Appendix B

Geotechnical Engineering Report

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Appendix B

GEOTECHNICAL ENGINEERING REPORT
90% REMEDIAL DESIGN - NORTHERN IMPOUNDMENT
SAN JACINTO RIVER WASTE PITS

HARRIS COUNTY, TEXAS

June 27, 2022
AAI File: 18-2876-003

GHD Services Inc.
5551 Corporate Boulevard, Suite 200
Baton Rouge, Louisiana 70808

Attention: Mr. Charles C. Munce, P.E.
Project Manager

Re: Geotechnical Engineering Report
Pre-Final 90% Remedial Design
San Jacinto River Waste Pits
Northern Impoundment
Harris County, Texas

We have completed our study and analyses based on the existing and available data to date for the San Jacinto Waste Pits Superfund Site's Northern Impoundment 90% Remedial Design. A summary of the methods of analysis and results are provided in the attached Geotechnical Engineering Report. The analyses were based on the information made available to Ardaman to date and may be subject to change in the future.

Sincerely,
ARDAMAN & ASSOCIATES, INC.
Texas Firm # 5822

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TABLE OF CONTENTS

TABLE OF CONTENTS I

EXECUTIVE SUMMARY III

SECTION 1. GENERAL PROJECT INFORMATION 1

1.1 Project Description 1
1.2 Northern Impoundment Location and Description 1
1.3 Geology 1
1.4 Groundwater 2
1.5 Seismic Site Class 3

SECTION 2. HISTORICAL GEOTECHNICAL INFORMATION 3

SECTION 3. PDI-2 GEOTECHNICAL INVESTIGATION 4

SECTION 4. PDI-2 LABORATORY TESTING 5

4.1 Classification and Index Testing 6
4.1.1 Visual Classification 6
4.1.2 Moisture Content and Density and Unit Weight Determinations 7
4.1.3 Atterberg Limits 7
4.1.4 Grain Size Determinations 7
4.1.5 Unconsolidated-Undrained Compression Tests 7
4.1.6 Consolidation Tests 7

SECTION 5. SDI GEOTECHNICAL INVESTIGATION 8

SECTION 6. EVALUATION OF CURRENT & HISTORIC SUBSURFACE CONDITIONS 8

SECTION 7. ANALYSIS 9

7.1.1 Pile Drivability Analysis 9
7.1.2 Slope Stability 9

SECTION 8. ADDITIONAL CONSIDERATIONS 10

List of Tables:

Table 1 Seismic Design Parameters 3

Table 2 Historical Soil Boring Details 4

Table 3 PDI-2 Soil Boring Details 5

Table 4 PDI-2 Laboratory Testing Summary 6

List of Figures:

Figure 1	Site Plan
Figure 2	Regional Geology
Figure 3	Historical Topographic Surveys
Figure 4-6	Geologic Profiles
Figure 7-8	Beaumont Clay Isopleths
Figure 9	Geotechnical Soil Boring Location Plan

List of Attachments:

Attachment A	Furnished Boring Logs and Geotechnical Testing Results From Previous Investigations
Attachment B	PDI-2 Boring Logs and Geotechnical Testing Data
Attachment C	Supplemental Design Investigation (SDI) Geotechnical Data Report
Attachment D	Pile Driveability Analysis
Attachment E	Hydraulic Heave Analysis Report

EXECUTIVE SUMMARY

This Geotechnical Engineering Report summarizes the results of the geotechnical investigation performed to better understand the soil characteristics and strengths of the underlying soil layers associated with the Pre-Final 90% Remedial Design (90% RD) of the Northern Impoundment at the San Jacinto River Waste Pits Superfund Site. The geotechnical investigation was performed to support removal activities and design of a cofferdam wall (referred to herein as the best management practices [BMP]) to be used to isolate areas at the Northern Impoundment during excavation of waste materials.

Previous investigations of the Northern Impoundment had identified that, based on the limited information available at the time, the top of a sand formation occurs at an elevation between -50 and -60 feet (ft) North American Vertical Datum of 1988 (NAVD88) to at least an elevation of approximately -80 ft NAVD88. After review of the boring log data from the Second Phase Pre-Design Investigation (PDI-2), it was concluded that these sands, although encountered in the PDI-2 borings, were not found to be as consistent at these elevations throughout the Northern Impoundment as originally believed. This was confirmed during the 2021 Supplemental Design Investigation (SDI). The occurrence of the sand is an important design consideration for the BMP as the deeper occurrence of the top of the sand layer requires a deeper embedment of the BMP. However, in the revised 90% RD BMP design, the sheet pile tips stay within the Beaumont Clays and do not penetrate into the Beaumont Sands.

The analyses for the BMP considered the Q-Case (short-term loading condition), where the cohesive (clay) soils behave in an undrained manner. The analysis also considered the S-case (long-term loading condition) where the cohesive (clay) soils behave in a drained manner, as the BMP structure will be left in place for a minimum period of seven years during the remedial action (RA). In addition, a series of stability analyses were performed to estimate the minimum required embedment of the BMP. For all cases considered, the top of BMP elevation was set to elevation +9 ft NAVD88. The water levels outside the BMP were set at variable levels and the ground surface was also varied to account for potential approaches that would be implemented during the RA. As the soil behavior changes from an undrained to the drained state, the drained state (the S-Case) governs the embedment depth, which on average, requires that the BMP be driven into the Beaumont Clay but stopping before reaching the dense Beaumont Sands.

Results of the slope stability analysis of the single cantilever BMP wall included in the Preliminary 30% RD indicated that there was potential that during the installation of the BMP, the vibrations caused by pile driving could induce localized instability of the near-surface soils on the Northern Impoundment slope. This instability of the slope could have caused soils containing waste to slide down and release waste to the San Jacinto River. Due to this potential, a double wall cofferdam terminating in the Beaumont Clay and set at a minimum 30-ft distance from the excavations is included in the 90% RD.

GEOTECHNICAL ENGINEERING REPORT
PRE-FINAL 90% REMEDIAL DESIGN
SAN JACINTO RIVER WASTE PITS
NORTHERN IMPOUNDMENT
HARRIS COUNTY, TEXAS

This Geotechnical Engineering Report summarizes the results of the analyses to better understand the soil characteristics and strengths of the underlying soil layers associated with the Northern Impoundment. Ardaman & Associates, Inc. (Ardaman) has worked with GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC) and McGinnes Industrial Maintenance Corporation (MIMC), to develop a Pre-Final 90% Remedial Design (90% RD) for the Northern Impoundment of the San Jacinto River Waste Pits Superfund Site located in Harris County, Texas (Site). The geotechnical analyses were developed based upon data obtained during the 2011 Remedial Investigation (RI), the 2018 First Phase Pre-Design Investigation (PDI-1), the 2019 Second Phase Pre-Design Investigation (PDI-2), and the 2021 Supplemental Design Investigation (SDI). The geotechnical investigation results from the RI and PDI-1 are provided in Attachment A. The geotechnical investigation results from PDI-2 are provided in Attachment B. The SDI Geotechnical Data Report is provided as Attachment C. Results of GRLWEAP analysis for pile drivability, as evaluated using PDI-2 borings SJGB053 and SJGB057 are provided in Attachment D. The Hydraulic Heave Analysis report submitted to the United States Environmental Protection Agency (EPA) on December 9, 2021, is included as Attachment E.

SECTION 1. GENERAL PROJECT INFORMATION

1.1 Project Description

This geotechnical investigation was performed to support the waste removal activities and design of the BMP for the 90% RD.

1.2 Northern Impoundment Location and Description

The Northern Impoundment is located along the San Jacinto River and near Interstate Highway-10 (I-10), as approximately shown on

Figure 1.

1.3 Geology

The geology in the vicinity of the Northern Impoundment is highly heterogeneous given the natural meander of the San Jacinto River over time. Based on the Geologic Atlas of Texas, Houston (1982), Holocene Alluvium (consisting of clay, silt, sand, and organic matter) comprises the shallow subsurface of the western bank of the San Jacinto River. These alluvium deposits can be comprised of point-bar, natural levee, stream channel, backswamp, and coastal marsh deposits. The shallow subsurface of the eastern bank of the San Jacinto River is comprised predominantly of the Pleistocene Beaumont Formation, which is predominantly clay, with lenses of sand and silt. The Beaumont Formation (also referred to as the Beaumont Clay) is considered a confining unit that overlies the Pleistocene Lissie and Willis Formations; known

hydrostratigraphically as the Chicot Aquifer (Texas Water Development Board [TWDB] Report 365). A geologic map and stratigraphic profile for the area in the vicinity of the Northern Impoundment is provided for reference as Figure 2.

Historical topographic maps of the area from the United States Geological Survey (USGS), as depicted in Figure 3, indicate that the near surface in the vicinity of the Northern Impoundment may have been comprised of backswamp and/or swamp deposits. The extent to which these were scoured out and/or eroded over time is unclear. Additionally, the extent of physical removal due to industrialization is unknown.

Previous geotechnical and geologic investigations were conducted during the RI, PDI-1 and PDI-2, as well as the SDI. These investigations spanned from March 2011 through September 2021; and included numerous conventional and CPT borings installed on land and under water, aquifer testing, and geotechnical and analytical laboratory analysis. The methods of investigation are more completely described in Section 2 of this report. The results of these studies were used to compile several Site-specific geologic cross-sections, included as Figures 4, 5, and 6. Consistent with published data from USGS and TWDB, Northern Impoundment soil lithology was characterized as being comprised of interbedded Holocene Alluvial Sediments (silts, sands, and clays) to an approximate depth of -37 ft NAVD88, which was confirmed during the SDI. The thickness of the Holocene Alluvial Sediments ranges from approximately 10 to 30 ft. The Beaumont Formation underlies the Holocene Alluvial Sediments and based on the findings of the RI and PDI-1 investigations, it was determined that the Beaumont Formation extended below the previously acknowledged reference elevation (-30 ft NAVD88) to a minimum elevation of -60 ft NAVD88 on the western side of the Northern Impoundment and to approximately -50 ft NAVD88 on the eastern side of the Northern Impoundment. Additional geotechnical borings installed during PDI-2 and the SDI (specifically boring SJSB057) determined however, that the Beaumont Clay formation extends to approximately -80 ft NAVD88 (an additional 20 ft of thickness), and on the eastern side, clays were encountered between approximately -50 to -65 ft NAVD88 (up to an additional 15 ft of thickness). The Beaumont Clay Formation's top elevation and isopach thickness are depicted on contour maps Figures 7 and 8. The Beaumont Clay's thickness varies from 16 to 60 ft, with an approximate average thickness of 30 ft. Though predominantly reddish-brown clay of high plasticity, the Beaumont Clay Formation also contains numerous saturated silty sand and clayey sand lenses observed in both conventional and CPT borings. These lenses were particularly prevalent in the northwest corner of the Northern Impoundment, occurring at various elevations ranging from -35 to -70 ft NAVD88. A laterally discontinuous gray clay and a sand layer of unknown lateral continuity were observed below the Beaumont Clay formation in borings SJSB057, SJSCPT011, and SJSB047 at elevations ranging from -50 ft to -80 ft NAVD88. These sand and clay layers underlying the Beaumont Formation possibly represent members of the Lissie Formation, but not enough is known at this time to make such a determination.

1.4 Groundwater

The Northern Impoundment is located on the San Jacinto River; therefore, the groundwater will fluctuate over time as the river rises and falls during periods of rain and drought. During previous investigations, groundwater measurements were not able to be recorded at all the boring

locations, as some of the soil borings were collected from marine vessels in open water, and groundwater was assumed to be near surface. The actual depth of the groundwater at the Northern Impoundment will fluctuate due to climatic conditions, local surface water control and drainage features, the San Jacinto River stage, and other factors. Hence, additional investigation was carried out in SDI to determine the groundwater levels.

During the SDI, piezometers were installed in borings SJMW-16 and SJMW-17 and the water levels were logged at regular time intervals. The groundwater elevations ranged from -1.5 ft to -4.5 ft NAVD88 (see Attachment C for more detail).

1.5 Seismic Site Class

Seismicity can be addressed in accordance with the International Building Code (IBC), Latest Edition. Based on the furnished soil borings, the Northern Impoundment is classified as Site Class "E," according to the criterion given in Table 20.3-1 of the IBC, according to the criterion given in the IBC and ASCE 7-10; any soil profile with an average standard penetration resistance in the top 100 ft less than 15 blows per foot, an average undrained shear strength less than 1,000 pounds per square foot (psf), or any soil profile with more than 10 ft of soil having the following characteristics:

1) Plasticity Index (PI) > 20.

2) Moisture content > 40 percent.

3) Undrained shear strength < 500 psf.

Some additional seismic design parameters obtained from the USGS website are presented in Table 1.

TABLE 1 SEISMIC DESIGN PARAMETERS

SEISMIC PARAMETERS (Per ASCE 7-16)	
PGA	0.034
S_s	0.069
S_1	0.04

The values in Table 1 are for use in seismic design, not to be confused with the pseudo-vibration analysis discussed further in this report.

SECTION 2. HISTORICAL GEOTECHNICAL INFORMATION

The following sections summarize the data Ardaman was provided that were obtained by Anchor QEA during the RI and PDI-1. Additional background data on the RI and PDI-1 investigations is included in the SDI Geotechnical Data Report included as Attachment C. Only handwritten field logs were available. A summary of these borings is provided in Table 2. The furnished historical information is provided in Attachment A for reference. The RI and PDI-1 geotechnical boring locations are shown on Figure 9.

TABLE 2 HISTORICAL SOIL BORING DETAILS

Boring ID	Termination Depth (feet below ground surface [ft bgs])	Completion Date	Boring ID	Termination Depth (ft bgs)	Completion Date
SJGB001	60	10/27/10	SJGB019	57	12/03/18
SJGB002	60	5/9/10	SJGB020	62	12/02/18
SJGB003	120	5/8/10	SJGB021	56	12/01/18
SJGB004	59.5	5/11/10	SJGB022	47	11/30/18
SJGB005	61.5	5/6/10	SJGB023	60	12/04/18
SJGB006	30	10/29/10	SJSB028	37	11/19/18
SJGB007	119.5	5/7/10	SJSB029	40	11/16/18
SJGB008	59.5	5/6/10	SJSB030	40	11/18/18
SJGB009	29.5	10/26/10	SJSB031	40	11/18/18
SJGB010	15	10/28/10	SJSB032	42	11/17/18
SJGB011	20	10/29/10	SJSB033	40	11/14/18
SJGB012	20	10/28/10	SJSB034	42	11/10/18
SJGB013	10	5/11/10	SJSB035	42	11/11/18
SJGB014	12	5/10/10	SJSB036	35	11/17/18
SJGB015	10	5/10/10	SJSB036B	10	11/17/18
SJGB016	12	5/10/10	SJSB037	37	11/16/18
SJGB017	12	5/11/10	SJSB037B	10	11/16/18
SJGB018	52	12/13/18	SJSB038	36	12/09/18

SECTION 3. PDI-2 GEOTECHNICAL INVESTIGATION

The geotechnical scope of work for the PDI-2 included installing nine (9) soil borings within and around the perimeter of the Northern Impoundment. A plan map showing the locations of the PDI-2 soil borings is provided on Figure.

The soil borings were installed between November 7 and December 13, 2019, by Tolunay-Wong Engineers (TWE) and logged by a representative of GHD. The borings were advanced using a 4-inch diameter bit and rotary wash methods to a maximum depth of 100 feet below ground surface (ft bgs). Discrete samples were obtained continuously to 16 ft bgs, and generally on 5-ft centers thereafter to the termination depth of the borehole.

The sampling procedure consisted of advancing the borehole to the desired depth, and then either a Shelby tube was lowered to the bottom of the boring and was then pushed into the soil in one continuous 24-inch stroke (ASTM D1587), or the Standard Penetration Test (SPT) (ASTM D1586) was performed. The SPT test consists of driving a 2-inch diameter split-spoon

sampler 1 foot (after first seating it 6 inches) with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler gives an indication of the consistency and density of the material.

Upon retrieval, the exposed soil surface at the bottom of each Shelby tube was visually classified, and field measurements of the strength of the material were obtained by means of a pocket penetrometer. Upon retrieval of the SPT samples, the split spoon was opened, the material was visually classified, and cuttings were removed from the sample. The sample was then placed in a labeled moisture proof bag for transportation to TWE's laboratory for testing. Table 3 provides a summary of the PDI-2 boring details.

TABLE 3 PDI-2 SOIL BORING DETAILS

Boring ID	Termination Depth (feet below ground surface [ft bgs])	Termination Elevation (ft NAVD88)	GPS Coordinate		Ground Surface Elevation (ft NAVD88)
			Latitude	Longitude	
SJSB024	30	-27.36	29°47'36.74"N	95° 3'44.65"W	2.64
SJSB025	29.5	-24.52	29°47'38.65"N	95° 3'48.91"W	4.98
SJSB026	21.5	-16.16	29°47'39.24"N	95° 3'49.86"W	5.34
SJSB027	50	-46.08	29°47'41.34"N	95° 3'47.36"W	3.92
SJSB047	100	-103.40	29°47'38.50"N	95° 3'41.90"W	-3.40
SJSB050	20	-23.60	29°47'41.36"N	95° 3'40.53"W	-3.60
SJSB053	100	-109.70	29°47'43.62"N	95° 3'42.93"W	-9.70
SJSB057	100	-117.10	29°47'45.29"N	95° 3'46.74"W	-17.1
SJSB058	20	-19.38	29°47'42.79"N	95° 3'48.02"W	0.62

SECTION 4. PDI-2 LABORATORY TESTING

Once the field logs were made available to Ardaman, a lab testing program was developed and submitted to TWE for geotechnical laboratory testing. An overview of the scope of the laboratory testing phase in terms of the type of tests performed is presented in Table 4. Results of the laboratory tests are presented and discussed in the following sections of this report.

TABLE 4 PDI-2 LABORATORY TESTING SUMMARY

Test Method	ASTM Reference
Moisture Content	D2216
Density (Unit Weight)	D7263
Unconsolidated-Undrained Compression Test (UU)	D2580
Atterberg Limit Determination	D4318
Grain Size (Sieve, Hydrometer, and/or #200 Wash)	D6913/D422/D1140
Organic Content	D2974
Consolidation	D2435

4.1 Classification and Index Testing

Subsurface conditions, in terms of soil classification, geotechnical index properties, effective stress history, and undrained shear strength profiles encountered at the various boring locations within the Northern Impoundment are somewhat variable. For a detailed description, refer to the individual boring logs provided in Attachment B. However, a general description of the subsurface conditions for the Northern Impoundment is provided below.

Down to an elevation of approximately -30 ft NAVD88, the Northern Impoundment is fairly heterogeneous consisting of highly interbedded alluvial deposits consisting of silty sands, sands, silts, lean clays, fat clays, and sandy clays. Below this reference elevation, the western and eastern side of the Northern Impoundment become more distinguishable. On the western side, sandy lean clays extend to an elevation of approximately -45 ft NAVD88 and are underlain by medium stiff to very stiff fat clay to an elevation of approximately -80 ft NAVD88. More granular medium dense to very dense clayey sands, silty sands and sandy lean clays extend to an elevation of approximately -108 ft NAVD88 and are underlain by stiff gray lean clay to at least an elevation of approximately -117 ft NAVD88, the maximum explored depth of boring SJSB057. On the eastern side alternating layers of silts and clays extend below an elevation of approximately -30 ft NAVD88. These appear to be coarser towards the north and finer towards the south, with soil boring SJSGB053 (north) indicating more granular medium dense to very dense clayey sands at an elevation of approximately -68 ft NAVD88, and soil boring SJSB047 (south) indicating silty sands at an elevation of approximately -84 ft NAVD88. These more granular soils extend to an elevation of approximately -98 ft NAVD88 where stiff to very stiff fat clays and silts were encountered to at least an elevation of approximately -110 ft NAVD88, the maximum explored depth of the borings.

4.1.1 Visual Classification

Visual classifications include a description of soil color, consistency and type, and identification of structural conditions (layering, seams, etc.) and variations (e.g., organics). Visual classifications are included on the soil boring logs attached in Attachment B and are based on the descriptions provided in the field logs and in the laboratory analytical reports.

4.1.2 Moisture Content and Density and Unit Weight Determinations

Numerous moisture content determinations (ASTM D2216) and total unit weight determinations (ASTM D2937) were performed in conjunction with the preparation of test specimens. Total unit weights were computed based on sample volume and weight measurements during the test preparation. Moisture content and total density values for each sample are included on the soil boring logs attached in Attachment B.

4.1.3 Atterberg Limits

Atterberg limit determinations (ASTM D4318) were performed on selected samples to assist in soil classification and to enable correlations to pertinent clay behavior properties. The Atterberg limit data consists of measured liquid limit (LL) and plastic limit (PL) values from which the plasticity index (PI = LL - PL) is derived. The individual test data are included on the boring logs attached in Attachment B.

4.1.4 Grain Size Determinations

Grain Size Distributions Curves (ASTM D422) were performed on select samples, and fines content determinations (ASTM D1140) were performed on selected granular samples. The test results, in terms of percent fines (i.e., percent by dry weight finer than the U.S. No. 200 sieve size, 0.074 millimeter (mm), or combined silt and clay fraction) are shown on the boring logs attached in Attachment B, as well as the individual grain size distribution curves.

4.1.5 Unconsolidated-Undrained Compression Tests

Unconsolidated-Undrained (UU) Triaxial Compression tests (ASTM D2850) were performed on select specimens. Results of these strength tests are included on the soil boring logs attached in Attachment B. Individual UU test stress-strain curves are also included in Attachment B.

4.1.6 Consolidation Tests

One-Dimensional Incremental consolidation tests (ASTM D2435) were included in the laboratory testing program to assess the stress history, one-dimensional stress-deformation, and time-rate of consolidation characteristics of the clay deposits. The tests were conducted using a load increment ratio (LIR) of one (LIR = 1.0) and generally included one unload-reload cycle to enable evaluation of recompression behavior.

During each load increment, the vertical displacement with time is measured. In general, each load increment was sustained for a period of 24 hours. The vertical displacement versus time data were evaluated using conventional log-time and square-root time curve fitting techniques to estimate the end of primary consolidation (i.e., the point in time at which dissipation of load-induced excess pore water pressures in the sample had dissipated and drained creep ensued for each load increment). The individual test results, in terms of vertical strain and void ratio versus effective vertical stress, are presented in Attachment B.

Typical laboratory consolidation test results, considered in terms of vertical strain, ε_v (%; at the end of primary consolidation) or void ratio, e_o, versus vertical effective stress, σ'_{vc}

(tons/square foot[ft^2]; log scale), may be simply characterized as being composed of recompression and virgin compression. The flatter recompression portion of the ε_v versus log σ'_{vc} curve occurs at vertical effective stresses lower than the pre-consolidation pressure, σ'_p to which the specimen had historically been subjected. The steeper virgin compression portion of the ε_v versus log σ'_{vc} response occurs at vertical effective stresses greater than the maximum past pressure, σ'_p.

SECTION 5. SDI GEOTECHNICAL INVESTIGATION

The geotechnical scope of work and results for the 2021 SDI are detailed in the SDI Geotechnical Data Report included as Attachment C. The purpose of the SDI was to provide additional data that is critical to inform the 90% RD and evaluate the subsurface soil and groundwater conditions along the new alignment of the BMP by means of two deep boreholes, 13 Cone Penetration Tests (CPT) soundings, shear vane measurements, pressuremeter testing (PMT) and geotechnical laboratory testing. The results of this investigation have been used to refine fundamental design recommendations such as excavation depths, excavation horizontal limits, and the alignment of the BMP. This includes major adjustments to the excavation contours and alignment of the BMP as it was proposed prior to this investigation. The surficial sediments are underlain by native clayey soils (Beaumont Clay), which extend to the termination depth of the CPTs and was proven to extend to depth of 58 ft bgs on the western side of the Northern Impoundment (as observed in SJCPT-01 and SJCPT-11) and to depth of 65 ft bgs on the eastern side of the Northern Impoundment, observed in Borehole SJMW-017. The Beaumont Sand layer was confirmed below a depth of 58 ft bgs on the western side of the Northern Impoundment in locations SJCPT-01 and SJCPT-11, and below a depth of 65 ft bgs on the eastern side of the Northern Impoundment, in Borehole SJMW-017. Within these CPTs and boreholes, the sand layer extends to the refusal depth at about 75 ft.

Based upon the data obtained during the SDI and the goal to perform the excavation activities under dry conditions, an extensive hydraulic heave evaluation was performed following the SDI. The results of that evaluation were detailed in a Hydraulic Heave Analysis Report, included as Attachment E.

SECTION 6. EVALUATION OF CURRENT & HISTORIC SUBSURFACE CONDITIONS

During the previous subsurface investigations (RI and PDI-1), the Northern Impoundment subsurface stratigraphy was idealized as being comprised of interbedded Recent Alluvial Sediments (silts, sands, and clays) to an elevation of approximately -30 ft NAVD88, which was confirmed during the PDI-2 and SDI subsurface investigations. The previous investigations indicated that the Beaumont Clay formation extended below this reference elevation to a minimum elevation of approximately -60 ft NAVD88 on the western side and an elevation of approximately -50 ft NAVD88 on the eastern side. The PDI-2 investigation, which included boring SJSB057 (on the northwest side) encountered clays to a much deeper elevation of approximately -80 ft NAVD88, and on the eastern side clays were encountered between elevations of approximately -50 to -65 ft NAVD88.

The previous investigations, based on limited data, identified that the top of a sand formation occurs across the Northern Impoundment at an elevation between -50 and -60 ft NAVD88 to at least an elevation of approximately -80 ft NAVD88. After review of the PDI-2 boring logs, it was determined these sand elevations, as encountered in PDI-2, were not found to be as consistent throughout the Northern Impoundment.

SECTION 7. ANALYSIS

Two sets of analyses (pile drivability and slope stability) were performed during the 30% RD when the BMP deep foundations were penetrating into the dense Beaumont Sands. In the current design, summarized in the Basis of Design report text in the 90% RD package and detailed in the Northern Impoundment BMP Wall-Type Analysis (Appendix I to the 90% RD), the sheet pile tips remain within the Beaumont Clays and do not penetrate into the Beaumont Sands. The 30% RD pile drivability and slope stability analyses are presented below but are no longer relevant based on the design presented in the 90% RD.

7.1.1 Pile Drivability Analysis

Analyses were performed during the 30% RD based on the two (2) deeper soil borings (SJGB053 and SJGB057) to evaluate the drivability of a 66-inch pipe pile with a wall thickness of 1-inch to depth. The analyses assumed a conventional diesel hammer Delmag D100-42 and the D80-42. The results of the drivability analyses for both hammers are attached in Attachment D. It should be noted that a gain/loss factor of 1.0 was used in order to model the driving condition of no soil strength loss during driving. The drivability analysis indicated that both hammers were capable of driving the piles to depth. Further detail on these analyses can be found within the 30% RD.

7.1.2 Slope Stability

Given the depth of embedment required for stability of the BMPs proposed in the 30% RD, a deep-seated failure extending beneath the BMP was unlikely. Instead, there was a possibility that during the installation of the BMP, the vibrations caused by pile driving could induce localized instability of the near surface soils on the Northern Impoundment slope causing soils containing waste material to slide down and release waste material to the San Jacinto River. Therefore, this was a critical case for consideration. A series of parametric studies were performed on a select number of cross sections having been identified by GHD as having the steepest existing slope, and therefore having the highest likelihood of instability. The analyses incorporated an incremental horizontal acceleration (g-force) of 0.0-g, 0.1-g, 0.2-g, and 0.3-g as a way to approximate the additional horizontal forces that could be generated as a result of pile driving activities. A range of horizontal acceleration (0 to 0.3) were used for a parametric study evaluating the potential impact of pile driving activities. However, 0.1-g s considered representative of accelerations from pile driving in stiff clays. Further detail on these analyses is included in the Northern Impoundment BMP Wall-Type Analysis (Appendix I; Attachment E).

Since the current 90% RD sheet pile tips will not penetrate into Beaumont Sands, additional evaluation of accelerations greater than 0.1-g are not necessary.

As part of the 30% RD slope stability evaluation, it was found that vibrations induced by pile driving activities would attenuate with distance away from the “epicenter,” and therefore, so

would the horizontal acceleration forces. Based on our experience with pile driving activities in stiff clays and dense sands, a g-force equal to about a 0.1-g would have been assumed as a representative value; however, these measurements would typically be obtained some distance away from the pile/pile-driving equipment. The 30% RD Geotechnical Report included slope stability analyses for various levels of vibrations.

Due to the revised 90% RD which shifts the alignment of the BMP further from the excavation slope and keeps the sheet pile tips within the Beaumont Clays and out of the Beaumont Sands, these analyses are no longer applicable.

SECTION 8. ADDITIONAL CONSIDERATIONS

Additional consideration would need to be given to the following potentialities if the BMP were to be driven into the Beaumont Sands, as was the case in the 30% RD. The current 90% RD includes a design which terminates the BMP within the Beaumont Clays and does not enter the Beaumont Sands.

- **Soil Remolding:** If the BMP were driven into the Beaumont Sand, the piles would shear the soils located at the soil-pile interface, and to a lesser extent, soils located at some distance away from the pile (typically assumed as 1 to 2 pile diameters). When clay soils are sheared, or remolded, they tend to exhibit a “peak strength” lower than that of an undisturbed clay, or un-sheared clay. A lower peak strength therefore means that once the BMP is installed, the soils in and around the soil-pile interface would have then been weaker, and more likely to undergo significant deformation.
- **Static Liquefaction / Cyclic Mobility:** If the BMP were driven into the Beaumont Sand, the vibrations induced by pile driving would be capable of generating excess pore pressures (an increase in the pore pressure from the normal in-situ condition). Static liquefaction is the sudden loss of strength when loose granular soils (sands, silty sands, etc.) experience a rapid increase in pore pressures. Given that the strength of granular soils is dependent on the effective stress of the soil, as the pore pressure increases, the effective stress decreases. As the pore pressure approximates the in-situ effective stress, there would have been a possibility for the soils to lose all strength, and “liquefy,” or flow, resulting in a failure. This typically would occur if the pore pressures were not able to dissipate quickly, either because of the amount of clay within the soil matrix, or because of the boundary conditions around the granular soil.
- **Densification:** If the BMP were driven into the Beaumont Sand, the vibrations induced by pile driving activities would have been capable of causing loosely packed granular material to rearrange itself into a dense packing order. Should these loose granular (sands) soils have densified, the volume of voids would decrease, meaning that the water/air within the void space would be displaced. The movement of this “pore-water” could have occurred vertically into the water column or laterally into the San Jacinto River depending on the local boundary conditions and impedance afforded by adjacent soils. Should any waste material have been located within this “pore-water,” then the potential of a release could have occurred.
- **Hydraulic Heave:** Potential for hydraulic heave was investigated in the Hydraulic Heave Analysis Report dated December 9, 2021, and is included as Attachment E. Safe excavation

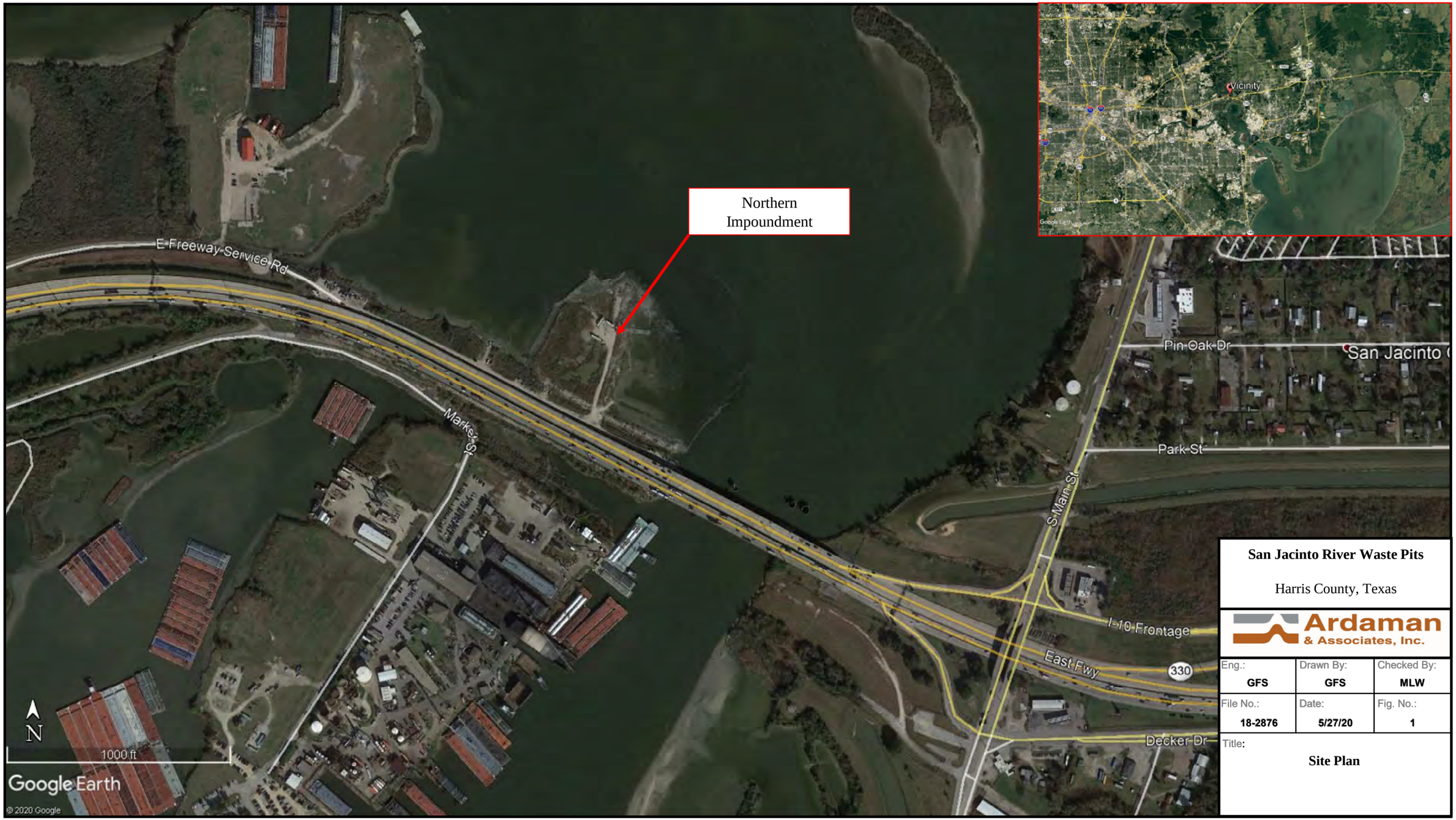
depth limits were established across the Northern Impoundment to ensure the charged sand layers beneath proposed excavation would not lead to bottom instability.

In addition to the potentialities listed above, there are adjacent structures in the vicinity of the Northern Impoundment that also should be considered.

- **I-10 Bridge Structure:** The southern boundary of the Northern Impoundment is located within 50 ft of the existing I-10 Bridge, which appears to be pile-founded. Should the pile supporting this bridge and/or the future bridge currently under design include batter piles, consideration would need to be given to the BMP's alignment for the Northern Impoundment to ensure that the footprint of the BMP, such as individual sheet piles are not laid over any existing piles. Should the sheet piles be driven into an existing bridge pile, they could damage the bridge's pile foundations.
- **Underground Utilities:** It is understood that there are a series of underground utilities located at depth which run parallel to the I-10 Bridge. Consideration would need to be given to the BMP's alignment for the Northern Impoundment relative to the underground utilities to ensure that the BMP does not impact the underground utilities.

FIGURES

FIGURE 1	**SITE PLAN**
FIGURE 2	**REGIONAL GEOLOGY**
FIGURE 3	**HISTORICAL TOPOGRAPHIC SURVEYS**
FIGURE 4-6	**GEOLOGIC PROFILES**
FIGURE 7-8	**BEAUMONT CLAY ISOPLETHS**
FIGURE 9	**GEOTECHNICAL SOIL BORING LOCATION PLAN**



San Jacinto River Waste Pits

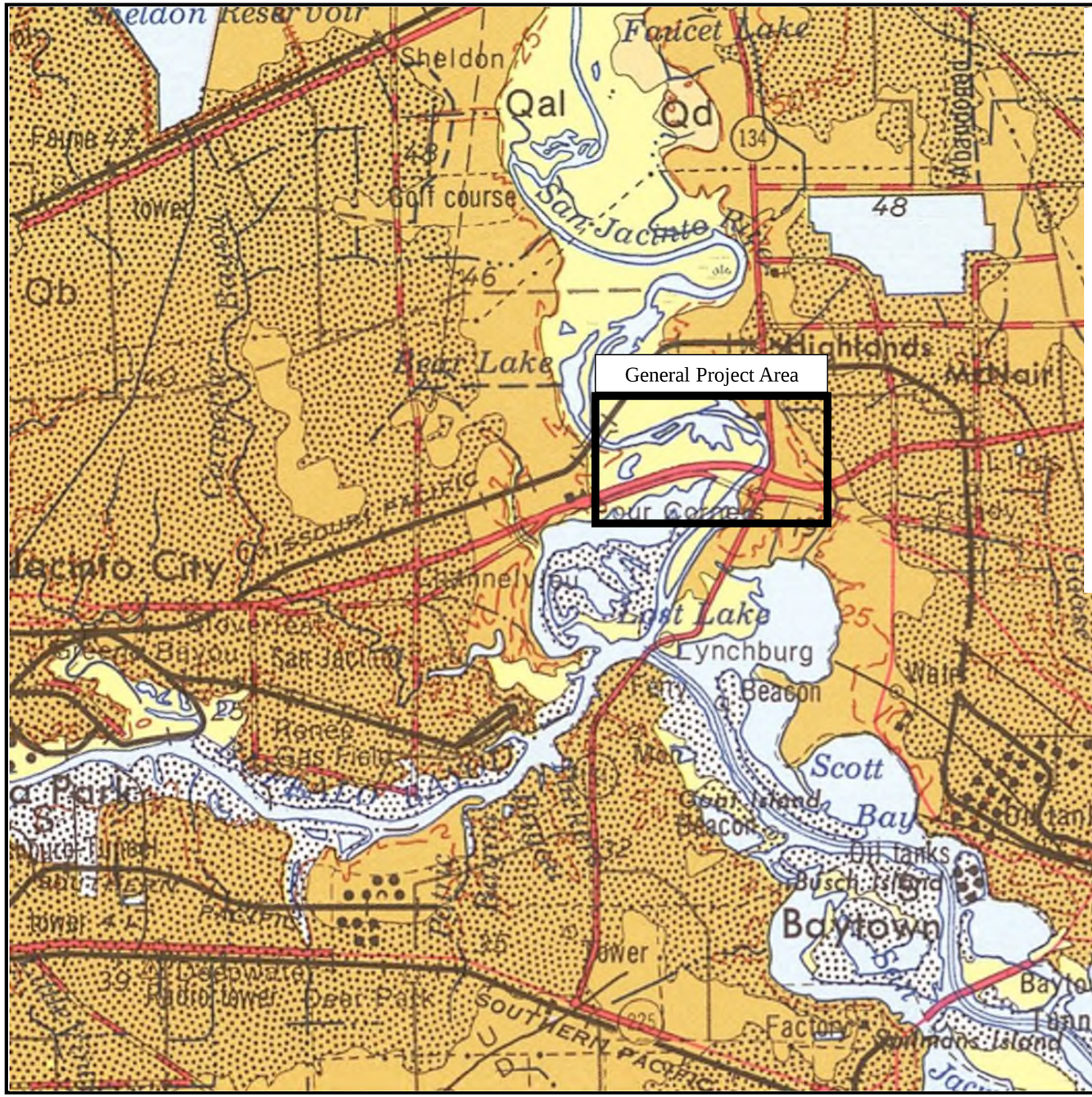
Harris County, Texas

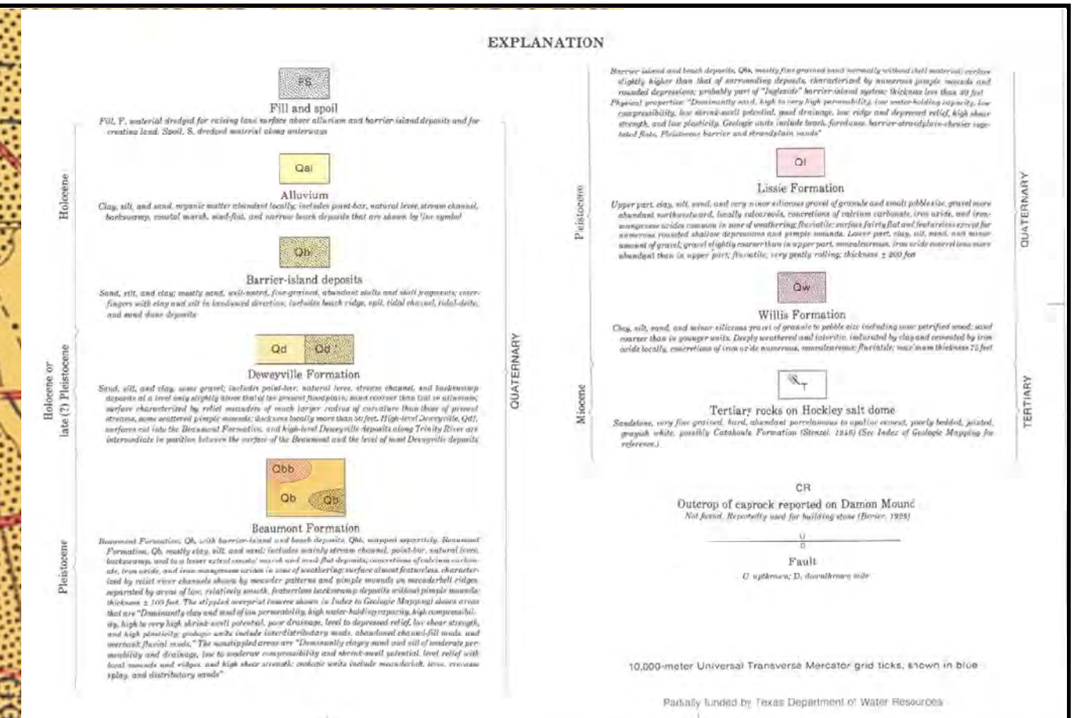
Ardaman & Associates, Inc.

Eng.:	Drawn By:	Checked By:
GFS	GFS	MLW
File No.:	Date:	Fig. No.:
18-2876	5/27/20	1

Title:

Site Plan





EXPLANATION

Holocene

FS

Fill and spoil

Fill, F, material dredged for raising land surface above alluvium and barrier-island deposits and for creating land. Spoil, S, dredged material along waterways

Qal

Alluvium

Clay, silt, and sand, organic matter abundant locally; includes point-bar, natural levee, stream channel, backswamp, coastal marsh, sinkfill, and narrow beach deposits that are shown by line symbol

Qbb

Barrier-island deposits

Sand, silt, and clay; mostly sand, well-sorted, fine-grained, abundant shells and shell fragments; interfingers with clay and silt in landward direction; includes beach ridge, spit, tidal channel, tidal-delta, and sand dune deposits

Holocene or late(?) Pleistocene

Qd Qd'

Deweyville Formation

Sand, silt, and clay, some gravel; includes point-bar, natural levee, stream channel, and backswamp deposits at a level only slightly lower than that of the present floodplain; most contour lines trail in alluvium; surface characterized by relict meanders of much larger radius of curvature than those of present streams, some scattered pimple mounds; backswamp locally more than 50 feet. High-level Deweyville, Qd', surfaces cut into the Beaumont Formation, and high-level Deweyville deposits along Trinity River are intermediate in position between the surface of the Beaumont and the level of most Deweyville deposits

Pleistocene

Qbb Qb Qb

Beaumont Formation

Beaumont Formation, Qb, with barrier-island and beach deposits, Qbb, mapped separately. Beaumont Formation, Qb, mostly clay, silt, and sand; includes mainly stream channel, point-bar, natural levee, backswamp, and to a lesser extent coastal marsh and mud flat deposits; concretions of calcium carbonate, iron oxide, and iron-manganese oxides in zone of weathering; surface almost featureless, characterized by relict river channels shown by meander patterns and pimple mounds on meanderbelt ridges, separated by areas of low, relatively smooth, featureless backswamp deposits without pimple mounds; thickness ± 100 feet. The stippled overprint (where shown in Index to Geologic Mapping) shows areas that are "Dominantly clay and mud of low permeability, high water-holding capacity, high compressibility, high to very high shrink-swell potential, poor drainage, level to depressional relief, low shear strength, and high plasticity; geologic units include interdistributary muds, abandoned channel-fill muds, and overbank fluvial muds." The nonstippled areas are "Dominantly clayey sand and silt of moderate permeability and drainage, low to moderate compressibility and shrink-swell potential, level relief with local mounds and ridges, and high shear strength; geologic units include meanderbelt, levee, crevasse splay, and distributary sands"

QUATERNARY

Pleistocene

Ql

Lissie Formation

Upper part, clay, silt, sand, and very minor siliceous gravel of granule and small pebble size, gravel more abundant northeastward, locally calcareous, concretions of calcium carbonate, iron oxide, and iron-manganese oxides common in zone of weathering; fluviatile; surface fairly flat and featureless except for numerous rounded shallow depressions and pimple mounds. Lower part, clay, silt, sand, and minor amount of gravel; gravel slightly coarser than in upper part, nonalluvium, iron oxide concretions more abundant than in upper part; fluviatile; very gently rolling; thickness ± 200 feet

Qw

Willis Formation

Clay, silt, sand, and minor siliceous gravel of granule to pebble size (including some petrified wood); sand coarser than in younger units. Deeply weathered and lateritic, indurated by clay and cemented by iron oxide locally, concretions of iron oxide numerous, nonalluvium; fluviatile; maximum thickness 75 feet

Miocene

$\mathcal{T}_T$

Tertiary rocks on Hockley salt dome

Sandstone, very fine grained, hard, abundant porcelainous to opaline cement, poorly bedded, jointed, grayish white, possibly Catahoula Formation (Stenzel, 1946) (See Index of Geologic Mapping for reference.)

QUATERNARY

TERTIARY

CR

Outcrop of caprock reported on Damon Mound

Not found. Reportedly used for building stone (Berier, 1928)

U D

Fault

U, upthrown; D, downthrown side

10,000-meter Universal Transverse Mercator grid ticks, shown in blue

Partially funded by Texas Department of Water Resources

San Jacinto River Waste Pits

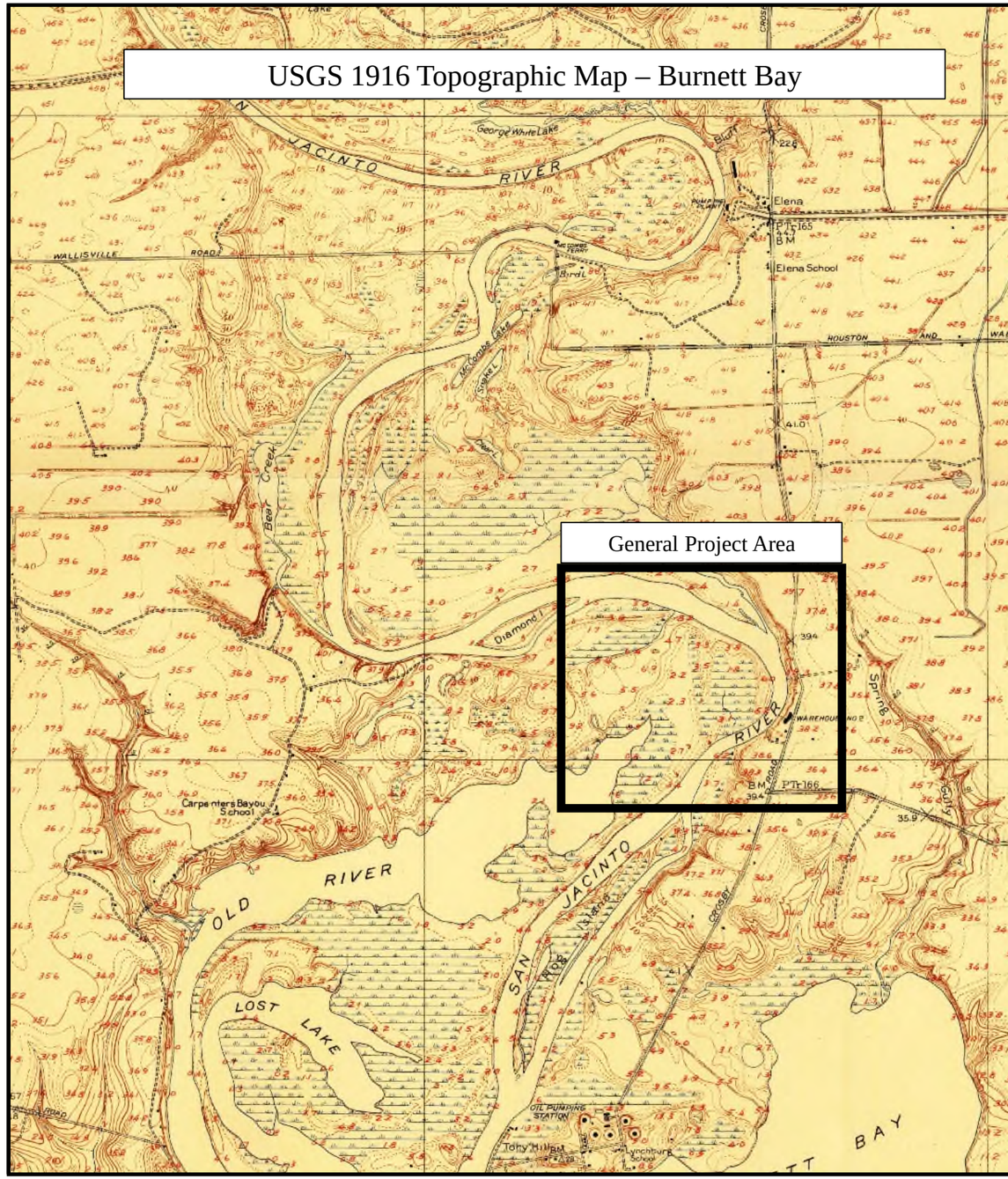
Harris County, Texas

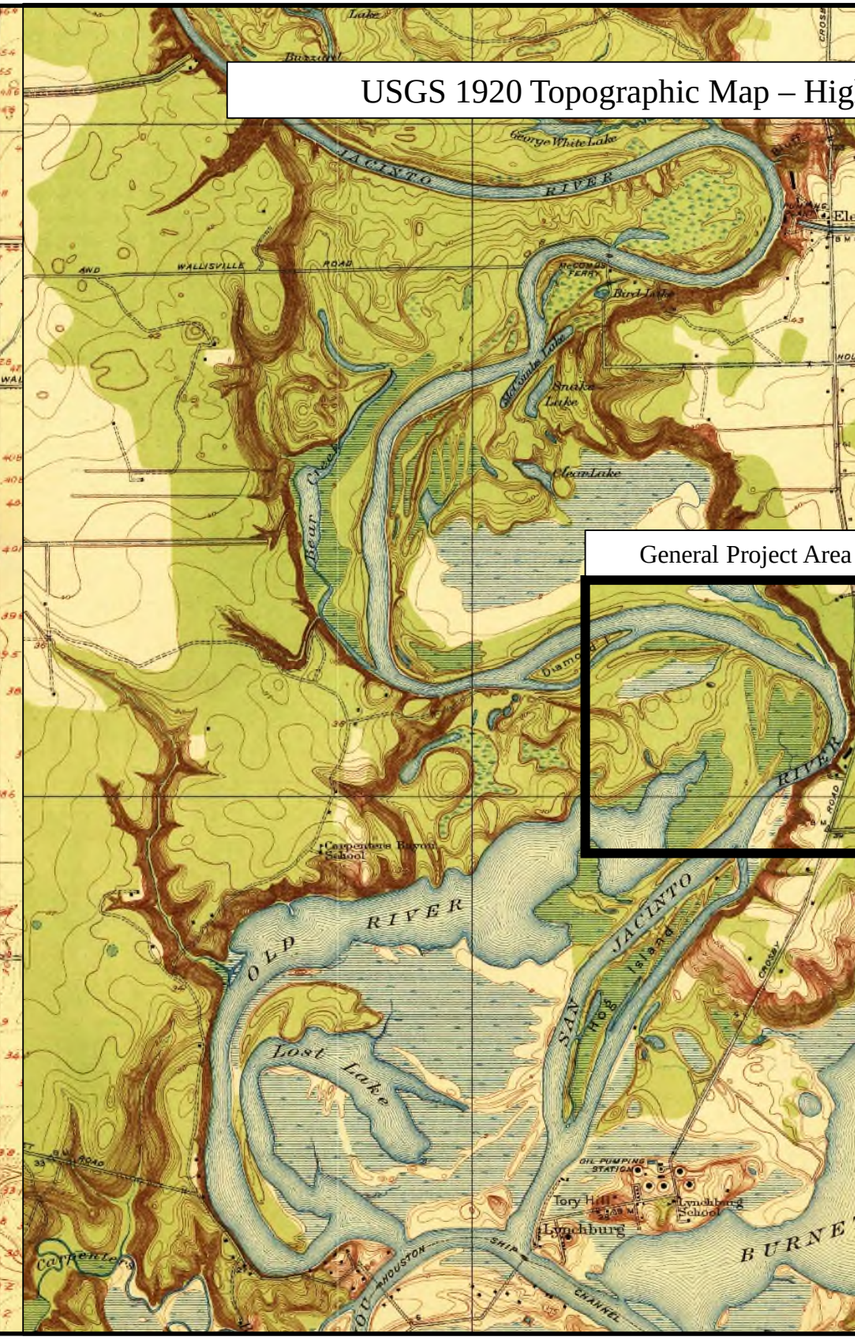
Ardaman & Associates, Inc.

Eng.:	Drawn By:	Checked By:
GFS	GFS	MLW
File No.:	Date:	Fig. No.:
18-2876	5/27/20	2

Title:

Regional Geology





San Jacinto River Waste Pits

Harris County, Texas

Ardaman & Associates, Inc.

Eng.:	Drawn By:	Checked By:
GFS	GFS	MLW
File No.:	Date:	Fig. No.:
18-2876	5/27/20	3

Title:

Historical Topographic Surveys

A
NORTH

A'
SOUTH

CROSS POINT WITH SECTION C-C'

CROSS POINT WITH SECTION B-B'

SJSCPT-04 | SJSB 103 | SJSB 057 | SJSB 098 | SJSB 037 | SJSCPT-11 | SJSB 036 | SJGB 030 | SJMW 17

RIVER

EOB = 14'

EOB = 32'

EOB = 24'

EOB = 37'

EOB = 35'

EOB = 40'

EOB = 75'

EOB = 75'

EOB = 100'

ELEVATION (FT)

0 | -25 | -50 | -75 | -100 | -125

0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900

DISTANCE ALONG BASELINE (FT)

LEGEND

SJSB — WELL ID
— GROUND
— WELL

EOB = END OF BORING (DEPTH BELOW SURFACE)

- SILTY CLAY TO CLAYEY SILT, SOFT (CL-ML)
- SILTY SAND WITH CLAY (SM)
- BEAUMONT CLAY (CH)
- SANDY TO SILTY CLAY (CL)
- CLAYEY SILTY SAND (SC-SM)
- GRAVELLY SAND (SW)
- GRAY CLAY (CH)

HORIZONTAL
1" = 80 ft
0 40 80Ft
0 10 20Ft
1" = 20 ft
VERTICAL

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS

GEOLOGIC CROSS-SECTION A-A'

Project No. 11215702
Date December 2021

FIGURE 4

Filename: \\ghdnet\ghd\US\Baton Rouge\Projects\562\11215702\Digital_Design\ACAD 2019\Figures\MISC-001\11215702-GHD-0000-MISC-0101_DE-001.dwg
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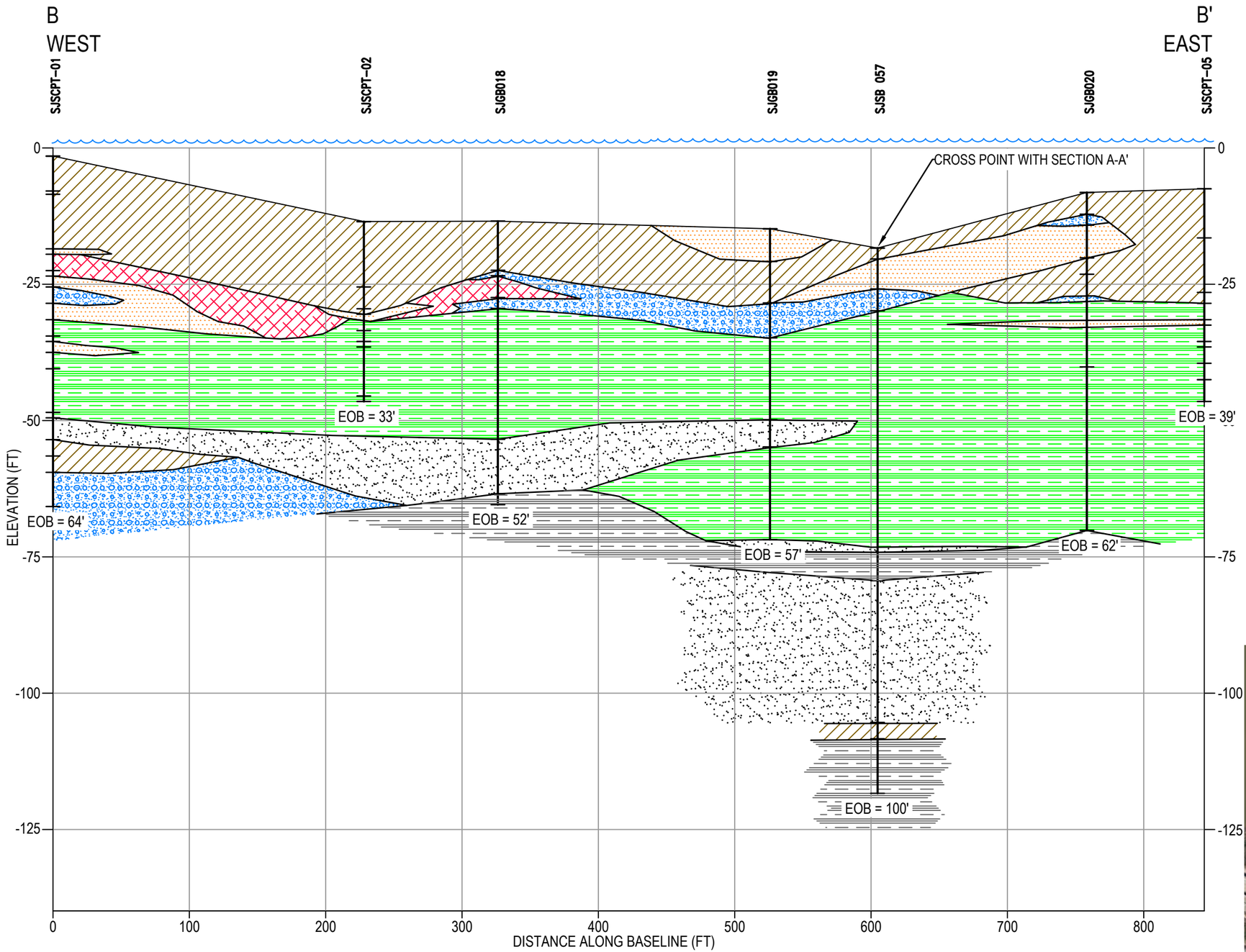

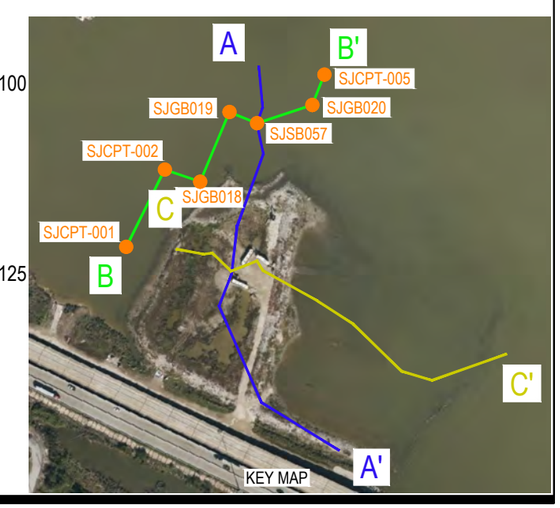

LEGEND

SJSB — WELL ID
— GROUND
— WELL

EOB = END OF BORING (DEPTH BELOW SURFACE)

- SILTY CLAY TO CLAYEY SILT, SOFT (CL-ML)
- SILTY SAND WITH CLAY (SM)
- BEAUMONT CLAY (CH)
- SANDY TO SILTY CLAY (CL)
- CLAYEY SILTY SAND (SC-SM)
- GRAVELLY SAND (SW)
- GRAY CLAY (CH)

HORIZONTAL
1" = 80 ft
0 40 80Ft
0 10 20Ft
1" = 20 ft
VERTICAL

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS

GEOLOGIC CROSS-SECTION B-B'

Project No. 11215702
Date December 2021

FIGURE 5

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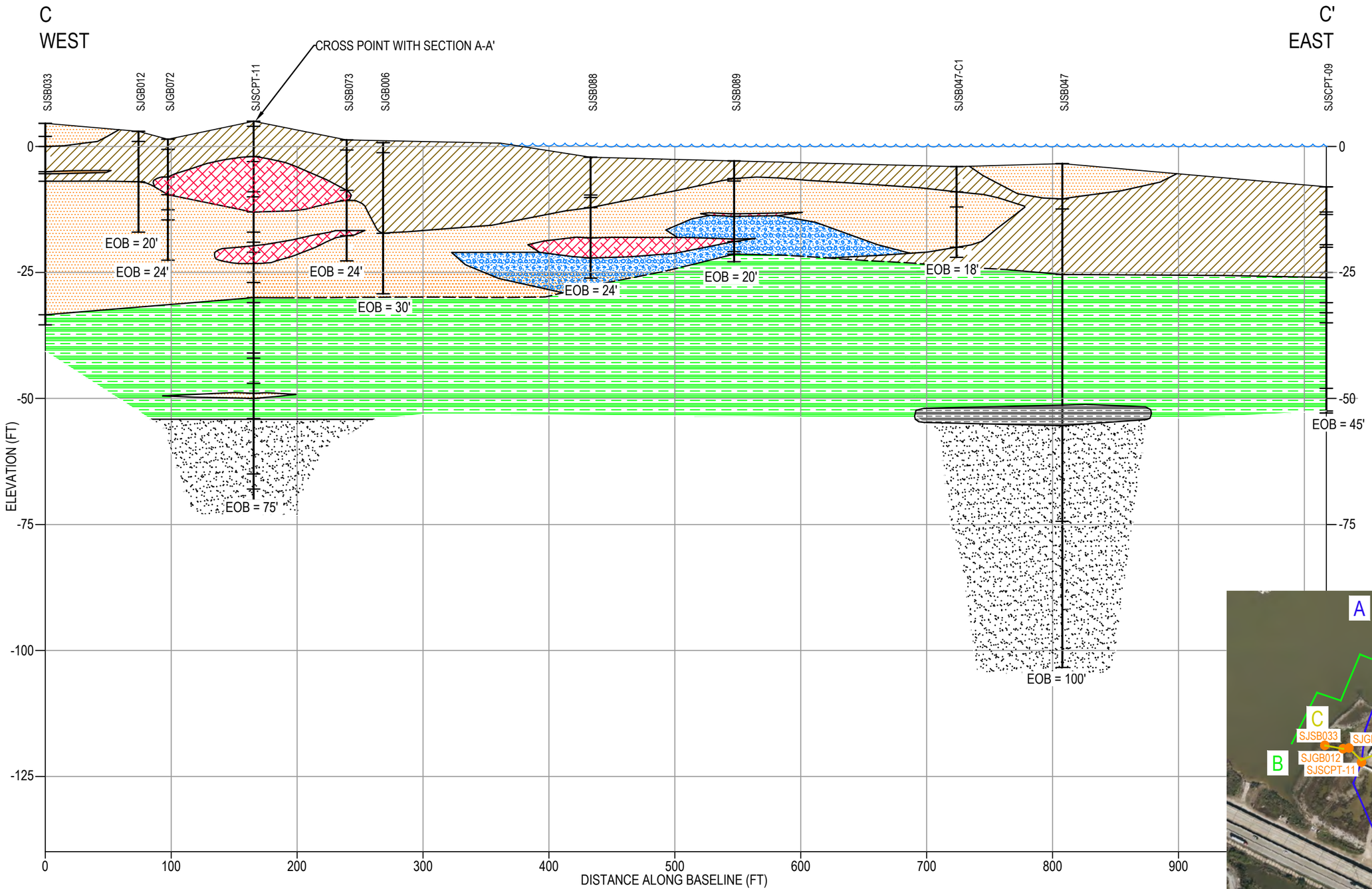

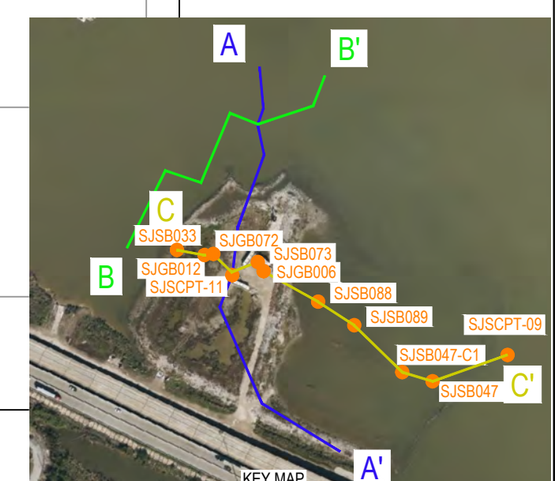

LEGEND

SJSB — WELL ID
— GROUND
— WELL

EOB = END OF BORING (DEPTH BELOW SURFACE)

- SILTY CLAY TO CLAYEY SILT, SOFT (CL-ML)
- SILTY SAND WITH CLAY (SM)
- BEAUMONT CLAY (CH)
- SANDY TO SILTY CLAY (CL)
- CLAYEY SILTY SAND (SC-SM)
- GRAVELLY SAND (SW)
- GRAY CLAY (CH)

HORIZONTAL
1" = 80 ft
0 40 80Ft
0 10 20Ft
1" = 20 ft
VERTICAL

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS

GEOLOGIC CROSS-SECTION C-C'

Project No. 11215702
Date December 2021

FIGURE 6

Filename: \\ghdnet\ghd\US\Baton Rouge\Projects\562\11215702\Digital_Design\ACAD 2019\Figures\MISC-001\11215702-GHD-0000-MISC-0101_DE-001.dwg
Plot Date: 17 December 2021 2:56 PM

Legend

-30 Contour (ft)

Paper Size ANSI B

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

N

GHD

SAN JACINTO RIVER WASTE PITS
CHANNELVIEW, HARRIS COUNTY, TEXAS

BEAUMONT CLAY
TOP ELEVATION

Project No. **11215702**
Revision No. **-**
Date **Dec 16, 2021**

FIGURE 7

Q:\GIS\PROJECTS\11215000s\11215702\Beaumont Clay\11215702_202111_BeaumontClay_GIS006.mxd

Data source: Google Earth, Imagery Date 11/16/2020

Paper Size ANSI B

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

N

GHD

SAN JACINTO RIVER WASTE PITS
CHANNELVIEW, HARRIS COUNTY, TEXAS

BEAUMONT CLAY
THICKNESS CONTOUR

Project No. **11215702**
Revision No. **-**
Date **Dec 16, 2021**

FIGURE 8

Q:\GIS\PROJECTS\11215000s\11215702\Beaumont Clay\11215702_202111_BeaumontClay_GIS004.mxd

Data source: Google Earth, Imagery Date 11/16/2020

SJCPT-004
SJCPT-005
SJCB020
SJCPT-003
SJCB019
SJCPT-006
SJSB057
SJCPT-002A
SJCPT-006A
SJCB003
SJCB013
SJCPT-002
SJCB018
SJSB053
SJCB004
SJCPT-007
SJCB002
SJCB014
SJSB058
SJSB037
SJSB034
SJCPT-001
SJSB033
SJCB012
SJCB005
SJCB023
SJCPT-011
SJCB006
SJSB038
SJCB015
SJSB050
SJMW-016
SJCB027
SJCB016
SJCPT-008
SJCB001
SJSB036
SJCB011
SJSB035
SJCB021
SJSB032
SJCB010
SJCB017
SJCPT-009
SJCB026
SJCB007
SJCB009
SJSB031
SJSB047
SJCB025
SJSB030
SJCB008
SJCB022
SJSB029
SJCB024
SJMW-017
SJSB028
SJCPT-010
Legend
SDI Geotechnical Boring and Deep Piezometer Location
SDI Geotechnical Boring and Deep Piezometer with SPT and Shelby Tubes
PDI-2 Analytical and Geotechnical Boring Location
PDI-2 Geotechnical Boring Location
CPT Boring
CPT Calibration Boring
Shear Vane Testing
RI Geotechnical Core with Primary and Secondary COPCs
RI Geotechnical Core
PDI-1 Geotechnical Boring Location
PDI-1 Analytical and Geotechnical Boring Location
Non-impacted Berm Area
TCRA Cap Perimeter
Extent of ACBM
Paper Size ANSI B
0 30 60 90 120
Feet
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet
N
GHD
SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
NORTHERN IMPOUNDMENT
GEOTECHNICAL SOIL BORING LOCATION PLAN
Project No. 11215702
Revision No. -
Date Jun 2, 2022
FIGURE 9
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Data source: Imagery - Google, 2019.

Attachment A Furnished Boring Logs and Geotechnical Testing Results From Previous Investigations

This Attachment contains the following:

A.1 PDI-1 Field Logs - Anchor (SJGB001 to SJGB017)

A.2 PDI-1 Field Logs - Anchor (SJSB018 to SJSB023)

A.3 PDI-1 Field Logs - Anchor (SJSB028 to SJSB038)

A.4 GeoTesting Express Lab data Sheets

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 3.5 FT FROM DECK TO MUDLINE; 5.5 FT FROM MUDLINE TO Measuring spot. ch	Boring SJGB001	Date 10/27	Sheet 1 of 3
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By WES MACDONALD		Weather P. SUNNY
	Drilled By TRIANGLE RESOURCES (PSI)		MARSH BUGGY
	Drill Type/ Method ROTARY		
Elevation:	Sampling Method SPT/ST		ATD Water
Datum:	Bottom of Boring 60 ft		Level Depth
Obs. Well Install. Yes / No			

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
–	10	90	930 935 940	0	2	ST	CRI-A CRI-B S1	0 2.2' 1 2		(Very soft), moist, ~~dk~~ grayish brown, sl. sandy SILT w/ abund. organics (Fill) @ 0.6 to 0.7' brown peaty silty Peat (OL) @ 0.7' to 1' moist gray ~~silty sand~~ sandy silt w/ roots/organics no plasticity 1 to 1.8' moist lt gray sandy-like silt particle. H2S ODOR from 0 to 1.8' Chemical-like odor @ 1.8' 1.8' v. soft wet dk gray to black clay w/ ~~chemical-like~~ odor Methane? Sulfur? 0-2'		OL
–	–	–	1000	2	4	ST	S2	2' 3		2-4' ST FOR GEOTECH STRENGTH/COHESIL	odor Not pattern egg H2S	Black Muck
<5	<5	95	1010	4	6	SPT	S3	4 2' 5	0 0 0	4-6' WOR v. soft, wet, dk gray w/ gray patches tr. sand + gravel CLAY (Muck/peat) w/ tr. ~~chem like~~ odor (Sulfur, Methane, Muck)		
<5	10	90	1020	6	8	SPT	S4	6 2' 7	0 0 0			
–	80	20	1040	8	10	SPT	S5	8 9 7.1' 10	6 6 14	6-8' @ v. soft. SAME AS ABOVE @ sampler shoe ~0.1' lt gray moist clayey SAND	unknown odor unknown odor @ 8'	SC
–	65	35	1050	13	15	SPT	S6	1 2 3 16' 4 5 6 7	6 7 13	8-10' (20) Md. dense, moist to wet, lt gray, clayey w/ layer Med grained SAND w/ layer of (0.1) (20) Md. dense, moist, lt gray clayey SAND w/ layer of ~~clay~~ sandy CLAY ~0.4 Alternating layers ~0.2-0.4' thick of SP, SC + CL	hammer not falling 30"	tr. odor unknown 8-10' in sand
–	85	15	1100	18	20	SPT	S7	8 14' 9 20	5 5 12	(17) Md. dense, same as above seams of CLAY tr. shells	of clay (SP) gravel sized unknown particles in sample	SP

Attachment Figure A.1-1

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SSGB001	Date 10/27/10	Sheet 2 of 3
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By WES MACDONALD		Weather SUNNY 90°F
	Drilled By TRIANGLE RESOURCES (PST) JOE/CHARLES		
	Drill Type/ Method ROTARY		
Elevation:	Sampling Method 2' SPT / 2' ST		ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 60'		Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								20				
								1				
								2			Digging trench for drilling water	SC/SP
—	70	30	1140	23	25	SPT	S8	3 / 1.4' / 4	7 / 6 / 10	(16) Md. dense, wet, lt gray clayey SAND (SC). ALTERNATING LAYERS/SEAMS upto 0.1' of silty gray CLAY + lt gray Medium grained SAND tr. shells		
								5				
								6				
								7				~~SC~~
15	35	50	1125	28	30	SPT	S9	8 / 1.6 / 9	5 / 4 / 6	(10) Soft, moist, gray sl. sandy CLAY to 0.8' (CH) reddish brown 0.8 to sampler shoe (soft) clay w/ gravel + sand (transition) tr. shells sampler shoe medium stiff lt bluish gray CLAY (Beaumont)		CH / transition / Beaumont
								30				
								1				
								2		ST N/R. USE SPT	TRY W/ ST Rig could only push 1FT N/R, clean out hole, add mud, + resample w/SPT	↓
5	45	95	1130	33	35	ST N/R SPT	S10	3 / 1' / 4	12 / 20 / 23	(43) V. HARD, damp, reddish brown CLAY w/ tr. gravel		
								5				
								6			Rough Drilling	
								7				
10	—	90	1145	38	40	SPT	S11	8 / 1.2' / 9	5 / 10 / 12	(22) Hard, damp, reddish brown, CLAY w/ seam of gravel @ 0.5'		
								40				

Attachment Figure A.1-2

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB001	Date 10/27/10	Sheet 3 of 3
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By WES MACDONALD		Weather SUNNY 92°F
	Drilled By TRIANGLE RESOURCES · PSI		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method 2'SPT / ST		ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 60FT		Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								40			Rough Drilling bit is stopped occassionally Rig Shaking	
								1				
								2				Beaumont
–	–	100	1220	43	45	SPT	S12	3	7 10 10	(20) Stiff, damp, reddish brown w/ tr. lt blue gray mottling CLAY		
								4				color change
								5			Unable to drive ST	
								6				
								7				CL
–	25	75	1240	48	50	SPT	S13	8 1.1' 9	10 23 24	(47) Very hard, ~~no~~ damp, lt bluish gray, sandy silty CLAY. grades to very sandy to clayey SAND. At bottom F.g. Sand.	G.S.	
								50				
								1				
								2				
–	5	95	1330	53	55	SPT	S14	3 4	23 24 18	(42) V. Hard, dry, lt bluish gray clayey SILT (ML) tr. fine grained SAND		ML
								5				
								6				
								7				
–	5	95	1345	58	60	SPT	S15	8 1' 9	4 27 27	(54) V. hard dry to damp, lt bluish gray SAME AS ABOVE		
								60		BOTTOM OF BORING @ 60' 1400 10/27/10		

Attachment Figure A.1-3

Soil Boring Processing Log

ANCHOR QEA

Boring Location:
2.6' FROM WATER TO MUDLINE
3.2' FROM DECK TO MUDLINE

Elevation: Datum:

Obs. Well Install. Yes (No)

Boring SJGB002 Date 5/9/10 Sheet 1 of 3
Job San Jacinto Waste Pits Job No. 090557-01
Logged By WES MACDONALD Weather CLOUDY 65°F
Drilled By TRIANGLE RESOURCES (3)
Drill Type/ Method ROTARY
Sampling Method SPT/ST ATD Water
Bottom of Boring 59.5 Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
—	10	90	0840	0	2	ST/SPT	S1	0	NR	1st 2 ATTEMPTS w/ SHELBY TUBE. NR. TRY WITH SPT. STRONG CHEMICAL-LIKE ODOR NO RECOVERY IN ST OR SPT IN UPPER 4 FT. S1 is taken from shovel sample off of surface		
				2	4	ST/SPT		1 2	NR			
—	10	90	830	4	5.5	SPT	S2	3 4 0.9 5	0	S1 is V. SOFT, WET DK OLIVE GRAY ORGANIC SILT w/ STRONG CHEM LIKE ODOR TRACE SAND WOH V. SOFT, wet, DK olive gray organic silt OL @ 0.2 ft gray, like mod chem odor soft, moist, sandy SILT. w/ black layer separating	OL AL	
—	15	85	835	6	7.5	SPT	S3	6 7 8 0.8	5 4 3	(7) stiff, damp, lt gray w/ lt brown + greenish gray mottling sand, CLAY (CL)	CL	
			0840	8	10	ST	S4	9 10 2'				
—	85	15	0850	13	14.5	SPT	S5	11 12 13 14 0.4	4 1 2	(2) Loose, wet, gray, silty, clayey SAND (SM) w/ slight chem-like odor		
—	95	5	0900	18	19.5	SPT	S6	15 16 17 18 19 20 1.3	3 5 9	(14) M. dense, wet, lt gray SAND trace silt fine grained sand pocket of dk gray clay w/ chem-like odor (possible slough) @ ~ 1.1 ft (not in sample)		

Attachment Figure A.1-4

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJ GB062	Date 5/9/10	Sheet 2 of 3
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT / ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 59.5		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								20				
								21				
								22				
								23				
–	80	20	0910	23	24.5	SPT	S7	24	4 6 13	(19) Md. dense, wet, lt gray w/ black specs, SAND w/ gray clay interbeds	SP	
								25				
								26				
								27				
								28				
–	85	15	915	28	29.5	SPT	S8	29	3 4 15	(19) Md. dense, wet, lt gray w/ black, red, + some shell gravel, SAND w interbeds of gray CLAY LAYER OF gray clay in bottom 0.2'	SP -SC	
								30				
								31				
								32				
								33				
–	35	65	925	33	34.5	SPT	S9	34	10 15 24	(39) Md. dense, wet, lt gray sand to ABUNDANT SHELLS IN-between layers Hard, lt bluish gray sl. sandy CLAY (CH) @ 0.9' (Beaumont Form) (sample taken is only clay)	SP CH	
								35				
								36				
								37				
								38				
5	5	90	935	38	39.5	SPT	S10	39	12 17 28	(45) Hard, damp, lt bluish gray + lt reddish brown, CLAY w trace gravel + sand (Beaumont)		
								40				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB002	Date 5/9/10	Sheet 3 of 3
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather CLOUDY 70°F
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 59.5		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								40				
								41				
								42				
			945	43	45	ST	511	43				
								44				
								45				
								46				
								47				
	--	100	1000	48	49.5	SPT	512	48	10	(45) HARD, damp, lt reddish-brown w/ gray + black mottling, CLAY w/ occassional chert		(CH)
								1.4	19			
								49	20			
								50				
								51				
~1002								52				
	—	—	100	1015	53	54.5	SPT 513	53	14	(40) HARD, damp, lt bluish-gray w/ lt reddish brown throughout CLAY (CH)		(CH)
								1.7	18			
								54	22			
								55				
								56				
								57				
	—	-	1030	58	59.5	SPT	514	58	28	(50/4") Bottom 0.9' collected		CH
								2'	50/4"	HARD, damp, lt bluish-gray CLAY		
								59		F to M grained gray SAND in sampler head		SP
								60		BOTTOM OF BORING AT 59.5 ft	BORING COMPLETED	

Attachment Figure A.1-6

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 10.7' DEPTH TO MUDLINE FROM WATER 11.4' " " DECK	Boring SJ GB003 Date 5/8/10 Sheet 1 of 6
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By WES MACDONALD Weather CLOUDY 75°F
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT / ST ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 119.5

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
			815	0	2	SPT/ST	S1	0 / 1		Appears to be soft gray sandy SILT w/ WOOD		
–	60	40	820	2	3.5	SPT	S2	2 / 3	0	WOH @ VERY LOOSE, WET GRAY v. silty SAND (SM)		
								4 / 5				
–	50	50	825	6	7.5	SPT	S3	6 / 7	1 / 0 / 1	(1) Very loose wet gray silty SAND (SM) w/ shells & H2S odor. to grading to soft wet gray sandy SILT to sandy CLAY (ML-CL)		
								8 / 9				
			835	10	12	ST	S4	10 / 11 / 12				
–	30	70	900	13	14.5	SPT	S5	13 / 14	2 / 4 / 6	(10) M. STIFF, wet fomoxel, gray CLAY w/ layers of light gray SAND fomgrey @ 0.3 ft reddish-brown stiff clay. (BEAUMONT FORM)	(RECENT SED.) gray clay/silt/sand RED CLAY	
								15 / 16 / 17				
–	5	95	925	18	19.5	SPT	S6	18 / 19 / 20	3 / 6 / 12	top 0.7' slough bottom (18) stiff, damp, reddish brown CLAY w/ layers + pockets of white CLAY. SLOUGH WAS LT GRAY, COARSE, SUB ROUND SAND (UTRAMARIN)		

Attachment Figure A.1-7

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB003	Date 5/8/10	Sheet 2 of 6
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather CLOUDY 75°F
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water Level Depth
Obs. Well Install. Yes / No	Bottom of Boring 119.5		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								20				
								21				
								22				
–	5	95	926	23	24.5	SPT	57	23 / 1.7 / 24	8 / 14 / 20	(34) STIFF, MOIST, very LT gray to white CLAY (CH) w/ TRACE of yellowish brown fg. SAND	CH	
								25				
								26				
								27		~~overpushed? large amount of soil~~		
			935	28	30	ST	58	28 / 29		tube v. slightly damaged yellow-red CLAY		
								30				
								31				
								32				
5	5	90	940	33	34.5	SPT	59	33 / 34	8 / 10 / 11	(21) poor recovery, poor sample (MD. STIFF, moist/damp, lt gray CLAY w trace of reddish brown clay (CL)	NT	
								35				
								36				
								37				
–	–	100	945	38	39.5	CPT	510	38 / 1.5 / 39	10 / 15 / 24	39 STIFF, DAMP, lt reddish-brown, CLAY w/ pockets of lt gray CLAY (CH)		
								40				

Attachment Figure A.1-8

Soil Boring Processing Log

ANCHOR QEA

Boring Location:

Elevation: Datum:

Obs. Well Install. Yes (No)

Boring SJGB023 Date 5/8/10 Sheet 3 of 6

Job San Jacinto Waste Pits Job No. 090557-01

Logged By MACDONALD Weather P. CLOUDY WINDY ~75°F

Drilled By TRIANGLE RESOURCES

Drill Type/ Method ROTARY

Sampling Method SPT/ ST ATD Water Level Depth

Bottom of Boring 119.5

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								40				
								41				
								42		1.2 ft good sample, remainder sloughed		
–	–	100	1000	43 ~~55~~	44.5 ~~54.5~~	SPT	S11	43 2' 44	12 21 35	(56) V. STIFF, DAMP, lt. reddish-brown to lt blush gray CLAY (Beaumont)		
								45				
								46				
								47				
–	–	~~10~~ 100	1000	48	49.5	SPT	S12	48 1.4 49	11 17 21	Good sample (38) STIFF, DAMP, lt. blush gray CLAY (Beaumont)		
								50				
								51				
								52				AL
–	–	100	1020	53	54.5	SPT	S13	53 1.2 54	6 6 8	(14) SOFT, no STIFF, DAMP, lt gray CLAY more plastic – containing occasional wood fibers + debris w/ depth grades to darker brown gray w/ wood content + depth (Beaumont)		
								55				
								56				
								57				
–	10	90	1030	58	59.5	SPT	S14	58 1.5 59	8 12 20	(32) STIFF, DAMP, lt gray sl. f-grained sandy CLAY w/ Trace wood fragments.		
								60				

Attachment Figure A.1-9

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB003	Date 2/5/10	Sheet 4 of 6
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather P. cloudy 75°F windy 60°F
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 119.5		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								60				
								61				
								62				
								63		(23) STIFF, damp, lt. gray CLAY w/ trace f. gravel SAND + trace wood fragments (Beaumont?)		
—	5	95	1040	63	64.5	SPT	S15	1.5	5			
								64	8 / 15			
								65				
								66				
								67		(45) sample overpenetrated (full of slough) slough is top 0.5'+ SAME AS ABOVE		
—	25	95	1055	68	69.5	SPT	S16	68	11			
								69	17 / 28			
								70				
								71				
								72		top 0.5' was slough		
								73		(26) STIFF, damp, dark gray CLAY w/ trace of wood fragments		
—	—	100	1105	73	74.5	SPT	S17	2'	6			
								74	11 / 15			
								75				
								76			switched drillers + cathead pullers	
								77				
			1150	77	79	ST	S18	2'				
								78				
								79				
								80				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB003 Date 5/5/10 Sheet 5 of 6
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By MACDONALD Weather CLOUDY 75°
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT/ST ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 119.5 Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								80				
								81				
								82				
—	40	60	1200	83	84.5	Grab	519	83 / 0.6 / 84	14 / 22 / 26	(48) ENTIRE sample appears to be slough; a mix of the layers above. red clay, gray sand etc.		NT
								85				
								86			SM	
								87		WM 5/8		
—	15	85	1245 1240	88	89.5	SPT	520	88 / 89	14 / 22 / 26	(48) 50/5" 50/5" 50/5" v. dense, moist, sl. silty to silty SAND (SM) f. grained sand		
								90				
								91				
								92				
			1230	93	94.5	SPT	521	93 / 2' / 94	11 / 17 / 25	top 0.1' slough (42) from 1.9 to 1.2 ft bgs Dense, Moist, lt gray f. to m. grained silty SAND SP w/ silt in pockets. FROM 0 to 1.2 ft: stiff, damp, dk gray CLAY w/ trace wood fragments + moderate pockets of lt. gray chert.	(sample from lower portion f.g.)	SP / CL
								95				
								96				
								97				
—	—	100	1245	98	99.5	SPT	522	98 / 2' / 99	24 / 50/4"	50/4" driven 10" but 2' of sample bottom 0.6' is stiff, damp, dark brown to black organic silt to pt.	OL/Pt	
								100		material in upper sampler is gray lmg sandy clay	gray clay	

Attachment Figure A.1-11

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJB003	Date 5/8/10	Sheet 6 of 6
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather P. CLOUDY 75° WIND GROWN
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water Level Depth
Obs. Well Install. Yes No	Bottom of Boring 119.5'		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								100				
								101				
								102				
								103		21 OF MAT. IN SAMPLE (32) Stiff, damp, lt. bluish gray CLAY (CH)		
–	–	100	1305	103	104.5	SPT	S23	1.6 104	10 12 22			
								105				
								106				
								107				
								108		(39) SAME AS ABOVE		
–	–	100	1325	108	109.5	SPT	S24	2' 109	15 15 24			
								110				
								111				
								112				
								113		(50/4") v. DENSE (no dens), wet, lt bluish gray f. grained silty SAND (SM)		
–	70	30	1340	113	114.5	SPT	S25	114	30 50/4"	though has sand clay + large grand	SM	
								115				
								116				
								117				
								118		0.7 good sample rest was stony		
–	80	20	1400	118	119.5	SPT	S26	0.7 119	15 30 45	(75) v. dense, gray f.g. silty SAND (SM)		
								120				

Attachment Figure A.1-12

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 5.6 FT TO MUDLINE	Boring SSGB004	Date 5/9/10 (5/11/10)	Sheet 1 of 3
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By WES MACDONALD		Weather SUNNY WIND FROM S
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT - ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 59.5		

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
—	20	80	1315	0	1.5	SPT	S1	0 0.4 1	6 2 2	poor recovery · catcher in backwards (0) soft, wet, dk gray sl. sandy SILT w trace shells + organic debris (wood)		NT
—	15	80	1330	2	3.5	SPT	S2	2 3	1 1 1	poor recovery · catcher in backwards SAME AS ABOVE		NT
—	<5	100	1345	4	6	ST push	S3	4 2' 5		SHELBY TUBE WAS EXTRUDED ON BOARD SOFT, WET, GRAY TO DK GRAY SILTY CLAY w/thin SAND LENS		GS AL
—	<5	100	1350	6	7.5	SPT	S4	6 2' 7	0 0 0	WOR SOFT, WET, DK GRAY CLAY w/TR. SILT + sand		
—	10	90	1355	8	9.5	SPT	S5	8 2' 9	0 0 0	WOR V. SOFT, WET, DK GRAY CLAY w/ TR SAND LAYERS, gray	CH	
			1400	10	12	ST push	S6	10 2' 11 12				
—	35	65	1410	13	14.5	SPT	S7	13 2' 14 15 16 17	0 0 0	WOR @ 14 ft change V. SOFT, WET, DK GRAY CLAY to M.D. dense, wet, lt gray SAND w black specks Fine to med grained	CH SP	
—	35	65	1420	18	19.5	SPT	S8	18 19 20	5 9 9	change at 19.1 ft (18) SOFT, wet DK gray CLAY to lt gray w/ black specks SAND	CH SP	

Attachment Figure A.1-13

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB004 Date 5/11/10 Sheet 2 of 3
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By WES MACDONALD Weather SUNNY 85°F WINDY
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT/ST ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 59.5

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								20				
								21				
								22				
			1430	23	24.5	SPT	S9	23	8 15 15	(30) No Recovery shoe of sampler was lost in ground		
								24				
								25				
								26				
								27				
5	-	95	1440	28	29.5	SPT	S10	28	7 12 20	(38) V. HARD, damp, lt reddish brown CLAY w/ few gravel	CH	
								29				
								30				
								31				
								32				
-	-	100	1455	33	34.5	SPT	S11	33	10 12 15	Upper 1.4 of sample appears to be slough (lt gray sand w patches of gray + red-brown silty clay) (27) HARD, damp to dry, lt reddish-brown w/ black + lt gray splotches CLAY	CH	
								34				
								35				
								36				
								37		Upper 1.4 slough		
-	-	100	1505	38	39.5	SPT	S12	38	8 11 17	(26) HARD, damp + same as above fewer to no splotches of other color trace gravel @ sample top (slough?)		
								39				
								40				

Attachment Figure A.1-14

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB004	Date 5/11/10	Sheet 3 of 3
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By WES MACDONALD		Weather SUNNY WINDY Hours from SE
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 59.5		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								40				
								41				
								42				
			1525	43	45	ST	S13	43 γ 44				
								45				
								46				
								47				
–	25	75	1530	48	49.5	SPT	S14	48 W3 49	12 50/6"	50/8" V. Hard, moist, lt. bluish gray sl. f-g sandy CLAY bottom 0.2 ft lt bluish gray, wet silty SAND	(cc)	
								50				
								51				
								52				
–	10	90	1550	53	54.5	SPT	S15	53 1.5 54	8 12 22	(34) V. HARD, wet to moist, lt. bluish-gray sl. sandy CLAY		
								55				
								56				
								57				
–	10	90	1605	58	59.5	SPT	S16	58 1.4 59	8 12 20	(32) V. HARD, moist, lt. bluish gray sl. sandy CLAY	(cc)	
								60		BOTTOM OF BORING 59.5' 5/11/10	1625	

Attachment Figure A.1-15

Soil Boring Processing Log

ANCHOR QEA

Boring Location: Water level 5.4 ft to deck 1006 5-6-10

Elevation: Datum:

Obs. Well Install. Yes No

Boring SJGB005 Date 5/6/10 Sheet 1 of 3

Job San Jacinto Waste Pits Job No. 090557-01

Logged By Laplante / MacDonald Weather Clear 85°

Drilled By Triangle Resources

Drill Type/ Method Rotary

Sampling Method SPT & Push ATD Water

Bottom of Boring 61.5 Level Depth

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
-	-	100		0	2		SJGB005-S1	0–2		(Soft), wet, brown organic SILT with abundant wood fibers		
-	95	5						2–4		Soft, wet, gray, fine to medium SAND		
-	40	60	1040	4	5.5	SPT	S2	4–5.5	9/18	V. SOFT, WET, GRAY V. SANDY CLAY (CL) MOD. w/ ALTERNATING LAYERS OF CLAY + SAND		
-	20	80	1050	10	11.5	SPT	S3	10–11.5	0, 0, 0	WT. OF HAMMER V. SOFT, WET, GRAY, SANDY CLAY w/ OCCASIONAL ALTERNATING LAYERS OF CLAY + SAND	OVER-PUSHED 6"	
-	40	60	1105	15	16.5	SPT	S4	15–16.5	4, 3, 12	(15) SOFT, WET, GRAY CLAY w LAYERS OF WT LT GRAY poorly graded rounded SAND LAYERS OF CLAY + SAND WERE 4-6" thick		

Attachment Figure A.1-16

Soil Boring Processing Log

ANCHOR QEA

Boring Location:

Elevation: Datum:

Obs. Well Install. Yes No

Boring SJGB005 Date 5/6/10 Sheet 2 of 3
Job San Jacinto Waste Pits Job No. 090557-01
Logged By LAPLANTE / MACDONALD Weather Clear 85°
Drilled By TRIANGLE RESOURCES
Drill Type/ Method Rotary
Sampling Method SPT & Shelby ATD Water Level Depth
Bottom of Boring 101.5

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
0	90	10	1120	20	21.5	X	S-5	20–21	6, 4, 6	(10) Loose to M. dense, moist, lt. gray fine to coarse SAND		
0	90	10	1122	25	26.5	X	S-6	25–26	11, 20, 30	(50) Dense to v. dense, moist lt. gray F-C SAND		
0	5	95						26–27		Hard, damp, brown and gray CLAY (Beaumont)		
0	5	95	1130	30	30.5	X	S-7	30–31	15, 20, 31	(51) Hard, damp gray transitioning to brown CLAY (Beaumont)		
0	10	90	1140	35	36.5	X	S-8	35–36	6, 8, 27	(35) Hard, damp, red brown CLAY (Beaumont)		

Depth scale: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40

Soil Boring Processing Log

ANCHOR QEA

Boring Location:

Elevation: Datum:

Obs. Well Install. Yes No

Boring SJGB005 Date 5/6/10 Sheet 3 of 3
Job San Jacinto Waste Pits Job No. 090557-01
Logged By LAPLANTE/MACDONALD Weather Clear 85°
Drilled By TRIANGLE RESOURCES
Drill Type/ Method ROTARY
Sampling Method SPT & PUSH ATD Water
Bottom of Boring 61.5 Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
0	10	90	1145	40	41.5	X	S-9	40–41	10, 16, 25	(41) Hard, damp, red brown CLAY (Beaumont) with lt. gray mottling		
0	15	85	1155	45	46.5	X	S-10	45–46	14, 18, 22	(40) Hard, damp, gray sl. sandy, silty CLAY		
0	50	50	1205	50	51.5	X	S-11	50–51	50, 50	50/5½" Dense to hard, gray, /5½" damp, silty, clayey fine SAND to sandy, silty CLAY		
0	10	90	1220	55	56.5	X	S-12	55–56	16, 16, 32	(48) Hard, damp, gray silty CLAY		
								57		DRILLER INDICATES CHANGE IN ACTION		
0	90	10	1230	60	61.5	X	S-13	60–61	15, 42, 50/4"	(92/10") Very dense, moist, gray fine to coarse SAND		

BOTTOM OF HOLE AT 61.5 ft 1240 5/6/10

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB006 Date 10/29/10 Sheet 1 of 2
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By WES MACDONALD Weather SUNNY 65°F
	Drilled By TRIANGLE RESOURCES (PSI) Mach Buggy
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method 2' SPT ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 30 FT Level Depth

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
-	<5	100	1030	0-6"		ST	CR1A	0		(Soft to med stiff) 0 to 0.4 Brown ~~moist~~ damp SILT w/ abundant roots	2 STs TAKEN + COMBINED FOR 0-2'	TOPSOIL
			1035	6"-12"	0-2'		CR1B	1.3' 1		0.4' to end ~~gray moist~~ brownish gray moist w/ ~~silty gray patches~~ blocky low plasticity w/ occassional roots SILT		RWP waste
			1040	12"-24"			S1	2				
				0'	2'				0			
			1100			SPT		0.8'		② soft brown SILT		
(5)	—	100		2	4		S2	3	0 2	@ 0.3' dark gray v. soft, moist CLAY (muck)		
								4	2	w/ small unknown gravel sized particles		Muck (waste?)
-	-	-	1110			ST		2'				
				4	6		S3	5		shelby tube		
								6		(13) stiff, damp to moist, gray sandy CLAY (CL)		
-	30	70	1120			SPT		1.5' 7	11 7			CL
				6	8		S4		8	sandy clayey sand in upper 0.3' tr. shells + yellow mottling.		
								8	9			
-	-	-	1130			ST		1.5				
				8	10		S5	9				
								10				
								1				
								2				
								3		(0) WOH v. soft, wet to moist, gray, sandy silty CLAY (CL)		
-	25	75	1140			SPT		1.9' 4	0 0			
				13	15		S6		0	@ 0.9 v. soft moist gray clay (CH)		
								5	0	w/ trace organics @ transition		
								6				
								7				
								8		(23) Med dense, lt gray, moist		SP-SC
			1150			SPT		12' 9	3 7	m to f grained clayey SAND sc		
-	75	25		18	20		S7		14	w/ SP containing layers of gray soft clay.		
								20	14			

Soil Boring Processing Log

ANCHOR QEA

Boring Location: CATHEAD MANUAL PULL HAMMER	Boring SJGB006	Date 10/29/10	Sheet 2 of 2
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By WES MACDONALD		Weather SUNNY 65°F
	Drilled By TRIANGLE RESOURCES (PSI) MARSH BUGGY		
	Drill Type/ Method ROTARY 4 1/4" BIT		
Elevation: Datum:	Sampling Method 2' SPT / 2' ST		ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 30 FT		Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
—	95	5	1200	23	25	SPT	S8	1.4	10, 18, 35, 50/3"	(53) V. Dense, Moist, lt gray, med to fine grained SAND (SP) w/ tr. pockets of Clay		
—	100	5	1210	28	30	SPT	S9	2'	15, 18, 27, 38	(45) Dense, wet, lt gray, coarse grained SAND (SP) rounded to subrounded particles; red, black gray white yellow grains		
										BOTTOM OF BORING, FILLING UP WITH MD. BENTONITE CHIPS		

Attachment Figure A.1-20

Soil Boring Processing Log

ANCHOR QEA

Boring Location: LL WATER DEPTH 5' 5.6' FROM DECK TO MUDLINE @ 0830	Boring SJGB007 Date 5/7/11 Sheet 1 of 6
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By MACDONALD Weather P. SUNNY 70°F
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
	Sampling Method SPT + SHELBY ATD Water Level Depth
Elevation: Datum:	Bottom of Boring 119.5FT
Obs. Well Install. Yes (No)	

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
			0830	0	~~0~~ 2	~~2~~ ST	S1	0–2		APPEARS TO BE SOFT, WET GRAY SANDY SILT		
–	~~40~~ 45	55	0835	2	~~2~~ 3.5	~~3.5~~ SPT	S2	2–3	0	WOH V. SOFT, GRAY, WET V. SANDY SILT (ML) W/ OCCASSIONAL WOOD DEBRIS		
–	55	45	0840	6	~~6~~ 7.5	SPT	S3	6–7	1, 1, 2	(2) LOOSE, WET, GRAY, V. SILTY SAND (SM) W/ OCCASSIONAL TO MOD. WOOD DEBRIS	ML/SM; CC	
–	15	85	0905	10	11.5	SPT	S4	10–11	1, 1, 1	(2) SOFT, WET, GRAY CLAY W OCCASIONAL INTERBEDS OF GRAY SAND		
			9:10	13	15	ST	S5	13–15	2.2			
–	100	~~0942~~ –	0910	18	19.5	ST	S6	18–19.5	1, 16, 14	(30) MD. DENSE, WET, GRAY LT GRAY w/ DARK SPECS SAND (SP) w 2x 4"–6" DK gray SOFT CLAY/SILT LAYERS (CH)	(Lower sample in depth picture)	
–	–	100										

NOTE: - No DRY ERASE MARKER, PICTURES OF SAMPLES ARE TAKEN IN ORDER. Some ST Samples pictures are omitted.

- SPT sample has extra material in upper 0.5'. THIS MATERIAL IS CONSIDERED TO be Roller slough here.

