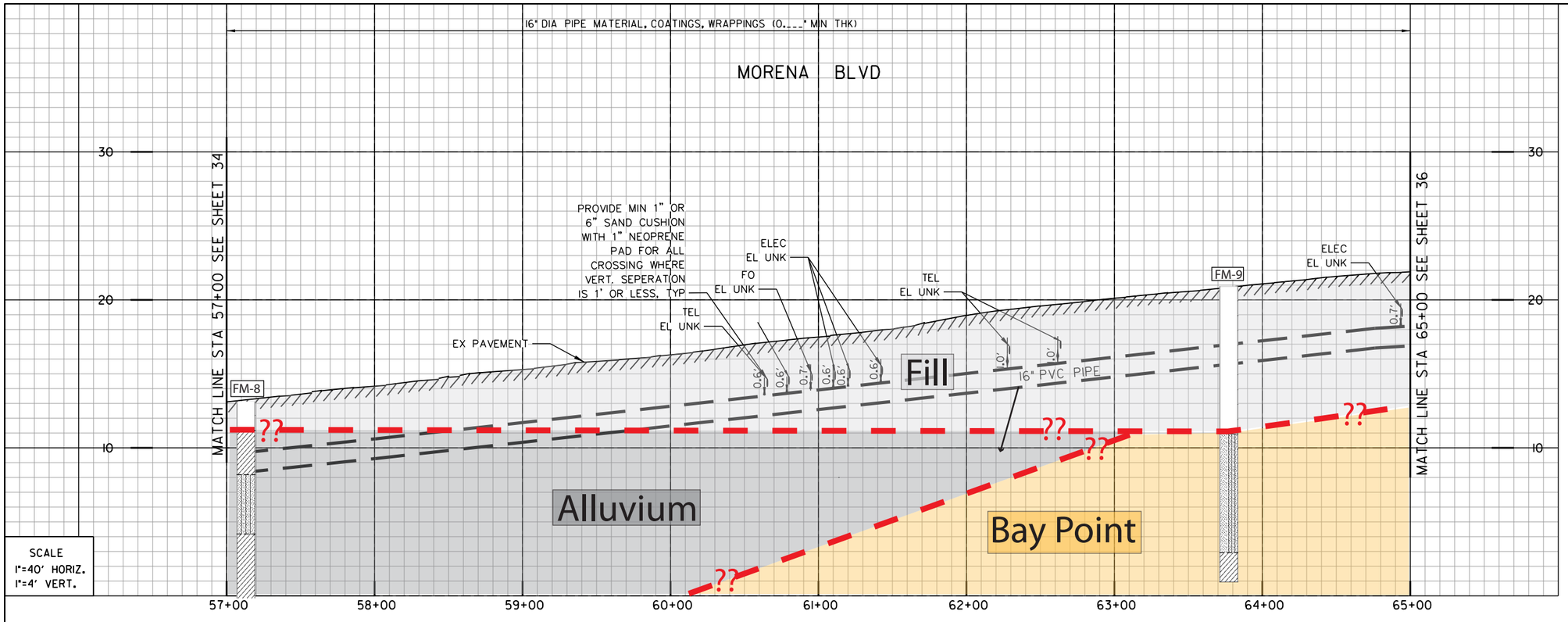
REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR7.dgn
9/5/2017 raul.sierra $PLTDRVSS $PENTBLSS

60% SUBMITTAL

MORENA BLVD

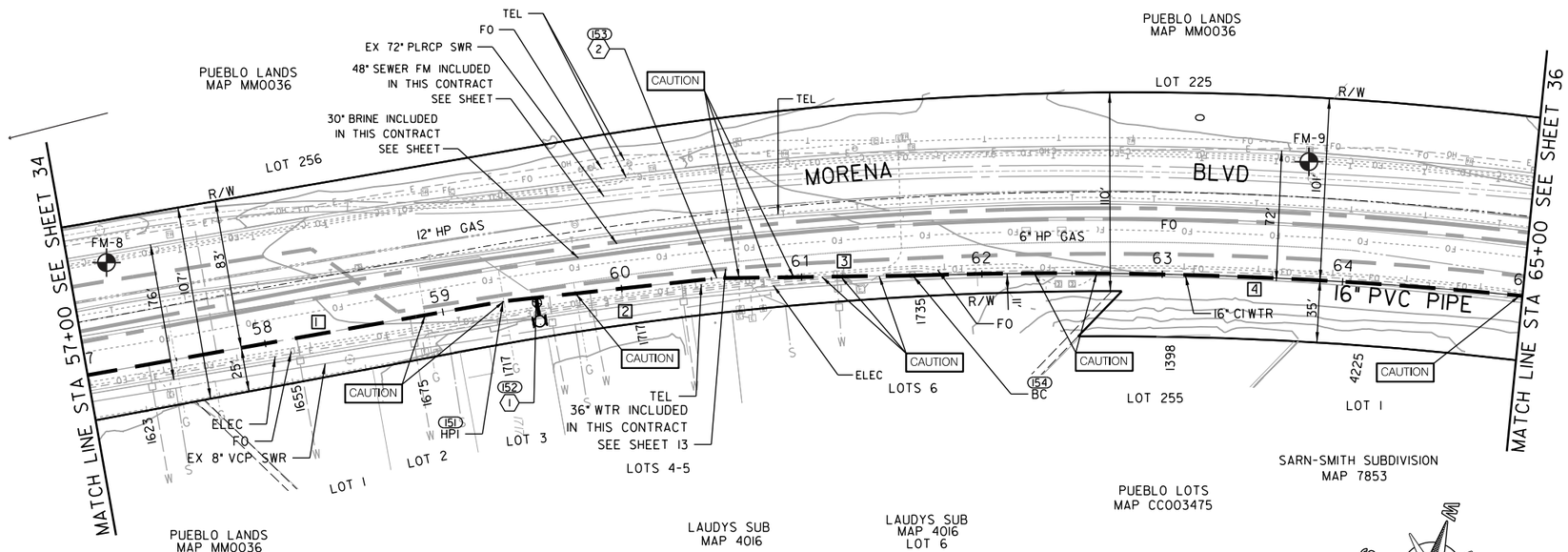


SCALE
1"=40' HORIZ.
1"=4' VERT.

① (152)
BY CONTRACTOR
FURNISH AND INSTALL
STA 59+52.33
1 - 16" X 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

② (153)
BY CONTRACTOR
FURNISH AND INSTALL
STA 60+53.04
1 - 5.38° HORIZ BEND

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- ?? Geological Contact
- ? Groundwater Level
- Topography (1967) RC or SC(1952)



CAUTION
12" AND 6" HP GAS CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

SCALE 1"=40'

REFERENCE:

WATER:	6066-D, 7760-W
SEWER:	6066-D, 25119-D
STORM DRAIN:	NO INFO
GAS:	15765-118170
ELECTRIC:	15765-118975
CABLE TV:	222-1704-B, BL 1967
ATT&TELEPHONE:	104-212
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(151)	1863690.74	6267416.03	HPI
(152)	1863708.71	6267411.72	FH
(153)	1863806.64	6267388.22	HPI
(154)	1863914.17	6267372.89	BC

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N17° 24'12"W		233.85'	16" PVC
2	N13° 29'31"W		119.19'	16" PVC
3	N8° 06'53"W		108.61'	16" PVC
4	7° 25'10"	2613'	338.35'	16" PVC

C-31

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 57+00 TO STA 65+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 35 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-35-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

MORENA BLVD

60% SUBMITTAL

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR8.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

16" DIA PIPE MATERIAL, COATINGS, WRAPPINGS (0.___" MIN THK)

MORENA BLVD

MATCH LINE STA 65+00 SEE SHEET 35

MATCH LINE STA 73+00 SEE SHEET 37

FO EL UNK

TEL EL UNK

RW-1 projected ~70'E

EX SD IE 18.86 MEAS

GAS EL UNK

EX PAVEMENT

GAS EL UNK

ELEC EL UNK

EX 18" RCP SD IE 16.9 MEAS

TEL EL UNK

FM-10a

FM-10b

FO EL UNK

TEL EL UNK

Fill

Alluvium

Bay Point

16" PVC PIPE

PROVIDE MIN 1' OR 6" SAND CUSHION WITH 1" NEOPRENE PAD FOR ALL CROSSINGS WHERE VERT. SEPERATION IS 1' OR LESS, TYP

EX 8" VC SWR EL UNK

ARV ASSY

STA 67+78.88 BLOWOFF ASSY

STA 68+20.43 ARV ASSY

STA 72+59.28 BLOWOFF ASSY

0.8' 0.6' 0.4' 0.7' 0.7' 0.8' 0.6' 1.2' 1.2'

30 20 10

65+00 66+00 67+00 68+00 69+00 70+00 71+00 72+00 73+00

SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (156) BY CONTRACTOR FURNISH AND INSTALL
STA 67+52.61
1 - 2" ARV ASSY

2 (157) BY CONTRACTOR FURNISH AND INSTALL
STA 67+78.88
1 - 4" B.O. ASSY

3 (158) BY CONTRACTOR FURNISH AND INSTALL
STA 67+89.04
1 - 16" X 6" TEE (MJ,MJ,F)
1 - FH ASSY & MARKER

4 (160) BY CONTRACTOR FURNISH AND INSTALL
STA 68+20.43
1 - 2" ARV ASSY

5 (161) BY CONTRACTOR FURNISH AND INSTALL
STA 72+59.28
1 - 4" B.O. ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	6066-D, 7660-W, 3493-D, 31594-D
SEWER:	1311-D, 25119-18-D, 1149-D
STORM DRAIN:	3477-D
GAS:	15765-118890
ELECTRIC:	15765-118990, 15765-118985
CABLE TV:	224-1704-D, BLN 1967
ATT&TELEPHONE:	104-213
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(155)	1864397.89	6267340.75	EC
(156)	1864503.18	6267346.87	ARV ASSY
(157)	1864529.41	6267348.40	B.O. ASSY
(158)	1864539.55	6267348.99	FH
(159)	1864548.23	6267349.49	HPI
(160)	1864570.64	6267353.08	ARV ASSY
(161)	1865003.96	6267422.50	B.O. ASSY

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	3°13'36"	2613'	147.14'	16" PVC
2	N3°19'32"E		150.59'	16" PVC
3	N9°06'06"E		502.26'	16" PVC

PUEBLO LANDS MAP MM0036

LOT 255

EX 18" RCP SD

EX 72" PLRCP SWR

R/W

FO

MORENA BLVD

12" HP GAS

ELEC

HPI

30" BRINE INCLUDED IN THIS CONTRACT SEE SHEET

48" SEWER FM INCLUDED IN THIS CONTRACT SEE SHEET

6" HP GAS

FM-10A FM-10B

ELEC TEL

EX 18" RCP SD

MATCH LINE STA 65+00 SEE SHEET 35

MATCH LINE STA 73+00 SEE SHEET 37

135' 98' 37' 12' 4225'

EX 8" VCP SWR

CAUTION

EC

ASHER ST

EX 8" VCP SWR

36" WTR INCLUDED IN THIS CONTRACT SEE SHEET 14-15

LOTS 15-17 LOTS 13-14 LOTS 11-12 LOTS 9-10 LOTS 5-8 LOTS 1-4

EX 12" PVC WTR

LITTLEFIELD ST

EX 8" VCP SWR

LOT 1

SARN-SMITH SUBDIVISION MAP 7853

MORENA VISTA CONDOMINIUMS MAP 9416

ASHERS CLOVER LEAF TERRACE MAP 1568 BLK 4

N W E S

0 40 80 120
SCALE 1"=40'

CAUTION

12" AND 6" HP GAS CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

C-32

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 65+00 TO STA 73+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 36 OF 50 SHEETS