Soil Boring Processing Log

ANCHOR QEA

Boring Location:

Elevation: Datum:

Obs. Well Install. Yes (No)

Boring SJGB007 Date 5/7/10
Job San Jacinto Waste Pits
Logged By MACDONALD
Drilled By TRIANGLE RESOURCES
Drill Type/ Method ROTARY
Sampling Method SPT / ST
Bottom of Boring 119.5FT

Sheet 2 of 6
Job No. 090557-01
Weather P.SUNNY 75°F

ATD Water Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								20				
								21				
								22				
								23		(40) HARD, DRY, Lt bluish gray, sl. sandy CLAY (CL)	(BEAMONT FORM)	
–	5	95	425	23	24.5	SPT	S7	2'	13			
								24	18			
									24			
								25				
								26				
								27				
								28		(97) V. HARD, DAMP, Lt bluish gray w/ RED BROWN MOTTLING, sl. sandy CLAY (CL-CH)	" "	
–	10	90	0945	28	29.5	SPT	S8	1.5	11		1st picture on board	
								29	47			
									50			
								30				
								31			color change	
								32				
								33		(41) HARD, MOIST, reddish brown w gray/white veins + mottling CLAY (CH)		
–	-	100	955	33	34.5	SPT	S9	2'	11			
								34	15			
									26	sand in overlying material		
								35				
								36				
								37				
								38		(32) HARD, MOIST to damp, reddish brown CLAY		
–	-	100	1000	38	39.5	SPT	S10	2'	11			
								39	14			
									18	gray + brown clay in		
								40				

Soil Boring Processing Log

ANCHOR QEA

Boring Location: PICTUR	Boring SJGB	Date 5/7/10	Sheet 3 of 6
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation:	Sampling Method SPT/ST	Datum:	ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 119.5 FT		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								40				
								41				
								42				
			1010	43	45	ST	S11	43		Appears to be sl. sandy bluish lt gray CLAY		
								22				
								44			~~gr. transition~~	
								45				
								46				
								47				
								48		(ST) HARD, MOIST, lt bluish gray F.G. sandy CLAY (CL) Low to No Plasticity		
								2'	20			
–	20	80	1020	48	49.5	SPT	S12	49	20			
									31			
								50			~~gr. transition~~ gr. transition	
								51				
								52				
								53		(SP) V. DENSE, moist to wet, lt gray fine to med.-grained SAND SP, sl. silty		
–	90	5/10	1030	53	54.5	SPT	S13	1.2	18			
								54	26	soft clay/sand mix		
									32			
								55			~~gr. transition~~	
								56				
								57				
–	80	20	1040	58	59.5	SPT	S14	58		(~~SP~~) (57) V. DENSE, wet, lt. gray silty f to m-grained SAND (SM)		
								1.1	15			
								59	26			
									31			
								60				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB007	Date 5/7/10	Sheet 4 of 6
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD W		Weather P-SUNNY 75°F
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 119.5 ft		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
						S		60				
								61				
162631								62				
–	45	55	1050	63	64.5	SPT	S15	63 / 1.4 / 64	15 / 5 / 14	(19) MD. DENSE, WET, LT GRAY SILTY FG SAND TO (SM) STIFF, DAMP, LT gray to LT blue gray f.g. sandy CLAY (CL)		
								65			color darkens + sl mat change	
								66				
								67				
			1100	68	69.5	SPT	S16	68 / 1.3 / 69	18 / 40 / 50/4"	90/10 V. DENSE, MOIST, GRAY, clayey SAND SC FG SAND		
								70				
								71				
								72				
–	50	50	1115	73	74.5	SPT	S17	73 / 0.7 / 74	26 / 40 / 36	(76) poor recovery sample missing from bottom. Recovered mat. possibly slough, Des. of recov. lt gray sand to gray & red-brown clay	?	NS
								75				
								76				
								77				NS
			1130	78	79.5	SPT	S18	78 / 0.5 / 79	26 / 50/5"	50/5" poor recovery mat rec likely slough/cave sampled above SPT. SPT AS ABOVE gray sand w/ clay		
								80				

Attachment Figure A.1-24

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB007	Date 5/7/10	Sheet 5 of 6
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather SUNNY 85°F
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 119.5 FT		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								80				
								81				
								82				
								83		(78) V. DENSE, WET LT GRAY w Black grains (charcoal?) (approximate) of dirty sand - subrounded F-M grained SAND w occasional pockets of clay. gray to red-brown		
—	85	15	1338 WET on COL	83	89.5	SPT	S19	1.8 84	36 47 36	32 46		
								85				
								86			color/texture change	
								87				
—	60	40	1335	88	89.5	SPT	S20	88 1.1' 89	40 50/5"	(50/5") Mo. Dense, Moist, gray fg-clayey SAND (SC) grades from clay on top to fg SAND @ bottom		
								90				
								91				
								92				
								93		(20) STIFF, MOIST TO DAMP, GRAY CLAY (CH)		
	-	-	100	1350	93	94.5	SP1	S21	2' 94	10 10 10		
								95				
								96				
								97				
								98		(35) STIFF, DAMP, DARK GRAYISH BROWN silty CLAY w moderate wood fragments to @ 0.7' Mt. stiff, moist, gray CLAY w/ Occasional wood fragments		
\	-	-	100	1405	98	99.5	SP1	S22	2' 99	10 17 18		
								100				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB007	Date 5/7/10	Sheet 6 of 6
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather SUNNY 90°F
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 119.5 ft		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								100				
								101				
								102				
-	-	100	1420	103	104.5	SPT	S23	103	15	(50) V. STIFF, MOIST, LT bluish gray CLAY (CH)		
								1.3	24			
								104	26	(MATERIAL was pulled back through auger on retrieval)		
								105				
								106				
								107				
-	5	95	1425	100	109.5	SPT	S24	108	13,	(50/5") TOP 1.2' APPEARED to be sloughy		
								2'	50/5"	V. STIFF, DAMP, lt bluish gray to lt gray		
								109		st. sandy silty CLAY. (CL)		
								110				
								111				
								112				
65? -	30	70	1450	113	114.5	SPT	S25	113	16	(46) only 1.6 was sample 0.3 - sloughy "and soft" - st. stiff moist, gray		
								1.9	18	p.g. sandy CLAY w/ (CL)		
								114	28	LAYERS of clayey sand		
								115				
								116				
								117			(High blow counts + soft sample sample may not be indicative)	
-	10	90	1510	118	119.5	SPT	S26	118	50/4"	POOR RECOVERY MOST OF SAMPLE IS SLOUGH		
								2'		BOTTOM		
								119		OH SOFT, GRAY, MOIST ~~CLAY~~ CH ~~w/ SAND~~ sandy CLAY		
								120		BOTTOM OF BORING AT 119.5 ft 5/7/10		

Attachment Figure A.1-26

Soil Boring Processing Log

ANCHOR QEA

Boring Location: WATER DEPTH 5.0 Ft to Deck 1315 5/6/10

Elevation: Datum:

Obs. Well Install. Yes No

Boring SJGB008 Date 5/6/10 Sheet 1 of 3

Job San Jacinto Waste Pits Job No. 090557-01

Logged By Laplante / MaC Donald Weather Clear 85°

Drilled By Triangle Resources - Joe Luder

Drill Type/ Method Rotary

Sampling Method SPT & Push ATD Water Level Depth

Bottom of Boring

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
0	60	40	1320	0	1.5	X	S-1	0–1.5	0, 0, 0	(0) very loose, moist to wet, dark gray clayey silty SAND with organics		
0	75	25	1325	4	5.5	X	S-2	4–5.5	0, 0, 0	(0) v. loose, moist to wet, dark gray slightly clayey to clayey SAND.		
0	55	45	1330	8	9.5	X	S-3	8–9.5	1, 0, 1	(1) very loose, moist, dark gray clayey SAND		
0	40 ~~60~~	60 ~~40~~	1335	13	14.5	X	S-4	13–14.5	1, 1, 2	(3) ~~very loose~~ Soft, moist to wet, dark gray ~~clayey~~ fine SANDY CLAY		
0	10	90	1340	18	19.5	X	S-5	18–19.5	1, 1, 3	(4) soft, moist to wet, dark gray CLAY		

Attachment Figure A.1-27

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB008 Date 5/6/10 Sheet 2 of 3
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By Laplante/ MacDonald Weather Clear 90°
	Drilled By Triangle Resources
	Drill Type/ Method Rotary
Elevation: Datum:	Sampling Method SPT ATD Water Level Depth
Obs. Well Install. Yes No	Bottom of Boring

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
5	10	85	1345	23	24.5	X	S-6	23–25	9, 9, 13	(22) Very stiff, moist, blue gray CLAY with brown mottling. (Beaumont)		
0	5	95	1400	28	29.5	X	S-7	28–30	11, 12, 20	(32) Hard, damp to moist, blue gray and brown CLAY (Beaumont)	Gray Brown	
0	5	95	1405	33	34.5	X	S-8	33–35	8, 17, 19	(33) Hard, damp, brown & red CLAY (Beaumont) with scattered black clasts		
0	5	95	1415	38	39.5	X	S-9	38–40	12, 14, 17	(31) Hard, damp, brown and red CLAY (Beaumont)		

Attachment Figure A.1-28

Soil Boring Processing Log

ANCHOR QEA

Boring Location:

Elevation: Datum:

Obs. Well Install. Yes No

Boring STGB008 Date 5/6/10 Sheet 3 of 3

Job San Jacinto Waste Pits Job No. 090557-01

Logged By Laplante / MacDonald Weather Clear 90°

Drilled By Triangle Resources

Drill Type/ Method Rotary

Sampling Method SPT-R ATD Water Level Depth

Bottom of Boring

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
0	80	20	1425	43	44.5	X	S-10	43–44	21, 32, 36	(68) Very dense, moist lt gray clayey fine SAND		
								47		– ? – ? – ? – ? – ? – ? –		
0	10	90	1430	48	49.5	X	S-11	48–49	15, 15, 20	(35) Hard, moist blue-gray, sl. sandy silty CLAY		
0	10	90	1440	53	54.5	X	S-12	53–54	16, 18, 34	(52) Hard, moist, blue-gray, sl. sandy silty CLAY		
0	80	20	1450	58	59.5	X	S-13	58–59	12, 14, 46	(60) Very dense, moist, blue gray clayey SAND		
								60		BOTTOM OF HOLE 59.5 FT		

1450 5/6/10

Attachment Figure A.1-29

Soil Boring Processing Log

ANCHOR QEA

Boring Location: Pull Cathead Rope SPT MANUAL	Boring SSCB3009 Date 10/26/10 Sheet 1 of 2
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By WES MACDONALD Weather SUNNY
	Drilled By TRIANGLE RESOURCES Joe Wells, Mark (PSI) Charles
	Drill Type/ Method ~~25~~ ROTARY
Elevation: Datum:	Sampling Method 2' SPT 2' ST ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 30 ft Level Depth

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
–	5	95	~~1115~~ 1120 1130 1130	0	2	ST	CRI-A CRI-B S1	0 1.8' 1 2		SOFT, MOIST, GRAY, PULP WASTE (soft) w/ H2S odor sl. sandy; no plasticity, blocky	#2 samples taken ~6" apart for chemchap	PULP WASTE (ML)
–	5	95	1150	2	4	SPT	S2	2' 3	0 0 0 0	@1.3 dk brownish gray ~~silty~~ SILT (ML) w/peat increased plasticity / w/ hair-like fibers w/ H2S ODOR to organics (Mangrove?)		
–	5	95	1200	4	6	SPT	S3	1.5' 5	0 0 0 0	WOR; @ WOR, V. soft, gray to lt gray, wet silty CLAY tr. sand + @ 0.4' LARGE amount of organics (OL) @ bottom w/ strong chemical-like odor; 1% organics + shells (organics)		
–	5	95	1215	6	8	SPT	S4	6 7	0 1 2	WOR @ V. soft, wet, dk gray, silty CLAY w/ tr. sand w/ moderate chemical-like odor tr. organics in the form of small wood chunks	S4 from bottom of sample	(CH)
–	15	85	1230	8	10	SPT	S5	1.3 9	1 3 3	@ soft, same as above	Shelby tube attempted @ 8' (No Recovery) Resample w/ SPT	SP
–	15	85										
–	85	15	1245	10	12	SPT	S6	10 1 2		@ 0.6' soft, moist, gray w/ black splotches, sandy (fine to med grained) CLAY	Sample S5 from lower portion (SP)	
			WAM							@ V. soft, moist gray w/ black splotches sl. sandy CLAY (CL)		
–	~~20~~ 40	~~80~~ 60	1310	13	15	SPT	S6	3 11' 4	0 1 0	@ 0.7 loose, wet, lt gray SAND slightly clayey Md. grained SP to SC 13-15'	no sample @ 10' ST NR	SP
								5 6 7		@ Soft, wet lt. gray, m.g. sandy CLAY w/ alternating layers of CLAY + SAND clayey sand towards bottom		CL
5	85	10	1430	18	20	SPT	S7	8 1.2' 9 20	10 15 25	@ Dense, moist, lt gray coarse to M.G. sand w/ tr. fine gravel + occassional pockets of gray tr. fine shells	*problem w/ R16 SPT Hoist; Rig hoist temp. fixed perhaps not 30" fall	

Soil Boring Processing Log

ANCHOR QEA

Boring Location: SPT CATHEAD MANUAL PULL	Boring A2 SJGB009	Date 10/26/10	Sheet 2 of 2
	Job San Jacinto Waste Pits		Job No. 090557-01
N	Logged By WES MACDONALD		Weather Mo. Sunny 90°F
	Drilled By TRIANGLE RESOURCES (PSI) Mush Buggy		
	Drill Type/ Method ROTARY (MUD) NO CIRCULATION		
Elevation: Datum:	Sampling Method 2'SPT / 2'ST		ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 30 FT		Level Depth

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
								20				
								1				
								2				
								3		(91) Dense, wet, lt gray, Clayey SAND SC		
–	70	30	1500	23	24.5	SPT	58	1.7' 4	9 18 23	SAND w/ pockets/layers of Clay 0.6' FT LAYER OF Gray SOFT CLAY @ 0.3' Subrounded wht, black + brown grains.	Sample had larger amount of Clay	(SC)
								5				
								6				
								7			blow counts may be overestimated due to manual pulling (not 30") + hammer not pulling directly over rods consistently	(SP)
–	95	5	1520	28	29.5'	SPT	59	8 1.7' 9	6 12 23	(35) Dense, moist, lt gray, fine to med grained SAND (SP) @ 0.3' grades to Coarse grained SAND w/ Fine grav		
10	90	–						30				
								1				
								2		BOTTOM OF BORING 29.5' 1530 10/26/10		
								3				
								4				
								5				
								6				
								7				
								8				
								9				
								0				

Soil Boring Processing Log

ANCHOR QEA

Boring Location: drilling @ sol angle	Boring SJGB010	Date 10/28/10	Sheet 1 of 1
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By WES MACDONALD		Weather sunny windy 80°F
	Drilled By TRIANGLE RESOURCES (PSI)		MARSH BOGGY
	Drill Type/ Method ROTARY 4 1/4" BIT		
Elevation:	Sampling Method 2' SPT / 2' ST		ATD Water
Datum:	Bottom of Boring 15 FT		Level Depth
Obs. Well Install. Yes (No)			

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
-	15	85	1500 1505 1510	0	2	ST	CR1-A CR1-B S1	0 1.4		0' to 0.2' (V. soft) brown, moist ~~sandy~~ organic SILT w/ abundant roots tr. H2S odor; 0.2' to bottom (V. soft), gray, pulp waste material w/ abundant roots & large woody debris up to 3" long tr. black @ bottom		OL; pulp waste; black marsh
-	5	95	1540	2	4	SPT	S2	1.7	0 0 0 0	② V. soft, wet, black, SILTY CLAY tr. unknown odor (marsh) tr. sand in sampler shoe M.D. dense moist. gray SAND		
-	-	-	1600	4	6	SPT	S3	0'	4 6 8	(14) NO RECOVERY		
-	70	30	1610 1630	6	8	SPT	S4	1.2'	10 7 8 8	(16) Md. dense, wet, lt. gray to gray SAND SP fine to medium grained 0.5' to 0.9' soft, wet, gray sandy clay tr. unknown odor @ top Layer of shell hash (0.1') @ 0.6' Shells throughout (fragmented) top to 0.5'	tram	SP
-	90	10	1615	8	10	SPT	S5	1.1'	10 3 4 4	(8) loose, wet, lt gray to lt gray sl. silty f+m SAND (SP) layer of shells from 0.6 to 0.7'		
-	90	10	1620	10	12	SPT	S6	1.2'	3 4 5 7	(9) loose, wet, lt. gray, f to m SAND (SP) w/ tr. silt/clay pockets towards bottom layer of shells from 0.7 to 0.8'		
			1625	13	15	SPT	S7	1.3'	5 4 9 16	(28) Md. dense, wet to moist, lt gray (13) f to m gr. SAND (SP) w/ seams of gray clay w/ tr. shells in clay		
								15		BOTTOM OF BORING 15', FILLING HOLE w/ MEDIUM BENTONITE CHIPS <5' below "pulp paper mill waste" DONE 1630 10/28/10		

Attachment Figure A.1-32

Soil Boring Processing Log

ANCHOR QEA

Boring Location: SJGB011	Boring SJGB011	Date 10/29/10	Sheet 1 of 1
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By WES MACDONALD		Weather SUNNY 55°F
	Drilled By TRIANGLE RESOURCES (PSI)		MARSH BUGGY
	Drill Type/ Method ROTARY 4¼" BIT		
Elevation:	Sampling Method 2' SPT / 2' ST		ATD Water
Datum:	Bottom of Boring 20'		Level Depth
Obs. Well Install. Yes (No)			

Gravel	Sand	Fines	Time/ PID	DEPTH From	DEPTH To	SAMPLE Type	SAMPLE Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
–	5	95	830 835	0 0.6 0	6" 12" 2	ST	CR1A CR1B	0 2' 1		(V. soft), moist, gray to lt gray, sl. sandy SILT, block texture, occassionally non plastic w/ occ. organics + occassional small shells,	2 SHELBY TUBES TAKEN FROM 0-2' DIRECTLY NEXT TO EACH OTHER FOR SAMPLE VOLUME BOTH COMPOSITED	RUP WASTE
			840	1	2		S1	2		@ 1.9' black, (v. soft) moist clay.		
–	<5	100	850	2	4	SPT	S2	1.9' 3 2.4'	0 0 0 0	lt gray to silver pockets moderate in upper 6" sl. H2S ODOR		MUCH
								4		@ WOR, v. soft, wet, gray to dk gray silty CLAY (MUD) w/ unknown odor		
–	–	–	900	4	6	ST NR	S3	1.6' 5 4-6	0 0 0 0	Shelby Tube No Recovery sampling w/ SPT		
–	<5	100				SPT		6	0			
–	<5	100	910	6	8	SPT	S4	1.4' 7	0 0 0	@ WOR, v. soft, same as above black to gray w/ flat fibrous chunk ~½" w/ unknown odor		
60	60	40						8	0		054 large small, hand chunks of debris in upper CLAY SAMPLE + sloughs	
–	50	50	920	8	10	SPT	S5	6-8 1.9 9	0 0 2	@ v. soft same as above w ~1.1' Md dense, moist, lt gray sand w/ layers (0.1') of gray w/ black patches, CLAY		C.L. SC
								10	3			Sand w/ clay
–	85	15	930	10	12	SPT	S6	8- 1.2' 1	3 3 6	@ soft, moist, gray w/ patches of brown, v. sandy silty CLAY (CL) w alternating layers of Clay + Sand lt gray w/ 2 layers of wood @ 1' + 0.2' (broken thick)		~~SC/SP~~ SP/SC
								2	7			
–	85	15	940	13	15	SPT	S7	3 1.0' 1.2' 1' 4 5	2 5 7 9	tr. organics throughout ~~[illegible]~~ (?) @ loose, wet, lt gray, clayey SAND (SC) w/ layers of clay (0.1') in (SP) f to m. grained sand		
								5				
								6		13-15 @ Md. dense same as above		
								7				
–	95	5	950	18	20	SPT	S8	8 9 1.2' 20	2 7 14 13	@ Md. dense, wet, lt gray, Md grained sl. clayey SAND (SP) tr. pockets of clay w/ tr. fine gravel @ 0.1 fine grained silty sand		SP
										BOTTOM OF BORING 20 FT		

BACKFILLED w/ 4 BAGS OF MED. BENTONITE CHIPS
10/29/10 1006

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB012	Date 10/28/10	Sheet 1 of 1
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By Wes MacDonald		Weather Sunny 70°F Windy
	Drilled By Triangle Resources (PSI)		
	Drill Type/ Method Rotary	Marsh Buggy	
Elevation:	Sampling Method 2' SPT 2' ST		ATD Water
Datum:	Bottom of Boring 20 ft		Level Depth
Obs. Well Install. Yes / No			

Gravel	Sand	Fines	Time/ PID	Depth From	Depth To	Sample Type	Sample Number	Depth/ Sample Recovery	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
–	5	95	0930 935 940	0	2	ST	CRI-A CRI-B S1	0 2.2' 1 2		Soft, moist, gray to brown, Sandy SILT, w/ abundant organics roots w/ H2S odor @ 0-8' LAYER OF ORGANICS @ sample bottom 2.2' wet (v. soft) black	2 STs taken directly next to each other	Pure waste/ topsoil
–	10	90	1245	2	4	SPT	S2	2 3	0 0 0 0	@ WOR. v. soft, wet, Black w/ sl. sandy CLAY w/ (MUCK) w/ unknown odor	live fiddler crab at surface	Muck Buffer CL
–	<5	100	1330	4	6	SPT	S3	4 1.5' 5	0 0 0 0	WOR @ SAME AS ABOVE w/ pocket of gray unknown round debris @ 0.3' tr. hairline fibers (cankroach)	After S1 rig moved to assist w/ Vibracoring + haul Benchmarks taken across site	
–	–	–	1345	6	8	ST	S4	6 2' 7	0 0	SHELBY TUBE		
–	35	65	1350	8	10	SPT	S5	8 1.4' 9	0 0 3	(3) Soft, wet, gray sandy CLAY w/ unknown particles (flat + rounded) (similar to OO1). w/ unknown odor @ 0.5 Md dense, wet, lt gray SAND m grained SP	Resume on location @ 1245 10/28/10	SP
–	100	<5						10	7 7			
–	80	20	1400	10	12	SPT	S6	1 1.9 2	6 9 13	(15) Md. dense, wet, lt gray, clayey silty SAND fine to medium grained SAND (SM-SC) w/ pocket ~~+ layers~~ up to 1cm seams w/ occasional organics (wood debris)		
–	95	5	1410	13	15	SPT	S7	3 1' 4 5	0 0 13 11	(13) Md. dense, moist, lt gray sl. silty SAND SP w/ tr. pockets of Clay. w/ flat metal shavings in sampler that appear to be flakes off of SPT split spoon sampler		
								6 7				
–	95	5	1420	18	20	SPT	S8	8 1.5' 9 20	6 16 28 32	(44) V. dense, moist to wet, lt gray SAND (SP) m-f grained sand w/ tr. seams of ~~clay~~ sandy CLAY		

BOTTOM OF BORING 20'. FILLING UP HOLE W/ MD. BENTONITE CHIPS (7 bags)
DONE 10/28/10 1450

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 12.3' MUDLINE

Elevation: Datum:

Obs. Well Install. Yes No

Boring SJGB 013 Date 5/11/10 Sheet 1 of 1

Job San Jacinto Waste Pits Job No. 090557-01

Logged By WES MACDONALD Weather SUNNY 90°F

Drilled By TRIANGLE RESOURCES

Drill Type/ Method ROTARY

Sampling Method SPT/ST ATD Water Level Depth

Bottom of Boring 10

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
–	5	95	1045	0	2	ST push	S1	0, 2', 1		0 to 2.0 Very soft, wet, dark gray w/ occasional gray pockets, sl sandy silty CLAY w/ trace organic fibers + shells, trace H2S/chem odor when initially broken. Layer of whole shells near (0.2) surface	ML/OL	
–	5	95	1100	2	4	ST push	S2	2, 2', 3		2.0 to 3.5 Very soft, wet, dk gray w/ pockets of gray, sl. sandy SILT + CLAY w occasional organic debris, decreasing moisture + increasing cons. w/ depth to moist + med. stiff.		
–	80	20						4		3.5 to 4 ft Loose, wet, gray SAND w occasional silt + clay pockets.	SP	
–	5	95	1150	4	6	ST PUSH	S3	2', 5		SAMPLE was very disturbed upon extrusion. ~~0 to~~ 4 to 5.6 Very soft, wet dark gray/w pockets of gray, sl. sandy SILT, ~~trace~~ 5.6 to 6 MD. dense, wet, gray sl silty SAND		
–	85	15						6				
			1210	6	8	ST	S4	7				
–	95	5	1230	8	10	SPT	S5	8, 1.5, 9, 10	5, 7	Over recovery in ST. SPT sample. (14) MD. Dense, wet, gray sl silty fine to med grained SAND sub rounded		

BOTTOM OF BORING 10 ft COMPLETED 12:30 5/11/10

Attachment Figure A.1-35

Soil Boring Processing Log

ANCHOR QEA

Boring Location: depth to mudline 2.6 FT

Elevation: Datum:

Obs. Well Install. Yes (No)

Boring SJGB014 Date 5/10/10 Sheet 1 of 2

Job San Jacinto Waste Pits Job No. 090557-01

Logged By ~~MM~~ WES MACDONALD Weather p.sunny/windy 80°F

Drilled By TRIANGLE RESOURCES

Drill Type/ Method ROTARY

Sampling Method SPT/ST ATD Water Level Depth

Bottom of Boring 12

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
			1000	0 0	2 1.5	ST ☑ SS ☒ SPT	NR	0 NR 1	2 1 3	1ST ATTEMPT w/ TUBE, NO RECOVERY TRY AGAIN WITH SPLIT SPOON No recovery w/ split spoon strong chemical-like odor (similar to -002) from sounding equipment		
–	5	95	1015	2	4	ST	S2	2 1.8'		SOFT, MOIST DARK GRAY TO OLIVE GRAY cl. sandy SILT w/ TRACE ORGANICS 0' to 1.8' to 0.3 ft STRONG H2S ODOR		
–	55	45						3		0.4 0.3 ft, Gray, st wet silty sand		
–	~~85~~ 15	~~8~~ 85	1030	4	6	ST	S3	4 1.9		0' to 1.3' appears to be soft dk gray wet, sandy SILT (possible sloughs from drag down + fallen. CLAM SHELL observed at material boundary wood fibers		
–	~~50~~ 95	~~85~~ 5						5		1.3 to 1.9' (loose) wet, gray sl. silty SAND		
–	70	30	1035	6	8	SPT	S4	6 0.8'	1 1	0' to ② Loose, wet, gray, silty SAND w/ dark gray silt w/ trace wood fragment in silt.		
			1140	8	10	ST	S5	7 8	1	SHELBY TUBE FOR GEOTECH		
								9 10				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SS6B00 014	Date 5/10/10	Sheet 2 of 2
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather SUNNY 80°F WIND FROM SOUTH
	Drilled By TRIANGLE		
	Drill Type/ Method Rotary		
Elevation: Datum:	Sampling Method SPT / ST		ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 12		Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
–	40	60	1150	10	12	ST	S6	10		SOFT, WET, DK gray sandy SILT w/ trace shell fragments		
								1.5				
								11				
								12		BOTTOM OF BORING 12' COMPLETED 5/10/10 1150		
								13				
								14				
								15				
								16				
								17				
								18				
								19				
								20				

Soil Boring Processing Log

ANCHOR QEA

Boring Location: MUDLINE 7.4 FT	Boring SJGB015 Date 5/10/10 Sheet 1 of 1
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By WES MACDONALD Weather SUNNY 85°F WIND FROM SOUTH
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT/ST ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 10 FT

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
		15/5	→			PUSH		0		SOFT, MOIST GRAY SANDY SILT		
	20	80		0	2	ST	S1			w/ occasional layers of SAND (<0.1')		
								1		+ brown silty wood @ 1.1 TO 1.8 (<0.1')		
										sl. H2S odor.		
								2		SOFT, DAMP, gray to dk gray sandy		
	15	1525 85	→	2	4	ST PUSH	S2	1.8		SILT w/ occasional pockets of CLAY		
								3				
								4	0	INITIAL TRY WITH ST resulted in NR TRY W/ SPT		
	15	1540 85	→	4	6	SPT	S3	1.5	0	WOH SAME AS ABOVE		
								5	0			
		1600	→			SPT		6	0	NO RECOVERY IN ST. TRY SPT		
	10	90		6	8		S4	0.9		WOH SOFT, WET, GRAY TO DK GRAY SANDY CLAY (CL)		
								7	0			
									0			
			1625			ST		8		Not extruded. Shelby tube for geotech		
				8	10		S5	8' 9				
								10		BOTTOM OF BORING 5/10/10 1625		

Attachment Figure A.1-38

Soil Boring Processing Log

ANCHOR QEA

5/10/10

Boring Location: 3.5 Depth from water to mudline 1210	Boring SJGB016	Date ~~5/9/10~~	Sheet 1 of 2
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By MACDONALD		Weather SUNNY 80F wind from S
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT + ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 12FT		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
			1210	0	2	ST	S1	0		0 to 0.1 loose, wet, grave sl. silty SAND w/ trace wood debris	This sample was logged in reverse order from ~~bottom~~ top to top.	
–	5	95						2' 1		0.1 to 1.1 soft, moist, dk gray to black (CH OH) CLAY w/ trace wood debris		
										1.1 to 1.4 soft, moist dk brown to dk gray organic silt w/ moderate wood debris + mod. chem-like odor		
								2		1.4 to 2 soft, moist, gray clayey SILT w/ mod. chem-like odor		
–	30	70	1230	2	4	ST	S2	1.1		1.1 0.8 ~~1.1 to 1.8~~ dk gray, soft sandy silt, damp 0.8 0.6 ~~1.8 to 0.8~~ lt gray, wet, SAND loose		
								3		0.8 to 0.4 dk brown, damp, SILT w/ wood debris 0.6		
										0.4 to 0.8 M. dense, dk lt gray SAND w/ occasional silt pockets		
			1350	4	6	ST	S3	4 2' 5		NOT EXTRUDED (Geotech)		
–	20	80	1406	6	8	ST	S4	6 2' 7		STIFF, MOIST, GRAY sandy SILT w/ occasional pockets + layer of lt. gray SAND		
			1410	8	10	ST	S5	8 2' 9		SOFT, WET, GRAY SANDY SILT w/ layers of sand occasional ~~Nut shell AT 0.2FT~~ intact trace shells throughout		
								10				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB 016	Date 5/10/10	Sheet 2 of 2
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By Wes MacDonald		Weather SUNNY 85°F WIND FROM S
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 12 FT		

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
			1425					10		Not extruded		
				10	12	ST	S6	2'		GEOTECH BORING		
								11				
								12		BORING TERMINATED		
								3				
								4				
								5				
								6				
								7				
								8				
								9				
								10				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:
2.9' depth from water to mudline
3.7' " " deck " "

Elevation: Datum:

Obs. Well Install. Yes (No)

Boring SJGB017 Date 5/11/10 Sheet 1 of 2
Job San Jacinto Waste Pits Job No. 090557-01
Logged By WES MACDONALD Weather sunny 80°F
Drilled By TRIANGLE RESOURCES (J)
Drill Type/ Method Rotary
Sampling Method SPT/ST ATD Water
Bottom of Boring 12 Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
–	10	90	0830	0	2	ST push	S1	0		0 to 0.3 Loose, wet, gray silty SAND	wood in sand	
										0.3 to 2 Soft, moist to damp, dk gray to black CLAY to SILT w/ trace organic fibers	wood on the border of two soils	
								2' 1		Long, skinny clam at soil horizon (intact)		
–	<5	100	0845	2	4	ST push	S2	2		0 to 1.7 soft to mod. stiff, dk gray to blk, damp CLAY		
								2.2'		thin sandy layer @ 1.7'		
								3		1.7' to 2.2' soft, dk brown/dk gray CLAY w/ moderate organic fibers		
–	25	75	0900	4	6	SPT	S3	4	0	ATTEMPTS TO OBTAIN SAMPLE w/ PUSH TUBE FAILED. SAMPLE OBTAINED w/ SPT.		
								1.5 5	0	WOH SOFT, WET, GRAY, sandy SILT w/ occasional interbeds of black CLAY		
									0			
								6	0	ATTEMPTS OF ST FAILED. SPT used. WOH		
–	20	80	0915	6	8	SPT	S4	1.4	0	SAME AS ABOVE		
								7	0			
			0930	8	10		S5	8		Not extruded		
								2' 9		Geotech sample		
								10				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJSBB17	Date 5/11/10	Sheet 2 of 2
	Job San Jacinto Waste Pits		Job No. 090557-01
	Logged By W. MACDONALD		Weather SUNNY 85°F
	Drilled By TRIANGLE RESOURCES		H. breeze SE
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST		ATD Water
Obs. Well Install. Yes (No)	Bottom of Boring 12		Level Depth

Grain size (%) Gravel	Sand	Fines	Time/ PID	DEPTH From	To	SAMPLE Type	Number	DEPTH/ SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMM. LOG (Water & Date)
—	90	10	1015	10	12	SPT	S6	10	0	ATTEMPTED SAMPLE w/ push ST. NO Recovery sample & obtained via SPT		
										for recovery.		
								11	0	(WOH) (MD dense) wet, lt gray sl. silty SAND in sampler head.		
								0.3	0			
								12		BOTTOM OF BORING 12' 10:20 5/11/10		
								3				
								4				
								5				
								6				
								7				
								8				
								9				
								10				

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Giamalva
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJGB18
DATE BEGAN 12/3/18
DATE COMPLETED 12/3/18
TOTAL DEPTH 52'
PAGE 1 OF 3

Field location of boring: Water depth to RWD - 20 ft

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION (Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil)	GRVL %	SND %	FNS %
SS	1	SJGB018-G01	.4	0-2'			very soft, wet, black slimy silt with small gravel	10		90
↓	WOH	SL0860			1					
		1050								
	↓				2		Casing sunk in this material to a depth of 8'			
					3					
					4					
					5					
					6					
					7					
					8					
SS	4	SJGB018-G02	1.0	8'-10'			@ 8.8': black slime			
↓	2	SL0861			9		@ 9': very loose wet light grey fine SAND grades to silty SAND @ 9.6'	~~100~~ 10	~~50~~ 50	100 ~~90~~
	WOH	1120								
	WOH				0					
SS	WOH	SJGB018-G03	1.9	10-12			very soft light grey moist SILT with clay			
↓	WOH	SL0862		(30-32)	1					100
	WOH	1135								
	WOH				2					
ST	PUSH	SJGB018-G04	2	12-14						
↓	↓	SL0863			3					
		1150								
					4					
					5					
SS	WOH	SJGB018-G05	1.4	14-16			loose, wet, coarse SAND with CLAY lamations, CLAY at 15.8'	5	60	35
↓	2	SL0864			6					
	7	1300								
	8				7					
SS	4	SJGB018-G06	1.7	16-18'		CL	stiff, damp to dry, bluish grey CLAY			100
↓	9	SL0865			8					
	13	1315								
↓	17				9					
					0					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-1

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Gimakos
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER inches SAMPLING METHOD in. by ft

BORING # SJGB018
DATE BEGAN 12/3
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLING DATA: SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	5	SJGB018-G07	1.8	~~18-20~~ (40-42)	1		SAA @ 18': Color changes to yellowish brown CLAY			100
↓	8	SL0866								
	14	1330								
↓	17				2		SAA to 21'			
SS	1	SJGB018-G08	2.0	20-22						
↓	3	SL0867			3		21': orangish brown damp CLAY with gravel	5		95
	9	1345								
↓	17				4					
					25					
ST	PUSH	SJGB018-G09	2.0	25-27'			SAA @ 21'			
↓	↓	SL0868		45-47	26					
		1405								
↓	↓				27					
					28					
					29					
S		S			30					
SS	5	SJGB018-G10	2.0	30-32'		CL	V Stiff reddish brown dry CLAY			100
	13	SL0869		50-52	31		PP: 4.5 TSF			
↓	18	1435					VT: .6 ksf/cm²			
	25				32					
					33					
					34					
				40-42'	35	→	driller pushed to 40' from 30' skipping 35' by mistake.			
SS	20	SJGB018-G11		~~35-37~~						
↓	44	SL0870		55-57	36					
	48	1510								
↓	50				37					
↓	↓			↓	38					
					39					
↓	↓				40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-2

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER inches SAMPLING METHOD in. by ft

BORING # SJGB018
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH
PAGE 3 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLING DATA: SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	20	SJGB018-G11	2.0	40-42			very dense dry light grey SILTY FINE		60	40
	44	SL0870			1		SAND with clay lamination			
	48	1510								
	50				2					
					3					
					4					
					5					
ST	Push	SJGB018-G12	2.3	45-47'			SAA @ 40', wood fragment at 45'			
		SL0871			6					
		1545								
					7					
					8					
					9					
					0					
SS	WOH	SJGB018-G13		50-52'			stiff, dry to damp, light grey SILTY			100
	4	SL0872			1		CLAY.			
	11	16					Boring complete @1405			
	16				2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					0					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-3

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Giannaka
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches

BORING # SJGB019
DATE BEGAN 12/2
DATE COMPLETED 12/3/18
TOTAL DEPTH 57'
PAGE 1 OF 3
SAMPLING METHOD 3 in. by 2 ft

Field location of boring
Water depth to TOD: 20'
Water depth to MI: 16'

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	3	SJGB019-601	0.1	0-2'			rock in catcher, no sample recovered.			
↓	WOH	SL0847		~~(19-21)~~	1		very loose sand (grey) with dark substance		50	50
↓	WOH	1225		(20-22)						
	WOH				2					
					3					
					4					
SS	WOH	SJGB019-602	0.4	4-6'			rock in catch, minimal recovery.			
↓	↓	SL0848		(24-26)	5		very soft dark grey CLAY w/ silt			100
		1245								
SS	WOH	SJGB019-603	.7	8'-10'	6					
↓	↓	SL0849		~~6-8~~ SG			casing fell under own weight to			
		~~1251~~ 1300		~~26-28~~	7		10', sample depth actual 8'-10'			
				28-30			Very soft dark grey moist silty CLAY			100
					8		catcher forced inside of SS.			
					9		Casing sunk under weight, 30' casing, 33' hole			
SS	WOH	SJGB019-604	2.0	~~10-12~~ SG	10					
↓	↓	SL0850		13-15	11		Very soft, moist, dark grey silty CLAY			100
		1325		(33-35)			@13.6' grades to loose grey medium			
↓	5	↓		↓	12		Silty SAND with clay lamations	60	40	
~~ST~~	~~PUSH~~	~~SJGB019-604~~ SG		~~35-37'~~	13					
↓	↓	~~SL0851~~			14					
ST	PUSH	SJGB019-604		15-17	15					
↓	↓	~~SL0851~~ 56		(35-37)	16		No Sample recovered,			
		1345					hit rock or gravel? bent shelby.			
					17		Sheared off bolts			
					18					
					19					
					20					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-4

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Giannakos
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJGB019
DATE BEGAN 12/2
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	WOH	SJGB-019-G05	2.0	20-22	21		Stiff, dry to damp, yellowish brown CLAY			100
	4	SL0851		(40-42)			redish brown layer @ 20.1'			
	8	1400			22		PP: 2.25, VT: 4.25			
	11									
					23					
					24					
					25					
ST	PUSH	SJGB019-G06	1.0	25-27	26		SAA @ 20'			
		SL0852		(45-47)						
		1425			27					
					28					
					29					
					30		Sluss ontop of sample.			
SS	7	SJGB019-G07	1.7	30-32	31		Hard, dry. reddish brown CLAY			100
	13	SL0853								
	20	1450			32					
	26									
					33					
					34					
					35					
SS	WOH	SJGB019-G08	2.0	35-37	36		Very soft, moist, orange brown			100
	~~WOH~~	SL0854					marbled with bluish grey clayey SILT			
	WOH	1530			37					
	3									
					38					
					39					
					40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-5

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Giannakos
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: in. by ft

BORING # SJGB019
DATE BEGAN 12/2
DATE COMPLETED 12/3
TOTAL DEPTH ~~62'~~ 57'
PAGE 3 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	7	SJGB019-09	2.0	40'-42'						
	11	SL0855		(60-62)	41	CL	Hard, dry, reddish brown marbled with bluish grey CLAY			100
	17	1600								
	26				42					
					43					
					44					
SS	PUSH	SJGB019-G10	2.3	45-47'	45		SAA @ 40'			
		SL0856		(65-67)						
		1630			46					
					47					
					48					
					49					
SS		SJGB019-G11	2.0	50-52	50		Stiff, dry to damp, light bluish grey to dark grey CLAY. Woody fragments when broken apart			100
	6	SL0857								
	7	0840			51					
	10									
	14				52					
					53					
					54					
SS					55					
	4	SJGB019-G12		55-57'						
	8	SL0858			56		Stiff dark grey dry to damp CLAY grades to SILTY CLAY @ 56.5			100
	6	~~0920~~ 915								
	13				57					
SS		SJGB019-G13		~~60-62~~	58		Driller hit sand @ ~57', brought up drill head and slurry of wet sand fell out. Sample w/ approx depth taken, no SPT			
		SL0859		~59'	59					
					60					
					61					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes: light grey sand w/ very little silt 80:20
end of boring @ 935

Attachment Figure A.2-6

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Giannuka
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches

BORING # SJGB020
DATE BEGAN 12/1/2018
DATE COMPLETED 12/2/18
TOTAL DEPTH
PAGE 1 OF 3
SAMPLING METHOD 3 in. by 2 ft

Field location of boring
Water depth to TOD: 10'
Water depth to ML: 6' (WL to TOD: 4')

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	9 7 11 9	SJGB020-G01 ~~SL0832SG~~ 1245	0	0-2' (10-12')	1 2 3 4		No sample recovered (rock in catcher) Shell fragments inside a wood spoon.			
SS	1 2 WOH WOH	SJGB020-G02 SL0832 1255	1.0	4-6' (14-16')	5 6		very loose, moist to wet, dark grey SAND with gravel (picture labeled G01)	5	90	5
SS	WOH WOH WOH WOH	SJGB020-G03 SL0833 1300	2.0	6'-8' (16-18)	7 8		very loose, wet dark silty Sand		80	20
SS	WOH WOH WOH	SJGB020-G04 SL0834 1325	1.7	8'-10' (18-20)	9 0		very loos, moist, dark grey silty SAND with Clay	5	60	35
ST	PUSH	SJGB020-G05 1335	—	10'-12' (20-22)	1 2		NO Sample recovered			
ST	PUSH	SJGB020-G06 SL0835 1350	0.4	12-14 (22-24)	3 4		~~SAA~~ Clayey Silt recovered.			
SS	WOH WOH WOH	SJGB020-G07 SL0836 1415	2.0	15-17 (25-27)	5 6		very soft dark grey, damp silty CLAY grades to silty gravel @15.8'	5 60	10 ~~85~~ 40	
ST	PUSH	SJGB020-G08 SL0837 1425	0.6	17-19	7 8					
~~SS~~		~~SJGB020-G10~~ SG ~~SL0838~~			9 20					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-7

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER: inches SAMPLING METHOD: in. by ft

BORING # SJGB020
DATE BEGAN 12/1/2018
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	5	SJGB020-G10	2.0	20-22	21		loose, damp to moist light grey, med to coarse SAND.		100	
	6	SL0838		(30-32)						
	6	1415			22		@22': Beaumont ? reddish brown CLAY		10	90
	13									
					23					
					24					
SS					25					
SS	2	SJGB020-G11	1.9	25-27	26	CH	Stiff, damp, Orangish brown + bluish grey CLAY			100
	4	SL0839		(35-37)						
	6	1505			27		lamination of fine wet SILT @ 26'			
	10									
					28					
					29					
					30		Stiff, damp, yellowish CLAY			100
SS	1	SJGB020-G12	2.0	30-32	31					
	6	SL0840		(40-42)						
	6	1520								
	8				32					
					33					
					34					
ST					35		SAA @ 30'			
	PUSH	SJGB020-G13	2.0	35-37	36					
		SL0841		(45-47)						
		1540			37					
					38					
					39					
					40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-8

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Giannako
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER: inches SAMPLING METHOD: in. by ft

BORING # SJGB020
DATE BEGAN 12/11/2018
DATE COMPLETED 12/12/18
TOTAL DEPTH 62'
PAGE 3 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	8	SJGB020-G14	2.0	40-42			Hard, dry, orangish brown CLAY			
	16	SL0842			41		VT: .7			10
	22	1620					PP: >4.5 TSF			
	29				42					
					43					
					44					
					45					
ST	PUSH	SJGB020-G15	2.3	45-47						
		SL0843		(55-57)	46		SAA @ 40'			100
		0820 (12/2)								
					47					
					48					
					49					
SS					50					
	WOH	SJGB020-G16	2.0	50-52			SAA @ 40'			
		SL0844		(60-62)	51					
		0840								100
					52					
					53					
					54					
					55					
SS	5	SJGB020-G17	2.0	55-57			very stiff, dry to damp,			
	8	SL0845			56		greenish gray CLAY			
	12	0920								
	23				57		@ 56.3' grades to Silty CLAY			100
					58					
SS		SSGB020-G18		60'-62'	60		SAA @ 56'			
		SL0846			59					
		0950								
					62		end of boring @ 1000			

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-9

ANCHOR QEA

SOIL BORING LOG

1130 Start

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Giannakos
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches

BORING # SJGB021
DATE BEGAN 11/30/18
DATE COMPLETED 12/1
TOTAL DEPTH
PAGE 1 OF 3
SAMPLING METHOD 3 in. by 2 ft

Field location of boring
Water Depth = 11' to TOD
WL to ML = ~~8~~ 7.5' (WL to TOD = 3.5')

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	16	SJGB021-G01	0.4	0-2		SC	~~0'~~ 0-1': V. Soft, wet, black SILT w/ substantial shell hash.	-	-	100
	2	SL0821		(11-13)	1					
	3	1145								
	1				2		1-2': Soft, wet, gray, V. clayey SAND (fine)	-	70	30
					3					
				4-6'	4					
SS	WOH	SJGB021-G02	0.7	~~15-17~~		CL	SA 1-2' above. ~~V. Cly~~			
		SL0822		15-17	5		Grades to V. silty, sandy CLAY	-	30	70
		1155								
				6'-8'	6					
SS	1	SJGB021-G03	~~0.5~~	(11'-19')			G-8: ~~SAA~~ Grades to slightly sandy CLAY	-	5	95
	3	SL0823	1.0		7					
	WOH	1220								
	WOH				8		@ 8': Rock blocking shoe.			
ST	Push	SJGB021-G04	0	8-10						
		Tube Damaged		19-21	9					
		1330								
					10					
		Casing fell								
					11					
					12					
ST	Push	SJGB021-G05	0.9	12-14			SA 6-8' above			
		SL0824		(23-25)	13					
		1345								
					14					
SS	WOH	SJGB021-G06	2.0	14-16			V soft, moist, dark grey CLAY to 14.9'	5	95	
	3	SL0825		(25-27)	15		@ 14.9': ~~laminations of~~ 36 fine to med sand with laminations of CLAY	70	30	
	3	1400								
	5				16					
					17					
					18					
SS	2	SJGB021-G07	1.4'	50 19-21	19		Very loose moist grey sand, clean SAND	~~100~~ 36	95	5
	1	SL0826		(30-32)						
	1	1415			20					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-10

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER: inches SAMPLING METHOD: in. by ft

BORING # 021
DATE BEGAN 11/30
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	6	SL0826	1.4	19-21			See previous page			
					21					
					22					
					23					
					24		No sample recovered, Hammer @ 29'-31'			
SS	9	SJGB021-G08	—	24-26'						
	26	~~SL0827~~ SG		(35-37)	25					
	25	1435								
	21				26					
					27					
					28					
					29					
SS	7	SJGB021-G09	1.7'	29-31			very stiff, damp to dry, orangish to reddish brown CLAY			100
	12	SL0827		(40-42)	30					
	17	1455					PP: 74.5, 4.0 TSF			
	25				31		VT: 5.75			
					32					
					33					
					34					
SS	6	SJGB021-G010		34-36			SAA @ 29'			
	9	SL0828		(45-47)	35					100
	16	1530								
	20				36					
					37					
					38					
ST	PUSH	SJGB021-G011	2.3	39-41	39		@ Top SAA @ 29' graded to bluish grey CLAY at bottom			
		SL0829		(50-52)						
		1550			40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-11

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: ~~Casey Janisch~~ Sam Giannakos
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJGB021
DATE BEGAN 11/30
DATE COMPLETED 12/1
TOTAL DEPTH 56'
PAGE 43 OF 43

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
ST	PUSH	SL0829			41					
					42					
					43					
					44					
SS	11	SJGB021-G12	2.0	44'-46		MH	SG [redacted], Hard, damp, light grey SILT			100
↓	21	SL0830		(55-[redacted])	45					
	37	1630								
	39				46					
					47					
					48					
~~SS~~		~~SJGB021-G13~~ SG	2.0	49-51'	49		SAA @ 44', grades to fine sandy grey SILT		10	90
SS	12	SL0831								
↓	21	SJGB021-G13			50					
	33	0830								
	32				51					
					52					
					53					
~~ST~~ SG										
~~ST~~	PUSH	SJGB021-G14		~~54-56'~~ 54-56'	54		No sample recovered			
↓	↓				55					
					56		---- end of bore @ 1000			
					57					
					58					
					59					
					60					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-12

ANCHOR QEA

SOIL BORING LOG

1300 Start

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJGB022
DATE BEGAN 11/29/18
DATE COMPLETED 11/30/18
TOTAL DEPTH 27 BML
PAGE 1 OF 3

Field location of boring: Mudline @ -11 ft from WL @ 1200 & 14 ft TOD

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	1	SJGB022-G01	0	0-2		CL	No Recovery			
	4	~~SL0811~~ CT			1					
	10	1310								
	33				2		@1.5' → hammer bouncing →			
				~~2-4~~ CT						
					3					
					4					
					5		5-6.8			
SS	WOH	SJGB022-G02	1.6	5-7			V. Soft, wet, olive gray slightly silty CLAY	–	5	95
		SL0811		19-21	6					
		1340					6.8-7: Lense			
ST	Push	SJGB022-G03	1.8	7-9'	7	SM	V loose, wet, olive gray, v. silty f. SAND	–	60	40
		SL0812			8	CL	ST: Top + Bot: ~~f~~ soft, wet, gray CLAY			
		1400					as 5-6.8' above			
					9					
					10					
SS	WOH	SJGB022-G04	2.0	10-12			SAA CLAY. silty. No plasticity, Moist	–	–	100
		SL0813		(24-26)	11					
		1420								
					12					
					13					
					14					
~~SS~~	~~WOH~~ CT	~~Slough~~ CT					14.5-15 Slough			
SS	WOH	SJGB022-G05	2.0	15-16.5	15		15-16.5: SAA.			
		SL0814		(29-30.5)						
		1455			16					
					17					
					18					
					19					
					20	CH	@19.5': Beaumont CLAY			

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-13

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER: inches
SAMPLING METHOD: in. by ft

BORING # SJGB022
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	5	SJGB022-606	1.8	20-22	21	CH	V. Stiff, damp, bluish-gray Beaumont CLAY			
	10	SL0815					@21.1': grades to bluish-gray + L. brown mottling			
	17	1530			22		@21.9': grades to gravelly			
	29				23		@20.7': lense of silty f-m SAND. Gray			
							PP = 3.75 - 4.5+ TSF			
					24		VT = 1.25; 1.225, kg/cm²			
					25					
SS	9	SJGB022-607	1.9	25-27			Hard, damp to dry, orangish brown CLAY	–	–	100
	14	SL0816			26					
	21	1620			27		– @27' end day 11/29			
	27						resume 11/30			
					28					
					29					
					30					
ST	Push	SJGB022-608	2.3	30-32 (44-46)	31		SAA			
		SL0817			32					
		0825								
					33					
					34					
SS	5	SJGB022-609	2.0	35-37 (49-51)	35	CH	Hard, damp to dry, orangish brown CLAY	–	–	100
	7	SL0818			36		~~BC~~ SG PP: 3 to 3.5 TSF			
	13	0855			37		VT = .675 x 2.5			
	18				38					
					39					
					40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-14

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER inches

BORING # SJGB022
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH
PAGE 3 OF 3
SAMPLING METHOD in. by ft

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
5 ← SS		SJGB022-G10	2.0	40-42	40	CH	very stiff, damp to dry, bluish gray CLAY	–	–	100
10 →		SL0819		(54-56)	41		PP: 3.25 TSF			
14 →		0930					VT: .275 x 2.5=			
21 → 50					42					
					43					
					44					
SS	6	SJGB022-G11	2.0	45-47	45	SC	~~[illegible]~~ SC, damp, greenish gray	–	90	10
↓	9	SL0820		(59-61)			loose to med dense CLAYEY SAND			
	9	1000			46		Slightly more clayey sand grades to			
	10				47		90% sand 10% fns at 46'.			
					48		End @ 47' 11/30/18 @ 1015			
					49					
					50					
					51					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					0					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.2-15

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 BORING # SJGB023
PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN 12/4
GEOLOGIST/ENGINEER Sam Giannakos DATE COMPLETED 12/4
DRILLING CONTRACTOR: Cascade TOTAL DEPTH
DRILLING METHOD Sonic SHEET 1 OF 3
HOLE DIAMETER 6 in Sample: 3" diam, 2' long

Field location of boring
~~Boat~~
depth to TOP: 7'
water: 3 ft

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
		SS	SJGB	023		WOH	0-2			black shiny grades to soft silty CLAY odorous damp to moist, @ .5'
		↓		G-01		WOH	(7-9)	1		
			SL08	73		2				
		↓		1000		3		2		
		SS	SJGB	023	1.6	WOH	2-4			SAA @ .5 ft
		↓		602		3	(9-11)	3		
		↓	SL08	74		3				
		↓		1010		4		4		
		SS	SJGB	023	1.6	WOH	4-6			Soft, damp, light grey fine sandy SILT
		↓		~~603~~		3	(11-13)	5		
		↓	SL08	75		5				
		↓		1020		7		6		
		SS	SJGB	023	2.0	WOH	6-8			SAA to 6.7'
		↓	~~SL08~~	604		3	(13-15)	7		@ 7' grades to loose wet silty SAND light grey
		↓	SL08	76		1				
		↓		1030		WOH		8		
		SS	SJGB	023		WOH	8-10			loose, damp to ~~moist~~ light grey silty SAND
		↓	~~SL08~~	605	1.8	1	(15-17)	9		
		↓	SL08	77		2				
		↓		1040		4		0		
		ST	PUSH	SJGB023 606	1.7	/	10-12			fine light grey wet SAND
		↓	↓	SL08 78		/	(17-19)	11		
		↓		1055		/				
		↓	↓			/		12		
		SS	SJGB	023	2.0	5	12-14			loose moist light grey fine to med SAND with pockets of clay
		↓		607		8	(19-21)	13		
		↓	SL08	79		5				
		↓		1115		3		14		
		~~AB~~								
								15		
		SS	SJGB	023	3	1.	~~18-20~~			loose, SAA @ 12'
		↓		80	3		(25-27)	16		
		↓	SL08	608	2					
		↓		1130	5			17		
		↓	↓	↓	↓		↓	18		
		↓						19		
								20		

Remarks:

Attachment Figure A.2-16

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 BORING # SJGB023
PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN
GEOLOGIST/ENGINEER DATE COMPLETED
DRILLING CONTRACTOR: Cascade TOTAL DEPTH
DRILLING METHOD SHEET 2 OF 3
HOLE DIAMETER

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
		SS	SJGB	023			7			
				669				21		
			SL08	81						
								22		
		SS						23		
			SJGB	023	1.0	8	23-25			med dense, wet, med grain clean SAND 100,
			SL08	81		10		24		
				1145		10				
						10		25		
								26		
								27		
								28		
		SS	SJGB	023	2.0	11	28-30'			med dense, moist, light grey coarse sand 100,
				610		15		29		layer above stiff bluish CLAY (dry) @ 29.6' 0, 10
			SL08	82 83		12				
				1200		13		30		SJGB023610A: 28-29.6' (SL0882)
								31		SJGB023610B: 29.6-30' (SL0883)
								32		
								33		
		ST	SJGB	023	1.8	Push	Push			SAA @ 29.6'
				611			33-35	34		
			SL08	84						
				1410				35		
								36		
								37		
								38		Stiff, dry, orangish brown CLAY 0, 0, 100
		SS	SJGB	023	2.0	6	38-40'			VT: 0.25
				612		10		39		PP 4.25 TSF
			SL08	85		13				
				1425		20		40		

Remarks:

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 BORING # SJGB023
PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN
GEOLOGIST/ENGINEER DATE COMPLETED
DRILLING CONTRACTOR: Cascade TOTAL DEPTH
DRILLING METHOD SHEET 3 OF 3
HOLE DIAMETER

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
		SS	SJGB023	023	2.0	2	43-45			V. stiff dry reddish orange grading to bluish grey CLAY (damp) 0 0 100
				618		9		41		
			SL08	86		12				
				1445		17		42		
								43		
								44		
								45		
								46		
								47		
		SS						48		
			SJGB	023	2.0	9	48-50			V stiff, dry, bluish grey silty CLAY 0,0,100
				614		12		49		grades to higher silt content w/ depth
			SL08	87		18				
				1515		24		50		
								51		
								52		
								53		
		ST	SJGB	023	1.6	PUSH	53-55			SAA @ 49'
				615				54		Full sample (2.0) ~4in crumbled off
			SL08	87						of bottom before recovery: silty
				1355				55		
								56		
								57		
								58		
		SS	SJGB	023	1.6	1	58-60			SAA, clayey dry SILT, grades to 0 0 100
				616		14		59		wet fine light grey sand @ 59.5' 0 100 0
			SL08	88+89		20				SJGB023 G16A, SL0888 @ 58-59.3
				1415		16		60		SJGB023 G16B, SL0889 @ 59.3-60

Remarks:

End of boring at 1615

Attachment Figure A.2-18

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches

BORING # SJSB028
DATE BEGAN 11-19-18
DATE COMPLETED 11/19/18
TOTAL DEPTH 37
PAGE 1 OF 2
SAMPLING METHOD 3 in. by 2 ft

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	30	SJSB028-G01	1.0	0-2		Fill	0-0.8: brown, damp, v. dense sandy silty GRAVEL	70	10	20
	7	0850			1					
	16	SL0699				ML	0.8-2: stiff, moist, dk brown slightly sandy SILT			
	~~16~~ 11				2					
SS	1	SJSB028-G02	1.6	2-4		CL	2-13.2: soft, moist, gray CLAY w/ trace organic	5	5	90
	2	1085			3		matter + trace gravel. Silty.			
	4	SL0800								
	26				4					
SS	1	SJSB028-G03	0.8	4-6			4-6 SAA			
	2	1015			5					
	1	SL0801								
	2				6					
SS	2	SJSB028-G04	2.0	6-8			6-8: SAA. Thin laminations of v. silty			
	1	1030			7		f. SAND and sandy CLAY. moist to wet			
	3	SL0802								
	2				8		SAA			
SS	1	SJSB028-G05	2.0	8-10			@ 8.6: ~~sub~~ moderate organic fibers.			
	1	1045			9					
	1	SL0803								
	1	SG, GS, AL			10		Substantial organic fibers @ 10.3' + 10.6'			
SS	2	SJSB028-G06	2.0	10-12						
	1	1100			11		@ 11-11.5: 2 thin lam. of l. brn silty f.			
	WOR						SAND			
	1				12					
SS	2	SJSB028-G07	2.0	12-14						
	1	1115			13					
	1					ML	13.2-13.9: l. olive gray, v. soft, moist	–	35	65
	1				14		v. sandy SILT.			
SS	1	SJSB028-G08	2.0	14-16		CL	13.9-14.6: SA 2-13.2' above			
	1	1130			15	SM	14.6-16.9: l. gray, moist, v. loose, v. silty	–	70	30
	1	SL0804					f. SAND. Trace lam. of gray CLAY			
	1				16					
SS	WOH	SJSB028-G09	1.7	16-18						
		1140			17	CL	16.9-20' v. soft, moist, gray, no plasticity	–	–	100
							CLAY.			
					18					
					19					
					20					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes: 1600 → Push ST 5-9' → driller over-pushed, Confirm as Clay is compact @ Top + bottom, Try ST 9-11' instead.

1610 → Push ST 9-11' → Gray, Soft CLAY @ bottom. 1.5' recovery. ~~SL0804~~ SL0810 CJ

Attachment Figure A.3-1

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJSB028
DATE BEGAN 11/19/18
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
ST	Push	SJSB028-G10	1.8	20-22	21	ML	Gray, moist, soft, v. sandy, clayey SILT	-	30	70
		1335								
		SL0805								
					22					
					23					
					24					
					25	CL	AOPP 16-20'			
SS	WOH	SJSB028-G11	2.0	25-27	26					
		SL0806								
		1355								
	1	GS, SG, AL			27					
					28					
					29					
					30		SAA			
SS	WOH	SJSB028-G12	2.0	30-32	31					
		1420								
		SL0807								
	2	~~H~~			32					
					33					
					34					
					35		35-35.7' SAA			
SS	2	SJSB028-G13	2.0	35-37	36		35.7-37': Beaumont CLAY			
	8	1435				CH				
	12	SL0808								
	16	SL0809			37					
					38		End @ 37' @ 1445			
					39					
					40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.3-2

(TW014)

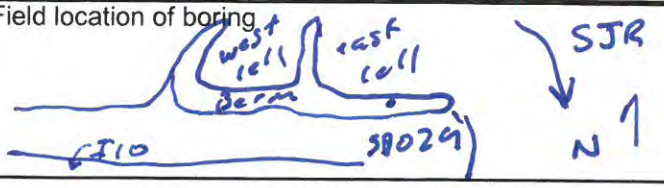
ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1
PROJECT NUMBER: 180557-01.01 Task 03
GEOLOGIST/ENGINEER: Torell
DRILLING CONTRACTOR: Cascade
DRILLING METHOD: 8" sonic
HOLE DIAMETER: 8"

BORING # SB029
DATE BEGAN 11/6/18
DATE COMPLETED 11/6/18
TOTAL DEPTH 40'
SHEET 1 OF 2

Field location of boring



OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
		sonic	~~0505~~	0600						DK BRN - BL PEAT, ROOTS
		CRT						1		MOIST SILT SOME CLAY &
										VF SAND MOIST
		CRT						2		
			~~0505~~	0601						
								3		
		CRT								AHEAD on 11/7/18 (moved over feet to Shelby tube 5.7' SL 0612)
		~~0505~~						4	ST pull	
			~~0505~~	0602						WET @ 5'
								5		
								6	SL 0612	SAND VF LIGHT GREY
		CRT	~~0505~~	0603						Some silt, little clay, clayier lense 5.5-6.0
								7		
										as 0-5
										occ thin 1" sandier zones
		CRT						8		
			~~0505~~	0604						As ~~6-8~~ 5-6 CRT
								9		
		CRT								
			~~0505~~	0605				10		
										AS 0-5
								11		
								12		
								13		
										CRT
								14		
								15		SAND LIGHT GREY f-m little silt trace clay & rootlets 12.5-15
	GS, SG			0606						
								16		
								17		Same as 12.5-15
								18		Dk brn black clay & silt some vf sand & shells plastic
								19		
								20		

Remarks:

Attachment Figure A.3-3

TW014

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1
PROJECT NUMBER: 180557-01.01 Task 03
GEOLOGIST/ENGINEER: Tolell
DRILLING CONTRACTOR: Cascade
DRILLING METHOD: 8" sonic
HOLE DIAMETER: 8"

BORING # SB029
DATE BEGAN 11/6/18
DATE COMPLETED 11/6/18
TOTAL DEPTH 40'
SHEET 2 OF 2

Field location of boring: See pg 1

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	SG, AL		0607					21		as 17.5-20, 2" sand lenses @ 20.7 & 21.5
								22		
								23		
								24		heaving material for 30-32
								25		
			0608					26		SHELBY TUBE
								27		
								28		sand 25-27.5 sand sample
								29		
								30		
			0609					31		SHELBY TUBE 1450
								32		sand
								33		
								34		
								35		34.9-35 co light brn sand co sand & gravel shells
	GS		0610	35-36.5				36		
								37		grey green w hard clay
	AL							38		grading to tan-brn @ 39
					39.5-40			39		
			0611					40		BEAUMONT CLAY

NOTE: INTERBEDDED TOOK PHOTOS OF 0-40. AS 20' + 40'

Remarks:

Attachment Figure A.3-4

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER 6 inches
SAMPLING METHOD 3 in. by 2 ft

BORING # SJSB030
DATE BEGAN 11/18/18
DATE COMPLETED 11/18/18
TOTAL DEPTH 40
PAGE 1 OF 2

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	19	SJSB030-G01	2.0	0-2		Fill	0-1.8: damp, dense, brown, silty sandy GRAVEL	60	15	25
	24	1050			1	GM				
	29	SL0688								
	21				2					
SS	2	SJSB030-G02	0.9	2-4		ML	1.8-4.6: damp to dry, ~~hard~~ v. stiff, slightly sandy SILT	–	10	90
	7	1055			3					
	12	SL0689					@3.6 grades to intermixed w/ yellowish-brown, dry; v silty f. SAND.			
	15				4	ML/SM				
SS	1	SJSB030-G03	2.0	4-6			4.6-5.2: loose of damp, light olive brown, v. sandy SILT	–	30	70
	4	1120			5	ML				
	8	SL0690				CL	5.2-6 dk gray, moist, stiff, sandy silty, low plasticity CLAY.			
	9				6					
SS	2	SJSB030-G04	2.0	6-8		ML	6-6.4: SA 1.8-4.6' above, moist			
	4	1125			7	CL	6.4-7.1: dk olive gray, moist, m. stiff CLAY	–	–	100
	5	SL0691				ML	7.1-11.4: dk brown, damp, stiff, sandy SILT	–	20	80
	8				8					
SS	WOH	SJSB030-G05	1.8	8-10			8-10 SAA. grades to olive gray.			
	↓	1135			9		@9.7-10': substantial shell hash.			
	2	SL0692								
	6	AL, SG			10					
SS	3	SJSB030-G06	2.0	10-12						
	7	1150			11					
	8									
	9				12	SM	11.4-14.6: moist, m. dense, l. gray w/ l. brown mottling; v. silty SAND (v. fine SAND)	–	60	40
SS	WOH	SJSB030-G07	1.7	12-14						
	9	1200			13					
	10						12-14: SAA			
	10				14					
SS	WOH	SJSB030-G08	2.0	14-16						
	2	1215			15	CL	14.6-15.1: loose of gray, moist soft, CLAY	–	–	100
	4	SL0693				SP/SM	15.1-16; wet, loose, l. gray v. fine silty sand.	–	80	20
	4	GS			16	SM	occassional laminations of gray + dk gray CLAY throughout			
SS	WOH	SJSB030-G09	2.0	16-18		CL	16-16.5: SA 11.4-14.6' above			
	1	1225			17					
	1	~~SL0694-CT~~								
	2				18	~~MAA~~	16.5-20: dk gray grading to gray; v. soft, moist slightly sandy CLAY. Trace organic fibers.	–	5	95
					19					
					20					

Field location of boring

marks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes: SL0698 → ST → 8-10', 11/18/18;

Attachment Figure A.3-5

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER inches SAMPLING METHOD 3 in. by 2 ft

BORING #
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH 40'
PAGE 2 OF 2

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
ST	Push	STSB030-G10	2.0	20-22		SM	Gray v. silty F. SAND in ST			
		1340			21					
		SL0694								
					22					
					23					
					24					
					25					
SS	12	STSB030-G11	0.3	25-27		SM	Wet, m. dense, gray silty F. SAND	—	90	10
	15	1400			26		Heaving sands → replaced catchers in SPTs			
	13	SL0695								
	13				27					
					28					
					29					
					30					
SS	10	STSB030-G12	0.5	30-32			SAA			
	15	1415			31					
	15	SL0696								
	13	SG, AL, GS			32					
					33					
					34					
					35					
SS	10	STSB030-G13		35-37						
	29	SL0697			36					
	11	1430								
	9				37					
					38		Beaumont CLAY (v. stiff, damp, ⊥ brown)			
					39					
					40		End @ 40' @ 1445.			

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

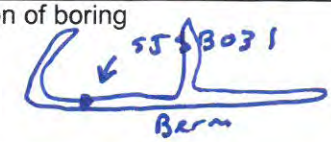
Attachment Figure A.3-6

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 | BORING # SJSB031/Two
PROJECT NUMBER: 180557-01.01 Task 03 | DATE BEGAN 11/8/18
GEOLOGIST/ENGINEER Torch | DATE COMPLETED
DRILLING CONTRACTOR: Cascade | TOTAL DEPTH
DRILLING METHOD 4x6 sonic + AUTO HAMMER | SHEET 1 OF
HOLE DIAMETER 6"

Field location of boring



OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	910	SS	0613			12				TAN BRN f-m sand, some clean
						15		1		fill gravel little silt + clay
						16				grading to brn at 2'
						15		2		
	920		0614			9				as above
						13		3		integral
						15				has 0-18
						9		4		pics
	930	SS	0615			4			RET	
						4		5		as above grading to gray
						4				5.5-6.0 black peat, roots
						5		6		~~Shelby tube 11/10/18 SL0627~~
										~~pull ahead~~
	945	SS	0616			7				as 4.0-5.5 oc (outlots, interbedded
	955					5		7		wet, bedding decreases w/ depth
						4				ST T24, 5-7 poor recovery
	300# hammer					5		8		0800 SL0627
SG		SS	0617			5				as above
GS						5		9		
AL				HOLD		8				
						13		0		
	1015	SS	0618		WEIGHT OF HAMMER					as above
					3	~~WOH~~ CUT		1		
						5				TAN BRN F-M SAND TRACE
	11/9/18			HOLD		11		12		SILT, WET
	~~1025~~	SS	0619			?				Sand, wet
	830					?		13		
						6				
						9		14		
	840	SS	0620			4				Sand, debris 14-15, tan brn
						8		15		15-16
						13				
						9		16		
	905	SS	0621			WOH				Sand tan brn debris
						WOH		17		16.8-17.2 gravelly w/
						1				depth
						4		18		
		NS			NO					
								19		
								20		

Remarks:

Attachment Figure A.3-7

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 | BORING # SJSB031/MW01
PROJECT NUMBER: 180557-01.01 Task 03 | DATE BEGAN 11/8/18
GEOLOGIST/ENGINEER Tarell | DATE COMPLETED
DRILLING CONTRACTOR: Cascade 300# | TOTAL DEPTH
DRILLING METHOD 4x6 Sonic auto hammer | SHEET 2 OF
HOLE DIAMETER 6"

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
SG		SS	0622			2				SAND GREY med some fine sand
GS						1		21		trace silt wet
AL						WOH				
						2		22		
								23		
								24		
								25		
		SS	0623			9				poor recovery (~8") saa
						18		26		
						19				
						15		27		
								28		
								29		
								30		
	1140	SS	0624			3				saa
						5		31		
						7				
						4		32		
								33		
								34		
	1200	SS	0625					35		saa greyplastic clay large 2" quick @ 36'
						26				
						27		36		
						21				
						24		37		
	1345	ST	0626							Attempt shelby tube 37-39 as above in top
								38		
								39		
								40		Beaverman in tip set well

Remarks:

have to overdrill to 40' to seal hole, at 38' backfill w/ pellets 40-38

ANCHOR QEA

SOIL BORING LOG

1400 Start

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJSB032
DATE BEGAN 11/17/18
DATE COMPLETED
TOTAL DEPTH
PAGE 1 OF

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	3	SJSB032-G01	1.2	0-2		Fill	0-1.5: d moist, med. dense, brown, silty sandy Gravel (Fill).	60	15	25
	8	1405			1	GM				
	10	SL0675								
	7				2	ML	@1.5': grades to dk gray to black, damp, mod. stiff SILT.	–	5	95
SS	4	SJSB032-G02	1.7	2-4			@2.0': Liner (fabric, geotextile, fabric)			
	6	1410			3	SM	2-2.7 SAA			
	9	SL0676					2.7-4.3 brown, damp to dry, m. dense, very silty f. SAND. pp = 2.25 to 3.0 tsf	–	70	30
	10				4					
SS	5	SJSB032-G03	2.0	4-6		CL	4.3-~~5.0~~ 4.7: dk brown, damp, stiff sandy CLAY	–	30	70
	6	1420			5	SC	4.7-5.0: grades to clayey SAND	–	60	40
	12	SL0677				CL	5-5.3 m. dense, damp, gray silty SAND			
	21				6	CL/OL	5.3-5.9 v. stiff, gray, damp sandy CLAY @ 5.6 grades to dk. gray			
SS	WOH	SJSB032-G04	2.0	6-8						
	4	1435			7	CH	5.9-6.9: dk gray, moist, CLAY w/ mod. organic fibers ~~m. stiff, soft~~ (Peat)	–	15	85
	5	SL0678								
	7				8		6.9-~~7.0~~: v. stiff, damp, gray sandy silty CLAY w/ higher plasticity (6.9-10.6)			
SS	4	SJSB032-G05	2.0	8-10						
	7	1445			9		~~9-: light gray~~			
	7	SL0679								
	10	AL, SG			10					
SS	1	SJSB032-G06	2.0	10-12			10.6- l. gray, damp, m. dense, v. silty f. SAND	–	70	30
	5	1505			11	SM				
	6	~~SL0680~~ GS								
	8				12					
SS	2	SJSB032-G07	1.5	12-14			SAA. Grades to loose, moist.			
	2	1515			13		@13.5-13.8: lense of soft, moist, dk gray SILT			
	3									
	4				14					
SS	WOH	SJSB032-G08	1.1	14-16		SM	@14': grades to v. loose, wet, silty f. SAND (heaving)	–	90	10
	↓	1530			15					
	3	SL0680								
	3	GS			16					
SS	3	SJSB032-G09	2.0	16-18			16-18 SAA			
	1	1540			17					
	1									
	3				18					
					19					
					20					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes: SL0686, 5-7', 11/18/18 0850, 2.3', sandy CLAY @ bottom.
SL0687 10-12' 11/18/18 0905, clayey, silty SAND @ bottom.

Attachment Figure A.3-9

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER 6 inches
SAMPLING METHOD 3 in. by 2 ft

BORING # SJSB032
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	4	SJSB032-G10	1.7	20-22		SM	AOPP. Shell fragments (trace)			
	4	1550			21					
	8	SL0681								
	7				22					
					23					
					24					
					25					
SS	10	SJSB032-G11	1.7	25-27			SAA			
	8	1610			26					
	5	SL0682								
	7				27					
					28					
					29					
					30					
SS	7	SJSB032-G12	1.	30-32			SAA.			
	12	1635			31					
	10	SL0683								
	8				32					
					33					
					34					
					35					
SS	4	SJSB032-G13	1.6	35-37			SAA. Shell fragments + halves (trace).			
	5	1650			36					
	6	SL0684								
	9	GS			37					
					38	?	Beaumont CLAY. Driller estimates interface @ 38' based on casing resistance.			
					39					
					40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.3-10

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER 6 inches

BORING # SBSJ032
DATE BEGAN 11/17/18
DATE COMPLETED
TOTAL DEPTH
PAGE 3 OF
SAMPLING METHOD 3 in. by 2 ft

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLING DATA: SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	7	SJSB032-G14		40-42			Beaumont CLAY. V. Stiff, damp, orangish-brown, high plasticity CLAY.	–	–	100
	8	1705			41					
	14	SL0685								
	17	SG, AL			42					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					0					
					1					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					0					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.3-11

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 8 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJSB033
DATE BEGAN 11-12-18
DATE COMPLETED 11-14-18
TOTAL DEPTH 40
PAGE 1 OF 2

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
6/2										
SS	2	SJSB033-G01	0.6	0-2		SP	Damp, brown, m. dense f-c SAND. Trace silt ~~clay~~ organic roots/fibers	–	80	20
	5	~~SL0640 No Sample~~			1					
	9	1540 SL0640								
	42	11-15-18 0830			2		2-2.5: moist, v. loose, brn f. SAND	–	95	5
SS	1	SJSB033-G02	2.0	2-4						
	1	SL0641			3	SC	2.5-4: moist, loose, gray clayey f. SAND	–	80	20
	2	1550								
	3				4		4-4.2: Rock, 4.2-4.5: dk gray, moist, soft CLAY			
SS	4	SJSB033-G03	1.3	4-6			4.5: m. stiff, moist, grays, sandy CLAY. occasional organic material. Trace f. sand laminations			
	3	SL0642			5	CL				
	2	1605								
	2				6		SAA			
SS	6	SJSB033-G04	1.8	6-8						
	7	SL0643			7					
	3	1625								
	4	SG, AL			8					
SS	2	SJSB033-G05	1.9	8-10			SAA. Trace Org. mat.			
	2	SL0644			9					
	3	1635								
	3				10	SC	@9.5: grades to loose clayey SAND	–	60	40
SS	18	SJSB033-G06	1.7	10-12						
	15	1655			11	~~SC~~ CL	@10: grades to dk gray to brn-gray slightly sandy CLAY.			
	10									
	10				12	SM	@11.2: Gravel up to 0.2'			
SS	4	SJSB033-G07		12-14			11.4-14.6: damp, m. dense, l. gray w/ brown mottling slightly silty f. SAND.	–	90	10
	4	1705			13		12-14: SAA			
	4									
	8				14		14-14.6 SAA			
SS	15	SJSB033-G08	1.9	14-16			14.6-16 grades to light gray. Sandy CLAY laminations @ 14.7' & 15.6'			
	14	SL0645			15					
	5	1035								
	5	SG AL GS			16					
SS	15	SJSB033-G09	2.0	16-18			SAA light gray to gray, wet, loose sand, clayey/silty	–	90	10
	4	1045			17					
	3									
	2				18					
					19					
					20					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes: SL0649, 5-7', 0900, 2.3/2, gray sandy CLAY @ bottom

SL0650, 10-12', 0920, 2.3/2, brown silty SAND @ bottom

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 8 inches

BORING # STSB033
DATE BEGAN 11/12/18
DATE COMPLETED 11/14/18
TOTAL DEPTH 40.
PAGE 2 OF 2
SAMPLING METHOD 3 in. by 2 ft

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	25	STSB033-G10	1.1	20-22		SM	Try ST @ 20' → no penetration. ST Denied AOPP. One 1½" x 2" gravel			
	10	SL0646			21					
	9	1135								
	13				22					
					23					
					24					
					25		Try ST @ 25-27' → cannot penetrate.			
SS	50/5"	STSB033-G11	0	0.4	26					
		1200								
		No Recovery			27					
					28					
					29					
					30					
SS	5	STSB033-G12	0.6	30-32	31	SM	wet, m.dense, gray, f-c, silty gravelly SAND trace shells. 3"x2" gravel conglomerate of sand + f. gravel	15	70	15
	13	1320								
	17	SL0647								
	9	GS			32					
					33					
					34					
					35					
SS	1	STSB033-G13		35-37			SAA. No gravel. Shell fragments			
	7				36					
	20 CT									
	32				37					
DP		~~STS~~ CT								
					38					
					39	CH	Beaumont CLAY. Bluish gray grading to greenish brown PP = 2.0 tsf			
		SL0648			40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 | BORING # SJSB034/TW017
PROJECT NUMBER: 180557-01.01 Task 03 | DATE BEGAN 11/10/18
GEOLOGIST/ENGINEER TORELL | DATE COMPLETED
DRILLING CONTRACTOR: Cascade | TOTAL DEPTH
DRILLING METHOD 8" sonic | SHEET 1 OF
HOLE DIAMETER 8"

Field location of boring: SJSB034/TW017

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	1250	SS	0628			10			SP	sand f some m sand & silt
						11		1		occ roots brn, grey, dk brn mottled
						9				
						8		2		
	1300	SS	0629			5				as above, little clay
						6		3		
						5				
						5		4		
	1315	SS	0630			2				as above occ shell
						5		5		
						4				
						3		6		
	1330	SS	0631		2	[illegible]			~~SM~~	vf sand & silt little clay, roots,
					1	[illegible]		7	ML	shells dk brn/black peaty
					2	[illegible]				wet
					7			8		loose
	1345	SS	0632			4				8-9 as above, shells lower
			↓			2		9		9-10 grey m sand some f sand
			0633			5			SP	& little silt wet
			↓			7		10		ST SL 0639 11/10/18 pics
	1400	SS				WOH			OL	10-11 peaty clay & silt some roots
						2		11		& shells plastic occ
						4			SM	11-12 as 9-10 above, shells
				CW		15		12		
	1410	SS	~~0634~~			WOH			OL	as 10-11, lower 3"
								13		grey med sand well, little
										f sand & silt
						9		14		
	1420	SS	0634			9			SP	sand f-m red brn, little silt
						12		15		& clay tight
						15				
						16		16		
	1440	SS				4				as above, grey @ 17.5
						5		17		
						5				
						7		18		
		NS				NS				
								19		
								20		

Remarks:

Integral has pics 0-18

Attachment Figure A.3-14

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 | BORING # SJSB034/T-1017
PROJECT NUMBER: 180557-01.01 Task 03 | DATE BEGAN 11/10/18
GEOLOGIST/ENGINEER: TORELL | DATE COMPLETED
DRILLING CONTRACTOR: Cascade | TOTAL DEPTH
DRILLING METHOD: 8" sonic | SHEET 2 OF
HOLE DIAMETER: 8"

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	1500	SS	0635			WOH			SP	Grey f sand, little med sand + silt
						↓		21		grey clay dense 1.5-1.7
						1				
						2		2		
		NS				NS				
								3		
								4		
								25		25-26.2
	1520	SS	0636			WOH			CL	~~35-36.2~~ clay + f sand
						WOH		6		interbeds, grey PP = 0.25 tsf
						4			SP	36.2-37 grey med sand
						3		7		
		NS				NS				try ST ~~27-29~~
								8		30-32
										cut
								9		
								30		
	1550	ST	0637			ST				SHELBY TUBE
								1		
								2		
		NS				NS				
								3		
								4		
								35		
	1615	SS	~~0638~~			1				NO Recovery, <1" Med-coarse sand in spoon
						1		6		
						2				
						3		7		
								8		
								9		
								0		

Remarks:

closed hole pics

Attachment Figure A.3-15

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1
PROJECT NUMBER: 180557-01.01 Task 03
GEOLOGIST/ENGINEER: Torch
DRILLING CONTRACTOR: Cascade
DRILLING METHOD: 8" SO-1'c
HOLE DIAMETER: 8"

BORING # SSJB034/TW017
DATE BEGAN: 11/10/18
DATE COMPLETED:
TOTAL DEPTH:
SHEET 3 OF

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	1705	SS	0638			3		4 1	GP	40-40.8 f-m gravels & shells
						5				40.8-42 BEAUMONT CLAY
						12			CH	BLEY TO BROWN
						20		2		
										4.7 Tons/ft²
								3		Set well @ 41' right on top of
										BEAUMONT
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

Remarks:

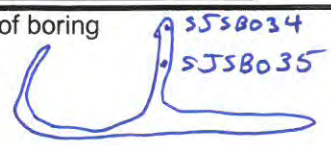
Attachment Figure A.3-16

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 | BORING # SJSB035
PROJECT NUMBER: 180557-01.01 Task 03 | DATE BEGAN 11/11/18
GEOLOGIST/ENGINEER TORELL | DATE COMPLETED
DRILLING CONTRACTOR: Cascade | TOTAL DEPTH
DRILLING METHOD 4x6" SONIC | SHEET 1 OF
HOLE DIAMETER 6"

Field location of boring



OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	1305	SS	0640			17				dk brn s+g some silt + clay, rocks
						15		1		full moist grading to grey fsand little silt
						14				
						12		2		
	1315	SS	SL0640			3				dk brn clay + some silt, little
						5		3		fsand coarsens w/ depth
						6				
						9		4		
	1325	SS	0642			4				Tan brn fsand + silt some clay
						4		5		
						4				
						4		6		
	1340	SS	0643		1.3	1	2			SAA.
						1		7		
						WOH				@ 7.5: 0.2'x 0.1' gravel
						1		8		@ 7.8: grades to v. soft moist, ~~black~~ gray sandy
SG	1350	SS	0644		2	6	2			clay w/ shells
GS						3		9		as 4-6 greying with depth
AL						5				
↓						6		10		
		SS				1				10.0 – 11.5 SAA
						2		1		11.5-12 dk grey f-m sand trace
						3				silt + clay
						5		2		
	1410	SS				7				SAA to 12.5
						7		3		12.5 - 14 tan brn fsand little silt
						13				+ mid sand
						14		4		
	1420	SS	SL0645			4				SAA occ clayier lenses ≤ 1"
						6		5		
						5				
						3		6		
		SS				5				SAA, occ shells
						7		7		
						4				
						3		8		
		NS				NS				
								9		
								20		

Remarks:

Interval was 0-18 pictures

Attachment Figure A.3-17

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 BORING # SJSB035

PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN

GEOLOGIST/ENGINEER DATE COMPLETED

DRILLING CONTRACTOR: Cascade TOTAL DEPTH

DRILLING METHOD SHEET 2 OF

HOLE DIAMETER

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	1445	SS	0646		WOH	3				SAA
					3 → 5	CM		2 1		@ 21.8 gray plastic clay
			21.8-23		1 →					
			only		1 →			2		
		NS			NS					
								3		
								4		
								5		
	1500	SS	0647			4				SA upper above
						2		6		
						6				
						11		7		
		NS				NS				
								8		
								9		
								3 0		
	1545	SS	0648			3				occ f-m sand gray, shells
						4		1		
						4				
						4		2		
		NS				NS				
								3		
								4		
								5		
	1600	ST				ST				TRY SHELBY TUBE
								6		ST EMPTY 30 to 40'
								7		heaving sands
		NS				NS				
								8		
								9		
								4 0		

Remarks:

Attachment Figure A.3-18

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 BORING # SJSB035
PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN
GEOLOGIST/ENGINEER DATE COMPLETED 11/12/18
DRILLING CONTRACTOR: Cascade TOTAL DEPTH
DRILLING METHOD SHEET OF
HOLE DIAMETER

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	1625	ss	0649			1				clean out from 37-40 had
			41-42			7		41		39-40 greengray clay some
						8				mottled red brn v hard
						9		2		BEAUMONT clay
										w/ splitspoon
								3		40-42
										40-42
								4		green gray clay grades
										to red brn clay
								5		2" gravel layers 40.4 41.0
										coarse
								6		grout borings
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

Remarks:

Attachment Figure A.3-19

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER 6 inches SAMPLING METHOD 3 in. by 2 ft

BORING # SJSB036 ~~SJSB036~~
DATE BEGAN 11/16/18
DATE COMPLETED 11/17/18
TOTAL DEPTH 35'
PAGE 1 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	3	SJSB036-G01	1.4	0-2.6		Waste	Overpenetrate by 7". V. Soft	–	–	100
	WOH	SL0664			1		V. Soft, moist, bluish-gray to blue, CLAY (waste).			
		1430					@ 1.3: grades to dk brown. Hydrocarbon Odor			
					2					
	WOH			~~2-4~~						
SS	WOH	SJSB036-G02	2.0	2.6-4	3		SAA. Trace gravel. Bluish-gray, dk brown, + black lenses.			
		SL0665								
		1435 GS, AL, SG			4		@ 3.6: Moderate organic fibers + yellow wood debris			
SS	5	SJSB036-G03	2.0	4-6						
	8	SL0666			5	CH	4-4.7: SAA (v soft, moist to wet, gray to black silty CLAY) Strong hydroC odor!	–	–	100
	7	1445								
	8				6		4.7-11.3 Stiff, damp, ~~dk~~ brownish gray CLAY. ~~Strong odor, (hydro C)~~ Trace hydroC odor to 5.6 ft. Mod. organic fibers @ 4.9'			
SS	WOH	SJSB036-G04	1.7	6-8						
	1	SL0667			7					
	4	1540								
	4	SG, AL			8		@ 5.7 grades to light/med gray. High Plast. @ 6' grades to med. stiff			
SS	2	SJSB036-G05	2.0	8-10						
	2	1600			9		8-10 SAA			
	4	SL0668								
	7				10					
SS	WOH	SJSB036-G06	2.0	10-12			10-11.3 SAA			
	3	1615			11					
	10	~~SL~~ CT								
	10				12	SC	11.3 - light gray, med dense, moist to damp clayey f. SAND.	–	80	20
SS	1	SJSB036-G07	2.0	12-14		CH	12-13.2: dk gray, moist, v. soft CLAY	–	–	100
	1	1630			13					
	5	~~SL~~ CT				SP	13.2 - moist, loose, gray f. SAND (silty)	–	75	25
	4				14					
					15		ST @ 15': No Recovery.			
ST	SS WOH	SJSB036-G08	1.5	15-17						
	2	1650			16		SAA			
	3	SL0669								
	5				17		END @ 17' on 11/16. Resume 11/17			
					18					
					19					
					20					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.3-20

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches

BORING # SJSB036
DATE BEGAN 11/16/18
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF
SAMPLING METHOD 3 in. by 2 ft

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	7	SJSB036-G09	1.6	20-22		SM	AOPP. Thin laminations of gray silt + gray clay throughout.	–	85	15
	7	0815			21					
	7	SL0670								
	8	GS			22					
					23					
					24					
					25					
SS	4	SJSB036-G10	1.7	25-27			SAA. Lense of dk gray silt @ 27' (1/4" thick)			
	9	0830			26					
	13	SL0671								
	7				27					
					28					
					29					
					30					
SS	8	SJSB036-G11	0	30-32			No recovery. Silty f-c Sand in shoe.			
	6	0845			31					
	7	~~SL0672~~ CJ								
	9				32					
					33	CH	clean-out casing 30-35': Beaumont CLAY observed from 32-35'. No sample from 35-37' needed.			
					34					
					35					
~~SS~~	5	~~SJSB036-G12~~ CJ		~~35-37~~ CJ			END @ 35' 0905			
					36					
					37					
					38					
					39					
					40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER: inches
SAMPLING METHOD: in. by ft

BORING # SJSB036 B
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH
PAGE 3 OF 3

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
ST		SJSB036-G12 1035	0	0-2	1					
					2					
ST		SJSB036-G13 1050 SL0672	2.2	2-4	3					
					4					
					5					
					6					
ST	Push	SJSB036-G14 1100 SL0673	2.3	6-8	7					
					8					
	Push	SJSB036-G15 1110 SL0674	2.1	8-10	9					
					10		End @ 10' @ 1120			
					1					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					0					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.3-22

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJSB037
DATE BEGAN 11-15-18
DATE COMPLETED 11-16-18
TOTAL DEPTH 37'
PAGE 1 OF

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS %
SS	3	SJSB037-G01	1.6	0-2						
	WOH	SL0651			1	Fill	moist, dk brown, v. soft gravelly silt. Occasional organic material. (fill)	15	20	65
	WOH	1450				Waste	@1.2': grades to bluish silt (waste).	—	—	100
	WOH				2		@1.8 grades back to dk gray brown.			
SS	WOH	SJSB037-G02	2.0	2-4			2-4: laminations of dk brown, black, bluish, + dk gray waste. Hydrocarbon odor.			
		SL0652			3					
		1455								
		SG, AL, GS			4		@3.8: wood fibers (waste)			
SS	3	SJSB037-G03	2.0	4-6'			4-5: Waste, med stiff ~~stiff~~ CJ, moist, CLAY w/ odor			
	6	CJ 1510			5		Munsell: 2.5Y (2.5/1) + 7.5YR (3/2)			
	7	SL0653					@5.2' grades to stiff (0.75 to 1.25 tsf w/PP) CLAY w/ odor			
	8				6					
SS	4	SJSB037-G04	2.0	6-8	6.1		contact			
	3	1535			7	CL	6.1 – stiff, damp, bluish gray sandy CLAY			
	7	SL0654					Native, black mottling throughout.			
	7				8		Munsell: GLEY 2 (6/10B and to 3/10B).			
SS	4	SJSB037-G05	1.4	8-10						
	5	1545			9		SAA. No black mottling			
	6	SL0655								
	6	AL, SG			10					
SS	WOH	SJSB037-G06		10-12						
		1640			11		SAA.			
		~~SL0656~~ CJ					11-12: laminations of black, v. soft SILT ~1/4" thick			
	2				12					
SS	1	SJSB037-G07								
	2	1650			13		12-12.6 SAA			
	1	SL0656					12.6: grades to dk gray laminations SILT w/in bluish-gray sandy CLAY.			
	2				14					
					15					
ST	Push	SJSB037-G08	2.1	15-17			ST: Gray, wet, soft sandy CLAY @ T+B.			
		1705			16					
		SL0657								
					17		End @ 17' 11-15-18.			
					18					
					19					
					20					

Marks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:
Contact potentially @ ~5.5' + stiff clay stained dk brown + dk gray

Attachment Figure A.3-23

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR Cascade Drilling
DRILLING METHOD:
HOLE DIAMETER inches

BORING #
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH
PAGE OF
SAMPLING METHOD in. by ft

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLING DATA: SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
SS	6	STSB037-G09	1.4	20-22		SM	Wet, loose, gray silty f-m. SAND	–	85	15
	3	0805			21					
	6	SL0658								
	10				22					
					23					
					24					
					25					
ST	4	STSB037-G10	1.6	25-27		SP	ST: No Recovery. Do SS.	–	95	5
	8	0845			26		SAA			
	11	SL0659								
	12	GS			27					
					28					
					29					
					30					
SS	1	STSB037-G11	0.7	30-32			SAA. Shell halves + pieces (trace).			
	2	0900			31					
	1	SL0660								
	2				32					
					33					
					34					
					35					
SS	2	STSB037-G12								
	3	0915			36					
	6	SL0661					36.5-37: Beaumont CLAY. Stiff, damp, L. brn.			
	6				37	CH				
							End @ 37'. 0930			
					38					
					39					
					40					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.3-24

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation
PROJECT NUMBER: 180557-01.01
GEOLOGIST/ENGINEER: Casey Janisch
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches
SAMPLING METHOD: 3 in. by 2 ft

BORING # SJSB037B
DATE BEGAN 11-16-18
DATE COMPLETED
TOTAL DEPTH
PAGE 3 OF

Field location of boring: 1 ft N of original boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION (Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil)	GRVL %	SND %	FNS %
ST	PUSH	No Recovery	0	0-2						
		1030			1					
		SJSB037-G13								
					2					
ST	Push	1075 50	1.8	2-4						
		SL0662			3					
		SJSB037-G14								
					4					
SS	WOH	1100	1.6	4-6			Wet to most, v. soft, dk brown CLAY (waste),			
		SJSB037-G15			5		Occassional to moderate wood debris.			
		No Sample								
					6					
ST	Push	No Recovery	0	6-8						
		SJSB037-G16			7					
					8					
ST	Push	SJSB037-G17	1.2	8-10						
		1120			9					
		SL0663								
					10		Bottom: Native, sandy CLAY, most, dk ~~bluish~~-gray	-	15	85
							End @ 10'			
					1					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					0					

Remarks: No O = No Odor AOPP = As on Previous Page SAA = Same as above Δ = change

Notes:

Attachment Figure A.3-25

SJSB038

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1
PROJECT NUMBER: 180557-01.01 Task 03
GEOLOGIST/ENGINEER: Sam Giannakos
DRILLING CONTRACTOR: Cascade
DRILLING METHOD: Sonic
HOLE DIAMETER: 6", 2' by 3" Samples

BORING #: ~~SJSB038~~
DATE BEGAN: 12/9/18
DATE COMPLETED: 12/9
TOTAL DEPTH: 36'
SHEET 1 OF 2

Field location of boring: East cell

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
		SJGB	038		1.0	14	0-2'			Wet, black, gravels with medium sand.
			~~601~~			33	(0-1)	1		geotextile fragments; 1'-2' below cap
		~~SJ08~~	~~890~~			18				
						12		2		
		SJGB	038		0.1	2	2-4'			gravel (large) with sand (no sample)
			~~602~~			2	(1-3)	3		
		~~SJ08~~	~~891~~			3				
						WOH		4		
		SJGB	038		0	1	4-6			no sample recovered.
			~~603~~			WOH	(3-5)	5		
		~~SJ08~~				1				
						WOH		6		
					0		6-8'			Soft → casing at 6', ~~[illegible]~~ at 8' - no sample
							(5-7)	7		
								8		
		SJGB	~~038~~		0.6	WOH	8-10			Oily - hydrocarbon odor (chem sample)
			604			WOH	(7-9)	9		waste. black ooze
			1130			1				
						WOH		0		
		SJGB	038		1.0	1	10-12			grading out of waste:
			605			1	(9-11)	1		light grey, moist to wet silt-like with
			1150			WOH				fine grains
						WOH		2		
		SJGB	038		2.0	WOH	12-14			damp, grey, v. soft SILT w/ pocket of
			606			↓		3		fine grey sand.
		SJ08	890							
			1200			↓		4		
		SJGB	038		2.0	WOH	14-16			SAA @ 12'
			607			↓	(13-15)	5		
		SJ08	891							
			1315			↓		6		
		SJGB	608		2.0	WOH	19'-21'			Very loose, grey, med. SILTY SAND 64,90
		SJ0	892			↓		7		
			1325							
						↓		8		
								9		
								0		

Remarks: Sonic: 0-10' (1-9): recovered dark gray/black silty waste with gravel fragments and strong odor

Attachment Figure A.3-26

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 BORING # ST 38078
PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN
GEOLOGIST/ENGINEER DATE COMPLETED
DRILLING CONTRACTOR: Cascade TOTAL DEPTH
DRILLING METHOD SHEET 2 OF 2
HOLE DIAMETER

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
								21		
								22		
								23		
								24		
	S5	SGSB	038		2.0	4	24-26'			loose, grey, moist fine to coarse SAND 90% 10%
			609			3		25		lamations of clay in cap.
		SLOB	93			2				
			1335			2		26		
								27		
								28		
								29		wet
	S6	SGSB	038		1.3	3	29-31			med. dense, moist, light grey coarse 100% SAND
			610			7		30		
		SLO	894			12				
			1345			8		31		
								32		
								33		
								34		
	ST	SJSB	038		2.3'	A/H	34-36			Beaumont
			611					35		
		SLO	895							
								36		
								37		
								38		
								39		
								40		

Remarks: ST taken from 11-13' BML at additional hole w/ 1.0 ft recovery

Attachment Figure A.3-27

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	486380		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJGB018	SL0860	0-2 ft	Moist, dark grayish brown clay	65.4
SJGB018	SL0861	8-10 ft	Moist, gray clay with sand	24.8
SJGB018	SL0862	10-12 ft	Moist, very dark gray clay	26.0
SJGB018	SL0864	14-16 ft	Moist, reddish brown silty sand	23.6
SJGB018	SL0865	16-18 ft	Moist, light yellowish brown clay	18.7
SJGB018	SL0866	18-20 ft	Moist, mottled light yellowish brown and gray clay	17.6
SJGB018	SL0867	20-22 ft	Moist, brownish yellow clay	17.0
SJGB018	SL0869	30-32 ft	Moist, mottled yellowish red and light gray clay	29.7
SJGB018	SL0870	40-42 ft	Moist, light brownish gray silty sand	19.1
SJGB018	SL0872	50-52 ft	Moist, gray clay	20.3

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	485090		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJGB019	SL0847	0-2'	Moist, dark yeollowish brown sand	36.4
SJGB019	SL0848	4-6'	Moist, dark olive brown sand with silt	37.1
SJGB019	SL0849	8-10'	Moist, dark gray clay	30.1
SJGB019	SL0850	13-15'	Moist dark grayish brown silty sand	27.3
SJGB019	SL0851	20-22'	Moist, light yellowish brown clay	20.9
SJGB019	SL0853	30-32'	Moist, mottled reddish yellow and light gray clay	28.1

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	486370		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
SJGB019	SL0854	35-37'	Moist, brownish yellow clayey sand	22.0
SJGB019	SL0855	40-42'	Moist, mottled reddish yellow and light gray clay	29.7
SJGB019	SL0857	50-52 ft	Moist, gray clay	28.2
SJGB019	SL0858	55-57 ft	Moist, very dark brown clay	29.8
SJGB019	SL0859	~59-60 ft	Moist, gray clay with sand	32.9

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	485079		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJGB020	SL0832	4-6'	Moist, brown sand with silt and gravel	22.3
SJGB020	SL0833	6-8'	Moist, dark olive brown sand	25.5
SJGB020	SL0834	8-10'	Moist, dark gray sand with silt	32.2
SJGB020	SL0836	15-17'	Moist, gray clay with gravel	34.1
SJGB020	SL0838	20-22'	Moist, dark grayish brown silty sand	18.0
SJGB020	SL0839	25-27'	Moist, mottled reddish yellow and gray clay	31.9

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	485084		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJGB020	SL0840	30-32'	Moist, light yellowish brown clay	21.6
SJGB020	SL0842	40-42'	Moist, yellowish red clay	27.1
SJGB020	SL0844	50-52'	Moist, yellowish red clay	30.4
SJGB020	SL0845	55-57'	Moist, light gray clay	23.4
SJGB020	SL0846	60-62'	Moist, grayish brown clay	26.8

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	485150		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJGB021	SL0821	0'-2'	Moist, reddish brown sand with silt	37.4
SJGB021	SL0822	4'-6'	Moist, dark grayish brown silty sand	39.9
SJGB021	SL0823	6'-8'	Wet, dark brown clay with sand	51.4
SJGB021	SL0825	14'-16'	Moist, reddish gray sand with clay	43.3
SJGB021	SL0826	19'-21'	Moist, light brown sand	19.2
SJGB021	SL0827	29'-31'	Moist, mottled reddish yellow and gray clay	45.1
SJGB021	SL0828	34'-36'	Moist, reddish yellow clay	30.5
SJGB021	SL0830	44'-46'	Moist, light brownish gray sandy silt	19.7
SJGB021	SL0831	49'-51'	Moist, light gray sand with silt	19.3

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	485141		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJGB022	SL0811	5'-7'	Moist, reddish brown sand with silt	47.6
SJGB022	SL0813	10'-12'	Moist, reddish brown sand with silt	50.2
SJGB022	SL0814	15'-17'	Moist, dark gray clay	56.6
SJGB022	SL0815	20'-22'	Moist, mottled pinkish gray and yellow clay	18.8
SJGB022	SL0816	25'-27'	Moist, yellowish red clay	25.2
SJGB022	SL0818	35'-37'	Moist, reddish brown clay	24.0
SJGB022	SL0819	40'-42'	Moist, light gray clay	21.0
SJGB022	SL0820	45'-47'	Moist, light brownish gray silty sand	21.8

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	486362		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJGB023G01	SL0873	0-2 ft	Moist, dark gray clay	29.8
SJGB023G02	SL0874	2-4 ft	Moist, dark brown clay	25.6
SJGB023G03	SL0875	4-6 ft	Moist, olive brown silty sand	23.0
SJGB023G04	SL0876	6-8 ft	Moist, gray clay	24.7
SJGB023G05	SL0877	8-10 ft	Moist, dark gray clay	27.6
SJGB023G07	SL0879	12-14 ft	Moist, dark gray clay	23.1
SJGB023G08	SL0880	18-20 ft	Moist, dark yellowish brown silty sand	21.7
SJGB023G09	SL0881	23-25 ft	Moist, dark grayish brown sand with silt	16.4
SJGB023G10A	SL0882	28-29.5 ft	Moist, light brown sand	15.8
SJGB023G10B	SL0883	29.5-30 ft	Moist, light gray clay	20.0

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	md
Sample ID:	---	Test Date:	02/28/19	Checked By:	emm
Depth :	---	Test Id:	493238		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJGB023G12	SL0884	38-40 ft	Moist, yellowish red clay	30.5
SJGB023G13	SL0885	43-45 ft	Moist, mottled yellowish red and light gray clay	34.2
SJGB023G14	SL0886	48-50 ft	Moist, light gray clay	19.6
SJGB023G16A	SL0888	58-59.3 ft	Moist, very pale brown clay	22.3
SJGB023G16B	SL0889	59.3-60 ft	Moist, light brownish gray silty sand	16.9
SJGB038	SL0896	11-13 ft	Moist, dark gray clay	48.8

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/10/18	Checked By:	emm
Depth :	---	Test Id:	482773		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB008-E1	SL1025	0-2 ft	Moist, mottled yellowish brown sand dark grayish brown clay	27.2
SJSB008-E1	SL1026	2-4 ft	Moist, dark yellowish brown clay with sand	25.9
SJSB008-E1	SL1027	4-6 ft	Moist, mottled dark grayish brown and yellowish brown clay	26.1
SJSB008-E1	SL1028	6-8 ft	Moist, mottled brown and dark gray clay	23.9
SJSB008-E1	SL1029	8-10 ft	Moist, very dark gray clay	63.7
SJSB008-E1	SL1030	14-16 ft	Moist, mottled very dark gray and gray clay	36.7
SJSB008-E1	SL1031	19-21 ft	Moist, mottled dark gray and light brownish gray clay	25.8
SJSB008-E1	SL1032	21-23 ft	Moist, dark gray clay	26.1
SJSB008-E1	SL1034	25-27 ft	Moist, light brownish gray silty sand	25.1
SJSB008-E1	SL1035	29-31 ft	Moist, grayish brown sand	24.3

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	01/06/19	Checked By:	emm
Depth :	---	Test Id:	482959		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB012-W1	SL1046	0-2 ft	Moist, dark brownish gray clay with sand	30.9
SJSB012-W1	SL1047	2-4 ft	Moist, dark brown sand with gravel	21.4
SJSB012-W1	SL1048	10-12 ft	Moist, very dark gray clay	36.5
SJSB012-W1	SL1050	15-17 ft	Moist, grayish brown silty, clayey sand	23.9
SJSB012-W1	SL1051	20-22 ft	Moist, very dark gray clay	22.0
SJSB012-W1	SL1052	25-27 ft	Moist, dark gray clay with sand	31.5
SJSB012-W1	SL1053	30-32 ft	Moist, grayish brown sand with silt	19.5

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/06/18	Checked By:	emm
Depth :	---	Test Id:	482748		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB019-E1	SL1000	0-2 ft	Moist, dark grayish brown silty clay with gravel	27.1
SJSB019-E1	SL1001	2-4 ft	Moist, mottled grayish brown and yellowish brown clay	40.6
SJSB019-E1	SL1002	4-6 ft	Moist, mottled yellowish brown and dark grayish brown clay with gravel	43.5
SJSB019-E1	SL1003	6-8 ft	Moist, mottled light brownish gray and very dark gray clay	49.1
SJSB019-E1	SL1004	8-10 ft	Moist, very dark gray clay	47.2
SJSB019-E1	SL1005	14-15 ft	Moist, dark grayish brown silty sand	22.1

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/07/18	Checked By:	emm
Depth :	---	Test Id:	482753		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB019-E1	SL1006	15-16 ft	Moist, very dark gray clay	65.5
SJSB019-E1	SL1008	19-21 ft	Moist, very dark gray clay	30.3
SJSB019-E1	SL1009	24-26 ft	Moist, dark grayish brown sandy silt	32.2
SJSB019-E1	SL1010	29-31 ft	Moist, light brownish gray sand	22.0
SJSB019-E1	SL1011	34-36 ft	Moist, gray sand	23.4

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/10/18	Checked By:	emm
Depth :	---	Test Id:	482763		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB023-E1	SL1013	0-2 ft	Moist, very dark gray sandy clay	14.5
SJSB023-E1	SL1014	2-4 ft	Moist, very dark gray silty clay	46.1
SJSB023-E1	SL1015	4-6 ft	Moist, very dark gray clay	70.2
SJSB023-E1	SL1016	6-8 ft	Moist, mottled dark grayish brown and very dark gray clay	52.9
SJSB023-E1	SL1017	10-12 ft	Moist, dark grayish brown silty sand	22.3
SJSB023-E1	SL1018	14-14.8 ft	Moist, gray sand	22.2
SJSB023-E1	SL1019	14.8-16 ft	Moist, mottled very dark gray and gray clay	46.2
SJSB023-E1	SL1020	19-21 ft	Moist, mottled gray and dark gray clay	26.8
SJSB023-E1	SL1022	24-26 ft	Moist, dark grayish brown clayey sand	28.2
SJSB023-E1	SL1023	29-31 ft	Moist, gray sand	22.6

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/10/18	Checked By:	emm
Depth :	---	Test Id:	482780		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB025-1W	SL1037	2-4 ft	Moist, mottled very dark gray and brown clay	27.2
SJSB025-1W	SL1039	6-8 ft	Moist, mottled light brownish gray and dark grayish brown clay with sand	25.8
SJSB025-1W	SL1040	8-10 ft	Moist, very dark grayish brown sandy clay	34.7
SJSB025-1W	SL1041	14-16 ft	Moist, light brownish gray sand with silt	20.6
SJSB025-1W	SL1043	19-21 ft	Moist, gray clay	30.8
SJSB025-1W	SL1044	24-26 ft	Moist, gray silty sand	21.3
SJSB025-1W	SL1045	29-31 ft	Moist, grayish brown sand	23.8

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	01/11/19	Checked By:	emm
Depth :	---	Test Id:	483630		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB028	SL0699	0-2 ft	Moist, dark gray clay with gravel	25.1
SJSB028	SL0800	2-4 ft	Moist, dark brown clay	30.3
SJSB028	SL0801	4-6 ft	Moist, very dark gray clay	25.0
SJSB028	SL0802	6-8 ft	Moist, dark brown clay	26.9
SJSB028	SL0803	8-10 ft	Moist, very dark brown clay	41.1
SJSB028	SL0804	14-16 ft	Moist, grayish brown silty clay	32.5
SJSB028	SL0806	25-27 ft	Moist, very dark brown clay with sand	49.9
SJSB028	SL0807	30-32 ft	Moist, dark gray clay	55.3
SJSB028	SL0808	35-35.7 ft	Moist, dark gray clay	55.0
SJSB028	SL0809	35.7-37 ft	Moist, gray clay	18.2

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/10/18	Checked By:	emm
Depth :	---	Test Id:	482786		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB029	SL0600	0-2 ft	Moist, very dark brown clay	32.2
SJSB029	SL0601	2-4 ft	Moist, very dark grayish brown clay	34.7
SJSB029	SL0602	4-6 ft	Moist, mottled very dark gray and grayish brown clay	41.9
SJSB029	SL0603	6-8 ft	Moist, very dark gray clay	63.6
SJSB029	SL0604	8-10 ft	Moist, very dark grayish brown clay with sand	35.3
SJSB029	SL0605	10-12 ft	Moist, very dark grayish brown clay	65.7

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/10/18	Checked By:	emm
Depth :	---	Test Id:	482791		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB029	SL0606	15-17 ft	Moist, dark grayish brown silty sand	27.0
SJSB029	SL0607	20-22 ft	Moist, dark grayish brown clay	44.9
SJSB029	SL0608	25-27 ft	Moist, dark gray silt	45.1
SJSB029	SL0610	35-36.5 ft	Moist, very dark grayish brown sand with silt	19.7
SJSB029	SL0611	39.5-40 ft	Moist, mottled yellowish brown and very dark grayish brown clay	17.6

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	01/11/19	Checked By:	emm
Depth :	---	Test Id:	483620		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB030	SL0688	0-2 ft	Moist, dark brown silt with gravel	14.1
SJSB030	SL0689	2-4 ft	Moist, dark brown clay	16.0
SJSB030	SL0690	4-6 ft	Moist, dark grayish brown clay	21.4
SJSB030	SL0691	6-8 ft	Moist, dark grayish brown clay	26.1
SJSB030	SL0692	8-10 ft	Moist, dark brown silty clay with gravel	21.0
SJSB030	SL0693	14-16 ft	Moist, dark grayish brown clayey sand	26.9
SJSB030	SL0695	25-27 ft	Moist, dark gray silty sand	21.8
SJSB030	SL0696	30-32 ft	Moist, brownish gray sand with silt	21.8
SJSB030	SL0697	35-37 ft	Moist, dark gray sand	20.2

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/10/18	Checked By:	emm
Depth :	---	Test Id:	482801		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB031	SL0613	0-2 ft	Moist, olive brown silty sand with gravel	14.0
SJSB031	SL0614	2-4 ft	Moist, mottled olive brown and dark gray clay with sand	19.1
SJSB031	SL0615	4-6 ft	Moist, mottled dark grayish brown, gray, and yellowish brown clay	25.5
SJSB031	SL0616	6-8 ft	Moist, very dark grayish brown clay	21.9
SJSB031	SL0617	8-10 ft	Moist, very dark grayish brown clayey sand	20.7
SJSB031	SL0620	14-16 ft	Moist, mottled yellowish brown and grayish brown clay with sand	18.2
SJSB031	SL0622	20-22 ft	Moist, grayish brown sand	21.3
SJSB031	SL0623	25-27 ft	Moist, dark gray sand	23.5
SJSB031	SL0624	30-32 ft	Moist, grayish brown sand	20.0
SJSB031	SL0625	35-37 ft	Moist, grayish brown sandy silt	33.3

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	483606		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB032	SL0675	0-2 ft	Moist, light grayish brown and very dark gray clay with gravel	13.8
SJSB032	SL0676	2-4 ft	Moist, very dark gray and very dark grayish brown clay	40.7
SJSB032	SL0677	4-6 ft	Moist, very dark grayish brown clay with sand	18.8
SJSB032	SL0678	6-8 ft	Moist, very dark grayish brown clay	25.6
SJSB032	SL0679	8-10 ft	Moist, dark gray clay	27.8
SJSB032	SL0680	14-16 ft	Moist, dark grayish brown sand with silt	25.3

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	483611		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB032	SL0681	20-22 ft	Moist, dark gray sand	23.8
SJSB032	SL0682	25-27 ft	Moist, gray sand	18.5
SJSB032	SL0683	30-32 ft	Moist, dark grayish brown sand	20.4
SJSB032	SL0684	35-37 ft	Moist, grayish brown sand	20.5
SJSB032	SL0685	38-40 ft	Moist, yellowish brown clay	21.9

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/11/19	Checked By:	emm
Depth :	---	Test Id:	483582		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB033	SL0640	0-2 ft	Moist, light brownish gray sandy clay with gravel	15.2
SJSB033	SL0641	2-4 ft	Moist, very dark brown sand	25.0
SJSB033	SL0642	4-6 ft	Moist, very dark brown clay	24.9
SJSB033	SL0643	6-8 ft	Moist, dark grayish brown silty clay with sand	21.0
SJSB033	SL0644	8-10 ft	Moist, very dark gray clay	24.5
SJSB033	SL0645	14-16 ft	Moist, grayish brown silty sand	23.8
SJSB033	SL0646	20-22 ft	Moist, dark gray sand	21.0
SJSB033	SL0647	30-32 ft	Moist, grayish brown sand with gravel	15.2
SJSB033	SL0648	35-37 ft	Moist, dark gray sand	17.9
SJSB033	SL0649	38-40 ft	Moist, light olive brown clay	19.2

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	01/06/19	Checked By:	emm
Depth :	---	Test Id:	482952		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB034	SL0628	0-2 ft	Moist, dark olive brown silt with sand	14.6
SJSB034	SL0629	2-4 ft	Moist, dark grayish brown clay	18.7
SJSB034	SL0630	4-6 ft	Moist, dark gray clay	20.5
SJSB034	SL0631	6-8 ft	Moist, very dark brown sandy clay	25.2
SJSB034	SL0632	8-9 ft	Moist, very dark gray clay with gravel	25.7
SJSB034	SL0633	9-10 ft	Moist, pale brown sand	19.5
SJSB034	SL0634	14-16 ft	Moist, light yellowish brown silty sand	18.9
SJSB034	SL0635	20-22 ft	Moist, very dark gray clay with silt and sand	28.5
SJSB034	SL0636	25-27 ft	Moist, very dark gray clay with sand	35.4
SJSB034	SL0638	40-40.8 ft	Moist, dark grayish brown silty sand	12.1

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	01/03/19	Checked By:	emm
Depth :	---	Test Id:	482942		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB035	SL0640	0-2 ft	Moist, mottled dark gray and brown clay	15.0
SJSB035	SL0641	2-4 ft	Moist, grayish brown clay	18.6
SJSB035	SL0642	4-6 ft	Moist, mottled light yellowish brown and grayish brown clay	21.3
SJSB035	SL0643	6-8 ft	Moist, very dark gray clay with gravel	29.6
SJSB035	SL0644	8-10 ft	Moist, very dark grayish brown sandy clay	24.8
SJSB035	SL0645	14-16 ft	Moist, mottled grayish brown and light olive brown clay	25.6
SJSB035	SL0646	21.8-22 ft	Moist, very dark gray clay	42.8
SJSB035	SL0647	25-27 ft	Moist, dark gray silty sand	24.5
SJSB035	SL0648	30-32 ft	Moist, dark gray silty sand	16.9
SJSB035	SL0649	40-42 ft	Moist, yellowish brown clay	19.8

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/11/19	Checked By:	emm
Depth :	---	Test Id:	483600		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB036	SL0664	0-2.6 ft	Wet, black clay	82.4
SJSB036	SL0665	2.6-4 ft	Moist, very dark grayish brown sandy clay	77.5
SJSB036	SL0666	4-6 ft	Moist, very dark gray clay	30.0
SJSB036	SL0667	6-8 ft	Moist, very dark grayish brown clay	28.4
SJSB036	SL0668	8-10 ft	Moist, mottled very dark gray and gray clay	23.4
SJSB036	SL0669	15-17 ft	Moist, gray sandy clay	29.3
SJSB036	SL0670	20-22 ft	Moist, dark gray sand with silt	22.0
SJSB036	SL0671	25-27 ft	Moist, gray sand	19.9

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/11/19	Checked By:	emm
Depth :	---	Test Id:	483592		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB037	SL0651	0-2 ft	Moist, dark gray and light brownish gray clay	48.4
SJSB037	SL0652	2-4 ft	Moist, very dark gray sandy clay	105.2
SJSB037	SL0653	4-6 ft	Wet, black clay	70.2
SJSB037	SL0654	6-8 ft	Moist, gray clay	21.1
SJSB037	SL0655	8-10 ft	Moist, dark grayish brown clay	28.5
SJSB037	SL0656	12-14 ft	Wet, very dark gray clay	39.8
SJSB037	SL0658	20-22 ft	Moist, very dark gray silty sand	24.6
SJSB037	SL0659	25-27 ft	Moist, grayish brown sand with silt	18.7
SJSB037	SL0660	30-32 ft	Moist, light brownish grey sand	16.5
SJSB037	SL0661	35-37 ft	Moist, light brownish gray clay	20.5

Notes: Temperature of Drying : 110° Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	02/25/19	Checked By:	emm
Depth :	---	Test Id:	486506		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
SJSB038	SL0890	11-13 ft	Moist, very dark grayish brown clay	41.7
SJSB038	SL0891	13-15 ft	Moist, very dark grayish brown sandy clay	47.6
SJSB038	SL0892	19-21 ft	Moist, very dark brown silt with sand	25.2
SJSB038	SL0893	24-26 ft	Moist, dark brown sand with silt	22.3
SJSB038	SL0894	29-31 ft	Moist, light yellowish brown silt	13.9

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	md
Sample ID:	---	Test Date:	02/28/19	Checked By:	bfs
Depth :	---	Test Id:	493256		

Laboratory Determination of Density (Unit Weight) of Soil Specimens by ASTM D7263

Boring ID	Sample ID	Depth	Visual Description	Bulk Density pcf	Moisture Content %	Dry Density pcf	*
SJGB022	SL0812	7-9 ft	Moist, grayish brown clay	102.5	39.69	73.40	(1)
SJGB038	SL0896	11-13 ft	Moist, dark gray clay	110.9	48.82	74.53	(2)

* Sample Comments

(1): Method B-Cylinder, Intact

(2): Method B-Cylinder, Intact

Notes: Moisture Content determined by ASTM D2216.

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	md
Sample ID:	---	Test Date:	02/28/19	Checked By:	bfs
Depth :	---	Test Id:	493254		

Laboratory Determination of Density (Unit Weight) of Soil Specimens by ASTM D7263

Boring ID	Sample ID	Depth	Visual Description	Bulk Density pcf	Moisture Content %	Dry Density pcf	*
JSB012-W	SL1054	8-10 ft	Moist, dark gray clay	108.4	34.90	80.38	(1)
SJSB019	SL1012	4-6 ft	Moist, brown clay with sand and gravel	125.3	18.56	105.7	(2)
SJSB023	SL1024	8-10 ft	Moist, gray clay with sand	114.3	36.57	83.72	(3)
SJSB025	SL1038	4-6'	Moist, grayish brown sandy clay	107.2	51.89	70.55	(4)
SJSB036	SL0672	2-4'	Moist, brown clay	81.85	80.10	45.45	(5)
SJSB037	SL0662	2-4'	Wet, gray silty clay	83.75	107.9	40.29	(6)

* Sample Comments

(1): Method B-Cylinder, Intact

(2): Method B-Cylinder, Intact

(3): Method B-Cylinder, Intact

(4): Method B-Cylinder, Intact

(5): Method B-Cylinder, Intact

(6): Method B-Cylinder, Intact

Notes: Moisture Content determined by ASTM D2216.

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	njf
Sample ID:	---	Test Date:	03/05/19	Checked By:	emm
Depth :	---	Test Id:	485156		

Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
SJGB018	SL0866	18-20 ft	Moist, mottled light yellowish brown and gray clay	2.64	
SJGB018	SL0870	40-42 ft	Moist, light brownish gray silty sand	2.66	
SJGB019	SL0851	20-22'	Moist, light yellowish brown clay	2.67	
SJGB019	SL0854	35-37'	Moist, brownish yellow clayey sand	2.68	
SJGB020	SL0840	30-32'	Moist, light yellowish brown clay	2.66	
SJGB020	SL0846	60-62'	Moist, grayish brown clay	2.68	
SJGB021	SL0823	6'-8'	Wet, dark brown clay with sand	2.64	
SJGB021	SL0830	44'-46'	Moist, light brownish gray sandy silt	2.69	
SJGB022	SL0818	35'-37'	Moist, reddish brown clay	2.65	
SJGB022	SL0820	45'-47'	Moist, light brownish gray silty sand	2.70	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854
Moisture Content determined by ASTM D2216.

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	01/10/19	Checked By:	emm
Depth :	---	Test Id:	482716		

Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
SJGB023G09	SL0881	23-25 ft	Moist, dark grayish brown sand with silt	2.67	
SJGB023G16B	SL0889	59.3-60 ft	Moist, light brownish gray silty sand	2.70	
SJSB008-E1	SL1026	2-4 ft	Moist, dark yellowish brown clay with sand	2.66	
SJSB008-E1	SL1029	8-10 ft	Moist, very dark gray clay	2.62	
SJSB019-E1	SL1004	8-10 ft	Moist, very dark gray clay	2.64	
SJSB019-E1	SL1008	19-21 ft	Moist, very dark gray clay	2.66	
SJSB023-E1	SL1015	4-6 ft	Moist, very dark gray clay	2.66	
SJSB023-E1	SL1022	24-26 ft	Moist, dark grayish brown clayey sand	2.69	
SJSB025-1W	SL1040	8-10 ft	Moist, very dark grayish brown sandy clay	2.65	
SJSB025-1W	SL1043	19-21 ft	Moist, gray clay	2.68	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854
Moisture Content determined by ASTM D2216.

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	njf
Sample ID:	---	Test Date:	03/07/19	Checked By:	emm
Depth :	---	Test Id:	483648		

Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
SJSB028	SL0803	8-10 ft	Moist, very dark brown clay	2.63	
SJSB028	SL0806	25-27 ft	Moist, very dark brown clay with sand	2.67	
SJSB029	SL0606	15-17 ft	Moist, dark grayish brown silty sand	2.69	
SJSB029	SL0607	20-22 ft	Moist, dark grayish brown clay	2.64	
SJSB030	SL0692	8-10 ft	Moist, dark brown silty clay with gravel	2.66	
SJSB030	SL0696	30-32 ft	Moist, brownish gray sand with silt	2.69	
SJSB031	SL0617	8-10 ft	Moist, very dark grayish brown clayey sand	2.68	
SJSB031	SL0622	20-22 ft	Moist, grayish brown sand	2.71	
SJSB032	SL0679	8-10 ft	Moist, dark gray clay	2.67	
SJSB032	SL0685	38-40 ft	Moist, yellowish brown clay	2.68	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854
Moisture Content determined by ASTM D2216.

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	njf
Sample ID:	---	Test Date:	03/05/19	Checked By:	emm
Depth :	---	Test Id:	483644		

Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
SJSB033	SL0643	6-8 ft	Moist, dark grayish brown silty clay with sand	2.70	
SJSB033	SL0645	14-16 ft	Moist, grayish brown silty sand	2.68	
SJSB034	SL0634	14-16 ft	Moist, light yellowish brown silty sand	2.70	
SJSB034	SL0638	40-40.8 ft	Moist, dark grayish brown silty sand	2.70	
SJSB035	SL0641	2-4 ft	Moist, grayish brown clay	2.69	
SJSB035	SL0644	8-10 ft	Moist, very dark grayish brown sandy clay	2.69	
SJSB036	SL0665	2.6-4 ft	Moist, very dark grayish brown sandy clay	2.61	
SJSB036	SL0667	6-8 ft	Moist, very dark grayish brown clay	2.66	
SJSB037	SL0652	2-4 ft	Moist, very dark gray sandy clay	2.67	
SJSB037	SL0655	8-10 ft	Moist, dark grayish brown clay	2.69	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854
Moisture Content determined by ASTM D2216.

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	---	Sample Type:	---	Tested By:	njf
Sample ID:	---	Test Date:	03/05/19	Checked By:	emm
Depth :	---	Test Id:	486510		

Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
SJSB038	SL0891	13-15 ft	Moist, very dark grayish brown sandy clay	2.64	
SJSB038	SL0893	24-26 ft	Moist, dark brown sand with silt	2.68	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854
Moisture Content determined by ASTM D2216.

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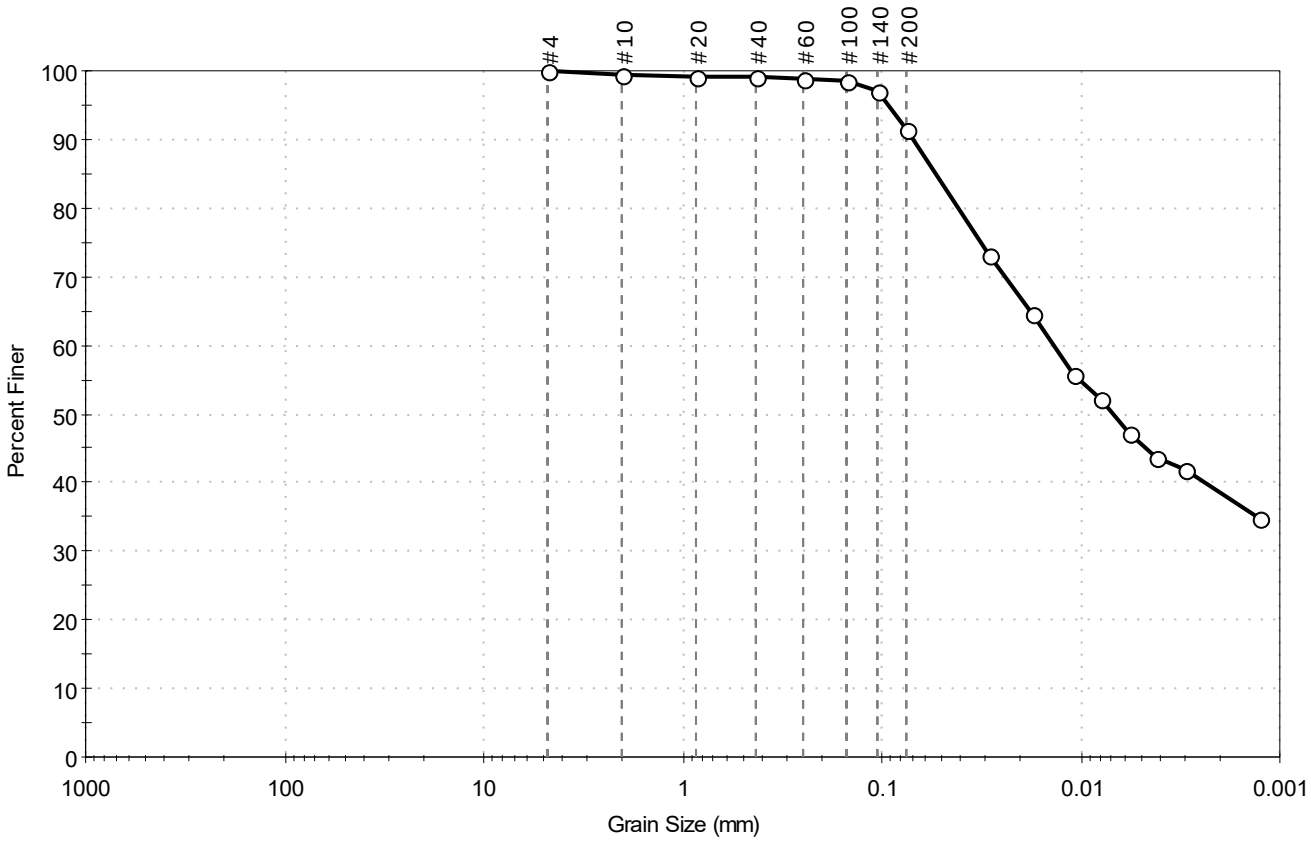
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB018	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0866	Test Date:	02/25/19	Checked By:	bfs
Depth :	18-20 ft	Test Id:	486394		
Test Comment:	---				
Visual Description:	Moist, mottled light yellowish brown and gray clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	8.5	91.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	97		
#200	0.075	91		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0287	73		
---	0.0177	65		
---	0.0108	56		
---	0.0079	52		
---	0.0057	47		
---	0.0042	44		
---	0.0030	42		
---	0.0013	35		

Coefficients

D_{85} = 0.0533 mm D_{30} = N/A

D_{60} = 0.0138 mm D_{15} = N/A

D_{50} = 0.0069 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM Lean CLAY (CL)

AASHTO Clayey Soils (A-7-6 (26))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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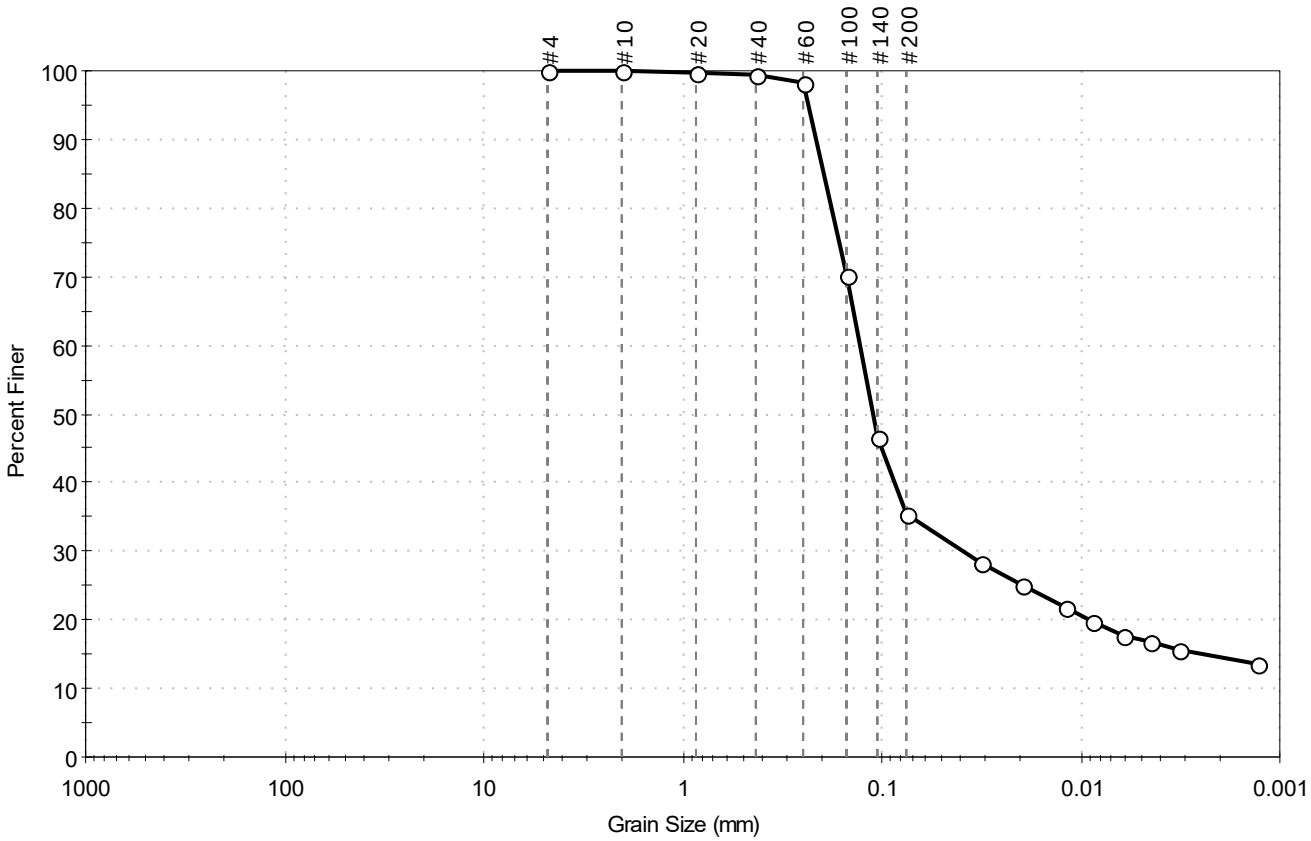
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB018	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0870	Test Date:	02/25/19	Checked By:	bfs
Depth :	40-42 ft	Test Id:	486395		
Test Comment:	---				
Visual Description:	Moist, light brownish gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	64.7	35.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	98		
#100	0.15	70		
#140	0.11	47		
#200	0.075	35		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0319	28		
---	0.0199	25		
---	0.0120	22		
---	0.0088	20		
---	0.0062	18		
---	0.0045	17		
---	0.0032	16		
---	0.0013	14		

Coefficients

D_{85} = 0.1963 mm D_{30} = 0.0395 mm
D_{60} = 0.1289 mm D_{15} = 0.0024 mm
D_{50} = 0.1113 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM Silty SAND (SM)

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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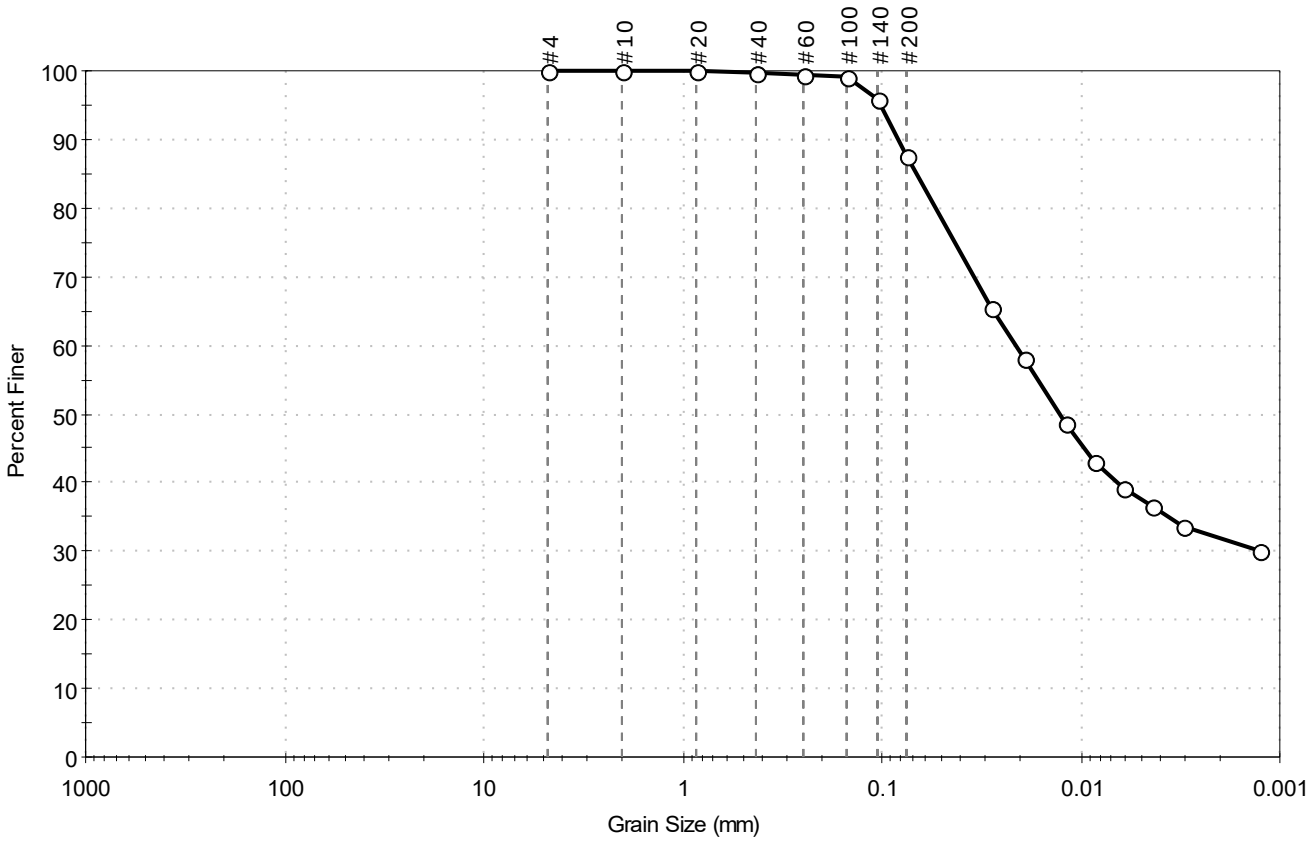
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB019	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0851	Test Date:	02/25/19	Checked By:	bfs
Depth :	20-22'	Test Id:	485119		
Test Comment:	---				
Visual Description:	Moist, light yellowish brown clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	12.3	87.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#140	0.11	96		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0284	66		
---	0.0194	58		
---	0.0119	49		
---	0.0086	43		
---	0.0061	39		
---	0.0044	37		
---	0.0030	34		
---	0.0013	30		

Coefficients

D_{85} = 0.0666 mm D_{30} = 0.0013 mm
D_{60} = 0.0214 mm D_{15} = N/A
D_{50} = 0.0128 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM Lean CLAY (CL)

AASHTO Clayey Soils (A-6 (21))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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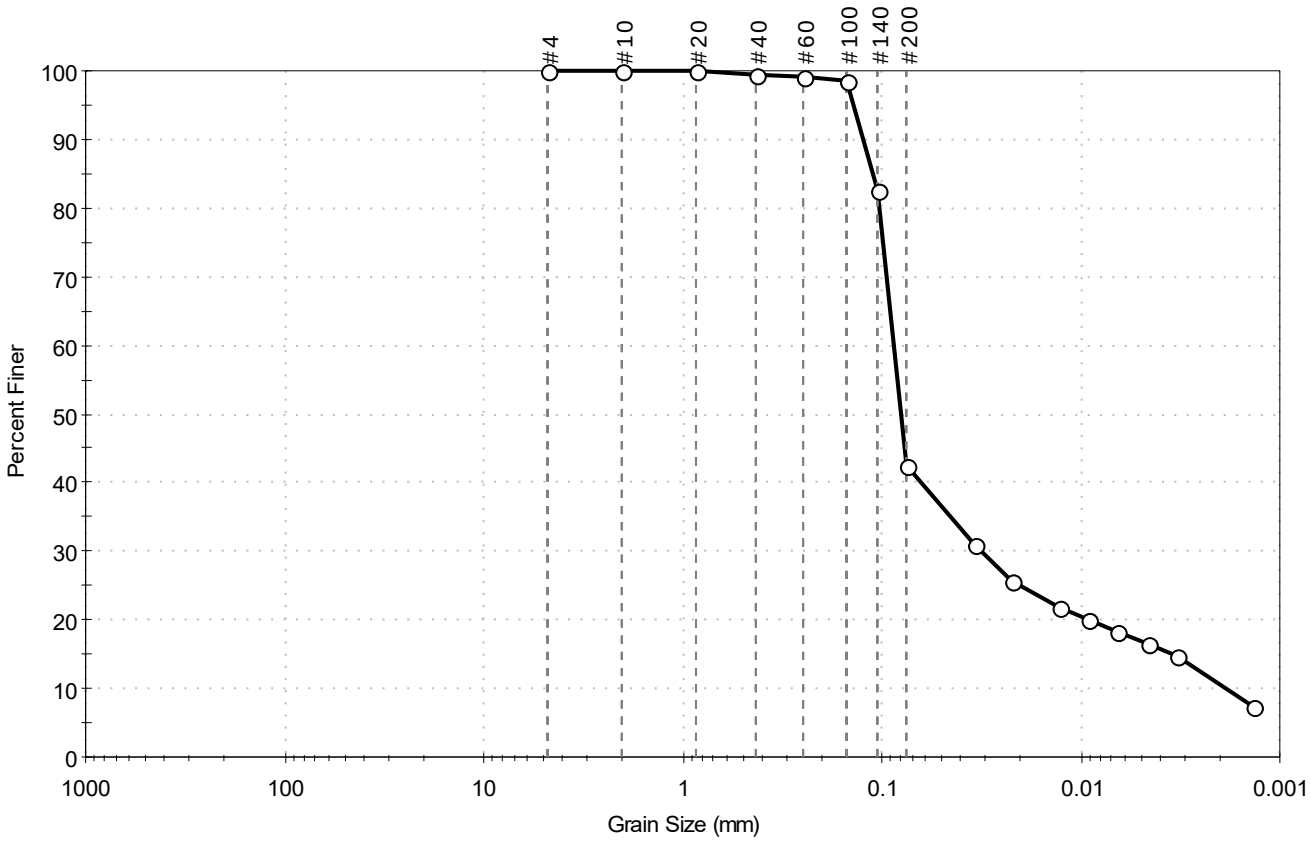
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB019	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0854	Test Date:	02/26/19	Checked By:	bfs
Depth :	35-37'	Test Id:	485120		
Test Comment:	---				
Visual Description:	Moist, brownish yellow clayey sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.1	57.4	42.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	83		
#200	0.075	43		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0339	31		
---	0.0223	26		
---	0.0129	22		
---	0.0093	20		
---	0.0066	18		
---	0.0047	16		
---	0.0033	15		
---	0.0014	7		

Coefficients

D_{85} = 0.1118 mm D_{30} = 0.0313 mm
D_{60} = 0.0872 mm D_{15} = 0.0035 mm
D_{50} = 0.0800 mm D_{10} = 0.0019 mm
C_u = 45.895 C_c = 5.913

Classification

ASTM Clayey SAND (SC)

AASHTO Silty Soils (A-4 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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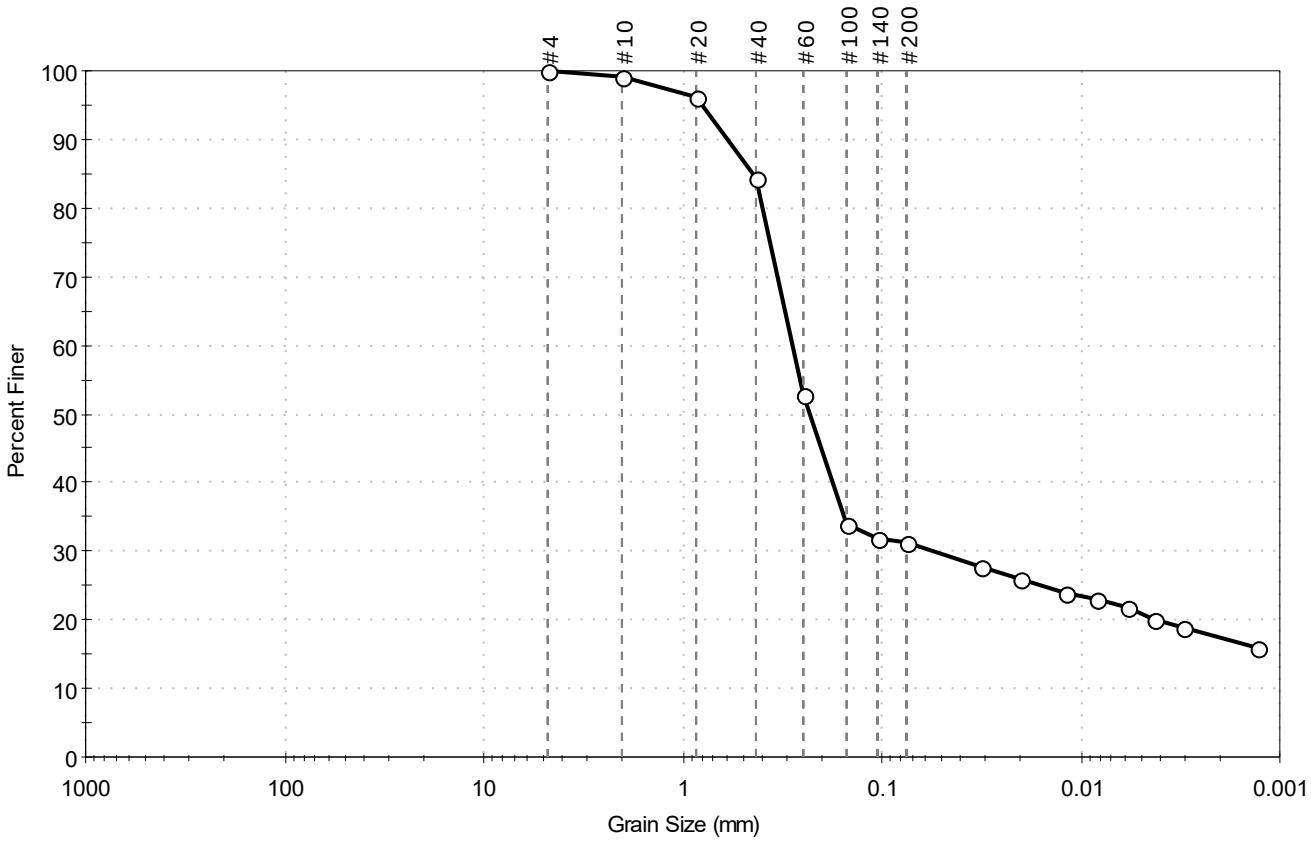
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB020	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0838	Test Date:	02/25/19	Checked By:	bfs
Depth :	20-22'	Test Id:	485117		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	68.7	31.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	96		
#40	0.42	84		
#60	0.25	53		
#100	0.15	34		
#140	0.11	32		
#200	0.075	31		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0317	28		
---	0.0204	26		
---	0.0119	24		
---	0.0083	23		
---	0.0059	22		
---	0.0043	20		
---	0.0031	19		
---	0.0013	16		

Coefficients

D_{85} = 0.4396 mm	D_{30} = 0.0542 mm
D_{60} = 0.2823 mm	D_{15} = N/A
D_{50} = 0.2321 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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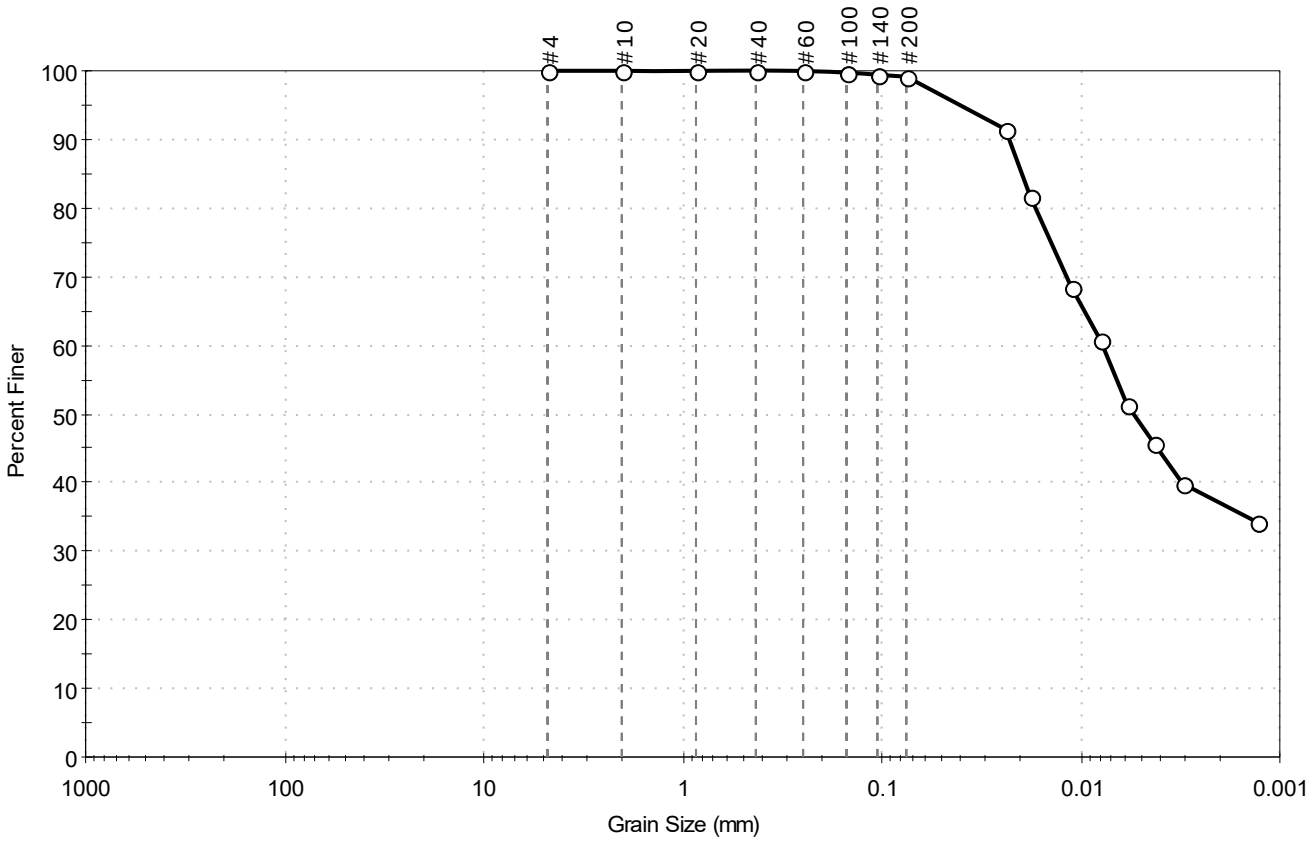
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB020	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0846	Test Date:	02/25/19	Checked By:	bfs
Depth :	60-62'	Test Id:	485118		
Test Comment:	---				
Visual Description:	Moist, grayish brown clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	0.9	99.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#140	0.11	99		
#200	0.075	99		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0241	91		
---	0.0180	82		
---	0.0111	68		
---	0.0080	61		
---	0.0058	51		
---	0.0043	46		
---	0.0031	40		
---	0.0013	34		

Coefficients

D_{85} = 0.0199 mm	D_{30} = N/A
D_{60} = 0.0078 mm	D_{15} = N/A
D_{50} = 0.0054 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Fat CLAY (CH)

AASHTO Clayey Soils (A-7-6 (42))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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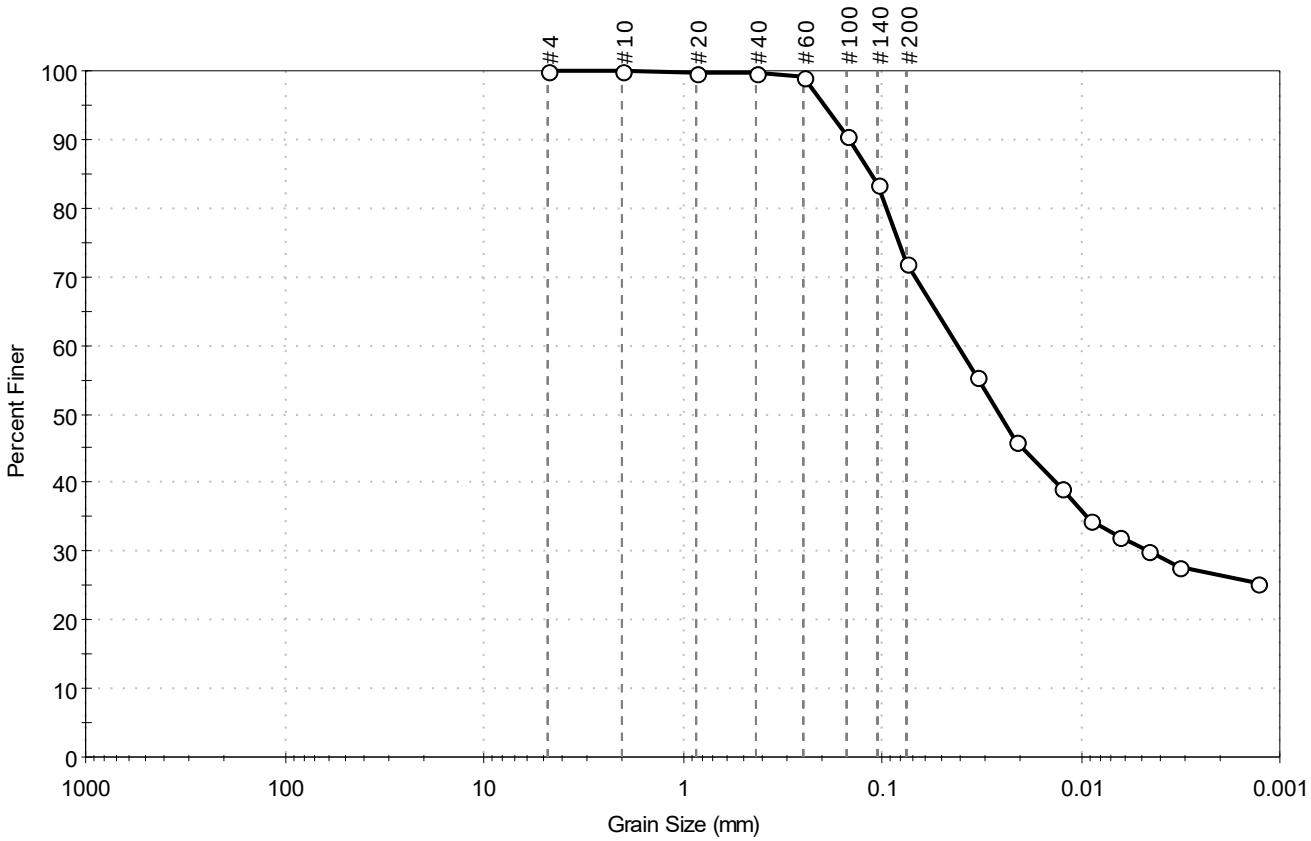
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJGB021	Sample Type: bag	Tested By:	ckg
Sample ID: SL0823	Test Date: 02/25/19	Checked By:	bfs
Depth : 6'-8'	Test Id: 485161		
Test Comment:	---		
Visual Description:	Wet, dark brown clay with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	27.9	72.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	91		
#140	0.11	83		
#200	0.075	72		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0331	55		
---	0.0210	46		
---	0.0126	39		
---	0.0091	35		
---	0.0064	32		
---	0.0046	30		
---	0.0032	28		
---	0.0013	25		

Coefficients

D_{85} = 0.1147 mm	D_{30} = 0.0046 mm
D_{60} = 0.0416 mm	D_{15} = N/A
D_{50} = 0.0255 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Lean CLAY with Sand (CL)

AASHTO Clayey Soils (A-7-6 (20))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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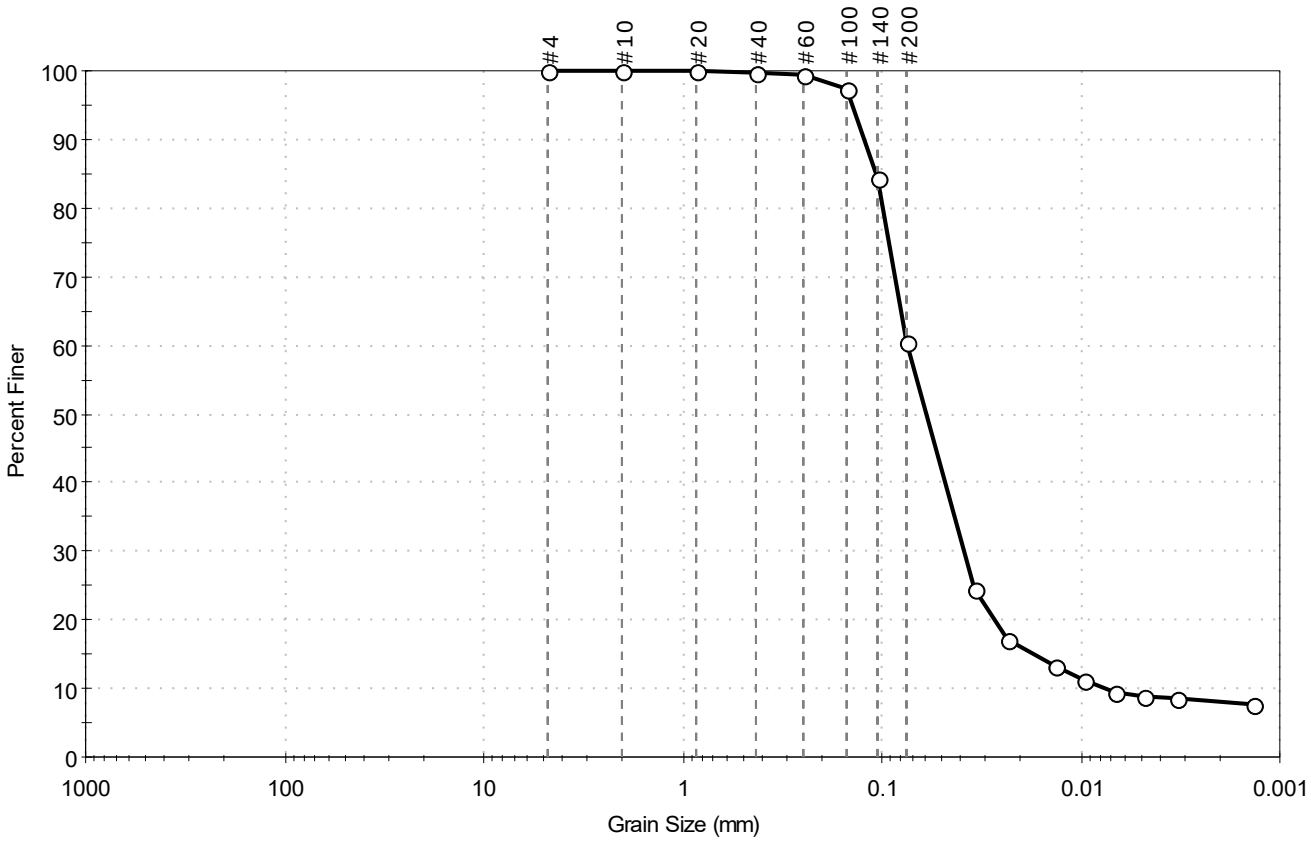
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB021	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0830	Test Date:	02/25/19	Checked By:	bfs
Depth :	44'-46'	Test Id:	485162		
Test Comment:	---				
Visual Description:	Moist, light brownish gray sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	39.6	60.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	97		
#140	0.11	84		
#200	0.075	60		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0342	25		
---	0.0231	17		
---	0.0135	13		
---	0.0096	11		
---	0.0068	9		
---	0.0048	9		
---	0.0033	9		
---	0.0014	8		

Coefficients

D_{85} = 0.1075 mm D_{30} = 0.0385 mm
D_{60} = 0.0744 mm D_{15} = 0.0174 mm
D_{50} = 0.0598 mm D_{10} = 0.0075 mm
C_u = 9.920 C_c = 2.656

Classification

ASTM Sandy SILT (ML)

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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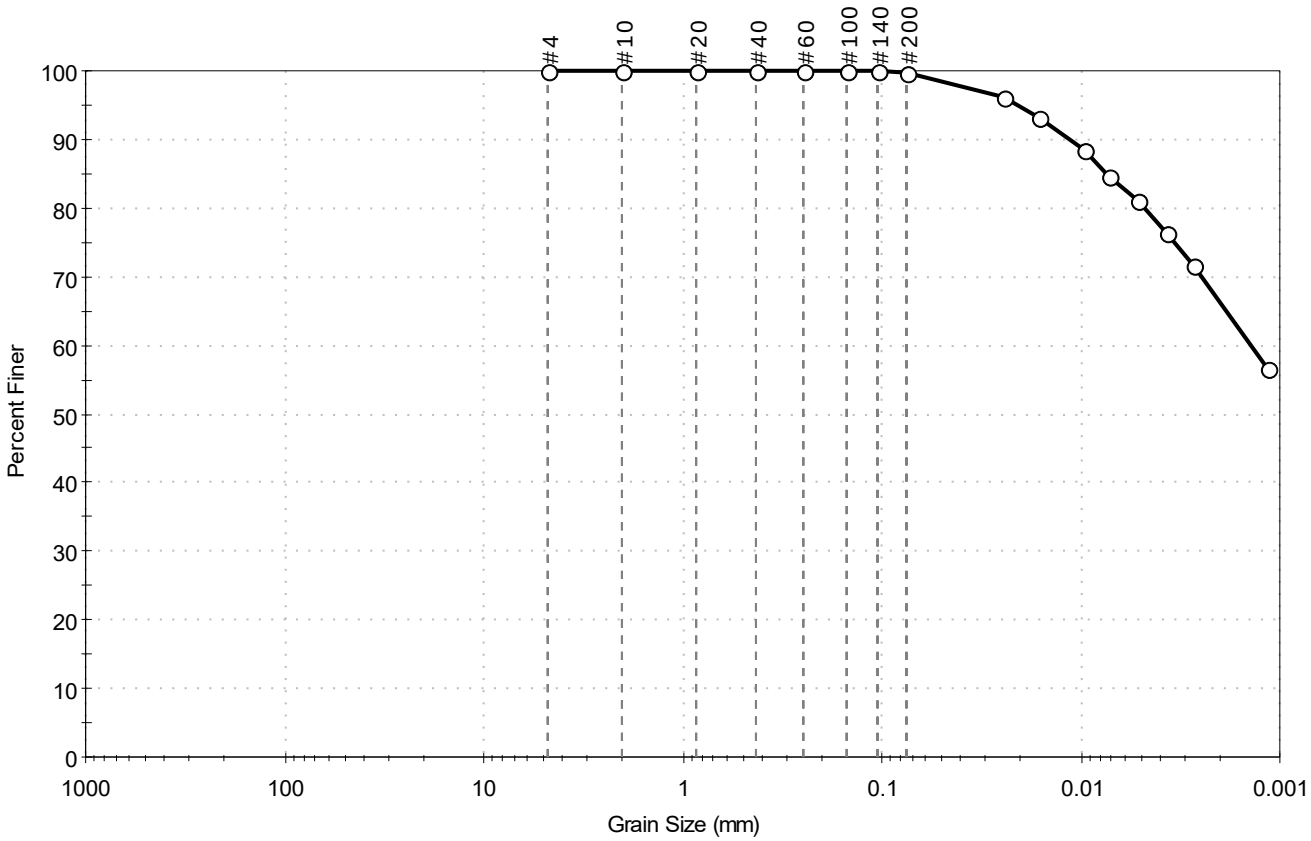
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB022	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0818	Test Date:	02/26/19	Checked By:	bfs
Depth :	35'-37'	Test Id:	485159		
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.2	99.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#140	0.11	100		
#200	0.075	100		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0243	96		
---	0.0163	93		
---	0.0097	89		
---	0.0072	85		
---	0.0052	81		
---	0.0038	76		
---	0.0027	72		
---	0.0012	57		

Coefficients

D_{85} = 0.0073 mm	D_{30} = N/A
D_{60} = 0.0014 mm	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Fat CLAY (CH)

AASHTO Clayey Soils (A-7-6 (50))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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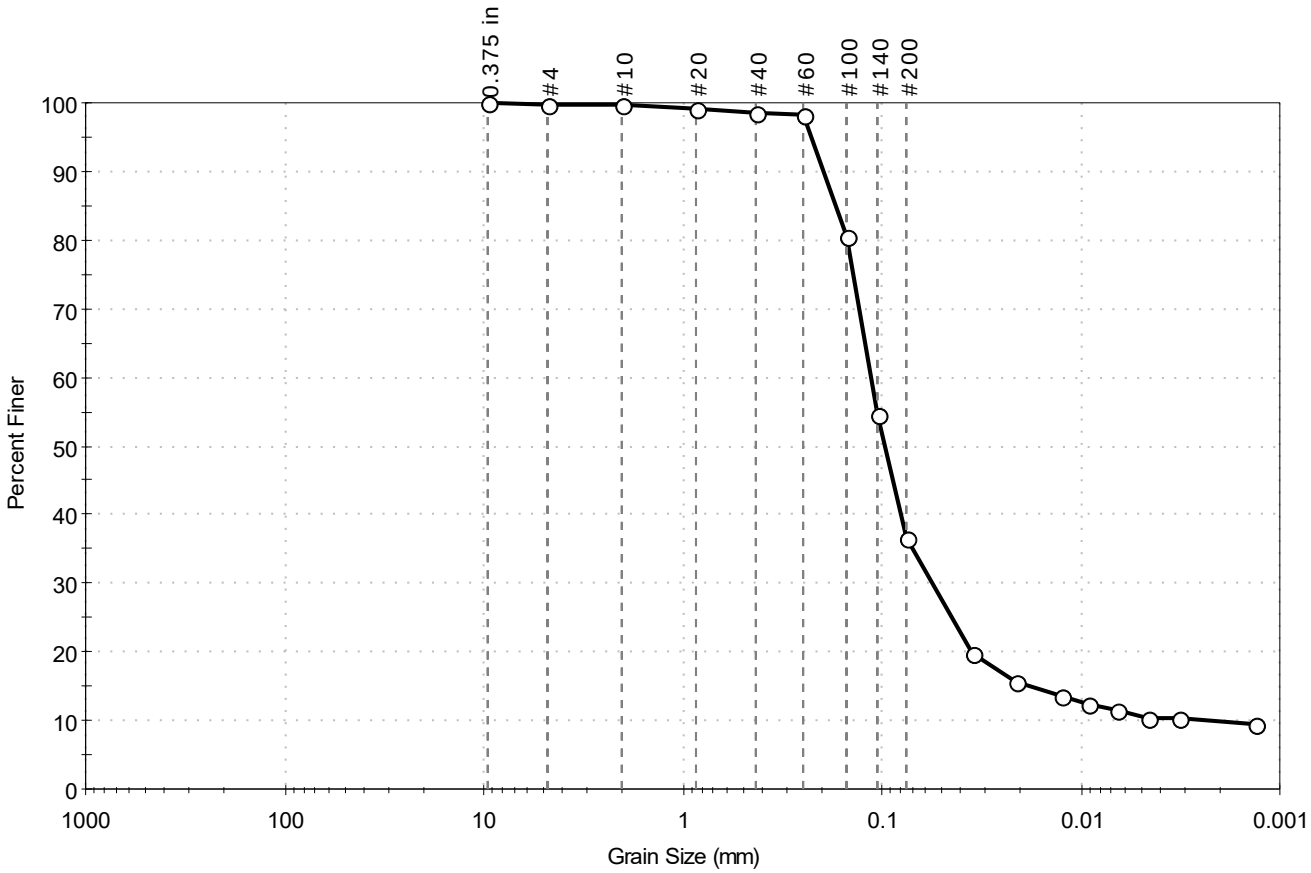
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB022	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0820	Test Date:	02/26/19	Checked By:	bfs
Depth :	45'-47'	Test Id:	485160		
Test Comment:	---				
Visual Description:	Moist, light brownish gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.3	63.0	36.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	81		
#140	0.11	55		
#200	0.075	37		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0347	20		
---	0.0214	16		
---	0.0127	14		
---	0.0092	12		
---	0.0065	11		
---	0.0046	10		
---	0.0032	10		
---	0.0013	9		

Coefficients

D_{85} = 0.1708 mm	D_{30} = 0.0553 mm
D_{60} = 0.1140 mm	D_{15} = 0.0183 mm
D_{50} = 0.0970 mm	D_{10} = 0.0023 mm
C_u = 49.565	C_c = 11.663

Classification

ASTM Silty SAND (SM)

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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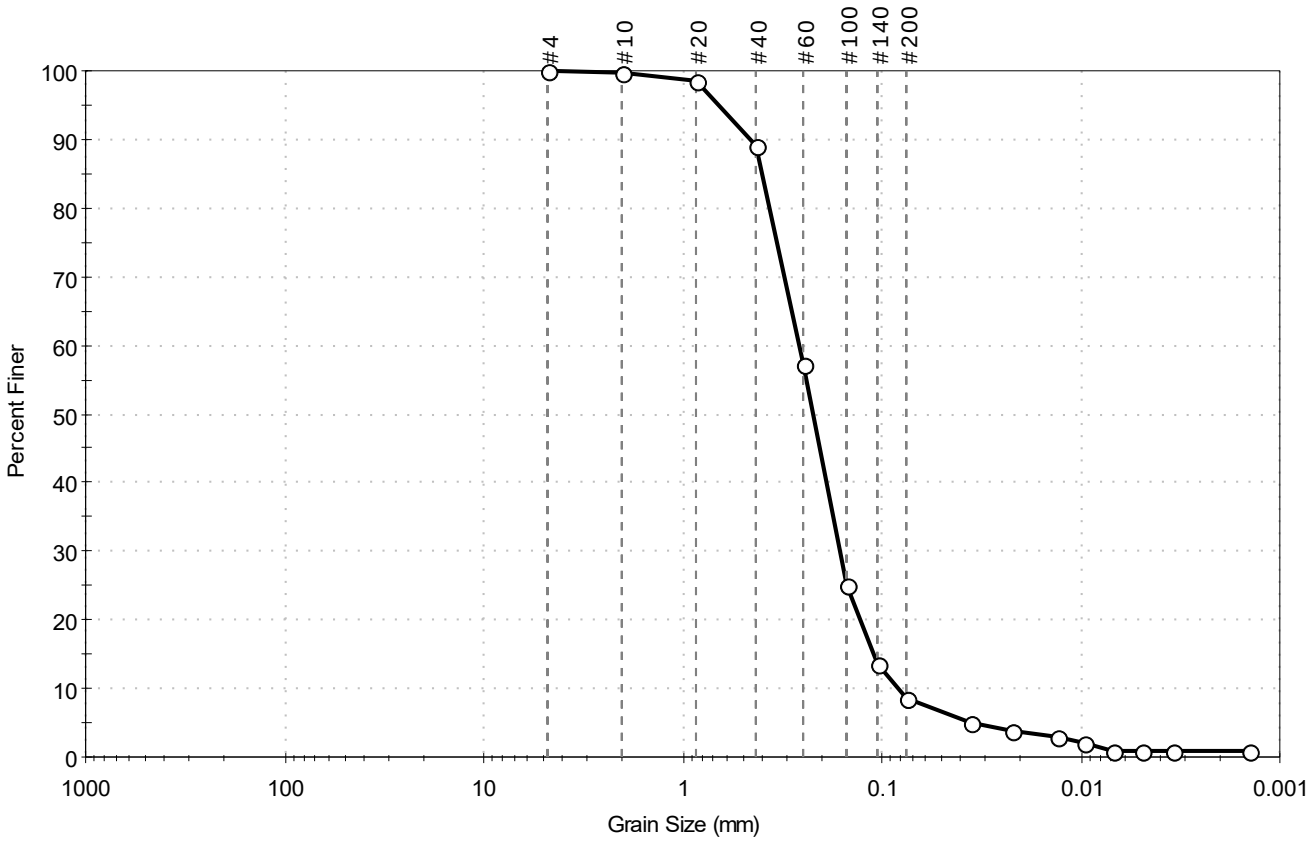
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB023G09	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0881	Test Date:	02/25/19	Checked By:	bfs
Depth :	23-25 ft	Test Id:	486391		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	91.5	8.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	89		
#60	0.25	57		
#100	0.15	25		
#140	0.11	13		
#200	0.075	8.5		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0359	5		
---	0.0225	4		
---	0.0133	3		
---	0.0097	2		
---	0.0069	1		
---	0.0049	1		
---	0.0035	1		
---	0.0014	1		

Coefficients

D_{85} = 0.3975 mm D_{30} = 0.1621 mm
D_{60} = 0.2623 mm D_{15} = 0.1109 mm
D_{50} = 0.2231 mm D_{10} = 0.0831 mm
C_u = 3.156 C_c = 1.205

Classification

ASTM Poorly graded SAND with Silt (SP-SM)

AASHTO Fine Sand (A-3 (1))

Sample / Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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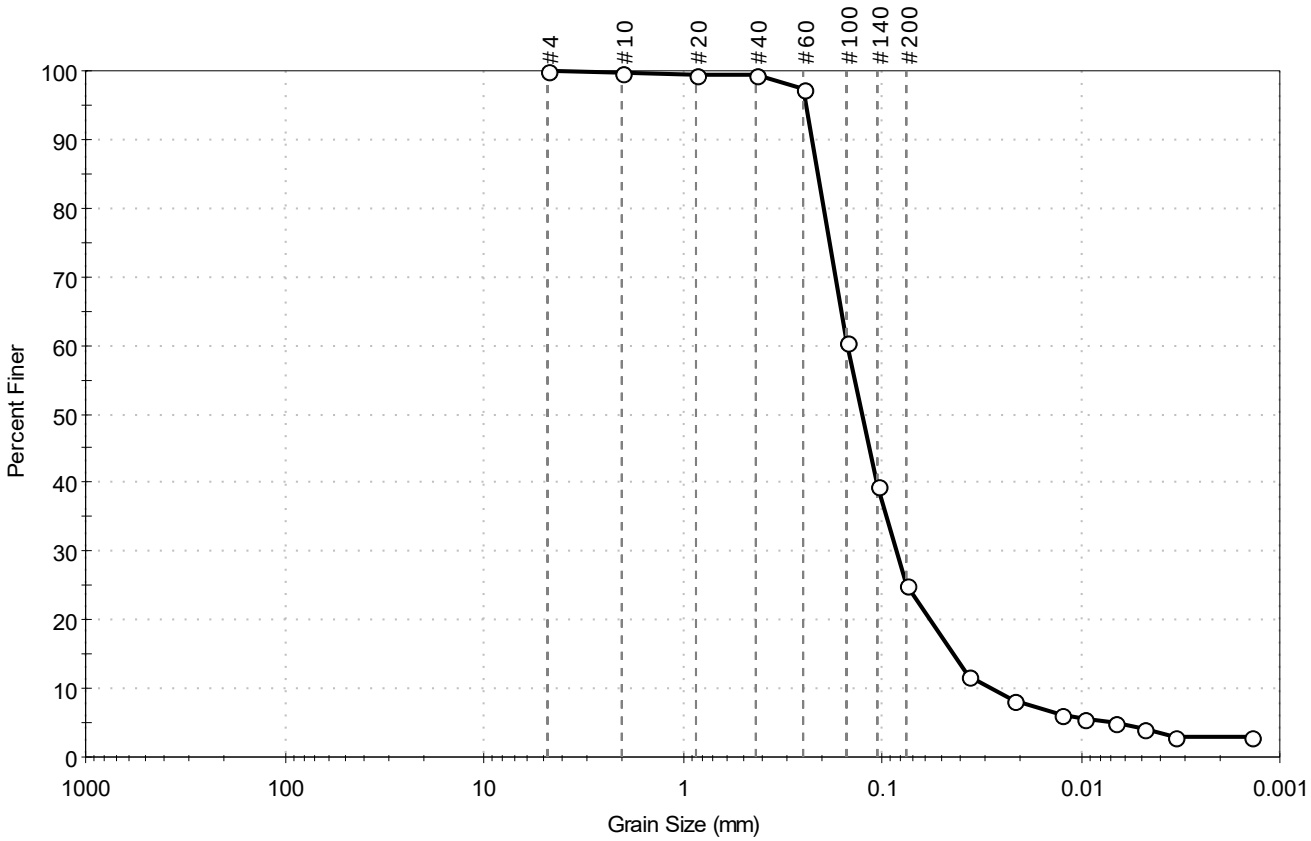
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB023G16B	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0889	Test Date:	02/25/19	Checked By:	bfs
Depth :	59.3-60 ft	Test Id:	486393		
Test Comment:	---				
Visual Description:	Moist, light brownish gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	75.1	24.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	97		
#100	0.15	61		
#140	0.11	39		
#200	0.075	25		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0367	12		
---	0.0218	8		
---	0.0126	6		
---	0.0096	6		
---	0.0068	5		
---	0.0048	4		
---	0.0034	3		
---	0.0014	3		

Coefficients

D_{85} = 0.2106 mm D_{30} = 0.0846 mm
D_{60} = 0.1487 mm D_{15} = 0.0437 mm
D_{50} = 0.1261 mm D_{10} = 0.0284 mm
C_u = 5.236 C_c = 1.695

Classification

ASTM Silty SAND (SM)

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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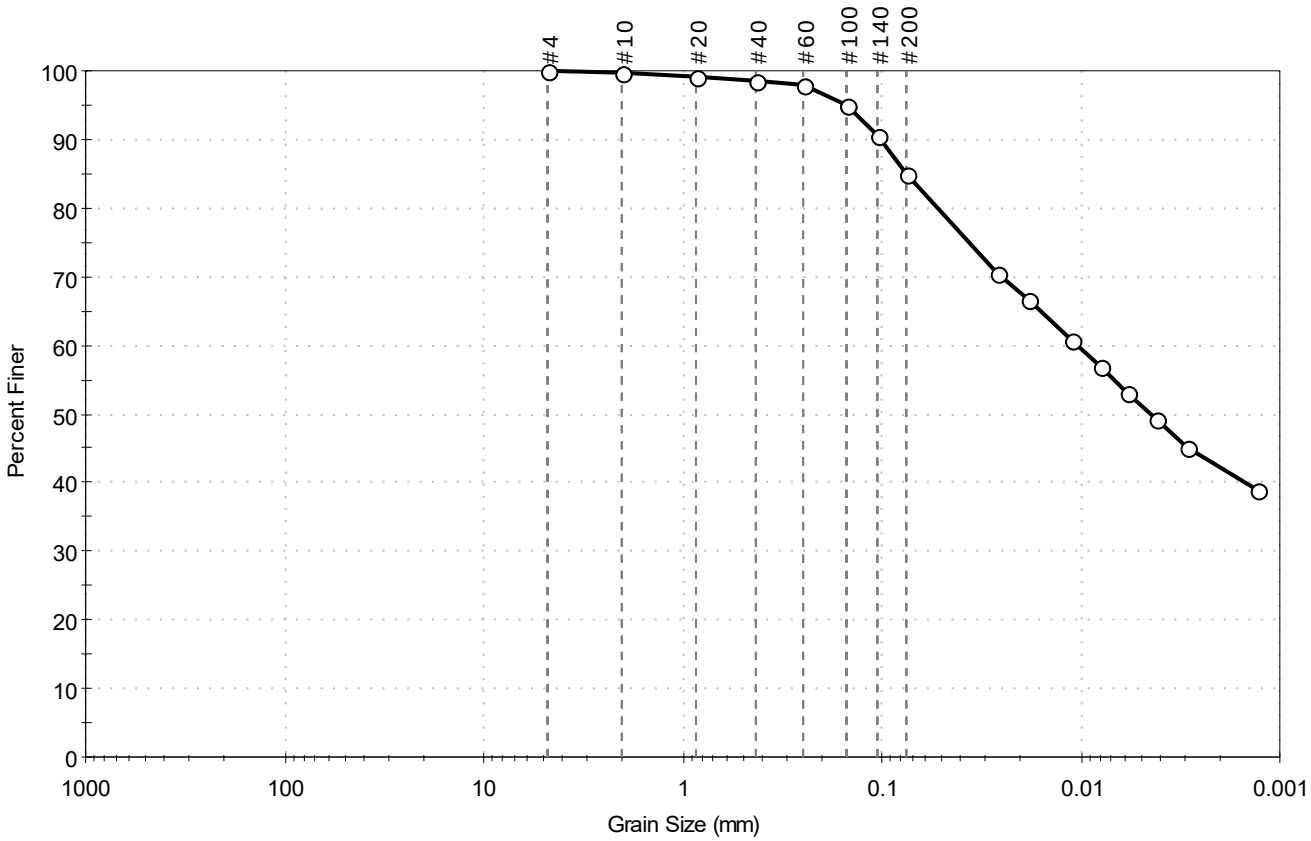
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB008-E1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1026	Test Date:	01/02/19	Checked By:	emm
Depth :	2-4 ft	Test Id:	482725		
Test Comment:	---				
Visual Description:	Moist, dark yellowish brown clay with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	15.1	84.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	95		
#140	0.11	91		
#200	0.075	85		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0264	70		
---	0.0185	67		
---	0.0111	61		
---	0.0080	57		
---	0.0058	53		
---	0.0042	49		
---	0.0029	45		
---	0.0013	39		

Coefficients

D_{85} = 0.0753 mm D_{30} = N/A

D_{60} = 0.0104 mm D_{15} = N/A

D_{50} = 0.0045 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM Lean CLAY with Sand (CL)

AASHTO Clayey Soils (A-7-6 (29))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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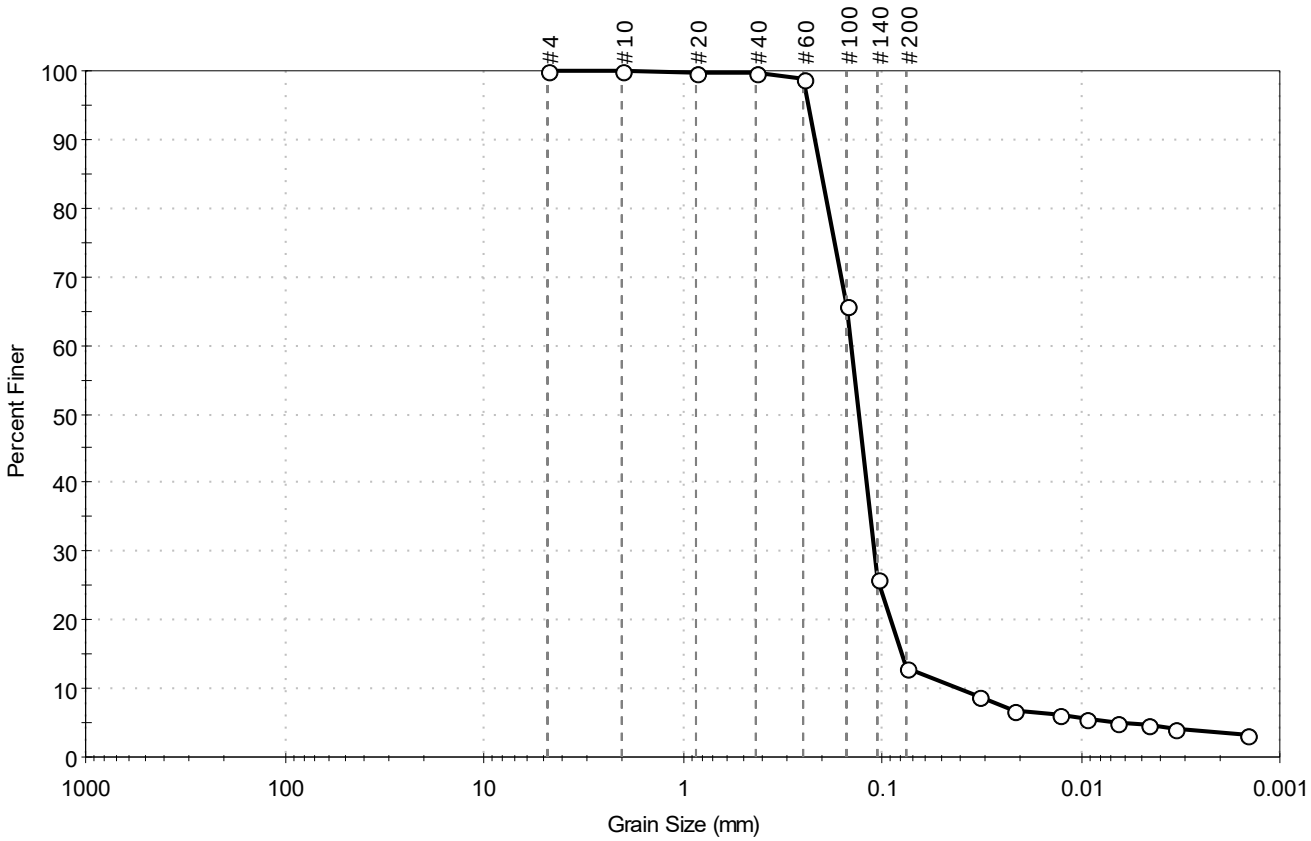
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB008-E1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1034	Test Date:	01/02/19	Checked By:	emm
Depth :	25-27 ft	Test Id:	482726		
Test Comment:	---				
Visual Description:	Moist, light brownish gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	86.9	13.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	66		
#140	0.11	26		
#200	0.075	13		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0328	9		
---	0.0219	7		
---	0.0129	6		
---	0.0095	6		
---	0.0066	5		
---	0.0046	5		
---	0.0033	4		
---	0.0015	3		

Coefficients

D_{85} = 0.2019 mm D_{30} = 0.1098 mm
D_{60} = 0.1425 mm D_{15} = 0.0789 mm
D_{50} = 0.1306 mm D_{10} = 0.0408 mm
C_u = 3.493 C_c = 2.074

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample / Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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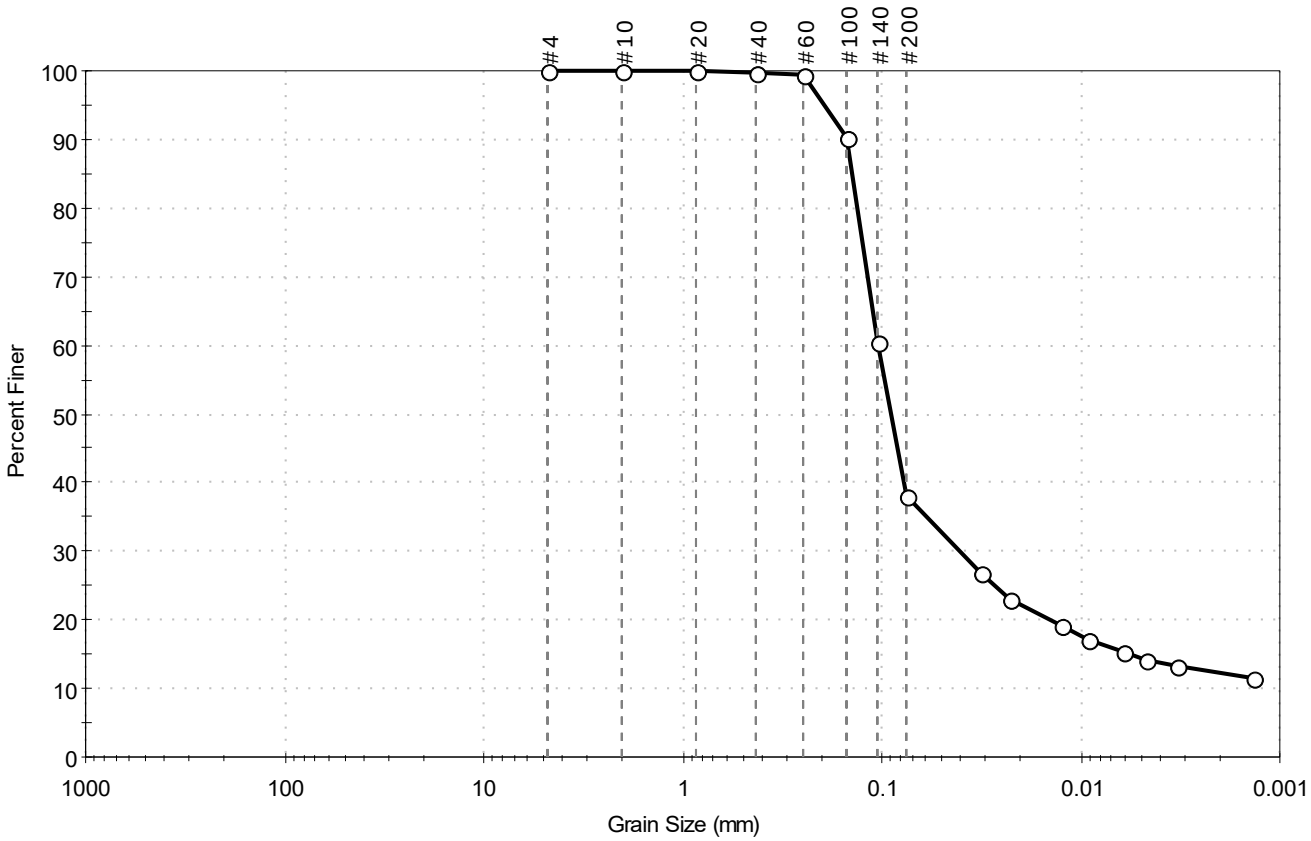
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB012-W1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1050	Test Date:	01/21/19	Checked By:	emm
Depth :	15-17 ft	Test Id:	482973		
Test Comment:	---				
Visual Description:	Moist, grayish brown silty, clayey sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	62.1	37.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	90		
#140	0.11	61		
#200	0.075	38		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0317	27		
---	0.0227	23		
---	0.0125	19		
---	0.0092	17		
---	0.0062	15		
---	0.0047	14		
---	0.0033	13		
---	0.0013	11		

Coefficients

D_{85} = 0.1412 mm	D_{30} = 0.0407 mm
D_{60} = 0.1052 mm	D_{15} = 0.0058 mm
D_{50} = 0.0902 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Silty, Clayey SAND (SC-SM)

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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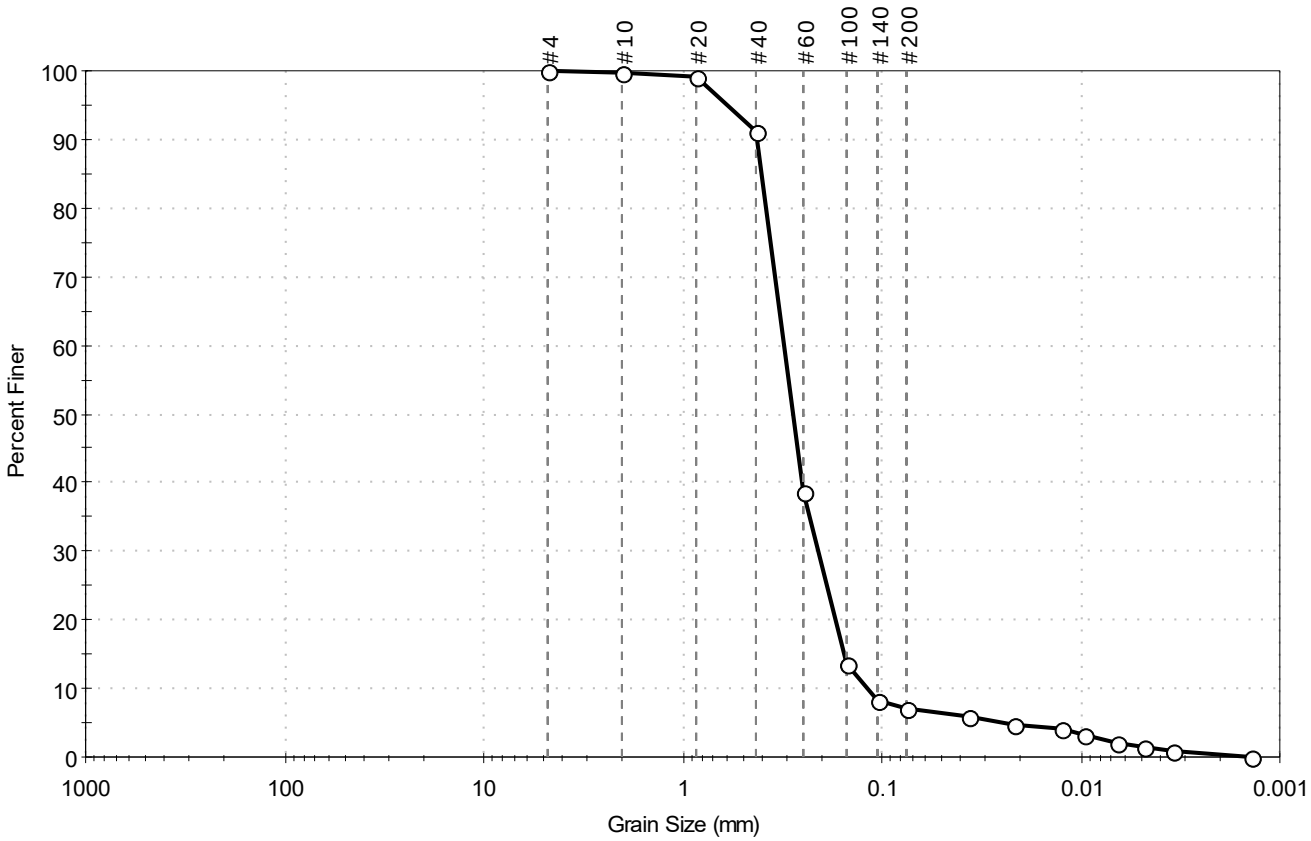
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB012-W1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1053	Test Date:	01/21/19	Checked By:	emm
Depth :	30-32 ft	Test Id:	482974		
Test Comment:	---				
Visual Description:	Moist, grayish brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	92.9	7.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	91		
#60	0.25	39		
#100	0.15	14		
#140	0.11	8		
#200	0.075	7.1		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0369	6		
---	0.0218	5		
---	0.0125	4		
---	0.0097	3		
---	0.0067	2		
---	0.0048	1		
---	0.0035	1		
---	0.0014	0		

Coefficients

D_{85} = 0.3995 mm D_{30} = 0.2093 mm
D_{60} = 0.3100 mm D_{15} = 0.1544 mm
D_{50} = 0.2802 mm D_{10} = 0.1183 mm
C_u = 2.620 C_c = 1.195

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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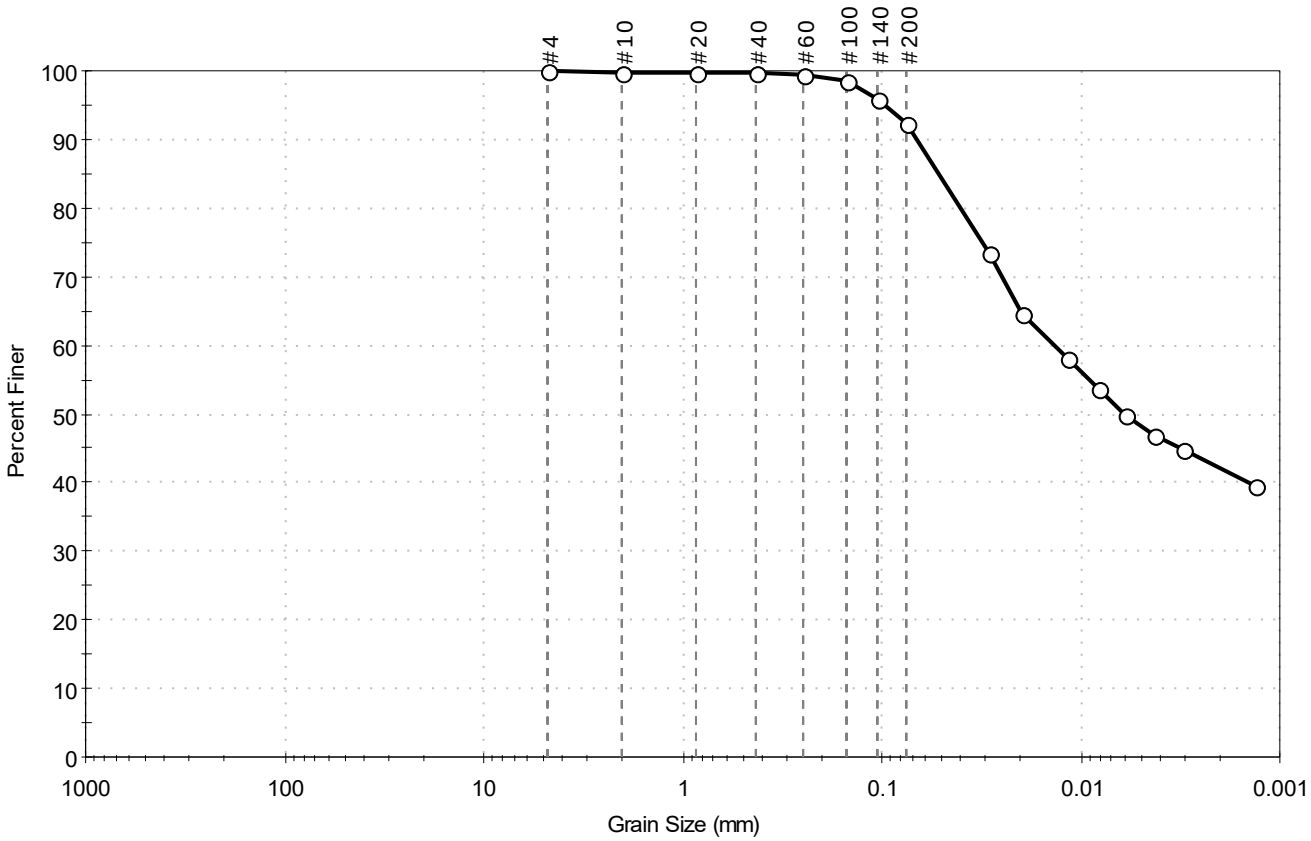
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB019-E1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1004	Test Date:	01/02/19	Checked By:	emm
Depth :	8-10 ft	Test Id:	482721		
Test Comment:	---				
Visual Description:	Moist, very dark gray clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	7.6	92.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	96		
#200	0.075	92		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0288	73		
---	0.0197	65		
---	0.0116	58		
---	0.0082	54		
---	0.0059	50		
---	0.0042	47		
---	0.0030	45		
---	0.0013	40		

Coefficients

D_{85} = 0.0517 mm D_{30} = N/A
D_{60} = 0.0136 mm D_{15} = N/A
D_{50} = 0.0061 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM Fat CLAY (CH)

AASHTO Clayey Soils (A-7-6 (69))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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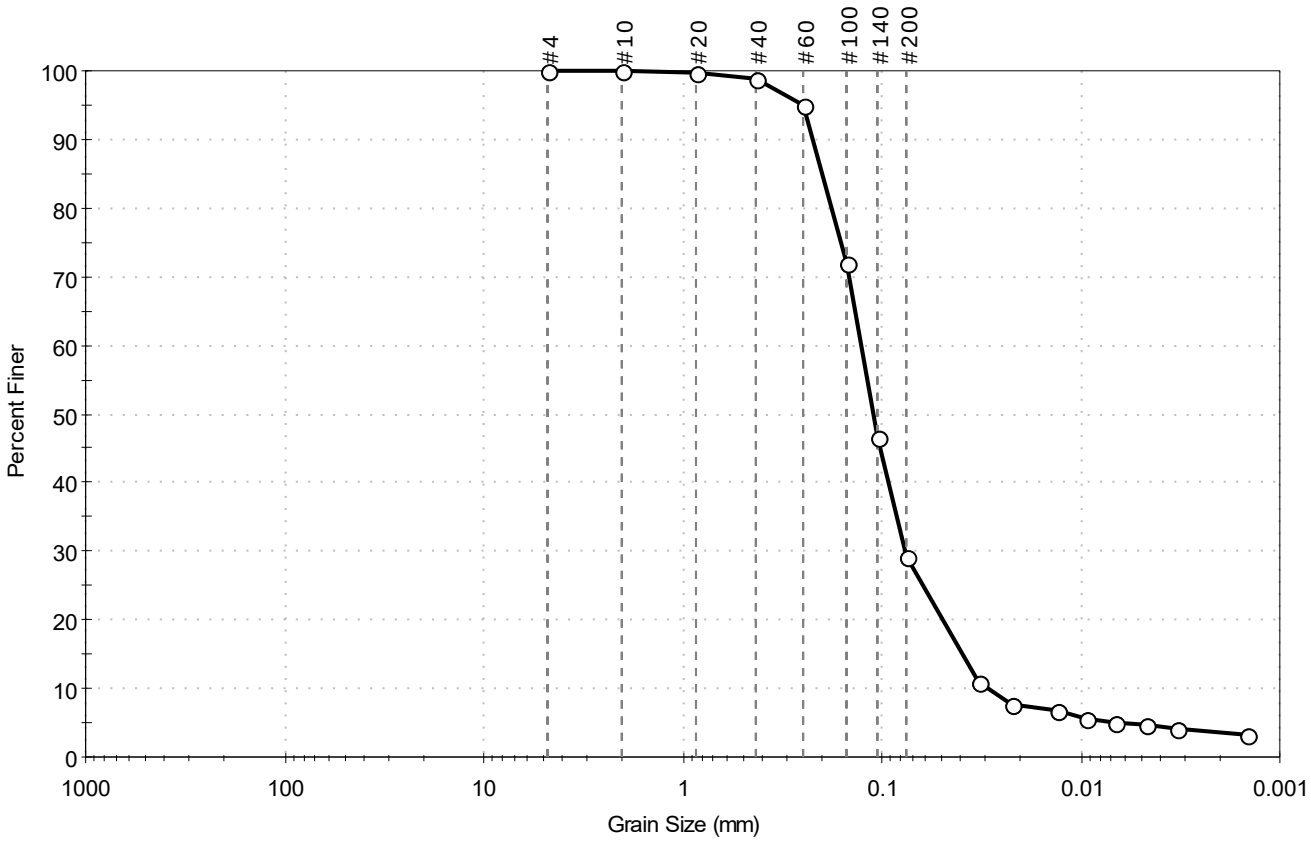
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB019-E1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1005	Test Date:	01/02/19	Checked By:	emm
Depth :	14-15 ft	Test Id:	482722		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	70.8	29.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	95		
#100	0.15	72		
#140	0.11	47		
#200	0.075	29		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0324	11		
---	0.0223	8		
---	0.0130	7		
---	0.0095	6		
---	0.0067	5		
---	0.0048	5		
---	0.0033	4		
---	0.0015	3		

Coefficients

D_{85} = 0.2005 mm D_{30} = 0.0762 mm
D_{60} = 0.1274 mm D_{15} = 0.0391 mm
D_{50} = 0.1111 mm D_{10} = 0.0291 mm
C_u = 4.378 C_c = 1.566

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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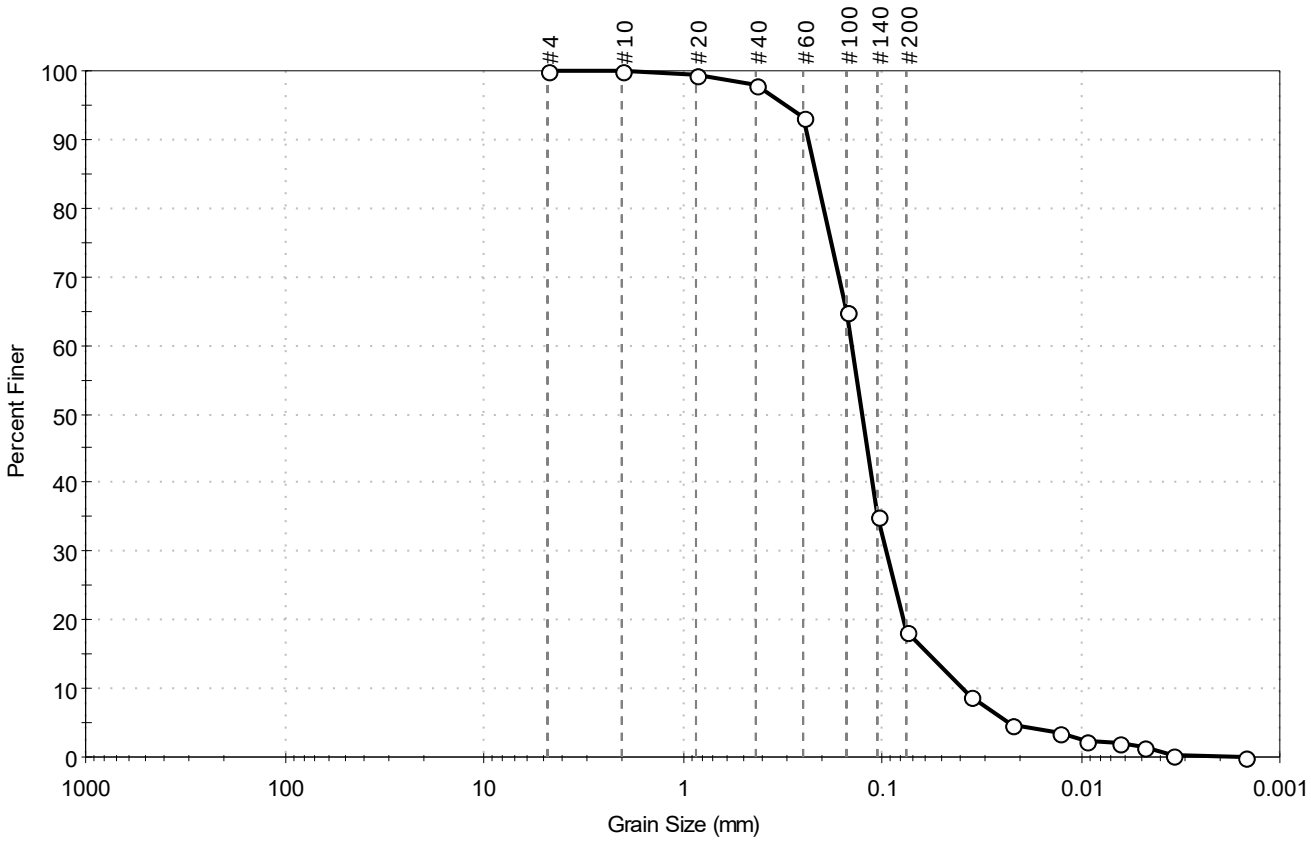
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB023-E1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1017	Test Date:	01/02/19	Checked By:	emm
Depth :	10-12 ft	Test Id:	482723		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	81.8	18.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	93		
#100	0.15	65		
#140	0.11	35		
#200	0.075	18		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0358	9		
---	0.0224	5		
---	0.0128	4		
---	0.0095	2		
---	0.0065	2		
---	0.0048	1		
---	0.0034	0		
---	0.0015	0		

Coefficients

D_{85} = 0.2152 mm D_{30} = 0.0955 mm
D_{60} = 0.1416 mm D_{15} = 0.0582 mm
D_{50} = 0.1260 mm D_{10} = 0.0393 mm
C_u = 3.603 C_c = 1.639

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

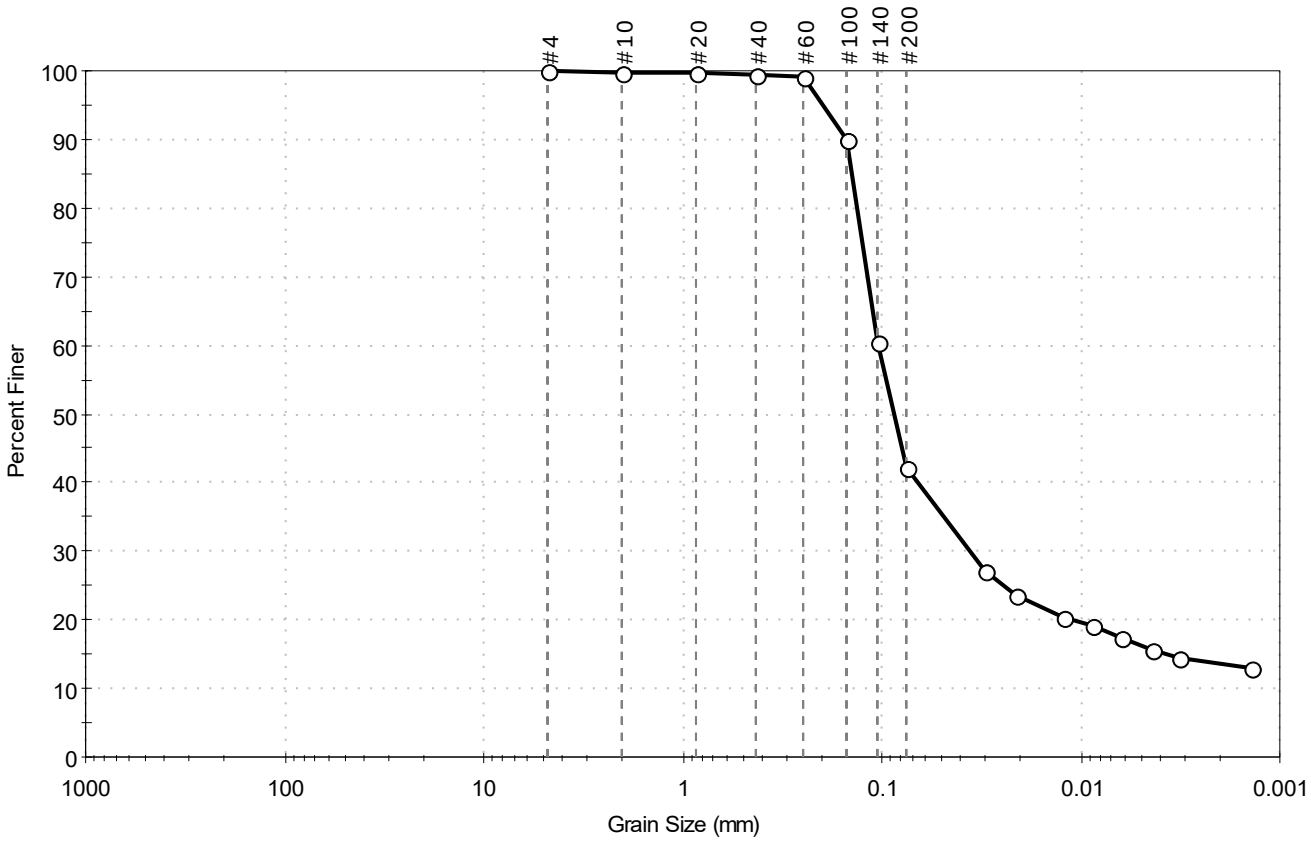
Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

printed 3/15/2019 12:44:09 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB023-E1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1022	Test Date:	01/02/19	Checked By:	emm
Depth :	24-26 ft	Test Id:	482724		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown clayey sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	57.9	42.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	90		
#140	0.11	60		
#200	0.075	42		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0301	27		
---	0.0210	24		
---	0.0123	20		
---	0.0087	19		
---	0.0062	17		
---	0.0044	16		
---	0.0032	14		
---	0.0014	13		

Coefficients

D_{85} = 0.1417 mm	D_{30} = 0.0357 mm
D_{60} = 0.1053 mm	D_{15} = 0.0038 mm
D_{50} = 0.0871 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Clayey SAND (SC)

AASHTO Silty Soils (A-4 (1))

Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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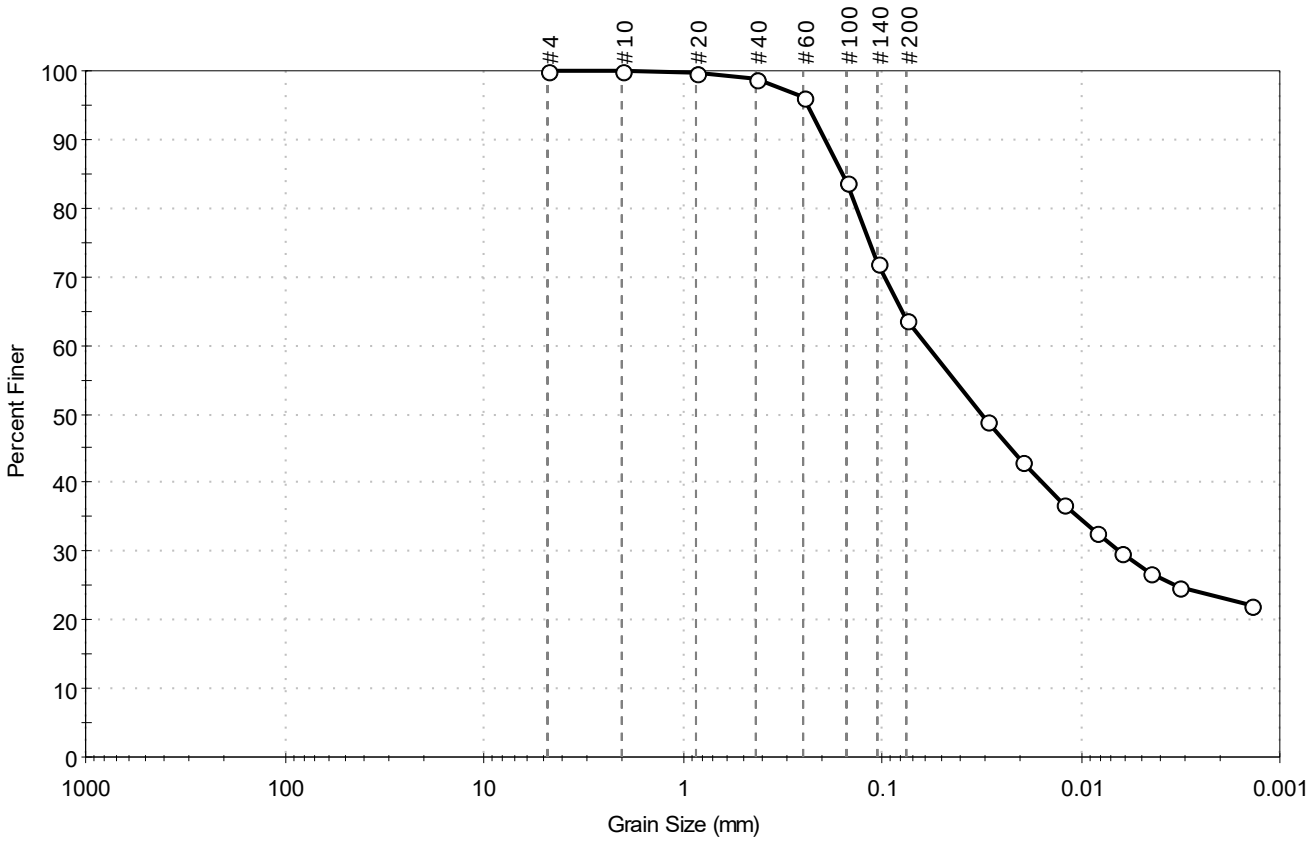
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB025-1W	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1040	Test Date:	01/02/19	Checked By:	emm
Depth :	8-10 ft	Test Id:	482727		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sandy clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	36.3	63.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	96		
#100	0.15	84		
#140	0.11	72		
#200	0.075	64		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0293	49		
---	0.0197	43		
---	0.0123	37		
---	0.0084	33		
---	0.0063	30		
---	0.0045	27		
---	0.0032	25		
---	0.0014	22		