WATER WBS S-16027

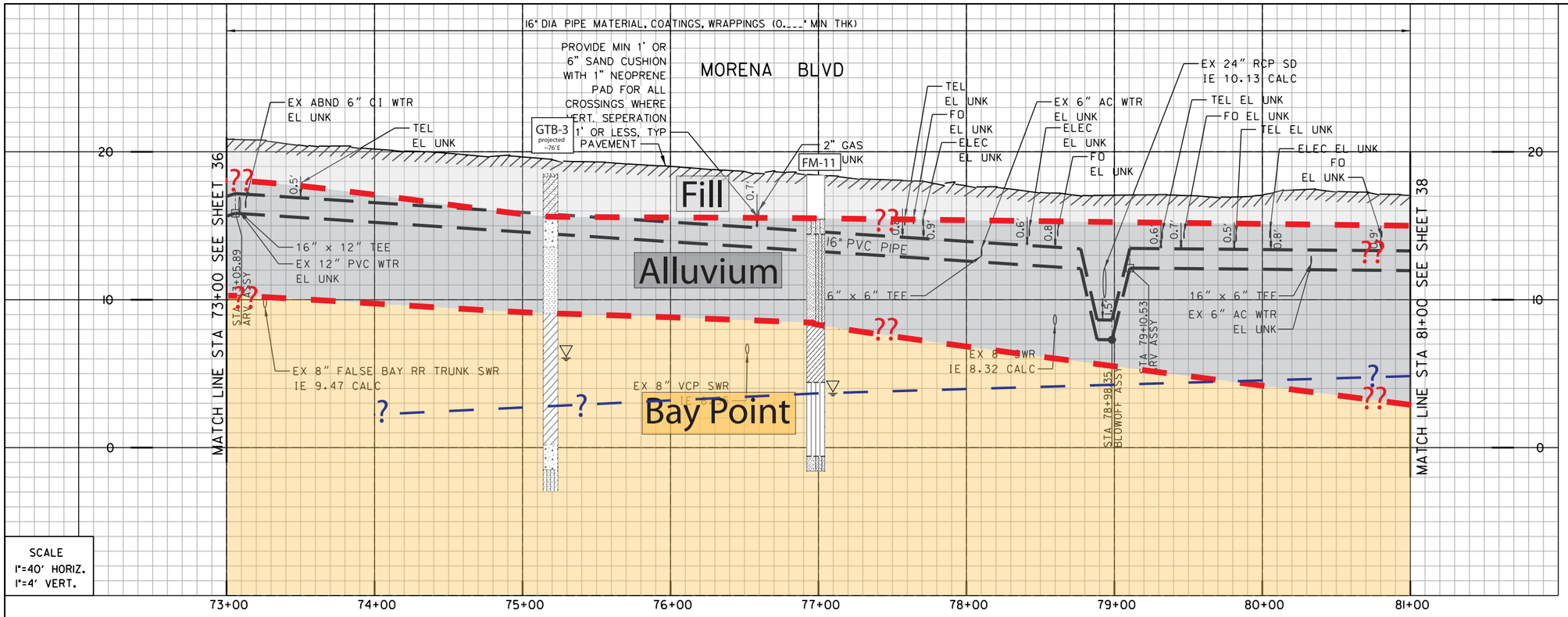
APPROVED: WENDY GAMBOA FOR CITY ENGINEER _____ DATE _____
PRINT NAME _____ RCE# _____

SUBMITTED BY: LAILA NASRAWI PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-36-D

MORENA BLVD

60% SUBMITTAL

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR9.dgn
9/5/2017 raul.sierra $PLTDRVSS$ $PENTBLS$



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (162)
BY CONTRACTOR
FURNISH AND INSTALL
STA 73+05.89
1 - 2" ARV ASSY

2 (163)
BY CITY FORCES
AHD OF CONTRACTOR
STA 73+08.74
CUT & PLUG:
EX 6" CI WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

3 (163)
BY CONTRACTOR
FURNISH AND INSTALL
STA 73+08.74
1 - 16" x 6" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 6" BFV (F,MJ) RT

4 (165)
BY CONTRACTOR
FURNISH AND INSTALL
STA 77+62.99
1 - 16" x 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

5 (166)
BY CITY FORCES
AHD OF CONTRACTOR
STA 78+10.17
CUT & PLUG:
EX 6" AC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

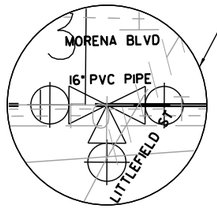
6 (166)
BY CONTRACTOR
FURNISH AND INSTALL
STA 78+10.17
1 - 16" X 6" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 6" BFV (F,MJ) RT

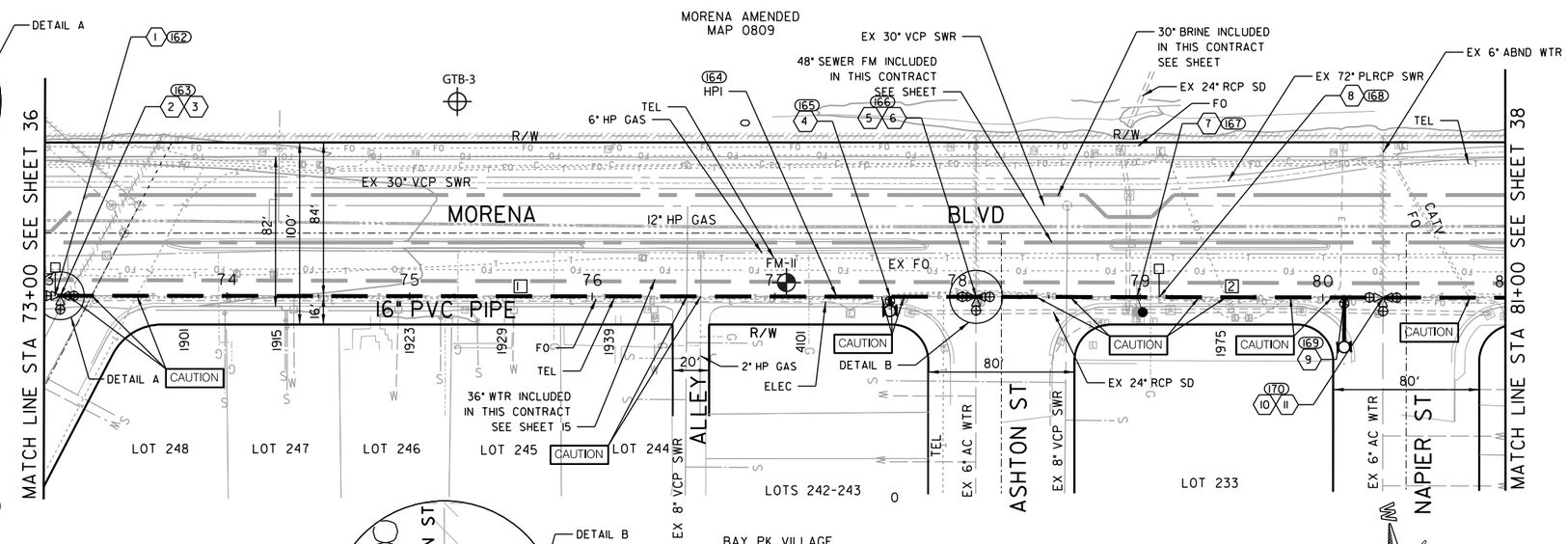
7 (167)
BY CONTRACTOR
FURNISH AND INSTALL
STA 78+98.35
1 - 4" B.O. ASSY

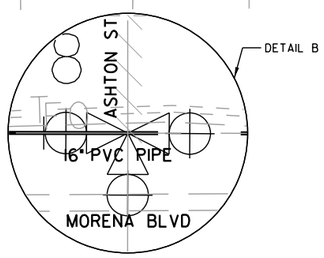
8 (168)
BY CONTRACTOR
FURNISH AND INSTALL
STA 79+10.53
1 - 2" ARV ASSY

REFERENCE:

WATER:	7660-W, 3493-D
SEWER:	25119-D, 1311-D, 1149-D, 7146-D
STORM DRAIN:	3477-D
GAS:	15765-11890
ELECTRIC:	224-1704-D
CABLE TV:	BLN 1967, 104-213
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	







- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- Boring
- Boring - AGE, 2017
- Boring - CWP, 1992
- Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

CAUTION
12", 6", 2" HP GAS CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

9 (169)
BY CONTRACTOR
FURNISH AND INSTALL
STA 80+11.80
1 - 16" X 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

10 (170)
BY CITY FORCES
AHD OF CONTRACTOR
STA 80+33.02
CUT & PLUG:
EX 6" AC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN (PHASE I) HAS BEEN ACCEPTED

11 (170)
BY CONTRACTOR
FURNISH AND INSTALL
STA 80+33.02
1 - 16" X 6" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 6" BFV (F,MJ) RT

0 40 80 120
SCALE 1"=40'

COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(162)	1865049.99	6267429.87	ARV ASSY
(163)	1865052.80	6267430.33	TEE
(164)	1865472.54	6267497.57	HPI
(165)	1865501.33	6267502.20	FH
(166)	1865547.91	6267509.68	TEE
(167)	1865634.97	6267523.67	B.O. ASSY
(168)	1865647.00	6267525.61	ARV ASSY
(169)	1865746.99	6267541.68	FH
(170)	1865767.93	6267545.04	TEE

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N9° 06'06"E		433.84'	16" PVC
2	N9° 07'48"E		366.16'	16" PVC

C-33

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 73+00 TO STA 81+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 37 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

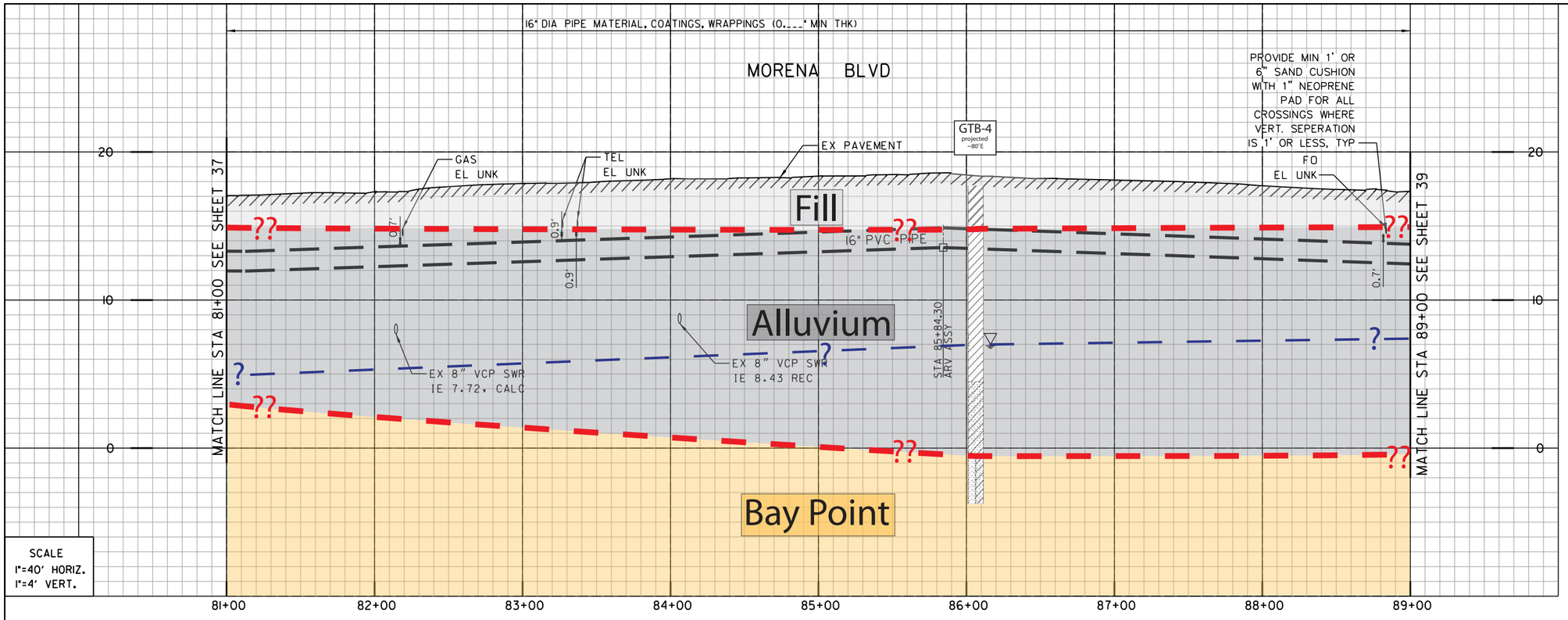
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-37-D