Coefficients

D_{85} = 0.1576 mm D_{30} = 0.0064 mm
D_{60} = 0.0591 mm D_{15} = N/A
D_{50} = 0.0313 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM Sandy Lean CLAY (CL)

AASHTO Clayey Soils (A-7-6 (18))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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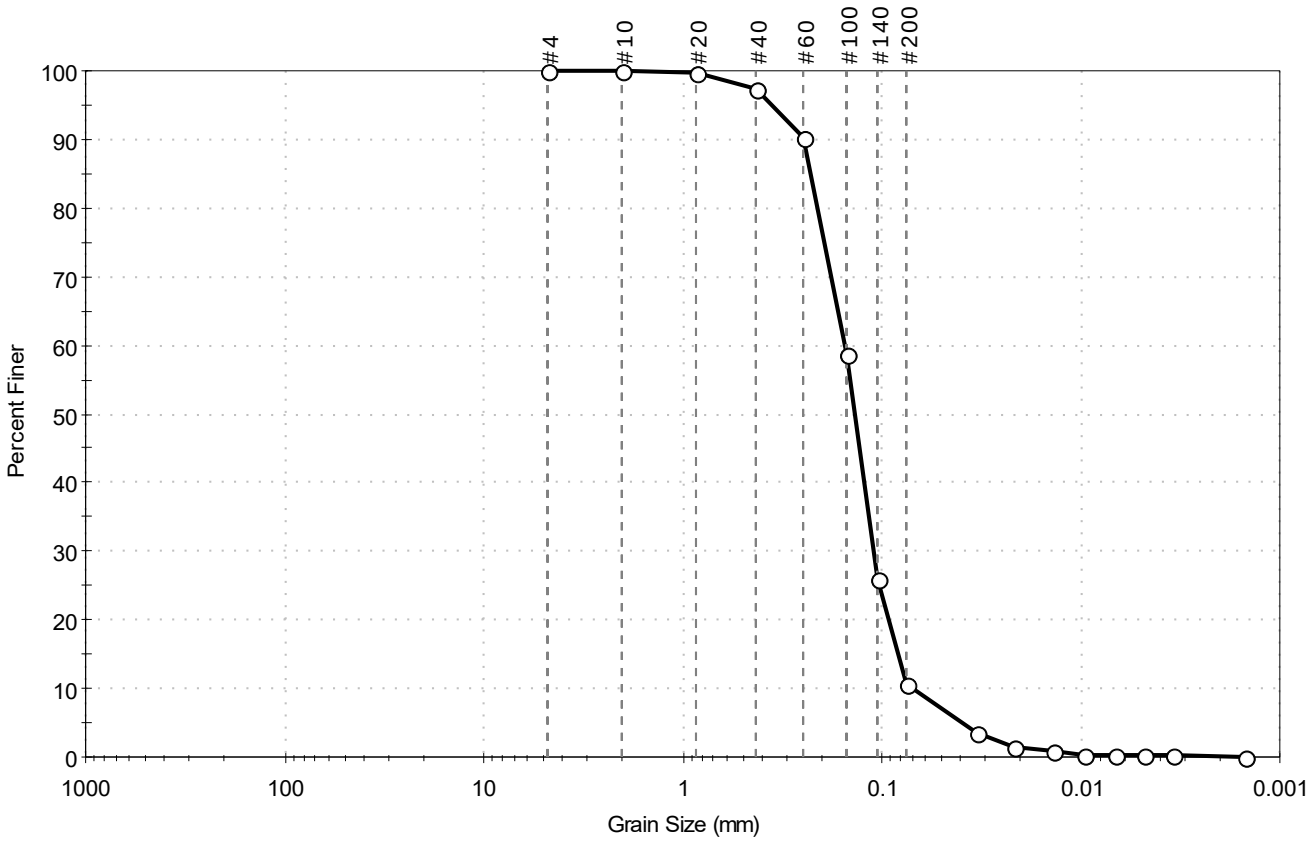
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB025-1W	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1041	Test Date:	01/02/19	Checked By:	emm
Depth :	14-16 ft	Test Id:	482728		
Test Comment:	---				
Visual Description:	Moist, light brownish gray sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	89.5	10.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	90		
#100	0.15	59		
#140	0.11	26		
#200	0.075	10		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0330	4		
---	0.0215	1		
---	0.0138	1		
---	0.0096	0		
---	0.0068	0		
---	0.0048	0		
---	0.0034	0		
---	0.0015	0		

Coefficients

D_{85} = 0.2296 mm D_{30} = 0.1106 mm
D_{60} = 0.1532 mm D_{15} = 0.0829 mm
D_{50} = 0.1367 mm D_{10} = 0.0707 mm
C_u = 2.167 C_c = 1.129

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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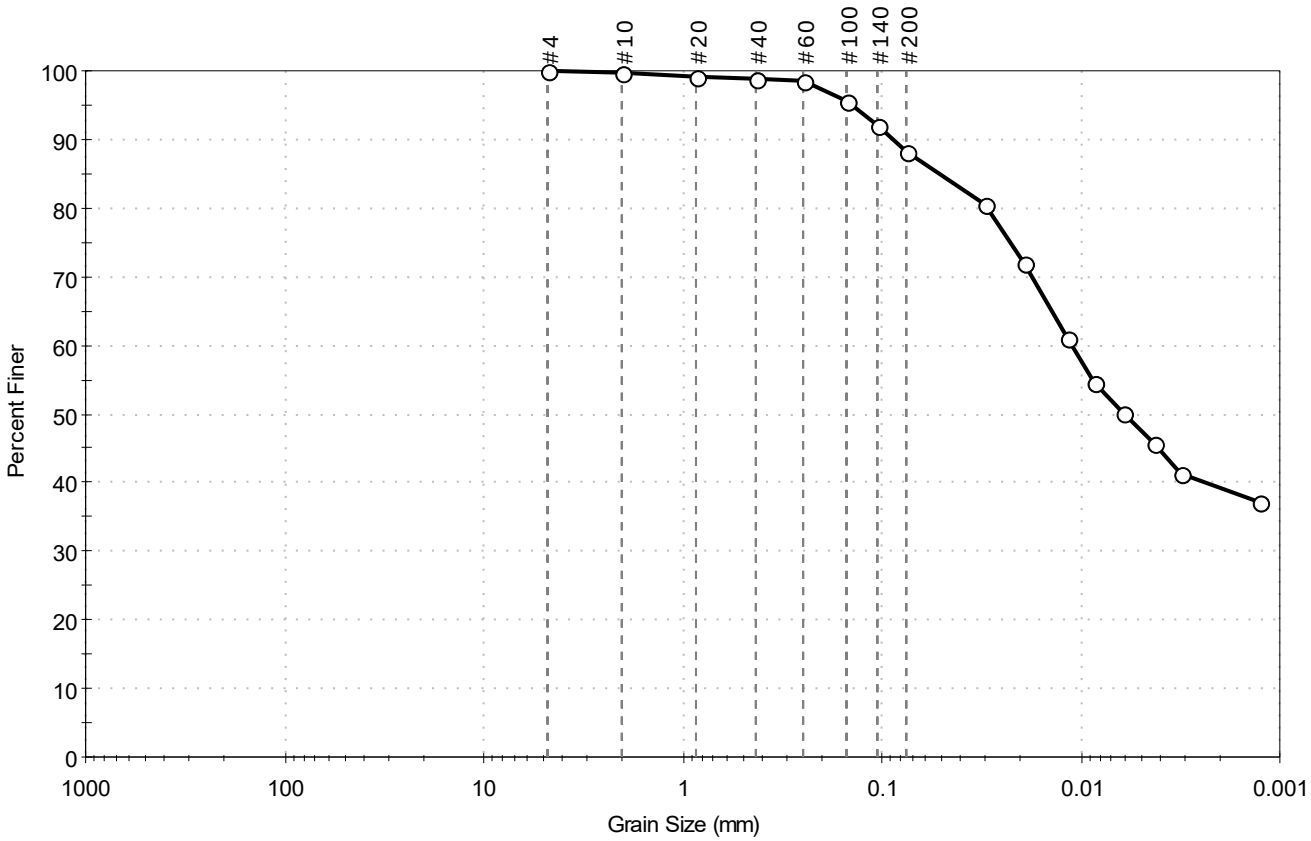
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB028	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0803	Test Date:	02/26/19	Checked By:	bfs
Depth :	8-10 ft	Test Id:	483656		
Test Comment:	---				
Visual Description:	Moist, very dark brown clay				
Sample Comment:	Sample contains organics				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.1	11.6	88.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	96		
#140	0.11	92		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0302	81		
---	0.0194	72		
---	0.0117	61		
---	0.0085	54		
---	0.0061	50		
---	0.0043	46		
---	0.0031	41		
---	0.0013	37		

Coefficients

D_{85} = 0.0506 mm D_{30} = N/A
D_{60} = 0.0111 mm D_{15} = N/A
D_{50} = 0.0060 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM Fat CLAY (CH)

AASHTO Clayey Soils (A-7-6 (46))

Sample / Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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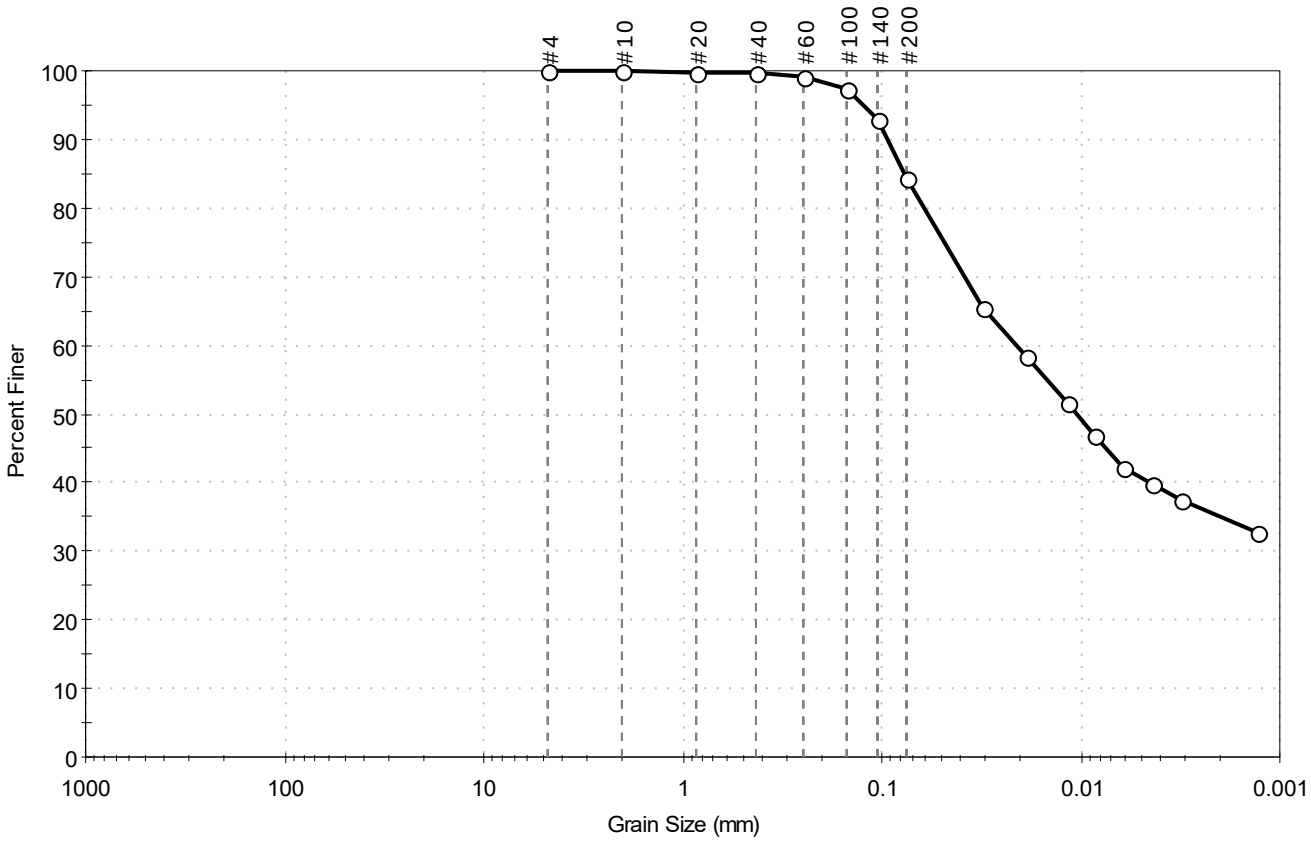
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB028	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0806	Test Date:	02/25/19	Checked By:	bfs
Depth :	25-27 ft	Test Id:	483657		
Test Comment:	---				
Visual Description:	Moist, very dark brown clay with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	15.6	84.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	97		
#140	0.11	93		
#200	0.075	84		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0314	66		
---	0.0189	58		
---	0.0116	51		
---	0.0086	47		
---	0.0061	42		
---	0.0044	40		
---	0.0031	37		
---	0.0013	33		

Coefficients

D_{85} = 0.0768 mm D_{30} = N/A

D_{60} = 0.0211 mm D_{15} = N/A

D_{50} = 0.0105 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM Fat CLAY with Sand (CH)

AASHTO Clayey Soils (A-7-6 (44))

Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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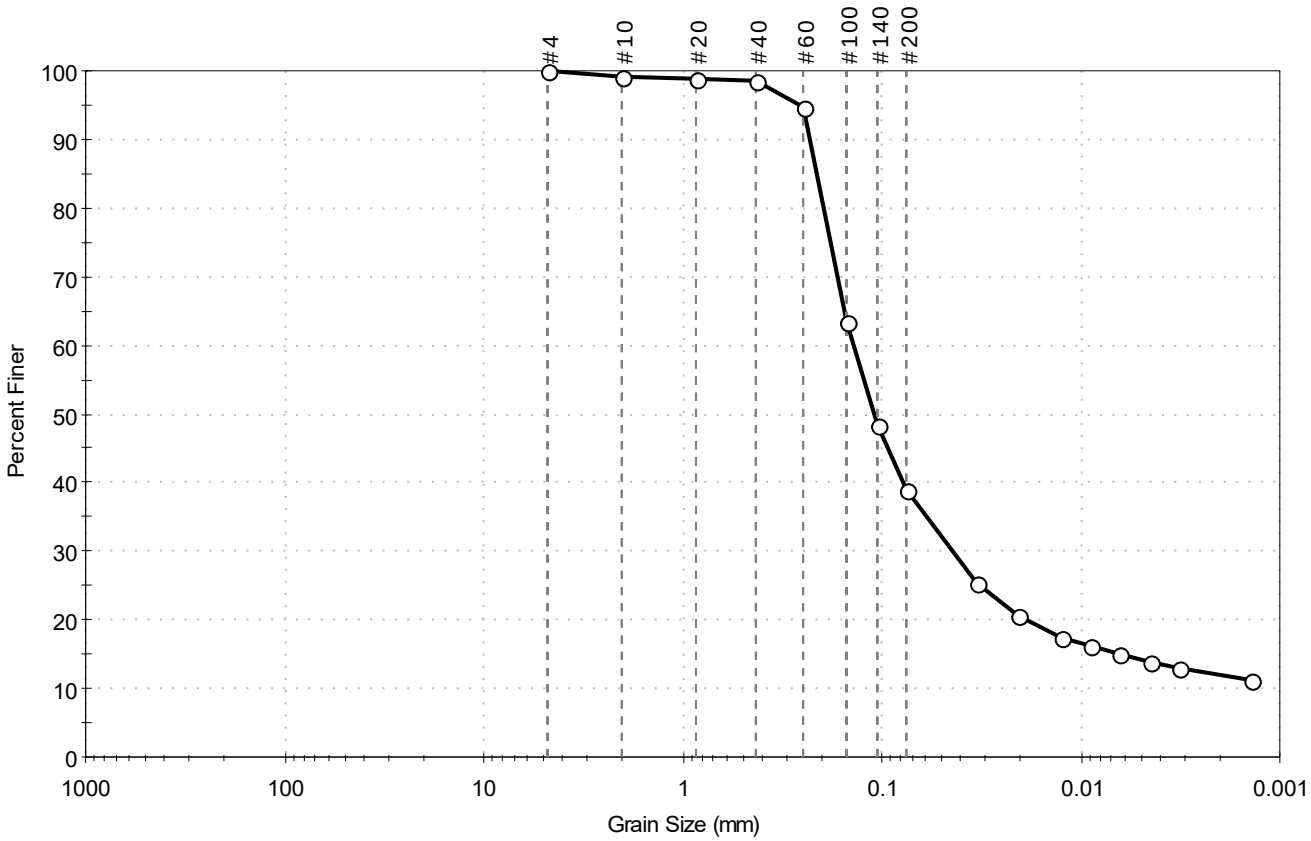
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB029	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0606	Test Date:	01/02/19	Checked By:	emm
Depth :	15-17 ft	Test Id:	482729		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	61.0	39.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	95		
#100	0.15	63		
#140	0.11	48		
#200	0.075	39		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0334	25		
---	0.0208	21		
---	0.0126	17		
---	0.0090	16		
---	0.0064	15		
---	0.0045	14		
---	0.0032	13		
---	0.0014	11		

Coefficients

D_{85} = 0.2137 mm D_{30} = 0.0441 mm
D_{60} = 0.1385 mm D_{15} = 0.0061 mm
D_{50} = 0.1098 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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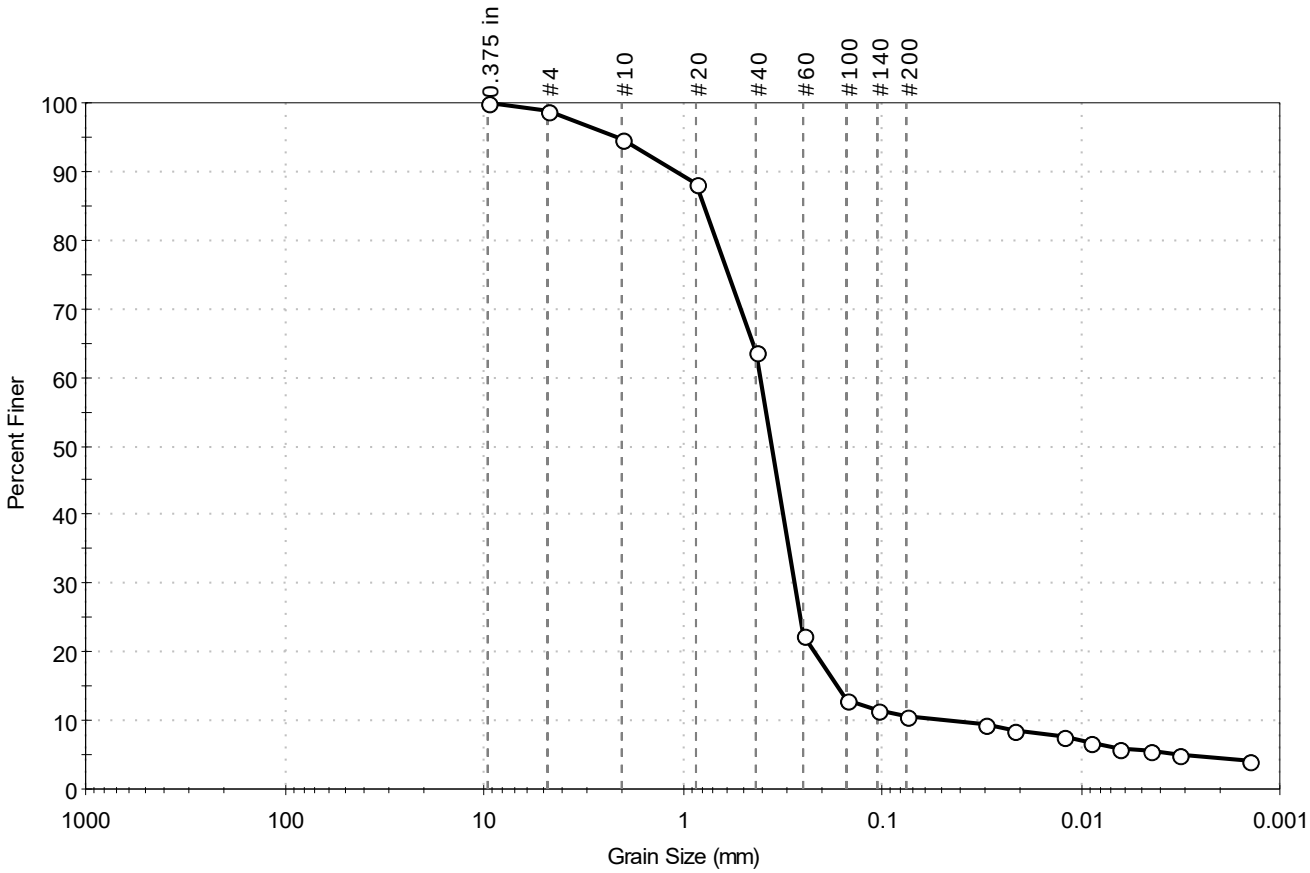
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB029	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0610	Test Date:	01/21/19	Checked By:	emm
Depth :	35-36.5 ft	Test Id:	482730		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sand with silt				
Sample Comment:	Sample contains shells				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.2	88.2	10.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	99		
#10	2.00	95		
#20	0.85	88		
#40	0.42	64		
#60	0.25	22		
#100	0.15	13		
#140	0.11	11		
#200	0.075	11		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0302	10		
---	0.0216	9		
---	0.0121	8		
---	0.0089	7		
---	0.0064	6		
---	0.0045	6		
---	0.0032	5		
---	0.0014	4		

Coefficients

D_{85} = 0.7778 mm D_{30} = 0.2756 mm
D_{60} = 0.4049 mm D_{15} = 0.1680 mm
D_{50} = 0.3562 mm D_{10} = 0.0444 mm
C_u = 9.119 C_c = 4.225

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample / Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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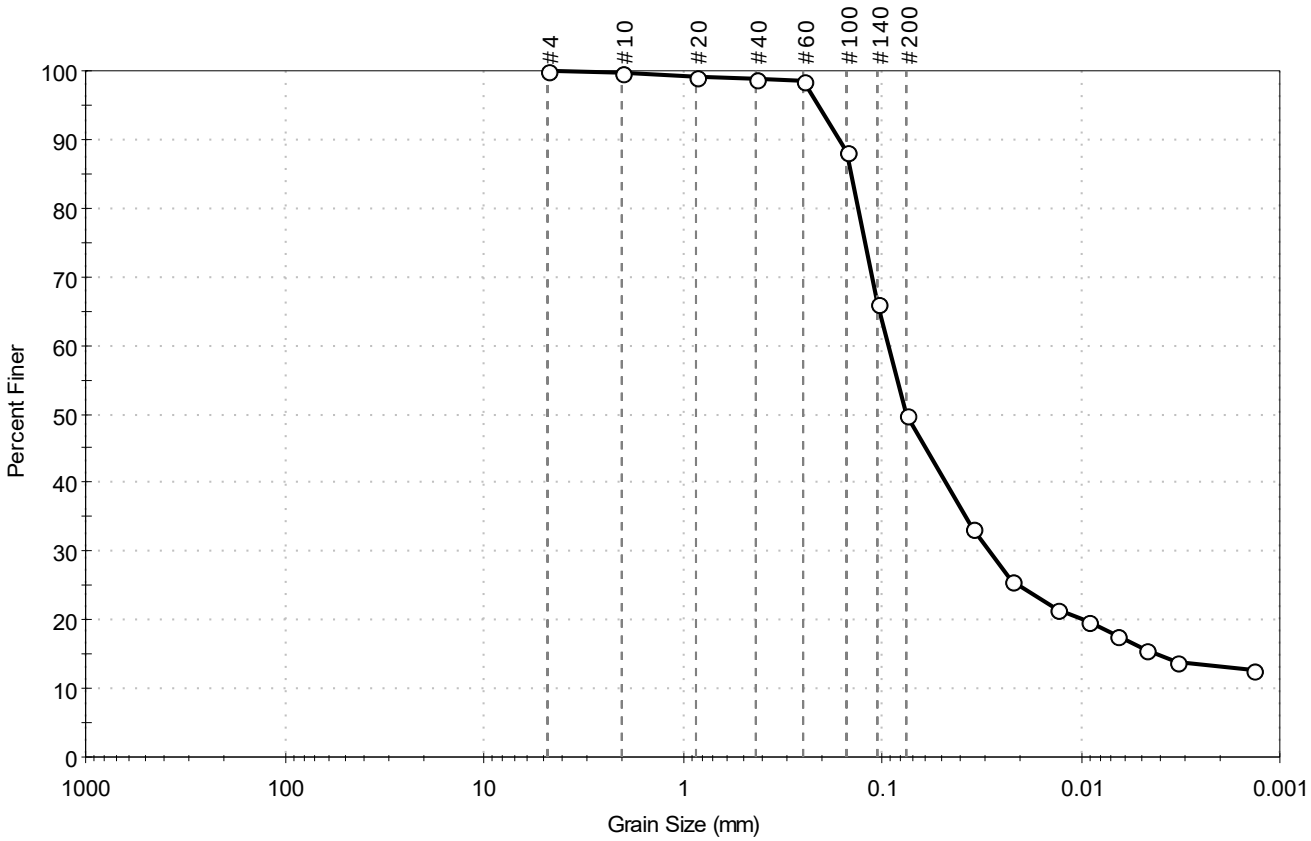
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB030	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0693	Test Date:	02/25/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	483654		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown clayey sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	50.2	49.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	88		
#140	0.11	66		
#200	0.075	50		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0350	33		
---	0.0223	26		
---	0.0132	22		
---	0.0092	20		
---	0.0065	18		
---	0.0047	16		
---	0.0033	14		
---	0.0014	13		

Coefficients

D_{85} = 0.1426 mm D_{30} = 0.0288 mm
D_{60} = 0.0931 mm D_{15} = 0.0041 mm
D_{50} = 0.0753 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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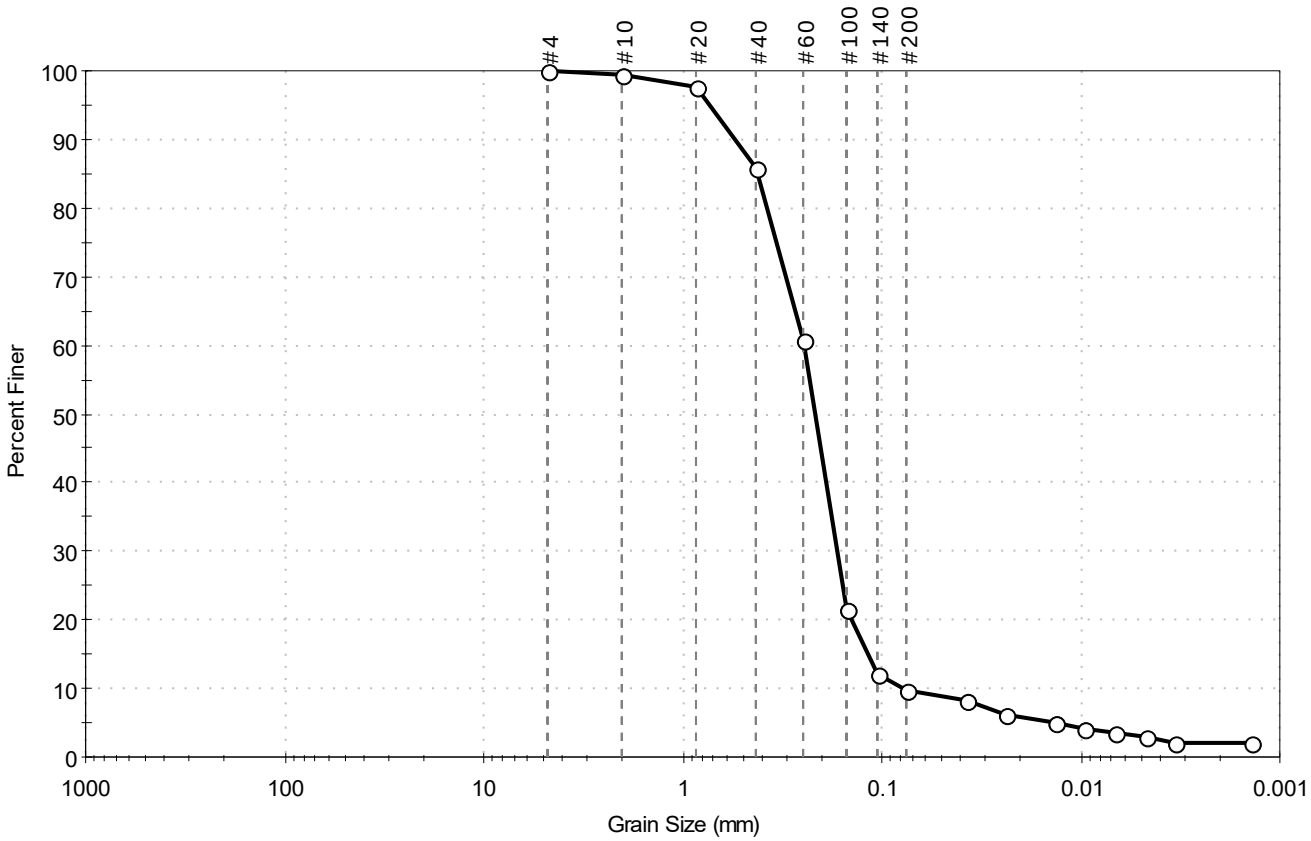
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB030	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0696	Test Date:	02/25/19	Checked By:	bfs
Depth :	30-32 ft	Test Id:	483655		
Test Comment:	---				
Visual Description:	Moist, brownish gray sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	90.3	9.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	86		
#60	0.25	61		
#100	0.15	21		
#140	0.11	12		
#200	0.075	9.7		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0372	8		
---	0.0237	6		
---	0.0134	5		
---	0.0095	4		
---	0.0068	4		
---	0.0047	3		
---	0.0034	2		
---	0.0014	2		

Coefficients

D_{85} = 0.4178 mm D_{30} = 0.1677 mm
D_{60} = 0.2480 mm D_{15} = 0.1184 mm
D_{50} = 0.2176 mm D_{10} = 0.0781 mm
C_u = 3.175 C_c = 1.452

Classification

ASTM Poorly graded SAND with Silt (SP-SM)

AASHTO Fine Sand (A-3 (1))

Sample / Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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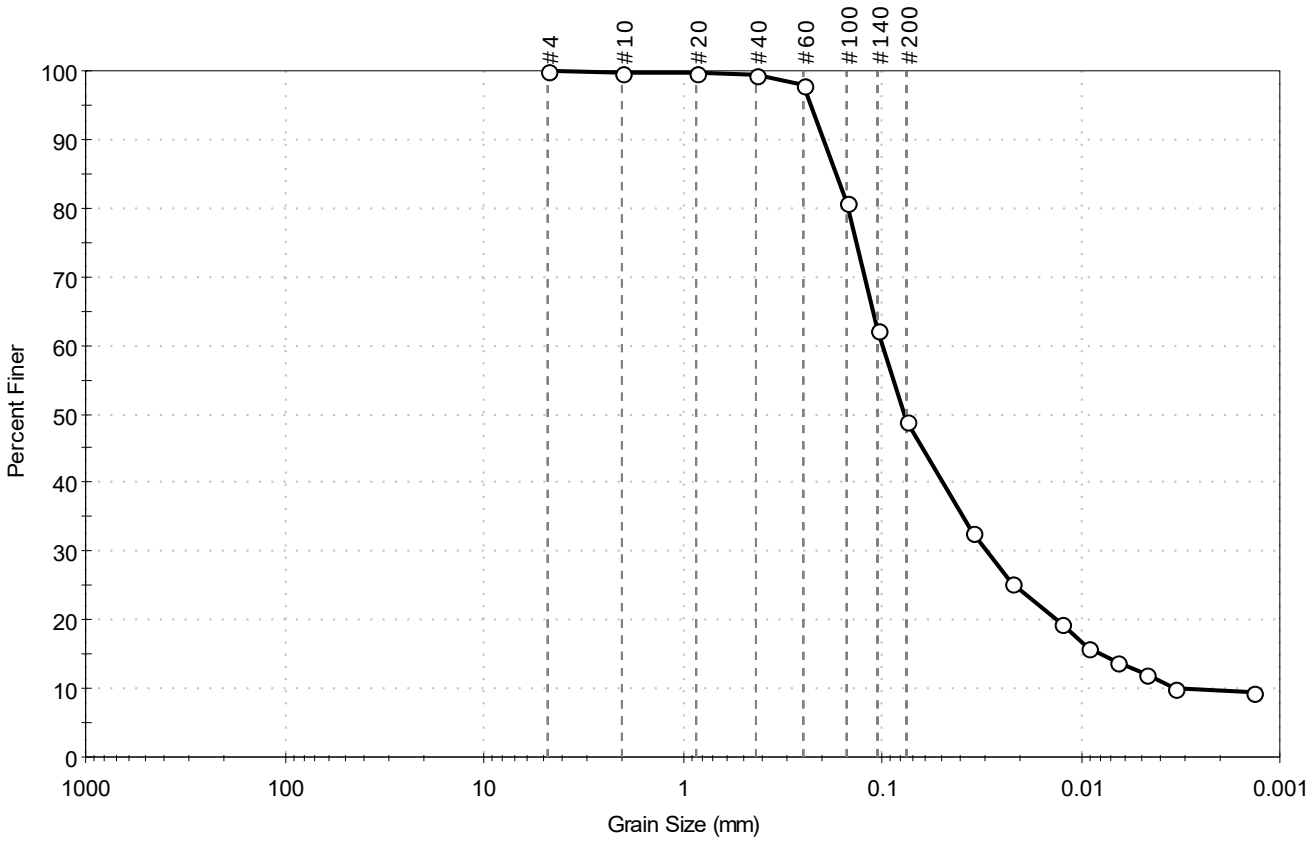
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB031	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0617	Test Date:	01/02/19	Checked By:	emm
Depth :	8-10 ft	Test Id:	482923		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown clayey sand				
Sample Comment:	Sample contains organics				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	51.2	48.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	98		
#100	0.15	81		
#140	0.11	62		
#200	0.075	49		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0349	33		
---	0.0224	25		
---	0.0126	20		
---	0.0092	16		
---	0.0066	14		
---	0.0047	12		
---	0.0033	10		
---	0.0014	9		

Coefficients

D_{85} = 0.1698 mm D_{30} = 0.0296 mm
D_{60} = 0.1003 mm D_{15} = 0.0080 mm
D_{50} = 0.0773 mm D_{10} = 0.0029 mm
C_u = 34.586 C_c = 3.012

Classification

ASTM Clayey SAND (SC)

AASHTO Clayey Soils (A-6 (5))

Sample / Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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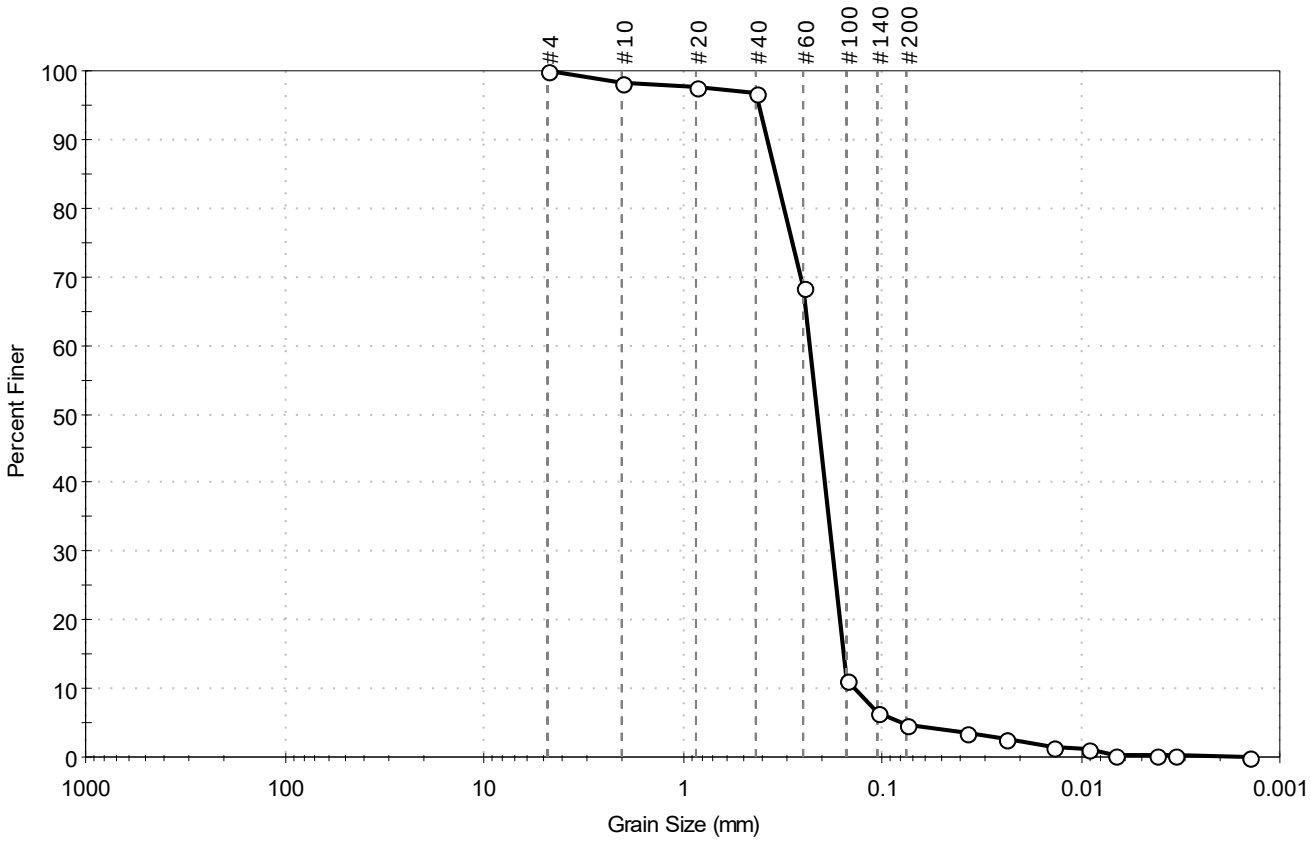
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB031	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0622	Test Date:	01/02/19	Checked By:	emm
Depth :	20-22 ft	Test Id:	482924		
Test Comment:	---				
Visual Description:	Moist, grayish brown sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	95.2	4.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	98		
#20	0.85	98		
#40	0.42	97		
#60	0.25	68		
#100	0.15	11		
#140	0.11	6		
#200	0.075	4.8		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0377	3		
---	0.0238	3		
---	0.0136	1		
---	0.0092	1		
---	0.0068	0		
---	0.0042	0		
---	0.0034	0		
---	0.0014	0		

Coefficients

D_{85} = 0.3406 mm D_{30} = 0.1774 mm
D_{60} = 0.2318 mm D_{15} = 0.1552 mm
D_{50} = 0.2120 mm D_{10} = 0.1374 mm
C_u = 1.687 C_c = 0.988

Classification

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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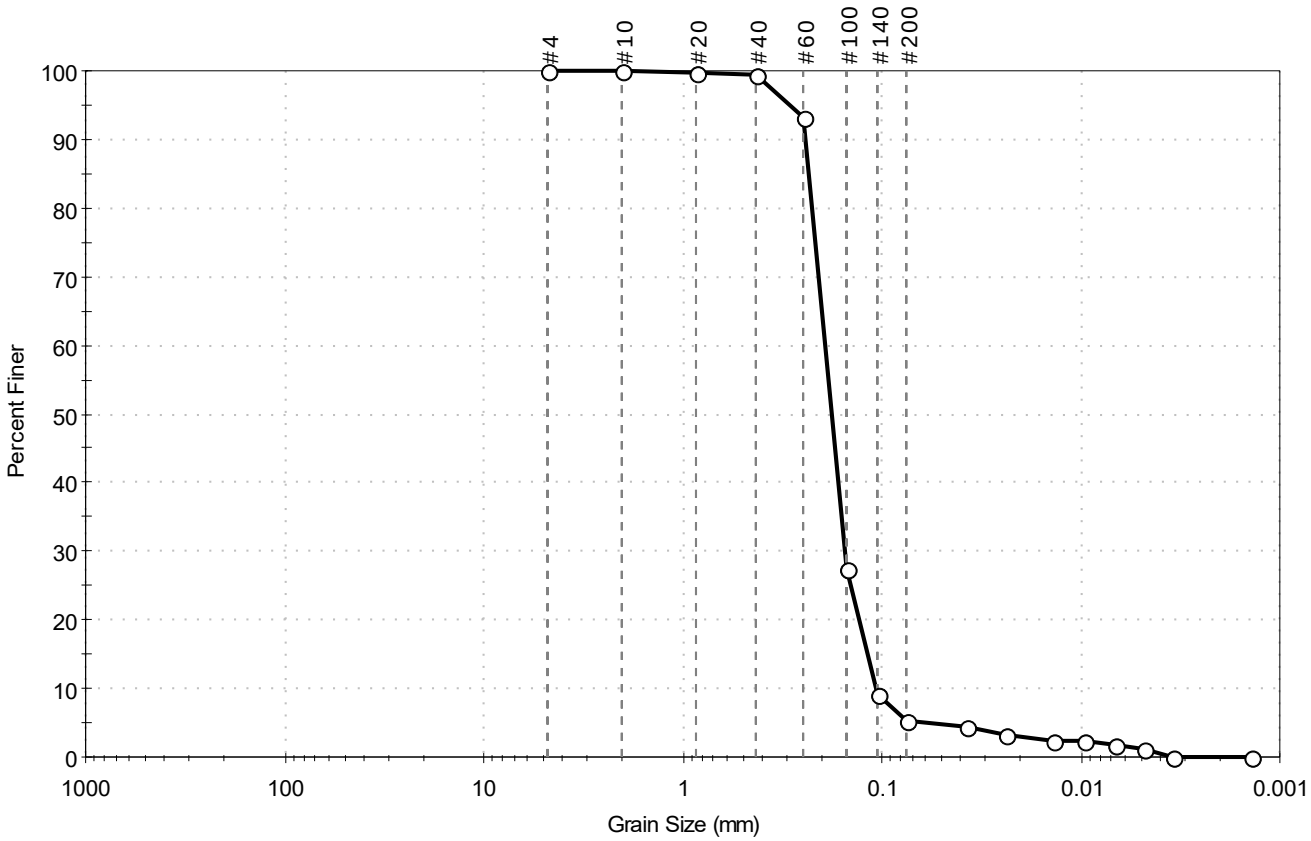
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB032	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0680	Test Date:	02/25/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	483684		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	94.7	5.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	93		
#100	0.15	27		
#140	0.11	9		
#200	0.075	5.3		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0376	4		
---	0.0238	3		
---	0.0138	2		
---	0.0097	2		
---	0.0067	2		
---	0.0049	1		
---	0.0035	0		
---	0.0014	0		

Coefficients

D_{85} = 0.2346 mm D_{30} = 0.1530 mm
D_{60} = 0.1932 mm D_{15} = 0.1186 mm
D_{50} = 0.1787 mm D_{10} = 0.1079 mm
C_u = 1.791 C_c = 1.123

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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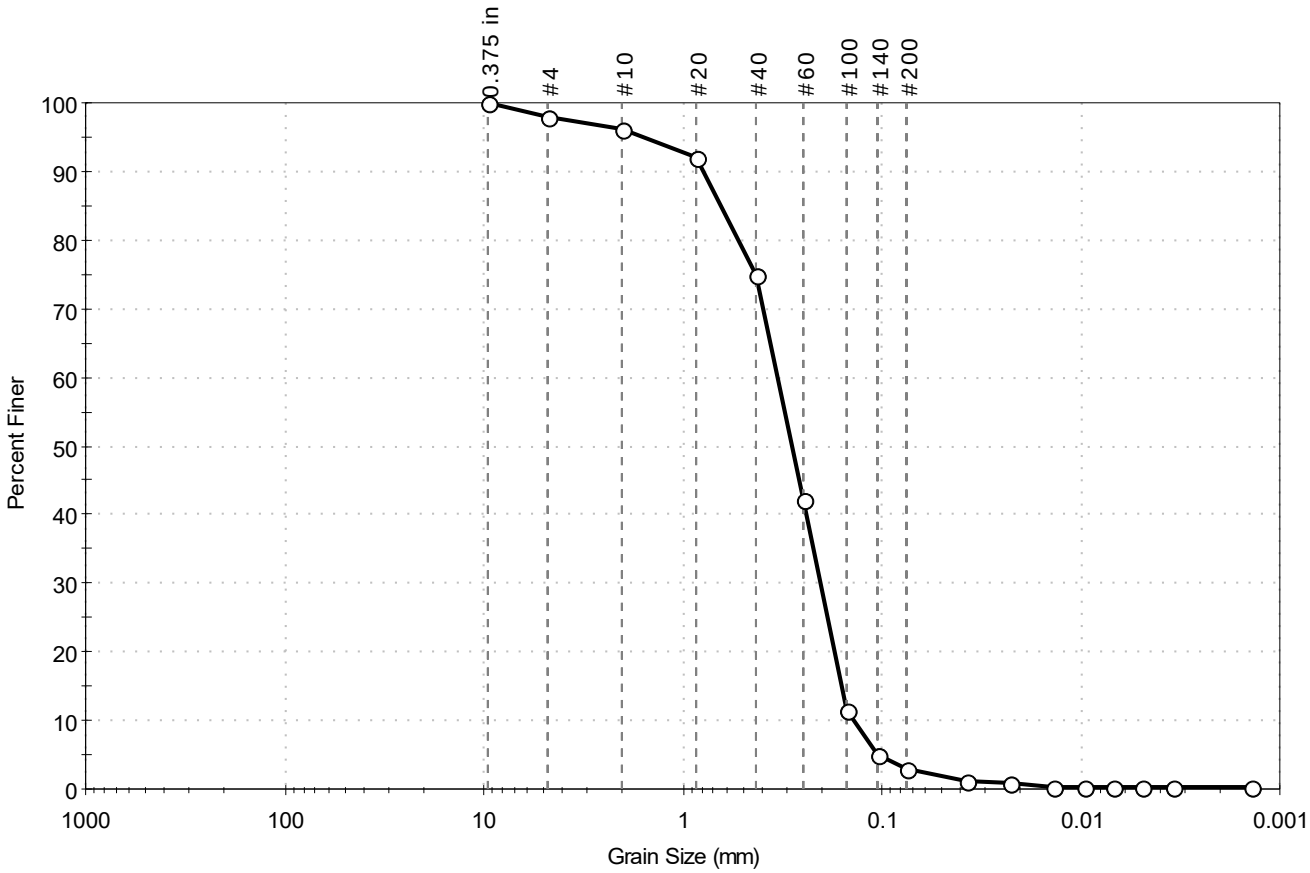
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB032	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0684	Test Date:	02/26/19	Checked By:	bfs
Depth :	35-37 ft	Test Id:	483653		
Test Comment:	---				
Visual Description:	Moist, grayish brown sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	2.1	95.0	2.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	98		
#10	2.00	96		
#20	0.85	92		
#40	0.42	75		
#60	0.25	42		
#100	0.15	11		
#140	0.11	5		
#200	0.075	2.9		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0376	1		
---	0.0229	1		
---	0.0139	0		
---	0.0098	0		
---	0.0070	0		
---	0.0049	0		
---	0.0034	0		
---	0.0014	0		

Coefficients

D_{85} = 0.6387 mm D_{30} = 0.2039 mm
D_{60} = 0.3337 mm D_{15} = 0.1591 mm
D_{50} = 0.2834 mm D_{10} = 0.1386 mm
C_u = 2.408 C_c = 0.899

Classification

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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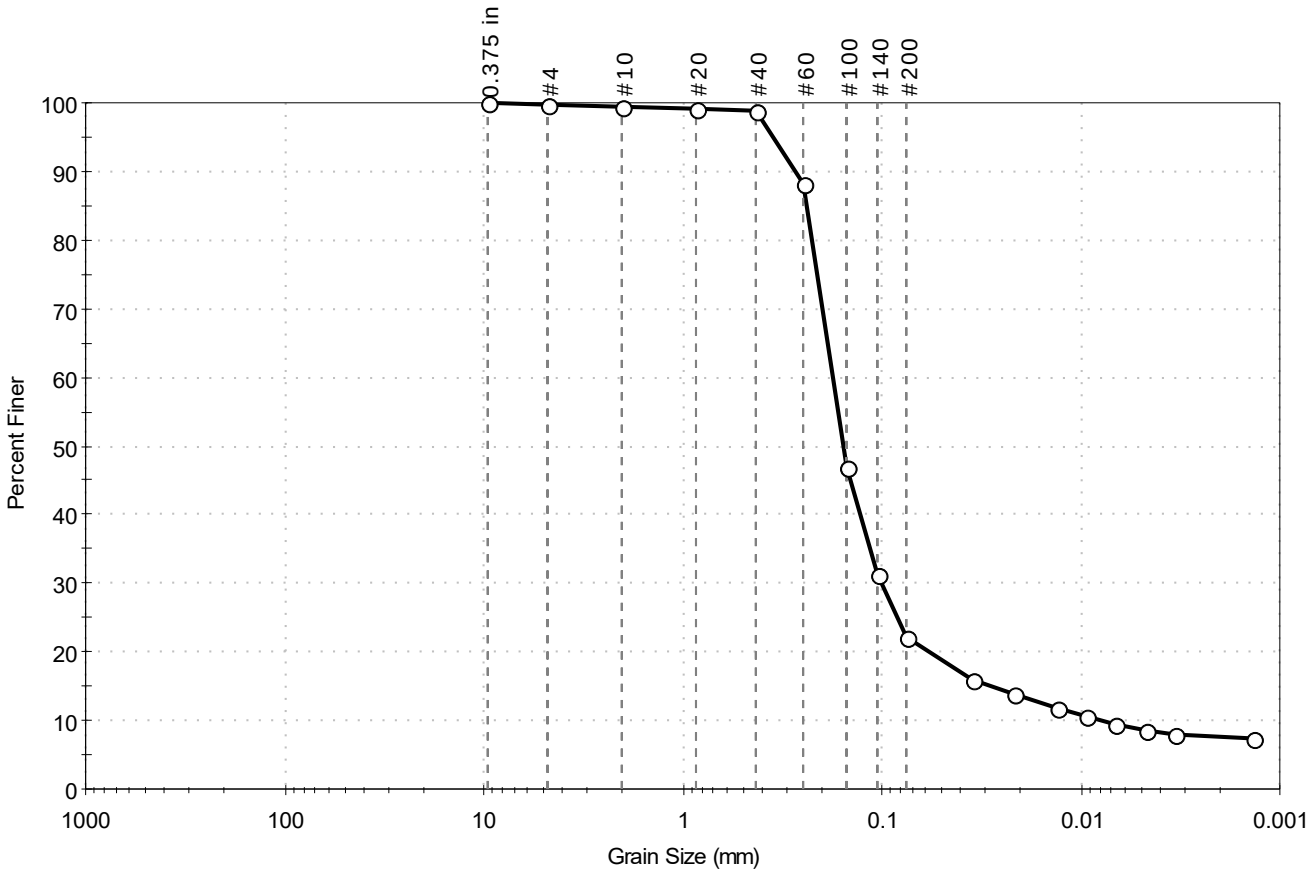
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB033	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0645	Test Date:	03/08/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	483678		
Test Comment:	---				
Visual Description:	Moist, grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.3	77.6	22.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	88		
#100	0.15	47		
#140	0.11	31		
#200	0.075	22		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0351	16		
---	0.0219	14		
---	0.0130	12		
---	0.0094	11		
---	0.0067	10		
---	0.0047	8		
---	0.0034	8		
---	0.0013	7		

Coefficients

D_{85} = 0.2404 mm	D_{30} = 0.1006 mm
D_{60} = 0.1765 mm	D_{15} = 0.0285 mm
D_{50} = 0.1560 mm	D_{10} = 0.0077 mm
C_u = 22.922	C_c = 7.447

Classification

ASTM Silty SAND (SM)

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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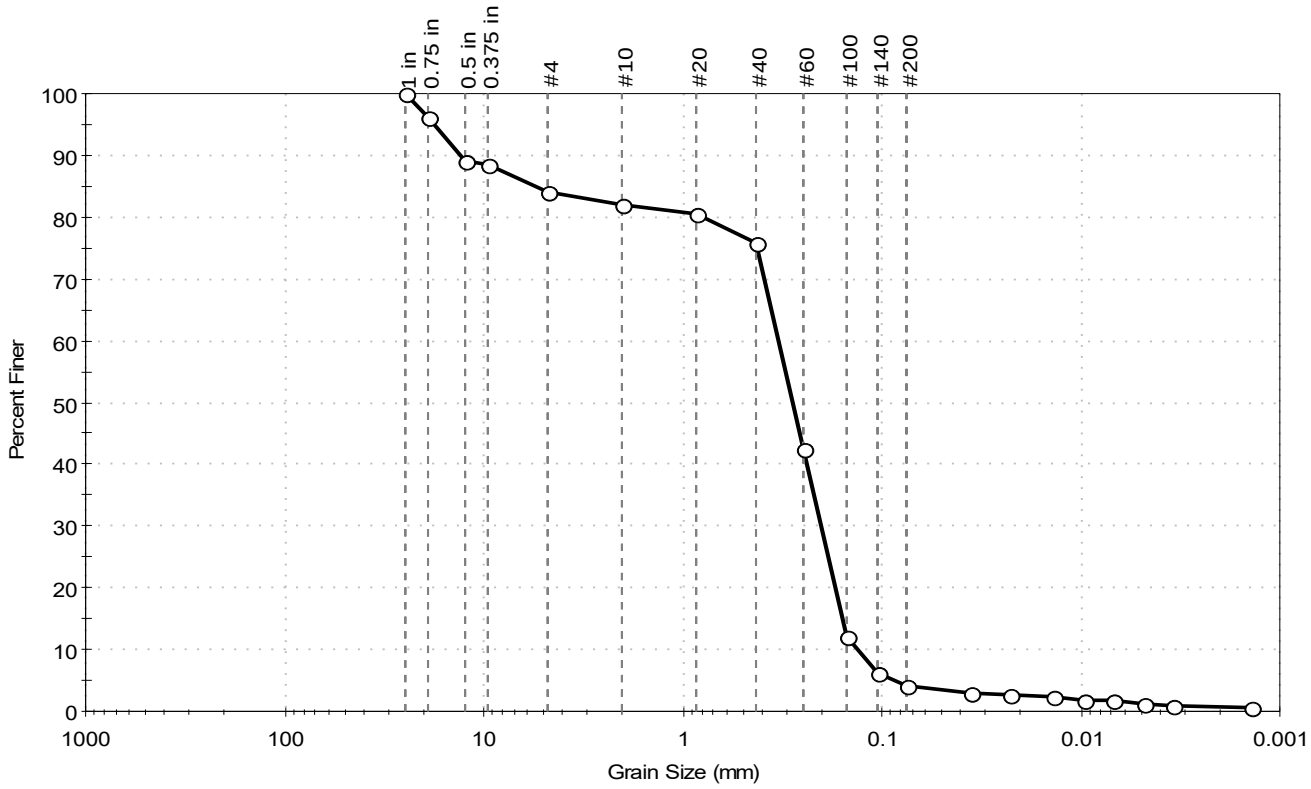
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB033	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0647	Test Date:	02/26/19	Checked By:	bfs
Depth :	30-32 ft	Test Id:	483679		
Test Comment:	---				
Visual Description:	Moist, grayish brown sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	16.0	79.8	4.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	96		
0.5 in	12.50	89		
0.375 in	9.50	88		
#4	4.75	84		
#10	2.00	82		
#20	0.85	81		
#40	0.42	76		
#60	0.25	42		
#100	0.15	12		
#140	0.11	6		
#200	0.075	4.2		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0358	3		
---	0.0228	3		
---	0.0138	2		
---	0.0097	2		
---	0.0069	2		
---	0.0048	1		
---	0.0035	1		
---	0.0014	1		

Coefficients

D_{85} = 5.5346 mm D_{30} = 0.2028 mm
D_{60} = 0.3305 mm D_{15} = 0.1576 mm
D_{50} = 0.2820 mm D_{10} = 0.1329 mm
C_u = 2.487 C_c = 0.936

Classification

ASTM Poorly graded SAND with Gravel (SP)

AASHTO Fine Sand (A-3 (1))

Sample / Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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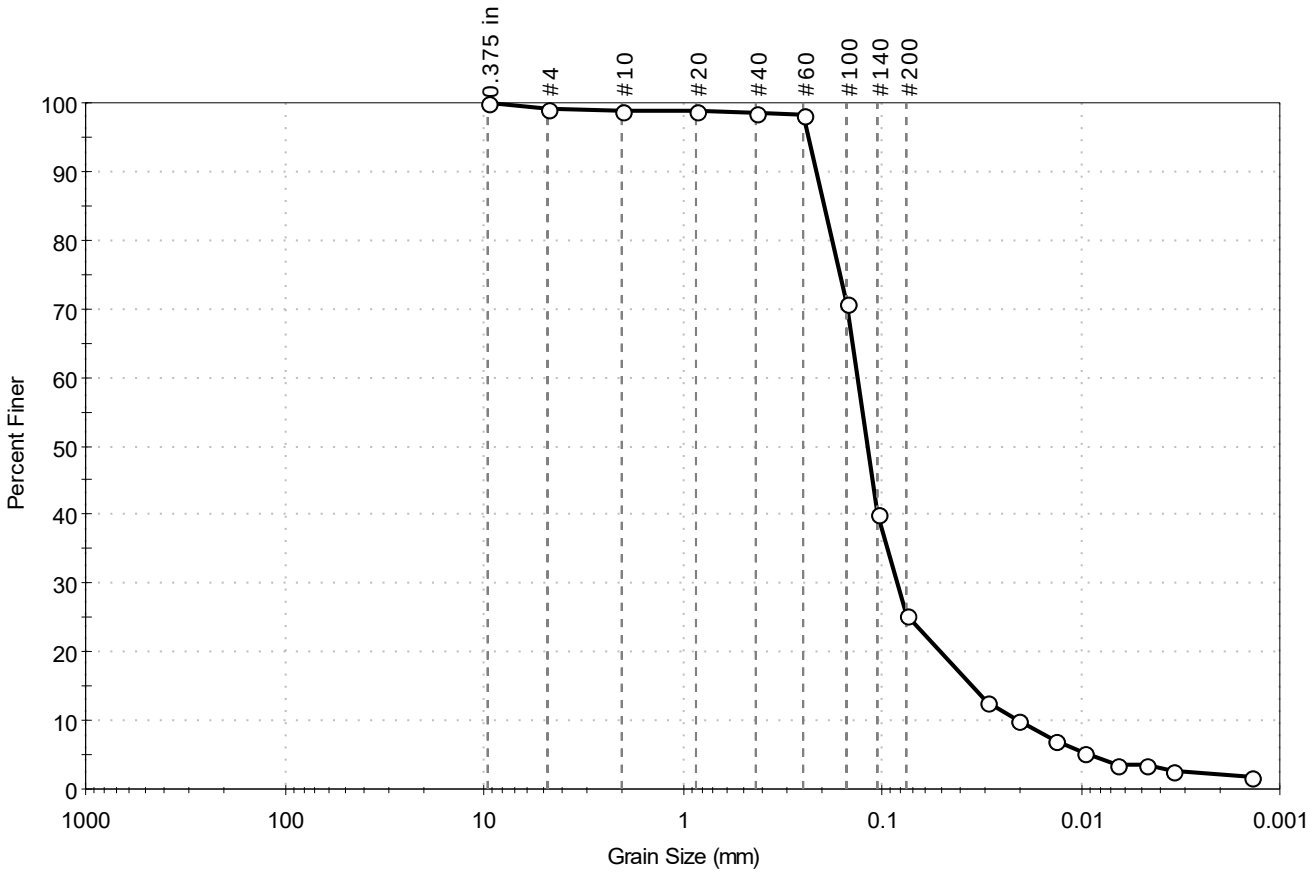
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB034	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0634	Test Date:	01/21/19	Checked By:	emm
Depth :	14-16 ft	Test Id:	482971		
Test Comment:	---				
Visual Description:	Moist, light yellowish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.0	73.5	25.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	99		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	71		
#140	0.11	40		
#200	0.075	25		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0293	13		
---	0.0207	10		
---	0.0136	7		
---	0.0097	5		
---	0.0066	4		
---	0.0048	4		
---	0.0034	3		
---	0.0014	2		

Coefficients

D_{85} = 0.1956 mm D_{30} = 0.0835 mm

D_{60} = 0.1329 mm D_{15} = 0.0348 mm

D_{50} = 0.1186 mm D_{10} = 0.0209 mm

C_u = 6.359 C_c = 2.510

Classification

ASTM Silty SAND (SM)

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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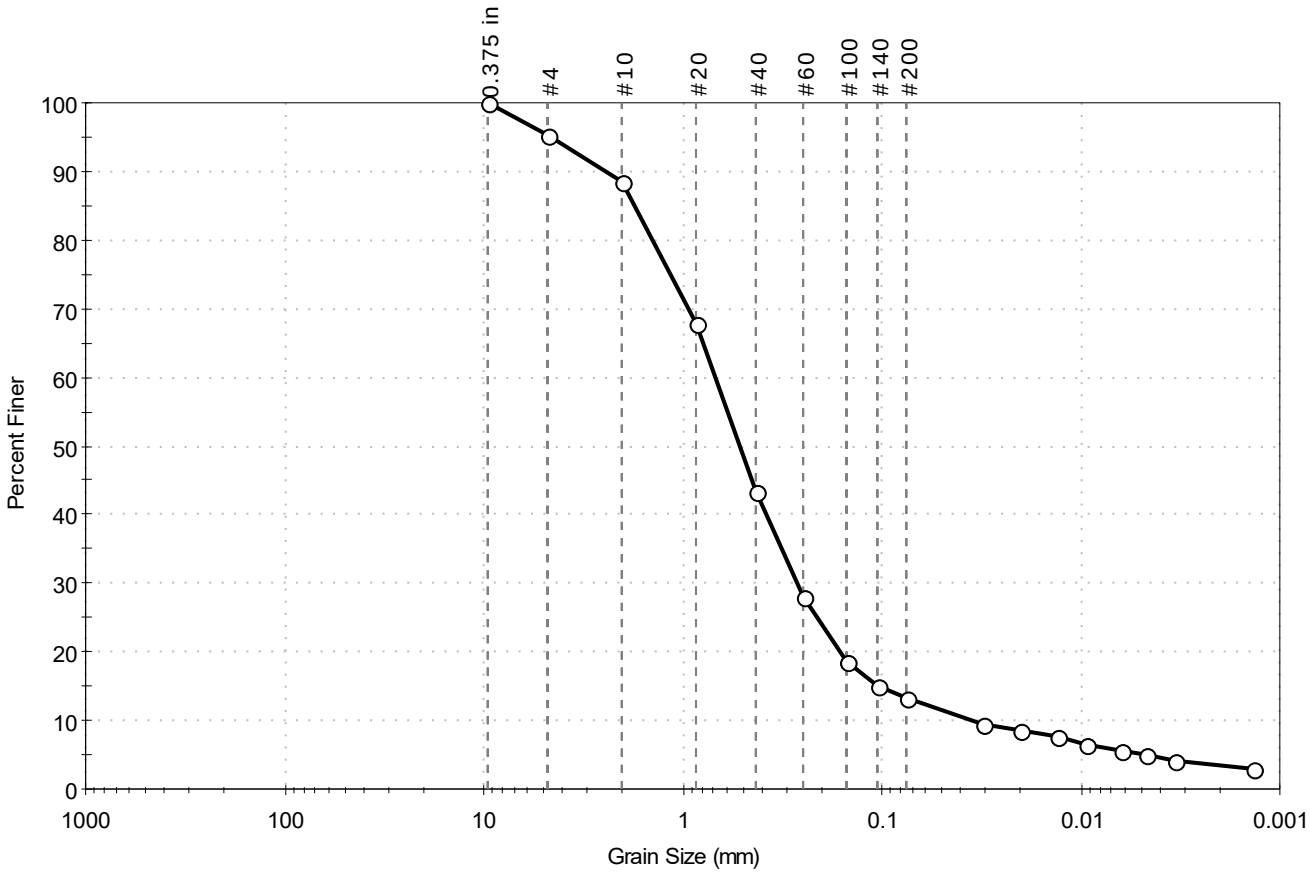
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB034	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0638	Test Date:	01/21/19	Checked By:	emm
Depth :	40-40.8 ft	Test Id:	482972		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown silty sand				
Sample Comment:	Sample contains shells				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	4.8	82.0	13.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	95		
#10	2.00	88		
#20	0.85	68		
#40	0.42	43		
#60	0.25	28		
#100	0.15	19		
#140	0.11	15		
#200	0.075	13		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0308	9		
---	0.0203	8		
---	0.0132	8		
---	0.0094	7		
---	0.0063	6		
---	0.0048	5		
---	0.0034	4		
---	0.0014	3		

Coefficients

D_{85} = 1.7309 mm D_{30} = 0.2672 mm
D_{60} = 0.6806 mm D_{15} = 0.1048 mm
D_{50} = 0.5123 mm D_{10} = 0.0353 mm
C_u = 19.280 C_c = 2.972

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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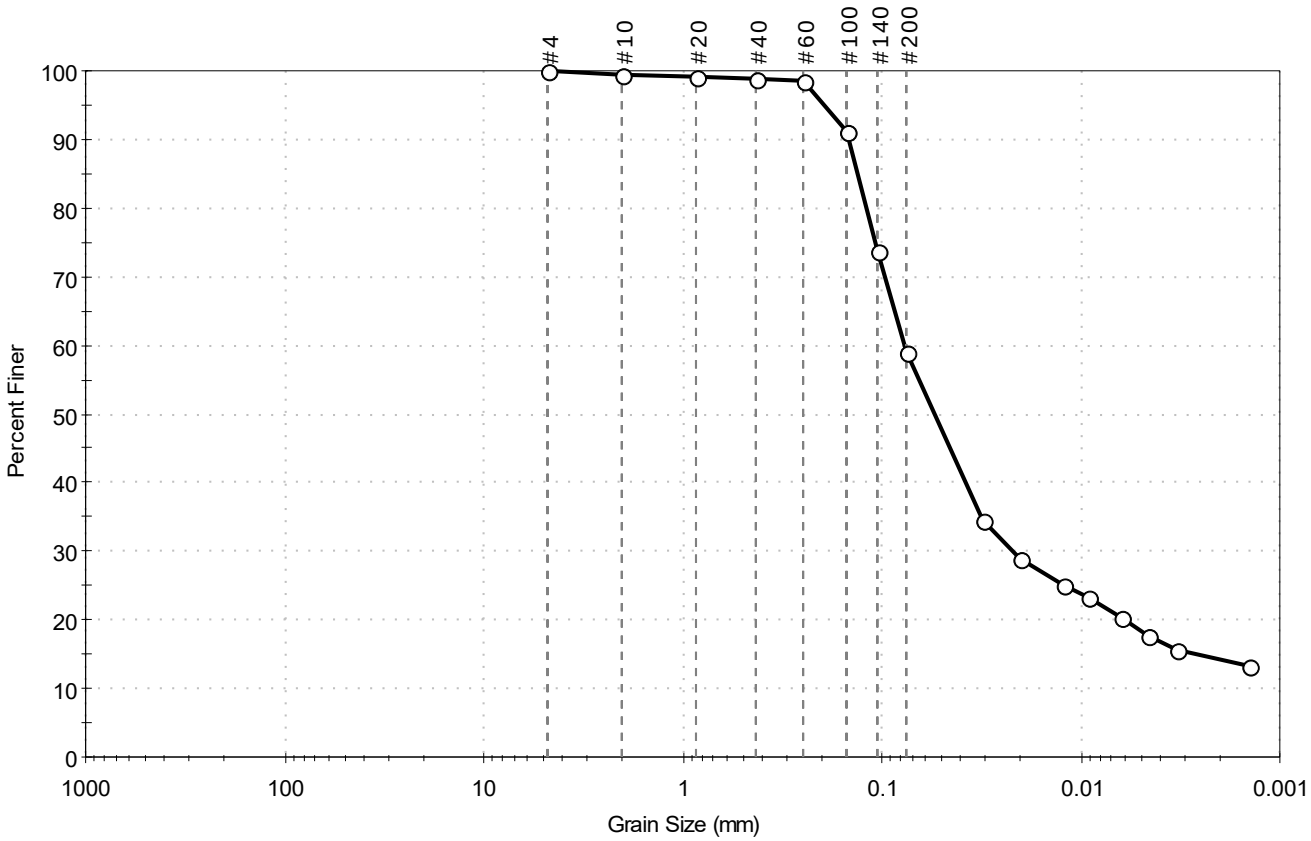
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB035	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0644	Test Date:	01/02/19	Checked By:	emm
Depth :	8-10 ft	Test Id:	482969		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sandy clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	41.1	58.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	91		
#140	0.11	74		
#200	0.075	59		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0308	35		
---	0.0200	29		
---	0.0123	25		
---	0.0091	23		
---	0.0064	20		
---	0.0046	18		
---	0.0033	16		
---	0.0014	13		

Coefficients

D_{85} = 0.1324 mm	D_{30} = 0.0217 mm
D_{60} = 0.0770 mm	D_{15} = 0.0026 mm
D_{50} = 0.0542 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Sandy Lean CLAY (CL)

AASHTO Clayey Soils (A-6 (5))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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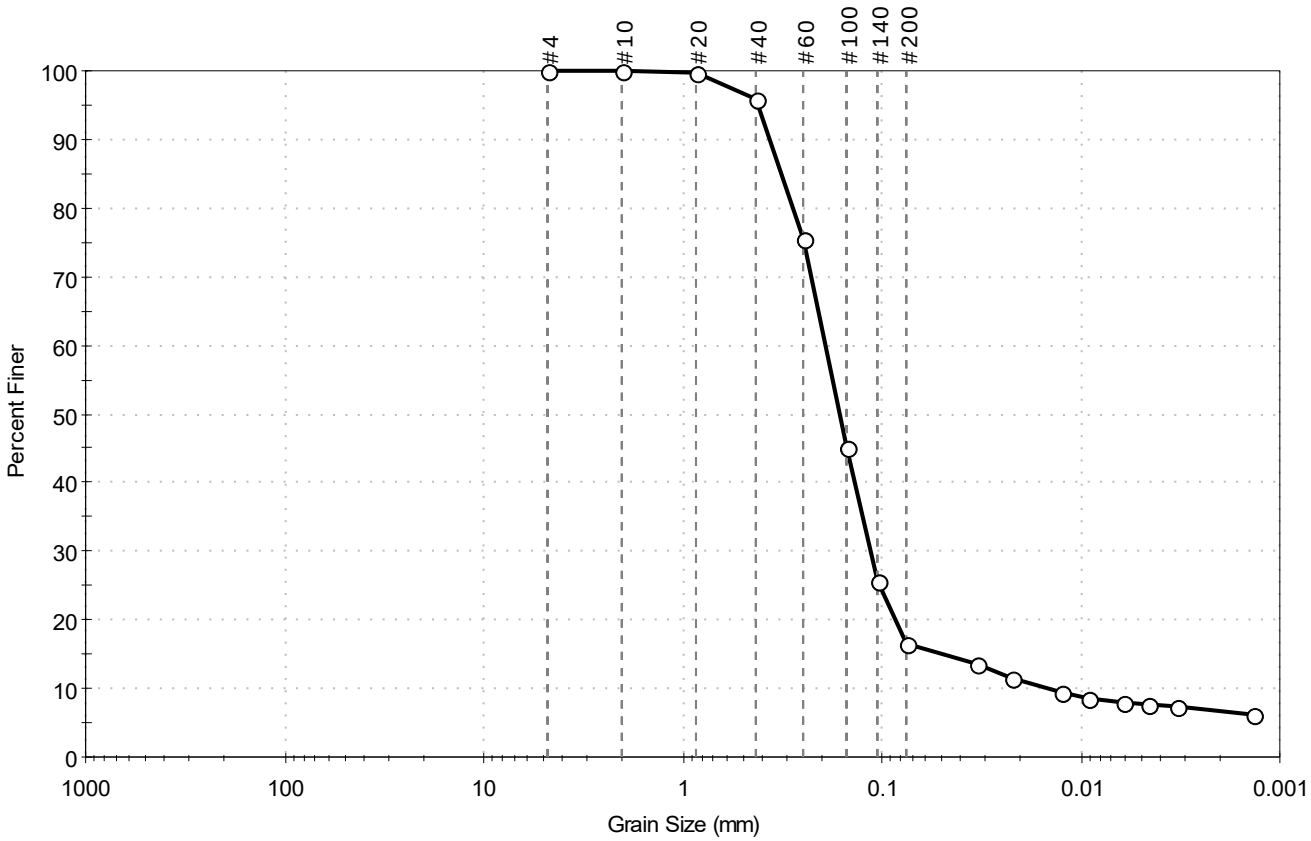
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB035	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0647	Test Date:	01/21/19	Checked By:	emm
Depth :	25-27 ft	Test Id:	482970		
Test Comment:	---				
Visual Description:	Moist, dark gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	83.4	16.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	75		
#100	0.15	45		
#140	0.11	26		
#200	0.075	17		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0332	14		
---	0.0221	12		
---	0.0126	9		
---	0.0092	8		
---	0.0061	8		
---	0.0046	8		
---	0.0033	7		
---	0.0014	6		

Coefficients

D_{85} = 0.3208 mm D_{30} = 0.1146 mm
D_{60} = 0.1927 mm D_{15} = 0.0477 mm
D_{50} = 0.1627 mm D_{10} = 0.0145 mm
C_u = 13.290 C_c = 4.700

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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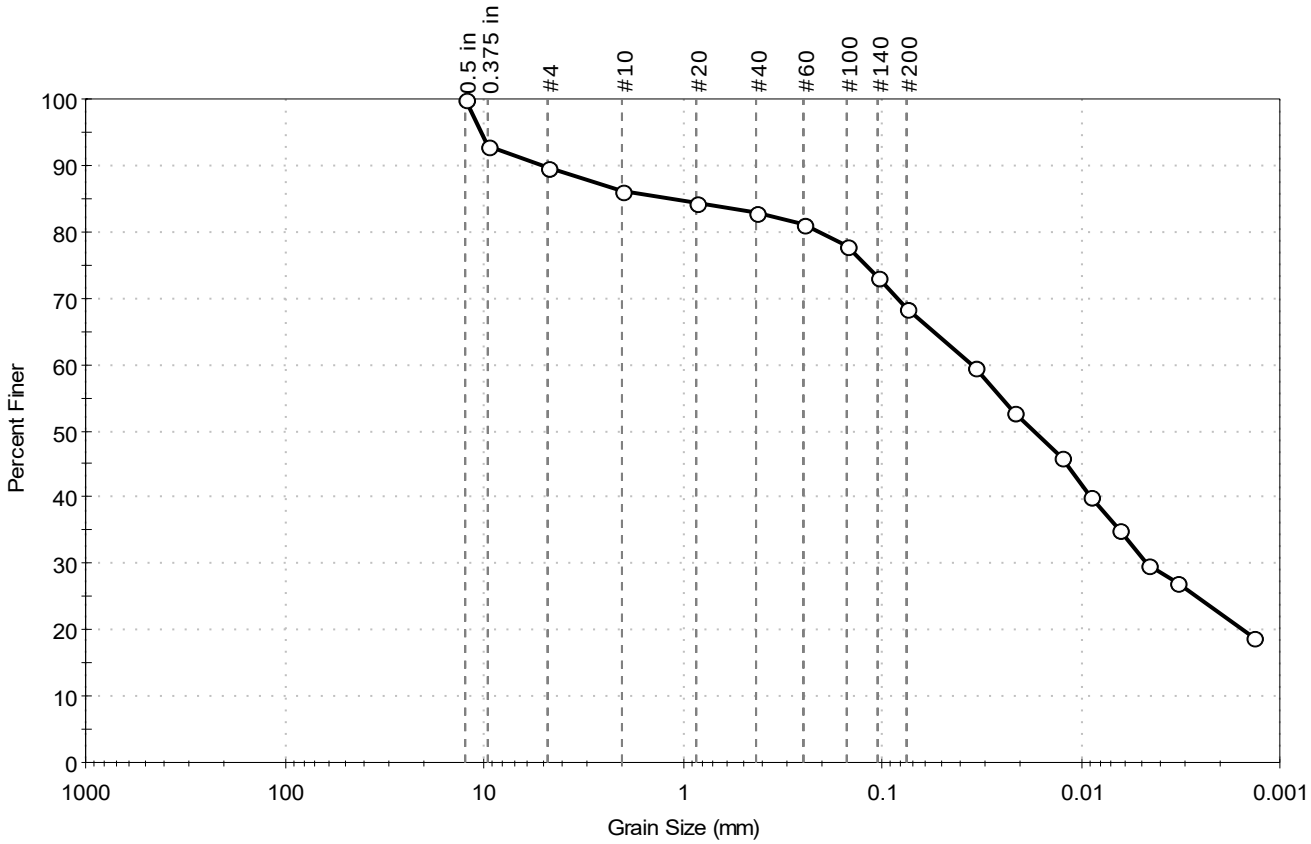
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB036	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0665	Test Date:	02/25/19	Checked By:	bfs
Depth :	2.6-4 ft	Test Id:	483682		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sandy clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	10.2	21.3	68.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	93		
#4	4.75	90		
#10	2.00	86		
#20	0.85	84		
#40	0.42	83		
#60	0.25	81		
#100	0.15	78		
#140	0.11	73		
#200	0.075	68		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0343	60		
---	0.0216	53		
---	0.0127	46		
---	0.0090	40		
---	0.0064	35		
---	0.0046	30		
---	0.0033	27		
---	0.0014	19		

Coefficients

D_{85} = 1.1351 mm D_{30} = 0.0046 mm
D_{60} = 0.0355 mm D_{15} = N/A
D_{50} = 0.0172 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM Sandy Fat CLAY (CH)

AASHTO Clayey Soils (A-7-5 (42))

Sample / Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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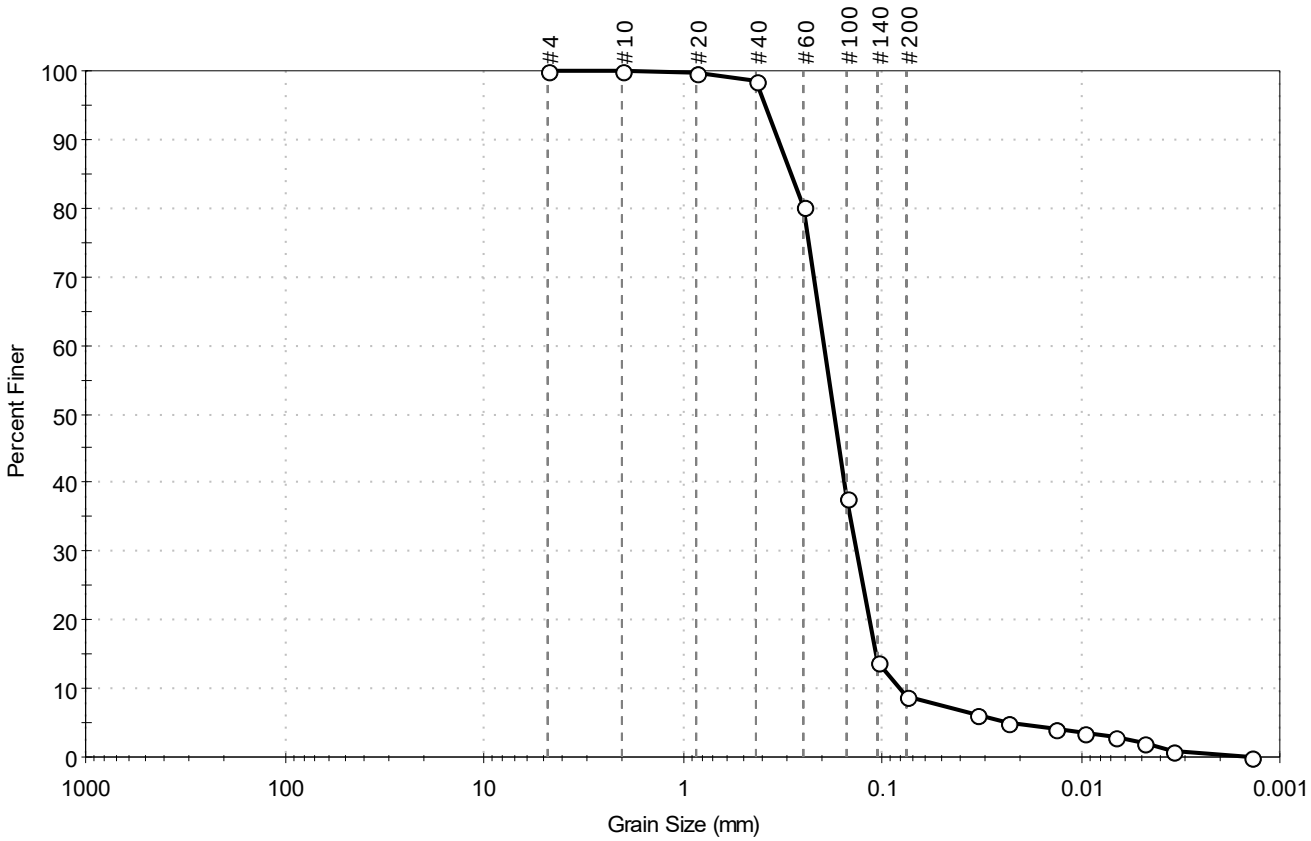
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB036	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0670	Test Date:	02/25/19	Checked By:	bfs
Depth :	20-22 ft	Test Id:	483683		
Test Comment:	---				
Visual Description:	Moist, dark gray sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	91.2	8.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	80		
#100	0.15	38		
#140	0.11	14		
#200	0.075	8.8		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0332	6		
---	0.0232	5		
---	0.0134	4		
---	0.0097	4		
---	0.0067	3		
---	0.0048	2		
---	0.0034	1		
---	0.0014	0		

Coefficients

D_{85} = 0.2878 mm D_{30} = 0.1339 mm
D_{60} = 0.1962 mm D_{15} = 0.1075 mm
D_{50} = 0.1739 mm D_{10} = 0.0812 mm
C_u = 2.416 C_c = 1.125

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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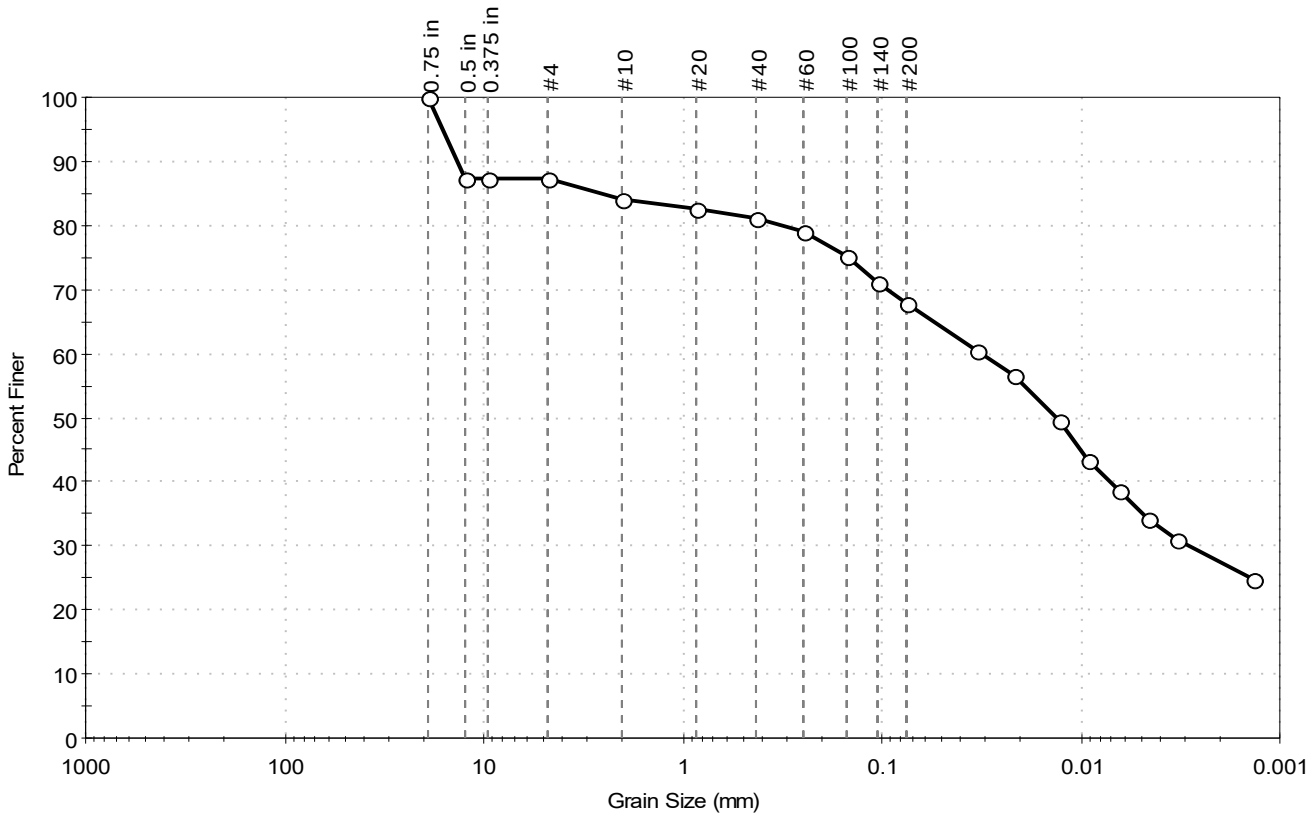
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB037	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0652	Test Date:	03/05/19	Checked By:	bfs
Depth :	2-4 ft	Test Id:	483680		
Test Comment:	---				
Visual Description:	Moist, very dark gray sandy clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
–	12.8	19.4	67.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	87		
0.375 in	9.50	87		
#4	4.75	87		
#10	2.00	84		
#20	0.85	83		
#40	0.42	81		
#60	0.25	79		
#100	0.15	75		
#140	0.11	71		
#200	0.075	68		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0334	60		
---	0.0217	57		
---	0.0128	50		
---	0.0092	43		
---	0.0065	39		
---	0.0047	34		
---	0.0033	31		
---	0.0013	25		

Coefficients

D_{85} = 2.5542 mm	D_{30} = 0.0029 mm
D_{60} = 0.0319 mm	D_{15} = N/A
D_{50} = 0.0132 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Sandy Fat CLAY (CH)

AASHTO Clayey Soils (A-7-5 (54))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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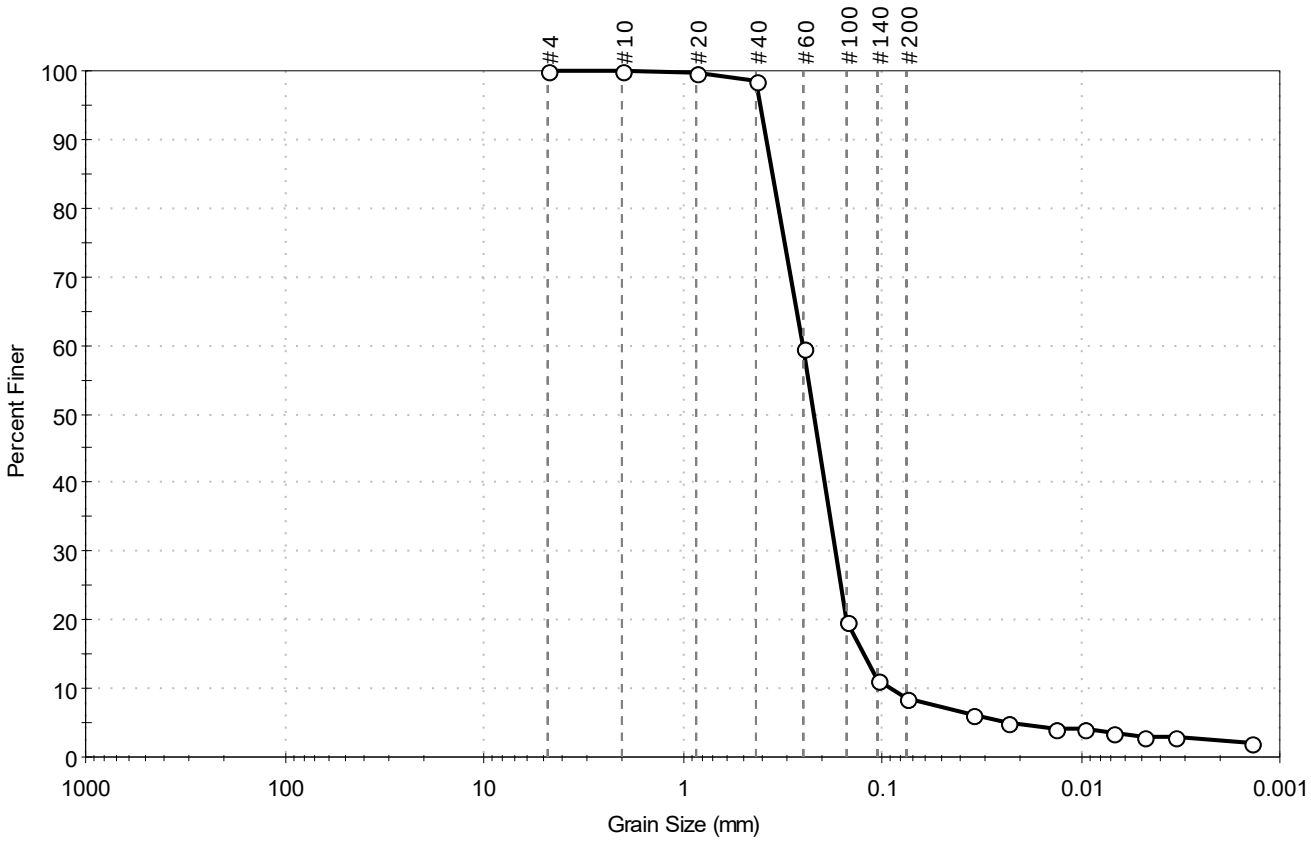
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB037	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0659	Test Date:	02/26/19	Checked By:	bfs
Depth :	25-27 ft	Test Id:	483681		
Test Comment:	---				
Visual Description:	Moist, grayish brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	91.4	8.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	60		
#100	0.15	20		
#140	0.11	11		
#200	0.075	8.6		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0351	6		
---	0.0234	5		
---	0.0135	4		
---	0.0097	4		
---	0.0069	4		
---	0.0048	3		
---	0.0034	3		
---	0.0014	2		

Coefficients

D_{85} = 0.3537 mm D_{30} = 0.1711 mm
D_{60} = 0.2514 mm D_{15} = 0.1237 mm
D_{50} = 0.2211 mm D_{10} = 0.0901 mm
C_u = 2.790 C_c = 1.292

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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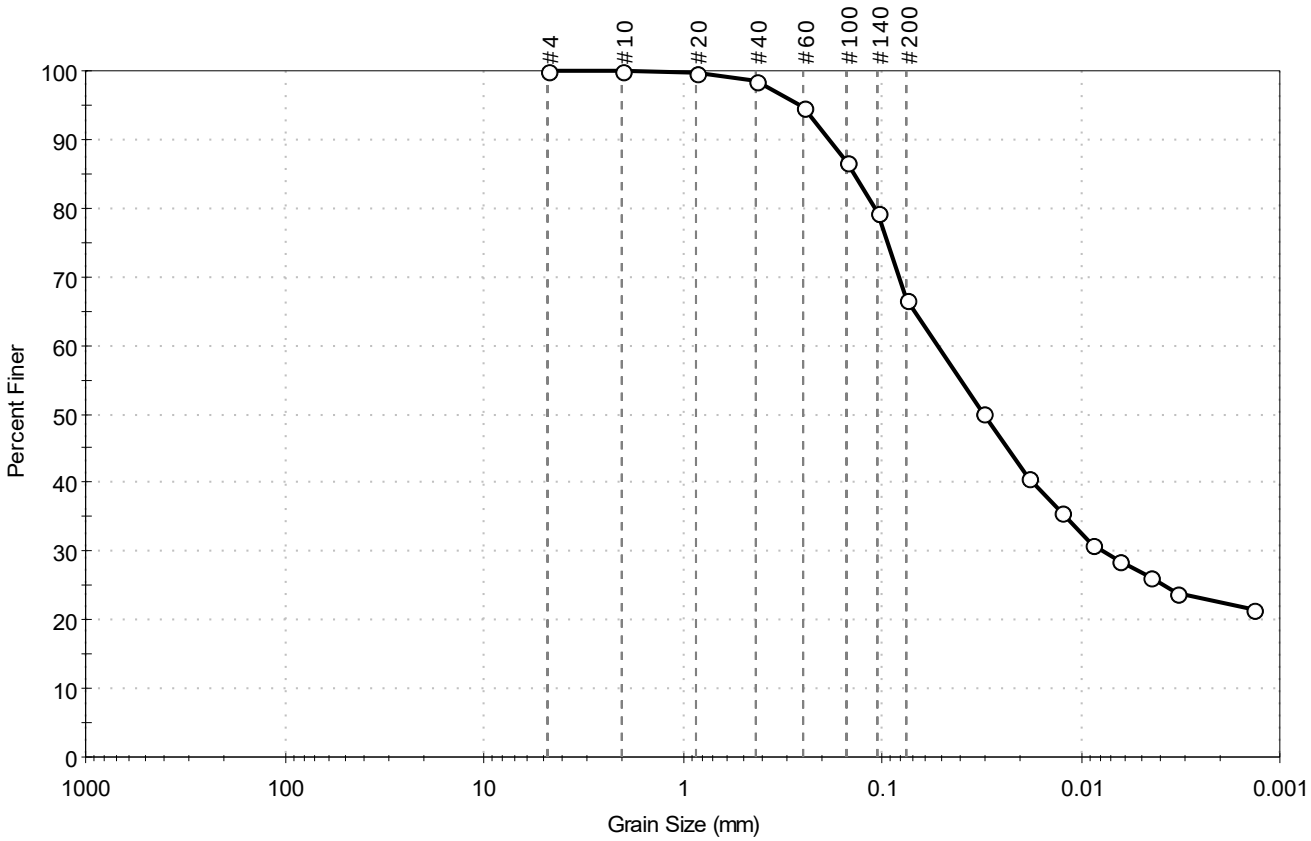
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB038	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0891	Test Date:	02/25/19	Checked By:	bfs
Depth :	13-15 ft	Test Id:	486511		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sandy clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	33.4	66.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	95		
#100	0.15	87		
#140	0.11	79		
#200	0.075	67		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0308	50		
---	0.0183	41		
---	0.0127	36		
---	0.0087	31		
---	0.0065	29		
---	0.0045	26		
---	0.0033	24		
---	0.0014	21		

Coefficients

D_{85} = 0.1376 mm	D_{30} = 0.0077 mm
D_{60} = 0.0526 mm	D_{15} = N/A
D_{50} = 0.0306 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Sandy Lean CLAY (CL)

AASHTO Clayey Soils (A-6 (10))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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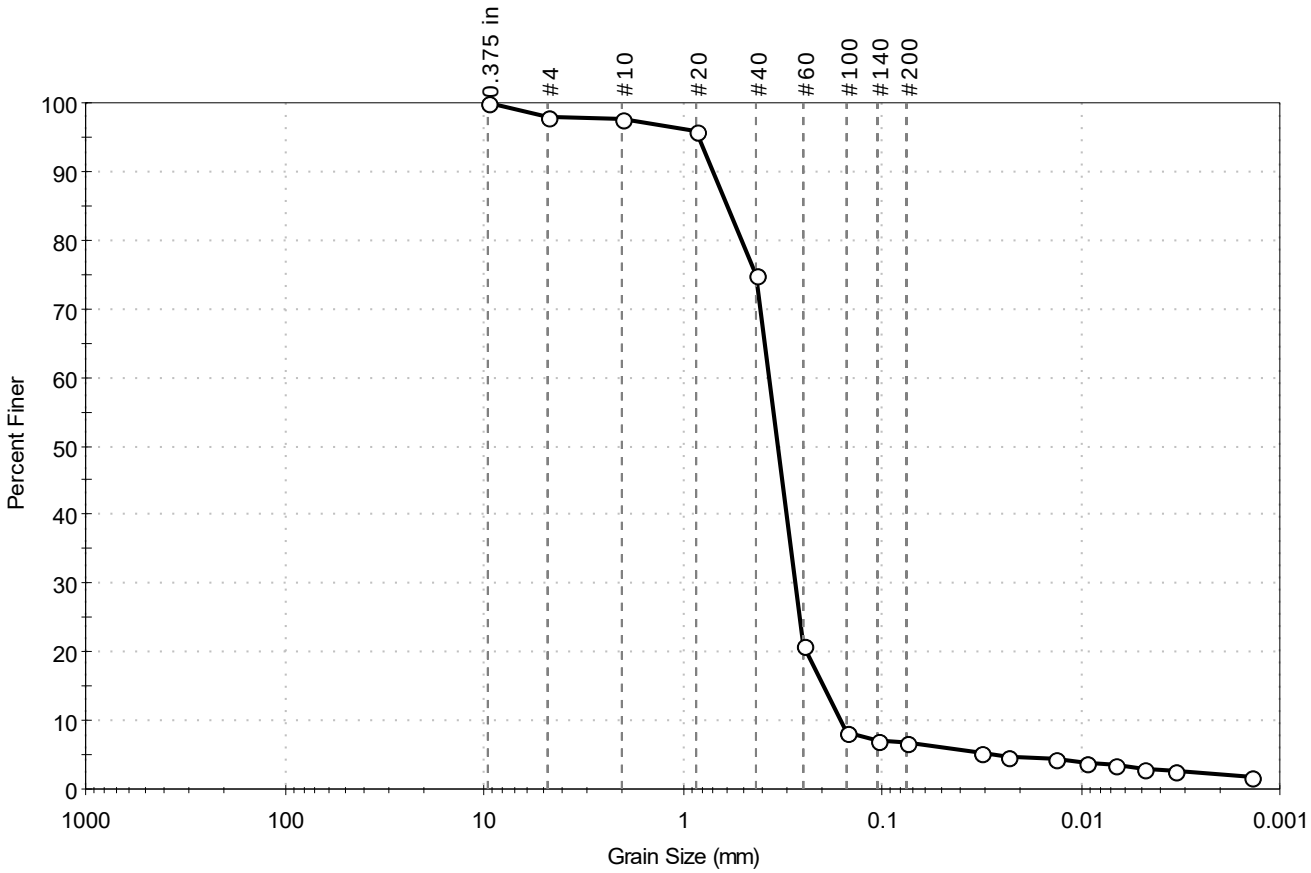
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB038	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0893	Test Date:	02/25/19	Checked By:	bfs
Depth :	24-26 ft	Test Id:	486512		
Test Comment:	---				
Visual Description:	Moist, dark brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	2.0	91.4	6.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	98		
#10	2.00	98		
#20	0.85	96		
#40	0.42	75		
#60	0.25	21		
#100	0.15	8		
#140	0.11	7		
#200	0.075	6.6		
Hydrometer	**Particle Size (mm)**	**Percent Finer**	**Spec. Percent**	**Complies**
---	0.0315	5		
---	0.0231	5		
---	0.0133	4		
---	0.0095	4		
---	0.0067	4		
---	0.0048	3		
---	0.0034	3		
---	0.0014	2		

Coefficients

D_{85} = 0.5909 mm	D_{30} = 0.2732 mm
D_{60} = 0.3667 mm	D_{15} = 0.1962 mm
D_{50} = 0.3324 mm	D_{10} = 0.1603 mm
C_u = 2.288	C_c = 1.270

Classification

ASTM Poorly graded SAND with Silt (SP-SM)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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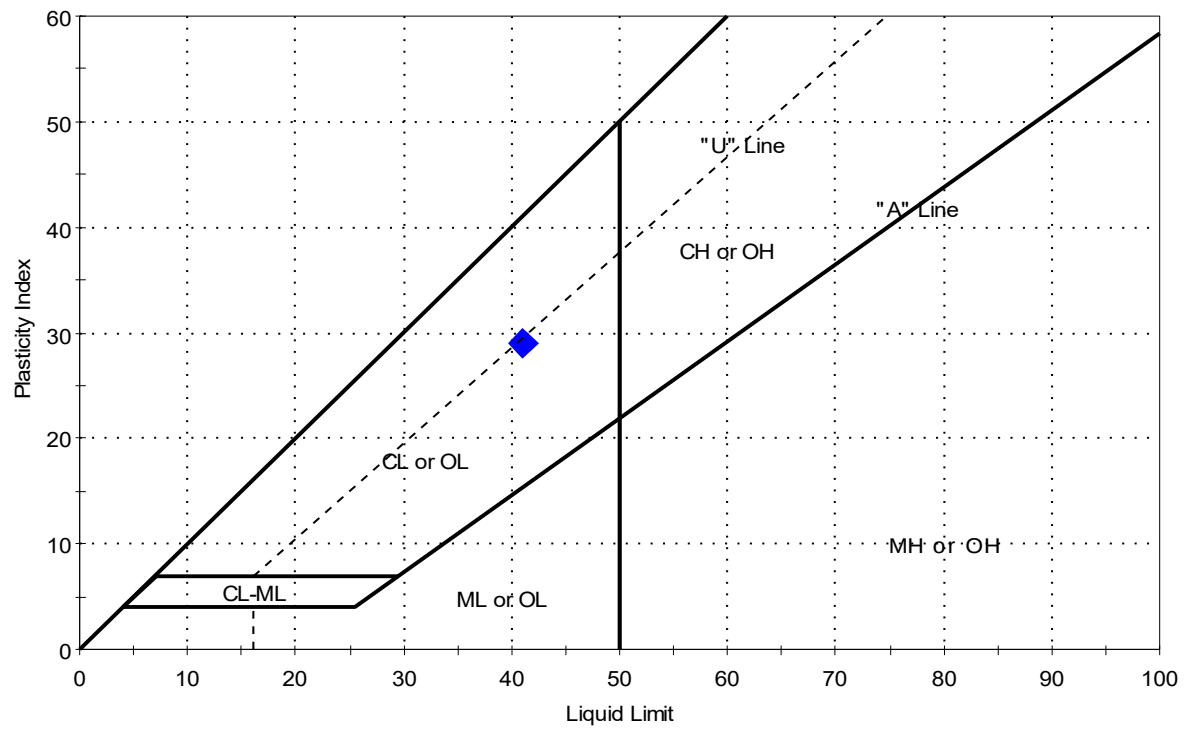
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB018	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0866	Test Date:	03/06/19	Checked By:	bfs
Depth :	18-20 ft	Test Id:	486384		
Test Comment:	---				
Visual Description:	Moist, mottled light yellowish brown and gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0866	SJGB018	18-20 ft	18	41	12	29	0.2	Lean CLAY (CL)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB018	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0870	Test Date:	03/05/19	Checked By:	bfs
Depth :	40-42 ft	Test Id:	486385		
Test Comment:	---				
Visual Description:	Moist, light brownish gray silty sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0870	SJGB018	40-42 ft	19	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW

Dilatancy: RAPID

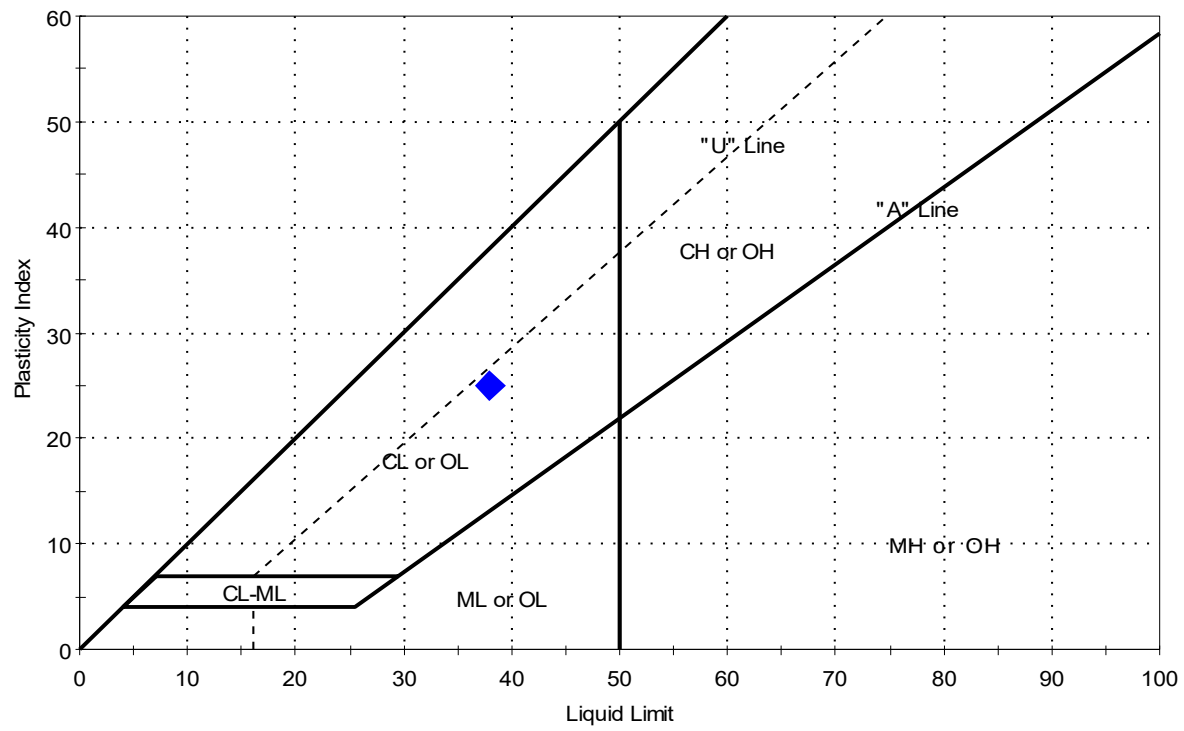
Toughness: n/a

The sample was determined to be Non-Plastic

printed 3/15/2019 12:35:15 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB019	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0851	Test Date:	03/01/19	Checked By:	bfs
Depth :	20-22'	Test Id:	485095		
Test Comment:	---				
Visual Description:	Moist, light yellowish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0851	SJGB019	20-22'	21	38	13	25	0.3	Lean CLAY (CL)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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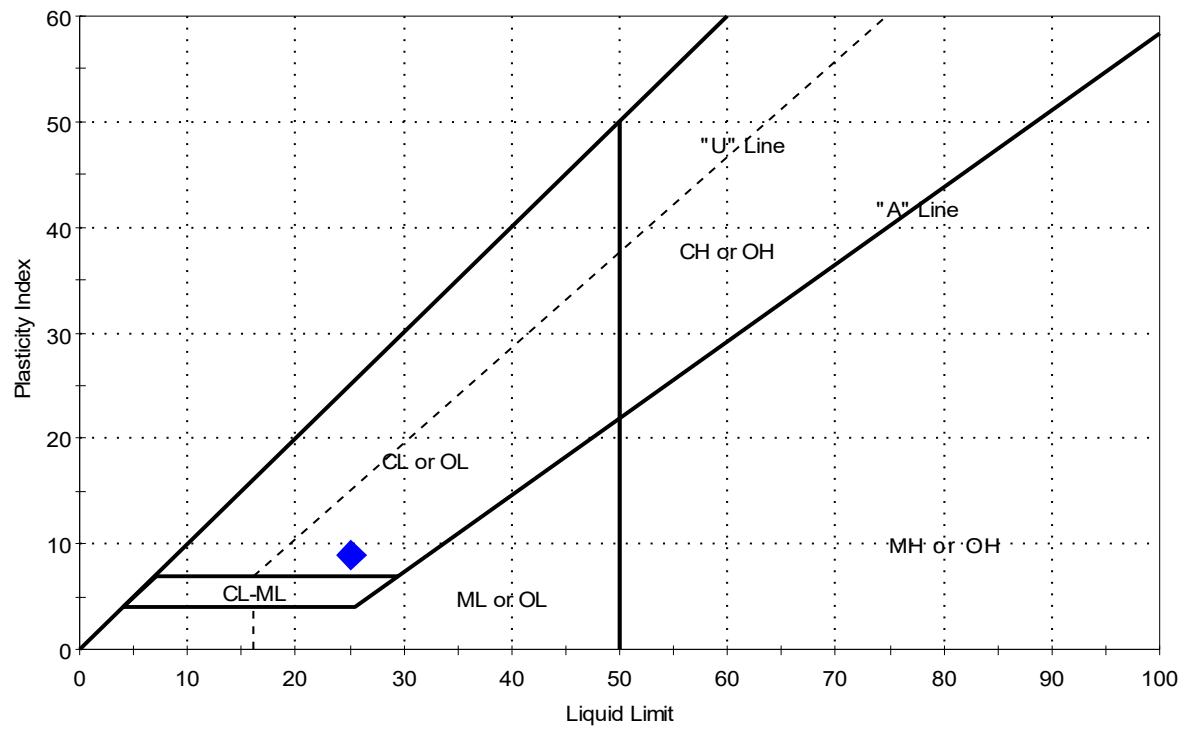
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB019	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0854	Test Date:	03/05/19	Checked By:	bfs
Depth :	35-37'	Test Id:	485096		
Test Comment:	---				
Visual Description:	Moist, brownish yellow clayey sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0854	SJGB019	35-37'	22	25	16	9	0.7	Clayey SAND (SC)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW

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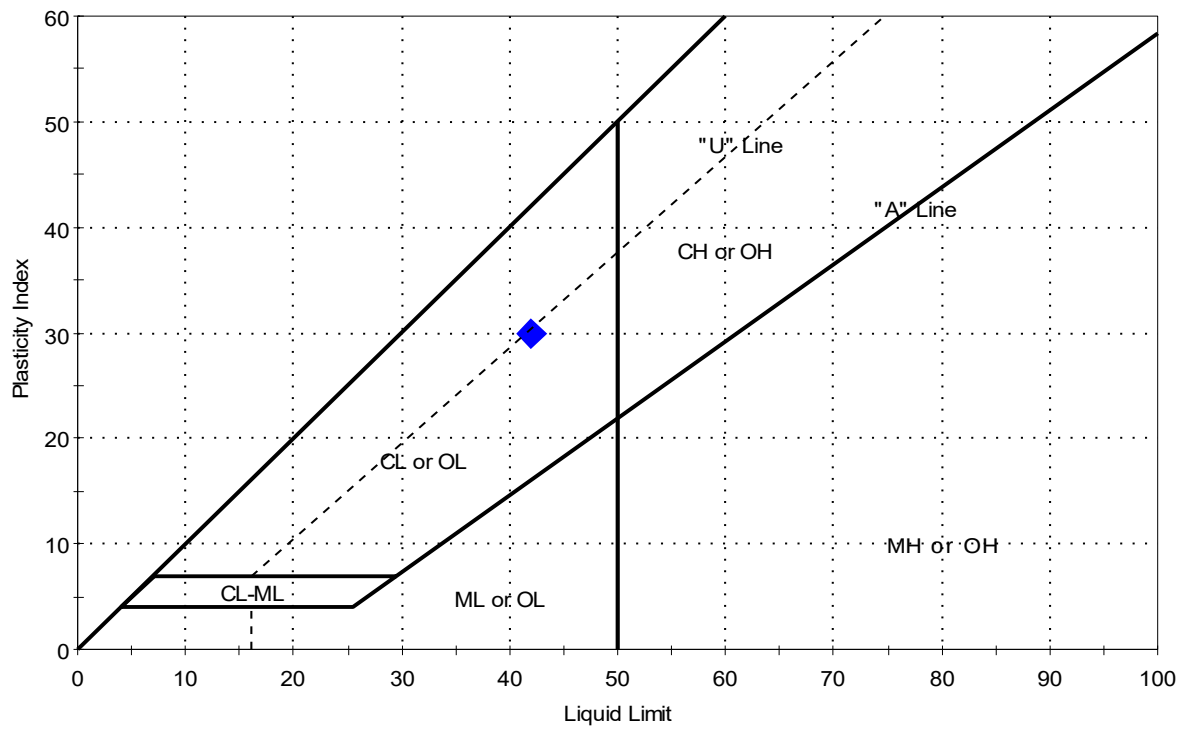
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB020	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0840	Test Date:	03/05/19	Checked By:	bfs
Depth :	30-32'	Test Id:	485093		
Test Comment:	---				
Visual Description:	Moist, light yellowish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0840	SJGB020	30-32'	22	42	12	30	0.3	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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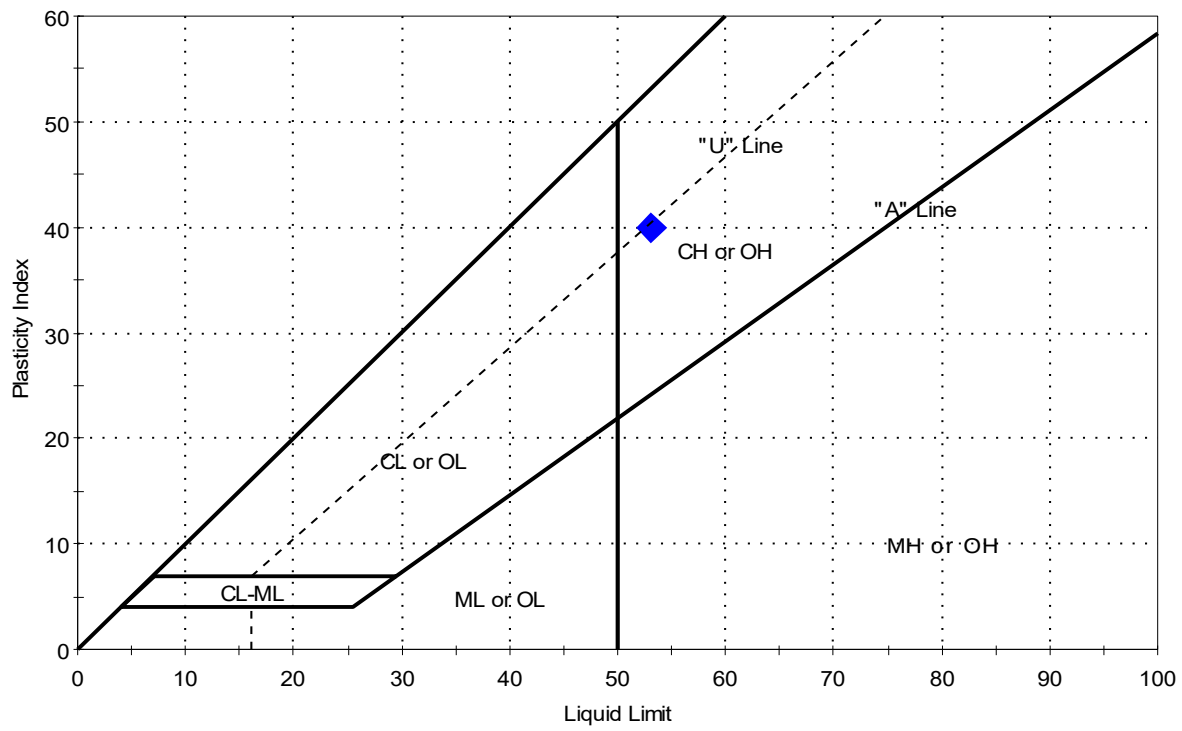
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB020	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0846	Test Date:	03/06/19	Checked By:	bfs
Depth :	60-62'	Test Id:	485094		
Test Comment:	---				
Visual Description:	Moist, grayish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0846	SJGB020	60-62'	27	53	13	40	0.3	Fat CLAY (CH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW

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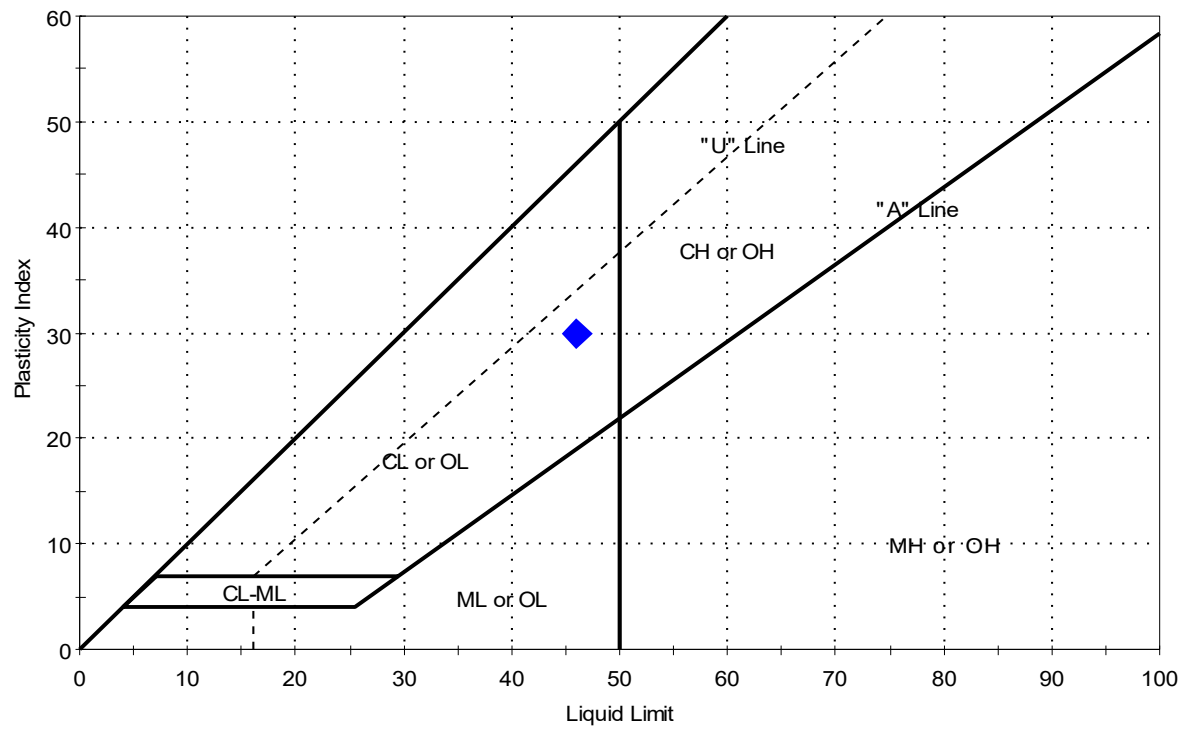
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB021	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0823	Test Date:	02/28/19	Checked By:	bfs
Depth :	6'-8'	Test Id:	485153		
Test Comment:	---				
Visual Description:	Wet, dark brown clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0823	SJGB021	6'-8'	51	46	16	30	1.2	Lean CLAY with Sand (CL)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB021	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0830	Test Date:	02/27/19	Checked By:	bfs
Depth :	44'-46'	Test Id:	485154		
Test Comment:	---				
Visual Description:	Moist, light brownish gray sandy silt				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0830	SJGB021	44'-46'	20	n/a	n/a	n/a	n/a	Sandy SILT (ML)

0% Retained on #40 Sieve

Dry Strength: MEDIUM

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

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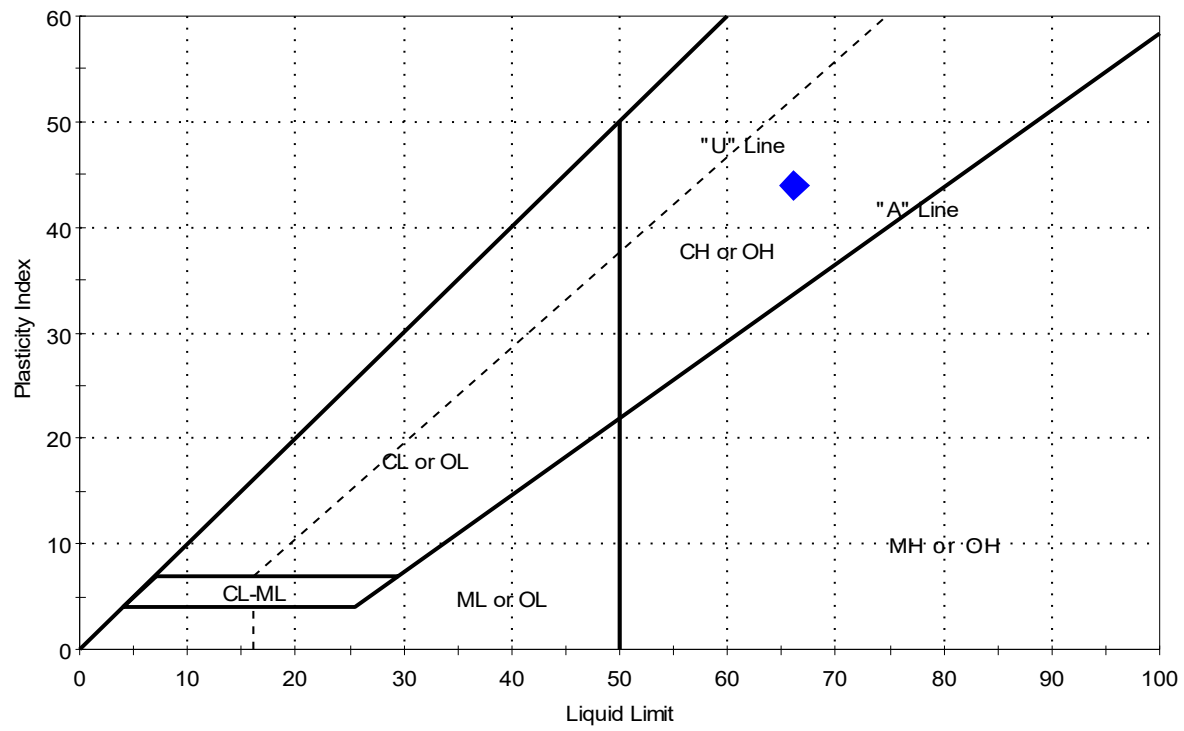
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB022	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0818	Test Date:	03/05/19	Checked By:	bfs
Depth :	35'-37'	Test Id:	485151		
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0818	SJGB022	35'-37'	24	66	22	44	0	Fat CLAY (CH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: MEDIUM

printed 3/15/2019 12:35:19 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB022	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0820	Test Date:	03/05/19	Checked By:	bfs
Depth :	45'-47'	Test Id:	485152		
Test Comment:	---				
Visual Description:	Moist, light brownish gray silty sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0820	SJGB022	45'-47'	22	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

printed 3/15/2019 12:35:20 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB023G09	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0881	Test Date:	02/26/19	Checked By:	bfs
Depth :	23-25 ft	Test Id:	486381		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown sand with silt				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0881	JGB023G0	23-25 ft	16	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

11% Retained on #40 Sieve

Dry Strength: MEDIUM

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

printed 3/15/2019 12:35:20 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB023G16B	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0889	Test Date:	03/05/19	Checked By:	bfs
Depth :	59.3-60 ft	Test Id:	486383		
Test Comment:	---				
Visual Description:	Moist, light brownish gray silty sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0889	GB023G1	59.3-60 ft	17	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: MEDIUM

Dilatancy: RAPID

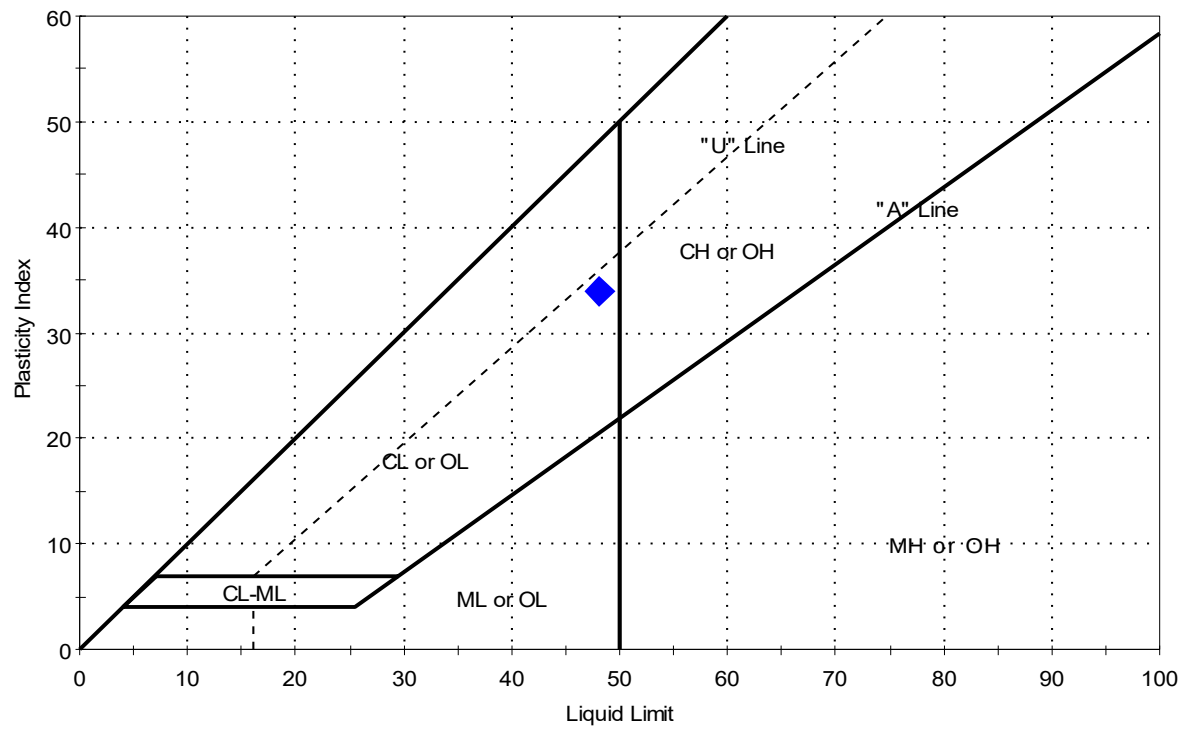
Toughness: n/a

The sample was determined to be Non-Plastic

printed 3/15/2019 12:35:21 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB008-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1026	Test Date:	12/10/18	Checked By:	emm
Depth :	2-4 ft	Test Id:	482735		
Test Comment:	---				
Visual Description:	Moist, dark yellowish brown clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1026	JSB008-E	2-4 ft	26	48	14	34	0.3	Lean CLAY with Sand (CL)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH

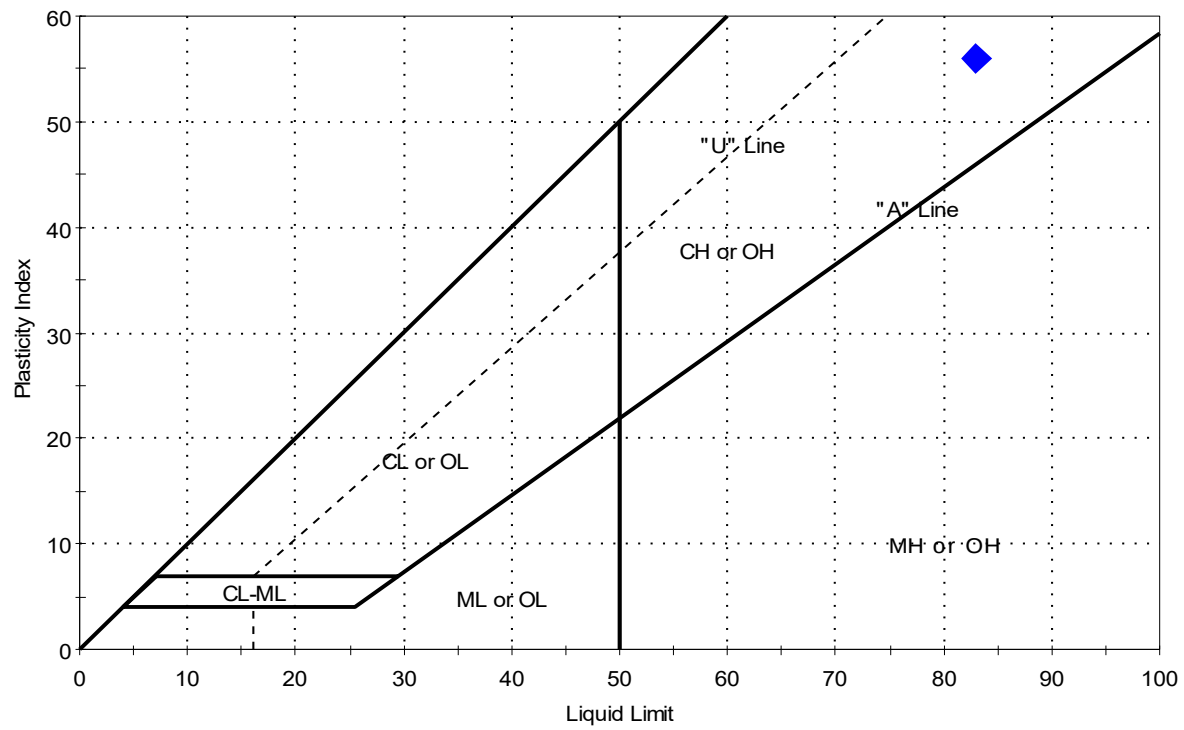
Dilatancy: SLOW

Toughness: LOW

printed 3/15/2019 12:35:21 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB008-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1029	Test Date:	12/28/18	Checked By:	emm
Depth :	8-10 ft	Test Id:	482736		
Test Comment:	---				
Visual Description:	Moist, very dark gray clay				
Sample Comment:	Sample contains organics				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1029	JSB008-E	8-10 ft	64	83	27	56	0.7	

Sample Prepared using the WET method

Dry Strength: HIGH

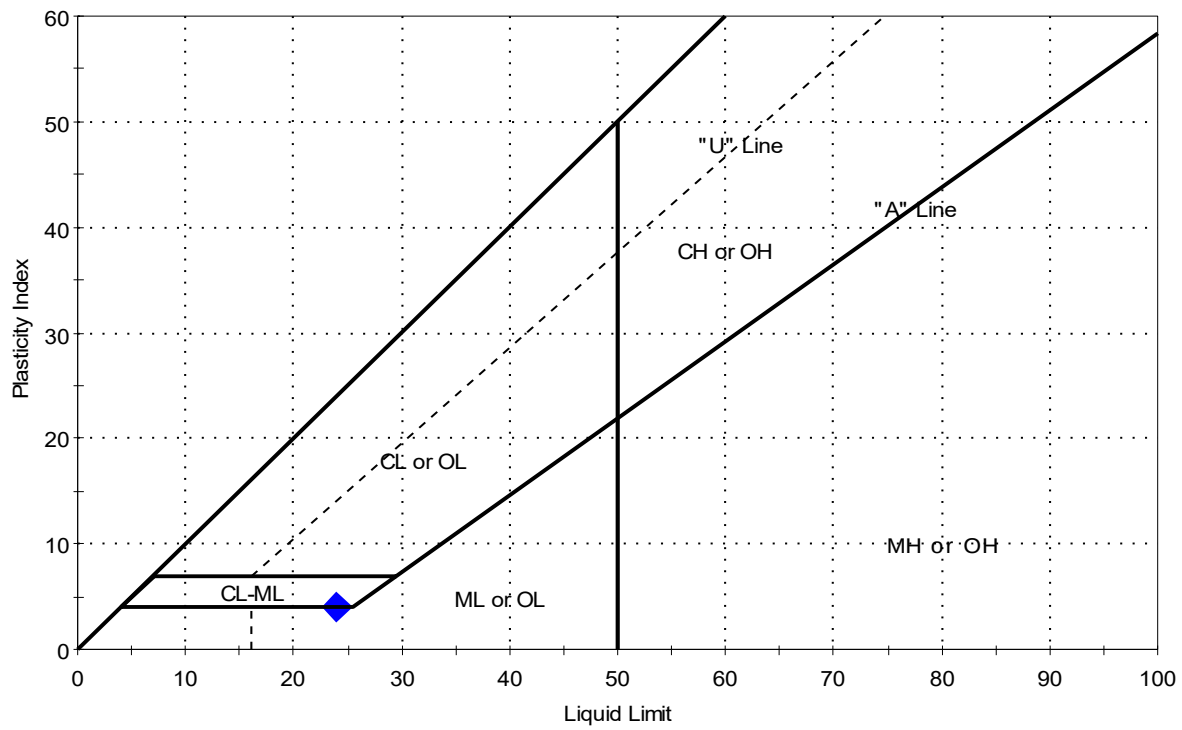
Dilatancy: SLOW

Toughness: LOW

printed 3/15/2019 12:35:22 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB012-W1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1050	Test Date:	01/05/19	Checked By:	emm
Depth :	15-17 ft	Test Id:	482979		
Test Comment:	---				
Visual Description:	Moist, grayish brown silty, clayey sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1050	JSB012-W	15-17 ft	24	24	20	4	1	Silty, Clayey SAND (SC-SM)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH

Dilatancy: RAPID

Toughness: LOW

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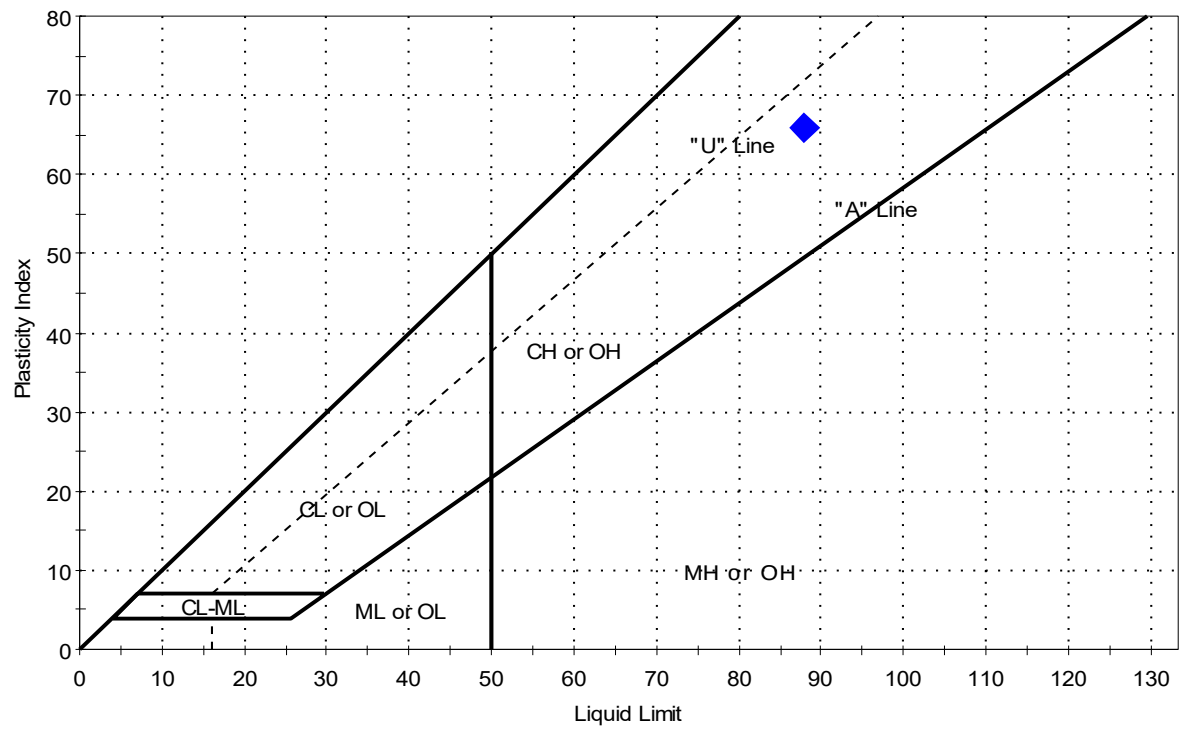
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB019-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1004	Test Date:	01/02/19	Checked By:	emm
Depth :	8-10 ft	Test Id:	482731		
Test Comment:	---				
Visual Description:	Moist, very dark gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1004	JSB019-E	8-10 ft	47	88	22	66	0.4	Fat CLAY (CH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: VERY HIGH

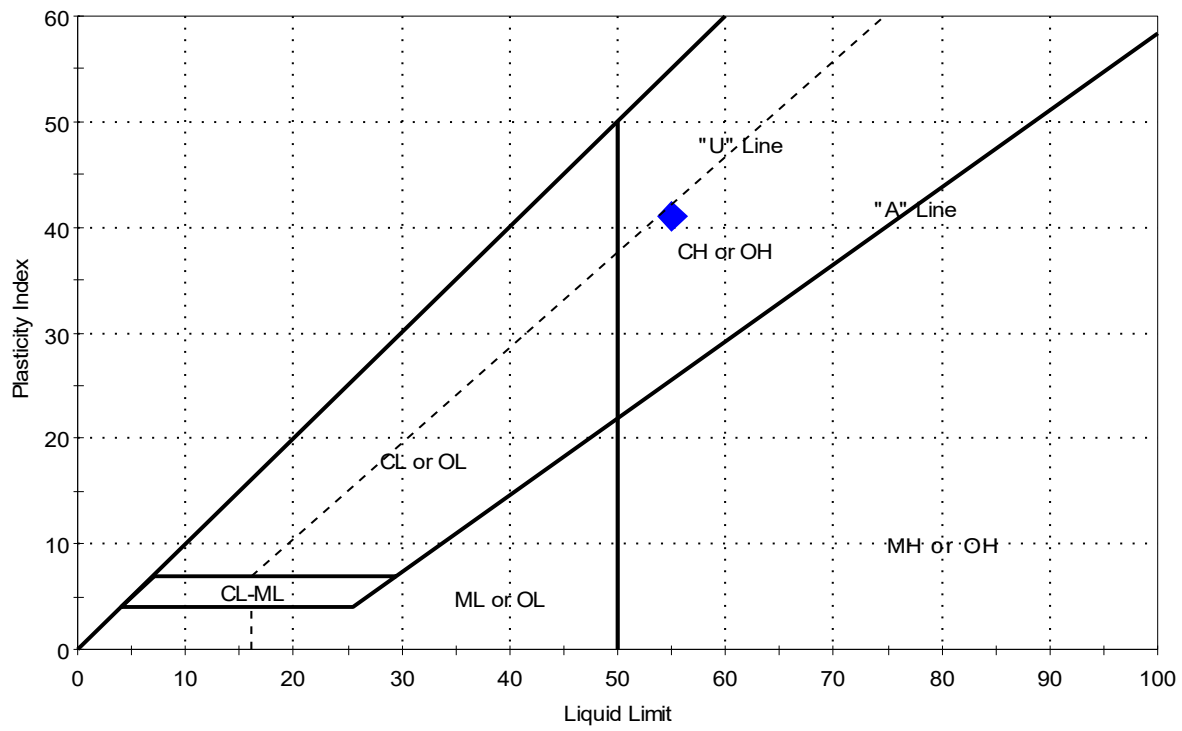
Dilatancy: SLOW

Toughness: MEDIUM

printed 3/15/2019 12:35:23 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB019-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1008	Test Date:	12/10/18	Checked By:	emm
Depth :	19-21 ft	Test Id:	482732		
Test Comment:	---				
Visual Description:	Moist, very dark gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1008	JSB019-E	19-21 ft	30	55	14	41	0.4	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: MEDIUM

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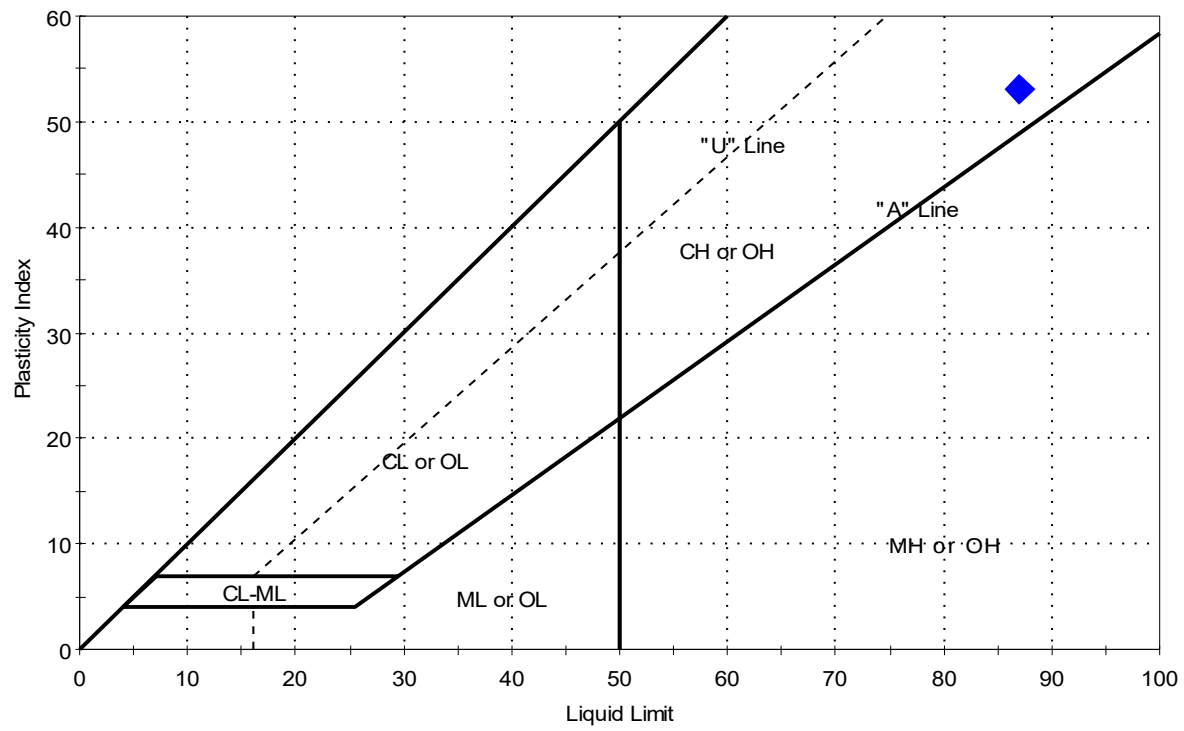
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB023-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1015	Test Date:	12/19/18	Checked By:	emm
Depth :	4-6 ft	Test Id:	482733		
Test Comment:	---				
Visual Description:	Moist, very dark gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1015	JSB023-E	4-6 ft	70	87	34	53	0.7	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

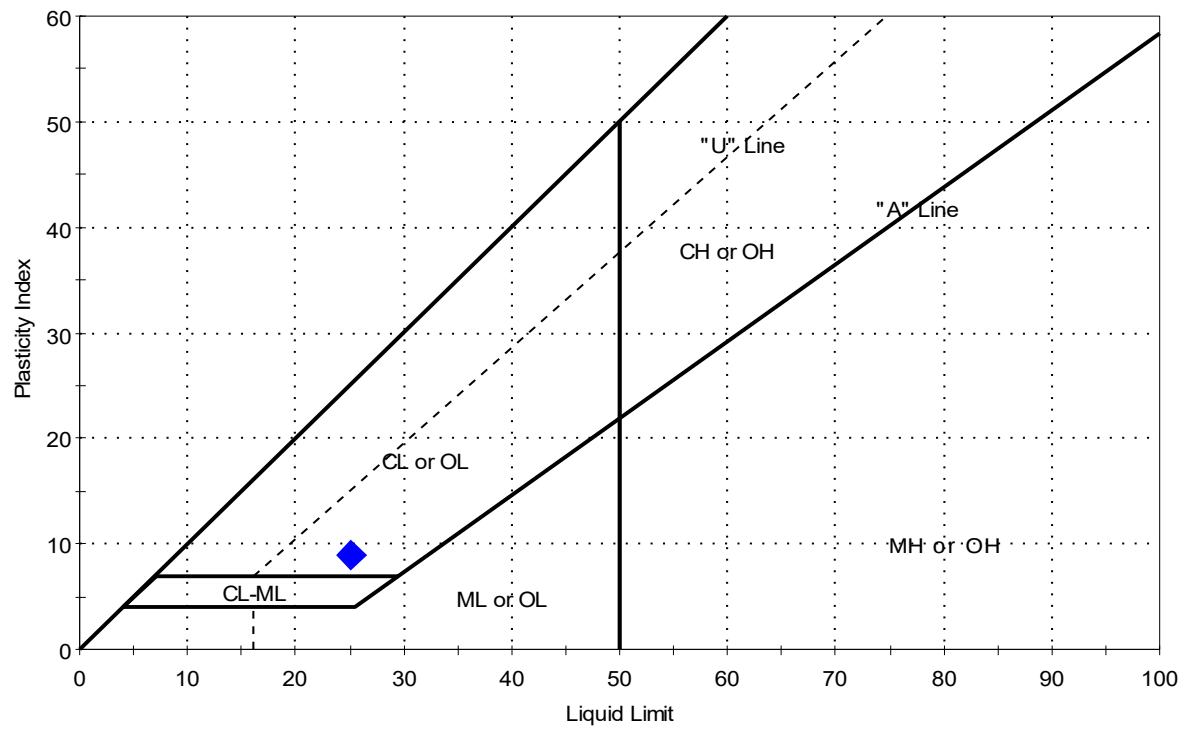
Dilatancy: SLOW

Toughness: MEDIUM

printed 3/15/2019 12:35:23 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB023-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1022	Test Date:	12/19/18	Checked By:	emm
Depth :	24-26 ft	Test Id:	482734		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown clayey sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1022	JSB023-E	24-26 ft	28	25	16	9	1.4	Clayey SAND (SC)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH

Dilatancy: RAPID

Toughness: LOW

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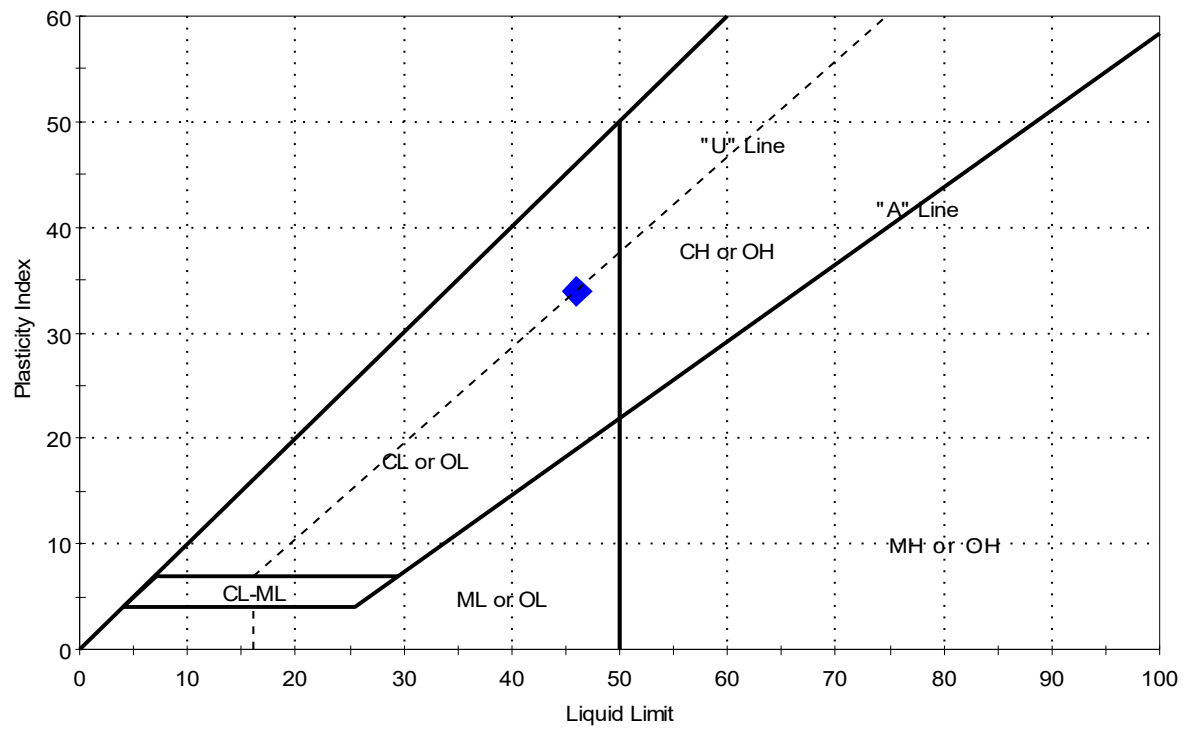
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB025-1W	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1040	Test Date:	12/19/18	Checked By:	emm
Depth :	8-10 ft	Test Id:	482737		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sandy clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1040	JSB025-1	8-10 ft	35	46	12	34	0.7	Sandy Lean CLAY (CL)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: MEDIUM

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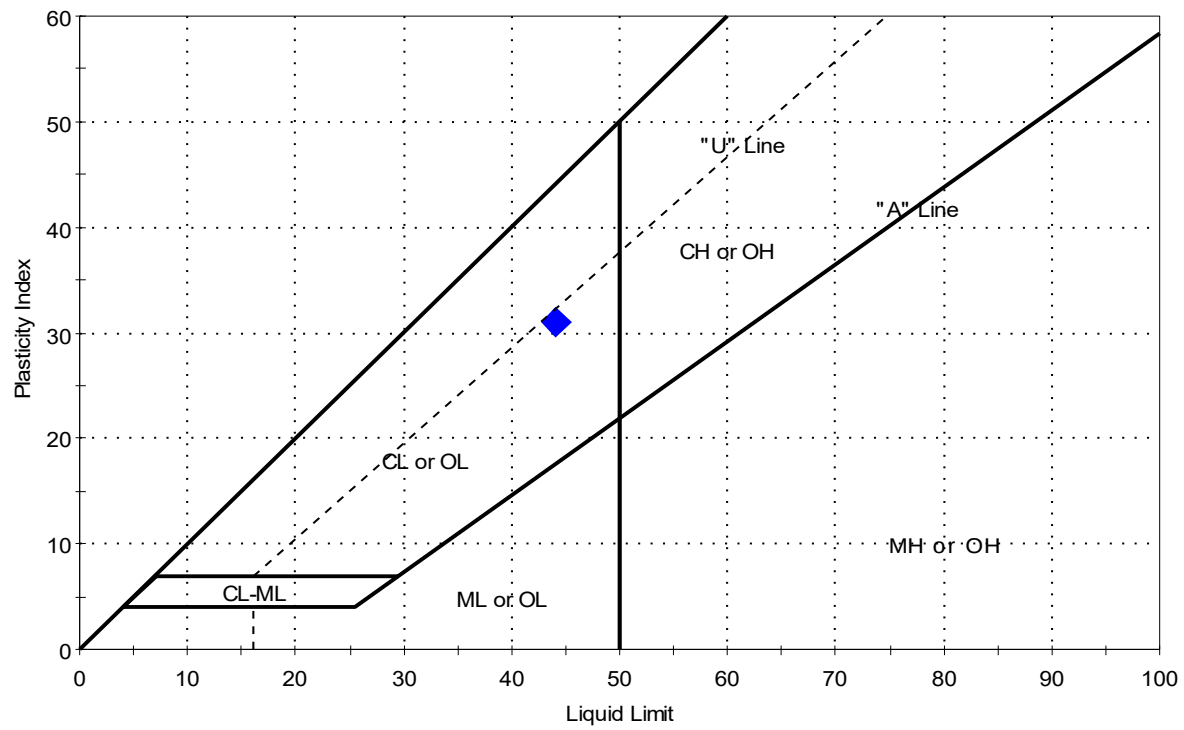
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB025-1W	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1043	Test Date:	12/10/18	Checked By:	emm
Depth :	19-21 ft	Test Id:	482738		
Test Comment:	---				
Visual Description:	Moist, gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL1043	JSB025-1	19-21 ft	31	44	13	31	0.6	

Sample Prepared using the WET method

Dry Strength: HIGH

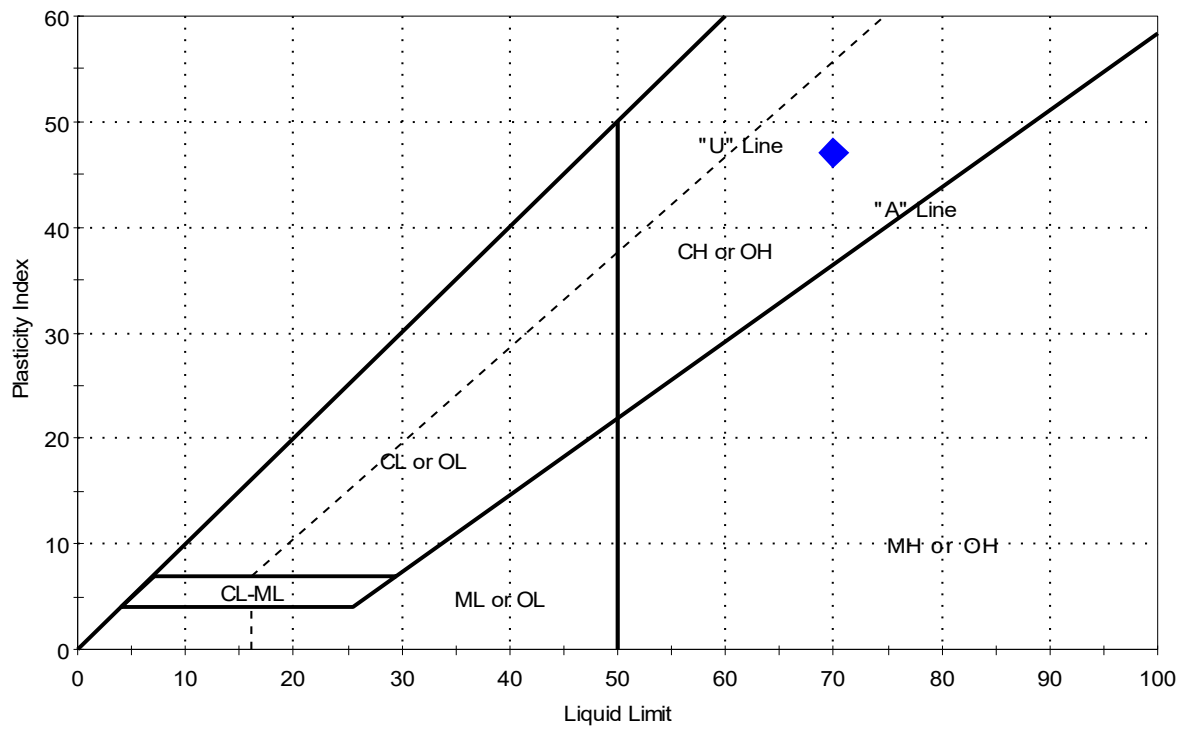
Dilatancy: SLOW

Toughness: MEDIUM

printed 3/15/2019 12:35:25 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB028	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0803	Test Date:	03/01/19	Checked By:	bfs
Depth :	8-10 ft	Test Id:	483640		
Test Comment:	---				
Visual Description:	Moist, very dark brown clay				
Sample Comment:	Sample contains organics				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0803	SJSB028	8-10 ft	41	70	23	47	0.4	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: VERY HIGH

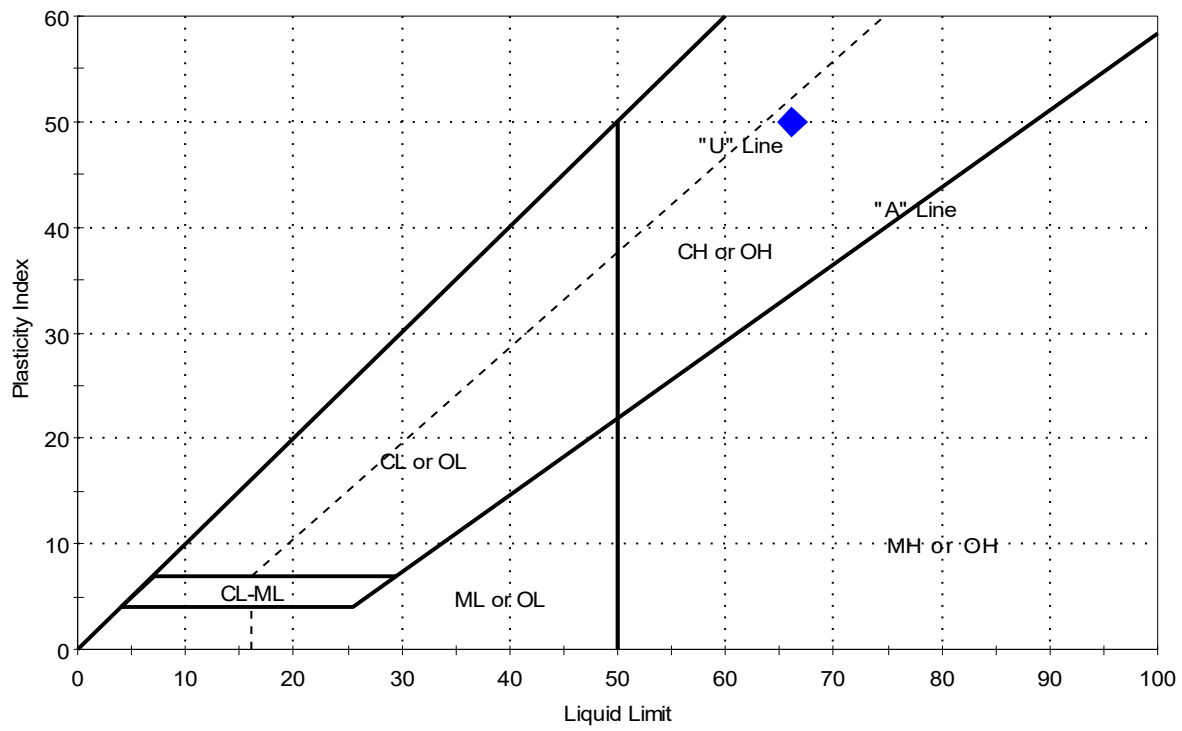
Dilatancy: SLOW

Toughness: LOW

printed 3/15/2019 12:35:26 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB028	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0806	Test Date:	03/02/19	Checked By:	bfs
Depth :	25-27 ft	Test Id:	483641		
Test Comment:	---				
Visual Description:	Moist, very dark brown clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0806	SJSB028	25-27 ft	50	66	16	50	0.7	Fat CLAY with Sand (CH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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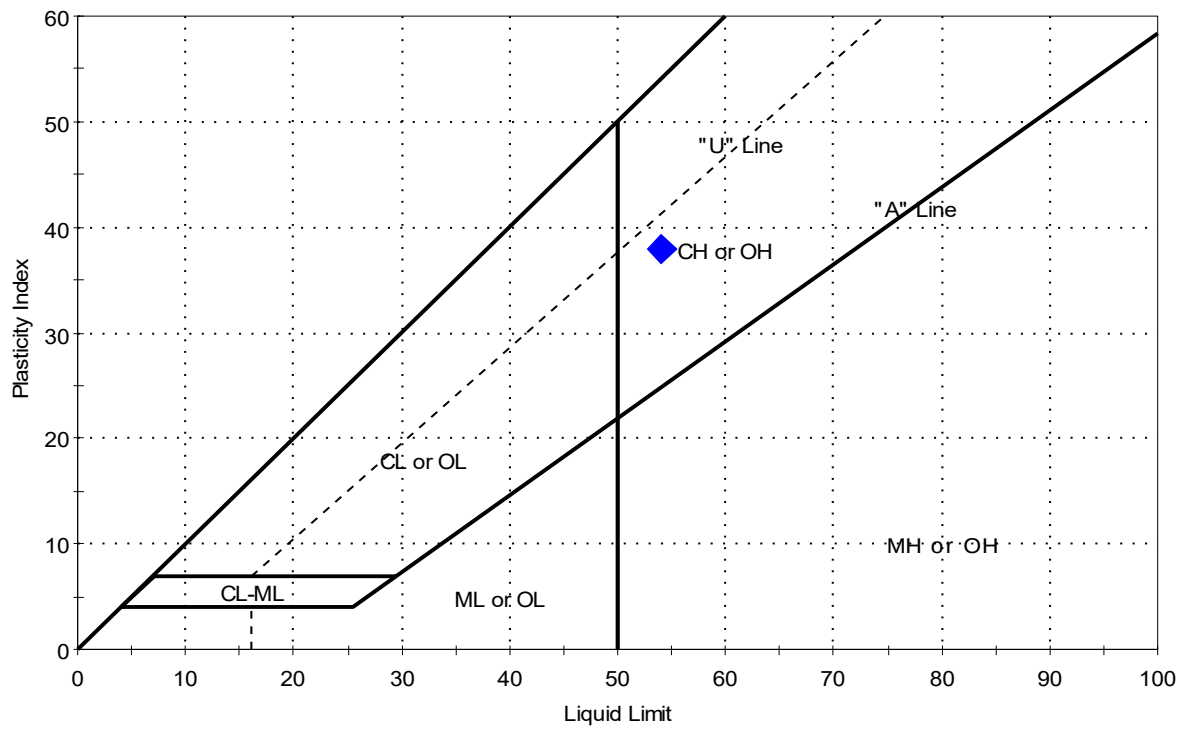
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB029	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0607	Test Date:	12/11/18	Checked By:	emm
Depth :	20-22 ft	Test Id:	482739		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0607	SJSB029	20-22 ft	45	54	16	38	0.8	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW

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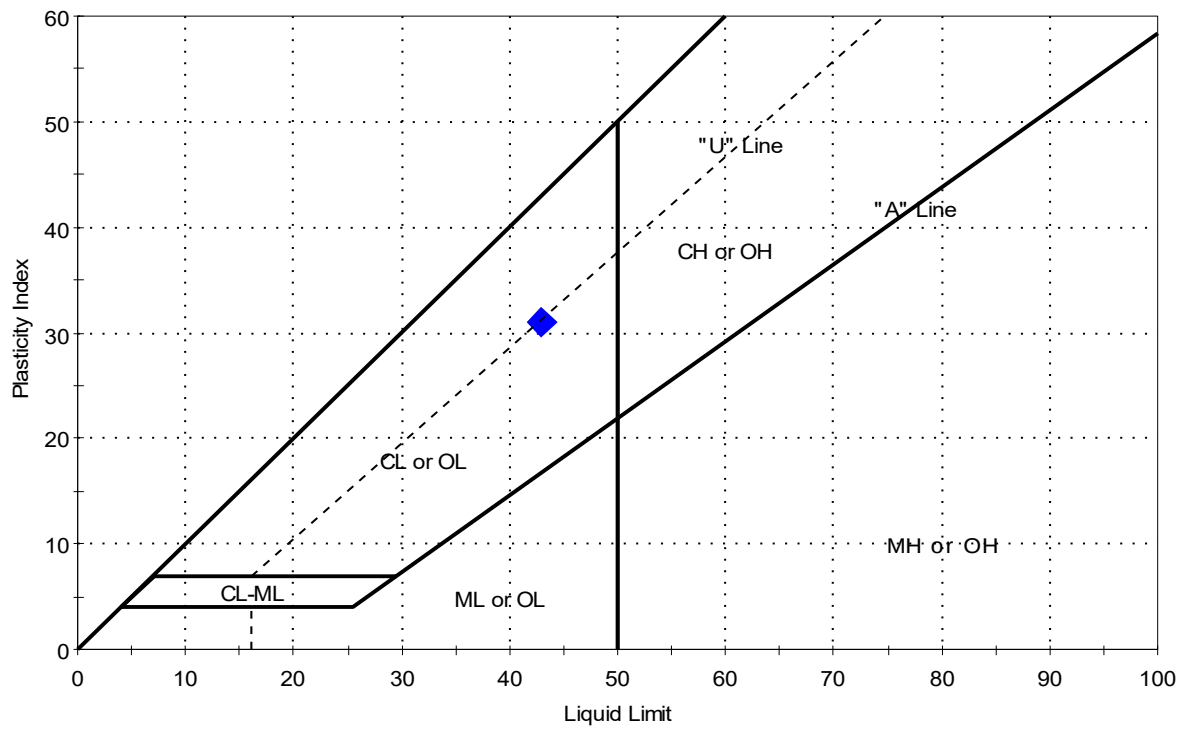
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB029	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0611	Test Date:	01/02/19	Checked By:	emm
Depth :	39.5-40 ft	Test Id:	482740		
Test Comment:	---				
Visual Description:	Moist, mottled yellowish brown and very dark grayish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0611	SJSB029	39.5-40 ft	18	43	12	31	0.2	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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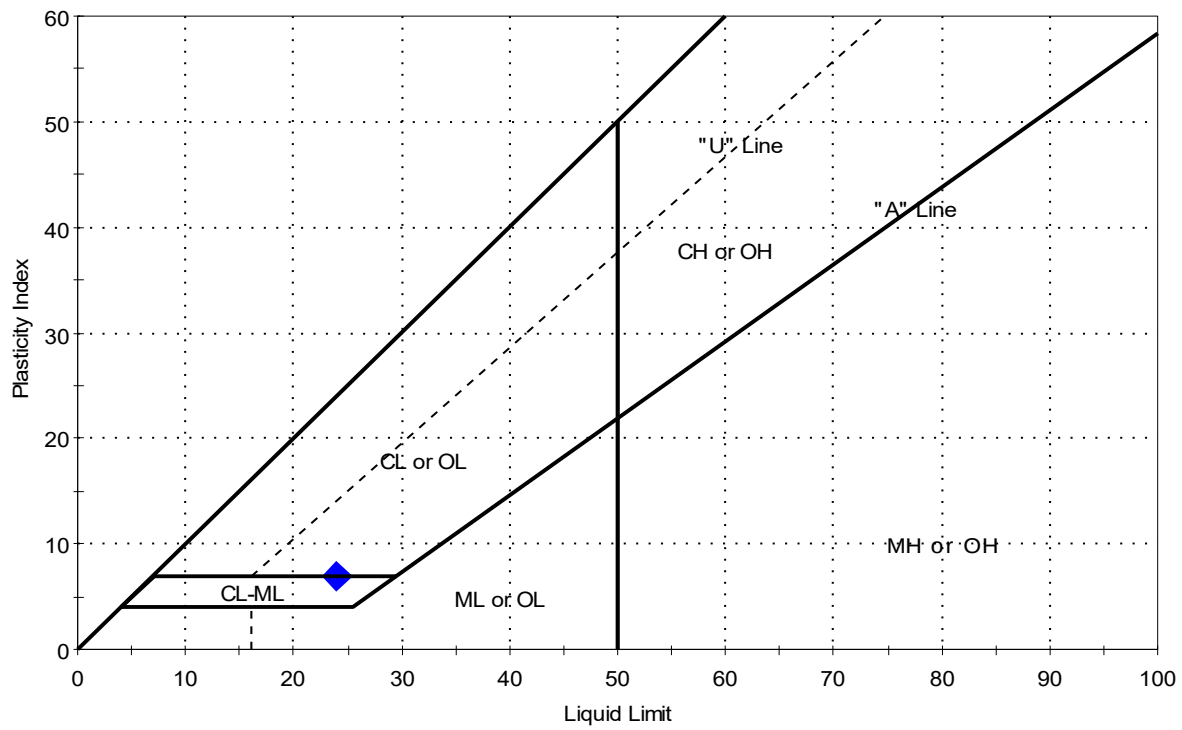
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB030	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0692	Test Date:	03/05/19	Checked By:	bfs
Depth :	8-10 ft	Test Id:	483638		
Test Comment:	---				
Visual Description:	Moist, dark brown silty clay with gravel				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0692	SJSB030	8-10 ft	21	24	17	7	0.6	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW

printed 3/15/2019 12:35:27 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB030	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0696	Test Date:	02/26/19	Checked By:	bfs
Depth :	30-32 ft	Test Id:	483639		
Test Comment:	---				
Visual Description:	Moist, brownish gray sand with silt				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0696	SJSB030	30-32 ft	22	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

14% Retained on #40 Sieve

Dry Strength: LOW

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

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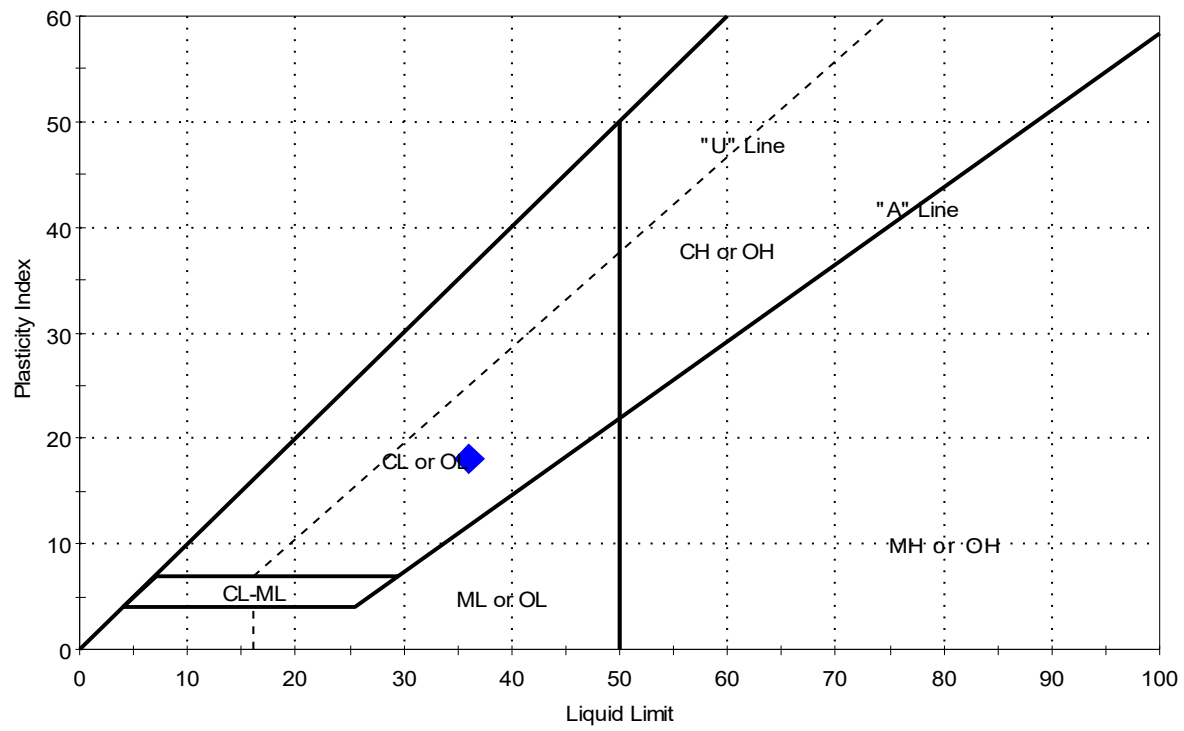
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB031	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0617	Test Date:	12/11/18	Checked By:	emm
Depth :	8-10 ft	Test Id:	482741		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown clayey sand				
Sample Comment:	Sample contains organics				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0617	SJSB031	8-10 ft	21	36	18	18	0.2	Clayey SAND (SC)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH

Dilatancy: RAPID

Toughness: LOW

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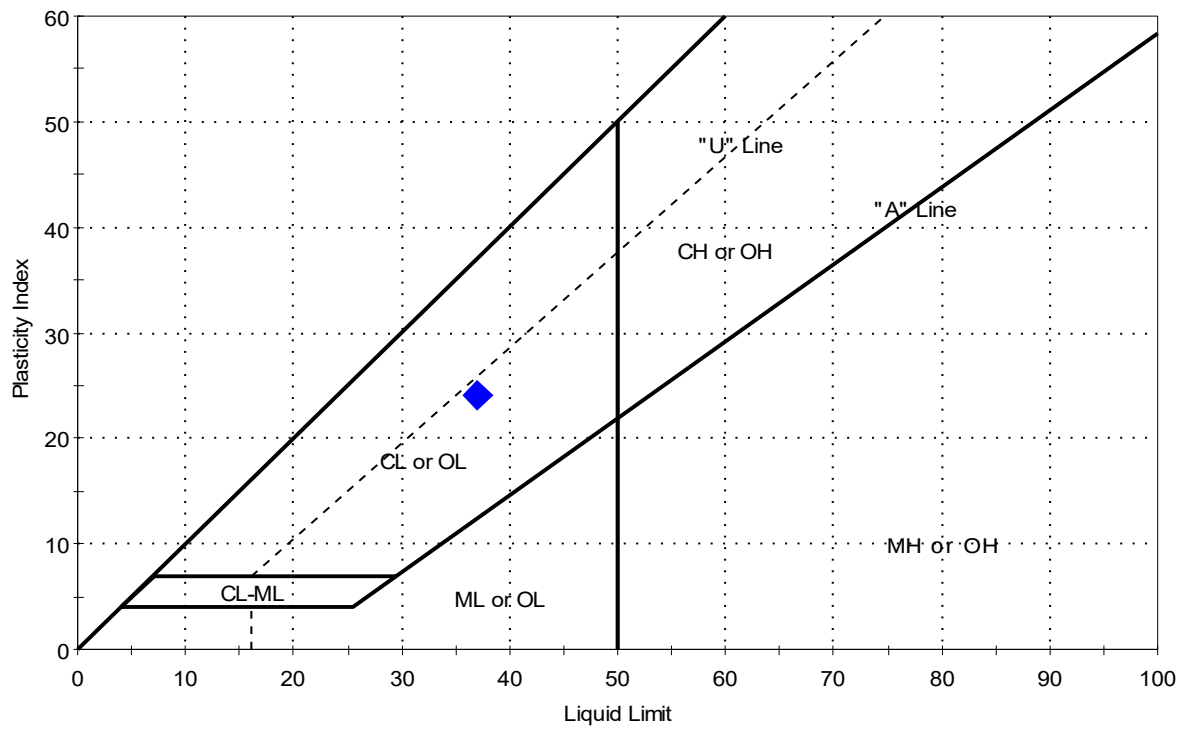
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB032	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0679	Test Date:	02/28/19	Checked By:	bfs
Depth :	8-10 ft	Test Id:	483636		
Test Comment:	---				
Visual Description:	Moist, dark gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0679	SJSB032	8-10 ft	28	37	13	24	0.6	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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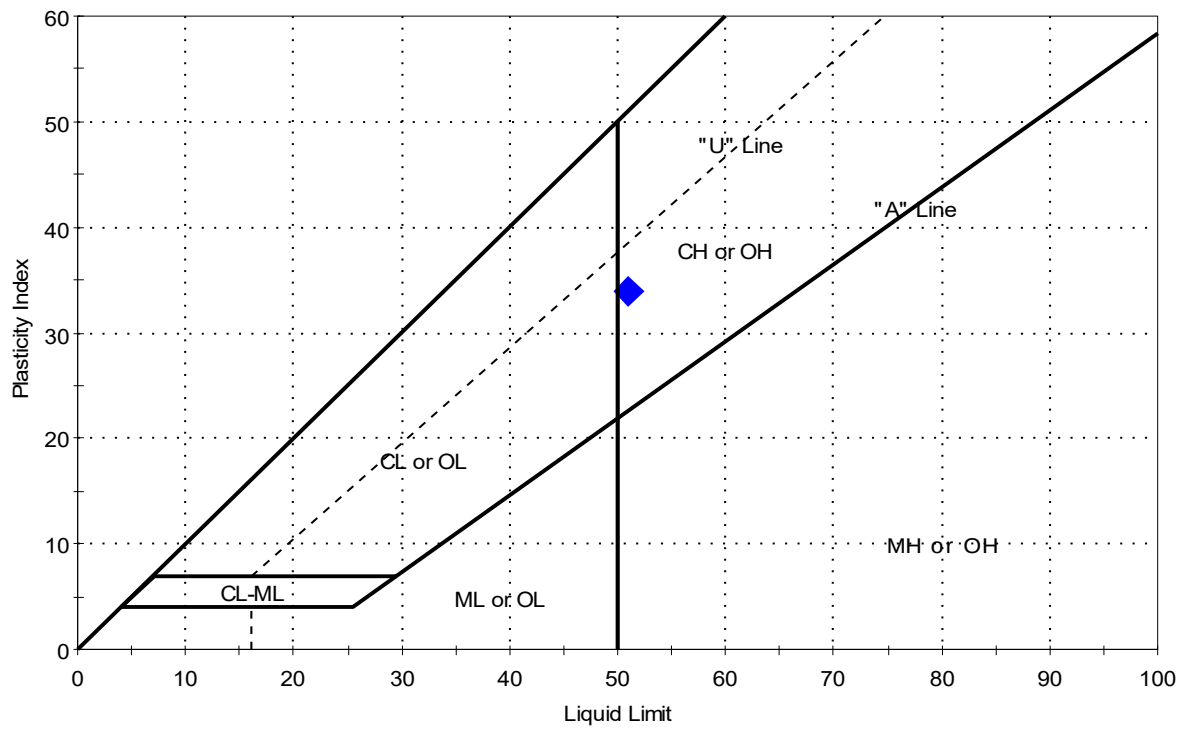
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB032	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0685	Test Date:	02/28/19	Checked By:	bfs
Depth :	38-40 ft	Test Id:	483637		
Test Comment:	---				
Visual Description:	Moist, yellowish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0685	SJSB032	38-40 ft	22	51	17	34	0.1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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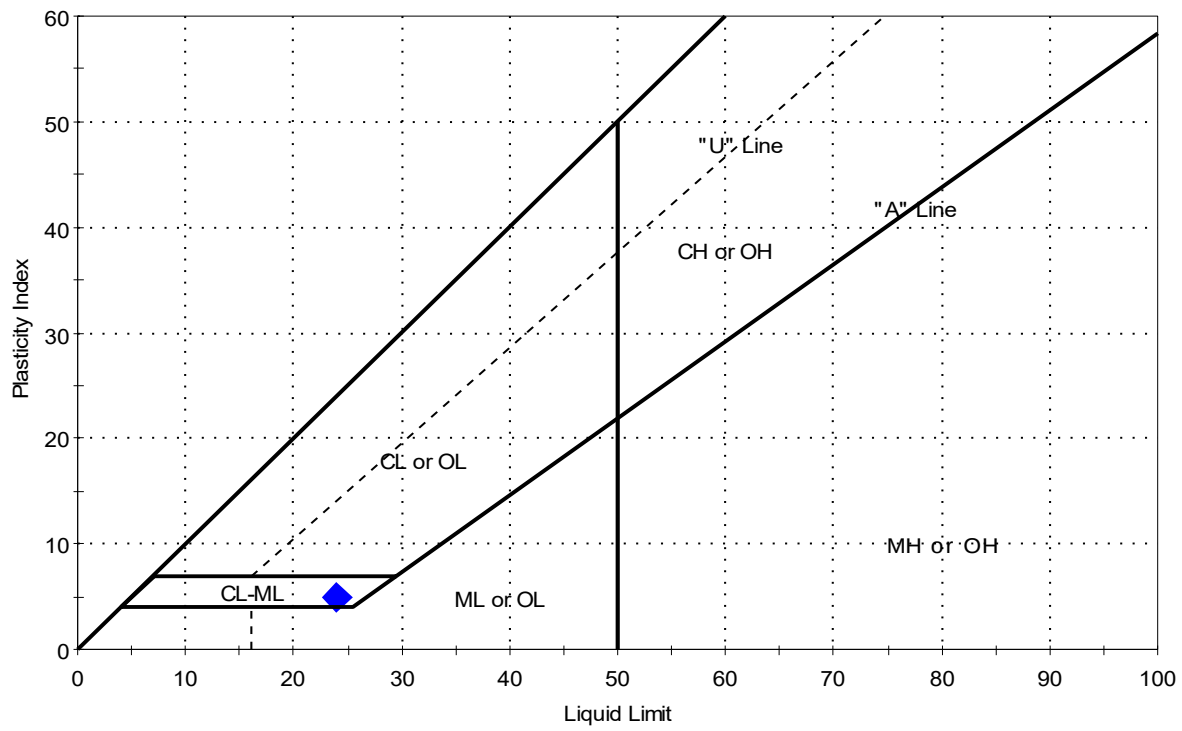
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB033	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0643	Test Date:	01/05/19	Checked By:	emm
Depth :	6-8 ft	Test Id:	482980		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown silty clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0643	SJSB033	6-8 ft	21	24	19	5	0.4	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: RAPID

Toughness: LOW

printed 3/15/2019 12:35:29 PM

Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB033	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0645	Test Date:	02/26/19	Checked By:	bfs
Depth :	14-16 ft	Test Id:	483631		
Test Comment:	---				
Visual Description:	Moist, grayish brown silty sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0645	SJSB033	14-16 ft	24	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: MEDIUM

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

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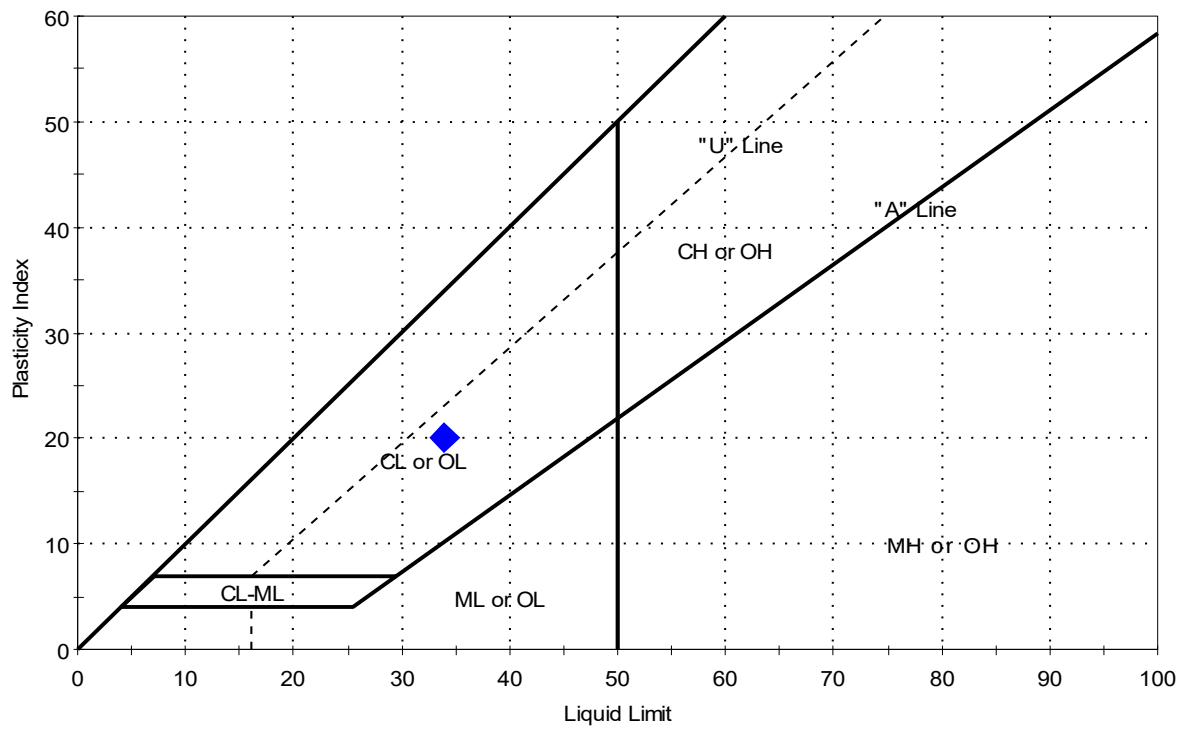
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB034	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0631	Test Date:	01/07/19	Checked By:	emm
Depth :	6-8 ft	Test Id:	482977		
Test Comment:	---				
Visual Description:	Moist, very dark brown sandy clay				
Sample Comment:	Sample contains organics				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0631	SJSB034	6-8 ft	25	34	14	20	0.6	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB034	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0634	Test Date:	01/04/19	Checked By:	emm
Depth :	14-16 ft	Test Id:	482978		
Test Comment:	---				
Visual Description:	Moist, light yellowish brown silty sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0634	SJSB034	14-16 ft	19	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: MEDIUM

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

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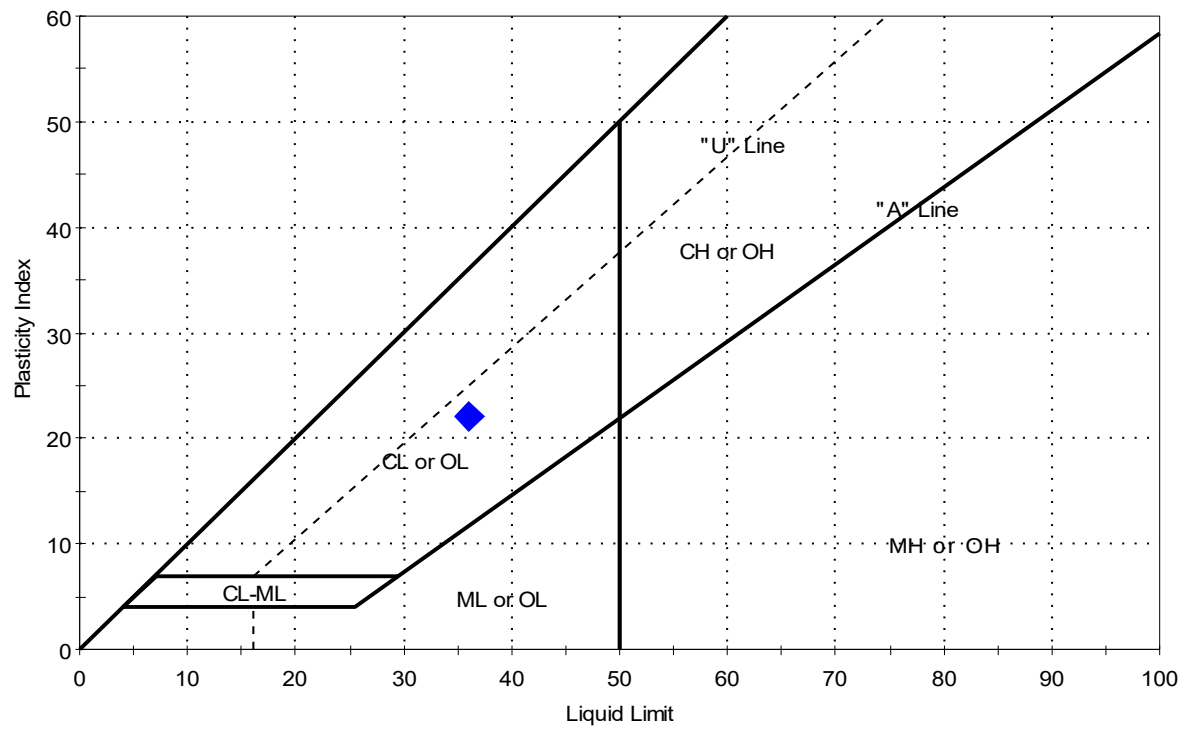
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB035	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0641	Test Date:	12/28/18	Checked By:	emm
Depth :	2-4 ft	Test Id:	482975		
Test Comment:	---				
Visual Description:	Moist, grayish brown clay				
Sample Comment:	Sample contains organics				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0641	SJSB035	2-4 ft	19	36	14	22	0.2	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW

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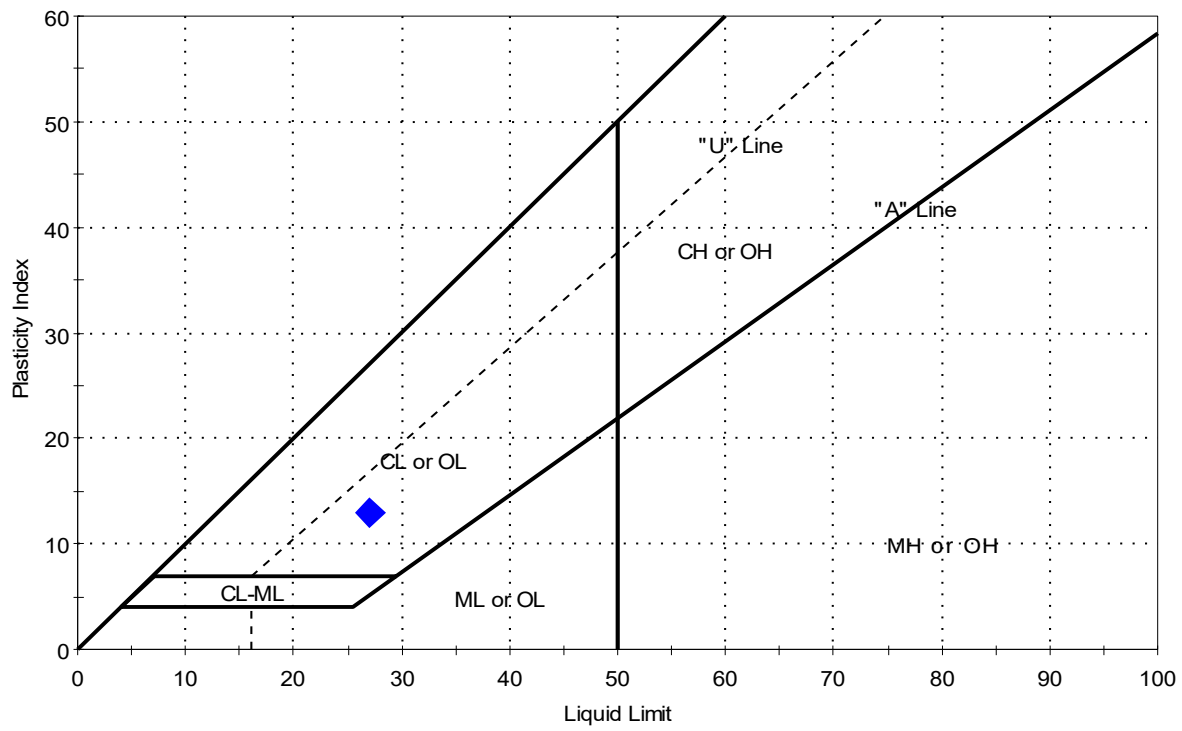
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB035	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0644	Test Date:	12/11/18	Checked By:	emm
Depth :	8-10 ft	Test Id:	482976		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sandy clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0644	SJSB035	8-10 ft	25	27	14	13	0.8	Sandy Lean CLAY (CL)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: RAPID

Toughness: LOW

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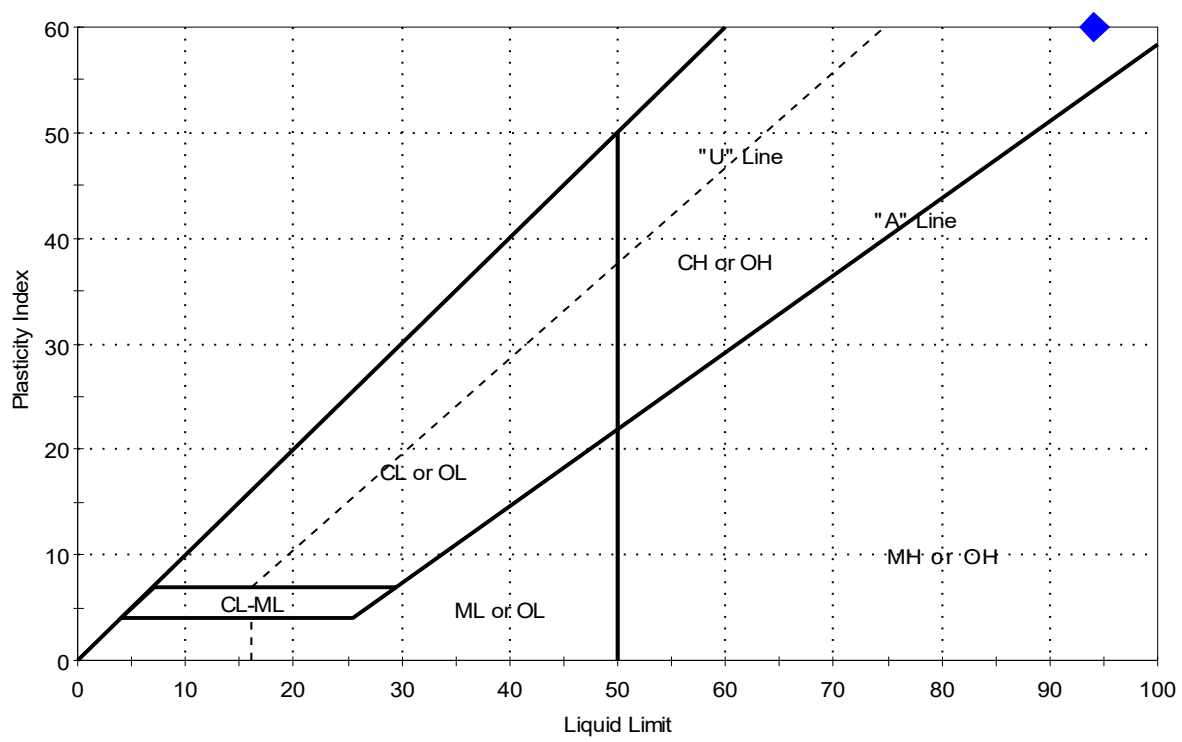
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB036	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0665	Test Date:	02/28/19	Checked By:	bfs
Depth :	2.6-4 ft	Test Id:	483634		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sandy clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0665	SJSB036	2.6-4 ft	77	94	34	60	0.7	Sandy Fat CLAY (CH)

Sample Prepared using the WET method

17% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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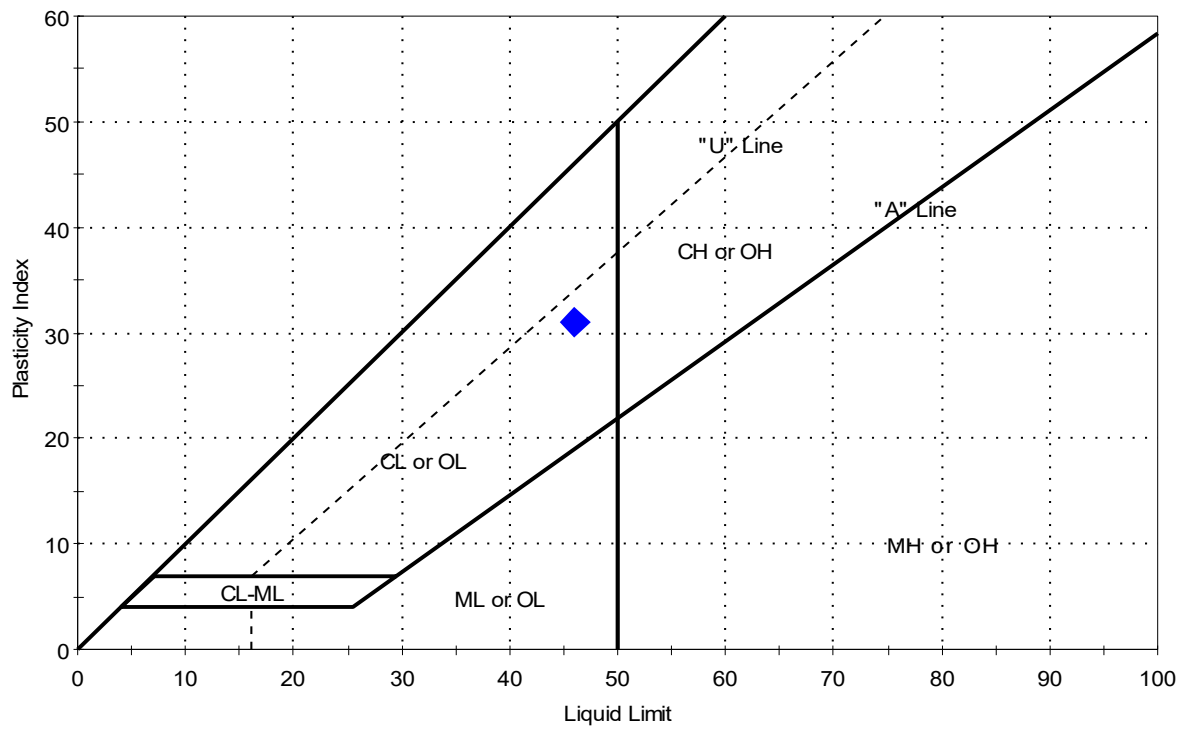
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB036	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0667	Test Date:	03/01/19	Checked By:	bfs
Depth :	6-8 ft	Test Id:	483635		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0667	SJSB036	6-8 ft	28	46	15	31	0.4	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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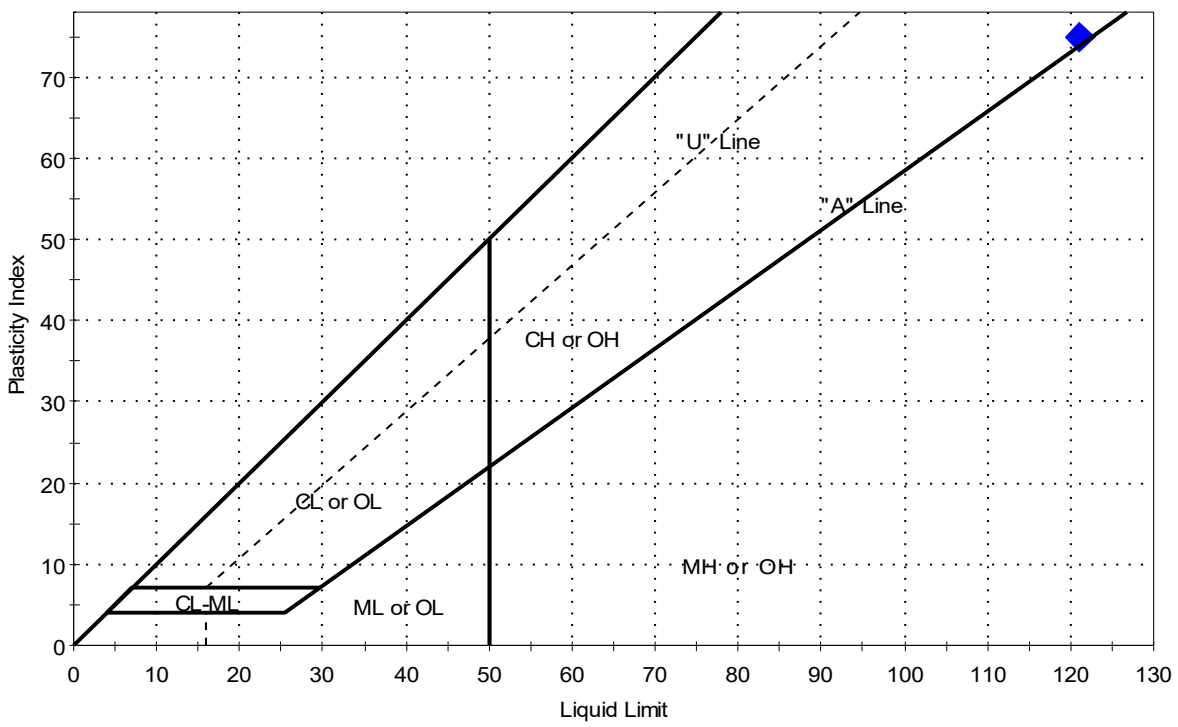
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB037	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0652	Test Date:	03/01/19	Checked By:	bfs
Depth :	2-4 ft	Test Id:	483632		
Test Comment:	---				
Visual Description:	Moist, very dark gray sandy clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0652	SJSB037	2-4 ft	105	121	46	75	0.8	Sandy Fat CLAY (CH)

Sample Prepared using the WET method

19% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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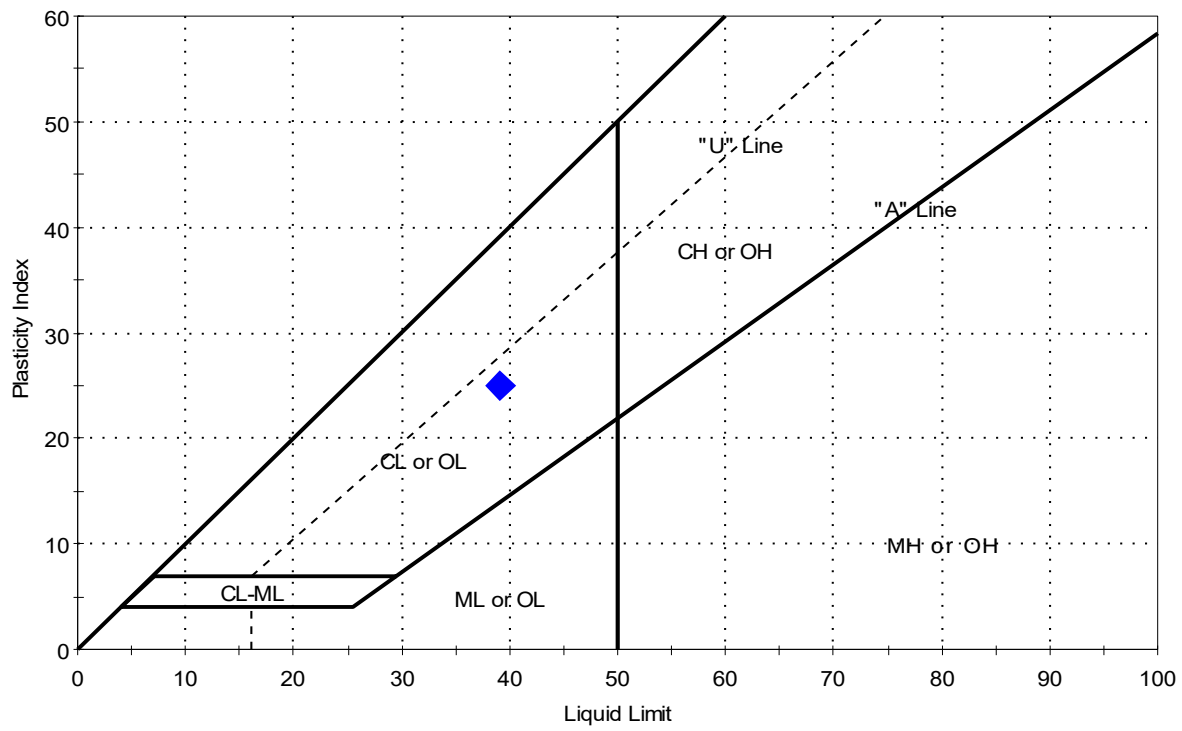
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB037	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0655	Test Date:	03/01/19	Checked By:	bfs
Depth :	8-10 ft	Test Id:	483633		
Test Comment:	---				
Visual Description:	Moist, dark grayish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0655	SJSB037	8-10 ft	29	39	14	25	0.6	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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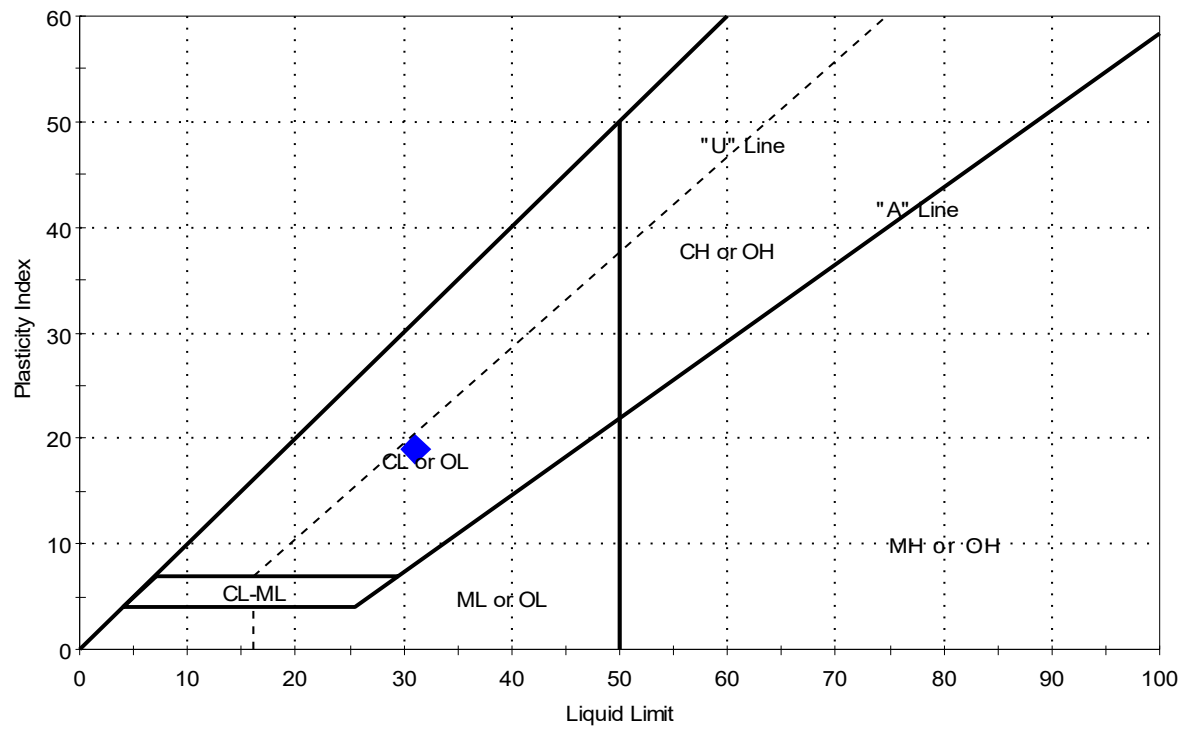
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB038	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0891	Test Date:	03/02/19	Checked By:	bfs
Depth :	13-15 ft	Test Id:	486507		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown sandy clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0891	SJSB038	13-15 ft	48	31	12	19	1.9	Sandy Lean CLAY (CL)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB038	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0893	Test Date:	02/27/19	Checked By:	bfs
Depth :	24-26 ft	Test Id:	486508		
Test Comment:	---				
Visual Description:	Moist, dark brown sand with silt				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	SL0893	SJSB038	24-26 ft	22	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

25% Retained on #40 Sieve

Dry Strength: LOW

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

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Client:	Anchor QEA, LLC		
Project Name:	San Jacinto Pre-Design Investigation		
Project Location:	---		
GTX #:	309154		
Start Date:	2/15/2019	Tested By:	jlw
End Date:	2/27/2019	Checked By:	emm
Boring #:	SJSB037		
Sample #:	SLO657		
Depth:	15-17		
Visual Description:	Moist, dark gray clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084

Constant Gradient

Sample Type: Intact
Permeant Fluid: De-aired Distilled water
Orientation: Vertical
Cell #: ---

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 36.6%.

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.62	2.56
Diameter, in	2.81	2.87
Area, in^2	6.21	6.45
Volume, in^3	16.3	16.5
Mass, g	497.4	496.0
Bulk Density, pcf	116.2	114.3
Moisture Content, %	36.2	35.8
Dry Density, pcf	85.3	84.1
Degree of Saturation, %	100	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	89.99	Increased Cell Pressure, psi:	94.98	Cell Pressure Increment, psi:	4.99
Sample Pressure, psi:	87.00	Corresponding Sample Pressure, psi:	91.70	Sample Pressure Increment, p	4.70
				B Coefficient:	0.94

B-value did not increase with increase in pressure.
Final degree of saturation >95%.

FLOW DATA

Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
2/26	---	90.0	87.5	86.7	8.7	7.00	14.00	---	---	---	---	---
2/26	3545	90.0	87.5	86.7	8.7	7.30	13.90	0.30	0.10	19.5	1.013	1.6E-07
2/26	----	90.0	87.5	86.7	8.7	7.00	14.00	---	---	---	---	---
2/26	3901	90.0	87.5	86.7	8.7	7.30	13.70	0.30	0.30	19.5	1.013	2.2E-07
2/26	----	90.0	87.5	86.7	8.7	7.00	14.00	---	---	---	---	---
2/26	3604	90.0	87.5	86.7	8.7	7.20	13.80	0.20	0.20	19.5	1.013	1.6E-07
2/26	----	90.0	87.5	86.7	8.7	7.00	14.00	---	---	---	---	---
2/26	3634	90.0	87.5	86.7	8.7	7.30	13.80	0.30	0.20	19.5	1.013	1.9E-07

PERMEABILITY AT 20° C: 1.8 x 10^{-7} cm/sec (@ 3 psi effective stress)

Client:	Anchor QEA, LLC		
Project Name:	San Jacinto Pre-Design Investigation		
Project Location:	---		
GTX #:	309154		
Start Date:	2/15/2019	Tested By:	jlw
End Date:	2/28/2019	Checked By:	emm
Boring #:	SJSB036		
Sample #:	SLO674		
Depth:	8-10 ft		
Visual Description:	Moist, gray clay with sand		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084

Constant Gradient

Sample Type: Intact Permeant Fluid: De-aired Distilled water

Orientation: Vertical Cell #: ---

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 58.4%.

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.41	2.35
Diameter, in	2.85	2.86
Area, in^2	6.36	6.41
Volume, in^3	15.3	15.0
Mass, g	394.7	395.4
Bulk Density, pcf	97.9	100.0
Moisture Content, %	58.9	59.1
Dry Density, pcf	61.6	62.9
Degree of Saturation, %	92	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	89.99	Increased Cell Pressure, psi:	95.02	Cell Pressure Increment, psi:	5.03
Sample Pressure, psi:	88.04	Corresponding Sample Pressure, psi:	92.12	Sample Pressure Increment, p	4.08
				B Coefficient:	0.81

B-value did not increase with increase in pressure.
Final degree of saturation >95%.

FLOW DATA

Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
2/25	---	90.0	88.5	87.5	11.8	7.00	14.00	---	---	---	---	---
2/25	2488	90.0	88.5	87.5	11.8	7.30	13.80	0.30	0.20	19.5	1.013	2.1E-07
2/25	----	90.0	88.5	87.5	11.8	7.00	14.00	---	---	---	---	---
2/25	2804	90.0	88.5	87.5	11.8	7.30	13.80	0.30	0.20	19.5	1.013	1.9E-07
2/25	----	90.0	88.5	87.5	11.8	7.00	14.00	---	---	---	---	---
2/25	3007	90.0	88.5	87.5	11.8	7.30	13.80	0.30	0.20	19.5	1.013	1.7E-07
2/26	----	90.0	88.5	87.5	11.8	7.00	14.00	---	---	---	---	---
2/26	3209	90.0	88.5	87.5	11.8	7.30	13.80	0.30	0.20	19.5	1.013	1.6E-07

PERMEABILITY AT 20° C: 1.8 x 10^{-7} cm/sec (@ 2 psi effective stress)

Client:	Anchor QEA, LLC		
Project Name:	San Jacinto Pre-Design Investigation		
Project Location:	---		
GTX #:	309154		
Start Date:	2/12/2019	Tested By:	jlw
End Date:	2/27/2019	Checked By:	emm
Boring #:	SJGB022		
Sample #:	SLO817		
Depth:	30-32 ft		
Visual Description:	Moist, light red clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084

Constant Gradient

Sample Type:	Intact	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 28.5%.

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	3.84	3.80
Diameter, in	2.79	2.85
Area, in^2	6.11	6.38
Volume, in^3	23.5	24.2
Mass, g	765.3	774.1
Bulk Density, pcf	123.9	121.4
Moisture Content, %	27.1	28.6
Dry Density, pcf	97.5	94.4
Degree of Saturation, %	100	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	89.99	Increased Cell Pressure, psi:	95.02	Cell Pressure Increment, psi:	5.03
Sample Pressure, psi:	85.00	Corresponding Sample Pressure, psi:	89.07	Sample Pressure Increment, p	4.07
				B Coefficient:	0.81

B-value did not increase with increase in pressure.
Final degree of saturation >95%.

FLOW DATA

Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
2/19	---	90.0	85.5	84.5	7.3	0.00	25.00	---	---	---	---	---
2/19	10690	90.0	85.5	84.5	7.3	0.20	24.80	0.20	0.20	19.5	1.013	6.3E-08
2/19	----	90.0	85.5	84.5	7.3	0.00	25.00	---	---	---	---	---
2/19	11730	90.0	85.5	84.5	7.3	0.20	24.80	0.20	0.20	19.5	1.013	5.8E-08
2/20	----	90.0	85.5	84.5	7.3	0.00	25.00	---	---	---	---	---
2/20	11210	90.0	85.5	84.5	7.3	0.20	24.80	0.20	0.20	19.5	1.013	6.0E-08
2/20	----	90.0	85.5	84.5	7.3	0.00	25.00	---	---	---	---	---
2/20	9186	90.0	85.5	84.5	7.3	0.20	24.80	0.20	0.20	19.5	1.013	7.4E-08

PERMEABILITY AT 20° C: 6.4 x 10^{-8} cm/sec (@ 5 psi effective stress)

Client:	Anchor QEA, LLC		
Project Name:	San Jacinto Pre-Deisgn Investigation		
Project Location:	---		
GTX #:	309154		
Start Date:	3/5/2019	Tested By:	jlw
End Date:	3/11/2019	Checked By:	emm
Boring #:	SJGB019		
Sample #:	SLO852		
Depth:	25-27ft		
Visual Description:	Moist, pale brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084

Constant Gradient

Sample Type:	Intact	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 20.5%.

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.87	2.82
Diameter, in	2.82	2.80
Area, in^2	6.25	6.16
Volume, in^3	17.9	17.4
Mass, g	586.1	589.8
Bulk Density, pcf	124.3	129.1
Moisture Content, %	20.3	21.1
Dry Density, pcf	103.3	106.6
Degree of Saturation, %	87	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	90.00	Increased Cell Pressure, psi:	95.03	Cell Pressure Increment, psi:	5.03
Sample Pressure, psi:	85.96	Corresponding Sample Pressure, psi:	89.91	Sample Pressure Increment, p	3.95
				B Coefficient:	0.79

FLOW DATA

Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
3/7	---	90.0	86.5	85.5	9.8	7.00	14.00	---	---	---	---	---
3/7	3600	90.0	86.5	85.5	9.8	7.30	13.50	0.30	0.50	19.5	1.013	2.9E-07
3/7	----	90.0	86.5	85.5	9.8	7.00	14.00	---	---	---	---	---
3/7	3600	90.0	86.5	85.5	9.8	7.30	13.50	0.30	0.50	19.5	1.013	2.9E-07
3/7	----	90.0	86.5	85.5	9.8	7.00	14.00	---	---	---	---	---
3/7	3660	90.0	86.5	85.5	9.8	7.30	13.60	0.30	0.40	19.5	1.013	2.5E-07
3/7	----	90.0	86.5	85.5	9.8	7.00	14.00	---	---	---	---	---
3/7	3600	90.0	86.5	85.5	9.8	7.30	13.50	0.30	0.50	19.5	1.013	2.9E-07

PERMEABILITY AT 20° C: 2.8 x 10^{-7} cm/sec (@ 4 psi effective stress)

Client:	Anchor QEA, LLC		
Project Name:	San Jacinto Pre-Design Investigation		
Project Location:	---		
GTX #:	309154		
Start Date:	2/15/2019	Tested By:	jlw
End Date:	2/26/2019	Checked By:	emm
Boring #:	SJGB038		
Sample #:	SL0896		
Depth:	11-13 ft		
Visual Description:	Moist, dark gray clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D5084

Constant Gradient

Sample Type:	Intact	Permeant Fluid:	De-aired Distilled water
Orientation:	Vertical	Cell #:	---

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 48.8%.

Assumed Specific Gravity: 2.70

Parameter	Initial	Final
Height, in	2.66	2.59
Diameter, in	2.81	2.79
Area, in^2	6.20	6.11
Volume, in^3	16.5	15.8
Mass, g	480.3	471.2
Bulk Density, pcf	110.7	113.1
Moisture Content, %	43.6	40.9
Dry Density, pcf	77.1	80.3
Degree of Saturation, %	99	100

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	89.98	Increased Cell Pressure, psi:	95.04	Cell Pressure Increment, psi:	5.06
Sample Pressure, psi:	88.03	Corresponding Sample Pressure, psi:	92.75	Sample Pressure Increment, p	4.72
				B Coefficient:	0.93

B-value did not increase with increase in pressure.
Final degree of saturation >95%.

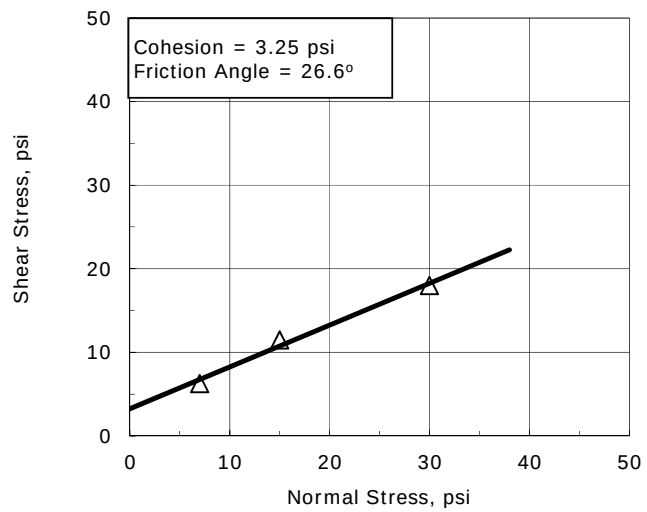
FLOW DATA

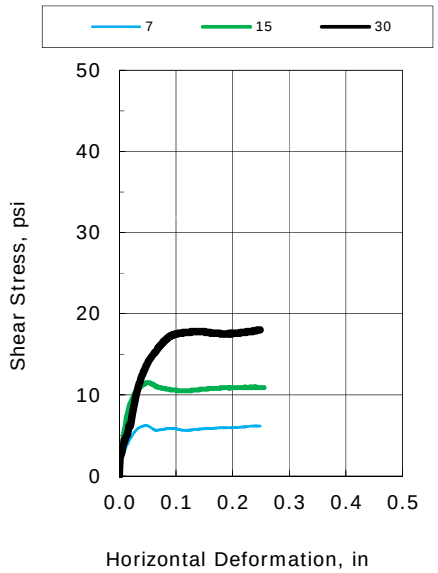
Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
2/25	---	90.0	88.5	87.5	10.7	7.00	14.00	---	---	---	---	---
2/25	3708	90.0	88.5	87.5	10.7	7.60	13.50	0.60	0.50	19.5	1.013	3.6E-07
2/25	----	90.0	88.5	87.5	10.7	7.00	14.00	---	---	---	---	---
2/25	3967	90.0	88.5	87.5	10.7	7.50	13.60	0.50	0.40	19.5	1.013	2.7E-07
2/25	----	90.0	88.5	87.5	10.7	7.00	14.00	---	---	---	---	---
2/25	2900	90.0	88.5	87.5	10.7	7.40	13.60	0.40	0.40	19.5	1.013	3.3E-07
2/25	----	90.0	88.5	87.5	10.7	7.00	14.00	---	---	---	---	---
2/25	3062	90.0	88.5	87.5	10.7	7.40	13.60	0.40	0.40	19.5	1.013	3.1E-07

PERMEABILITY AT 20° C: 3.2 x 10^{-7} cm/sec (@ 2 psi effective stress)

Client:	Anchor QEA, LLC
Project Name:	San Jacinto Pre-Design Investigation
Project Location:	---
GTX #:	309154
Test Date:	01/21/19
Tested By:	md
Checked By:	njh
Boring ID:	SJGB018
Sample ID:	SL0871
Depth, ft:	45-47
Visual Description:	Moist, blueish gray clay

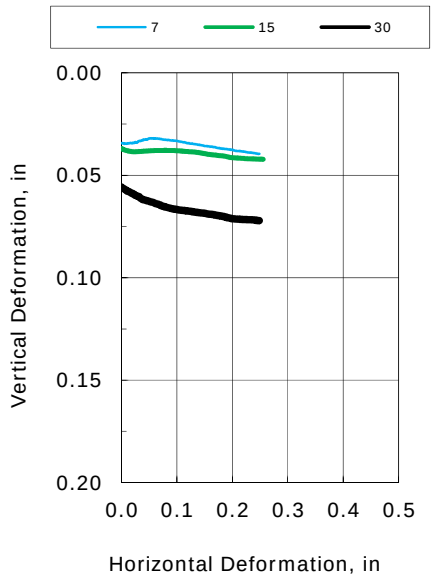
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





Test No.:	DS-16	DS-17	DS-18
Initial Diameter, in:	2.5	2.5	2.5
Initial Height, in:	1.0	1.0	1.0
Initial Mass, grams:	159	161	159
Initial Dry Density, pcf:	102.2	102.8	101.4
Initial Moisture Content, %:	20.8	21.3	21.9
Initial Bulk Density, pcf:	123	125	124
Initial Degree of Saturation:	86.7	90.0	89.3
Initial Void Ratio:	0.65	0.64	0.66
Final Dry Density, pcf:	106.5	107.4	109.3
Final Moisture Content, %:	22.2	23.6	21.5
Final Bulk Density, pcf:	130	133	133
Normal Stress, psi:	7.0	15	30
Maximum Shear Stress, psi:	6.3	12	18
Shear Rate, in/min:	0.0003	0.0003	0.0003

Sample Type:	intact
Estimated Specific Gravity:	2.70
Liquid Limit:	---
Plastic Limit:	---
Plasticity Index:	---
% Passing #200 sieve:	---
Soil Classification:	---
Group Symbol:	---



Notes:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

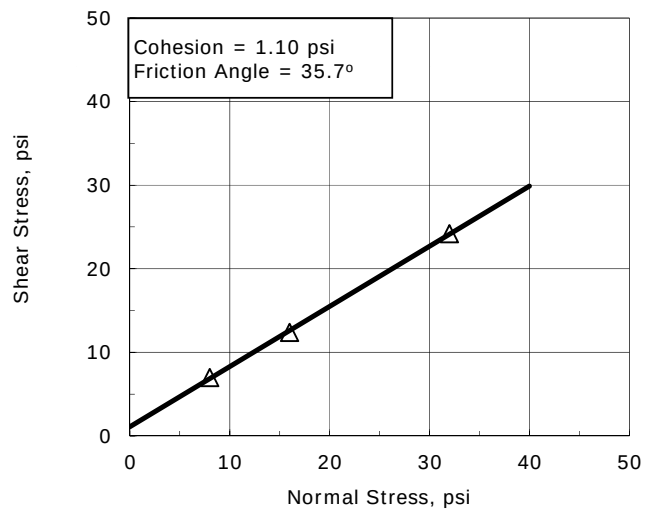
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

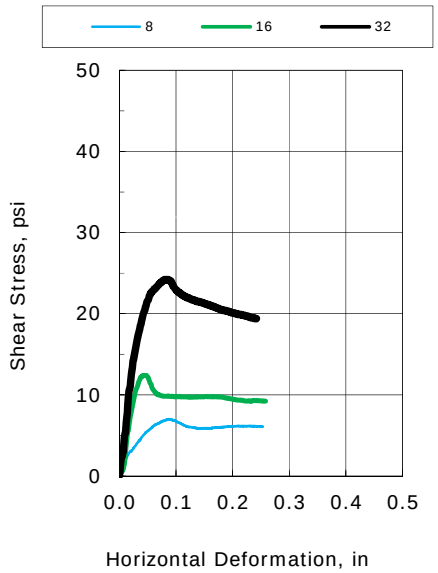
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" indicates testing required to determine these values was not requested.

Client:	Anchor QEA, LLC
Project Name:	San Jacinto Pre-Design Investigation
Project Location:	---
GTX #:	309154
Test Date:	01/18/19
Tested By:	md
Checked By:	njh
Boring ID:	SJGB019
Sample ID:	SL0856
Depth, ft:	45-47
Visual Description:	Moist, light gray clay

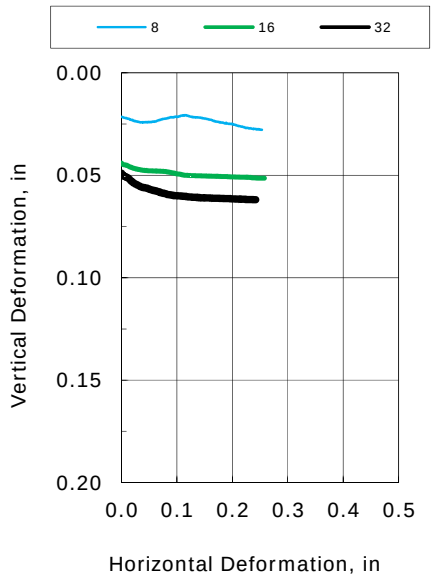
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





Test No.:	DS-13	DS-14	DS-15
Initial Diameter, in:	2.5	2.5	2.5
Initial Height, in:	1.0	1.0	1.0
Initial Mass, grams:	154	157	155
Initial Dry Density, pcf:	99.0	100.4	96.9
Initial Moisture Content, %:	20.5	21.6	24.6
Initial Bulk Density, pcf:	119	122	121
Initial Degree of Saturation:	78.8	85.8	89.6
Initial Void Ratio:	0.70	0.68	0.74
Final Dry Density, pcf:	101.9	105.9	103.3
Final Moisture Content, %:	23.5	23.7	23.7
Final Bulk Density, pcf:	126	131	128
Normal Stress, psi:	8.0	16	32
Maximum Shear Stress, psi:	7.0	12	24
Shear Rate, in/min:	0.0003	0.0003	0.0003

Sample Type:	intact
Estimated Specific Gravity:	2.70
Liquid Limit:	---
Plastic Limit:	---
Plasticity Index:	---
% Passing #200 sieve:	---
Soil Classification:	---
Group Symbol:	---



Notes:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

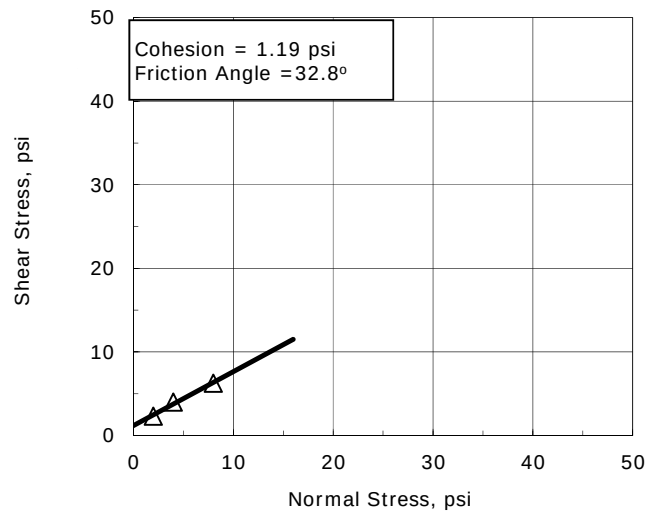
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

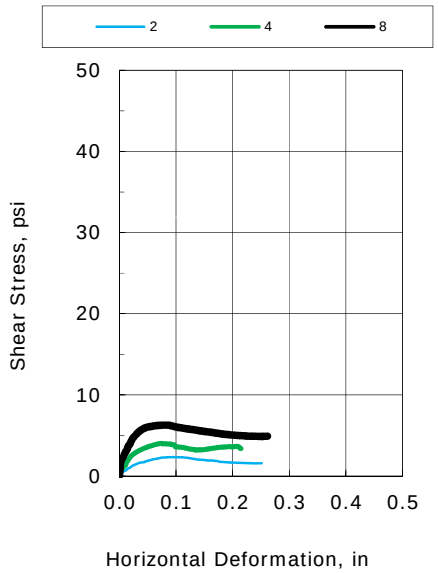
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" indicates testing required to determine these values was not requested.

Client:	Anchor QEA, LLC
Project Name:	San Jacinto Pre-Design Investigation
Project Location:	---
GTX #:	309154
Test Date:	01/18/19
Tested By:	md
Checked By:	njh
Boring ID:	SJGB023
Sample ID:	SL0878
Depth, ft:	10-12
Visual Description:	Moist, gray sand with shells

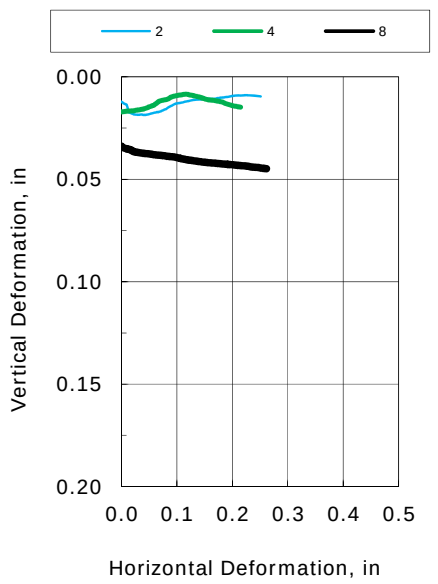
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





Test No.:	DS-10	DS-11	DS-12
Initial Diameter, in:	2.5	2.5	2.5
Initial Height, in:	1.0	1.0	1.0
Initial Mass, grams:	153	153	152
Initial Dry Density, pcf:	96.9	99.7	96.9
Initial Moisture Content, %:	22.3	19.2	21.4
Initial Bulk Density, pcf:	118	119	118
Initial Degree of Saturation:	83.4	77.0	80.1
Initial Void Ratio:	0.71	0.66	0.71
Final Dry Density, pcf:	97.8	101.2	101.5
Final Moisture Content, %:	25.0	25.3	24.6
Final Bulk Density, pcf:	122	127	126
Normal Stress, psi:	2.0	4.0	8.0
Maximum Shear Stress, psi:	2.3	4.0	6.3
Shear Rate, in/min:	0.002	0.002	0.002

Sample Type:	intact
Estimated Specific Gravity:	2.65
Liquid Limit:	---
Plastic Limit:	---
Plasticity Index:	---
% Passing #200 sieve:	---
Soil Classification:	---
Group Symbol:	---



Notes:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

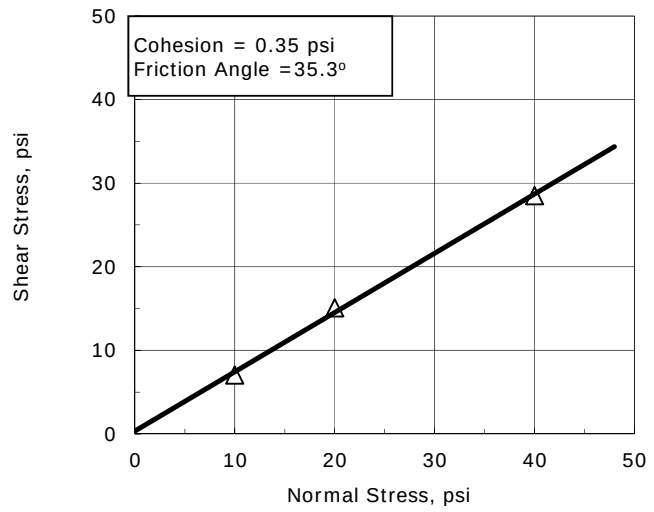
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

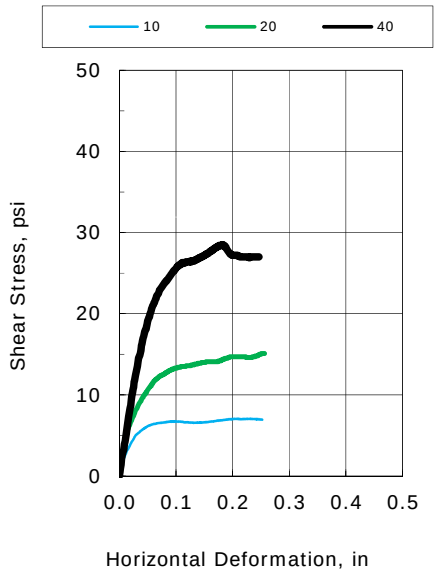
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" indicates testing required to determine these values was not requested.

Client:	Anchor QEA, LLC
Project Name:	San Jacinto Pre-Design Investigation
Project Location:	---
GTX #:	309154
Test Date:	01/18/19
Tested By:	md
Checked By:	njh
Boring ID:	SJGB023
Sample ID:	SL0887
Depth, ft:	53-55
Visual Description:	Moist, light gray clay

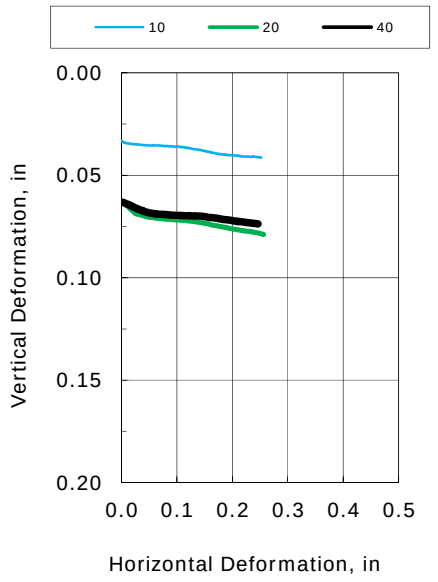
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





Test No.:	DS-7	DS-8	DS-9
Initial Diameter, in:	2.5	2.5	2.5
Initial Height, in:	1.0	1.0	1.0
Initial Mass, grams:	155	158	159
Initial Dry Density, pcf:	99.6	102.0	103.0
Initial Moisture Content, %:	20.7	20.2	19.7
Initial Bulk Density, pcf:	120	123	123
Initial Degree of Saturation:	80.8	83.8	83.3
Initial Void Ratio:	0.69	0.65	0.64
Final Dry Density, pcf:	103.9	110.7	111.2
Final Moisture Content, %:	23.1	22.1	21.1
Final Bulk Density, pcf:	128	135	135
Normal Stress, psi:	10	20	40
Maximum Shear Stress, psi:	7.1	15	29
Shear Rate, in/min:	0.0004	0.0004	0.0004

Sample Type:	intact
Estimated Specific Gravity:	2.70
Liquid Limit:	---
Plastic Limit:	---
Plasticity Index:	---
% Passing #200 sieve:	---
Soil Classification:	---
Group Symbol:	---



Notes:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

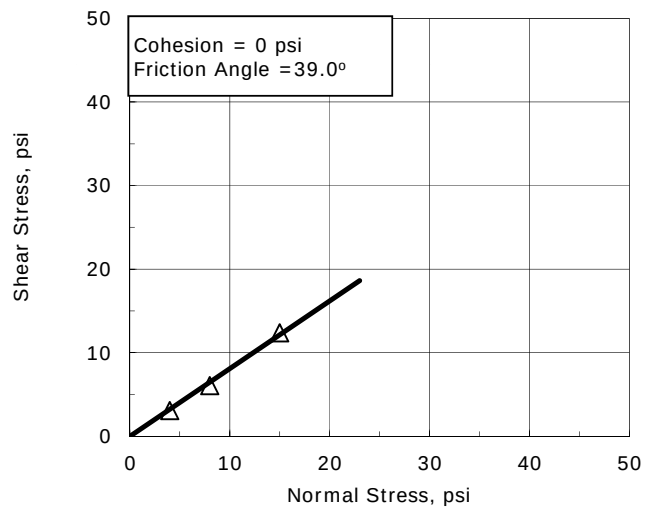
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

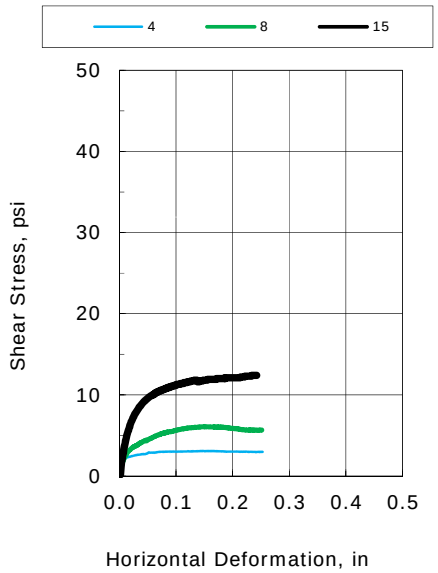
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" indicates testing required to determine these values was not requested.

Client:	Anchor QEA, LLC
Project Name:	San Jacinto Pre-Design Investigation
Project Location:	---
GTX #:	309154
Test Date:	12/28/18
Tested By:	md
Checked By:	njh
Boring ID:	SJSB028
Sample ID:	SL0805
Depth, ft:	20-22
Visual Description:	Wet, gray sand with clay

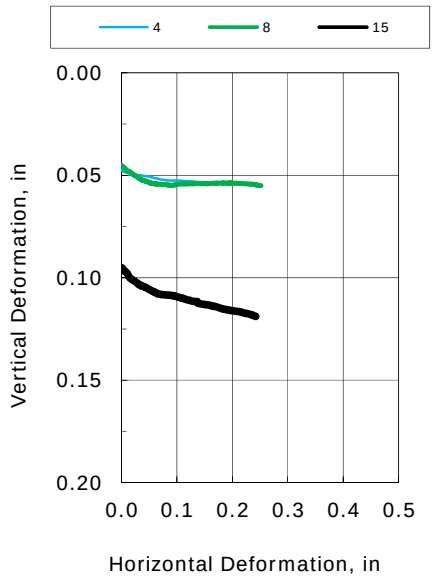
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





Test No.:	DS-1	DS-2	DS-3
Initial Diameter, in:	2.5	2.5	2.5
Initial Height, in:	1.0	1.0	1.0
Initial Mass, grams:	146	151	144
Initial Dry Density, pcf:	85.1	91.9	88.3
Initial Moisture Content, %:	33.3	27.9	31.3
Initial Bulk Density, pcf:	113	118	116
Initial Degree of Saturation:	93.5	92.3	88.3
Initial Void Ratio:	0.94	0.80	0.94
Final Dry Density, pcf:	90.1	97.3	96.9
Final Moisture Content, %:	28.9	24.2	27.4
Final Bulk Density, pcf:	116	121	123
Normal Stress, psi:	4.0	8	15
Maximum Shear Stress, psi:	3.1	6	12
Shear Rate, in/min:	0.0004	0.0004	0.0004

Sample Type:	intact
Estimated Specific Gravity:	2.65
Liquid Limit:	---
Plastic Limit:	---
Plasticity Index:	---
% Passing #200 sieve:	---
Soil Classification:	---
Group Symbol:	---



Notes:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

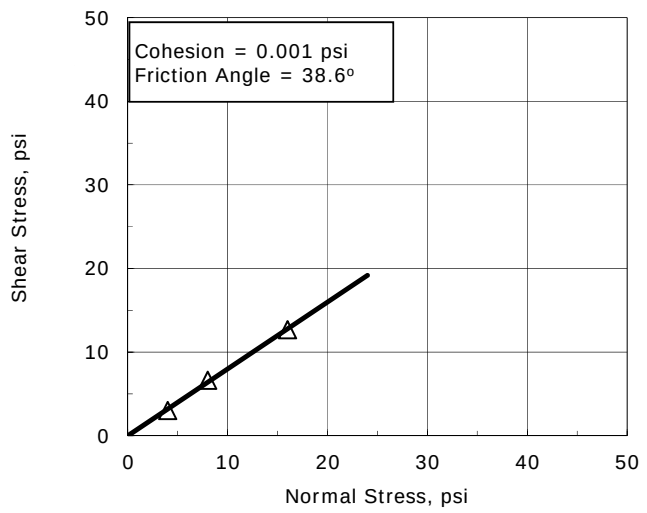
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

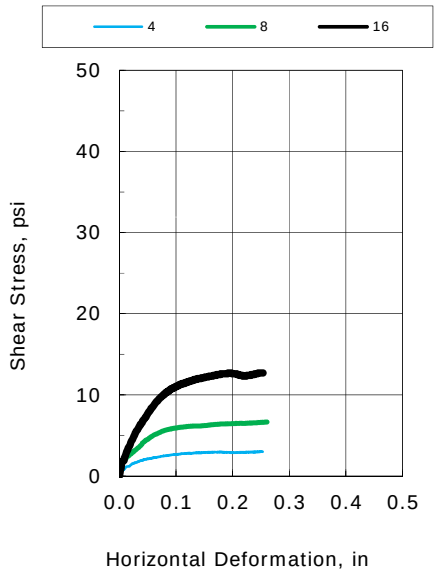
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" indicates testing required to determine these values was not requested.

Client:	Anchor QEA, LLC
Project Name:	San Jacinto Pre-Design Investigation
Project Location:	---
GTX #:	309154
Test Date:	01/04/19
Tested By:	md
Checked By:	njh
Boring ID:	SJSB030
Sample ID:	SL00694
Depth, ft:	20-22
Visual Description:	Moist, gray sand with clay

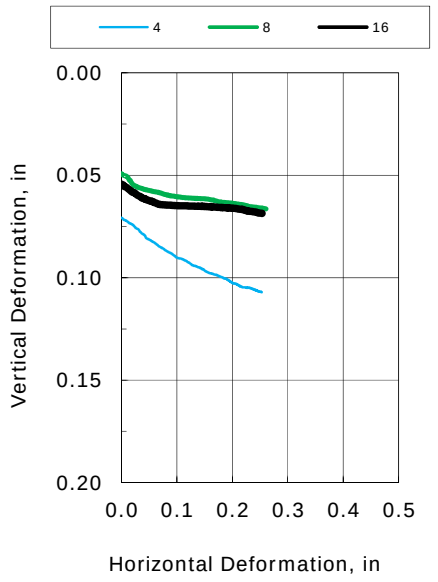
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





Test No.:	DS-4	DS-5	DS-6
Initial Diameter, in:	2.5	2.5	2.5
Initial Height, in:	1.0	1.0	1.0
Initial Mass, grams:	137	148	151
Initial Dry Density, pcf:	83.1	89.0	91.3
Initial Moisture Content, %:	28.0	29.4	28.6
Initial Bulk Density, pcf:	106	115	117
Initial Degree of Saturation:	74.8	90.7	93.2
Initial Void Ratio:	0.99	0.86	0.95
Final Dry Density, pcf:	93.1	95.4	98.0
Final Moisture Content, %:	38.5	26.1	25.7
Final Bulk Density, pcf:	129	120	123
Normal Stress, psi:	4.0	8.0	16
Maximum Shear Stress, psi:	3.0	6.7	13
Shear Rate, in/min:	0.0003	0.0003	0.0003

Sample Type:	intact
Estimated Specific Gravity:	2.65
Liquid Limit:	---
Plastic Limit:	---
Plasticity Index:	---
% Passing #200 sieve:	---
Soil Classification:	---
Group Symbol:	---



Notes:

Moisture content obtained before shear from sample trimmings

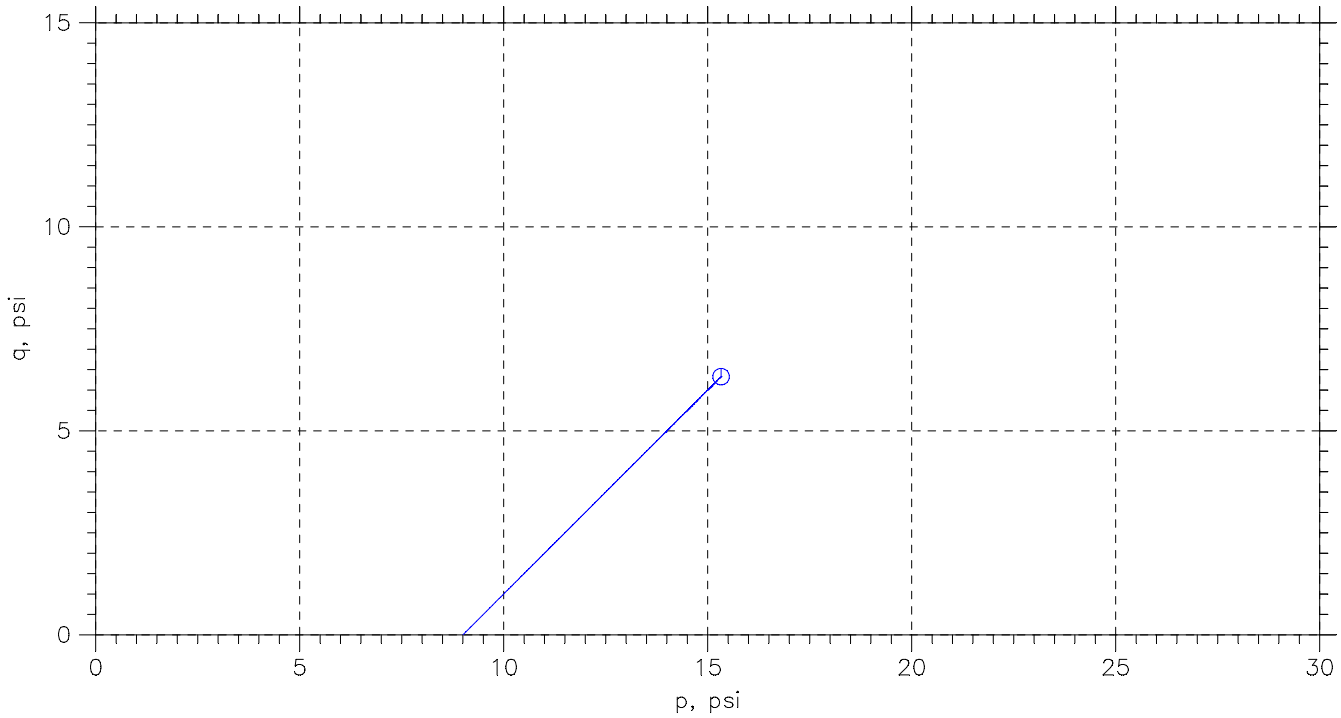
Moisture Content determined by ASTM D2216

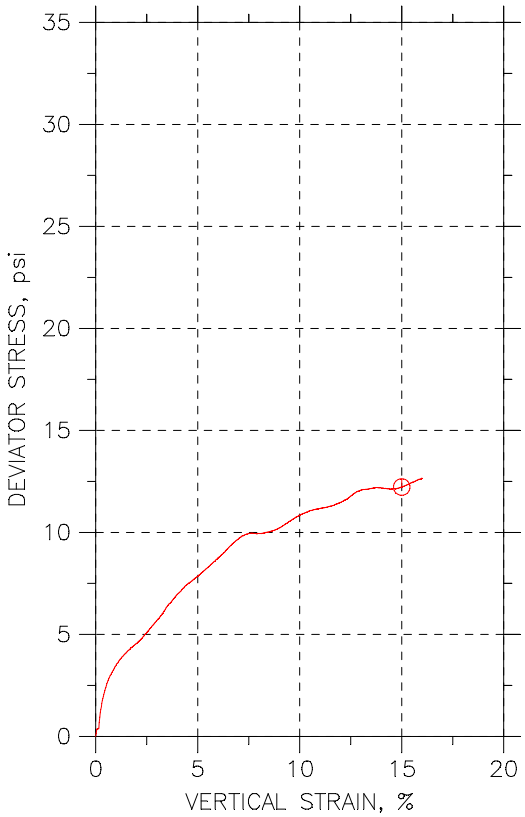
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" indicates testing required to determine these values was not requested.

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⏲			
Sample No.	SL0852			
Test No.	UU-21-1			
Depth	25-27 ft			
Tested by	trm			
Test Date	3/6/19			
Checked by	njh			
Check Date	3/14/19			
Diameter, in	2.86			
Height, in	6.45			
Water Content, %	23.3			
Dry Density, pcf	96.39			
Saturation, %	84.1			
Void Ratio	0.749			
Confining Stress, psi	9			
Undrained Strength, psi	6.113			
Max. Dev. Stress, psi	12.23			
Strain at Failure, %	15			
Strain Rate, %/min	1			
Estimated Specific Gravity	2.7			
Liquid Limit	---			
Plastic Limit	---			
Plasticity Index	---			

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJGB019

Sample Type: intact

Description: Moist, pale brown clay

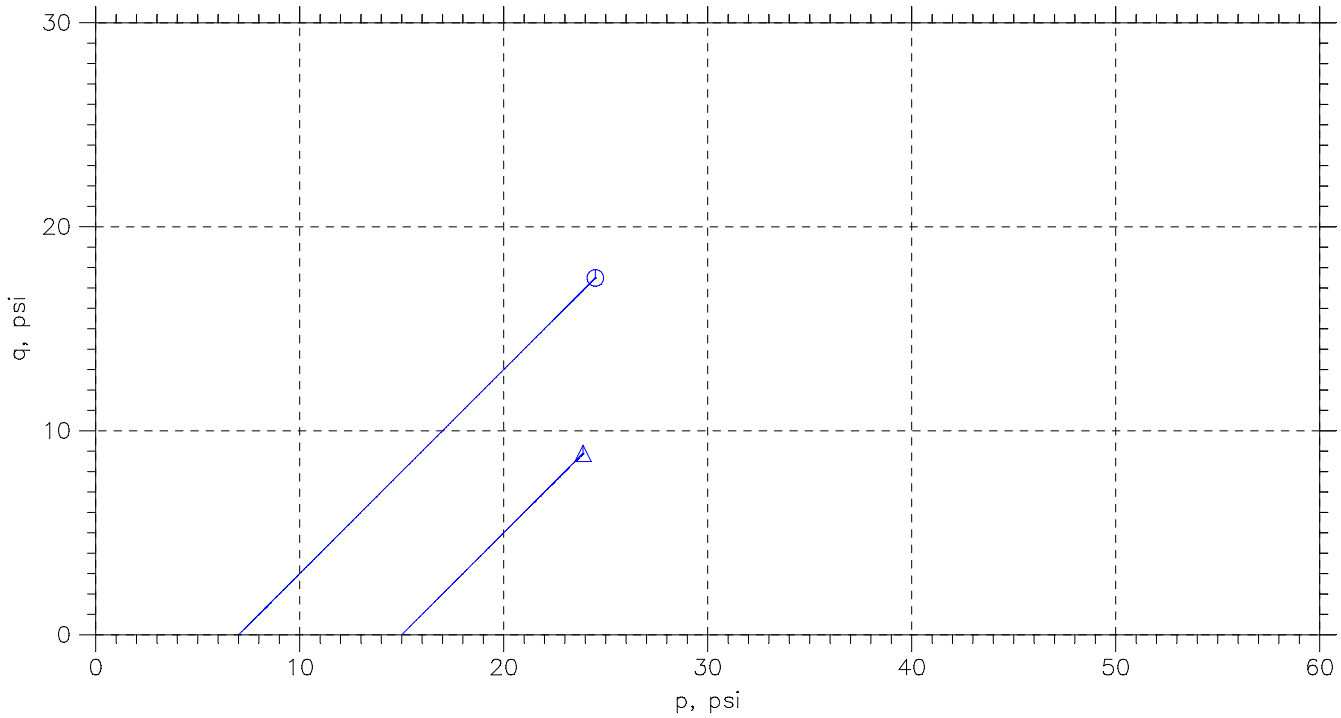
Remarks: System W

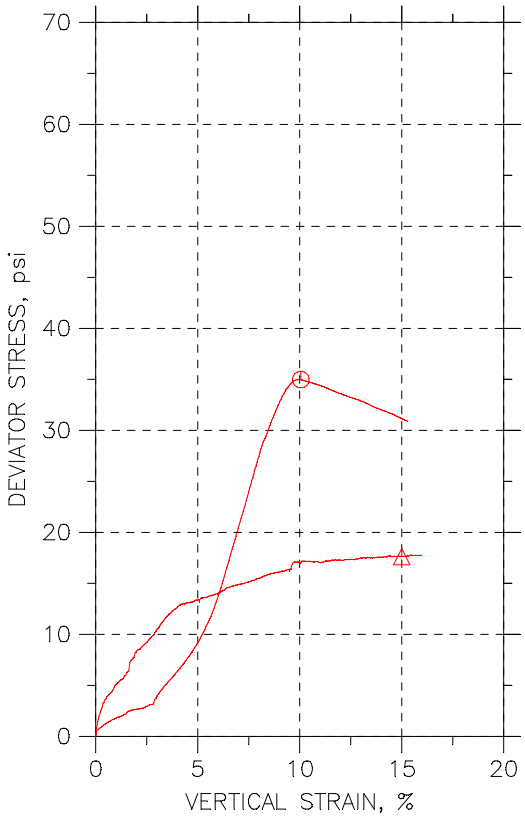
Phase calculations based on start and end of test.

Attachment Figure A.4-133

Thu, 14-MAR-2019 13:49:09

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0856	SL0856		
Test No.	UU-16-1	UU-16-2		
Depth	45-47 ft	45-47 ft		
Tested by	trm	trm		
Test Date	1/30/19	1/30/19		
Checked by	njh	njh		
Check Date	3/14/19	3/14/19		
Diameter, in	2.87	2.83		
Height, in	6.15	6.35		
Water Content, %	22.0	25.0		
Dry Density, pcf	95.45	95.23		
Saturation, %	77.5	87.6		
Void Ratio	0.766	0.77		
Confining Stress, psi	7	15		
Undrained Strength, psi	17.49	8.816		
Max. Dev. Stress, psi	34.98	17.63		
Strain at Failure, %	10.1	15		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

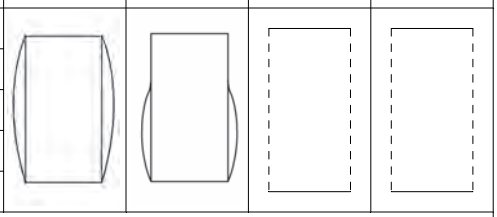
Project No.: GTX-309154

Boring No.: SJGB019

Sample Type: intact

Description: Moist, light gray clay and silt

Remarks: System LL

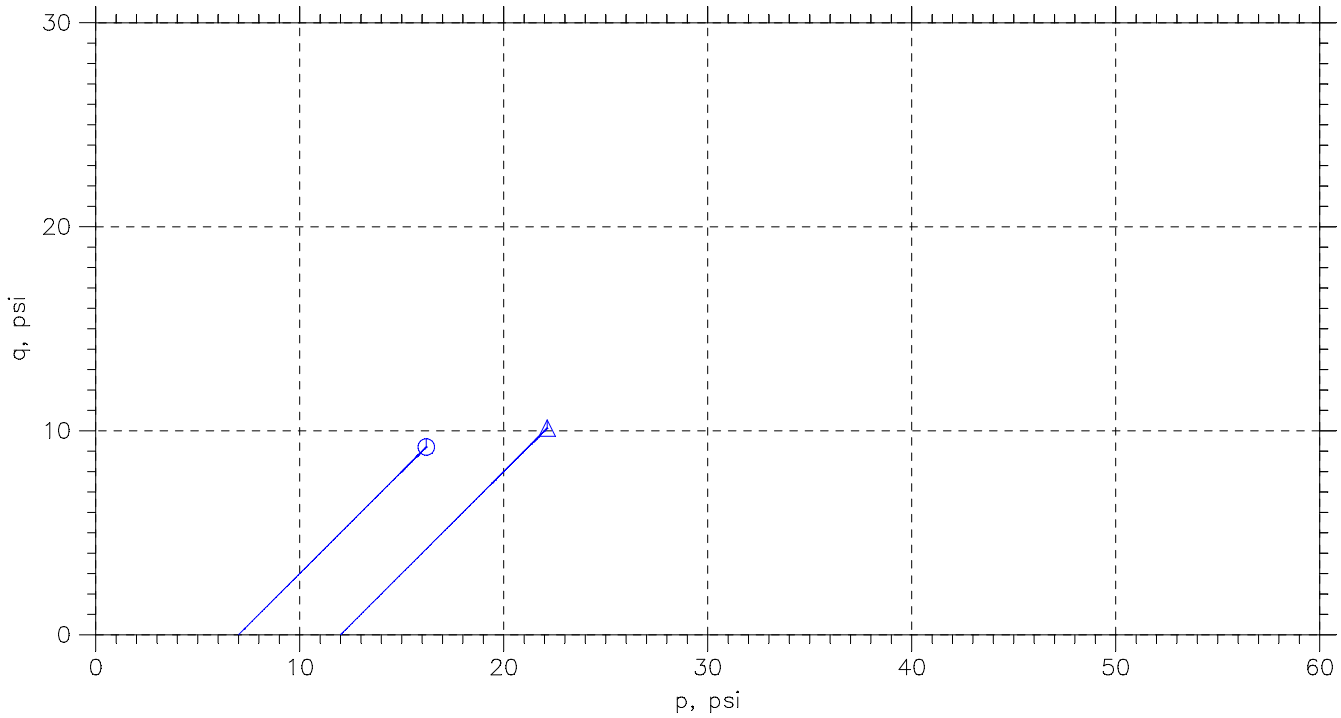


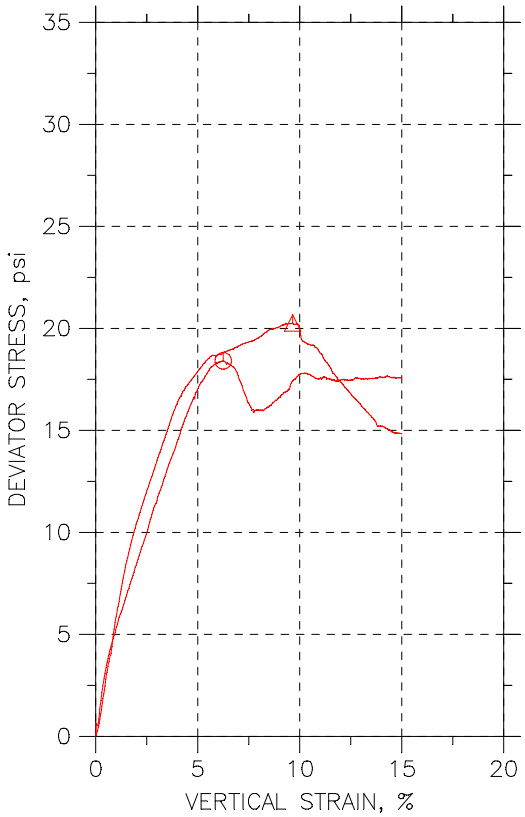
Phase calculations based on start and end of test.

Attachment Figure A.4-134

Thu, 14-MAR-2019 11:20:36

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0841	SL0841		
Test No.	UU-11-1	UU-11-2		
Depth	35-37	35-37		
Tested by	trm	trm		
Test Date	1/25/19	1/25/19		
Checked by	njh	njh		
Check Date	3/13/19	3/13/19		
Diameter, in	2.85	2.85		
Height, in	6	5.95		
Water Content, %	21.3	18.7		
Dry Density, pcf	105.	103.8		
Saturation, %	94.8	81.1		
Void Ratio	0.606	0.624		
Confining Stress, psi	7	12		
Undrained Strength, psi	9.204	10.13		
Max. Dev. Stress, psi	18.41	20.26		
Strain at Failure, %	6.25	9.65		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

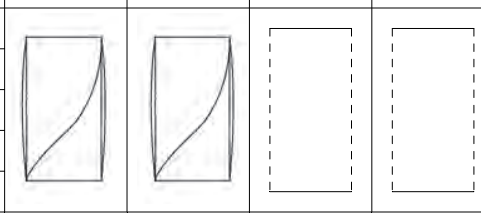
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJGB020

Sample Type: Intact



Description: Moist, light gray and light brown clay and silt

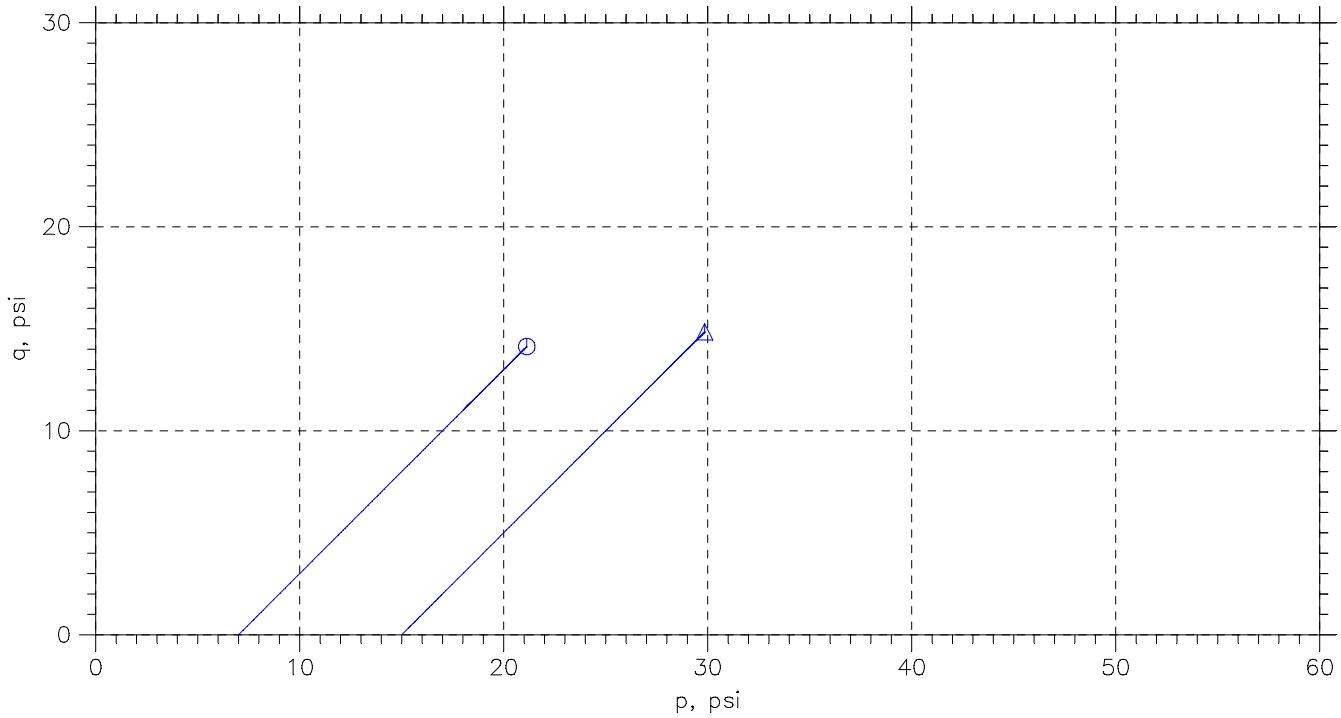
Remarks: System R

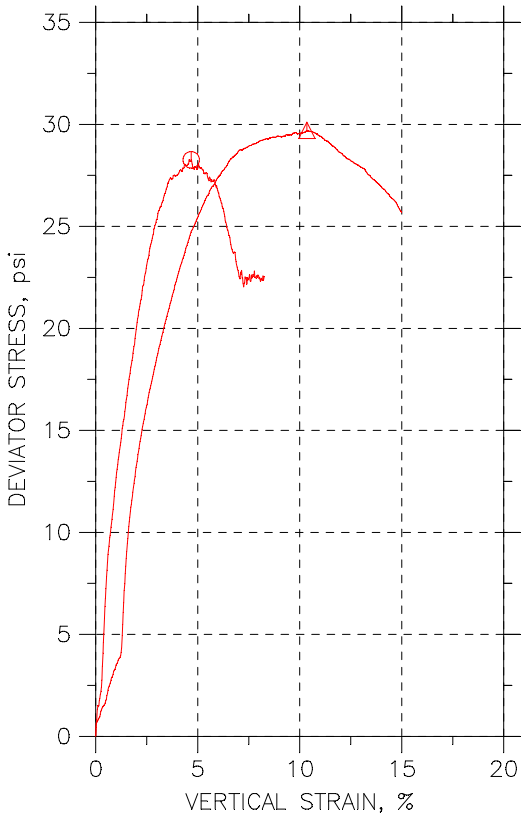
Phase calculations based on start and end of test.

Attachment Figure A.4-135

Wed, 13-MAR-2019 13:17:14

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0843	SL0843		
Test No.	UU-10-1	UU-10-2		
Depth	45-47	45-47		
Tested by	trm	trm		
Test Date	1/25/19	1/25/19		
Checked by	njh	njh		
Check Date	3/13/19	3/13/19		
Diameter, in	2.87	2.87		
Height, in	5.95	6.6		
Water Content, %	30.7	28.1		
Dry Density, pcf	90.69	95.86		
Saturation, %	96.7	99.9		
Void Ratio	0.859	0.758		
Confining Stress, psi	7	15		
Undrained Strength, psi	14.13	14.85		
Max. Dev. Stress, psi	28.26	29.71		
Strain at Failure, %	4.68	10.4		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

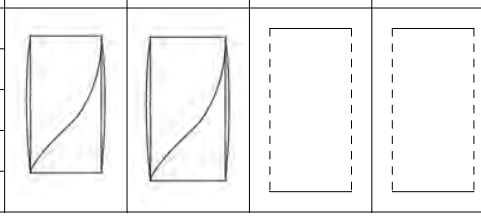
Project No.: GTX-309154

Boring No.: SJGB020

Sample Type: intact

Description: Moist, light brown clay

Remarks: System R

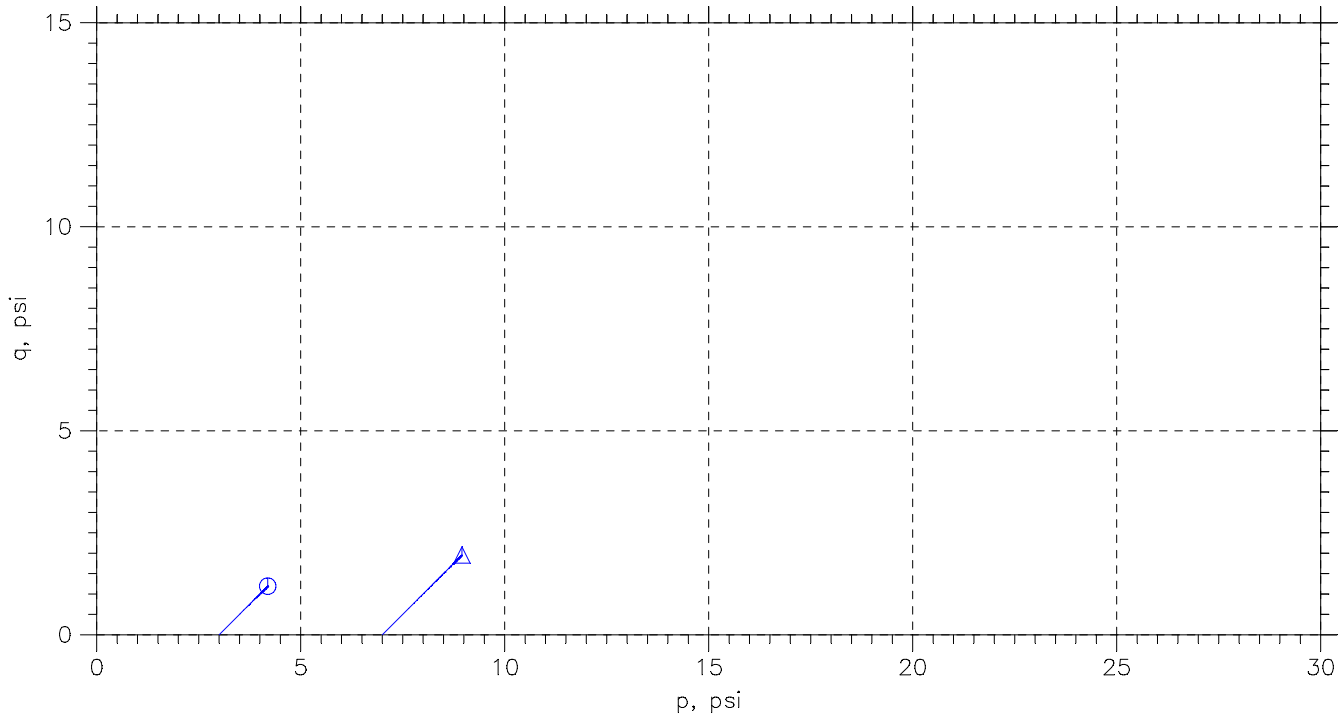


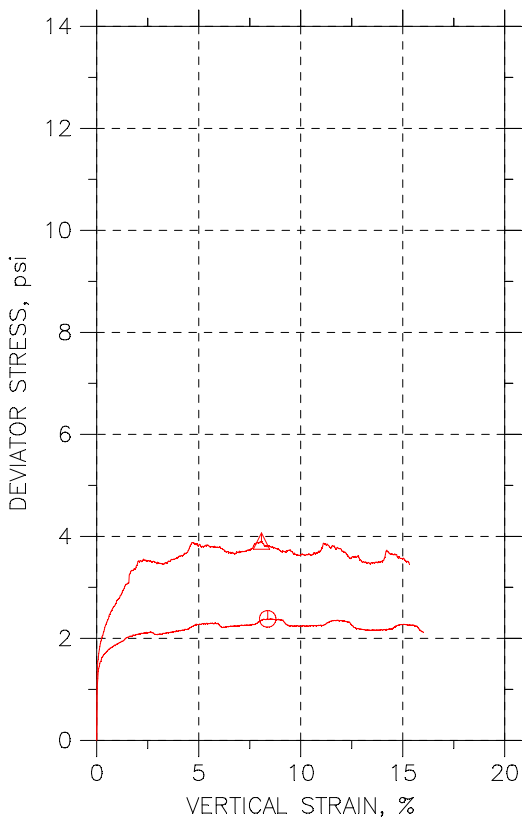
Phase calculations based on start and end of test.

Attachment Figure A.4-136

Wed, 13-MAR-2019 12:43:14

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0812	SL0812		
Test No.	UU-17-1	UU-17-2		
Depth	7-9 ft	7-9 ft		
Tested by	trm	trm		
Test Date	1/30/19	1/30/19		
Checked by	njh	njh		
Check Date	3/14/19	3/14/19		
Diameter, in	2.84	2.83		
Height, in	6	6.05		
Water Content, %	39.7	58.6		
Dry Density, pcf	73.4	65.08		
Saturation, %	82.7	99.5		
Void Ratio	1.3	1.59		
Confining Stress, psi	3	7		
Undrained Strength, psi	1.191	1.953		
Max. Dev. Stress, psi	2.382	3.907		
Strain at Failure, %	8.38	8.08		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

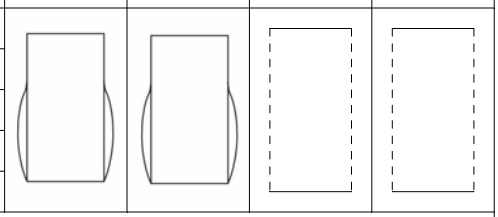
Project No.: GTX-309154

Boring No.: SJGB022

Sample Type: intact

Description: Moist, grayish brown clay

Remarks: System LL

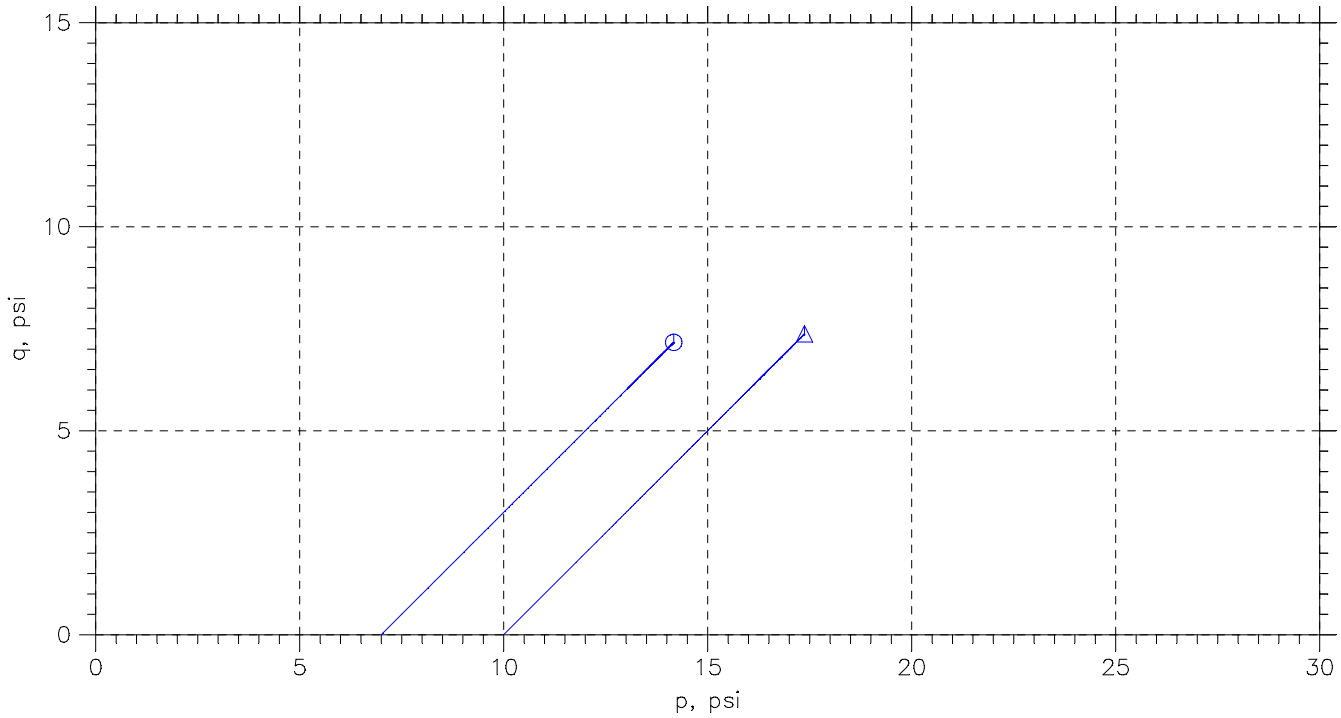


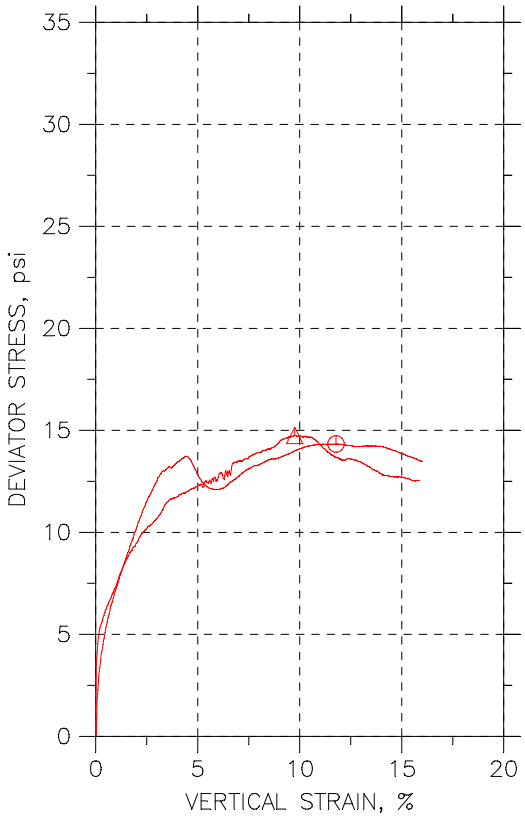
Phase calculations based on start and end of test.

Attachment Figure A.4-137

Thu, 14-MAR-2019 12:02:16

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0817	SL0817		
Test No.	UU-15-1	UU-15-2		
Depth	30-32 ft	30-32 ft		
Tested by	trm	trm		
Test Date	1/30/19	1/30/19		
Checked by	njh	njh		
Check Date	3/14/19	3/14/19		
Diameter, in	2.85	2.85		
Height, in	6	6.1		
Water Content, %	28.3	33.2		
Dry Density, pcf	92.53	85.06		
Saturation, %	93.1	91.2		
Void Ratio	0.822	0.982		
Confining Stress, psi	7	10		
Undrained Strength, psi	7.167	7.373		
Max. Dev. Stress, psi	14.33	14.75		
Strain at Failure, %	11.8	9.75		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

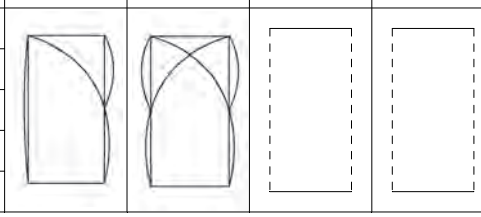
Project No.: GTX-309154

Boring No.: SJGB022

Sample Type: intact

Description: Moist, reddish brown clay

Remarks: System LL

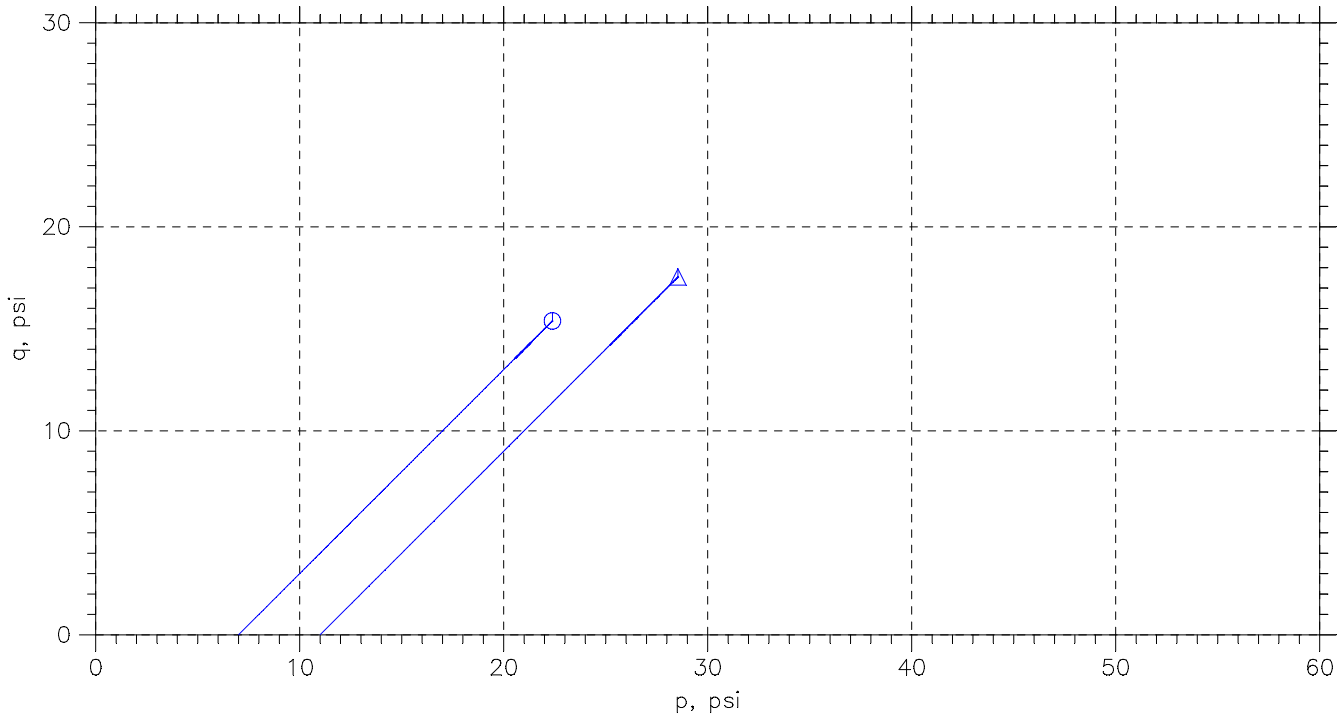


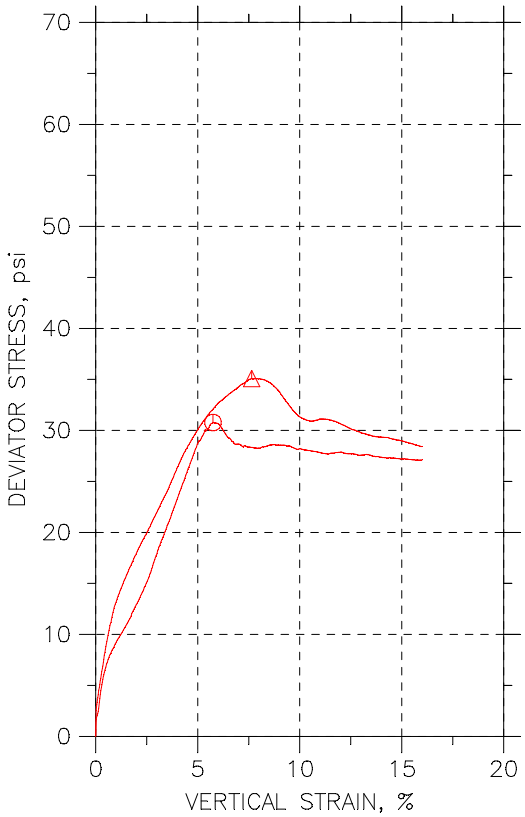
Phase calculations based on start and end of test.

Attachment Figure A.4-138

Thu, 14-MAR-2019 11:11:36

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0884	SL0884		
Test No.	UU-12-1	UU-12-2		
Depth	33-35 ft	33-35 ft		
Tested by	trm	trm		
Test Date	1/29/19	1/29/19		
Checked by	njh	njh		
Check Date	3/13/19	3/13/19		
Diameter, in	2.86	2.87		
Height, in	5.95	6		
Water Content, %	20.0	23.0		
Dry Density, pcf	102.8	100.		
Saturation, %	84.2	90.8		
Void Ratio	0.64	0.685		
Confining Stress, psi	7	11		
Undrained Strength, psi	15.39	17.54		
Max. Dev. Stress, psi	30.77	35.09		
Strain at Failure, %	5.75	7.65		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

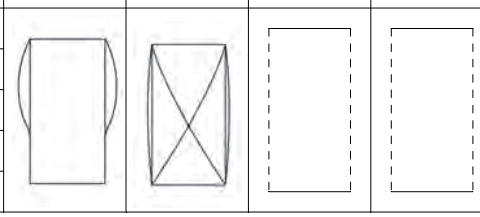
Project No.: GTX-309154

Boring No.: SJGB023

Sample Type: intact

Description: Moist, light brown and light gray clay

Remarks: System Q

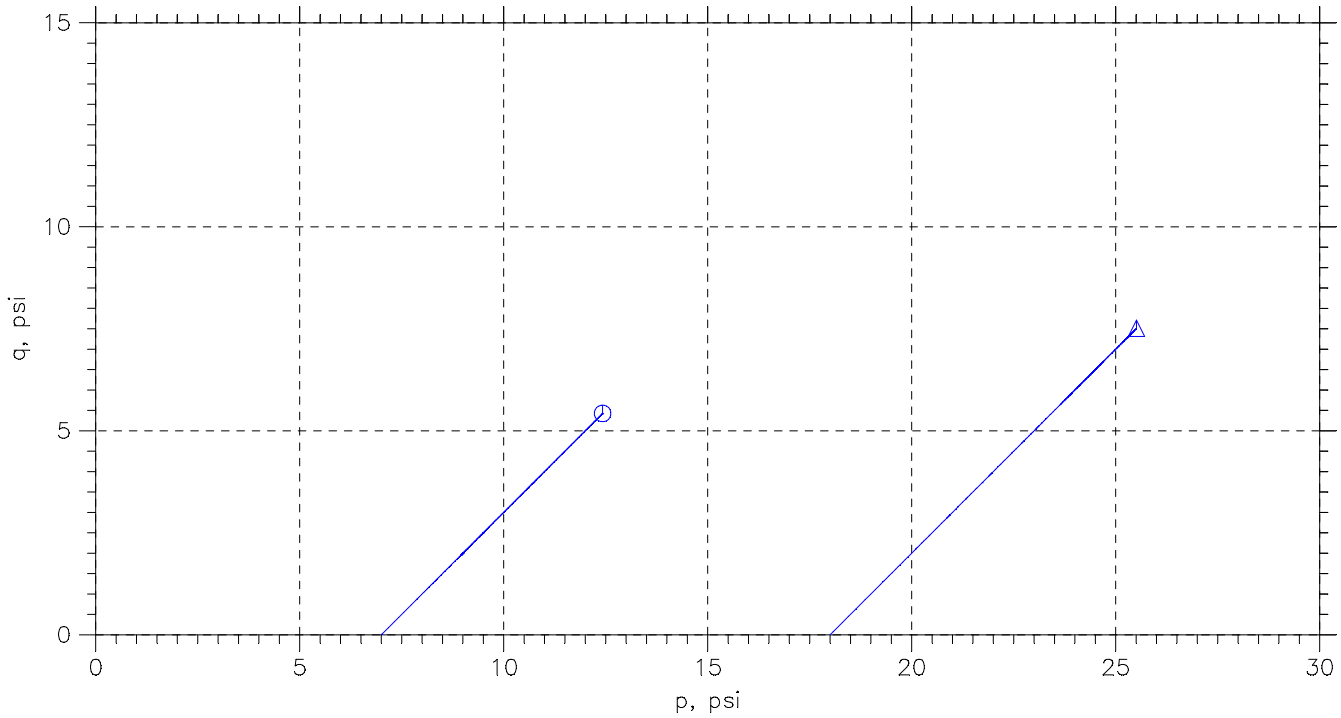


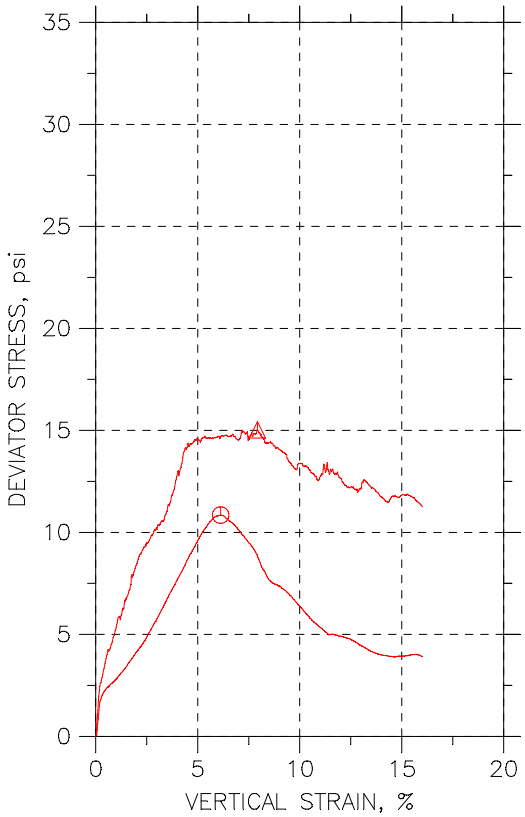
Phase calculations based on start and end of test.

Attachment Figure A.4-139

Wed, 13-MAR-2019 13:47:00

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0887	SL0887		
Test No.	UU-18-1	UU-18-2		
Depth	53-55 ft	53-55 ft		
Tested by	trm	trm		
Test Date	1/28/19	1/28/19		
Checked by	njh	njh		
Check Date	3/14/19	3/14/19		
Diameter, in	2.85	2.85		
Height, in	6.15	6.1		
Water Content, %	21.0	19.0		
Dry Density, pcf	105.6	103.		
Saturation, %	95.4	80.5		
Void Ratio	0.595	0.636		
Confining Stress, psi	7	18		
Undrained Strength, psi	5.424	7.511		
Max. Dev. Stress, psi	10.85	15.02		
Strain at Failure, %	6.12	7.93		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

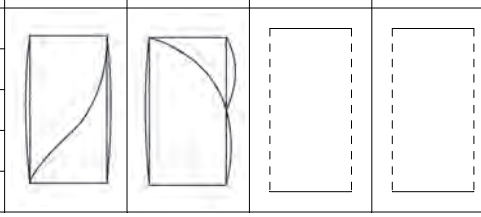
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJGB023

Sample Type: intact



Description: Moist, llight gray sand and clay

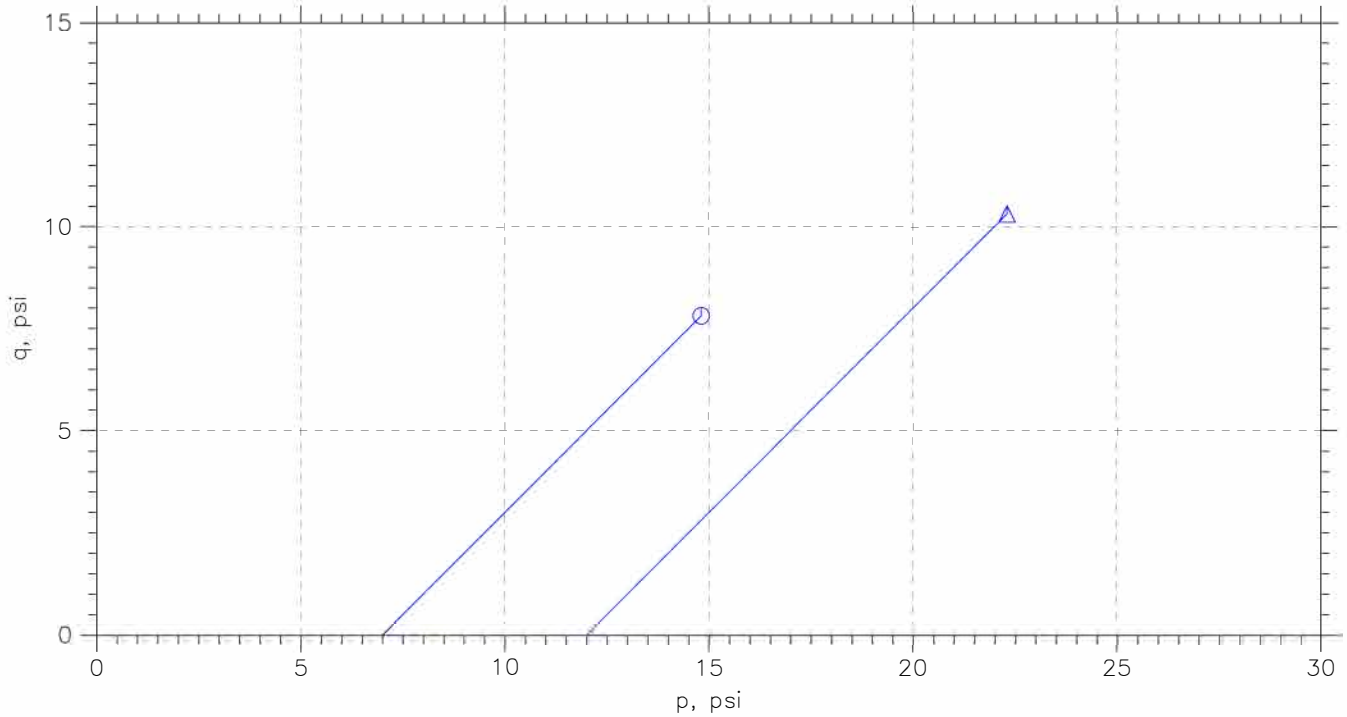
Remarks: System X

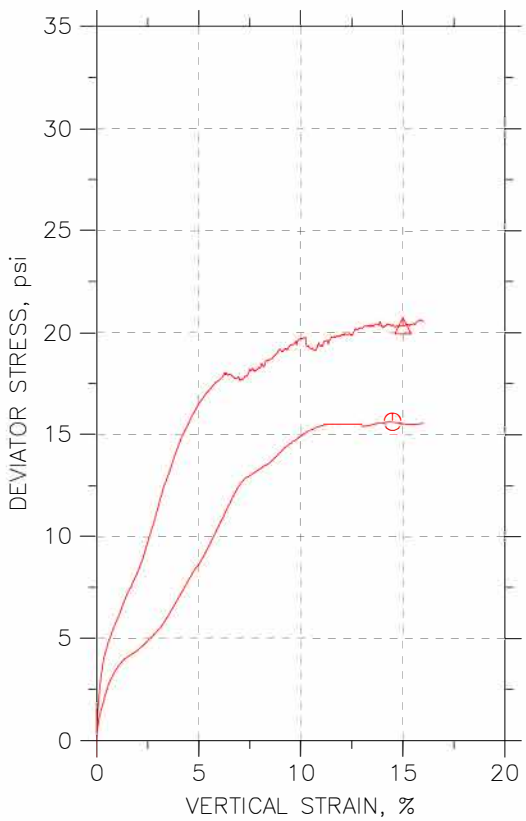
Phase calculations based on start and end of test.

Attachment Figure A.4-140

Thu, 14-MAR-2019 12:10:58

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0895	SL0895		
Test No.	UU-14-1	UU-14-2		
Depth	34-36 ft	34-36 ft		
Tested by	trm	trm		
Test Date	1/29/19	1/29/19		
Checked by	njh	njh		
Check Date	3/13/19	3/13/19		
Diameter, in	2.85	2.84		
Height, in	6	6		
Water Content, %	21.5	19.9		
Dry Density, pcf	100.3	105.1		
Saturation, %	85.5	88.9		
Void Ratio	0.68	0.604		
Confining Stress, psi	7	12		
Undrained Strength, psi	7.811	10.16		
Max. Dev. Stress, psi	15.62	20.33		
Strain at Failure, %	14.5	15		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

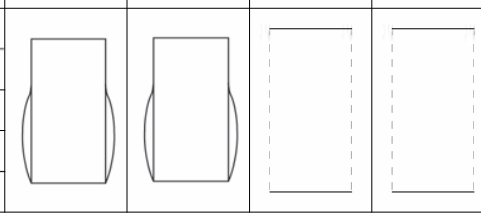
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJGB038

Sample Type: intact



Description: Moist, brown and reddish brown clay

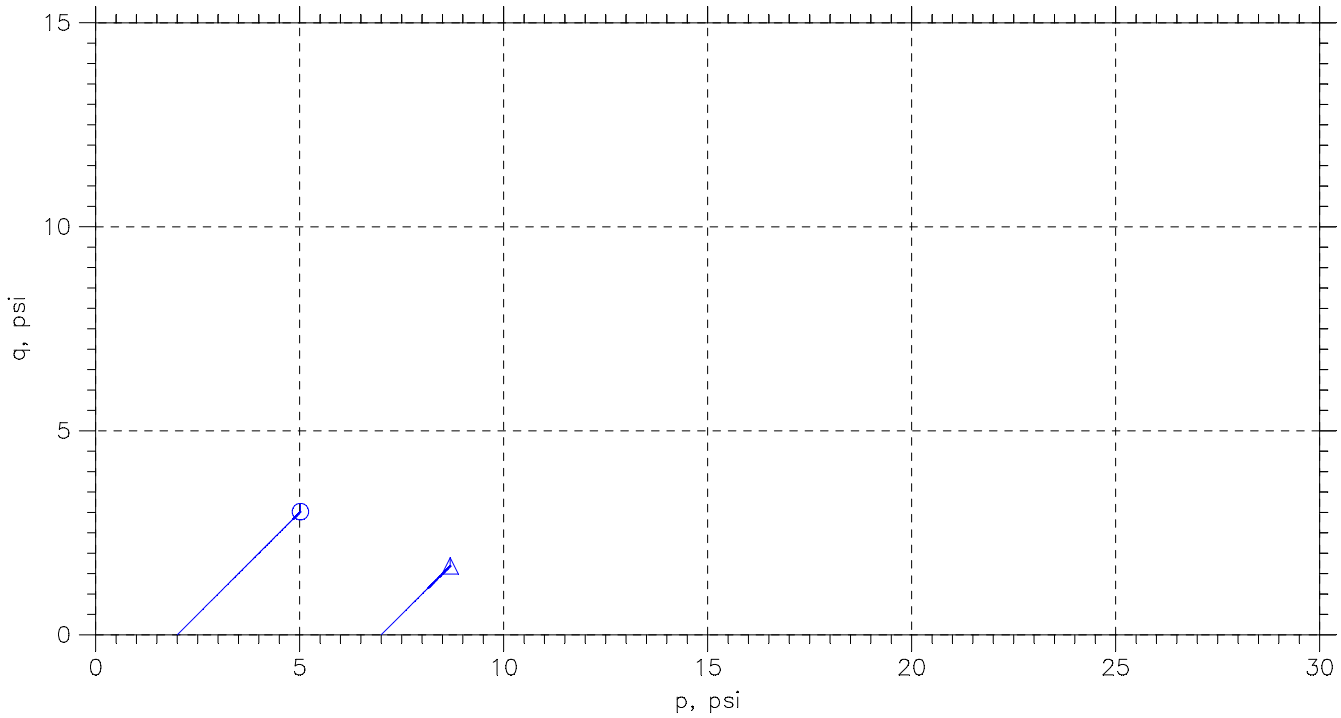
Remarks: System Q

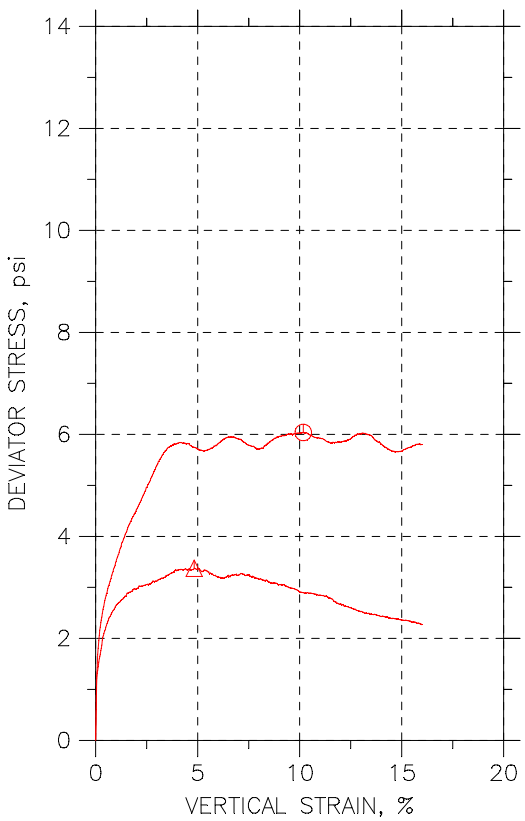
Phase calculations based on start and end of test.

Attachment Figure A.4-141

Wed, 13-MAR-2019 16:38:45

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL1038	SL1038		
Test No.	UU-4-1	UU-4-2		
Depth	4-6 ft	4-6 ft		
Tested by	trm	trm		
Test Date	12/26/18	12/26/18		
Checked by	njh	njh		
Check Date	2/28/19	2/28/19		
Diameter, in	2.86	2.83		
Height, in	6.25	5.85		
Water Content, %	29.4	20.9		
Dry Density, pcf	82.8	87.81		
Saturation, %	76.7	61.5		
Void Ratio	1.04	0.92		
Confining Stress, psi	2	7		
Undrained Strength, psi	3.018	1.688		
Max. Dev. Stress, psi	6.037	3.375		
Strain at Failure, %	10.2	4.83		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

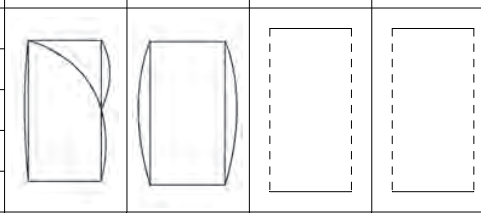
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJSB025

Sample Type: intact



Description: Moist, grayish brown sandy clay

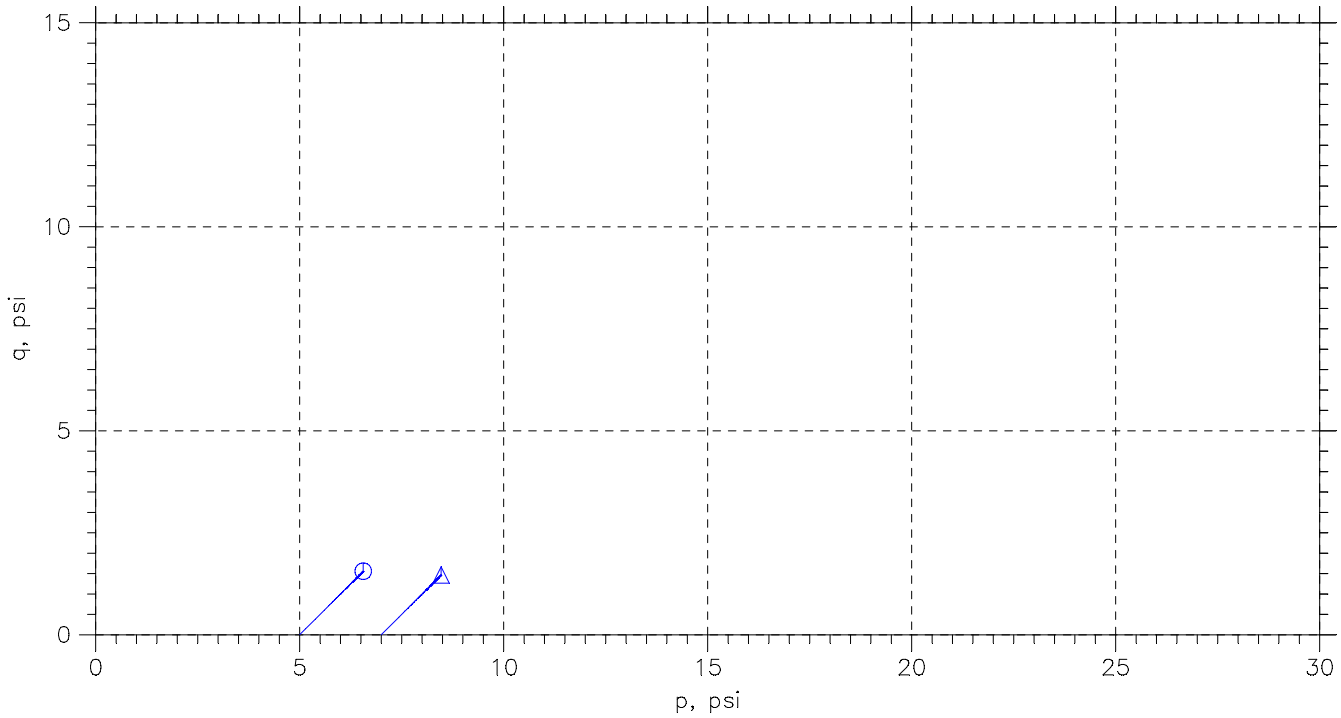
Remarks: System W

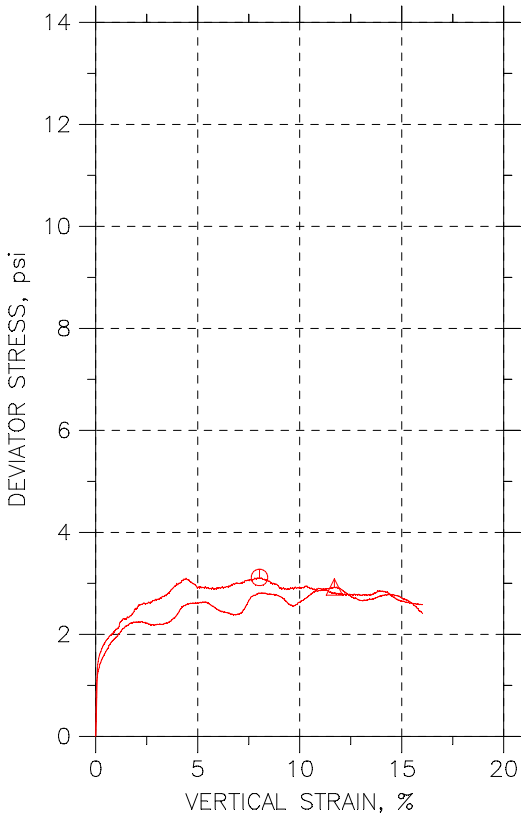
Phase calculations based on start and end of test.

Attachment Figure A.4-142

Thu, 28-FEB-2019 15:37:41

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0805	SL0805		
Test No.	UU-7-1	UU-7-2		
Depth	20-22 ft	20-22 ft		
Tested by	trm	trm		
Test Date	12/27/18	12/27/18		
Checked by	njh	njh		
Check Date	3/1/19	3/1/19		
Diameter, in	2.83	2.83		
Height, in	6.45	6.05		
Water Content, %	31.0	43.1		
Dry Density, pcf	81.79	77.78		
Saturation, %	78.9	99.8		
Void Ratio	1.06	1.17		
Confining Stress, psi	5	7		
Undrained Strength, psi	1.558	1.464		
Max. Dev. Stress, psi	3.116	2.929		
Strain at Failure, %	8.03	11.7		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

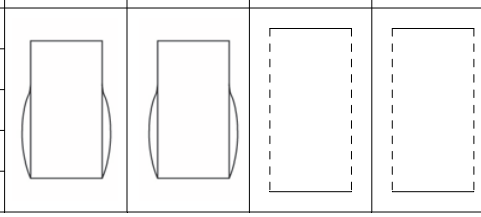
Project No.: GTX-309154

Boring No.: SJSB028

Sample Type: intact

Description: Moist, gray sandy clay

Remarks: System W

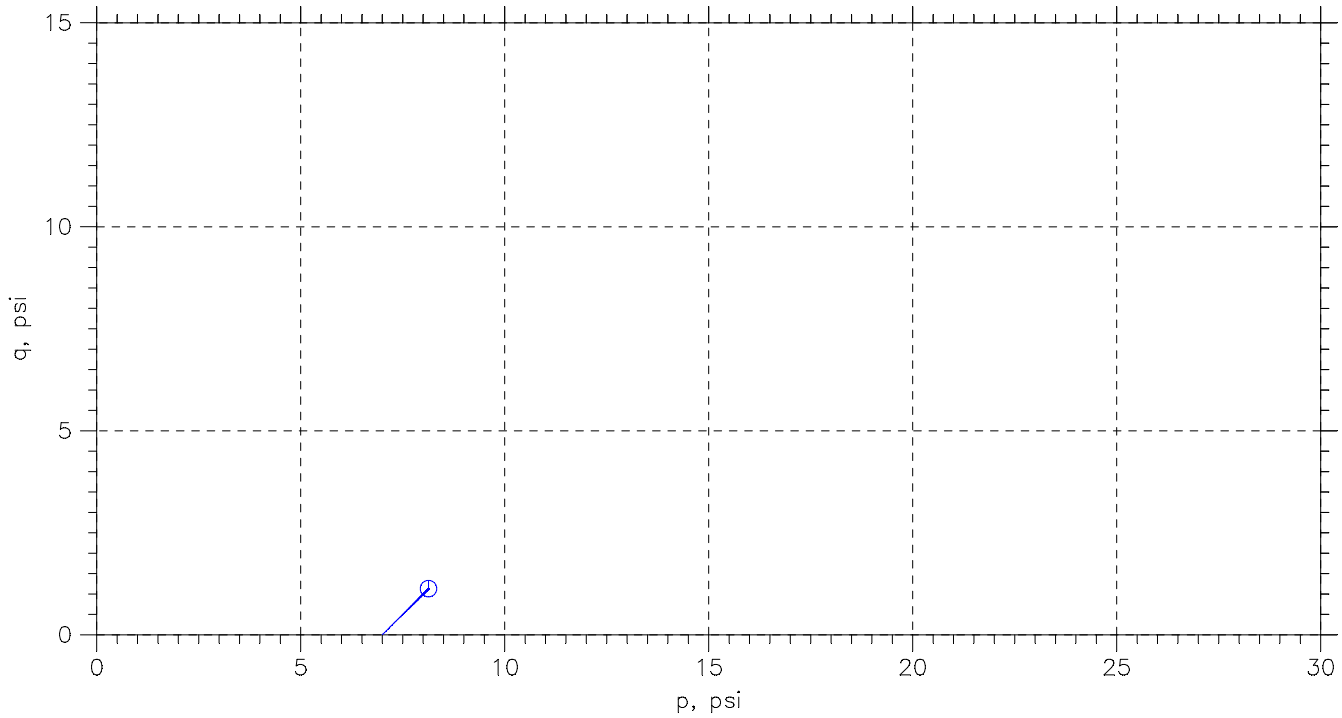


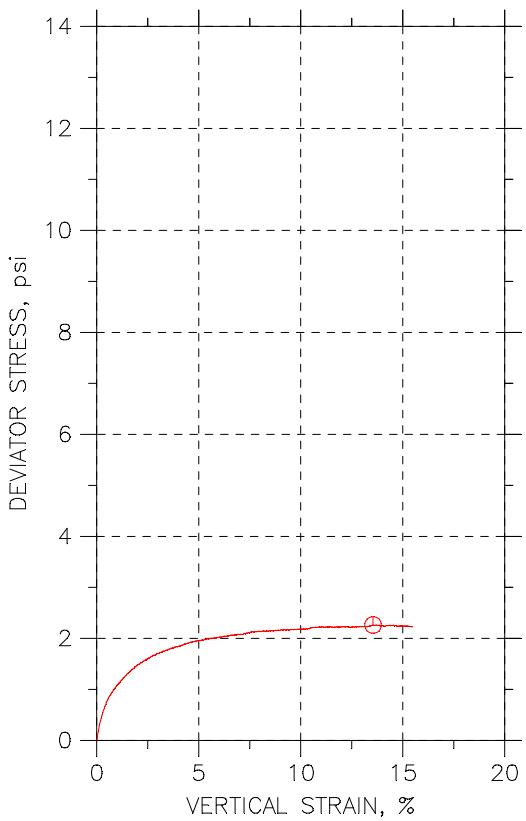
Phase calculations based on start and end of test.

Attachment Figure A.4-143

Fri, 01-MAR-2019 12:26:24

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⏲			
Sample No.	SL0612			
Test No.	UU-9			
Depth	5-7 ft			
Tested by	trm			
Test Date	1/2/19			
Checked by	njh			
Check Date	3/1/19			
Diameter, in	2.82			
Height, in	6.6			
Water Content, %	29.8			
Dry Density, pcf	86.92			
Saturation, %	85.7			
Void Ratio	0.939			
Confining Stress, psi	7			
Undrained Strength, psi	1.131			
Max. Dev. Stress, psi	2.262			
Strain at Failure, %	13.5			
Strain Rate, %/min	1			
Estimated Specific Gravity	2.7			
Liquid Limit	---			
Plastic Limit	---			
Plasticity Index	---			

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJSB029

Sample Type: intact

Description: Moist, gray sandy clay

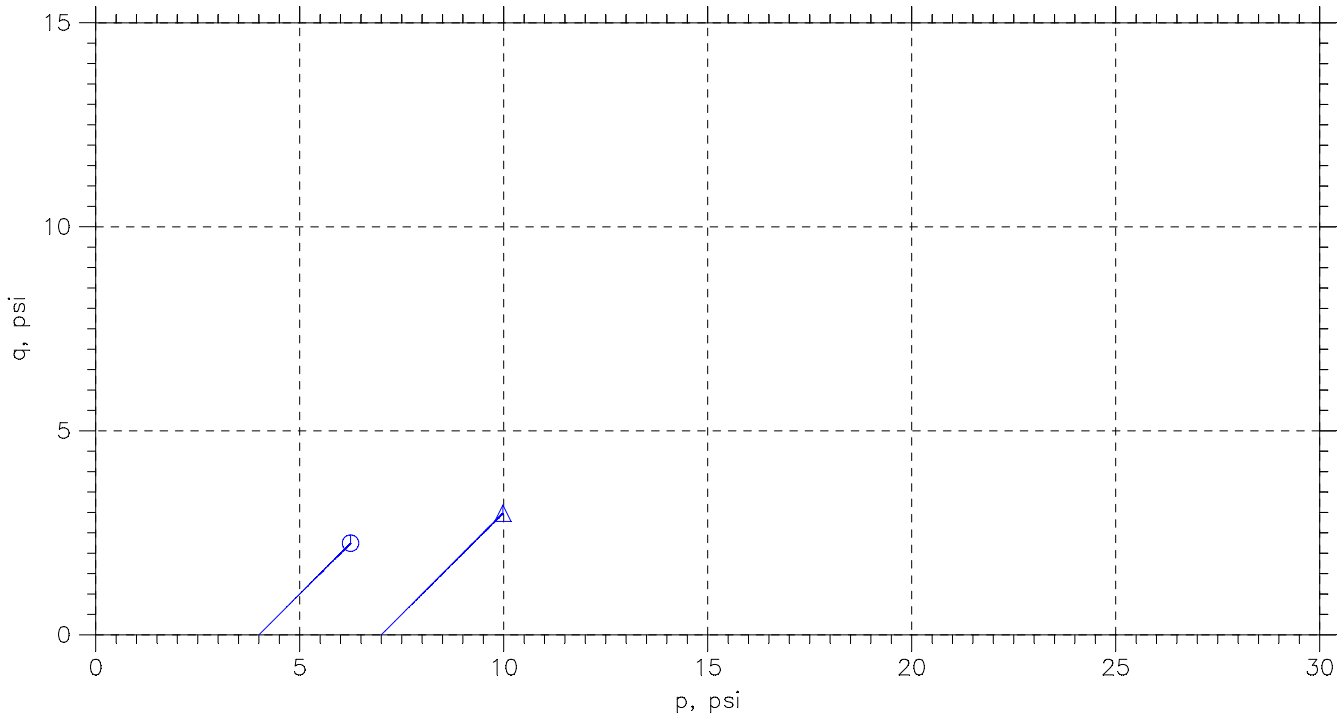
Remarks: System II

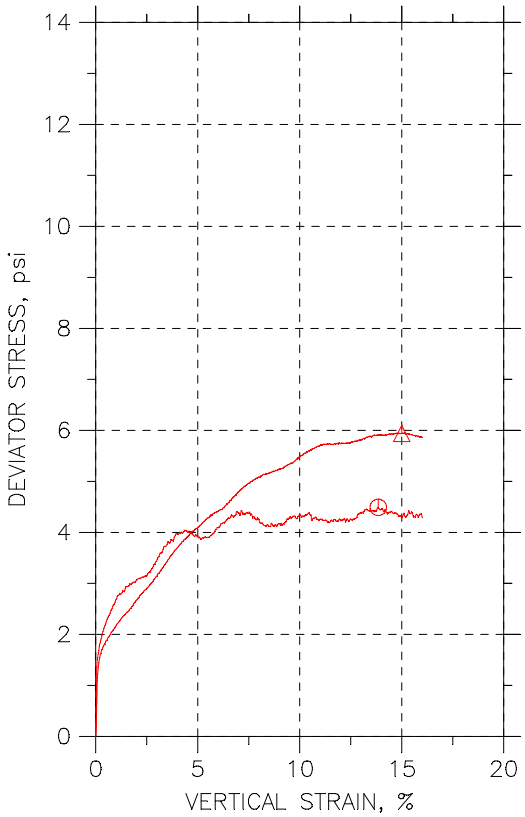
Phase calculations based on start and end of test.