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR10.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

① (168)
BY CONTRACTOR
FURNISH AND INSTALL
STA 83+44.45
1 - 16" X 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

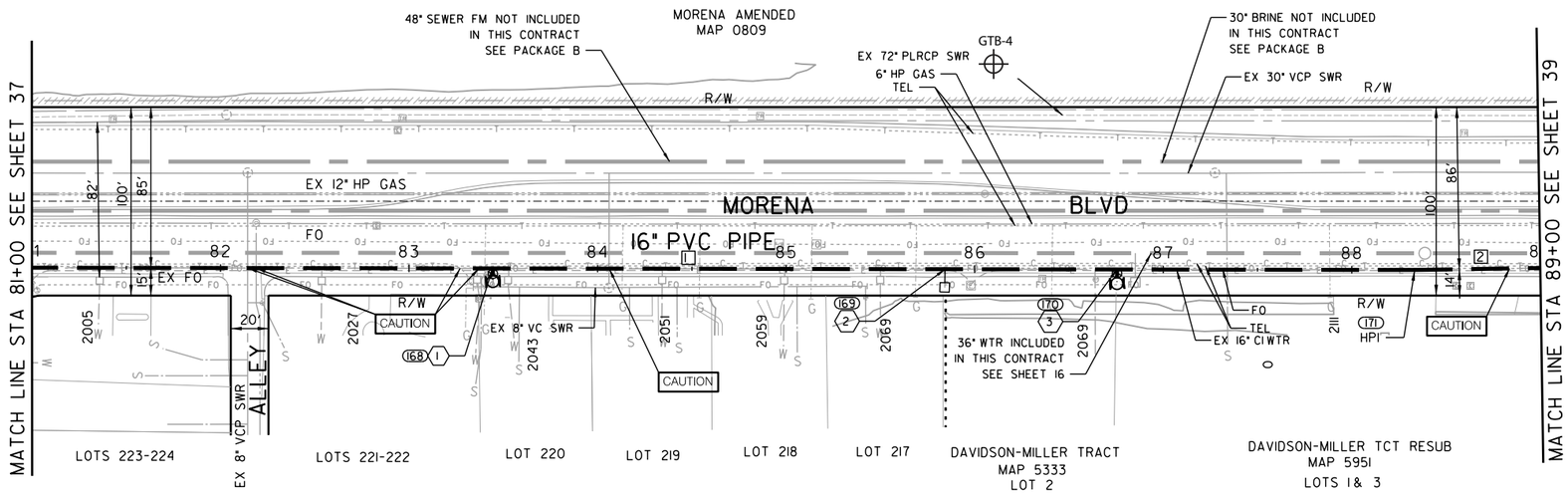
② (169)
BY CONTRACTOR
FURNISH AND INSTALL
STA 85+84.30
1 - 2" ARV ASSY

③ (170)
BY CONTRACTOR
FURNISH AND INSTALL
STA 86+75.50
1 - 16" X 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7660-W
SEWER:	25119-D, 1311-D, 7149-D
STORM DRAIN:	NO INFO
GAS:	15765-119000
ELECTRIC:	15765-119000
CABLE TV:	224-1704-B, 104-213
ATT&TELEPHONE:	BLN 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

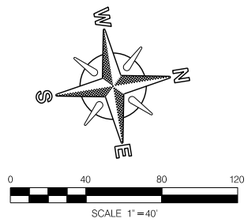


COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(168)	1866075.42	6267594.46	FH
(169)	1866312.23	6267632.52	ARV ASSY
(170)	1866402.27	6267646.99	FH
(171)	1866558.20	6267672.05	HPI

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N9° 07'48"E		733.42'	16" PVC
2	N8° 08'45"E		66.58'	16" PVC

CAUTION
12" AND 6" HP GAS CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION
SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956



C-34

MORENA PUMP STATION AND CONVEYANCE SYSTEM
16" WATER DISTRIBUTION
STA 81+00 TO STA 89+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 38 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

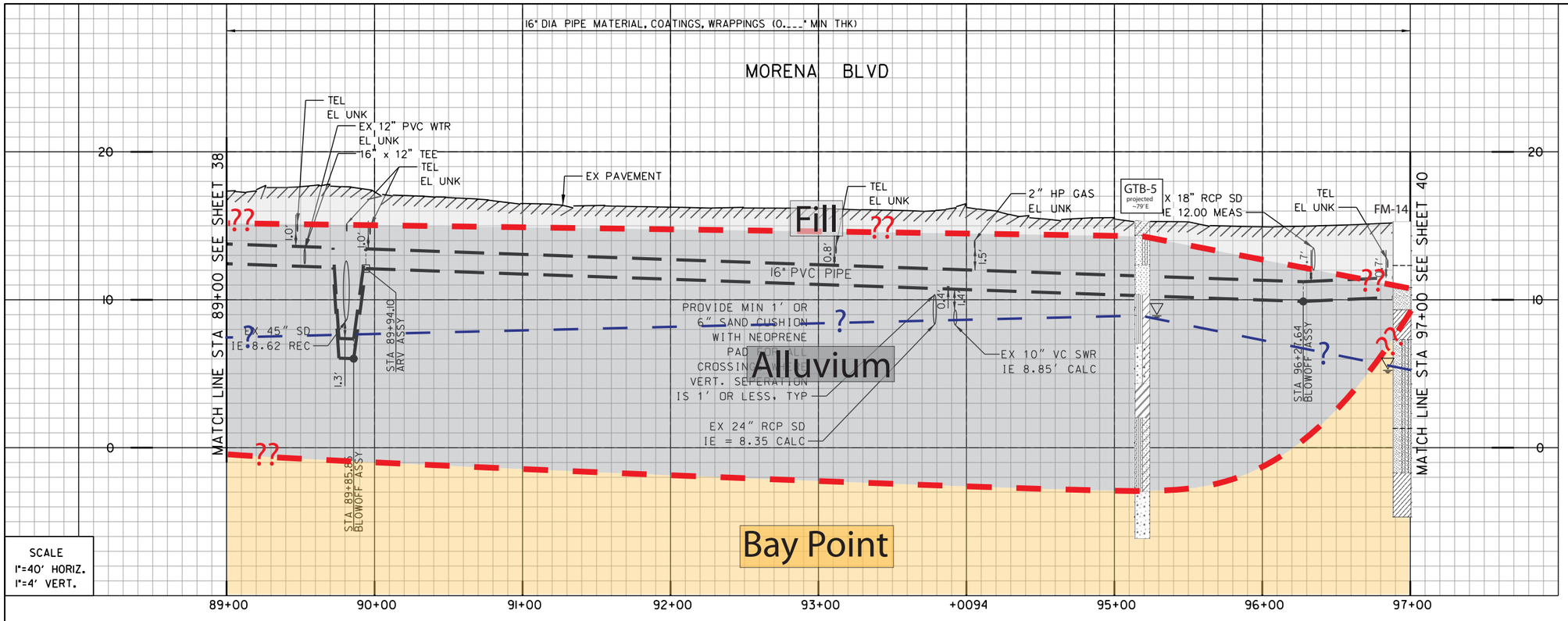
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-38-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR11.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

1 (173) BY CITY FORCES AHD OF CONTRACTOR
STA 89+52.77
CUT & PLUG:
EX 12" PVC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN HAS BEEN ACCEPTED

2 (173) BY CONTRACTOR FURNISH AND INSTALL
STA 89+52.77
1 - 16" X 12" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 12" BFV (F,MJ) RT

3 (174) BY CONTRACTOR FURNISH AND INSTALL
STA 89+85.85
1 - 4" B.O. ASSY

4 (175) BY CONTRACTOR FURNISH AND INSTALL
STA 89+94.10
1 - 2" ARV ASSY

5 (176) BY CONTRACTOR FURNISH AND INSTALL
STA 92+97.67
1 - 16" x 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

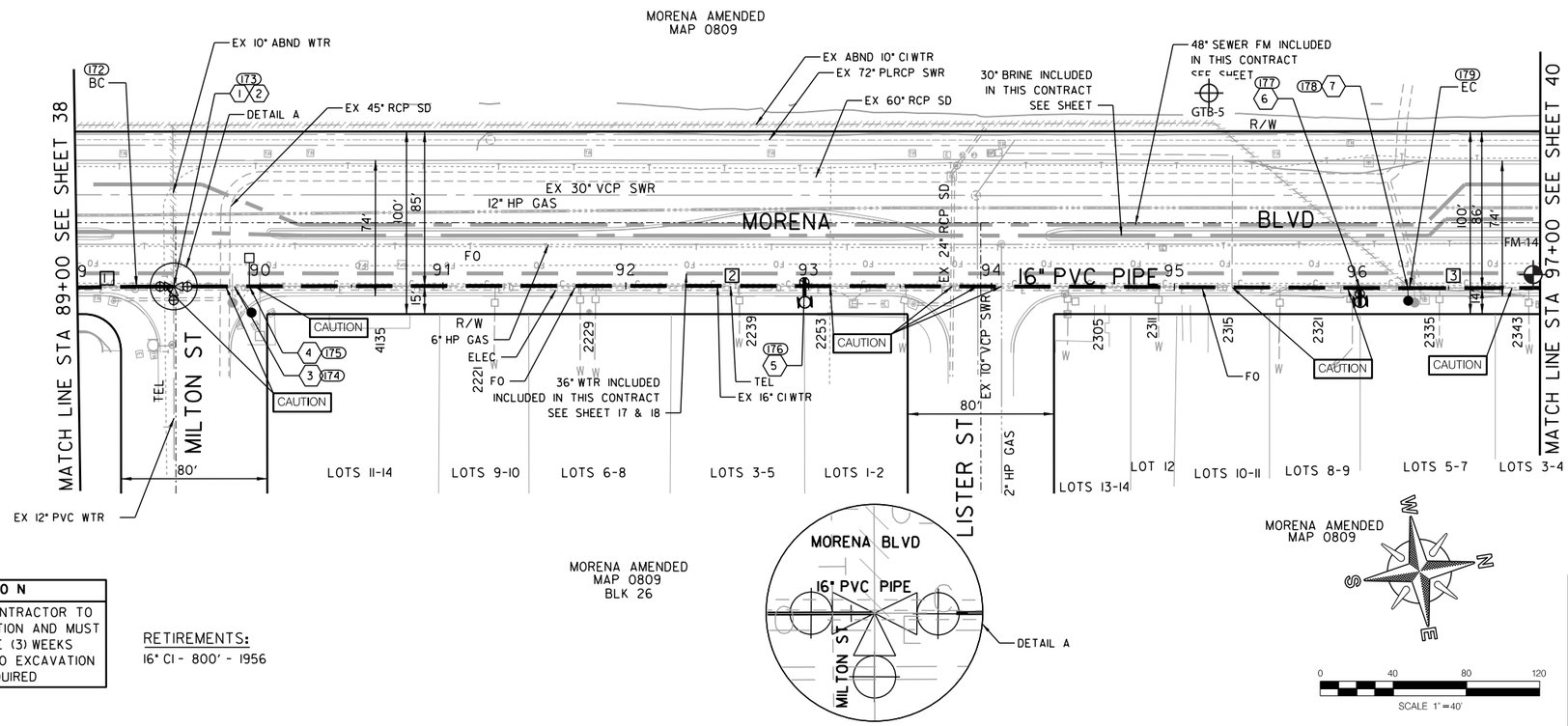
6 (177) BY CONTRACTOR FURNISH AND INSTALL
STA 96+01.45
1 - 16" x 6" TEE (MJ,MJ,F)
1 - 6" FH ASSY & MARKER

7 (178) BY CONTRACTOR FURNISH AND INSTALL
STA 96+27.64
1 - 4" B.O. ASSY

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-14 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-5 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	34257-D, 7660-W
SEWER:	1150-D, 1151-D, 25119-D
STORM DRAIN:	9355-L
GAS:	15765-119010
ELECTRIC:	NO INFO
CABLE TV:	226-7704
ATT&TELEPHONE:	BLN 1967
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	



COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(172)	1866656.20	6267686.07	BC
(173)	1866676.31	6267689.21	TEE
(174)	1866708.99	6267694.32	B.O. ASSY
(175)	1866717.14	6267695.59	ARV ASSY
(176)	1867016.97	6267743.13	FH
(177)	1867316.81	6267791.86	FH
(178)	1867342.65	6267796.11	B.O. ASSY
(179)	1867343.59	6267796.26	EC

PROPOSED PIPE DATA TABLE				
NO.	Δ/BEARING	RADIUS	LENGTH	REMARKS
1	N8° 08'45"E		32.42'	16" PVC
2	0° 30'15"	79099'	696.17'	16" PVC
3	N8° 54'01"E		71.41'	16" PVC

MORENA AMENDED MAP 0809 BLK 26

CAUTION
12", 6", 2" HP GAS CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

C-35

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 89+00 TO STA 97+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 39 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

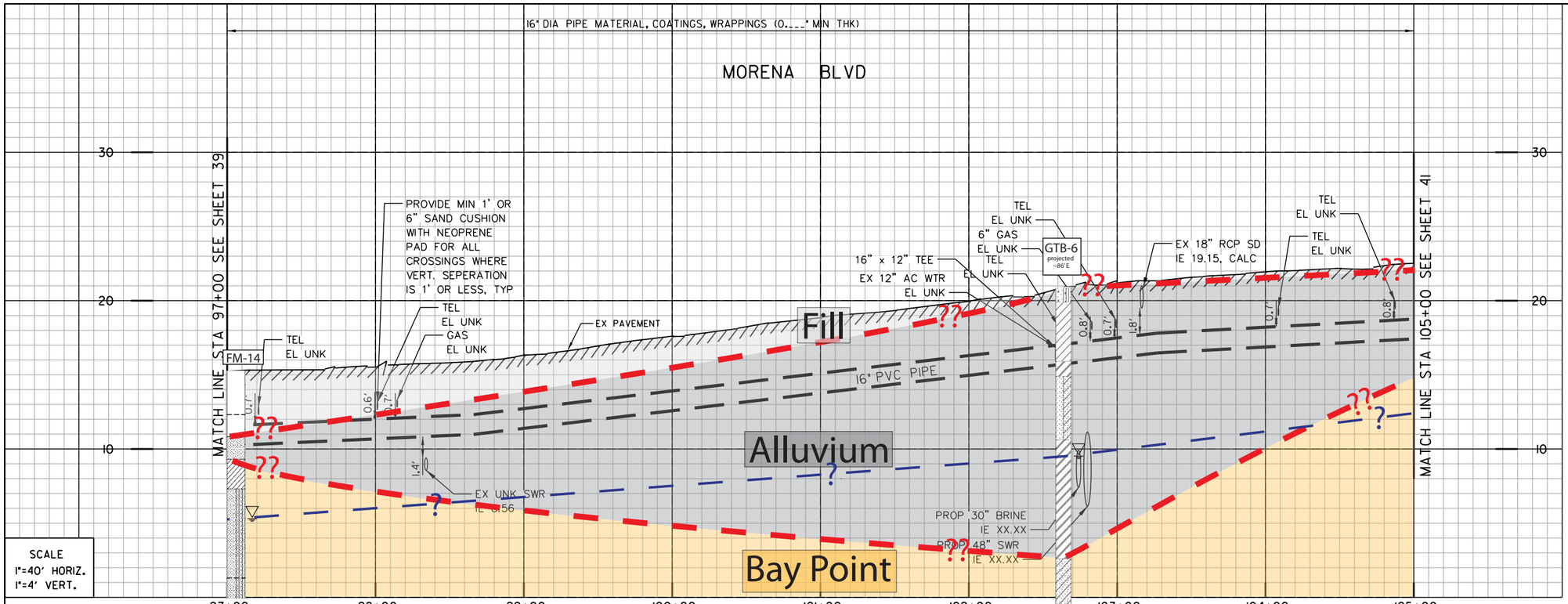
SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER
000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE
40067-39-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

MORENA BLVD

u:\resources\transportation_&_civil\pure_water_workspace\Sheets\60530732-SHT-C-DIST_WTR12.dgn
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$

60% SUBMITTAL



SCALE
1"=40' HORIZ.
1"=4' VERT.

(1) (179)
BY CONTRACTOR
FURNISH AND INSTALL
STA 97+86.32
1- 16" X 6" TEE (MJ,MJ,F)
1- FH ASSY & MARKER

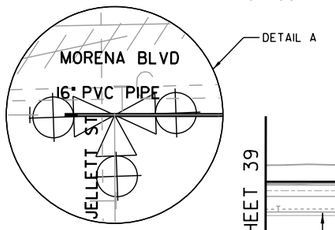
(2) (181)
BY CITY FORCES
AHD OF CONTRACTOR
STA 102+60.36
CUT & PLUG:
EX 12" AC WTR, 10'+- RT
RECONNECT AFTER NEW
MAIN HAS BEEN ACCEPTED

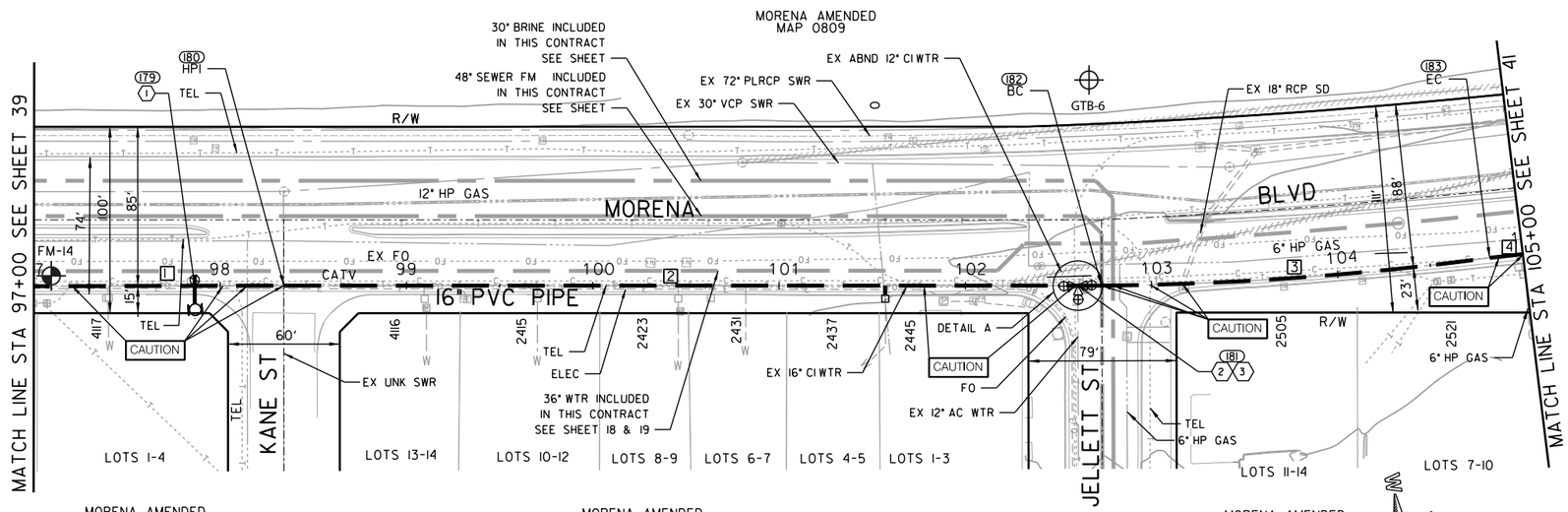
(3) (181)
BY CONTRACTOR
FURNISH AND INSTALL
STA 102+60.36
1- 16" X 12" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1- 12" BFV (F,MJ) RT

- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	7660-D,5373-W
SEWER:	25119-D,1151-D
STORM DRAIN:	9355-D,3493-D, 25119-17, 1150-D
GAS:	15765-119020, 15765-119015
ELECTRIC:	15765-119020
CABLE TV:	226-1704B
ATT&TELEPHONE:	NO INFO
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	





COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(179)	1867499.41	6267820.69	FH
(180)	1867546.76	6267828.08	HPI
(181)	1867967.60	6267895.01	TEE
(182)	1867980.2	6267897.02	BC
(183)	1868188.25	6267915.04	EC

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N8° 54'01"E		134.24'	16" PVC
2	N9° 02'13"E		438.88'	16" PVC
3	7° 07'06"	1682'	208.97'	16" PVC
4	N2° 34'07"E		17.91'	16" PVC

CAUTION
6" HP GAS CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 800' - 1956

0 40 80 120
SCALE 1"=40'

C-36

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 97+00 TO STA 105+00 AT MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 40 OF 50 SHEETS

WATER WBS S-16027

REGISTERED PROFESSIONAL ENGINEER JOSEPH F. LONG C 54329 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-40-D

60% SUBMITTAL

MORENA BLVD

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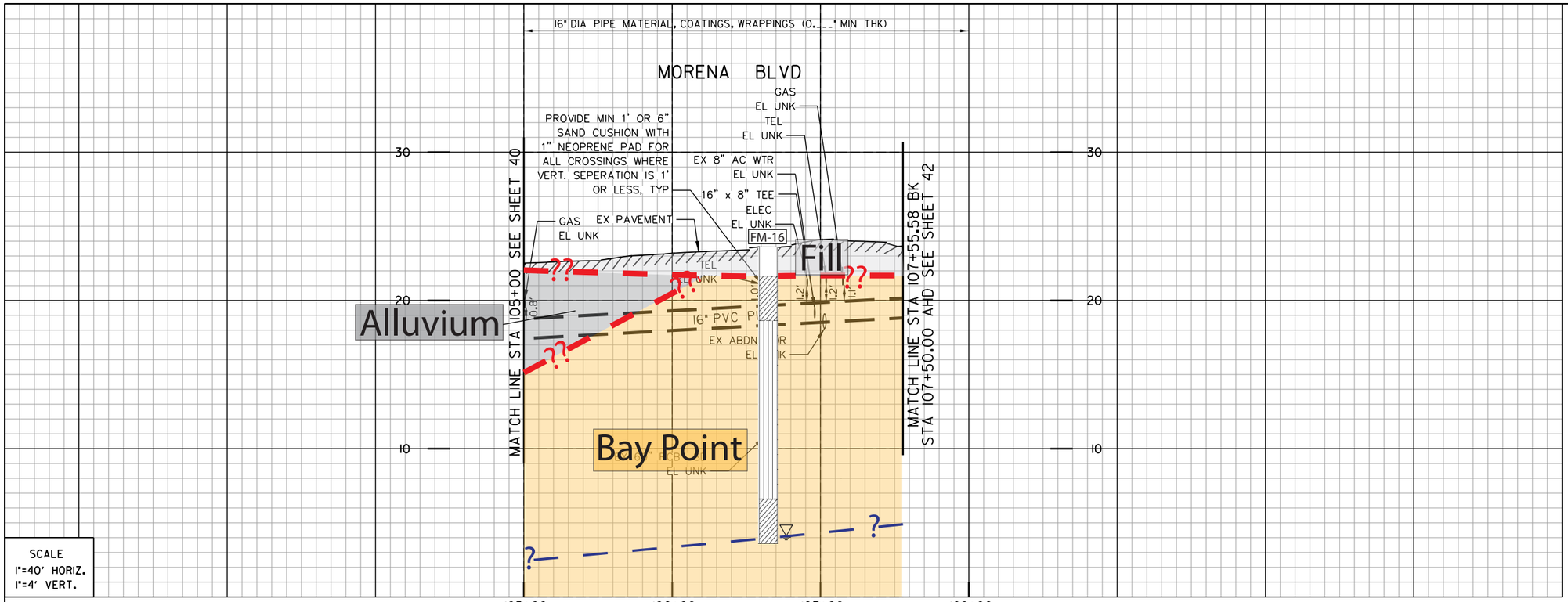
9/5/2017 raul.sierra $PLTDRVS$ $PENTBLS$



SCALE
1"=40' HORIZ.
1"=4' VERT.