Attachment Figure A.4-144

Fri, 01-MAR-2019 12:47:58

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0698	SL0698		
Test No.	UU-8-1	UU-8-2		
Depth	8-10 ft	8-10 ft		
Tested by	trm	trm		
Test Date	12/27/18	12/27/18		
Checked by	njh	njh		
Check Date	3/1/19	3/1/19		
Diameter, in	2.85	2.84		
Height, in	6.2	5.95		
Water Content, %	21.4	21.4		
Dry Density, pcf	92.42	101.7		
Saturation, %	70.2	88.1		
Void Ratio	0.824	0.657		
Confining Stress, psi	4	7		
Undrained Strength, psi	2.245	2.97		
Max. Dev. Stress, psi	4.491	5.941		
Strain at Failure, %	13.9	15		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

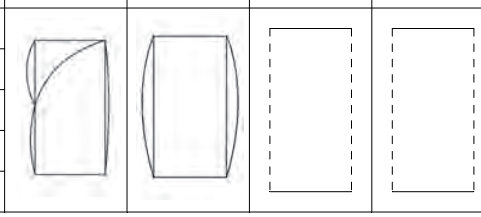
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJSB030

Sample Type: intact



Description: Moist, brownish gray sandy clay

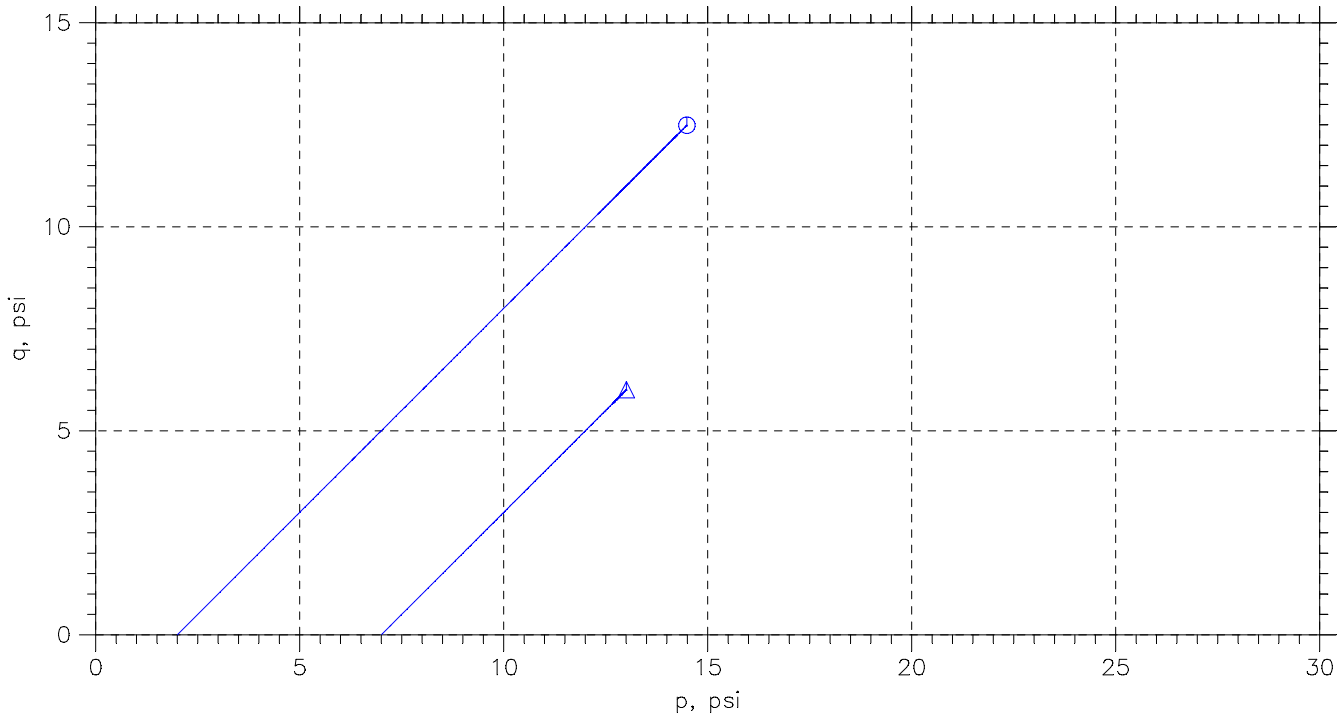
Remarks: System W

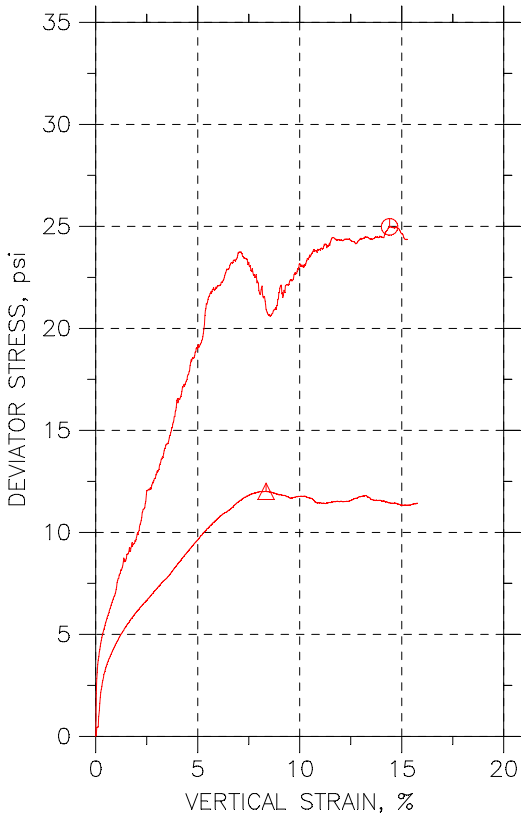
Phase calculations based on start and end of test.

Attachment Figure A.4-145

Fri, 01-MAR-2019 12:41:39

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0626	SL0626		
Test No.	UU-13-1	UU-13-2		
Depth	---	---		
Tested by	trm	trm		
Test Date	1/29/19	1/29/19		
Checked by	njh	njh		
Check Date	3/13/19	3/13/19		
Diameter, in	2.86	2.83		
Height, in	6	6.6		
Water Content, %	20.8	20.9		
Dry Density, pcf	101.6	100.8		
Saturation, %	85.3	84.2		
Void Ratio	0.659	0.672		
Confining Stress, psi	2	7		
Undrained Strength, psi	12.49	6.006		
Max. Dev. Stress, psi	24.98	12.01		
Strain at Failure, %	14.4	8.35		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

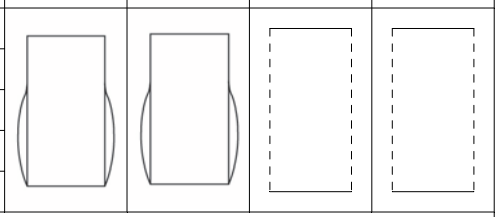
Project No.: GTX-309154

Boring No.: SJSB031

Sample Type: intact

Description: Moist, brown clay with sand

Remarks: System Q

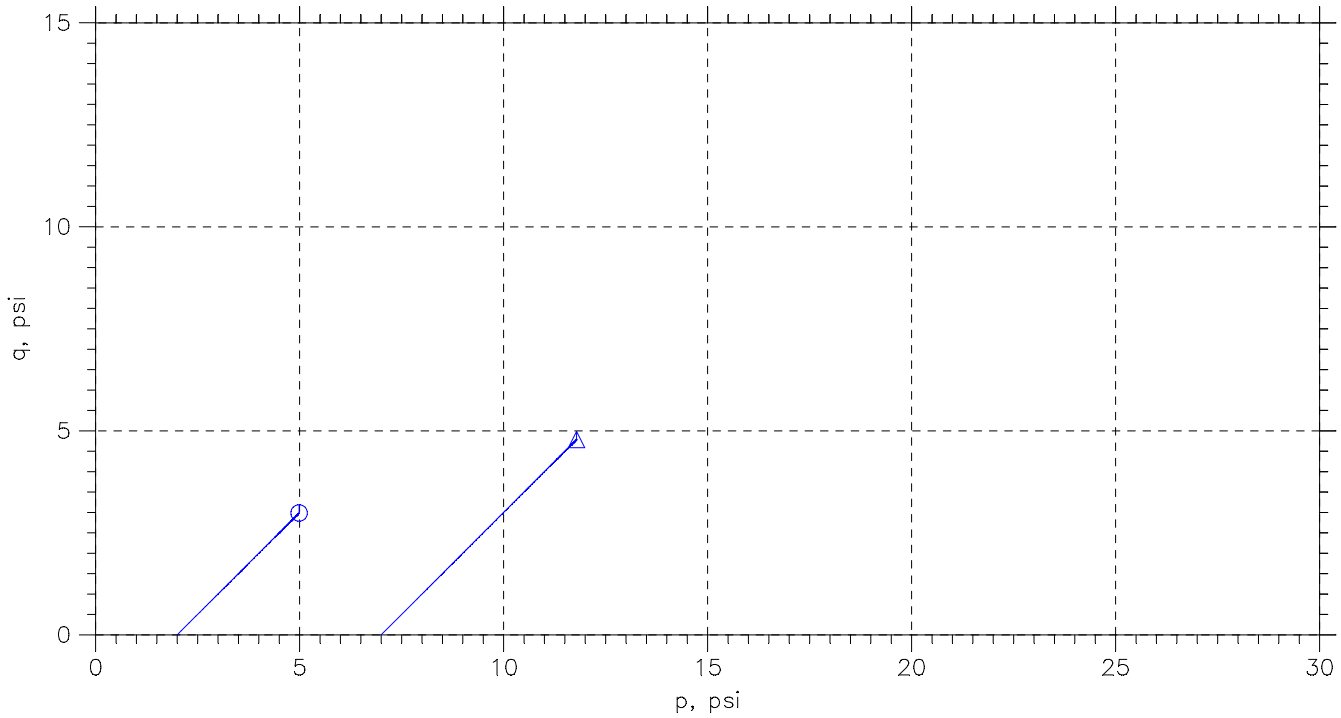


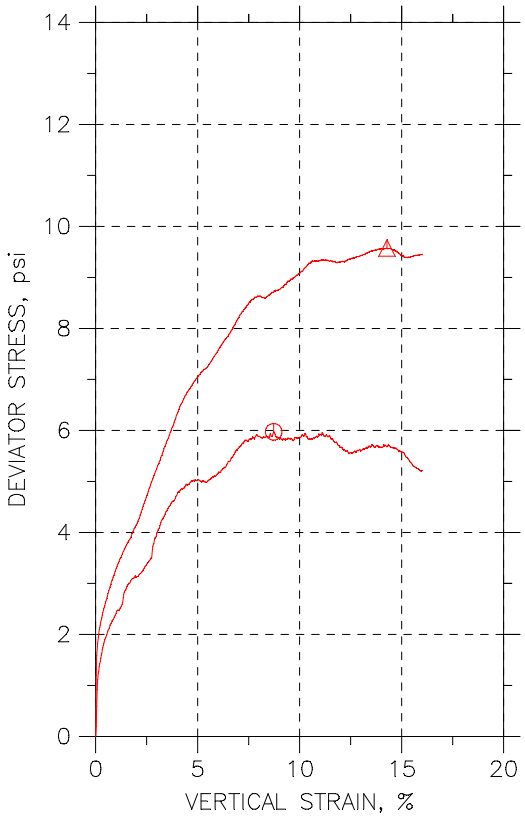
Phase calculations based on start and end of test.

Attachment Figure A.4-146

Wed, 13-MAR-2019 16:11:11

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

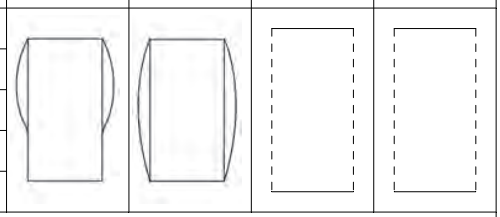




Symbol	⦶	△		
Sample No.	SL0686	SL0686		
Test No.	UU-5-1	UU-5-2		
Depth	5-7 ft	5-7 ft		
Tested by	trm	trm		
Test Date	12/27/18	12/27/18		
Checked by	njh	njh		
Check Date	2/28/19	2/28/19		
Diameter, in	2.85	2.85		
Height, in	6.05	6.12		
Water Content, %	27.8	17.8		
Dry Density, pcf	82.18	109.2		
Saturation, %	71.4	88.6		
Void Ratio	1.05	0.543		
Confining Stress, psi	2	7		
Undrained Strength, psi	2.987	4.788		
Max. Dev. Stress, psi	5.973	9.576		
Strain at Failure, %	8.73	14.3		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJSB032
Sample Type: intact
Description: Moist, gray clay
Remarks: System W

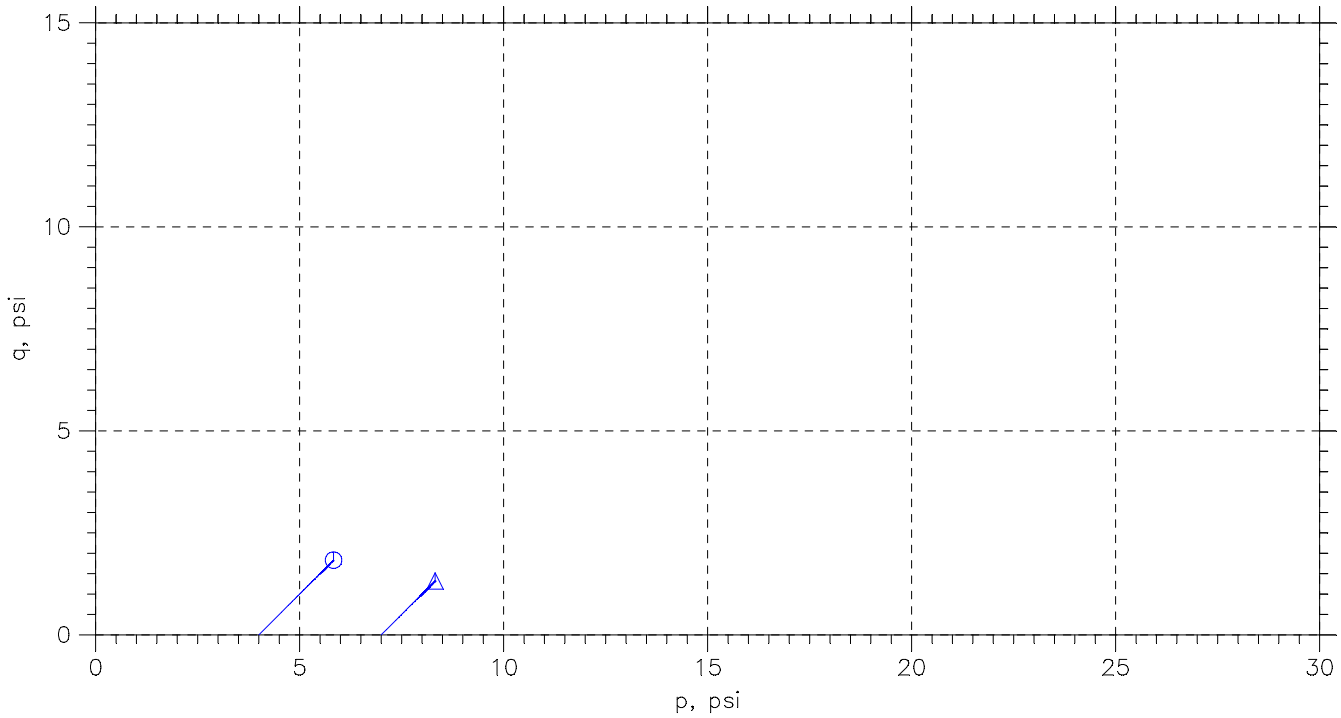


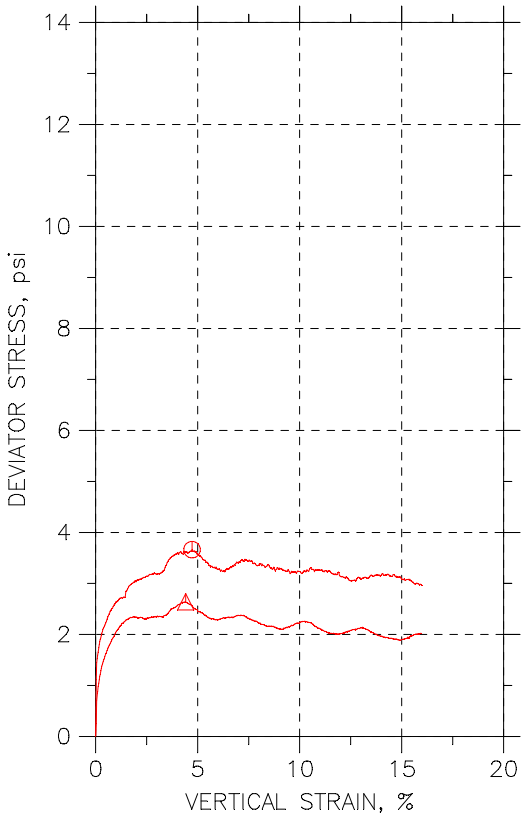
Phase calculations based on start and end of test.

Attachment Figure A.4-147

Thu, 28-FEB-2019 15:48:49

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

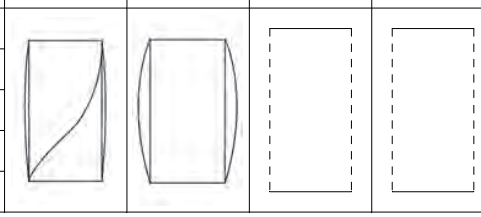




Symbol	⦶	△		
Sample No.	SL0687	SL0687		
Test No.	UU-6-1	UU-6-2		
Depth	10-12 ft	10-12 ft		
Tested by	trm	trm		
Test Date	12/27/18	12/27/18		
Checked by	njh	njh		
Check Date	2/28/19	2/28/19		
Diameter, in	2.83	2.83		
Height, in	6.25	6.8		
Water Content, %	29.2	31.8		
Dry Density, pcf	91.86	90.61		
Saturation, %	94.5	99.9		
Void Ratio	0.835	0.86		
Confining Stress, psi	4	7		
Undrained Strength, psi	1.831	1.32		
Max. Dev. Stress, psi	3.662	2.64		
Strain at Failure, %	4.73	4.41		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJSB032
Sample Type: intact
Description: Moist, gray sandy clay
Remarks: System W

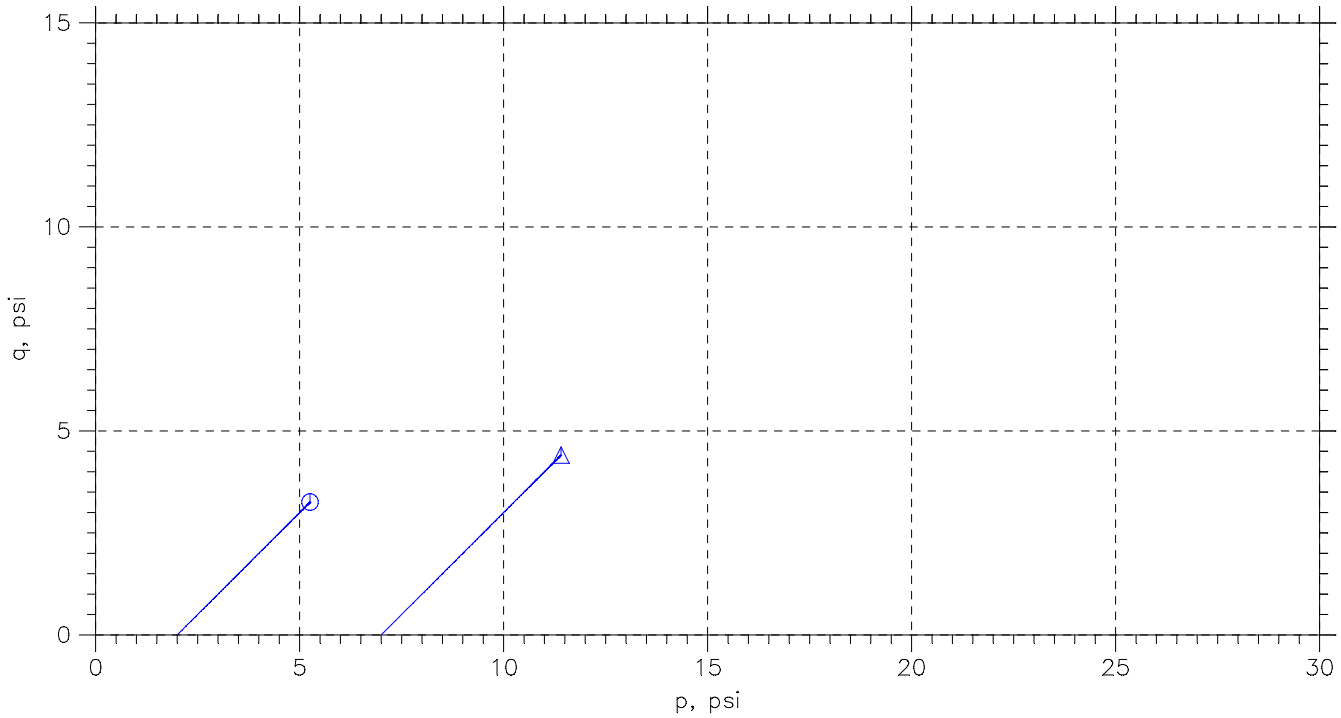


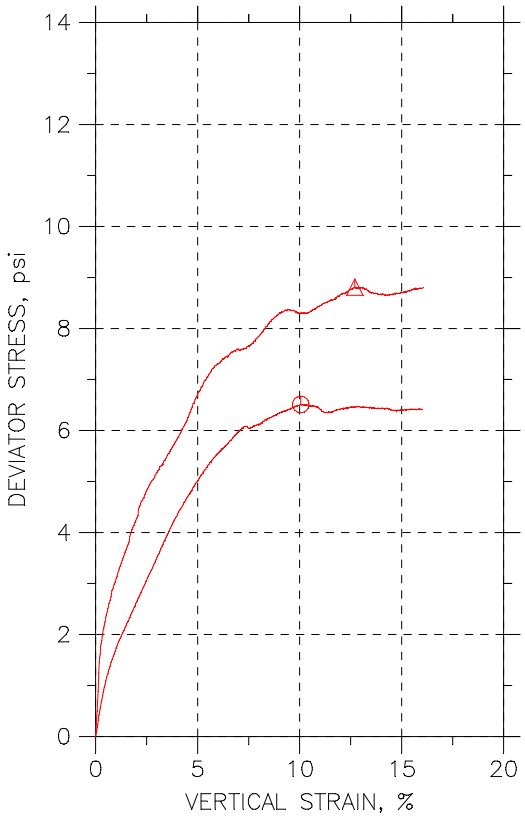
Phase calculations based on start and end of test.

Attachment Figure A.4-148

Thu, 28-FEB-2019 15:59:12

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

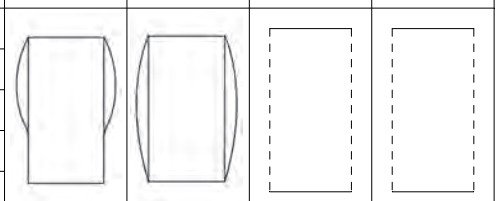




Symbol	⦶	△		
Sample No.	SL0649	SL0649		
Test No.	UU-1-1	UU-1-2		
Depth	---	---		
Tested by	trm	trm		
Test Date	12/26/18	12/26/18		
Checked by	njh	njh		
Check Date	2/28/19	2/28/19		
Diameter, in	2.85	2.83		
Height, in	6	5.8		
Water Content, %	22.5	20.6		
Dry Density, pcf	103.3	106.4		
Saturation, %	96.0	95.0		
Void Ratio	0.632	0.585		
Confining Stress, psi	2	7		
Undrained Strength, psi	3.255	4.405		
Max. Dev. Stress, psi	6.511	8.81		
Strain at Failure, %	10.1	12.7		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJSB033
Sample Type: intact
Description: Moist, gray sandy clay
Remarks: System W

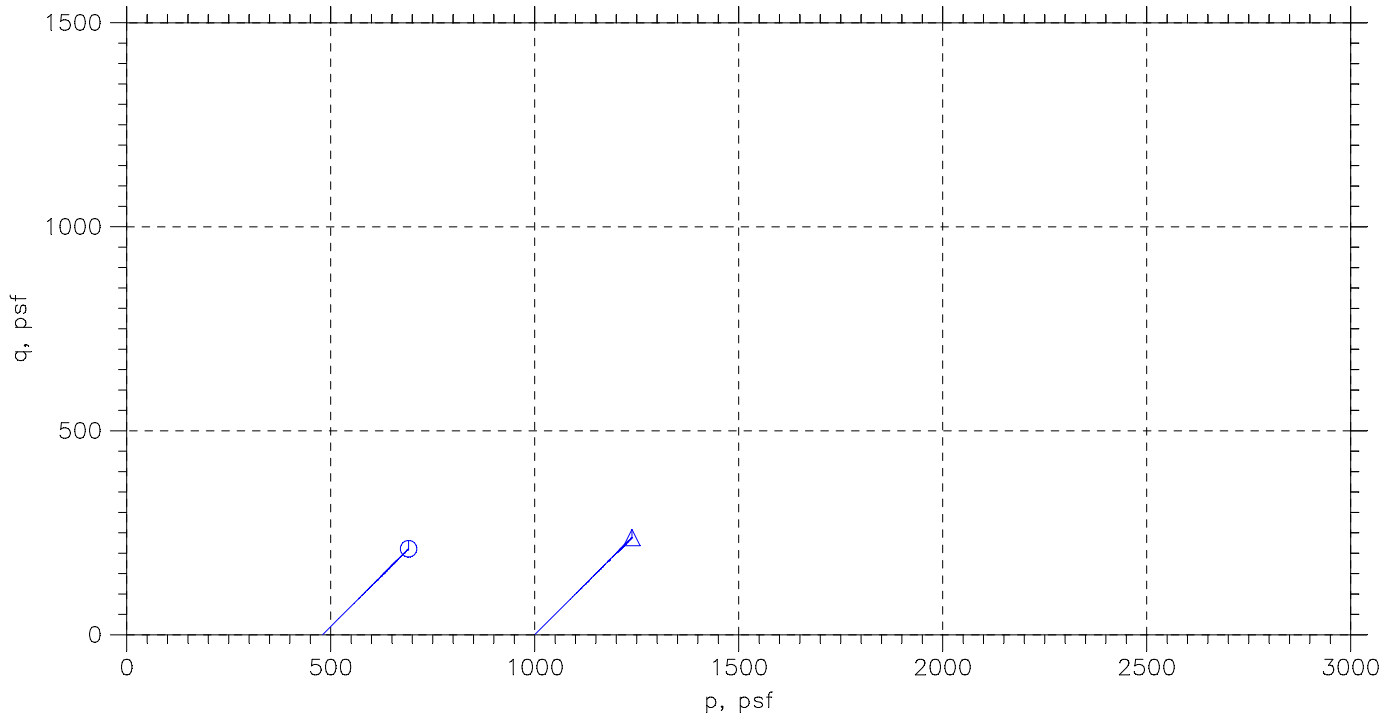


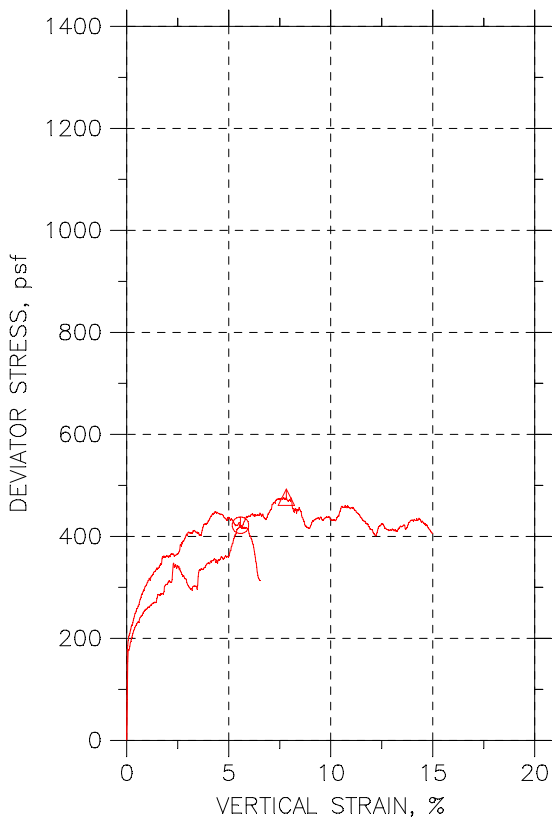
Phase calculations based on start and end of test.

Attachment Figure A.4-149

Thu, 28-FEB-2019 09:08:50

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⦶	△		
Sample No.	SL0672	SL0672		
Test No.	UU-19-1	UU-19-2		
Depth	2-4 ft	2-4 ft		
Tested by	trm	trm		
Test Date	2/11/19	2/11/19		
Checked by	njh	njh		
Check Date	3/14/19	3/14/19		
Diameter, in	2.84	2.84		
Height, in	5.9	6		
Water Content, %	80.1	71.8		
Dry Density, pcf	45.45	53.38		
Saturation, %	79.8	89.9		
Void Ratio	2.71	2.16		
Confining Stress, psf	480	1000		
Undrained Strength, psf	210.9	238.3		
Max. Dev. Stress, psf	421.8	476.6		
Strain at Failure, %	5.58	7.83		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design

Location: ---

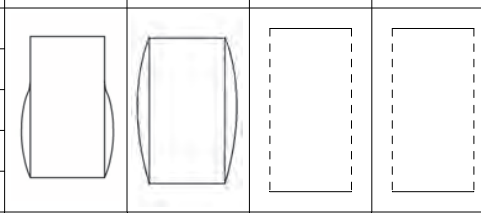
Project No.: GTX-309154

Boring No.: SJSB036

Sample Type: intact

Description: Moist, brown clay

Remarks: System II

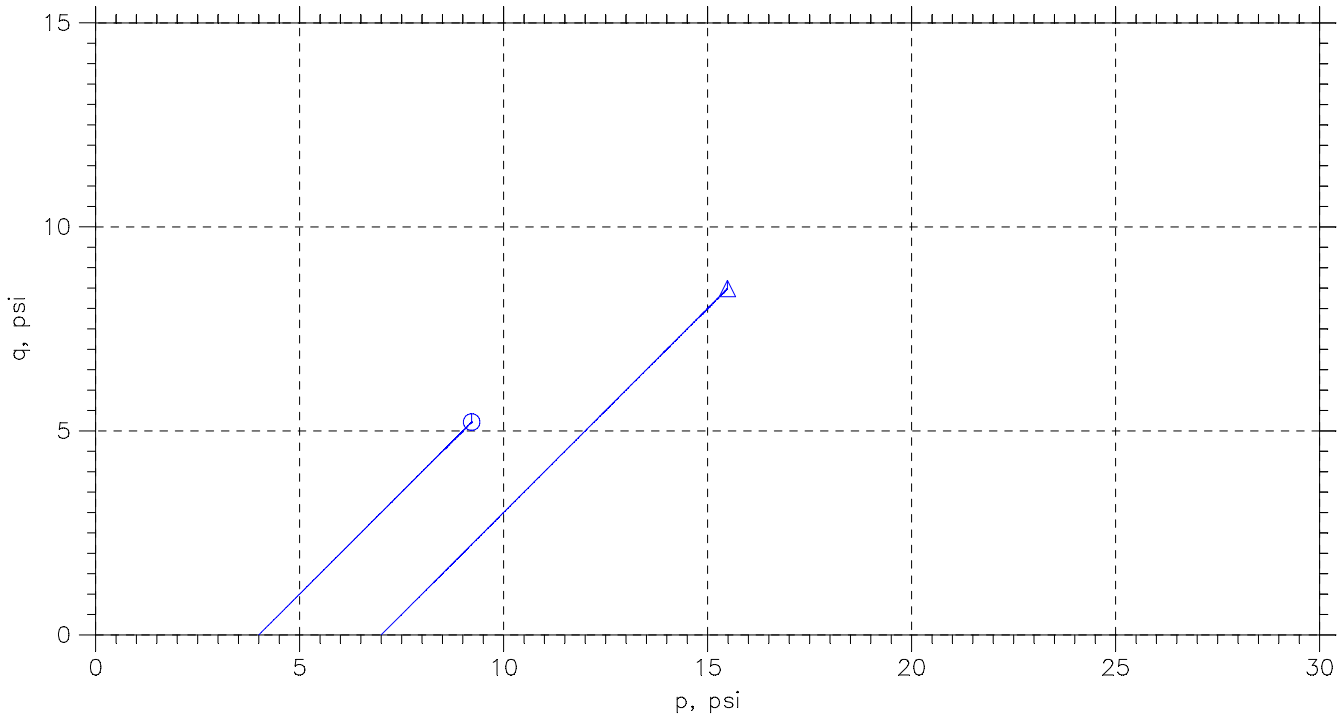


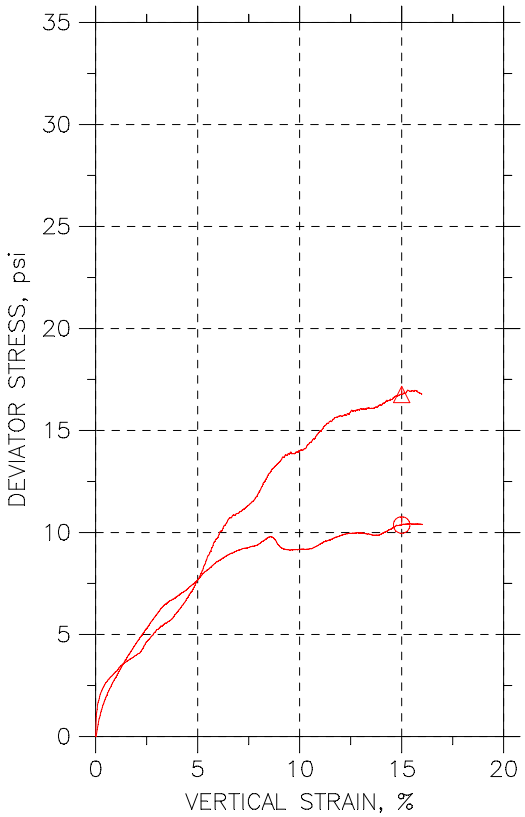
Phase calculations based on start and end of test.

Attachment Figure A.4-150

Thu, 14-MAR-2019 12:58:46

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

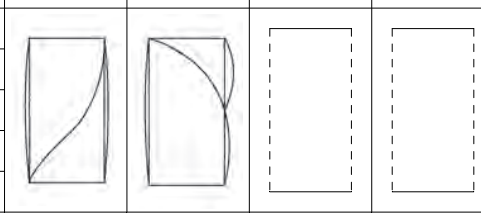




Symbol	⏲	△		
Sample No.	SL0673	SL0673		
Test No.	UU-2-1	UU-2-2		
Depth	6-8 ft	6-8 ft		
Tested by	trm	trm		
Test Date	12/26/18	12/26/18		
Checked by	njh	njh		
Check Date	2/28/19	2/28/19		
Diameter, in	2.85	2.83		
Height, in	6.6	6.9		
Water Content, %	18.1	17.9		
Dry Density, pcf	106.3	102.7		
Saturation, %	83.6	75.5		
Void Ratio	0.586	0.641		
Confining Stress, psi	4	7		
Undrained Strength, psi	5.184	8.382		
Max. Dev. Stress, psi	10.37	16.76		
Strain at Failure, %	15	15		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJSB036
Sample Type: intact
Description: Moist, gray sandy clay
Remarks: System W

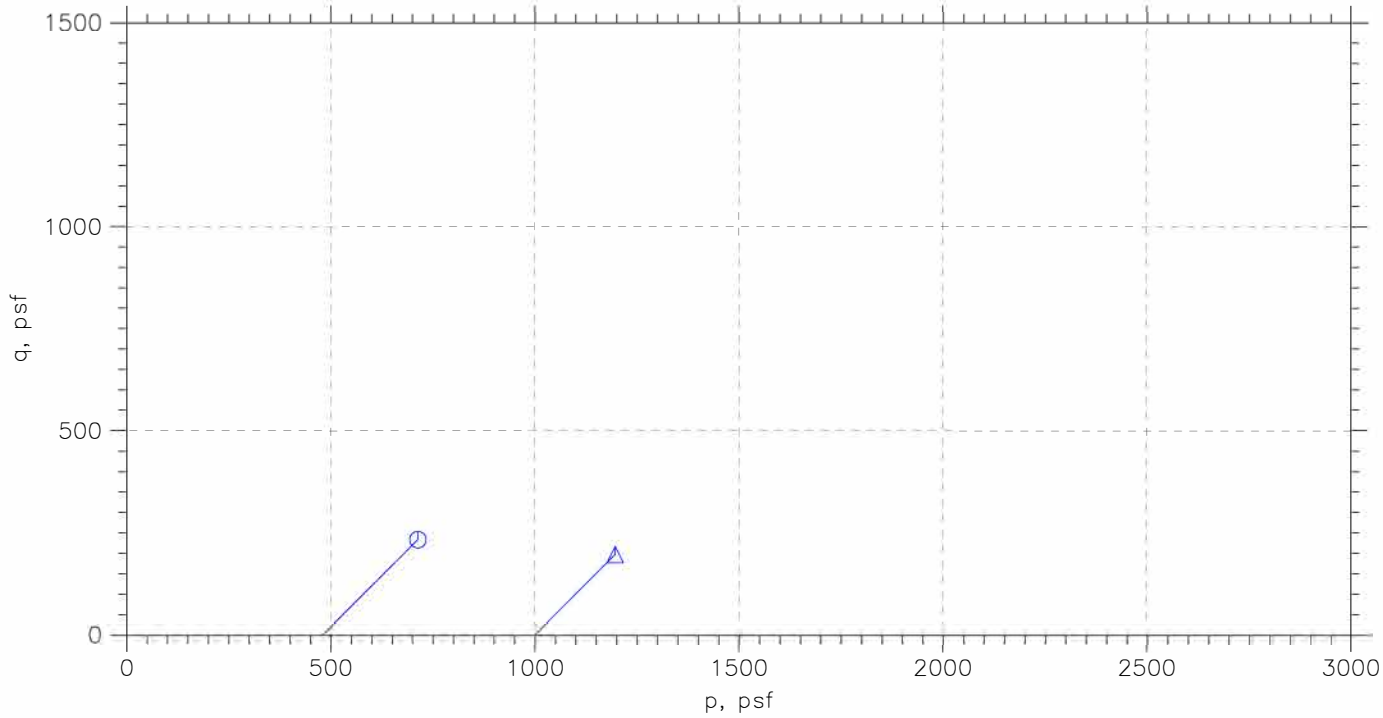


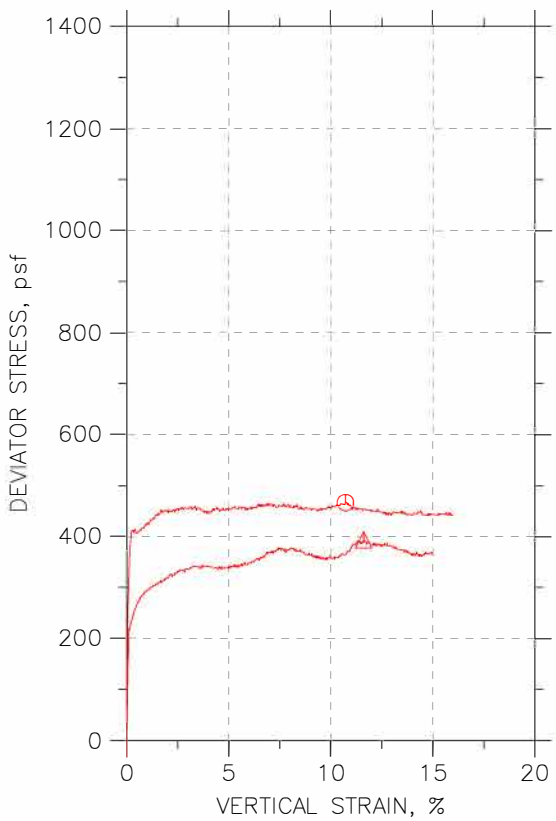
Phase calculations based on start and end of test.

Attachment Figure A.4-151

Thu, 28-FEB-2019 09:36:56

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

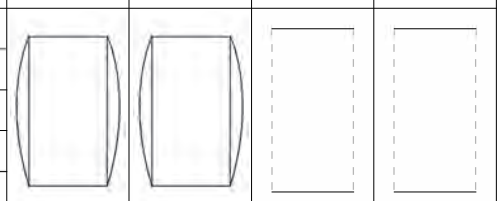




Symbol	⦶	△		
Sample No.	SL0662	SL-0662		
Test No.	UU-20-1	UU-20-2		
Depth	2-4 ft	2-4 ft		
Tested by	trm	trm		
Test Date	2/11/19	2/11/19		
Checked by	njh	njh		
Check Date	3/14/19	3/14/19		
Diameter, in	1.93	1.93		
Height, in	4.4	4.52		
Water Content, %	107.9	119.0		
Dry Density, pcf	40.29	38.15		
Saturation, %	91.5	94.0		
Void Ratio	3.18	3.42		
Confining Stress, psf	480	1000		
Undrained Strength, psf	233.2	196.6		
Max. Dev. Stress, psf	466.4	393.1		
Strain at Failure, %	10.7	11.6		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJSB037
Sample Type: intact
Description: Wet, gray silty clay
Remarks: System II

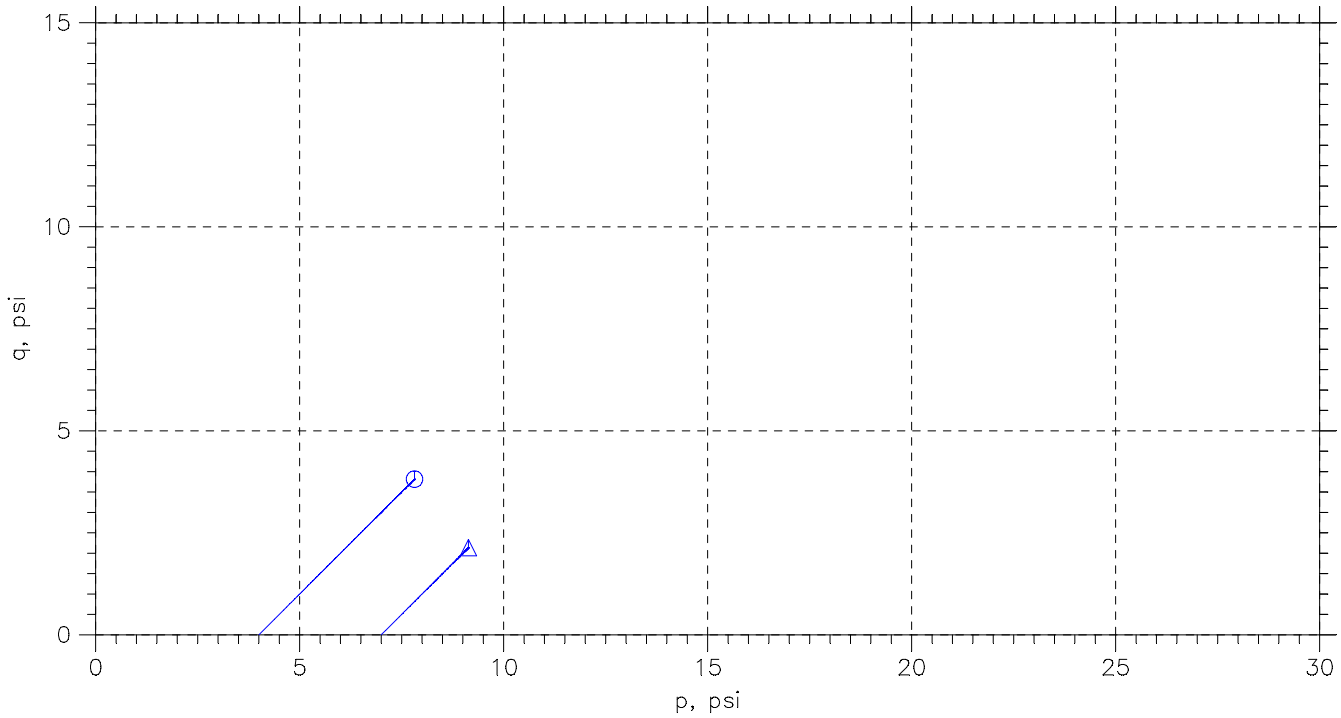


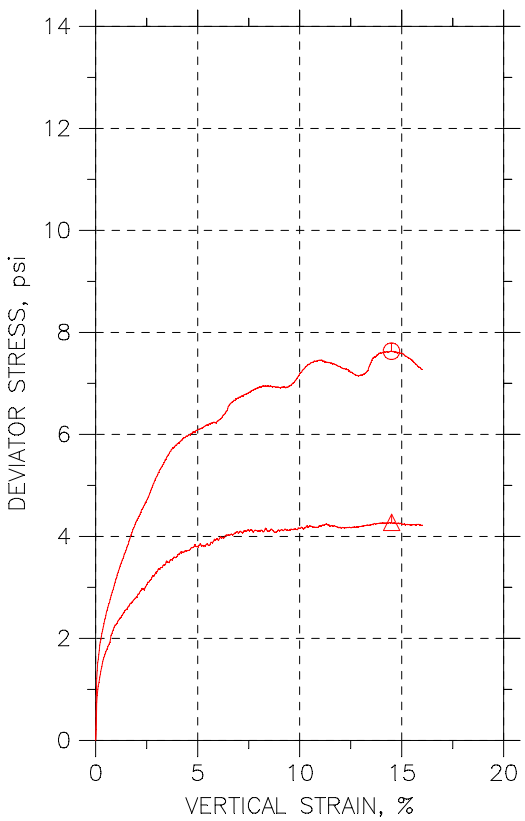
Phase calculations based on start and end of test.

Attachment Figure A.4-152

Thu, 14-MAR-2019 13:30:21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

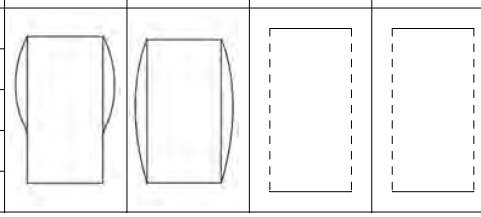




Symbol	⏲	△		
Sample No.	SL0663	SL0663		
Test No.	UU-3-1	UU-3-2		
Depth	8-10 ft	8-10 ft		
Tested by	trm	trm		
Test Date	12/26/18	12/26/18		
Checked by	njh	njh		
Check Date	2/28/19	2/28/19		
Diameter, in	2.83	2.84		
Height, in	5.75	5.95		
Water Content, %	25.9	24.1		
Dry Density, pcf	94.44	94.21		
Saturation, %	89.0	82.6		
Void Ratio	0.785	0.789		
Confining Stress, psi	4	7		
Undrained Strength, psi	3.815	2.137		
Max. Dev. Stress, psi	7.63	4.273		
Strain at Failure, %	14.5	14.5		
Strain Rate, %/min	1	1		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		
Plasticity Index	---	---		

GeoTesting EXPRESS

Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJSB037
Sample Type: intact
Description: Moist, gray sandy clay
Remarks: System W



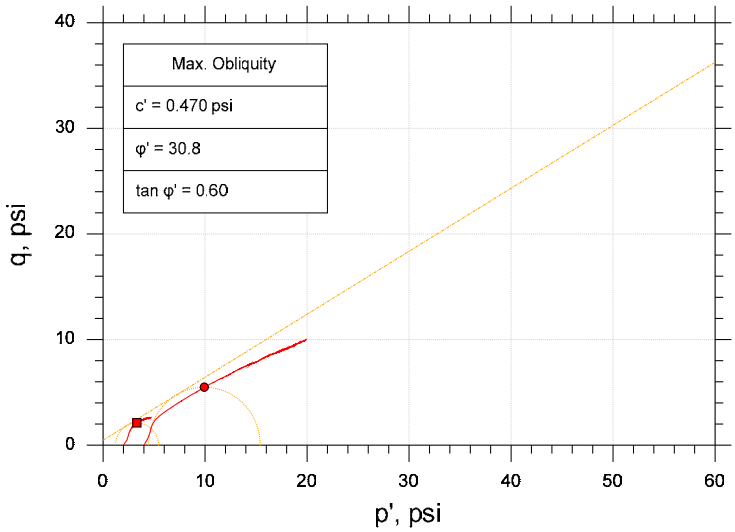
Phase calculations based on start and end of test.

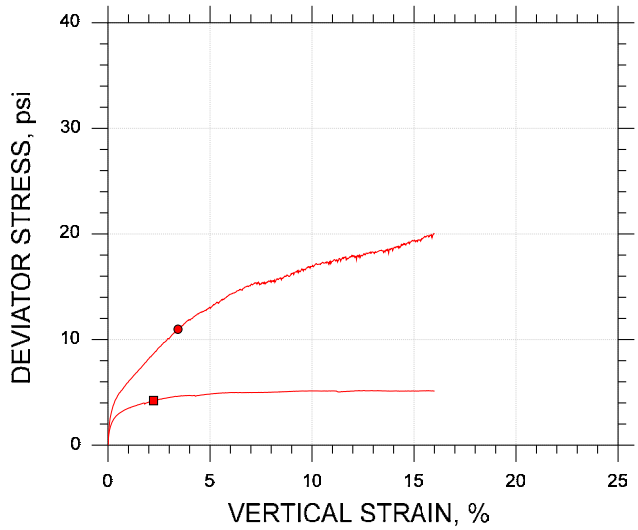
Attachment Figure A.4-153

Thu, 28-FEB-2019 11:05:41

Client: Anchor QEA, LLC	
Project Name: San Jacinto Pre-Design	
Project Location: ---	
Project Number: GTX-309154	
Tested By: trm	Checked By: njh
Boring ID: SJGB018	
Preparation: Intact	
Description: Moist, gray clay with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●		
Sample ID		SL0863	SL0863		
Depth, ft		12-14	12-14		
Test Number		CU-7-1	CU-7-2		
Initial	Height, in	6.100	6.070		
	Diameter, in	2.870	2.880		
	Moisture Content (from Cuttings), %	13.6	10.6		
	Dry Density, pcf	104.	111.		
	Saturation (Wet Method), %	58.8	54.4		
	Void Ratio	0.623	0.524		
Before Shear	Moisture Content, %	23.0	19.3		
	Dry Density, pcf	104.	111.		
	Cross-sectional Area (Method A), in²	6.450	6.499		
	Saturation, %	100.0	100.0		
	Void Ratio	0.620	0.520		
	Back Pressure, psi	126.9	145.0		
Vertical Effective Consolidation Stress, psi		1.996	4.000		
Horizontal Effective Consolidation Stress, psi		1.994	3.997		
Vertical Strain after Consolidation, %		-0.002507	0.04992		
Volumetric Strain after Consolidation, %		0.4965	0.2225		
Time to 50% Consolidation, min		---	0.2500		
Shear Strength, psi		2.108	5.487		
Strain at Failure, %		2.23	3.43		
Strain Rate, %/min		0.01600	0.01600		
Deviator Stress at Failure, psi		4.217	10.97		
Effective Minor Principal Stress at Failure, psi		1.220	4.437		
Effective Major Principal Stress at Failure, psi		5.437	15.41		
B-Value		0.95	0.95		

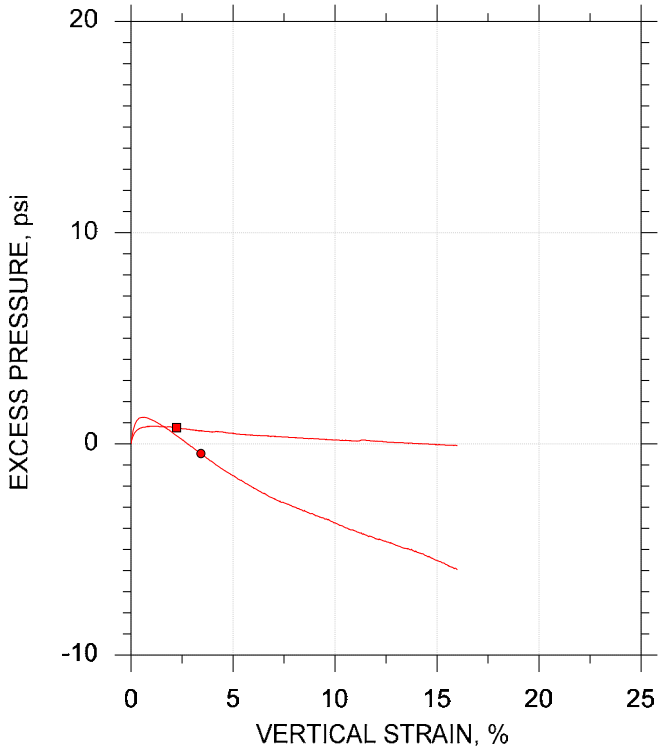
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

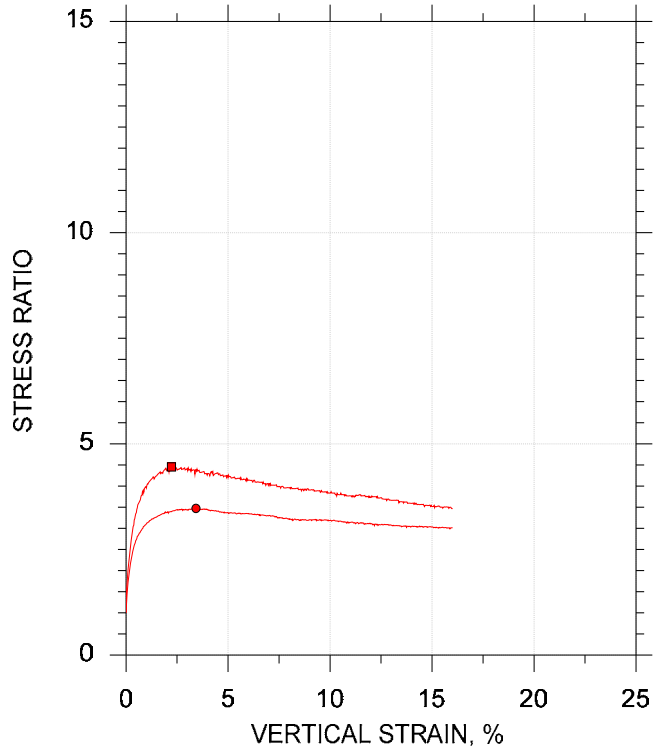
Remarks:

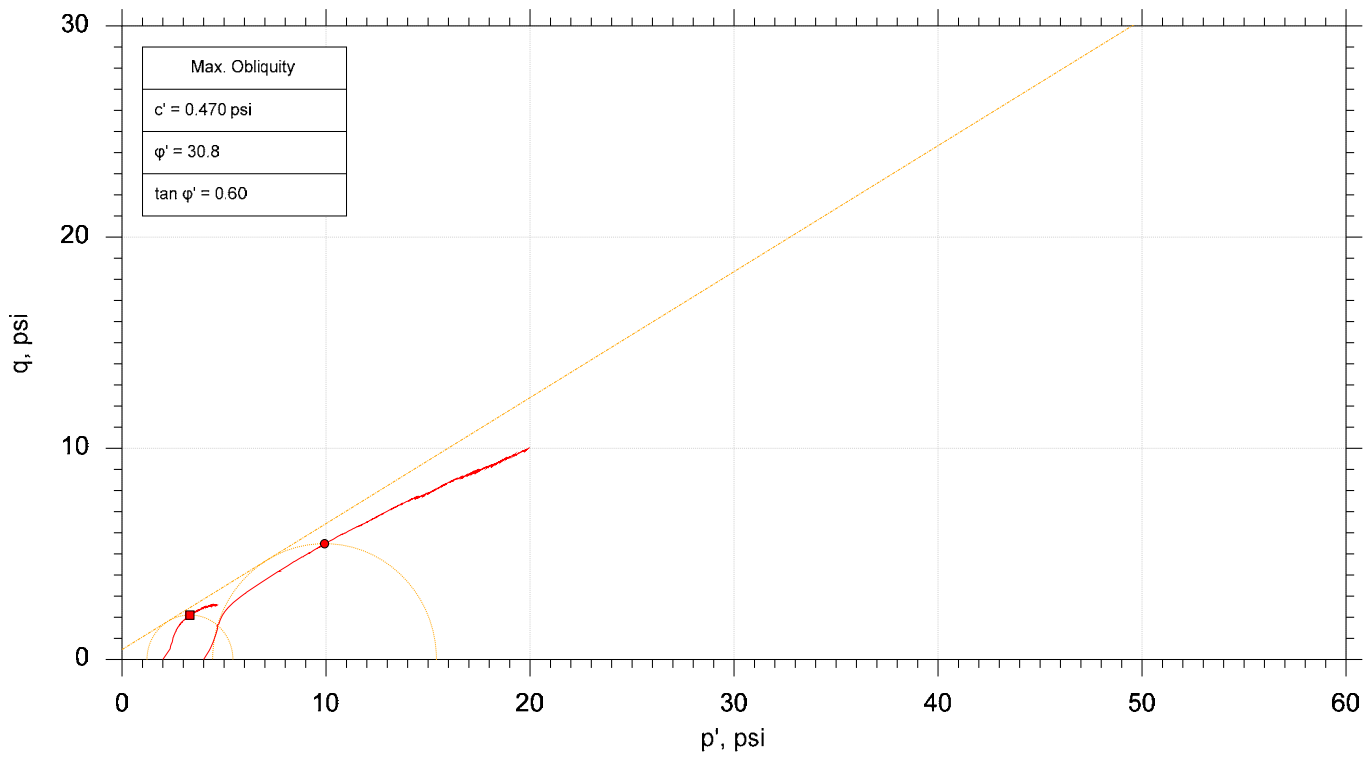
System T

Attachment Figure A.4-154

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	SL0863	CU-7-1	12-14	trm	3/7/19	njh	---	309154-CU-7-1n.dat
●	SL0863	CU-7-2	12-14	trm	3/7/19	njh	3/14/19	309154-CU-7-2n.dat

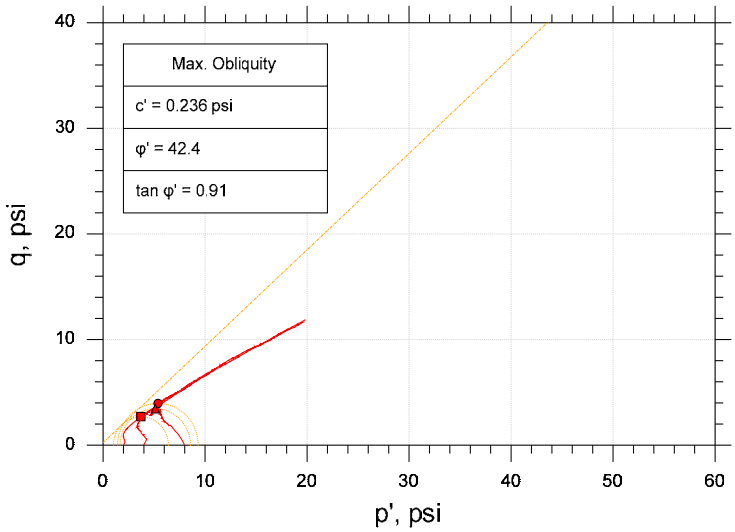
GeoTesting EXPRESS

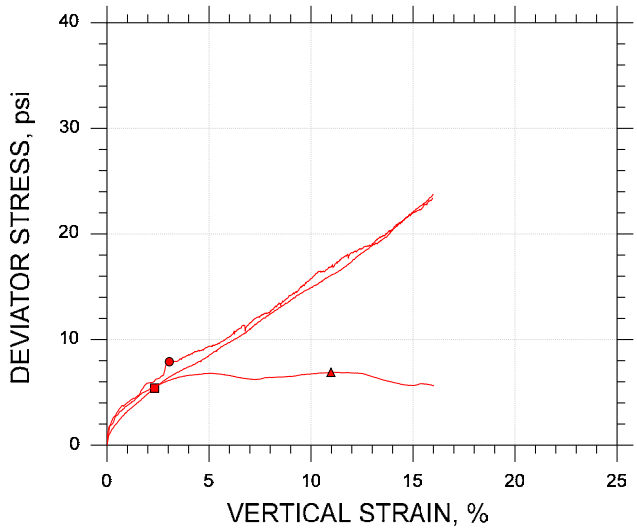
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Sample Type: Intact	
Description: Moist, gray clay with sand		
Remarks: System T		

Attachment Figure A.4-155

Client: Anchor QEA, LLC	
Project Name: San Jacinto Pre-Design	
Project Location: ---	
Project Number: GTX-309154	
Tested By: md	Checked By: njh
Boring ID: SJGB021	
Preparation: intact	
Description: Moist, gray clayey sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.65

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

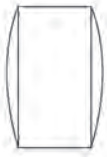




Symbol		■	●	▲
Sample ID		SL0824	SL0824	SL0824
Depth, ft		12-14	12-14	12-14
Test Number		CU-6-1	CU-6-2	CU-6-3
Initial	Height, in	3.000	3.310	2.820
	Diameter, in	1.410	1.410	1.410
	Moisture Content (from Cuttings), %	22.2	27.5	65.1
	Dry Density, pcf	104.	95.0	60.7
	Saturation (Wet Method), %	99.7	98.3	99.9
	Void Ratio	0.590	0.741	1.73
Before Shear	Moisture Content, %	21.6	21.5	57.2
	Dry Density, pcf	105.	105.	65.8
	Cross-sectional Area (Method A), in²	1.552	1.452	1.502
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.574	0.570	1.52
	Back Pressure, psi	114.5	149.9	150.7
Vertical Effective Consolidation Stress, psi		1.976	3.972	7.683
Horizontal Effective Consolidation Stress, psi		1.993	3.968	7.965
Vertical Strain after Consolidation, %		0.1773	0.007624	2.436
Volumetric Strain after Consolidation, %		0.2409	0.7632	2.804
Time to 50% Consolidation, min		---	---	90.00
Shear Strength, psi		2.703	3.947	3.451
Strain at Failure, %		2.33	3.05	11.0
Strain Rate, %/min		0.01600	0.01600	0.01600
Deviator Stress at Failure, psi		5.405	7.895	6.902
Effective Minor Principal Stress at Failure, psi		1.006	1.430	1.666
Effective Major Principal Stress at Failure, psi		6.411	9.325	8.568
B-Value		0.97	0.95	0.95

Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

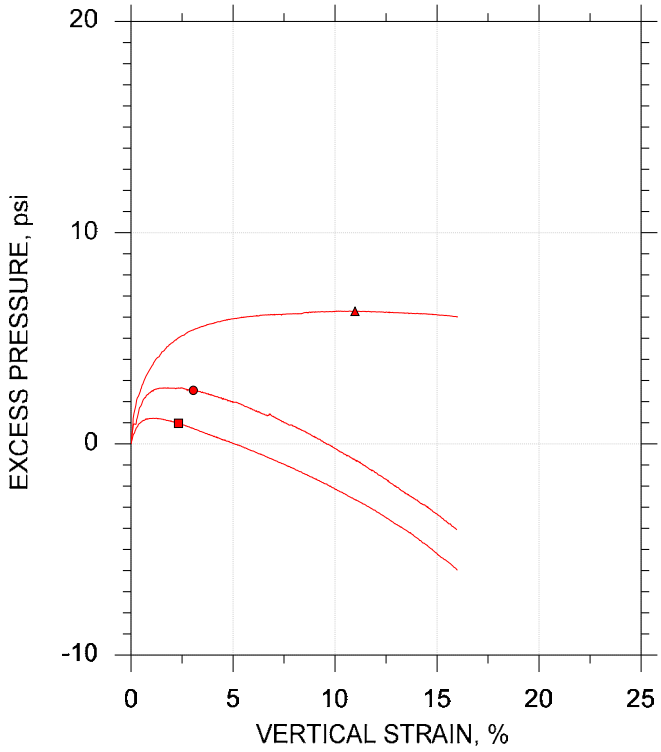
Remarks:

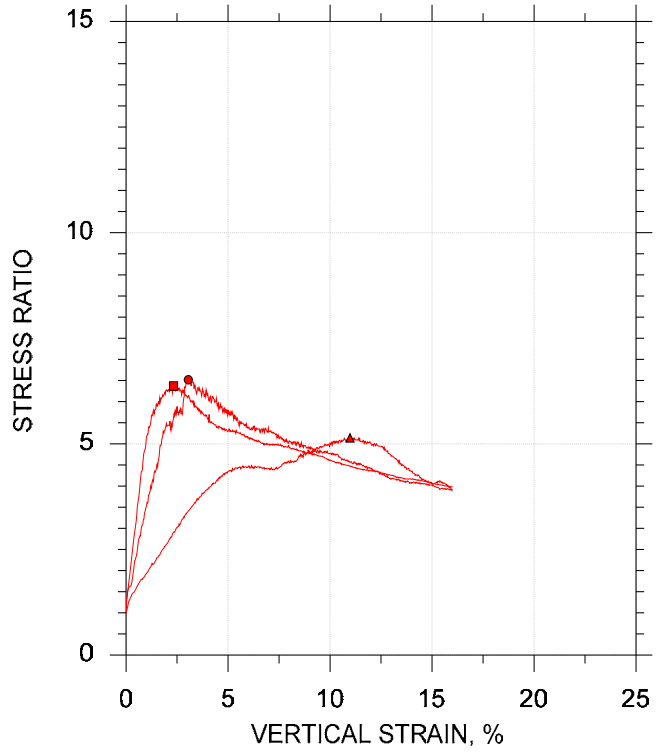


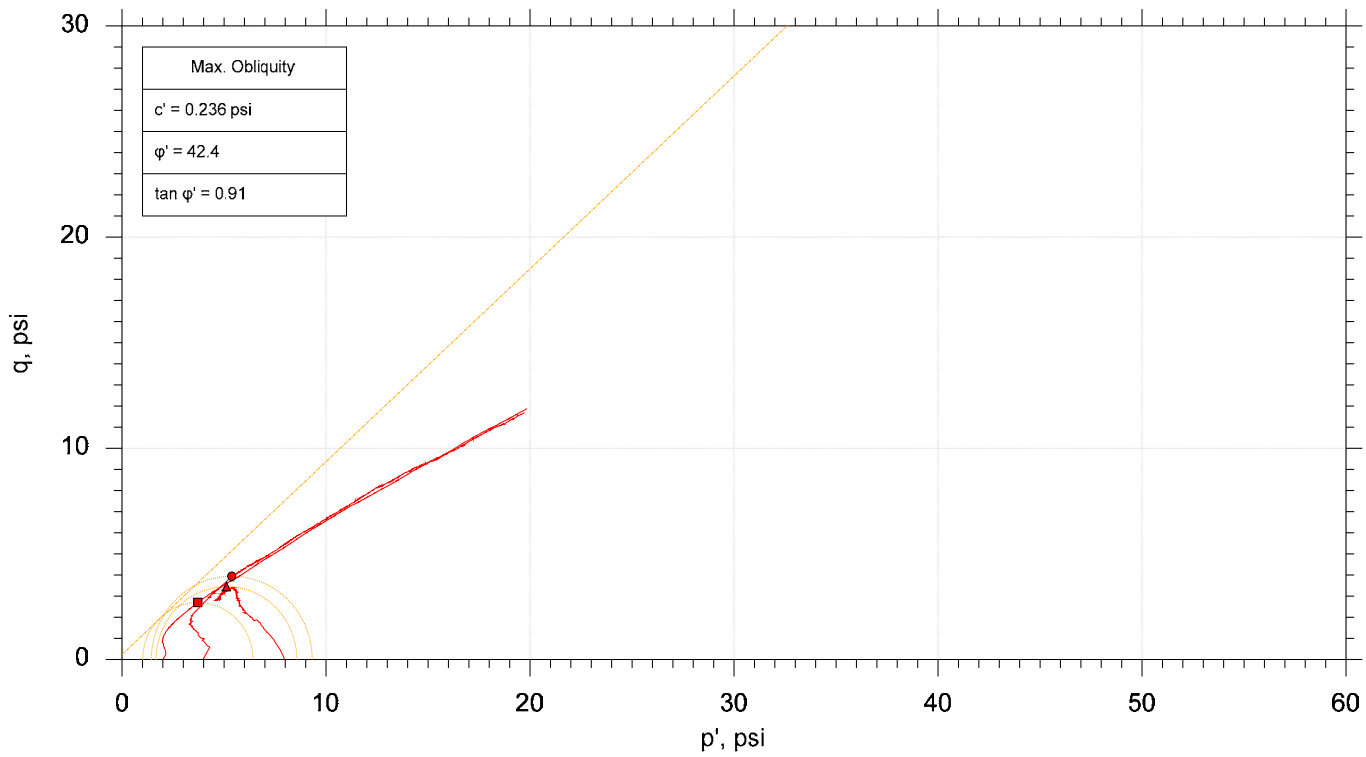
System E

Attachment Figure A.4-156

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	SL0824	CU-6-1	12-14	md	01/15/19	njh	2/5/19	309154-CU-6-1n.dat
●	SL0824	CU-6-2	12-14	md	01/15/19	njh	2/5/19	309154-CU-6-2n.dat
▲	SL0824	CU-6-3	12-14	md	01/15/19	njh	2/5/19	309154-CU-6-3n.dat

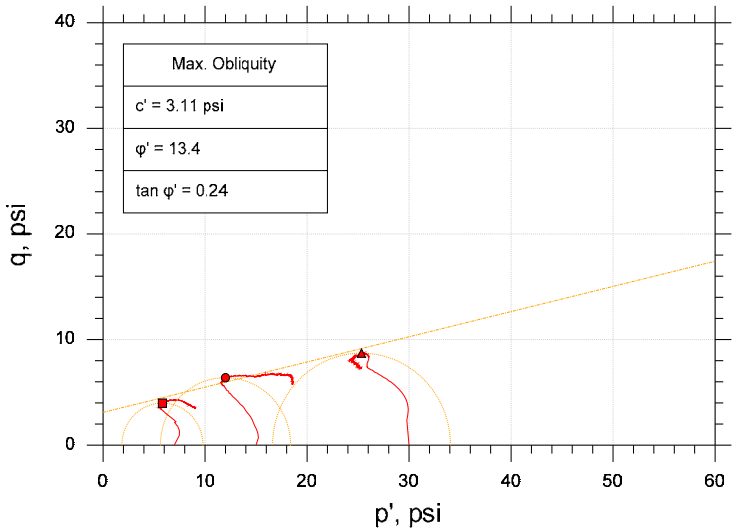
GeoTesting EXPRESS

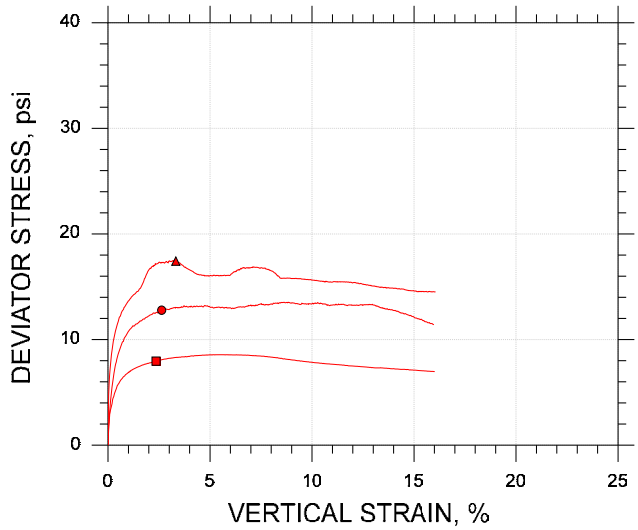
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Sample Type: intact	
Description: Moist, gray clayey sand		
Remarks: System E		

Attachment Figure A.4-157

Client: Anchor QEA, LLC	
Project Name: San Jacinto Pre-Design	
Project Location: ---	
Project Number: GTX-309154	
Tested By: md	Checked By: njh
Boring ID: SJGB-021	
Preparation: intact	
Description: Moist , reddish brown and gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲
Sample ID		SL0829	SL0829	SL0829
Depth, ft		39-41	39-41	39-41
Test Number		CU-5-1	CU-5-2	CU-5-3
Initial	Height, in	4.400	4.420	4.470
	Diameter, in	2.030	2.020	1.990
	Moisture Content (from Cuttings), %	36.7	35.0	36.0
	Dry Density, pcf	84.1	81.2	80.2
	Saturation (Wet Method), %	98.7	87.9	88.4
	Void Ratio	1.00	1.07	1.10
Before Shear	Moisture Content, %	37.1	37.7	39.0
	Dry Density, pcf	84.2	83.5	82.1
	Cross-sectional Area (Method A), in²	3.236	3.139	3.071
	Saturation, %	100.0	100.0	100.0
	Void Ratio	1.00	1.02	1.05
	Back Pressure, psi	150.7	150.7	150.6
Vertical Effective Consolidation Stress, psi		6.975	14.99	29.94
Horizontal Effective Consolidation Stress, psi		6.991	14.99	30.00
Vertical Strain after Consolidation, %		0.2258	0.03834	0.6596
Volumetric Strain after Consolidation, %		0.3596	0.7104	1.078
Time to 50% Consolidation, min		---	---	72.00
Shear Strength, psi		3.976	6.388	8.717
Strain at Failure, %		2.35	2.63	3.32
Strain Rate, %/min		0.01600	0.01600	0.01600
Deviator Stress at Failure, psi		7.953	12.78	17.43
Effective Minor Principal Stress at Failure, psi		1.840	5.616	16.62
Effective Major Principal Stress at Failure, psi		9.793	18.39	34.05
B-Value		0.95	0.95	0.94

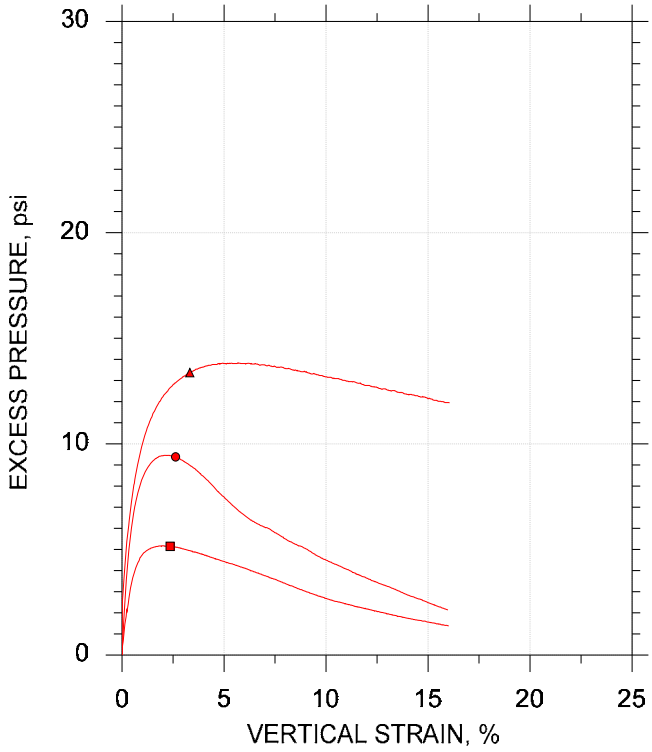
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

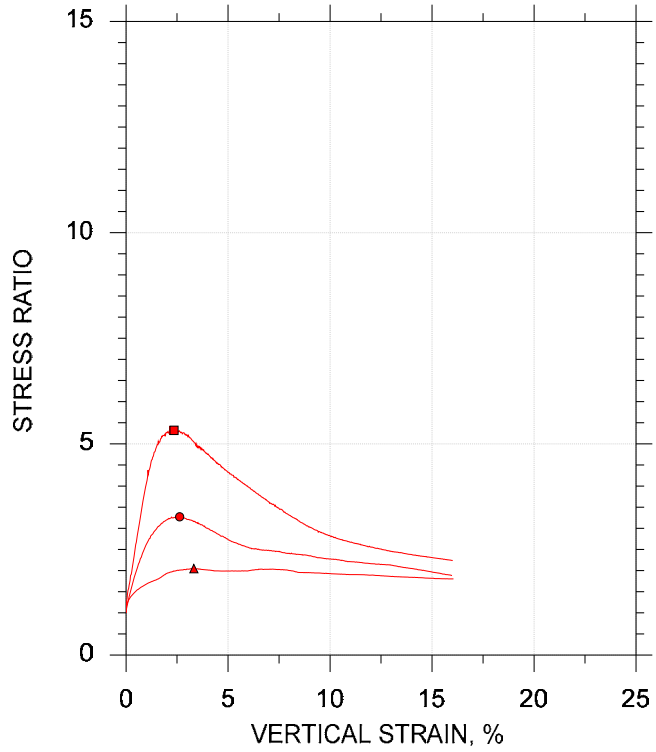
Remarks:

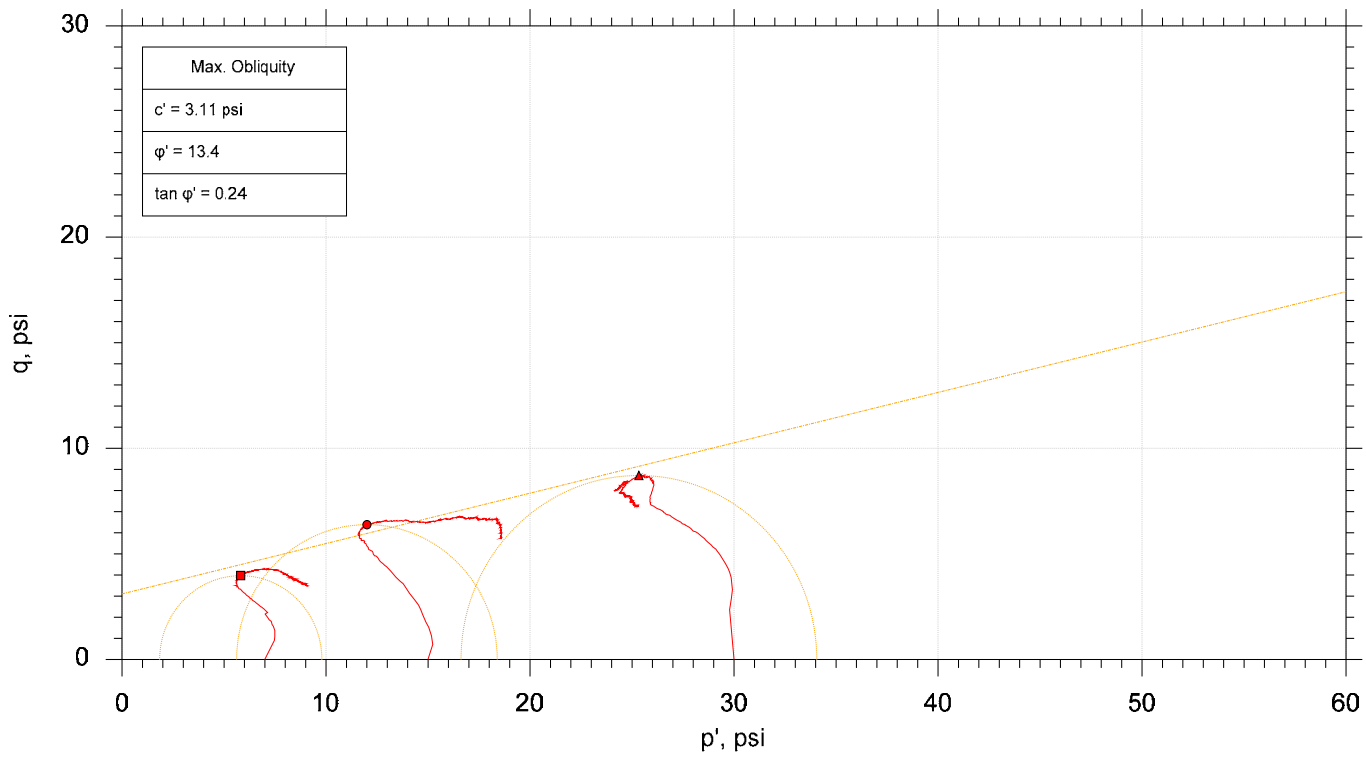
System Q

Attachment Figure A.4-158

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	SL0829	CU-5-1	39-41	md	01/15/19	njh	2/5/19	309154-CU-5-1n.dat
●	SL0829	CU-5-2	39-41	md	01/15/19	njh	2/5/19	309154-CU-5-2n.dat
▲	SL0829	CU-5-3	39-41	md	01/11/19	njh	2/5/19	309154-CU-5-3n.dat

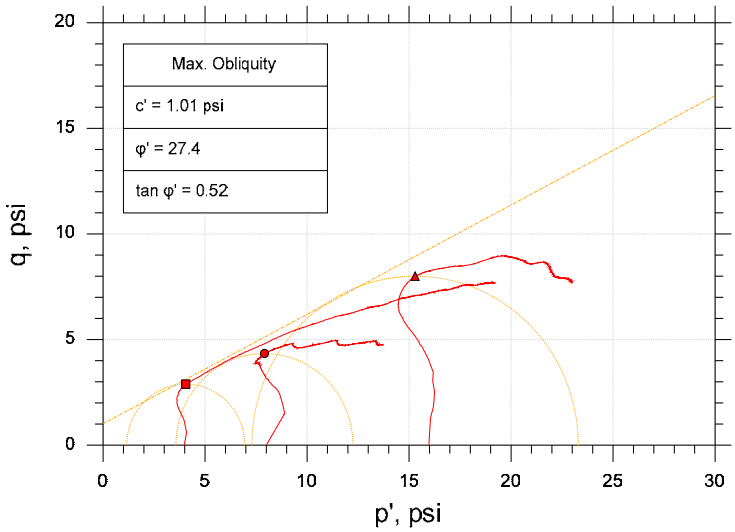
GeoTesting EXPRESS

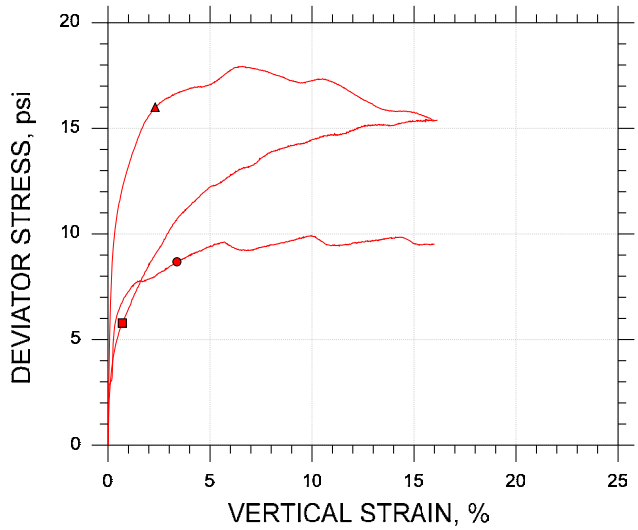
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB-021	Sample Type: intact	
Description: Moist , reddish brown and gray clay		
Remarks: System Q		

Attachment Figure A.4-159

Client: Anchor QEA, LLC	
Project Name: San Jacinto Pre-Design	
Project Location: ---	
Project Number: GTX-309154	
Tested By: md	Checked By: njh
Boring ID: SJGB018	
Preparation: intact	
Description: Moist, reddish brown clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		SL0868	SL0868	SL0868	
Depth, ft		25-27	25-27	25-27	
Test Number		CU-4-1	CU-4-2	CU-4-3	
Initial	Height, in	4.500	4.520	4.600	
	Diameter, in	2.020	2.030	2.030	
	Moisture Content (from Cuttings), %	25.7	27.0	28.9	
	Dry Density, pcf	97.5	92.1	90.4	
	Saturation (Wet Method), %	95.0	87.7	90.2	
	Void Ratio	0.729	0.831	0.865	
Before Shear	Moisture Content, %	26.1	31.2	31.3	
	Dry Density, pcf	98.8	91.6	91.4	
	Cross-sectional Area (Method A), in²	3.176	3.243	3.215	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.705	0.841	0.845	
	Back Pressure, psi	163.3	150.4	150.7	
Vertical Effective Consolidation Stress, psi		3.976	8.020	15.96	
Horizontal Effective Consolidation Stress, psi		3.980	7.998	15.96	
Vertical Strain after Consolidation, %		0.09279	0.001025	0.3482	
Volumetric Strain after Consolidation, %		0.2028	0.5529	0.7681	
Time to 50% Consolidation, min		---	---	90.00	
Shear Strength, psi		2.892	4.341	8.001	
Strain at Failure, %		0.700	3.38	2.31	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		5.783	8.682	16.00	
Effective Minor Principal Stress at Failure, psi		1.161	3.572	7.293	
Effective Major Principal Stress at Failure, psi		6.944	12.25	23.29	
B-Value		0.97	0.95	0.97	

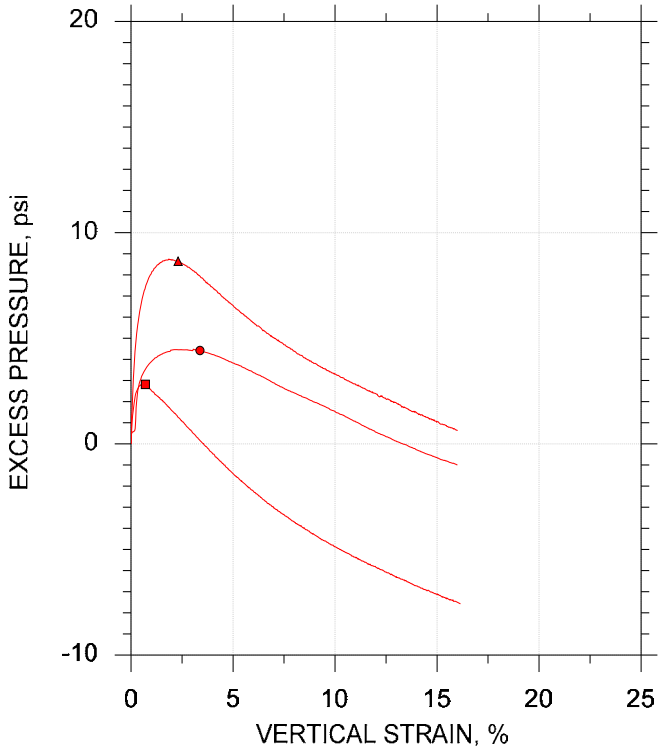
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

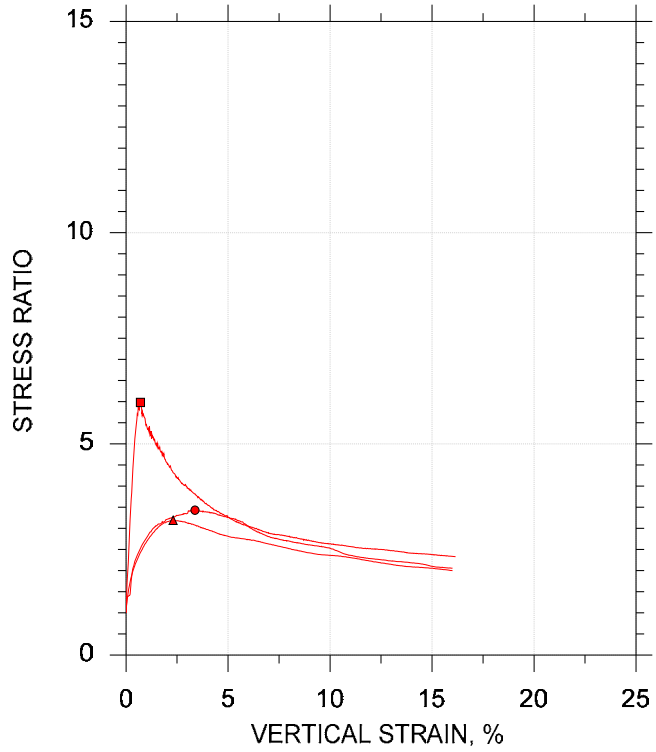
Remarks:

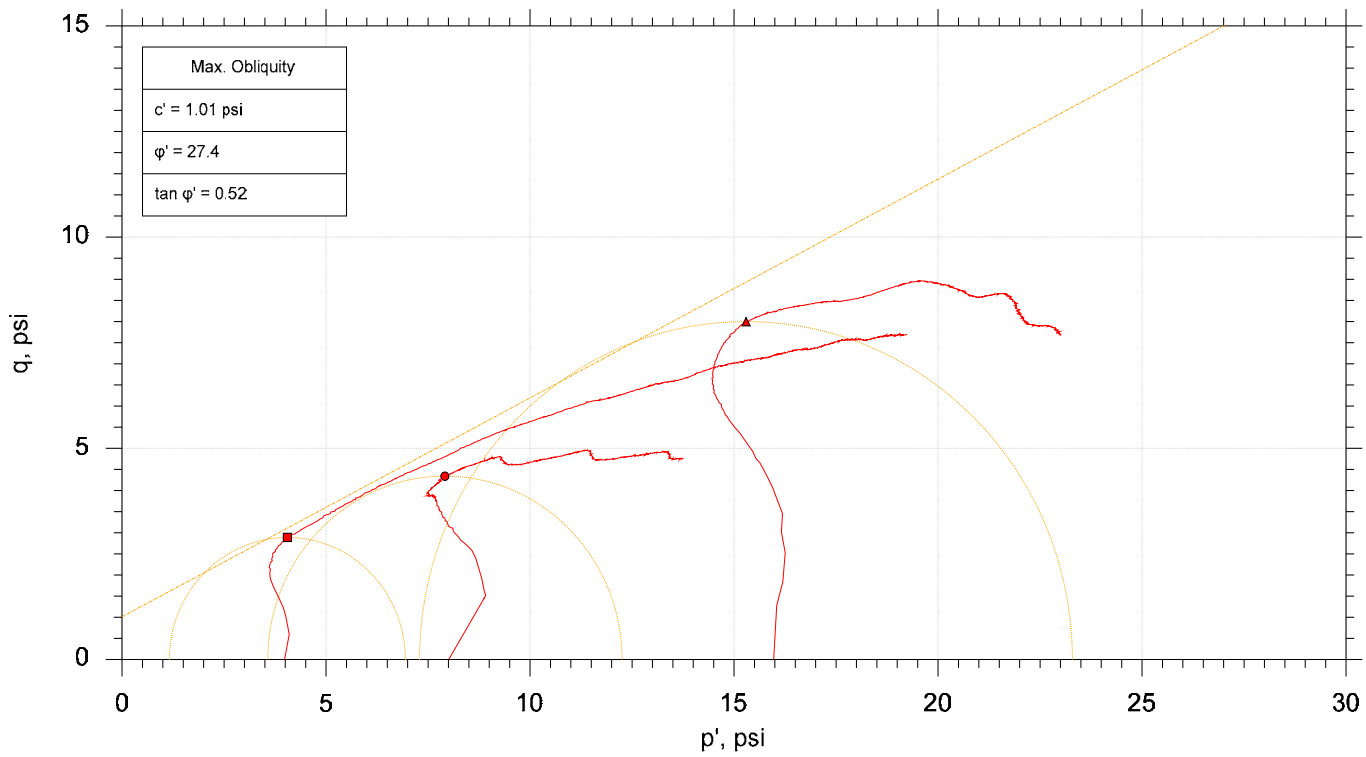
System LL

Attachment Figure A.4-160

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	SL0868	CU-4-1	25-27	md	01/11/19	njh	2/5/19	309154-CU-4-1n.dat
●	SL0868	CU-4-2	25-27	md	01/11/19	njh	2/5/19	309154-CU-4-2n.dat
▲	SL0868	CU-4-3	25-27	md	01/11/19	njh	2/5/19	309154-CU-4-3n.dat

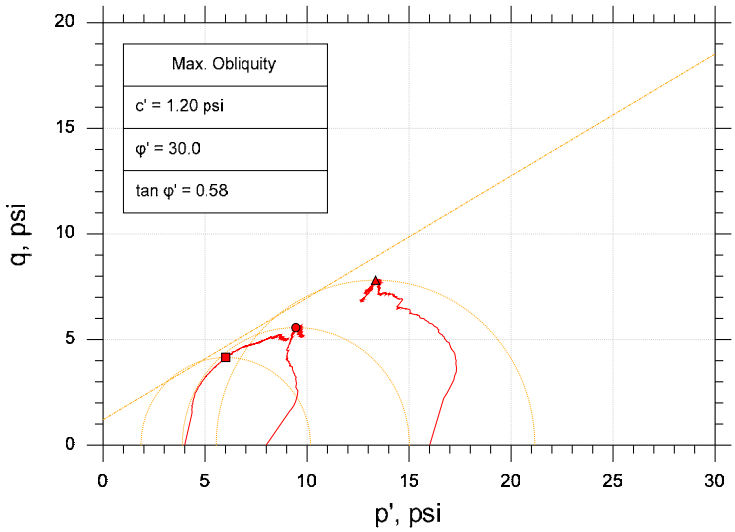
GeoTesting EXPRESS

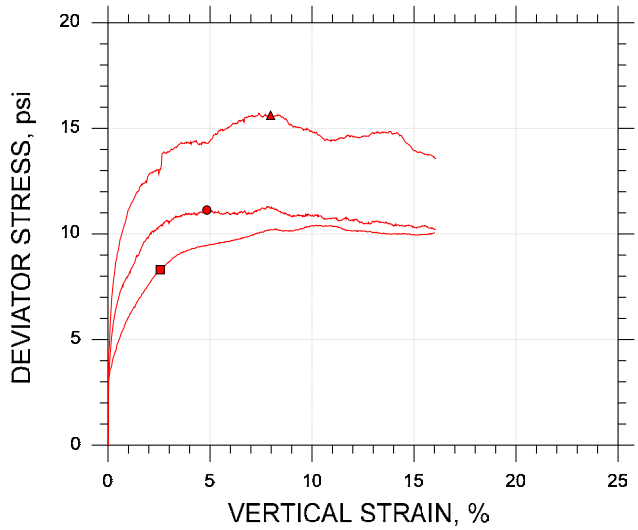
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Sample Type: intact	
Description: Moist, reddish brown clay		
Remarks: System LL		

Attachment Figure A.4-161

Client: Anchor QEA, LLC	
Project Name: San Jacinto Pre-Design	
Project Location: ---	
Project Number: GTX-309154	
Tested By: md	Checked By: njh
Boring ID: SJSB025	
Preparation: intact	
Description: Moist, black clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.8

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲
Sample ID		SL1042	SL1042	SL1042
Depth, ft		16-18	16-18	16-18
Test Number		CU-3-1	CU-3-2	CU-3-3
Initial	Height, in	3.080	3.250	3.240
	Diameter, in	1.410	1.410	1.410
	Moisture Content (from Cuttings), %	39.7	37.3	38.4
	Dry Density, pcf	82.7	85.3	84.2
	Saturation (Wet Method), %	99.9	99.6	99.8
	Void Ratio	1.11	1.05	1.08
Before Shear	Moisture Content, %	39.6	37.1	37.6
	Dry Density, pcf	82.9	85.8	85.2
	Cross-sectional Area (Method A), in²	1.560	1.560	1.552
	Saturation, %	100.0	100.0	100.0
	Void Ratio	1.11	1.04	1.05
	Back Pressure, psi	149.8	150.7	150.4
Vertical Effective Consolidation Stress, psi		3.972	7.956	15.96
Horizontal Effective Consolidation Stress, psi		3.997	7.994	16.01
Vertical Strain after Consolidation, %		0.2295	0.3525	0.4944
Volumetric Strain after Consolidation, %		0.5639	0.2645	0.9214
Time to 50% Consolidation, min		---	---	56.00
Shear Strength, psi		4.153	5.566	7.810
Strain at Failure, %		2.56	4.84	7.97
Strain Rate, %/min		0.01600	0.01600	0.01600
Deviator Stress at Failure, psi		8.305	11.13	15.62
Effective Minor Principal Stress at Failure, psi		1.863	3.882	5.546
Effective Major Principal Stress at Failure, psi		10.17	15.01	21.17
B-Value		0.95	0.95	0.94

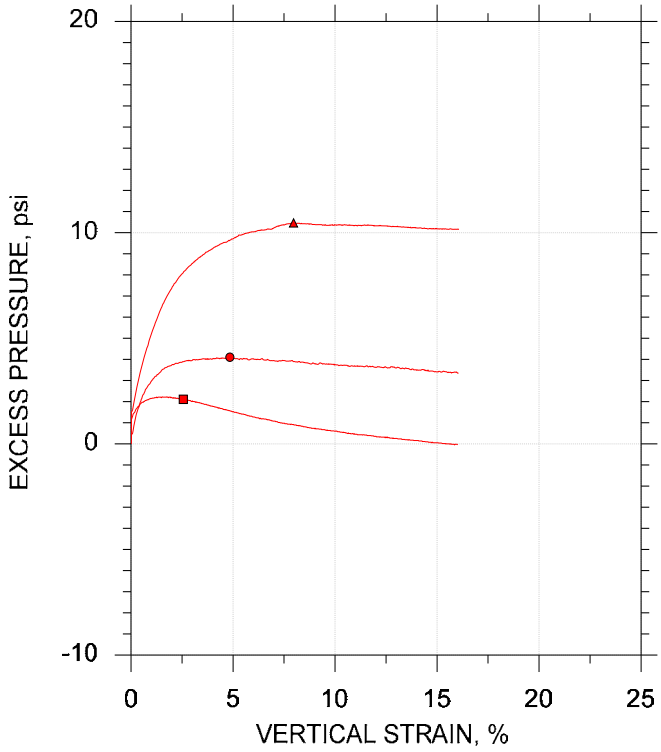
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

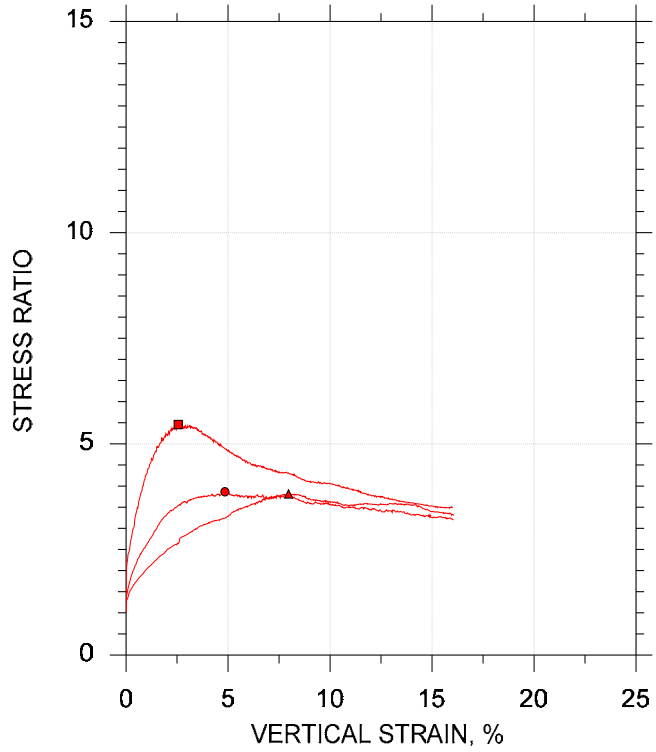
Remarks:

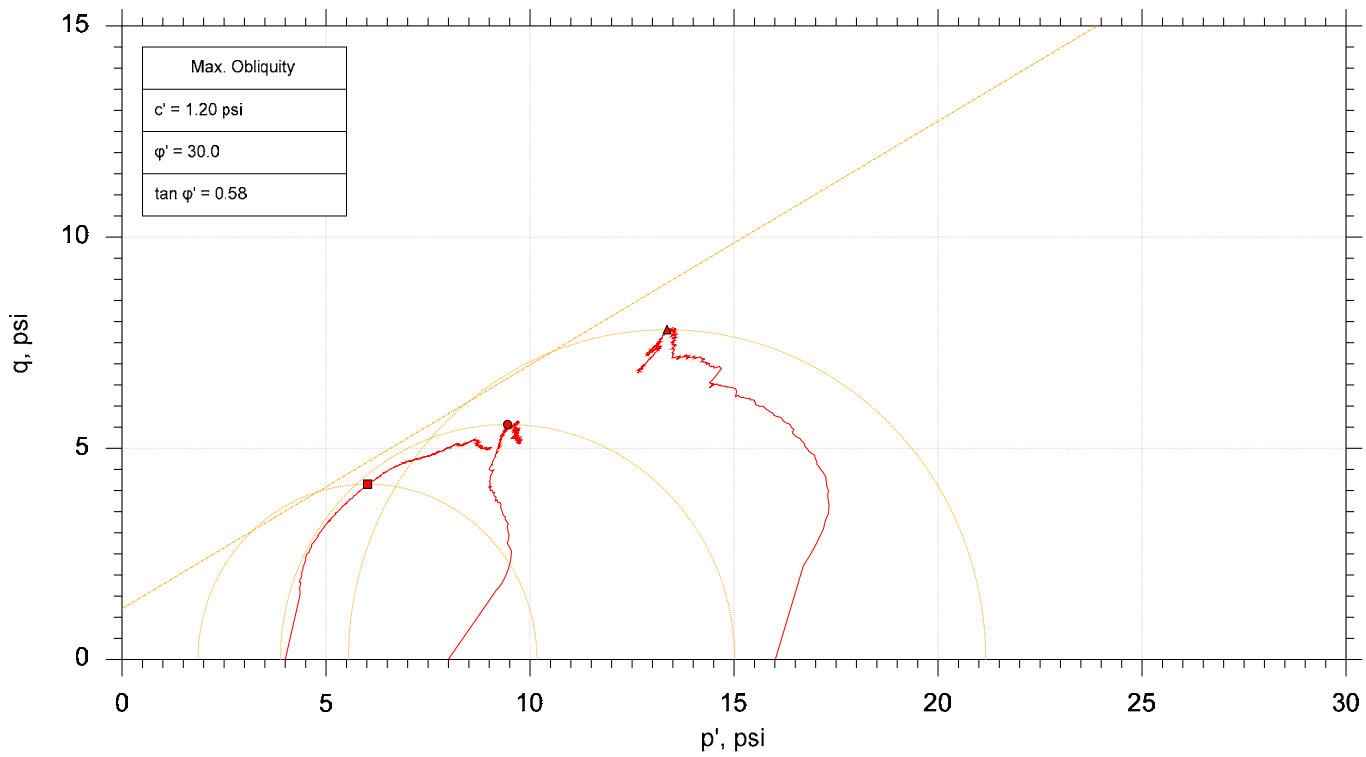
System K

Attachment Figure A.4-162

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	SL1042	CU-3-1	16-18	md	01/04/19	njh	2/5/19	309154-CU-3-1n.dat
●	SL1042	CU-3-2	16-18	md	01/04/19	njh	2/5/19	309154-CU-3-2n.dat
▲	SL1042	CU-3-3	16-18	md	01/04/19	njh	2/5/19	309154-CU-3-3n.dat