① (184)
BY CITY FORCES
AHD OF CONTRACTOR
STA 106+96.05
CUT & PLUG:
EX 8" AC WTR, 10'+- RT
RECONNECT AFTER NEW MAIN HAS BEEN ACCEPTED

② (184)
BY CONTRACTOR
FURNISH AND INSTALL
STA 106+96.05
1 - 16" X 8" TEE (F)
2 - 16" BFV (F,MJ) BK, AHD
1 - 8" BFV (F,MJ) RT

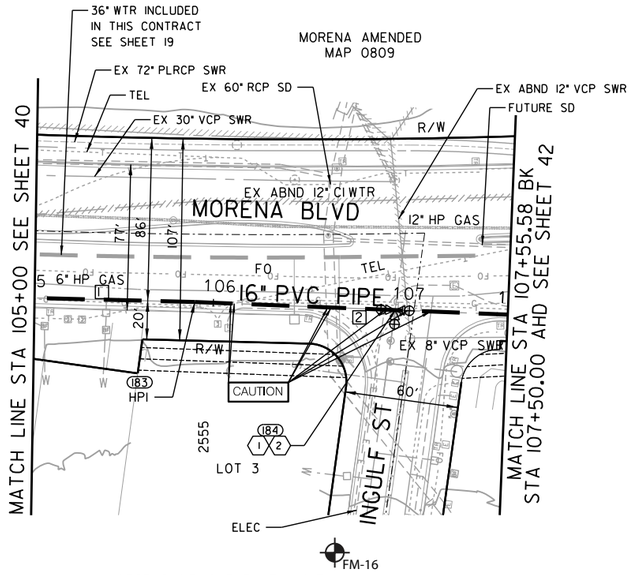
- Artificial fill (Qaf)
- Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Bay Point Formation (Qbp)
- Lindavista Formation (Qln)
- Ardath Shale (Ta)
- Scripps Formation (Tsc)
- Water Level Depth
- FM-1 Boring
- H-7 Boring - AGE, 2017
- D-3 Boring - CWP, 1992
- GTB-1 Boring - Kleinfelder, 2014
- Geological Contact
- Groundwater Level
- Topography (1967) RC or SC(1952)

REFERENCE:

WATER:	5209-D
SEWER:	9321-L,25119-D,4242-D
STORM DRAIN:	5207-D,3479-D
GAS:	15765-119025
ELECTRIC:	15765-119025
CABLE TV:	NO INFO
ATT&TELEPHONE:	BLM1968, pb0407dc
IMPROVEMENTS:	NO INFO
100' SCALE/FIELD BOOK:	
THOMAS BROS.:	
HGL:	

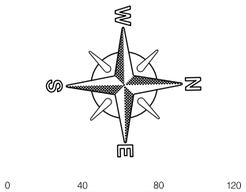
COORDINATE TABLE			
NO.	NORTHING	EASTING	DESCRIPTION
(183)	1868296.27	6267919.89	HPI
(184)	1868401.92	6267926.21	TEE

PROPOSED PIPE DATA TABLE				
NO.	△/BEARING	RADIUS	LENGTH	REMARKS
1	N2° 34'07"E		90.22'	16" PVC
2	N3° 25'24"E		165.36'	16" PVC



CAUTION
12" AND 6" HP GAS CONTRACTOR TO VERIFY EXACT LOCATION AND MUST NOTIFY SDG&E THREE (3) WEEKS IN ADVANCE PRIOR TO EXCAVATION SDG&E STANDBY REQUIRED

RETIREMENTS:
16" CI - 250' - 1956



0 40 80 120
SCALE 1"=40'

MORENA PUMP STATION AND CONVEYANCE SYSTEM

16" WATER DISTRIBUTION

STA 105+00 TO STA 107+50 MORENA BLVD

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC UTILITIES DEPARTMENT
SHEET 41 OF 50 SHEETS

WATER WBS S-16027

APPROVED: WENDY GAMBOA FOR CITY ENGINEER — DATE
PRINT NAME — RCE#

SUBMITTED BY: LAILA NASRAWI, PROJECT MANAGER
CHECKED BY: DARIN SANCHEZ, PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XX/XX			

REGISTERED PROFESSIONAL ENGINEER — JOSEPH F. LONG — C 54329 — Exp. 12/31/17 — CIVIL — STATE OF CALIFORNIA

000-0000 CCS27 COORDINATE
0000-0000 CCS83 COORDINATE

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

40067-41-D

C-37

MORENA BLVD

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9/5/2017 raul.sierra $PLTDRVSS$ $PENTBLSS$

60% SUBMITTAL

APPENDIX D – Subsurface Conditions

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APPENDIX E

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APPENDIX E – Liquefaction Analyses Results

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Calculation Cover Sheet

Morena Pump Station

Project Location:	San Diego, CA	Client Name:	The City of San Diego
PM Name:	Steve Fitzwilliam	PIC Name:	Joe Long

Identifying Information

This section is to be completed by the Project Manager.

Assigned Checker: *Pallavi Kumar*

Calculation to be checked: Liquefaction Analyses

Calculation Originator: Ryan Bourdette

Checker's comments required by:

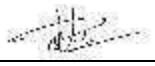
Submitted by:  Project Manager Signature — 4/17/2017 Date

Checker Report

This Section is to be completed by the Checker.

Check Box A or B:

A. [ ] All items have been found to be correct. Checker has no comments.

 Checker Signature — 4/18/2017 Date

or

B. [X] Checker's comments have been provided on:

- [X] Calculation
- [ ] Comment and Disposition Form (Form 3-5 (MM))
- [ ] Other _____

This section is to be completed after verification of comment incorporation, if box B is checked off above.

Check box C or D and E:

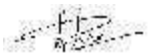
C. [X] *Back-check of Checker's comments has been performed by Originator AND all issues have been resolved between Originator and Checker.*

or

D. [ ] *Unresolved issues have been submitted to the Project Manager, Principal-in-Charge or designee for resolution.*

and

E. [X] *Verification of correct incorporation of resolved comments into final document is complete.*

 Checker Signature — 4/212017 Date

APPROVAL and DISTRIBUTION

To be signed after box A or E are completed.

The Calculation Check has been completed. Any significant issues not resolved between the Checker and the Originator have been resolved by the Approver.

Project Manager, Principal-in-Charge or Designee Signature — Date

Distribution:

Project Central File – Quality Folder

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Liquefaction Analyses of Borings PS-1, PS-2 and PS-3

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Method: Idriss and Boulanger (2008), *Soil Liquefaction during Earthquakes*, EERI MNO-12

Title: SPT Liquefaction Analysis
Project: PURE Water
Project No.: 60530732
Date: 4/17/2017
Boring No. PS-1
Units American feet, pounds, pcf
Fault San Andreas

Input Parameters:

Peak ground acceleration, PGA (g):	0.59			
Earthquake Magnitude (M):	7			
Water Table Depth at the time of drilling	9	ft	2.74	m
Water Table Depth at the time of earthquake	9	ft	2.74	m
Avg Unit Weight above GWT	120	pcf	18.8504957	kN/m^3
Avg Unit Weight below GWT	125	pcf	19.635933	kN/m^3
Borehole Diameter	0.5	ft	152	mm
Correction for Sampler Liner (N/Y)	N	ft		
Rod stickup above ground at start of drive	0	ft	0	m
Boring Total Depth	61.5	ft	18.7452	m
Ground Surface Elevation	13	ft	3.9624	m

	14.44	in
Calculated Volumetric Settlement:	1.20	ft
Calculated LDI:	13.9	ft
MSF for Sand	1.14	

Data No.	Depth	Elevation	Measured N (*)	Soil Type (USCS)	Flag: "Unsaturated", "Clay", "85% Sat"	Fines Content (%)	Energy Ratio (%)	N_{60}	$(N_1)_{60}$	$(N_1)_{60\text{-}cs}$ for liquefaction triggering	$(N_1)_{60\text{-}cs}$ for residual strength	CRR	CSR	Factor of Safety	Limiting Shear Strain, γ_{lim}	Parameter A	Maximum Shear Strain, γ_{max}	Layer Thickness ΔH_i	ΔLDI_i	Vertical Reconsol. Strain, ε_v	Layer Settlement ΔS_i
	ft	ft																ft	ft		ft
1	3	10	9.0	SM	Unsaturated	20	80	10.4	17.6	22.1	19	na	0.383	na	0.1256	0.4043	0.0000	3.00	0.00	0.000	0.000
2	8	5	9.0	SP-SM	Unsaturated	10	80	10.4	15.0	16.2	15	na	0.376	na	0.2418	0.7034	0.0000	5.00	0.00	0.000	0.000
3	13	0	6.0	SP-SM		10	80	7.4	9.4	10.6	9	0.145	0.438	0.33	0.4447	0.9013	0.4447	5.00	2.22	0.036	0.181
4	18	-5	6.0	SP		5	80	7.8	9.0	9.0	9	0.130	0.483	0.27	0.5000	0.9323	0.5299	5.00	2.65	0.040	0.199
5	23	-10	3.0	SM		20	80	4.4	4.6	9.0	6	0.128	0.508	0.25	0.5000	0.9315	0.5268	5.00	2.63	0.040	0.198
6	29	-16	8.0	SM		20	80	11.7	11.1	15.6	12	0.182	0.520	0.35	0.2583	0.7299	0.2583	6.00	1.55	0.028	0.168
7	32	-19	8.0	SM		20	80	11.7	10.7	15.2	12	0.176	0.522	0.34	0.2701	0.7473	0.2701	3.00	0.81	0.029	0.086
8	38	-25	4.0	ML		70	80	6.1	5.2	10.8	9	0.137	0.520	0.26	0.4354	0.8966	0.4354	6.00	2.61	0.036	0.215
9	41.5	-28.5	8.0	ML		70	80	12.3	10.2	15.8	14	0.177	0.516	0.34	0.2536	0.7226	0.2536	3.50	0.89	0.028	0.097
10	43	-30	13.0	ML	Clay	70	80	19.9	na	na	na	na	0.514	na	#VALUE!	0.0000	0.0000	1.50	0.00	0.000	0.000
11	45	-32	9.0	CL	Clay	70	80	13.8	na	na	na	na	0.510	na	#VALUE!	0.0000	0.0000	2.00	0.00	0.000	0.000
12	46.5	-33.5	10.0	SP-SM		10	80	15.3	12.0	13.1	12	0.153	0.508	0.30	0.3359	0.8247	0.3359	1.50	0.50	0.031	0.047
13	49	-36	10.0	ML	Clay	70	80	15.3	na	na	na	na	0.503	na	#VALUE!	0.0000	0.0000	2.50	0.00	0.000	0.000
14	51	-38	27.0	ML	Clay	70	80	41.4	na	na	na	na	0.499	na	#VALUE!	0.0000	0.0000	2.00	0.00	0.000	0.000
15	56	-43	23.0	SM		20	80	35.3	28.2	32.7	29	0.697	0.488	1.43	0.0316	-0.2715	0.0149	5.00	0.07	0.003	0.014
16	61.5	-48.5	50.0	SP	Unreliable	5	80	76.7	63.3	63.3	63	1.793	0.475	?	0.0000	-2.7091	0.0000	5.50	0.00	0.000	0.000

Method: Idriss and Boulanger (2008), *Soil Liquefaction during Earthquakes*, EERI MNO-12

Title: SPT Liquefaction Analysis
Project: PURE Water
Project No.: 60530732
Date: 4/17/2017
Boring No. PS-2
Units American feet, pounds, pcf
Fault San Andreas

Input Parameters:

Peak ground acceleration, PGA (g):	0.59			
Earthquake Magnitude (M):	7			
Water Table Depth at the time of drilling	8.5	ft	2.59	m
Water Table Depth at the time of earthquake	8.5	ft	2.59	m
Avg Unit Weight above GWT	120	pcf	18.8504957	kN/m^3
Avg Unit Weight below GWT	125	pcf	19.635933	kN/m^3
Borehole Diameter	0.5	ft	152	mm
Correction for Sampler Liner (N/Y)	N	ft		
Rod stickup above ground at start of drive	0	ft	0	m
Boring Total Depth	65	ft	19.812	m
Ground Surface Elevation	13	ft	3.9624	m

	4.11	in
Calculated Volumetric Settlement:	0.34	ft
Calculated LDI:	3.6	ft
MSF for Sand	1.14	

Data No.	Depth	Elevation	Measured N (*)	Soil Type (USCS)	Flag: "Unsaturated", "Clay", "85% Sat"	Fines Content (%)	Energy Ratio (%)	N_{60}	$(N_1)_{60}$	$(N_1)_{60\text{-}cs}$ for liquefaction triggering	$(N_1)_{60\text{-}cs}$ for residual strength	CRR	CSR	Factor of Safety	Limiting Shear Strain, γ_{lim}	Parameter A	Maximum Shear Strain, γ_{max}	Layer Thickness ΔH_i	ΔLDI_i	Vertical Reconsol. Strain, ε_v	Layer Settlement ΔS_i
	ft	ft																ft	ft		ft
1	5.5	7.5	7.0	SM	Unsaturated	20	80	8.1	13.7	18.2	15	na	0.380	na	0.1950	0.6115	0.0000	5.50	0.00	0.000	0.000
2	8	5	7.0	SP-SM	Unsaturated	10	80	8.1	12.0	13.1	12	na	0.376	na	0.3364	0.8252	0.0000	2.50	0.00	0.000	0.000
3	13	0	5.0	SM		20	80	6.1	7.9	12.3	9	0.162	0.448	0.36	0.3666	0.8517	0.3666	5.00	1.83	0.033	0.164
4	18	-5	6.0	SM		20	80	7.8	8.9	13.4	10	0.168	0.492	0.34	0.3261	0.8150	0.3261	5.00	1.63	0.031	0.155
5	24	-11	3.0	SM	Unreliable	20	80	4.4	4.5	9.0	6	0.127	0.519	?	0.5000	0.9321	0.0000	6.00	0.00	0.000	0.000
6	28	-15	4.0	CL-ML	Clay	50	80	5.8	na	na	na	na	0.526	na	#VALUE!	0.0000	0.0000	4.00	0.00	0.000	0.000
7	33	-20	21.0	SP-SM		10	80	32.2	30.1	31.2	30	0.629	0.528	1.19	0.0390	-0.1728	0.0244	5.00	0.12	0.005	0.023
8	38	-25	5.0	CL-ML	Clay	50	80	7.7	na	na	na	na	0.525	na	#VALUE!	0.0000	0.0000	5.00	0.00	0.000	0.000
9	43	-30	16.0	CL-ML	Clay	50	80	24.5	na	na	na	na	0.519	na	#VALUE!	0.0000	0.0000	5.00	0.00	0.000	0.000
10	50	-37	10.0	CL-ML	Clay	50	80	15.3	na	na	na	na	0.505	na	#VALUE!	0.0000	0.0000	7.00	0.00	0.000	0.000
11	53	-40	27.0	SP-SM		10	80	41.4	34.1	35.2	34	1.116	0.498	2.00	0.0212	-0.4514	0.0000	3.00	0.00	0.000	0.000
12	58	-45	27.0	SP-SM	Unreliable	10	80	41.4	33.0	34.2	33	0.893	0.487	?	0.0251	-0.3773	0.0000	5.00	0.00	0.000	0.000
13	65	-52	39.0	SP-SM		10	80	59.8	48.8	50.0	49	1.764	0.470	2.00	0.0004	-1.5879	0.0000	7.00	0.00	0.000	0.000

Method: Idriss and Boulanger (2008), *Soil Liquefaction during Earthquakes*, EERI MNO-12

Title: SPT Liquefaction Analysis
Project: PURE Water
Project No.: 60530732
Date: 4/17/2017
Boring No. PS-3
Units American feet, pounds, pcf
Fault San Andreas

Input Parameters:

Peak ground acceleration, PGA (g):	0.59			
Earthquake Magnitude (M):	7			
Water Table Depth at the time of drilling	10	ft	3.05	m
Water Table Depth at the time of earthquake	10	ft	3.05	m
Avg Unit Weight above GWT	120	pcf	18.8504957	kN/m^3
Avg Unit Weight below GWT	125	pcf	19.635933	kN/m^3
Borehole Diameter	0.5	ft	152	mm
Correction for Sampler Liner (N/Y)	N	ft		
Rod stickup above ground at start of drive	0	ft	0	m
Boring Total Depth	81	ft	24.6888	m
Ground Surface Elevation	13	ft	3.9624	m

	11.86	in
Calculated Volumetric Settlement:	0.99	ft
Calculated LDI:	8.8	ft
MSF for Sand	1.14	

Data No.	Depth	Elevation	Measured N (*)	Soil Type (USCS)	Flag: "Unsaturated", "Clay", "85% Sat"	Fines Content (%)	Energy Ratio (%)	N_{60}	$(N_1)_{60}$	$(N_1)_{60\text{-cs}}$ for liquefaction triggering	$(N_1)_{60\text{-cs}}$ for residual strength	CRR	CSR	Factor of Safety	Limiting Shear Strain, γ_{lim}	Parameter A	Maximum Shear Strain, γ_{max}	Layer Thickness ΔH_i	ΔLDI_i	Vertical Reconsol. Strain, ε_v	Layer Settlement ΔS_i
	ft	ft																ft	ft		ft
1	3	10	4.0	SM	Unsaturated	15	80	4.6	7.8	11.1	9	na	0.383	na	0.4203	0.8883	0.0000	3.00	0.00	0.000	0.000
2	9	4	4.0	SM	Unsaturated	15	80	4.6	6.6	9.9	8	na	0.375	na	0.4797	0.9165	0.0000	6.00	0.00	0.000	0.000
3	13	0	5.0	SP-SM		10	80	6.1	7.7	8.9	8	0.131	0.419	0.31	0.5000	0.9337	0.5356	4.00	2.14	0.040	0.160
4	19	-6	15.0	SP-SM		10	80	19.6	21.1	22.2	21	0.277	0.473	0.59	0.1232	0.3950	0.1232	6.00	0.74	0.021	0.126
5	23	-10	3.0	ML	Clay	70	80	4.4	na	na	na	na	0.492	na	#VALUE!	0.0000	0.0000	4.00	0.00	0.000	0.000
6	30	-17	3.0	ML	Clay	70	80	4.4	na	na	na	na	0.508	na	#VALUE!	0.0000	0.0000	7.00	0.00	0.000	0.000
7	38	-25	7.0	ML	Clay	70	80	10.7	na	na	na	na	0.509	na	#VALUE!	0.0000	0.0000	8.00	0.00	0.000	0.000
8	43	-30	9.0	ML/SM		50	80	13.8	11.2	16.9	13	0.187	0.504	0.37	0.2249	0.6734	0.2249	5.00	1.12	0.026	0.132
9	51	-38	12.0	ML/SM		50	80	18.4	14.2	19.9	16	0.215	0.491	0.44	0.1616	0.5252	0.1616	8.00	1.29	0.023	0.185
10	53	-40	10.0	SP		5	80	15.3	11.1	11.1	11	0.135	0.487	0.28	0.4193	0.8878	0.4193	2.00	0.84	0.035	0.070
11	61	-48	16.0	SP		5	80	24.5	17.5	17.5	17	0.185	0.469	0.40	0.2104	0.6449	0.2104	8.00	1.68	0.026	0.205
12	65	-52	11.0	SM		20	80	16.9	11.6	16.1	13	0.172	0.460	0.37	0.2452	0.7092	0.2452	4.00	0.98	0.027	0.109
13	66	-53	8.0	SC/CL	Clay	50	80	12.3	na	na	na	na	0.458	na	#VALUE!	0.0000	0.0000	1.00	0.00	0.000	0.000
14	73	-60	6.0	ML	Clay	70	80	9.2	na	na	na	na	0.443	na	#VALUE!	0.0000	0.0000	7.00	0.00	0.000	0.000
15	75	-62	6.0	ML	Clay	70	80	9.2	na	na	na	na	0.439	na	#VALUE!	0.0000	0.0000	2.00	0.00	0.000	0.000
15	77	-64	53.0	GP		15	80	9.2	na	na	na	na	0.439	na	#VALUE!	0.0000	0.0000	2.00	0.00	0.000	0.000
16	81	-68	32.5	GP		15	80	49.8	36.9	40.2	38	1.620	0.427	2.00	0.0084	-0.8192	0.0000	6.00	0.00	0.000	0.000

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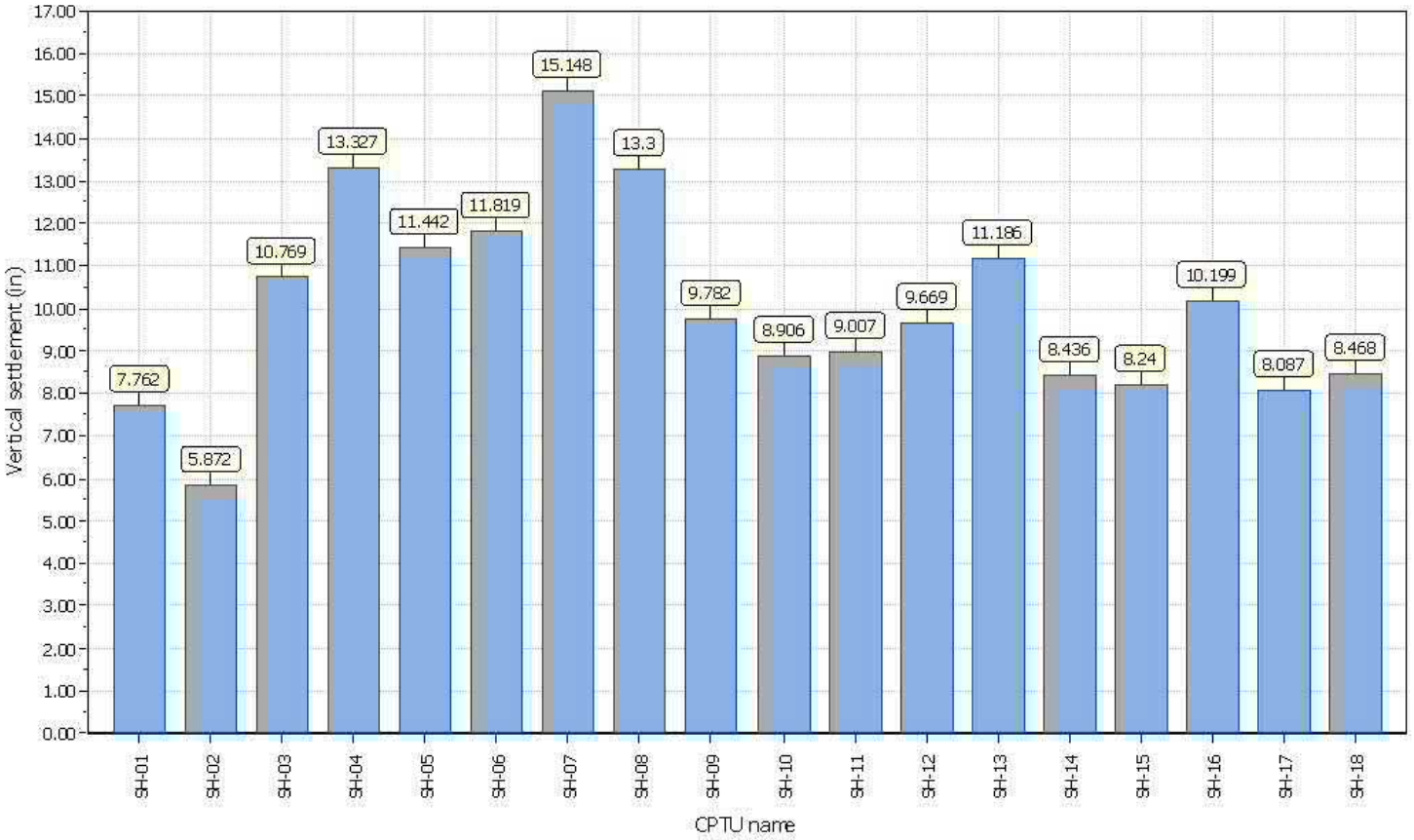
Liquefaction Analyses of CPTs Located on Sherman Street

AECOM
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

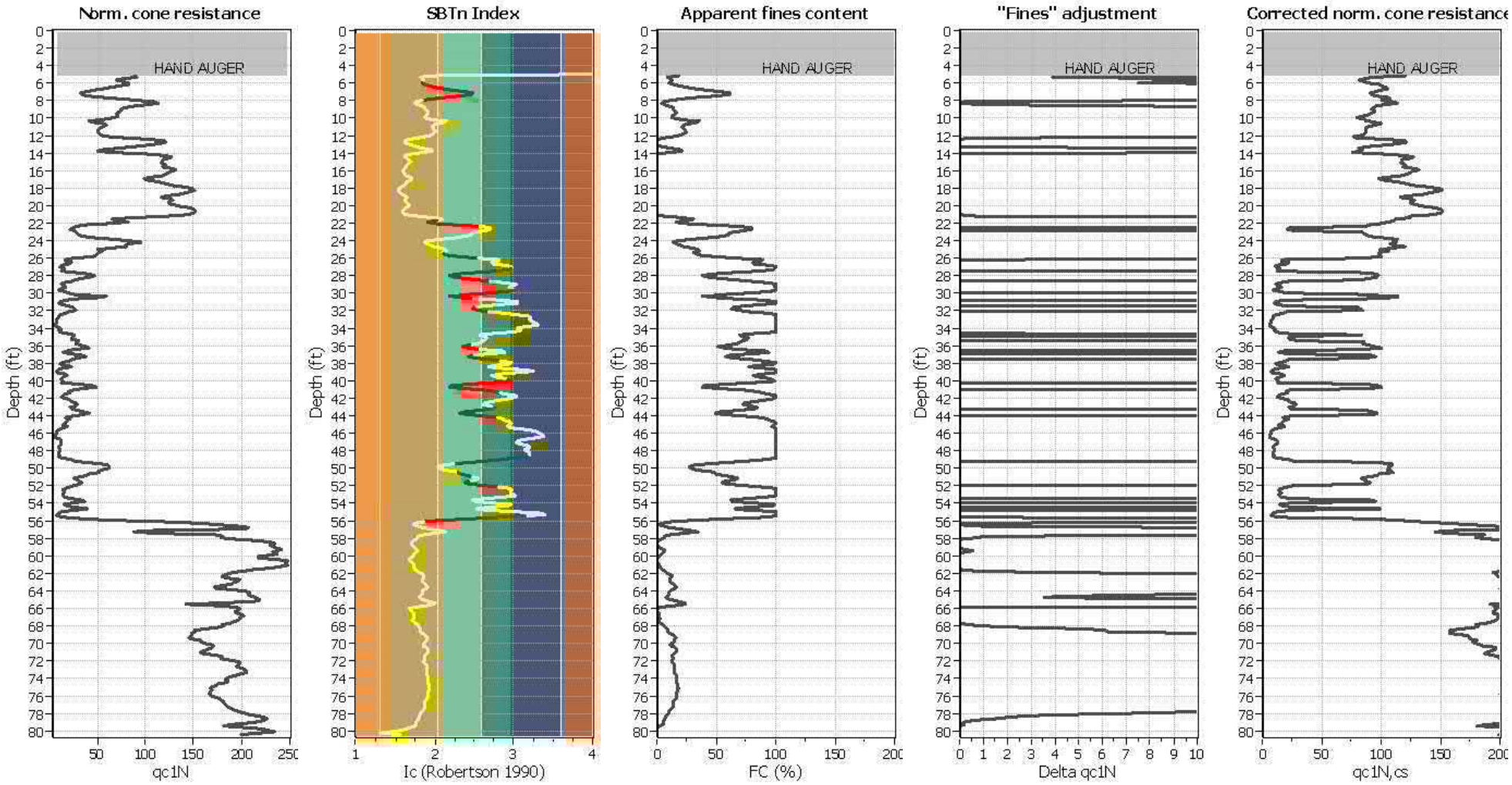
Project title : PURE Water

Location : Sherman Street

Overall vertical settlements report



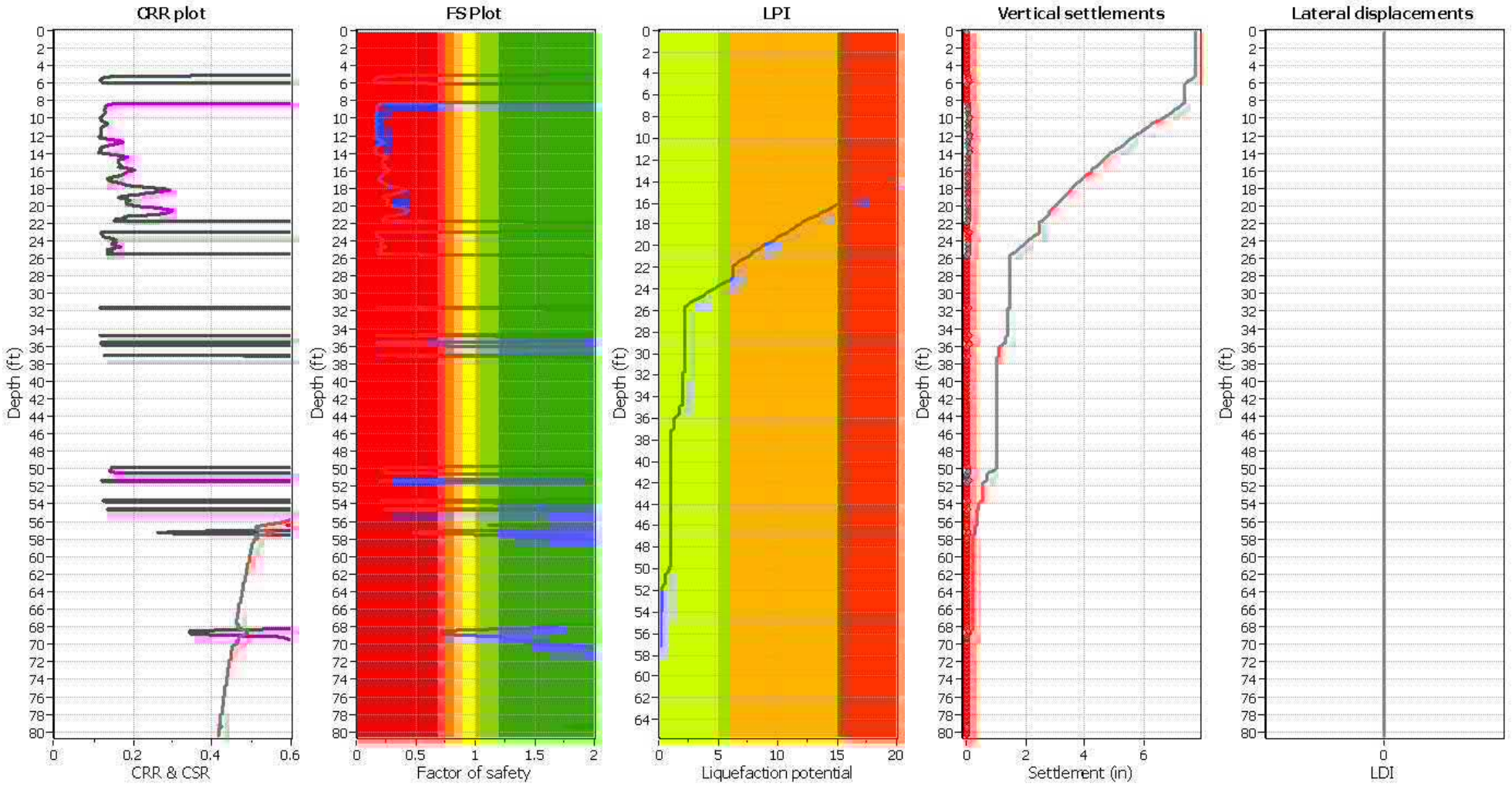
Liquefaction analysis overall plots (intermediate resu



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	9.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
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Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	9.00 ft	Fill height:	N/A	Limit depth:	N/A

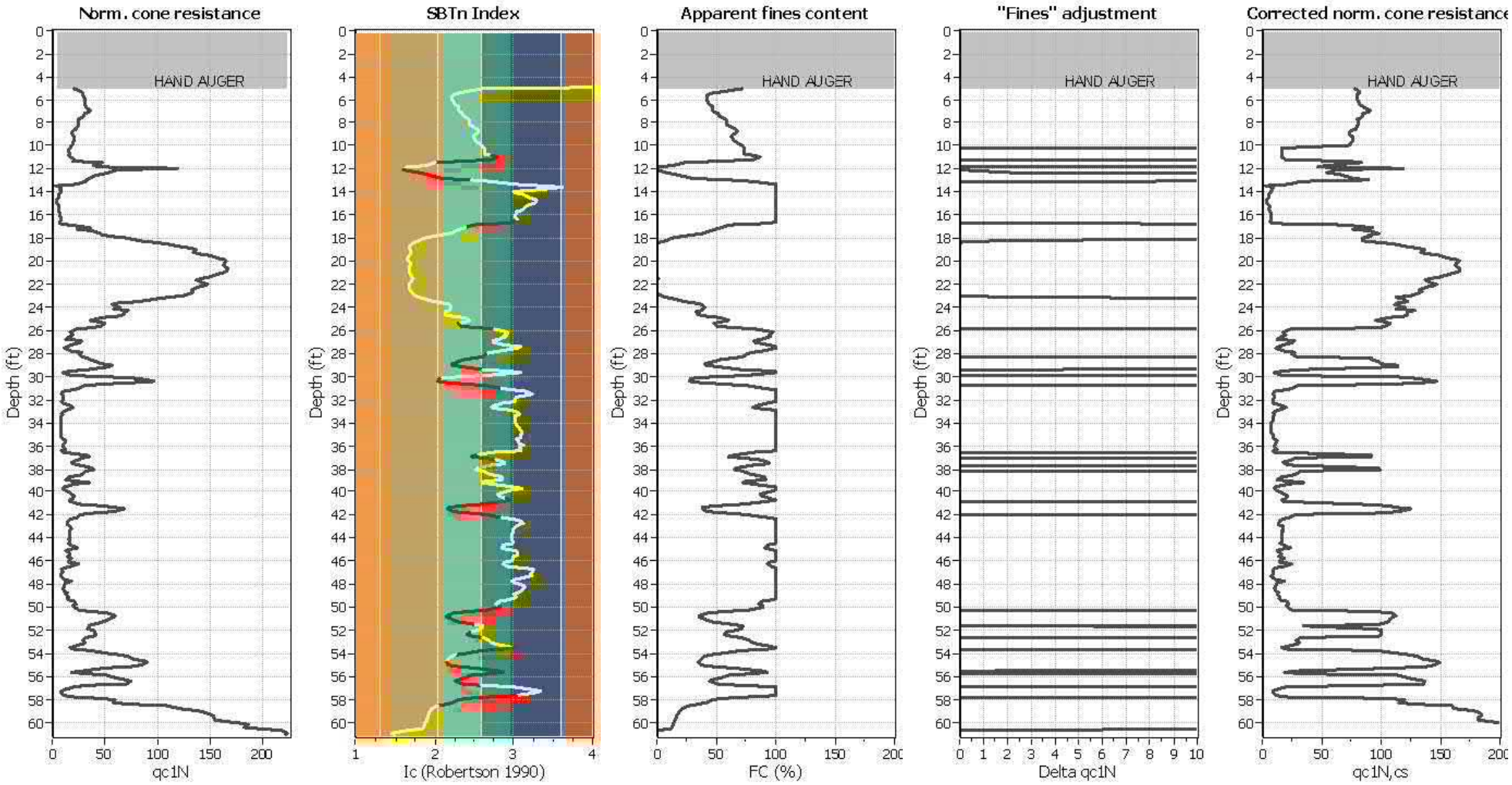
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots (intermediate resu



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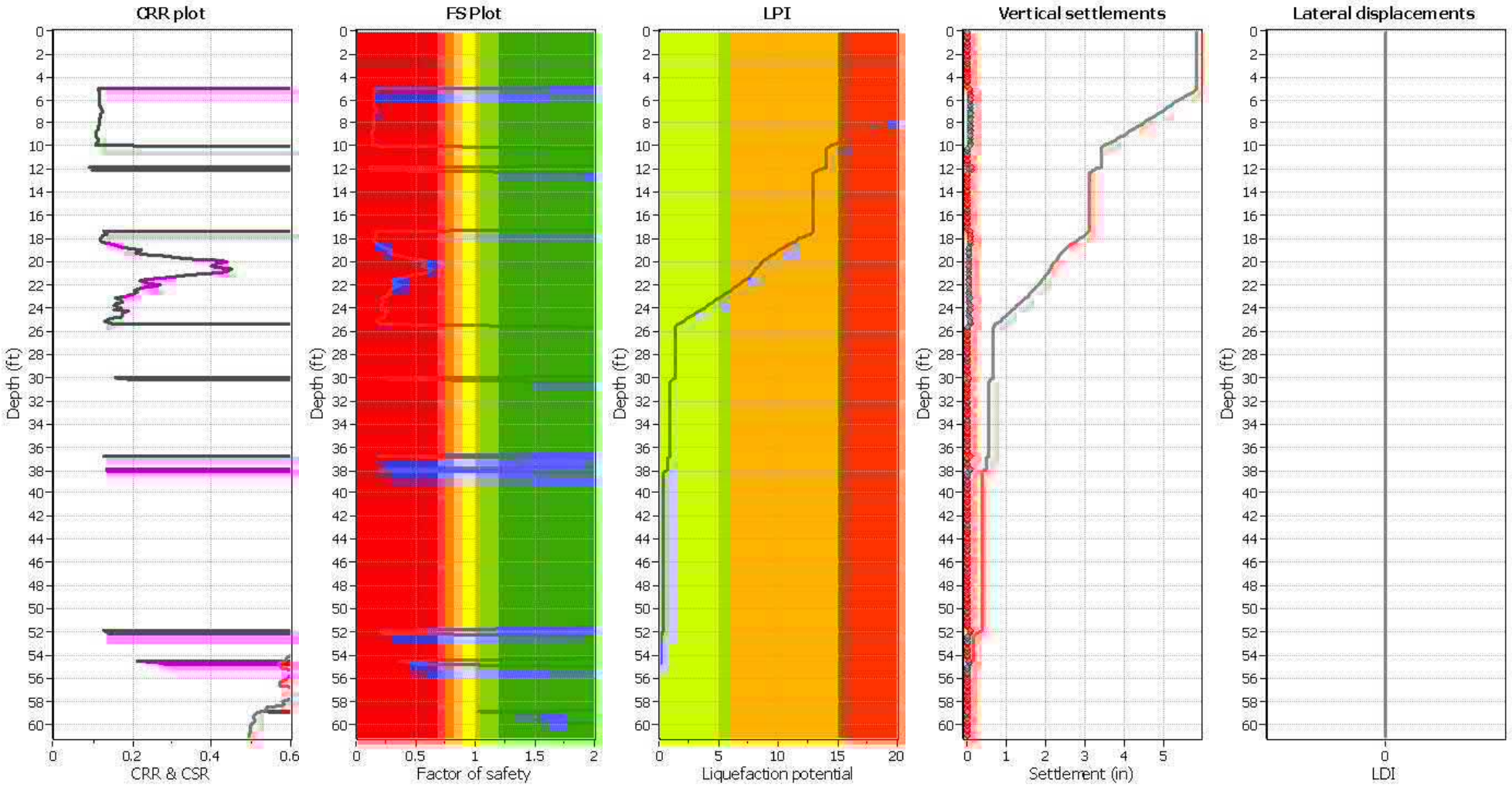
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.59	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	9.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plot



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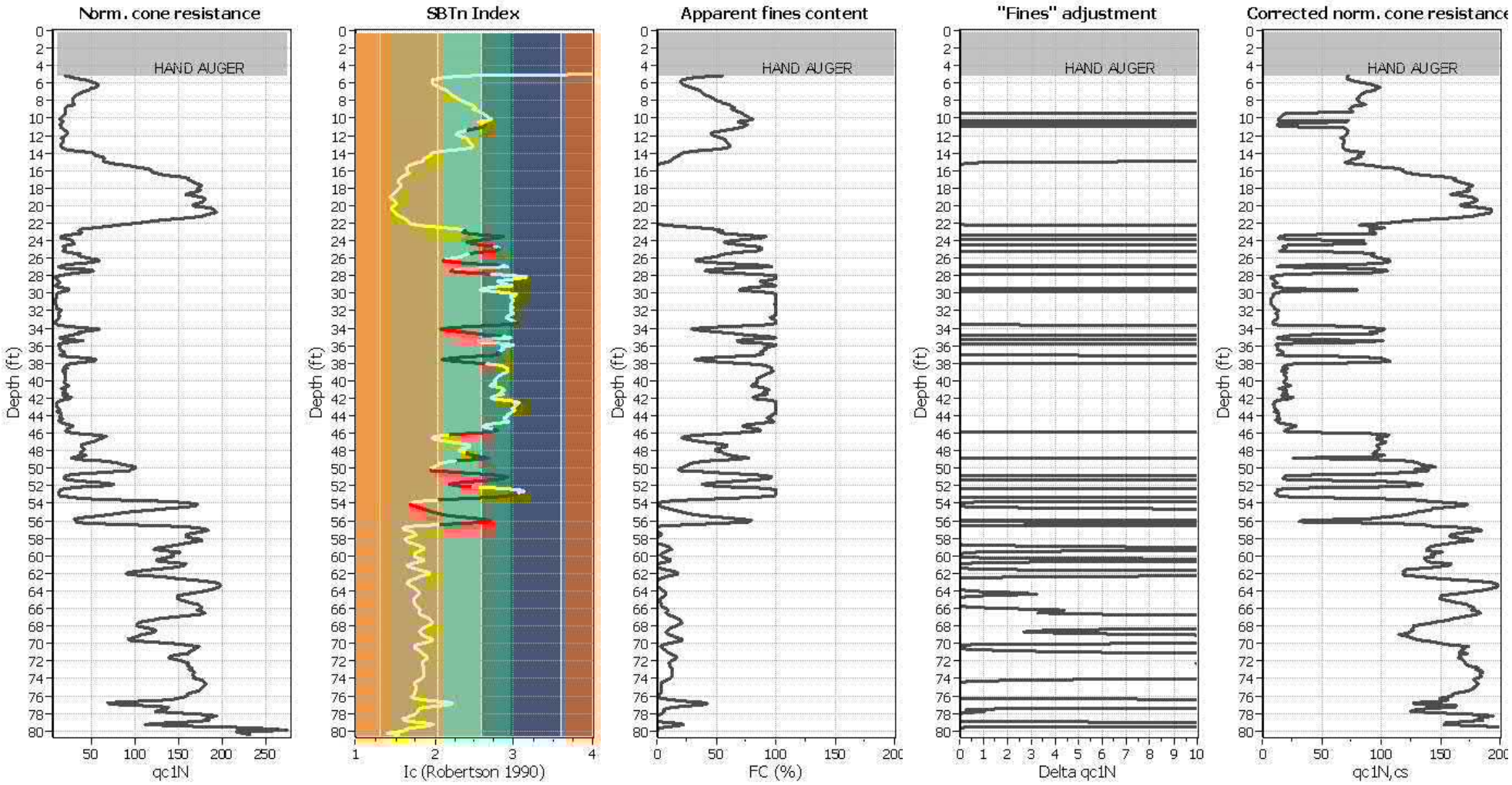
Liquefaction analysis overall plots (intermediate resu



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	0.00 ft	Fill weight:	N/A
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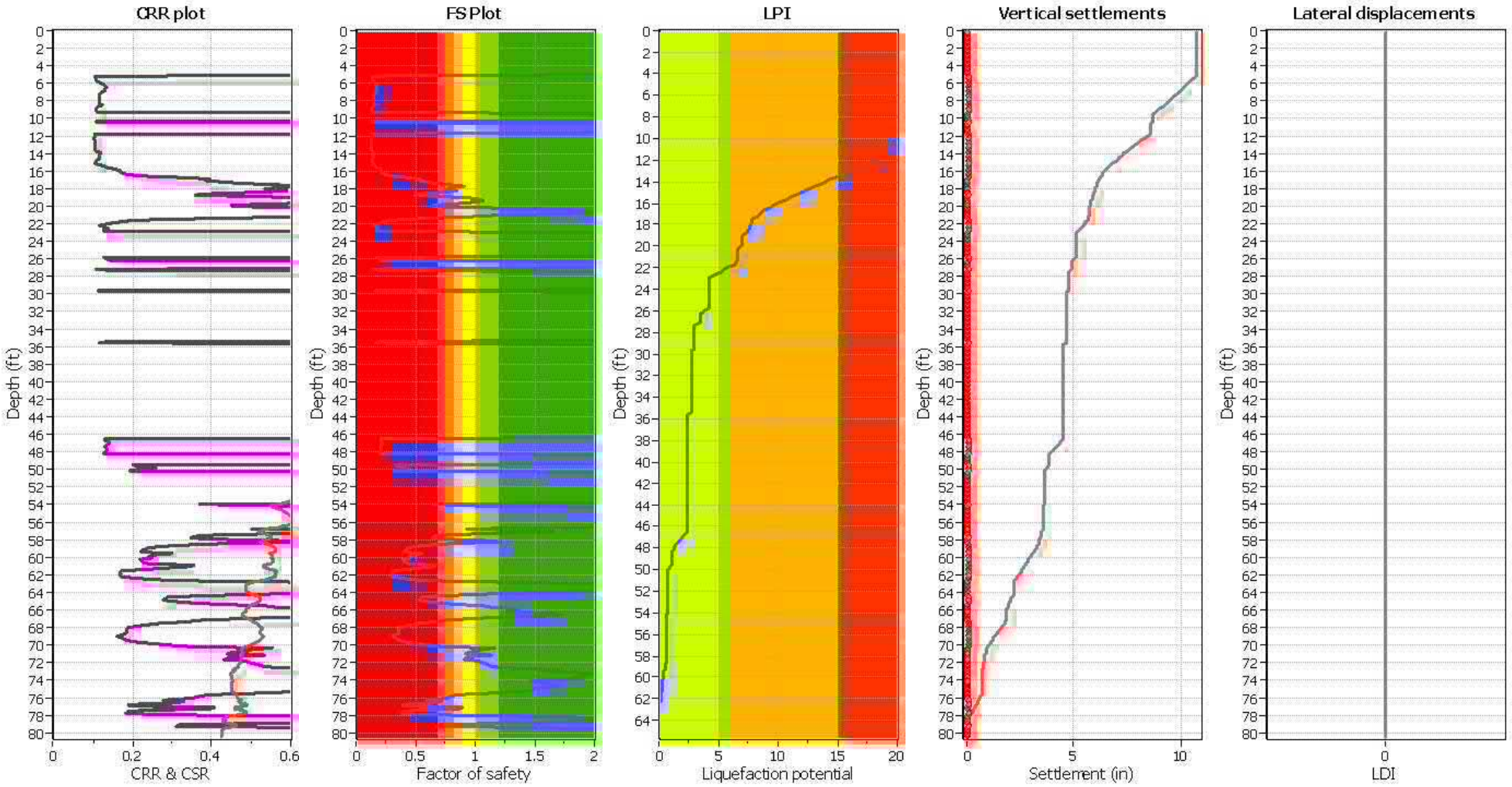
Liquefaction analysis overall plot



Input parameters and analysis data

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