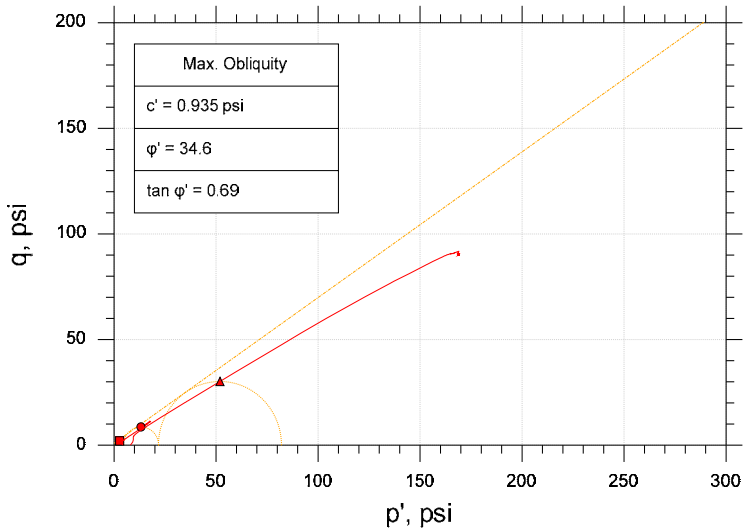
GeoTesting EXPRESS

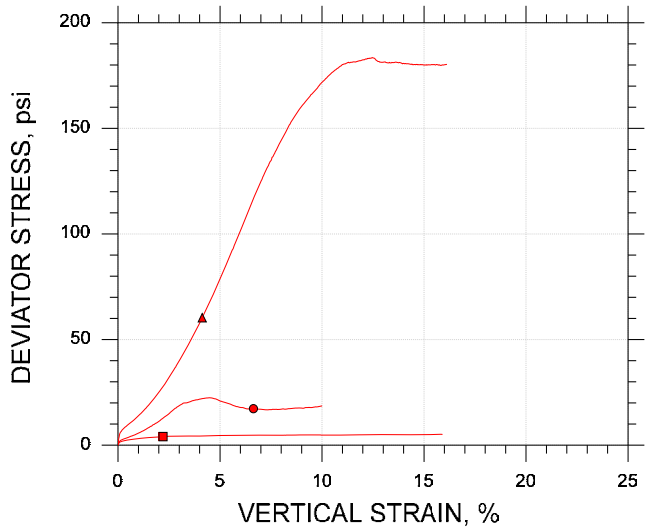
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Sample Type: intact	
Description: Moist, black clay		
Remarks: System K		

Attachment Figure A.4-163

Client: Anchor QEA, LLC	
Project Name: San Jacinto Pre-Design	
Project Location: ---	
Project Number: GTX-309154	
Tested By: trm	Checked By: njh
Boring ID: SJSB034	
Preparation: intact	
Description: Moist, gray sand with clay and shells	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



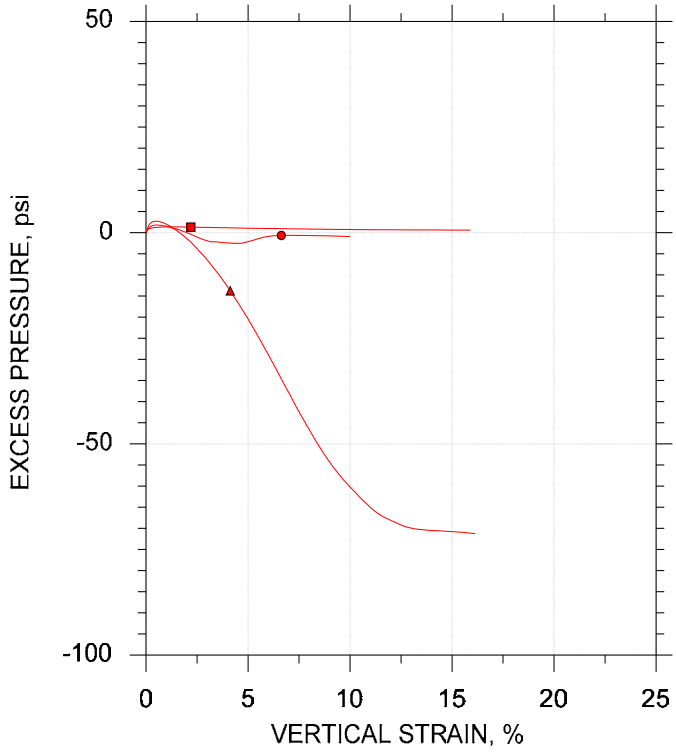


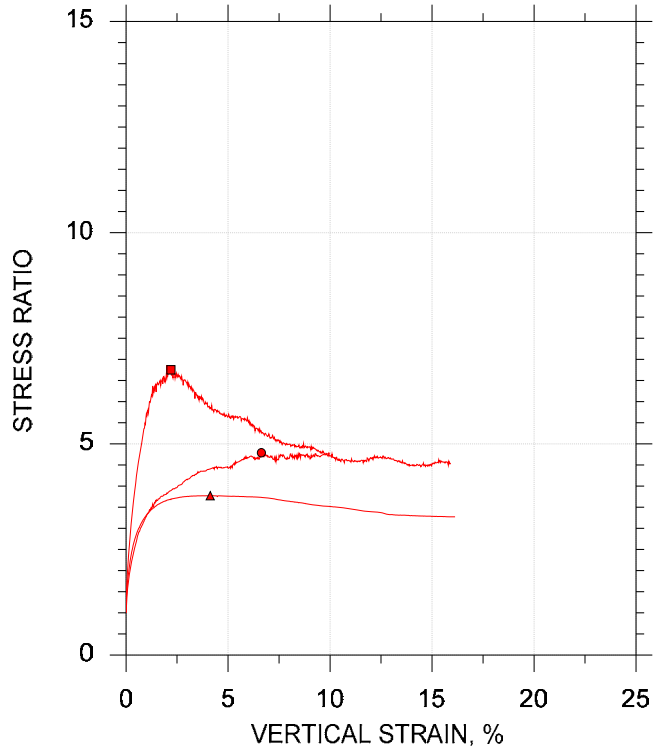
Symbol		■	●	▲
Sample ID		SL0639	SL0639	SL0639
Depth, ft		10-12	10-12	10-12
Test Number		CU-1-1	CU-1-2	CU-1-3
Initial	Height, in	6.100	6.350	6.250
	Diameter, in	2.860	2.870	2.860
	Moisture Content (from Cuttings), %	19.1	13.5	23.7
	Dry Density, pcf	98.8	108.	103.
	Saturation (Wet Method), %	73.0	64.8	99.9
	Void Ratio	0.707	0.561	0.642
Before Shear	Moisture Content, %	25.7	23.0	23.5
	Dry Density, pcf	99.5	104.	103.
	Cross-sectional Area (Method A), in²	6.374	6.721	6.392
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.694	0.622	0.634
	Back Pressure, psi	87.95	38.99	151.0
Vertical Effective Consolidation Stress, psi		2.056	4.006	8.011
Horizontal Effective Consolidation Stress, psi		2.052	4.005	8.003
Vertical Strain after Consolidation, %		0.001646	0.02871	0.0007690
Volumetric Strain after Consolidation, %		0.8510	-3.807	0.6056
Time to 50% Consolidation, min		---	---	0.3600
Shear Strength, psi		2.023	8.633	30.17
Strain at Failure, %		2.20	6.63	4.13
Strain Rate, %/min		0.01600	0.01600	0.01600
Deviator Stress at Failure, psi		4.046	17.27	60.35
Effective Minor Principal Stress at Failure, psi		0.7033	4.555	21.75
Effective Major Principal Stress at Failure, psi		4.750	21.82	82.09
B-Value		0.95	0.95	0.96

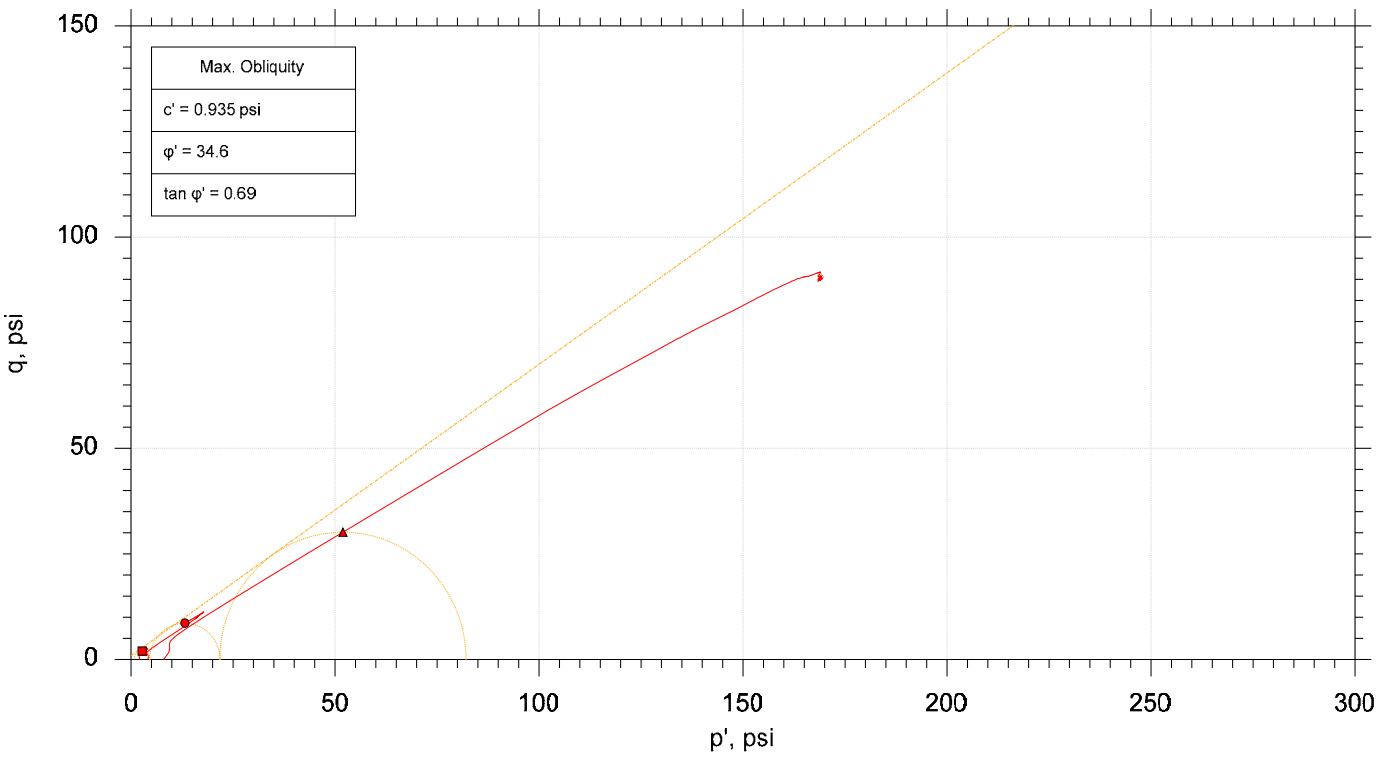
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

Remarks:

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	SL0639	CU-1-1	10-12	trm	12/26/18	njh	2/5/19	309154-CU-1-1n.dat
●	SL0639	CU-1-2	10-12	trm	12/26/18	njh	2/5/19	309154-CU-1-2n.dat
▲	SL0639	CU-1-3	10-12	trm	12/26/18	njh	2/5/19	309154-CU-1-3n.dat

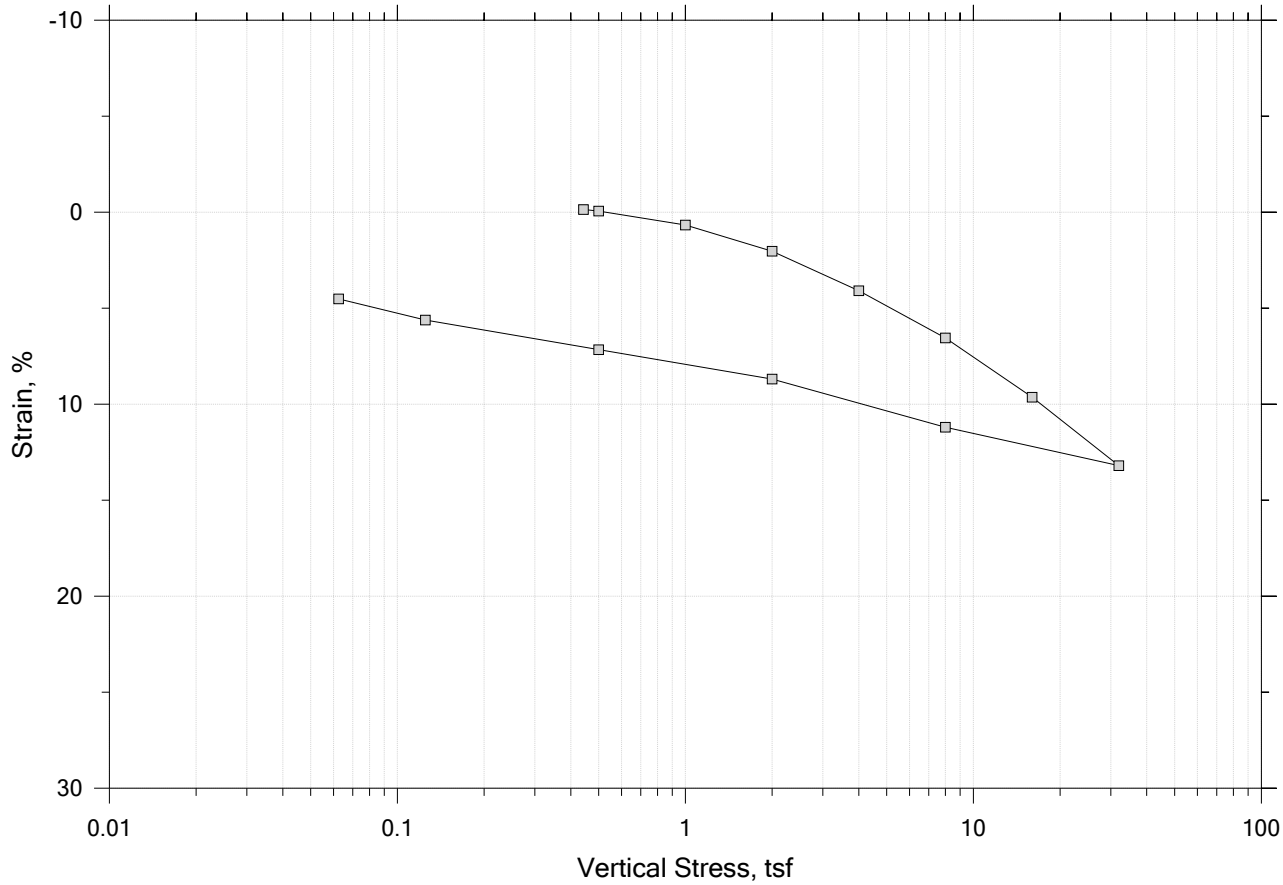
GeoTesting EXPRESS

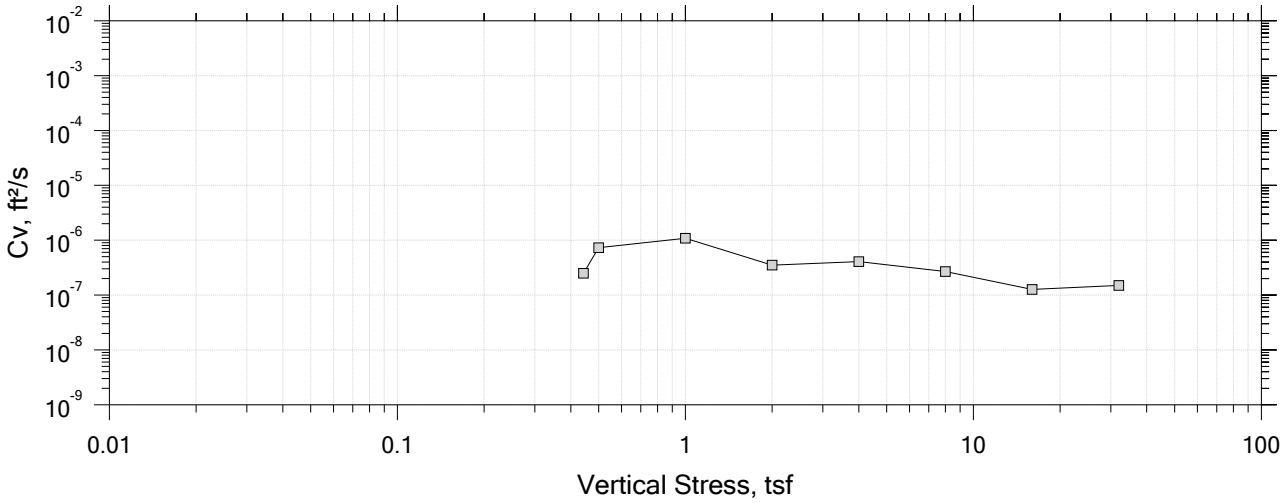
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB034	Sample Type: intact	
Description: Moist, gray sand with clay and shells		
Remarks: System Q		

Attachment Figure A.4-165

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





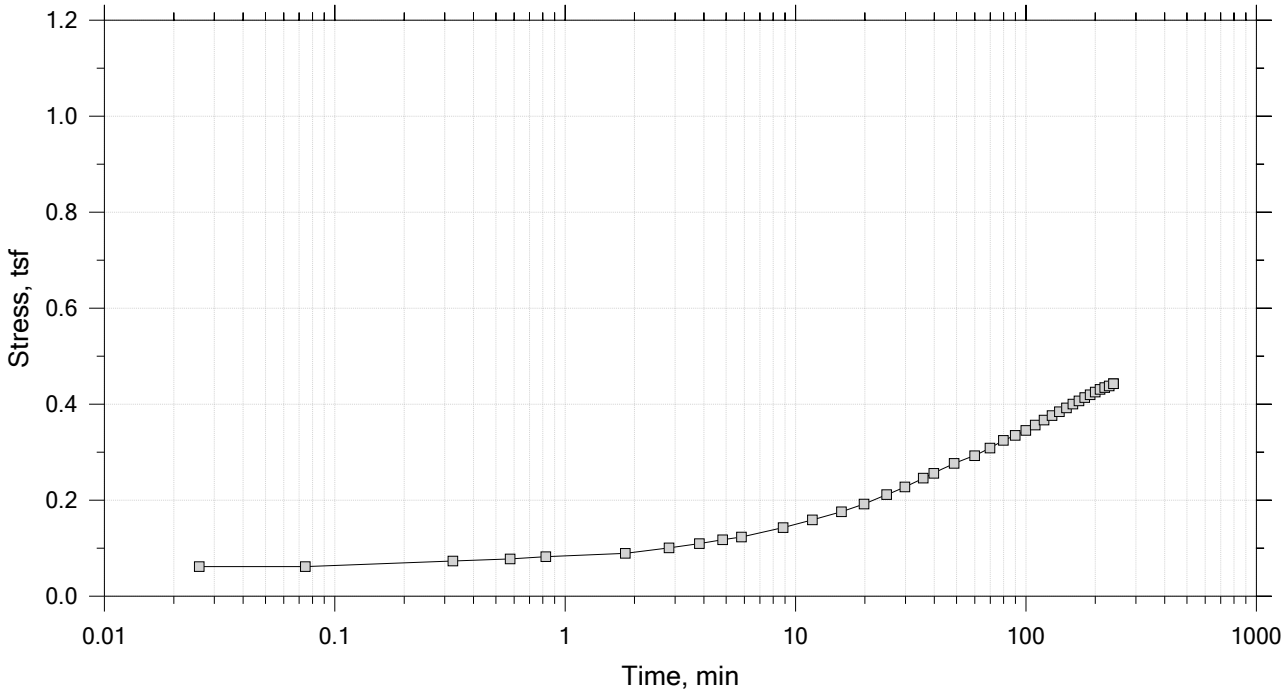
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		
Displacement at End of Increment		

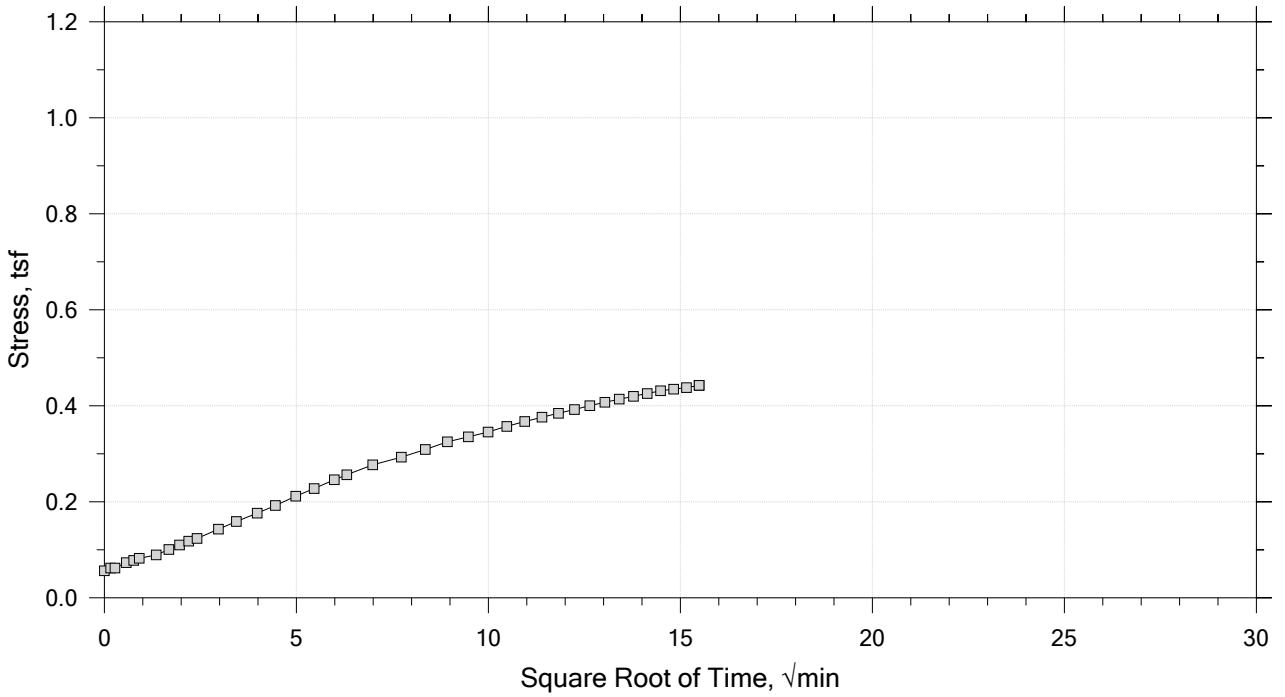
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 13

Constant Volume Step

Stress: 0.443 tsf





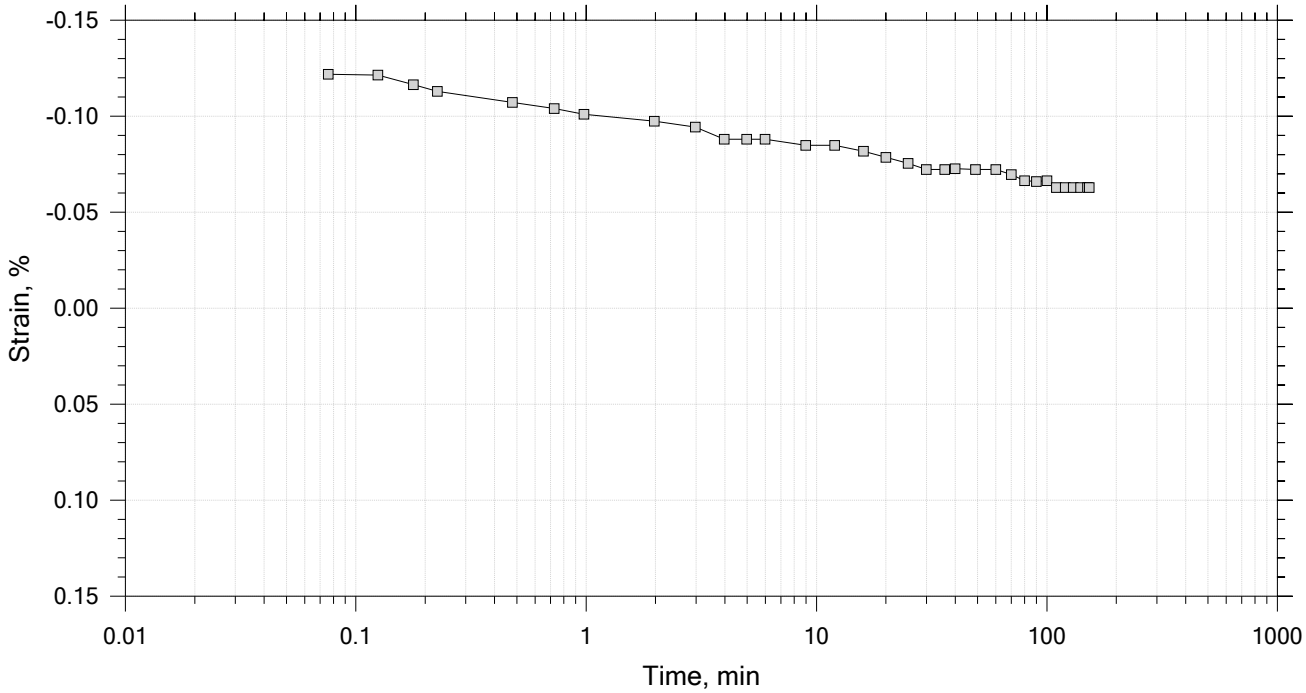
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

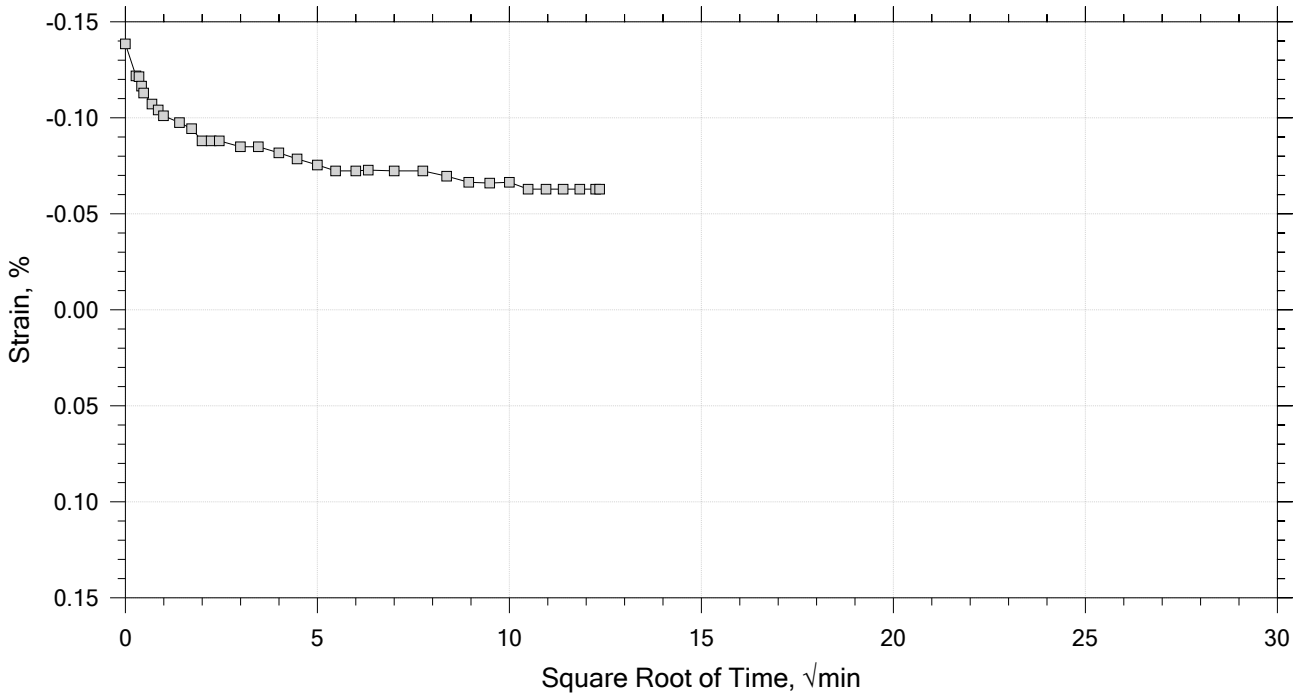
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 13

Constant Load Step

Stress: 0.5 tsf





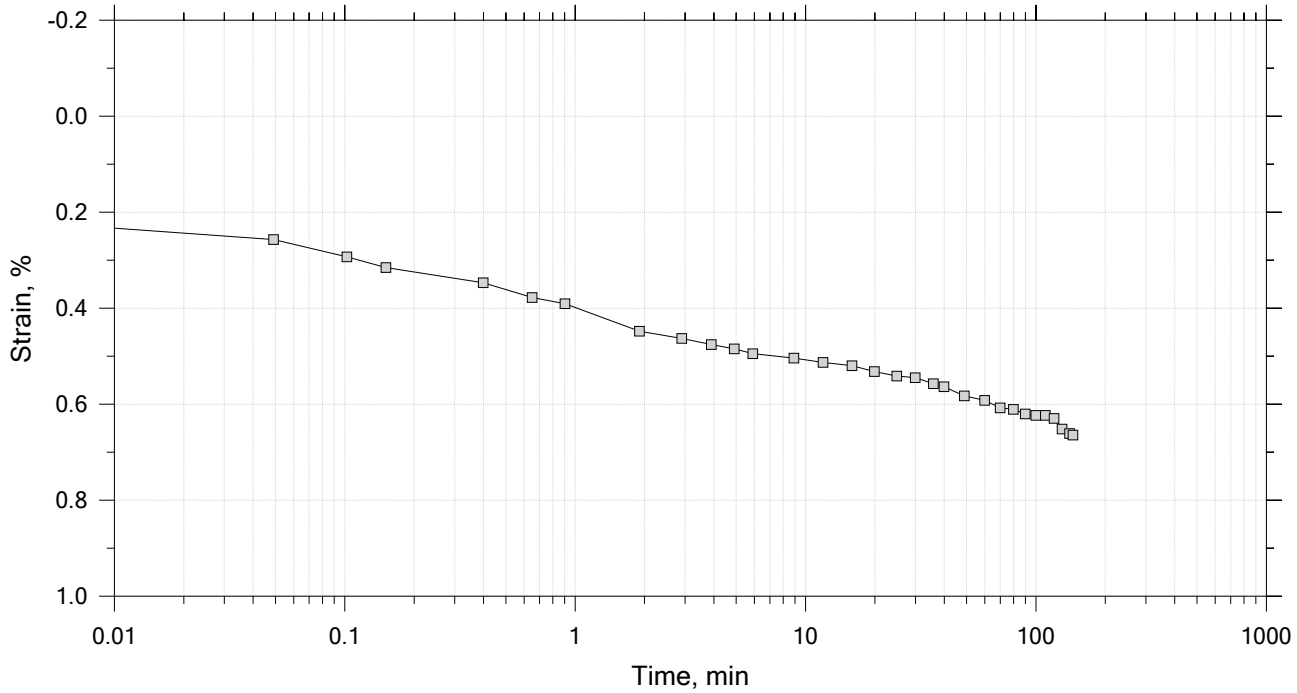
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

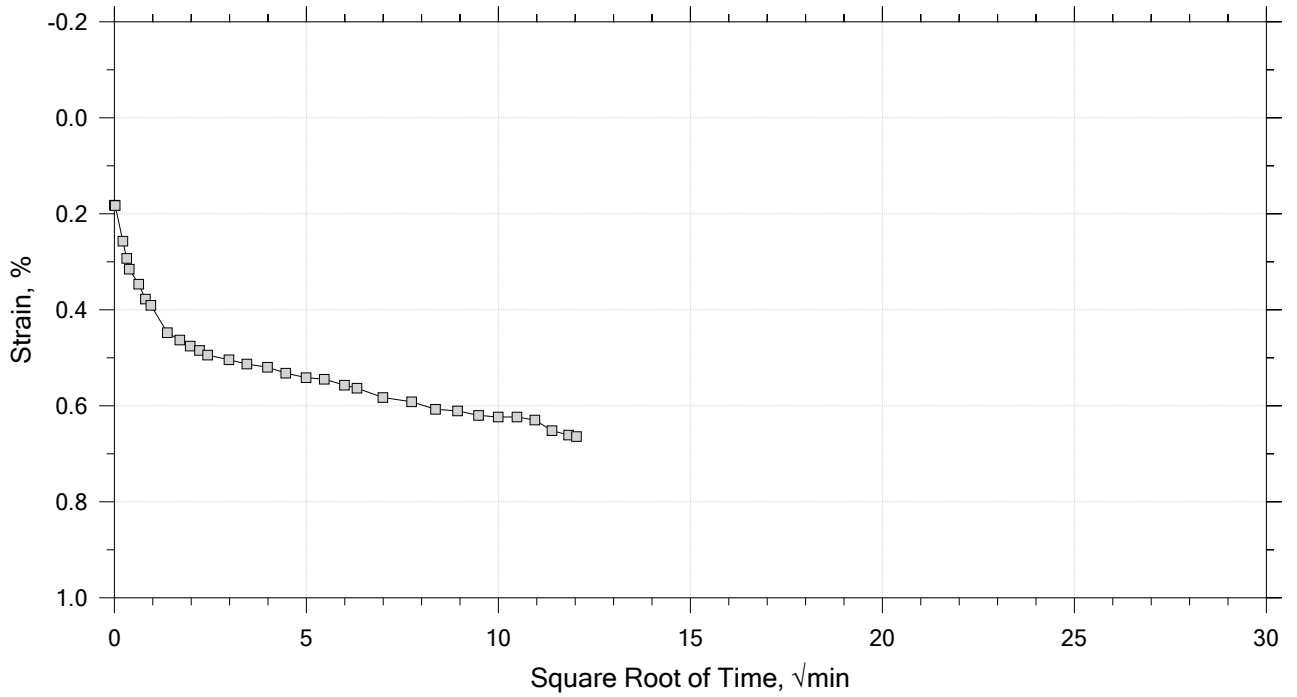
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 13

Constant Load Step

Stress: 1 tsf





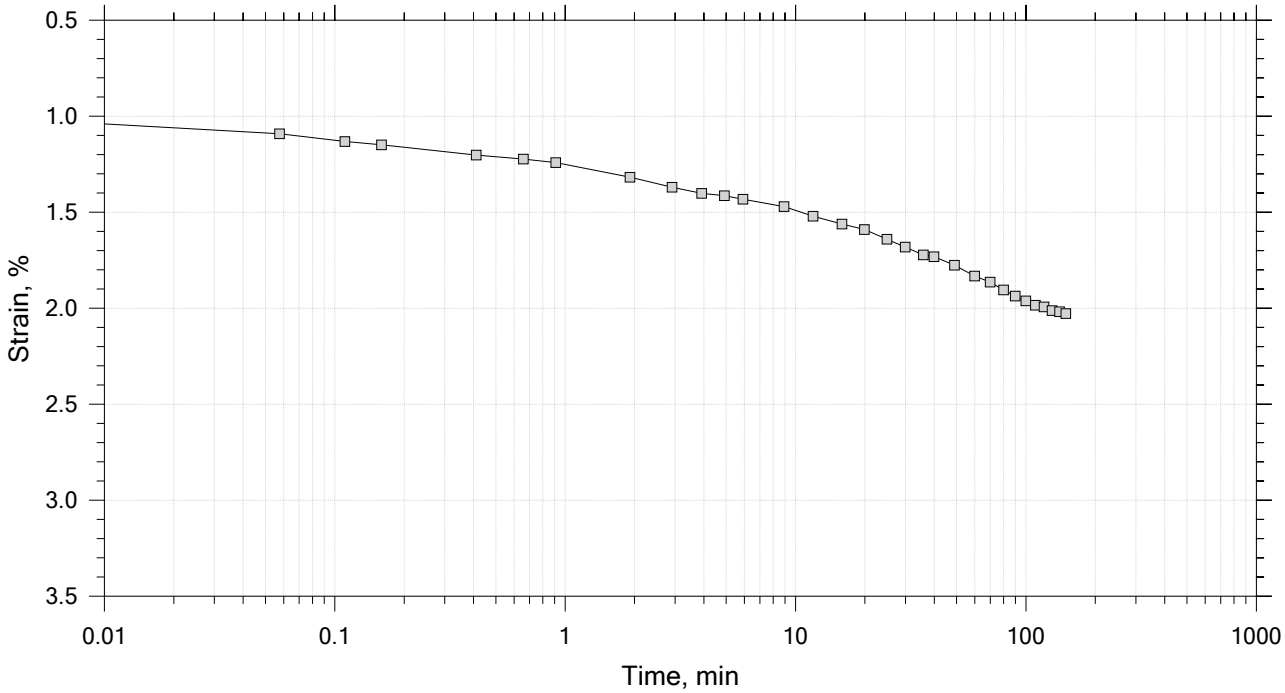
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

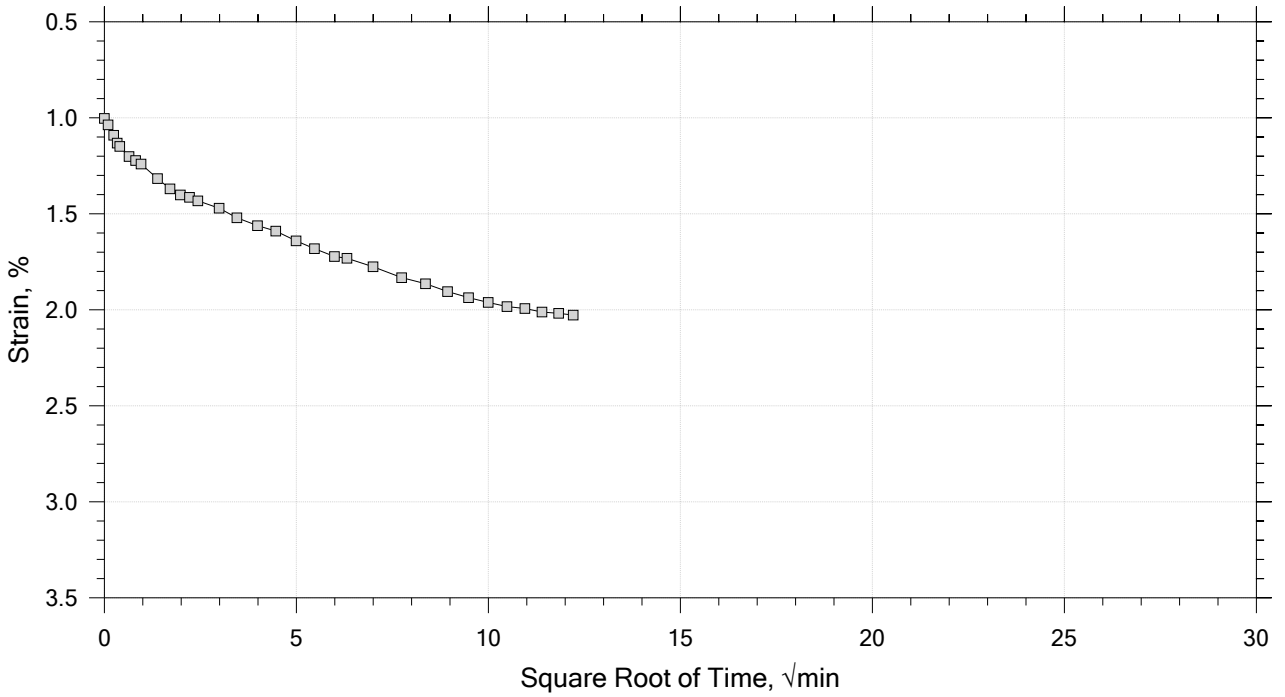
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 13

Constant Load Step

Stress: 2 tsf





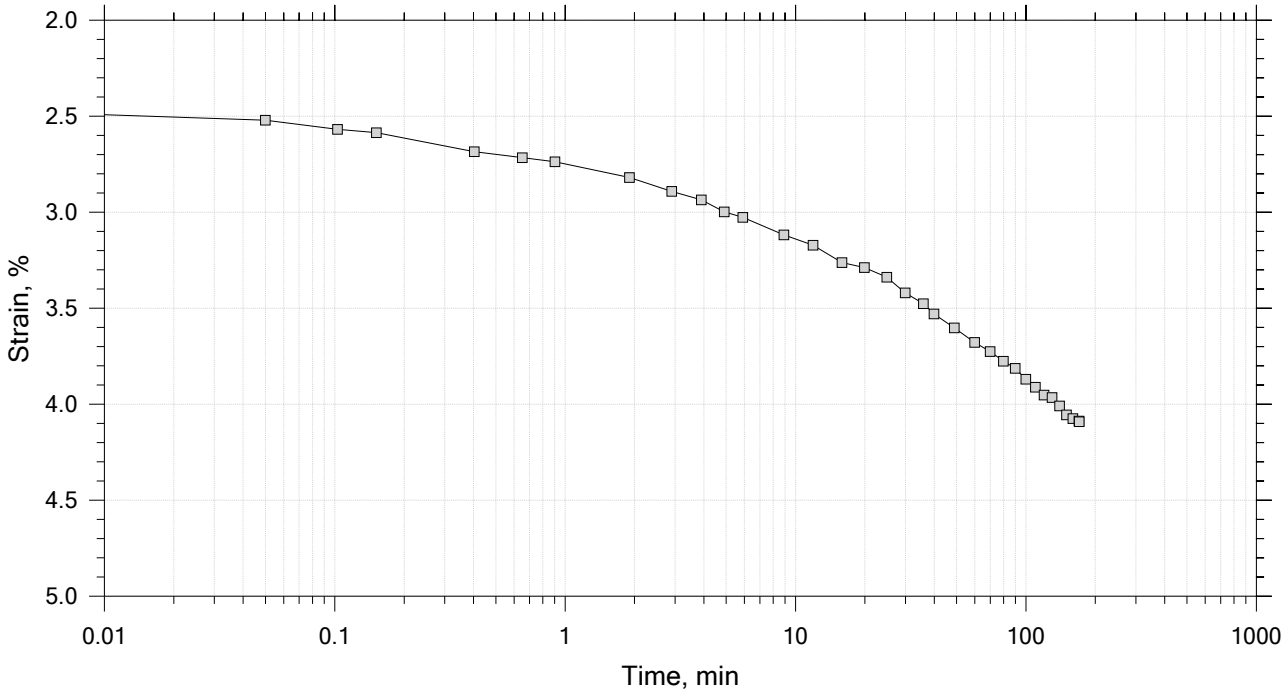
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

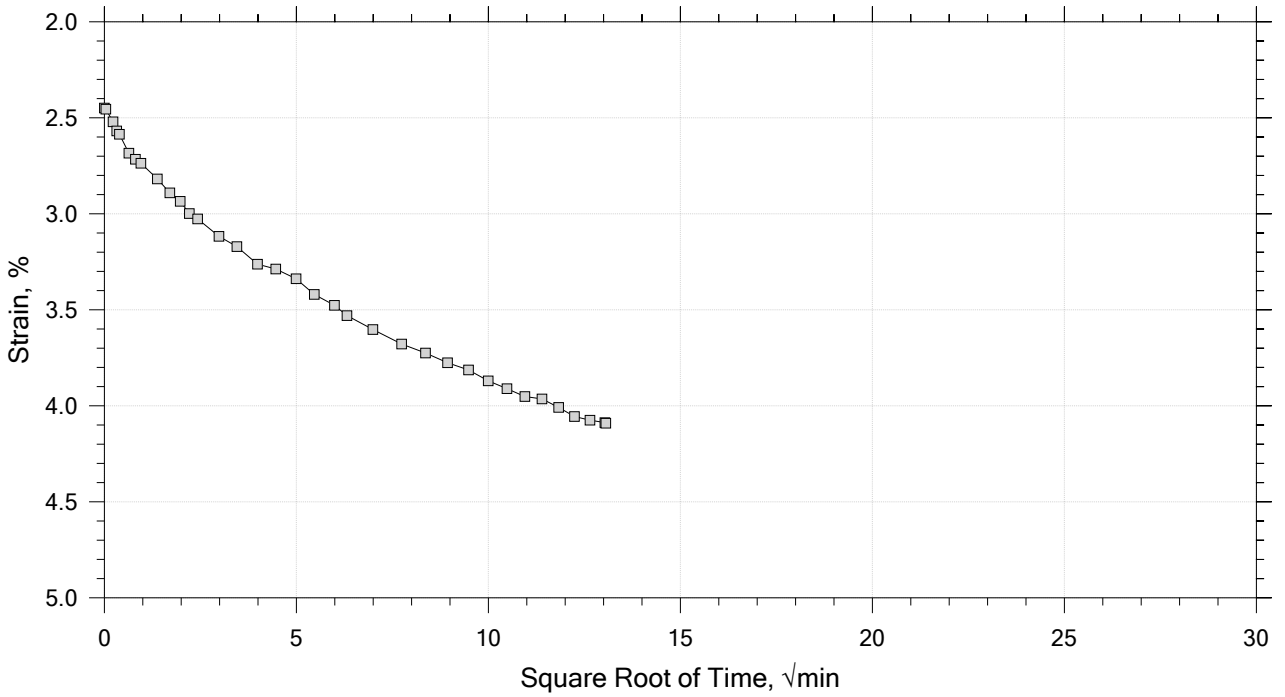
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 13

Constant Load Step

Stress: 4 tsf





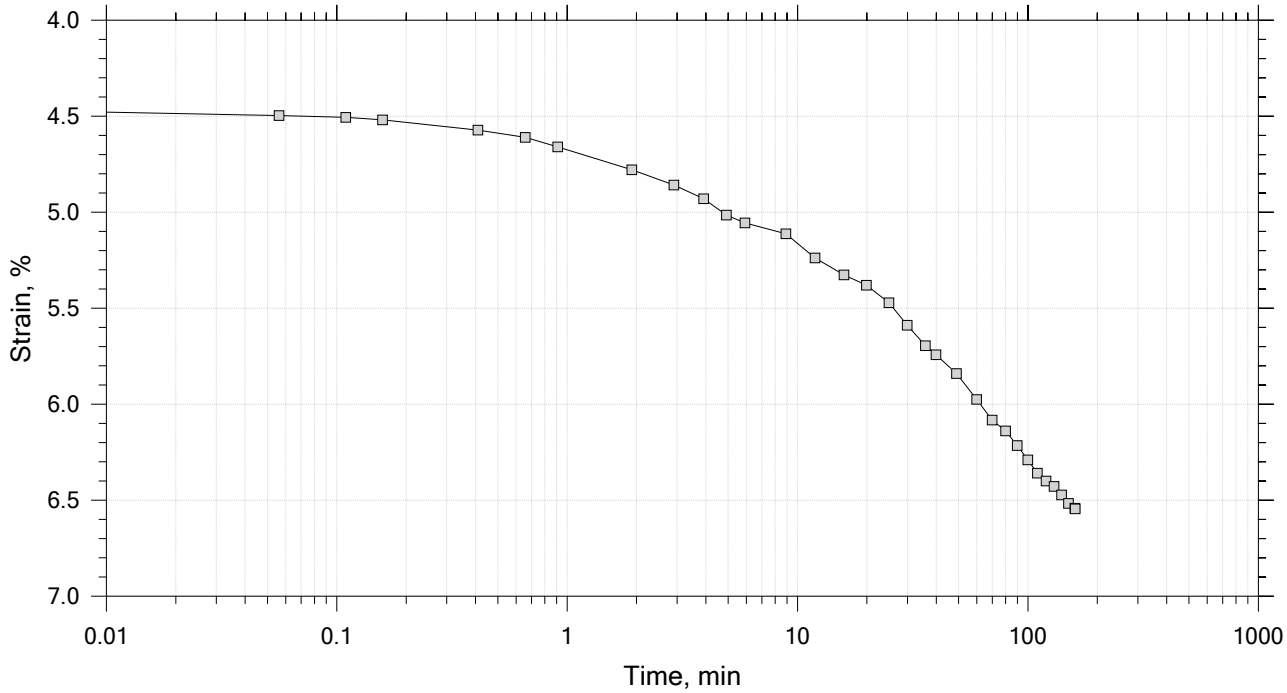
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

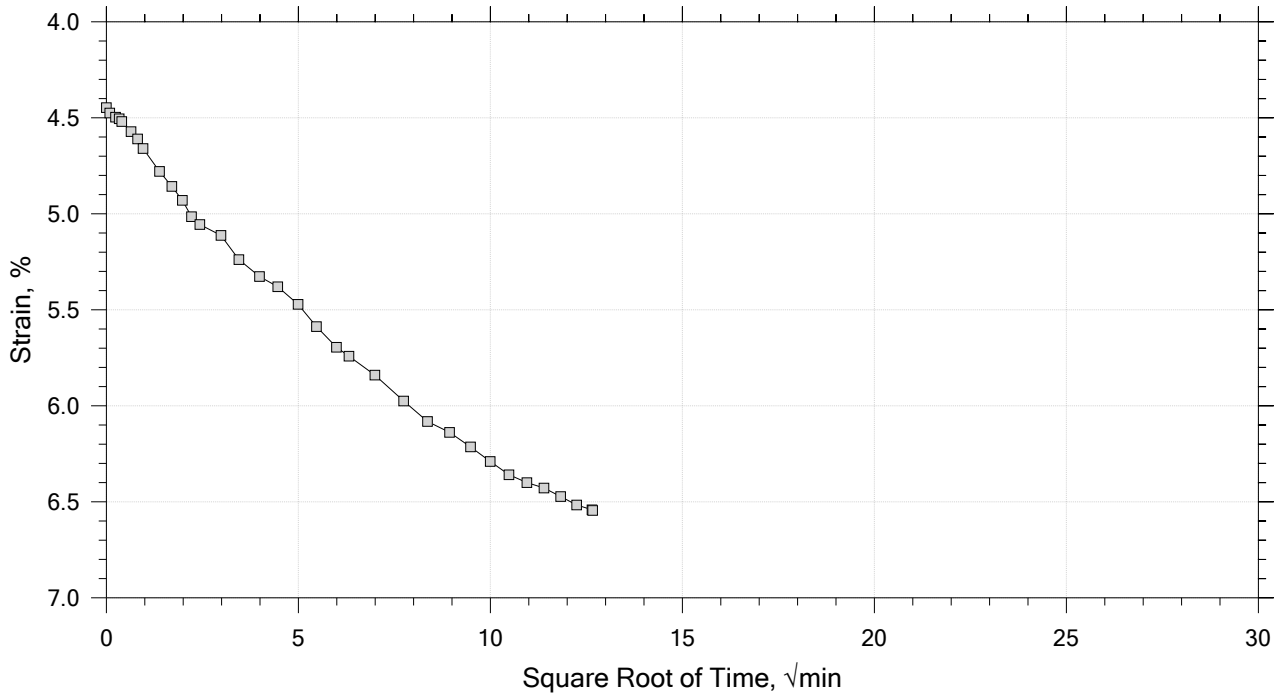
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 13

Constant Load Step

Stress: 8 tsf





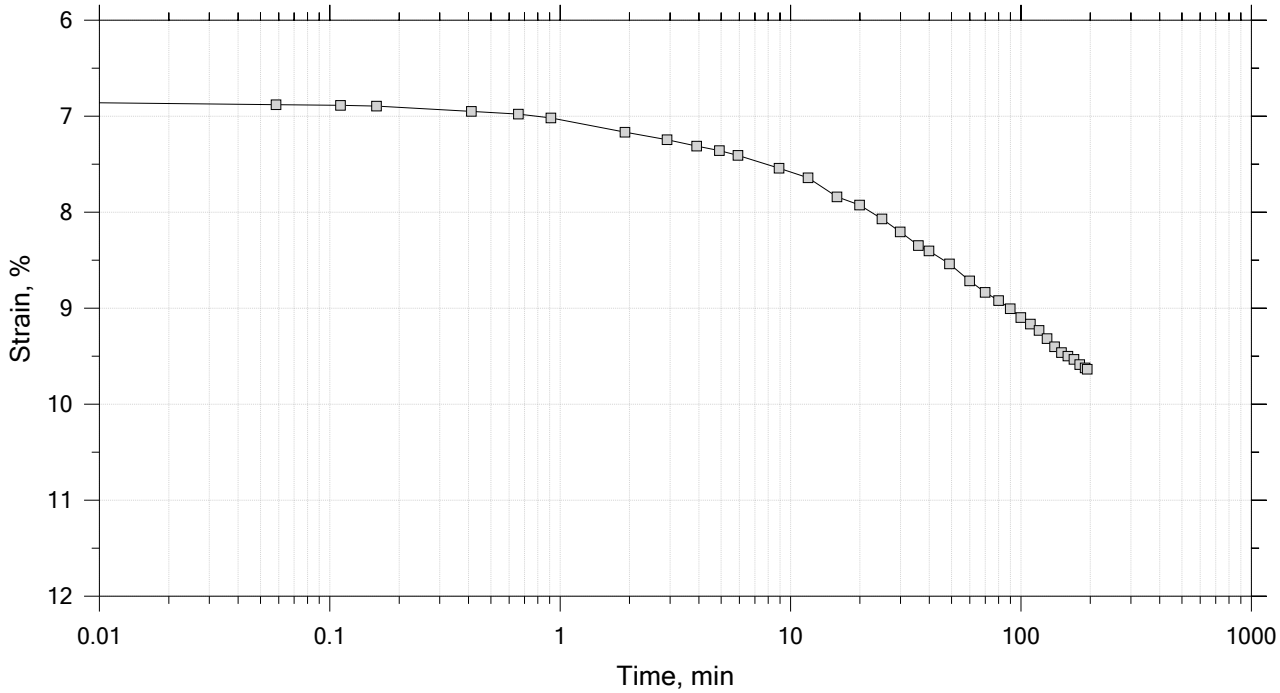
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

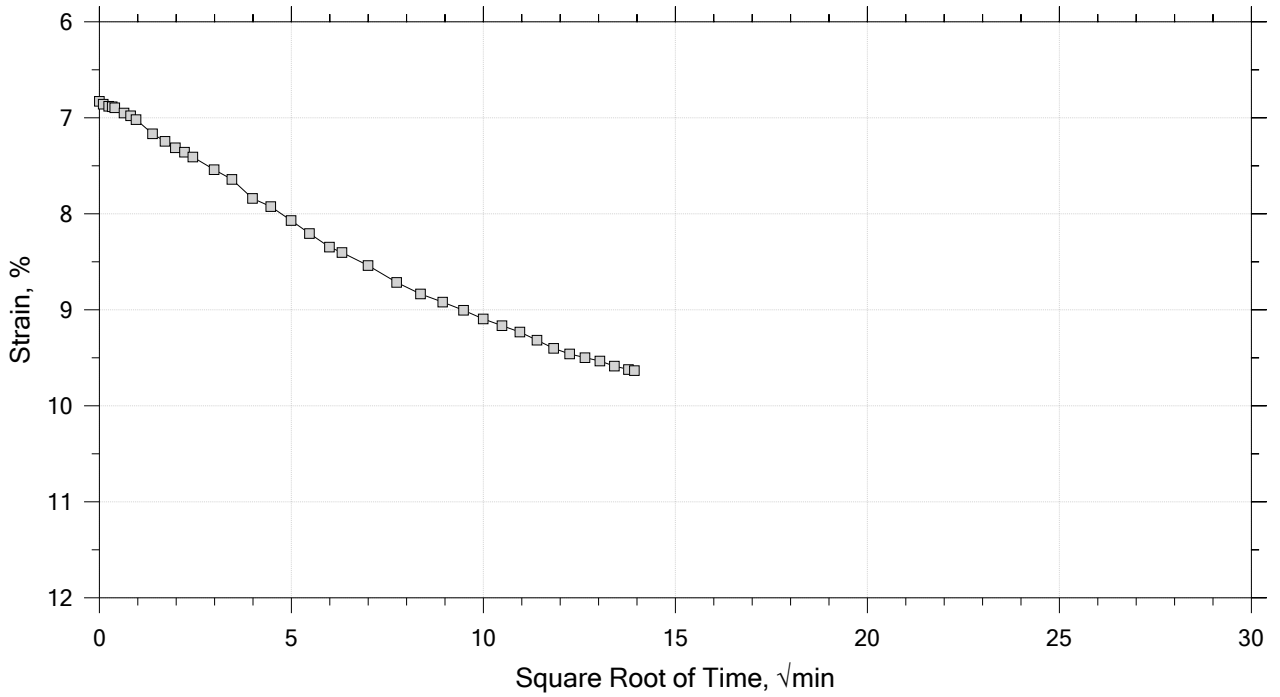
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 13

Constant Load Step

Stress: 16 tsf





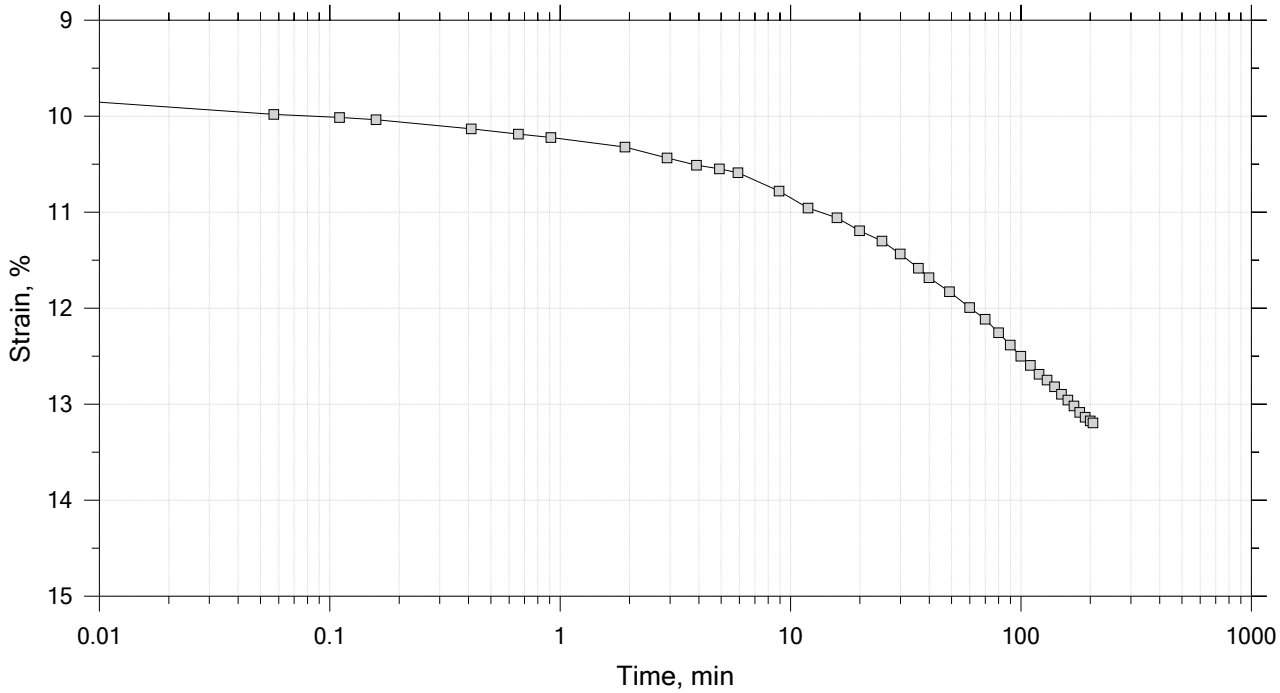
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

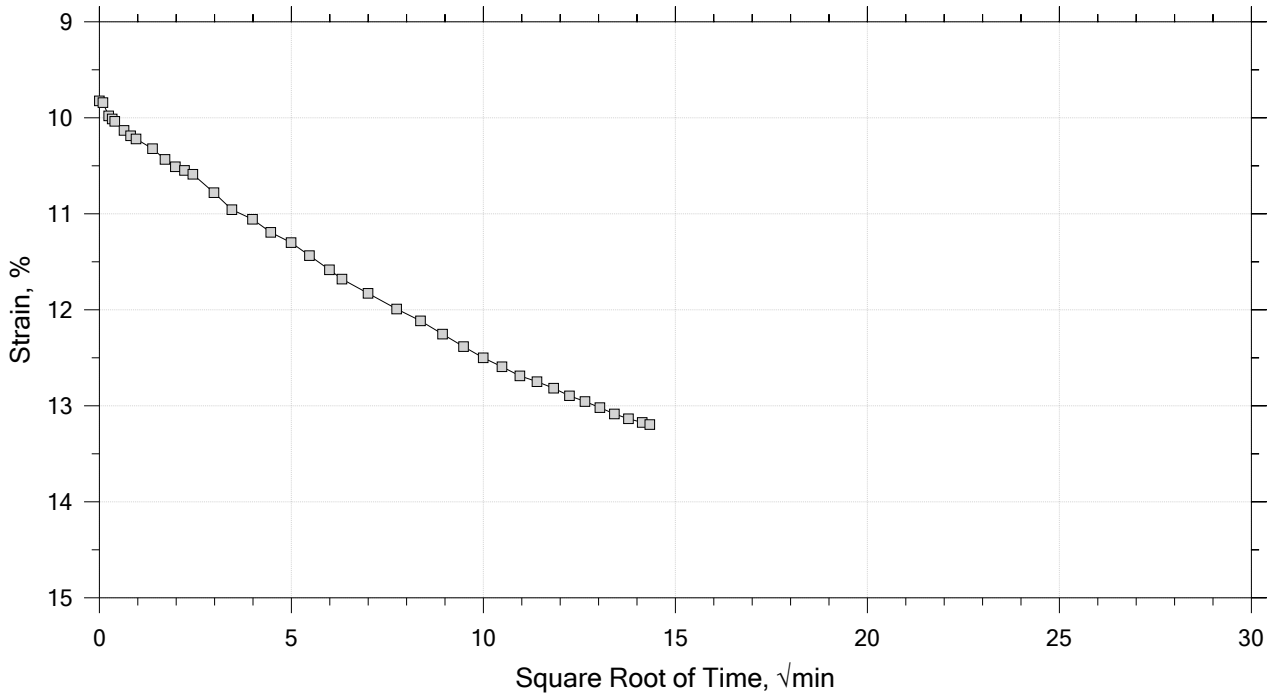
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 13

Constant Load Step

Stress: 32 tsf





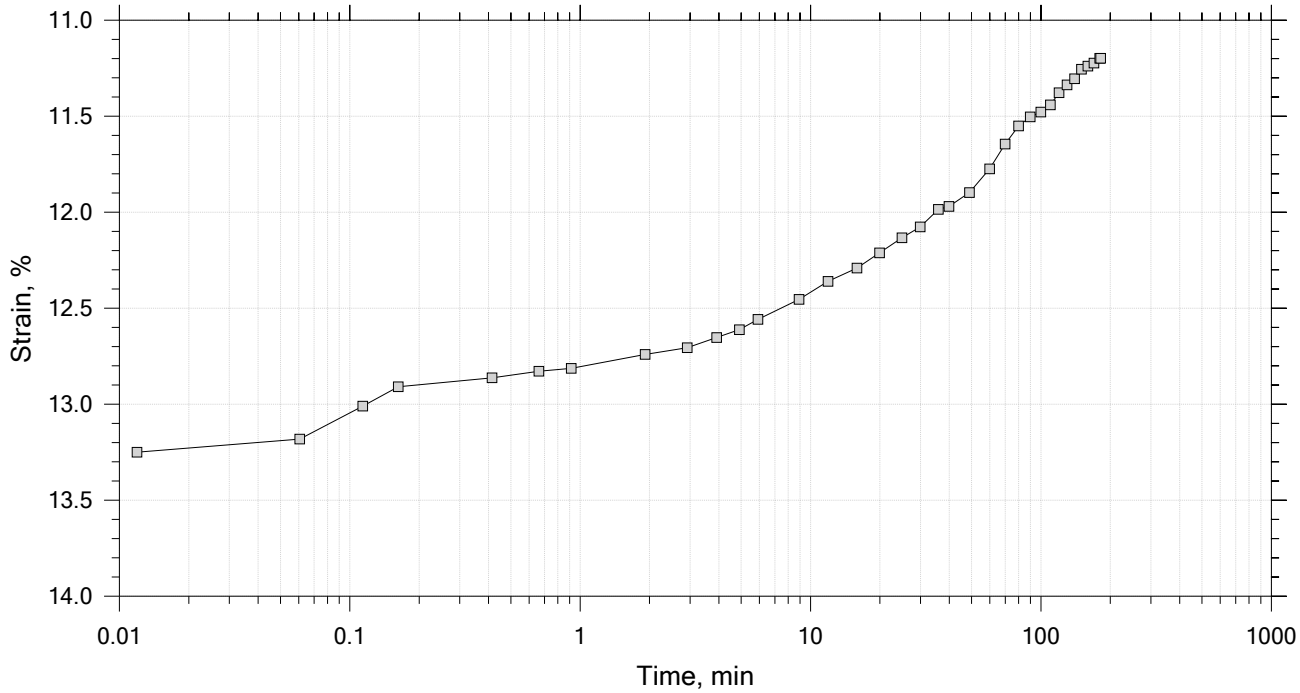
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

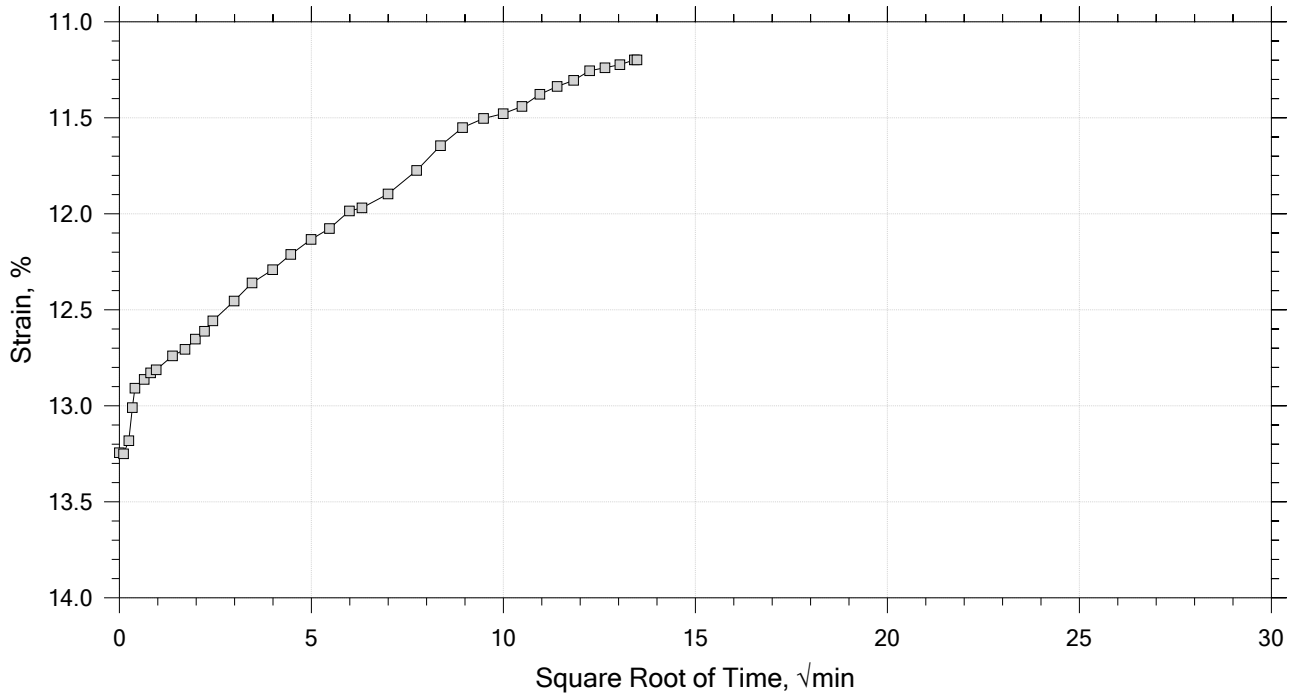
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 13

Constant Load Step

Stress: 8 tsf





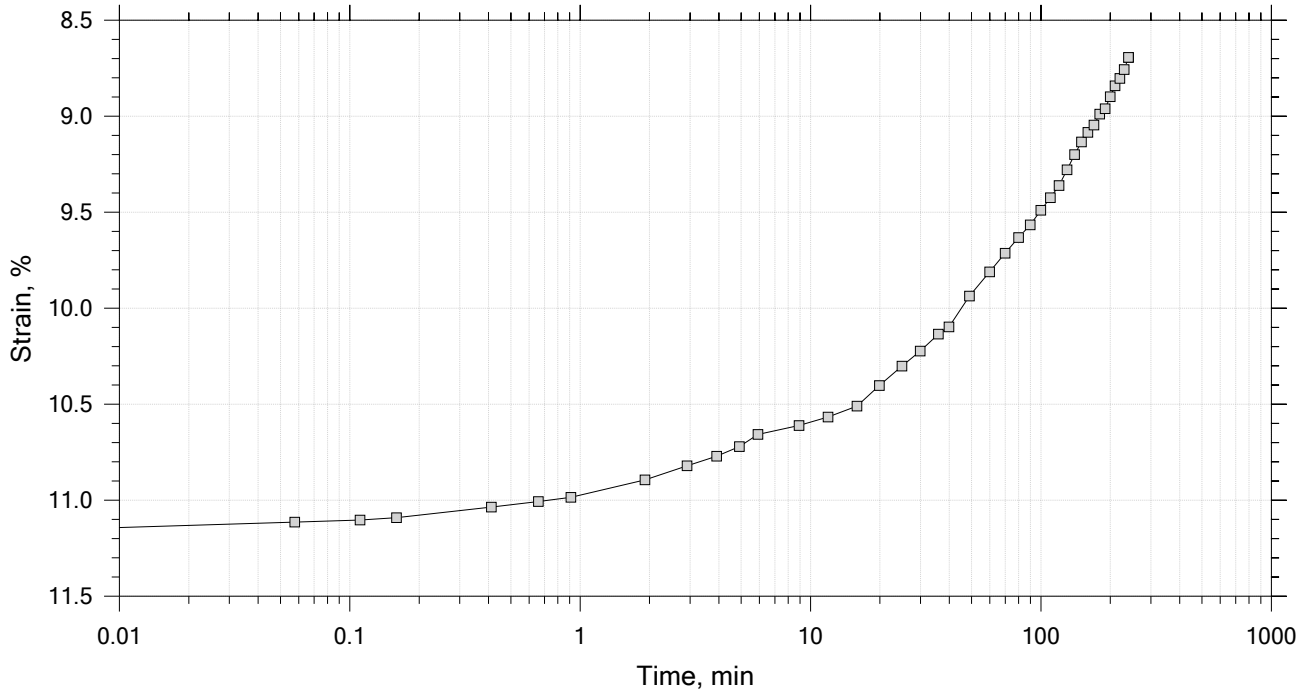
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

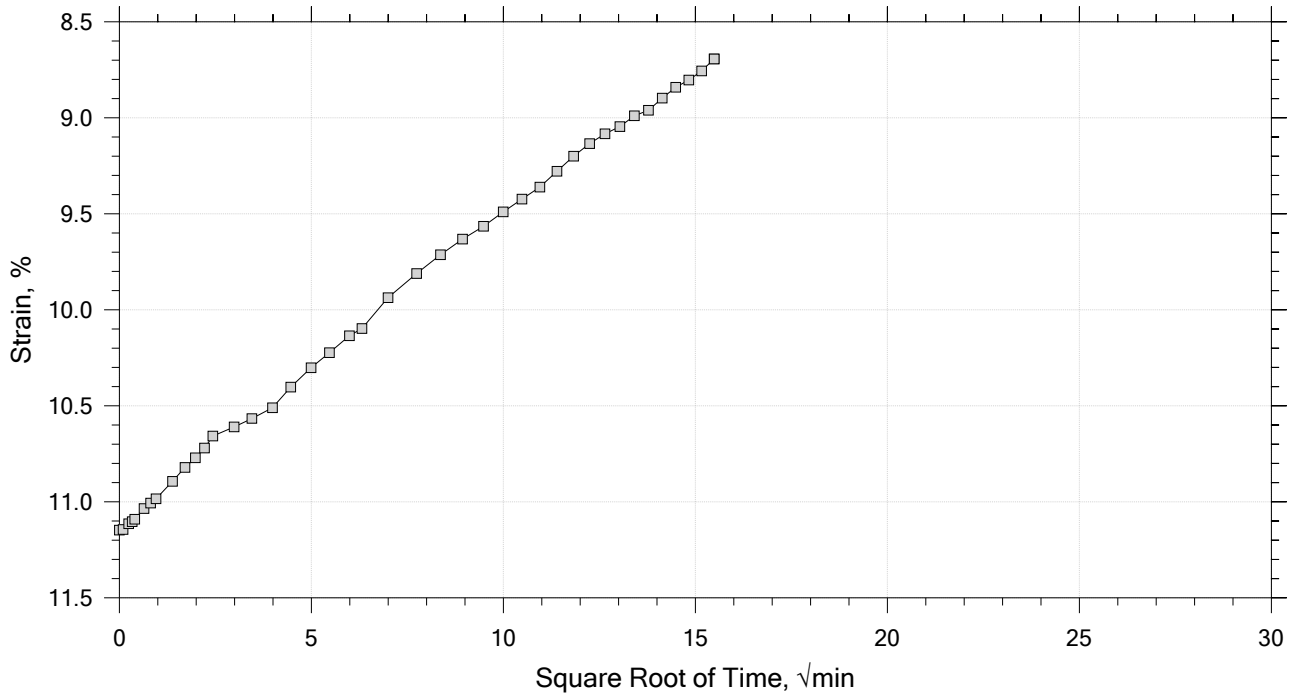
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 13

Constant Load Step

Stress: 2 tsf





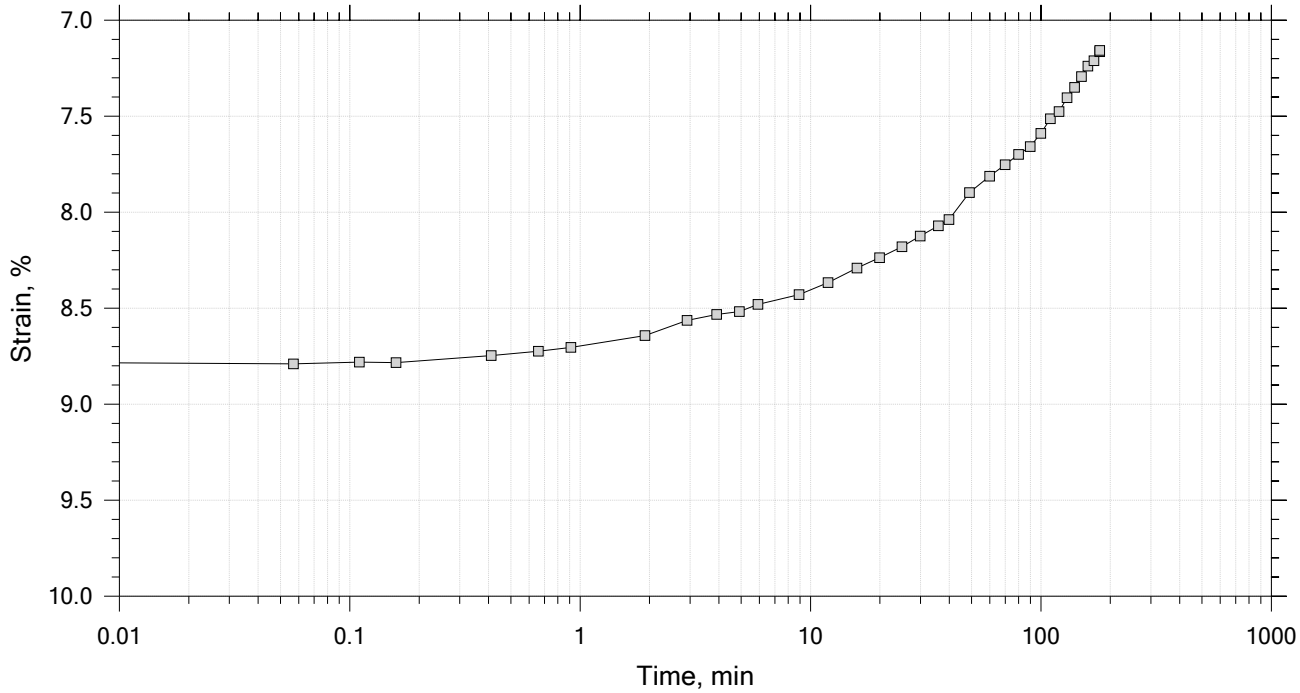
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

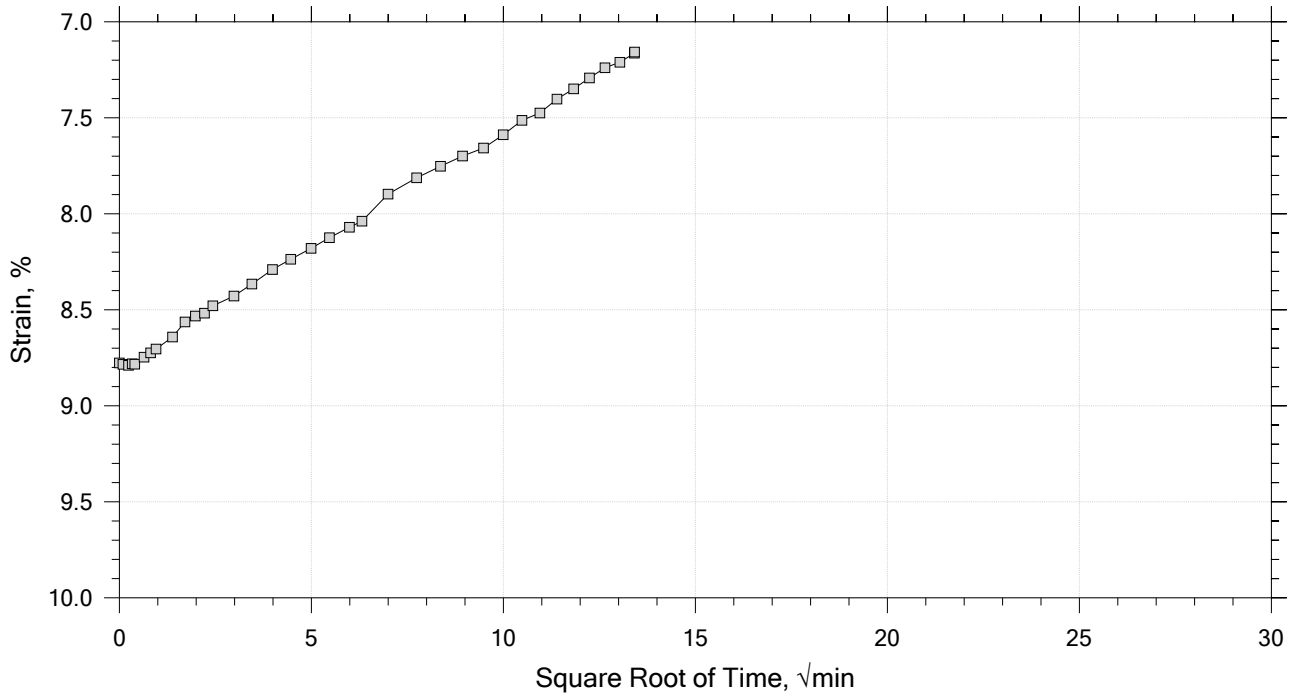
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 13

Constant Load Step

Stress: 0.5 tsf





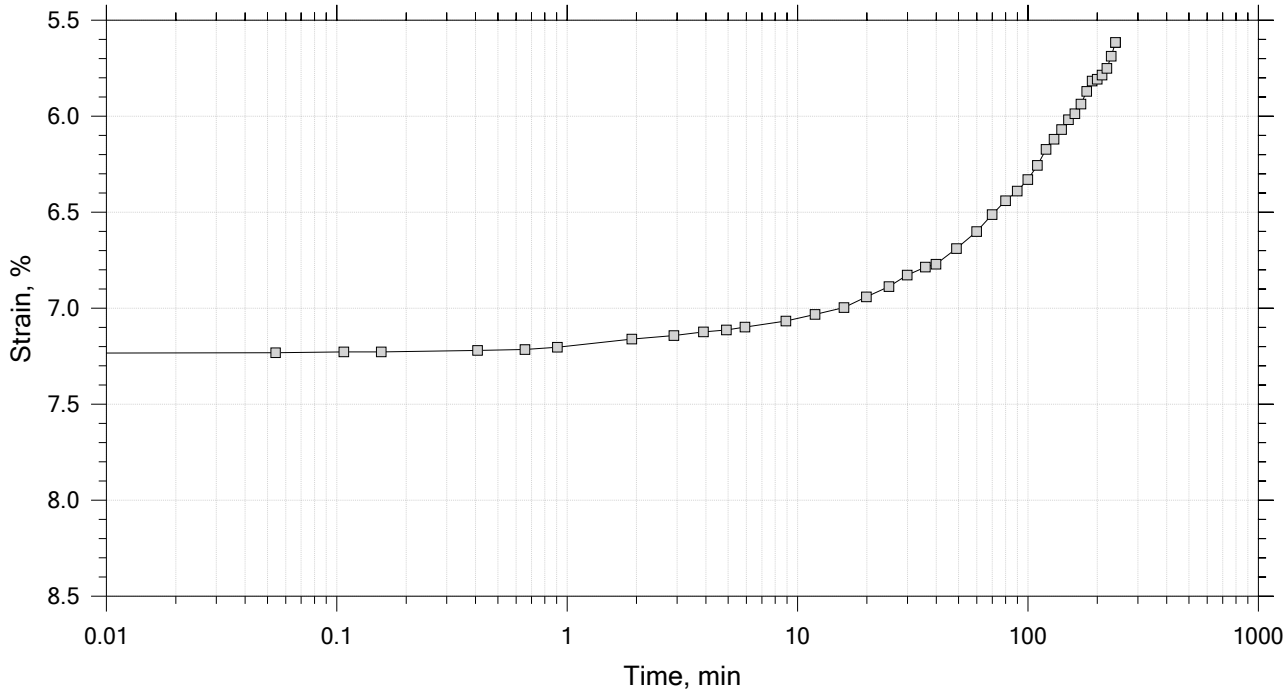
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

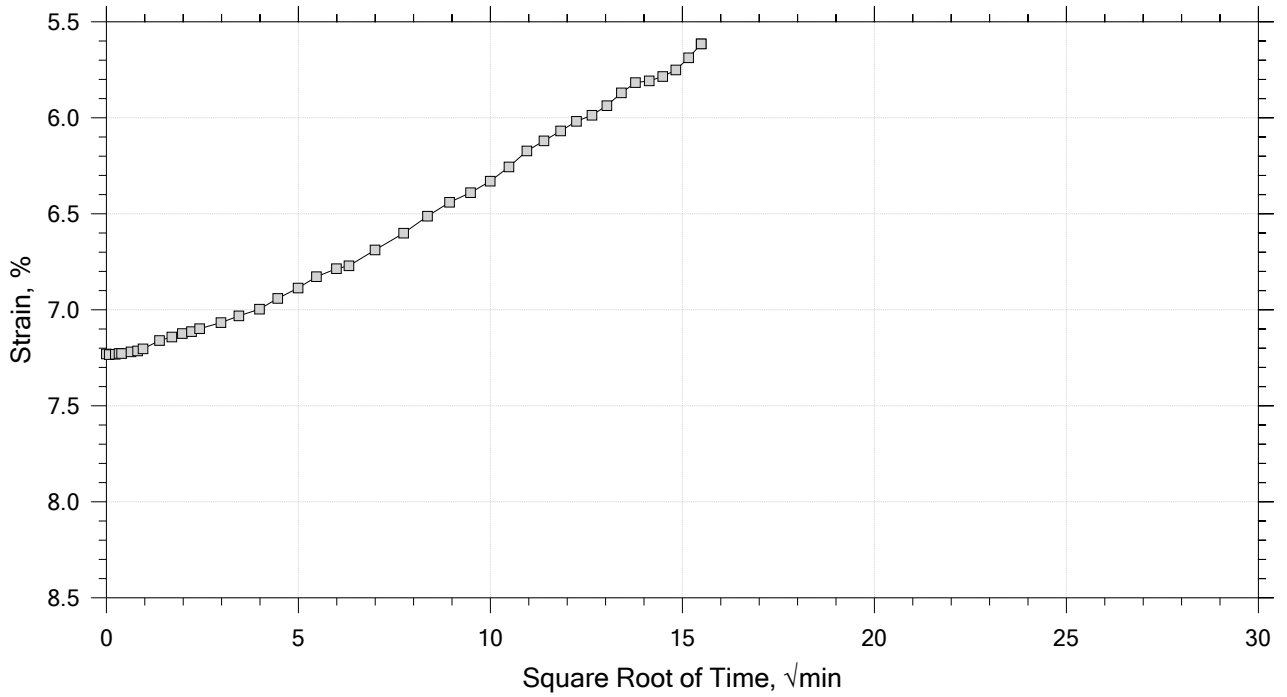
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 13

Constant Load Step

Stress: 0.125 tsf





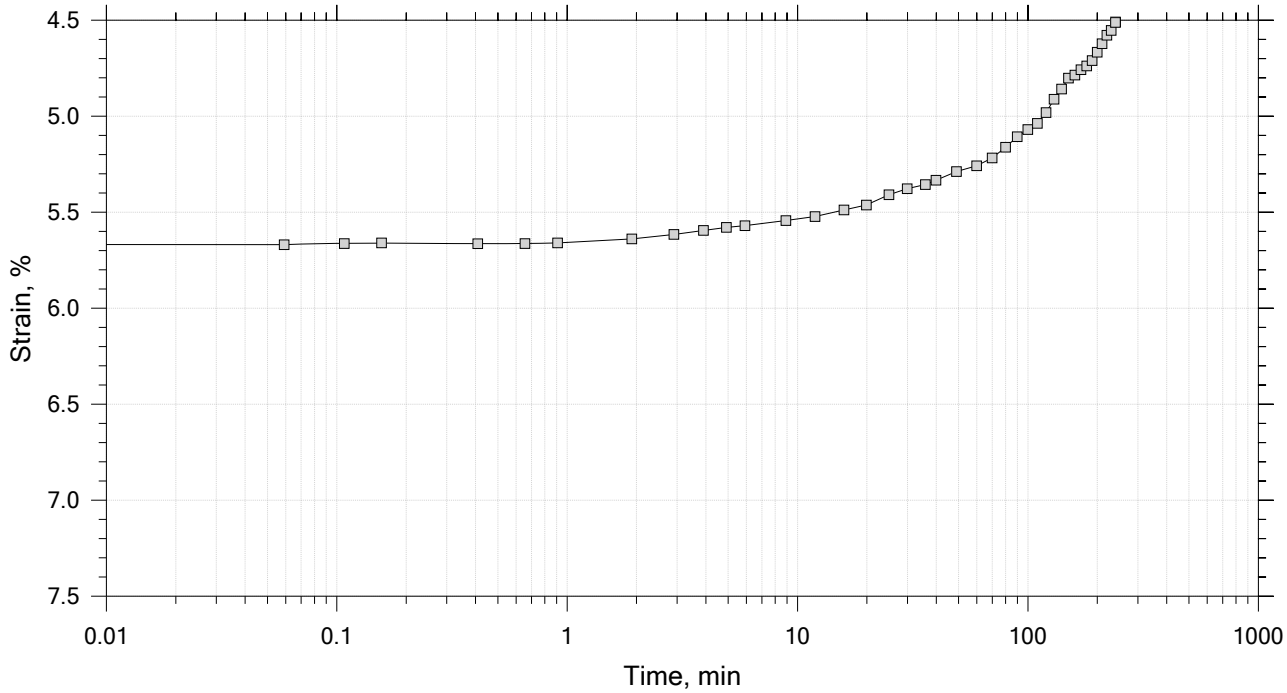
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

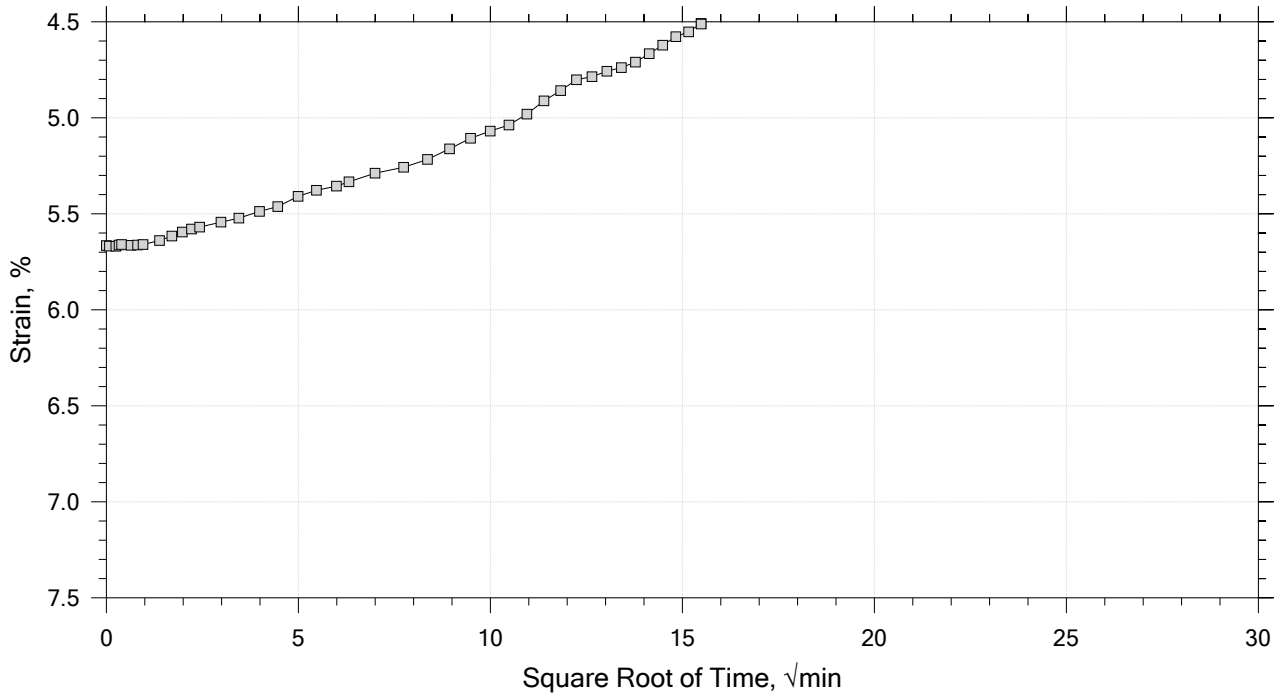
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 13

Constant Load Step

Stress: 0.0625 tsf





Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.81	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 0.918	Plastic Limit: ---
Final Height: 0.95 in	Final Void Ratio: 0.822	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-1367	RING		D2620
Mass Container, gm	8.21	107.89	107.89	8.28
Mass Container + Wet Soil, gm	195.96	263.43	260.38	162.37
Mass Container + Dry Soil, gm	153.75	225.9	225.9	127.53
Mass Dry Soil, gm	145.54	118.01	118.01	119.25
Water Content, %	29.00	31.80	29.22	29.22
Void Ratio	---	0.92	0.82	---
Degree of Saturation, %	---	97.48	100.00	---
Dry Unit Weight, pcf	---	91.587	96.407	---

Warning: The change in the sample wet weight during the test is not consistent with the change in the moisture content.

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Tested By: md	Checked By: njh
Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
Test No.: IP-4	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.443	-0.001474	0.921	-0.147	0.000	0.00e+00	-3.33e-03	-0.00e+00	0.00e+00
2	0.500	-0.0006285	0.919	-0.0628	0.000	0.00e+00	1.47e-02	0.00e+00	0.00e+00
3	1.00	0.006642	0.905	0.664	0.000	0.00e+00	1.45e-02	0.00e+00	0.00e+00
4	2.00	0.02028	0.879	2.03	0.000	0.00e+00	1.36e-02	0.00e+00	0.00e+00
5	4.00	0.04091	0.840	4.09	0.000	0.00e+00	1.03e-02	0.00e+00	0.00e+00
6	8.00	0.06545	0.792	6.55	0.000	0.00e+00	6.14e-03	0.00e+00	0.00e+00
7	16.0	0.09634	0.733	9.63	0.000	0.00e+00	3.86e-03	0.00e+00	0.00e+00
8	32.0	0.1320	0.665	13.2	0.000	0.00e+00	2.23e-03	0.00e+00	0.00e+00
9	8.00	0.1120	0.703	11.2	0.000	0.00e+00	8.32e-04	0.00e+00	0.00e+00
10	2.00	0.08693	0.751	8.69	0.000	0.00e+00	4.17e-03	0.00e+00	0.00e+00
11	0.500	0.07157	0.781	7.16	0.000	0.00e+00	1.02e-02	0.00e+00	0.00e+00
12	0.125	0.05615	0.810	5.62	0.000	0.00e+00	4.11e-02	0.00e+00	0.00e+00
13	0.0625	0.04512	0.831	4.51	0.000	0.00e+00	1.77e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

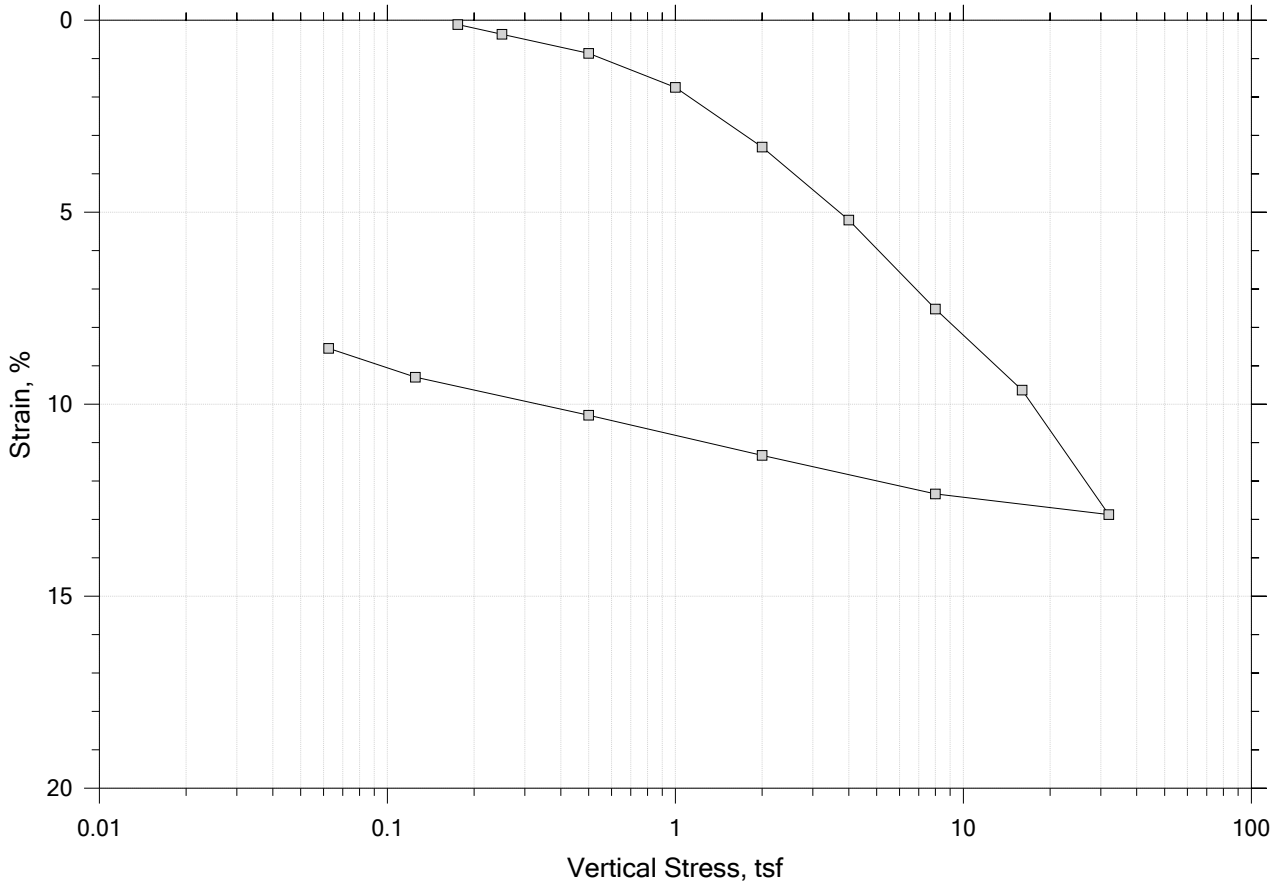
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.443	-0.001474	0.921	-0.147	89.042	2.76e-07	-3.33e-03	-2.48e-06
2	0.500	-0.0006285	0.919	-0.0628	29.471	8.34e-07	1.47e-02	3.31e-05
3	1.00	0.006642	0.905	0.664	25.071	9.73e-07	1.45e-02	3.82e-05
4	2.00	0.02028	0.879	2.03	63.686	3.75e-07	1.36e-02	1.38e-05
5	4.00	0.04091	0.840	4.09	54.943	4.20e-07	1.03e-02	1.17e-05
6	8.00	0.06545	0.792	6.55	68.357	3.22e-07	6.14e-03	5.33e-06
7	16.0	0.09634	0.733	9.63	167.241	1.24e-07	3.86e-03	1.29e-06
8	32.0	0.1320	0.665	13.2	117.365	1.64e-07	2.23e-03	9.85e-07
9	8.00	0.1120	0.703	11.2	86.170	2.20e-07	8.32e-04	4.93e-07
10	2.00	0.08693	0.751	8.69	205.876	9.67e-08	4.17e-03	1.09e-06
11	0.500	0.07157	0.781	7.16	136.653	1.52e-07	1.02e-02	4.20e-06
12	0.125	0.05615	0.810	5.62	0.000	0.00e+00	4.11e-02	0.00e+00
13	0.0625	0.04512	0.831	4.51	0.000	0.00e+00	1.77e-01	0.00e+00

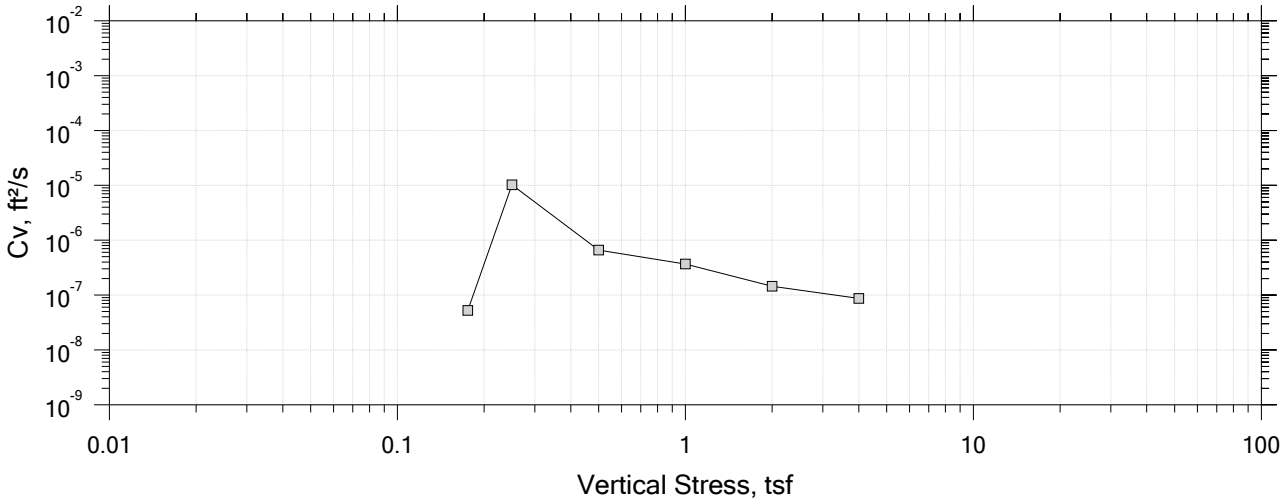
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		
	Displacement at End of Increment		

Attachment Figure A.4-182

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





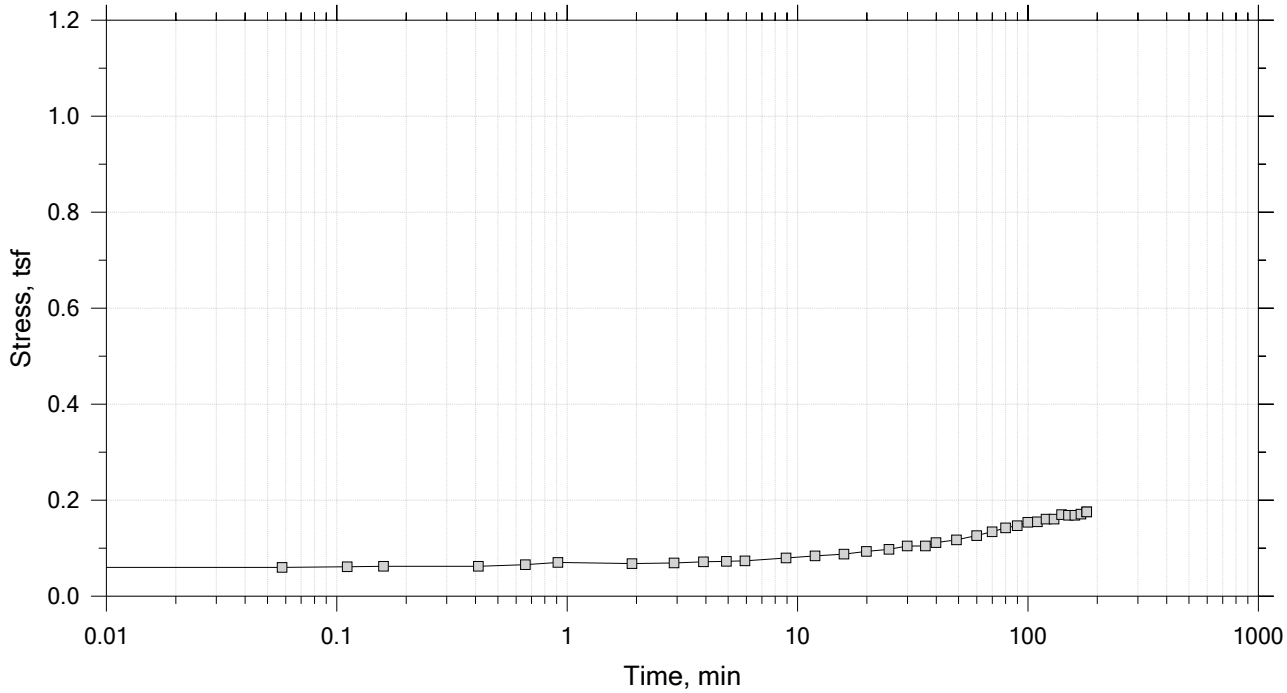
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		
Displacement at End of Increment		

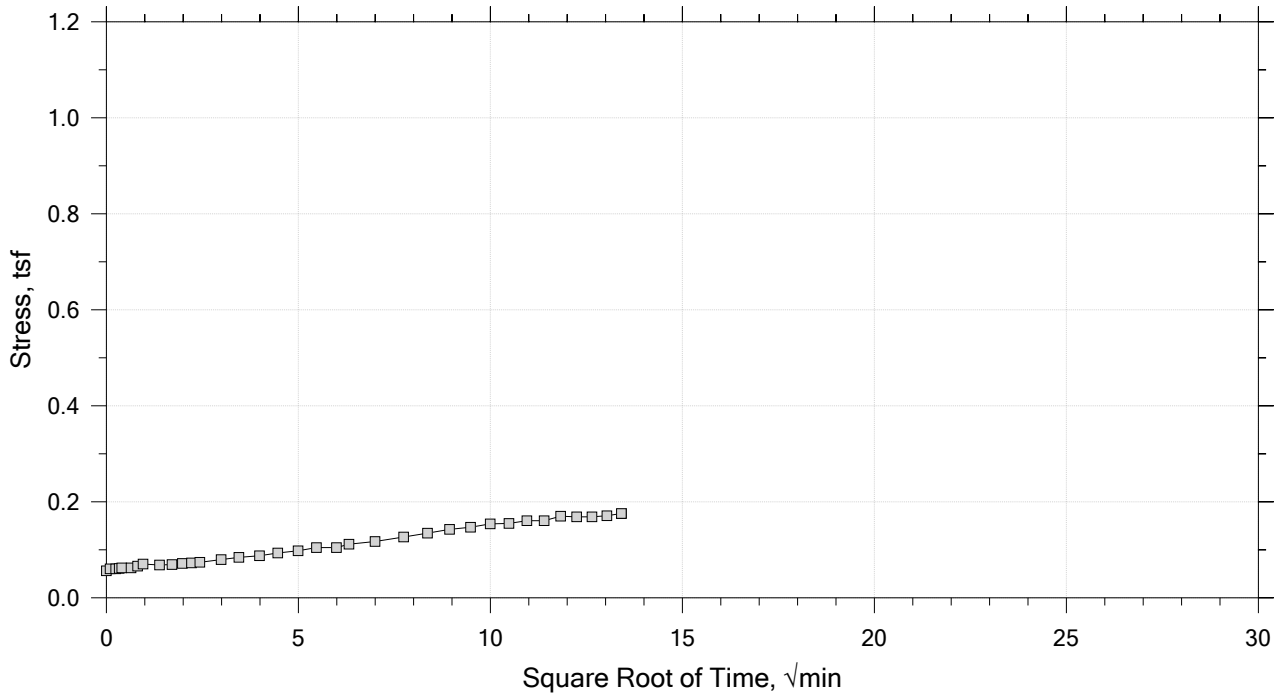
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 14

Constant Volume Step

Stress: 0.176 tsf





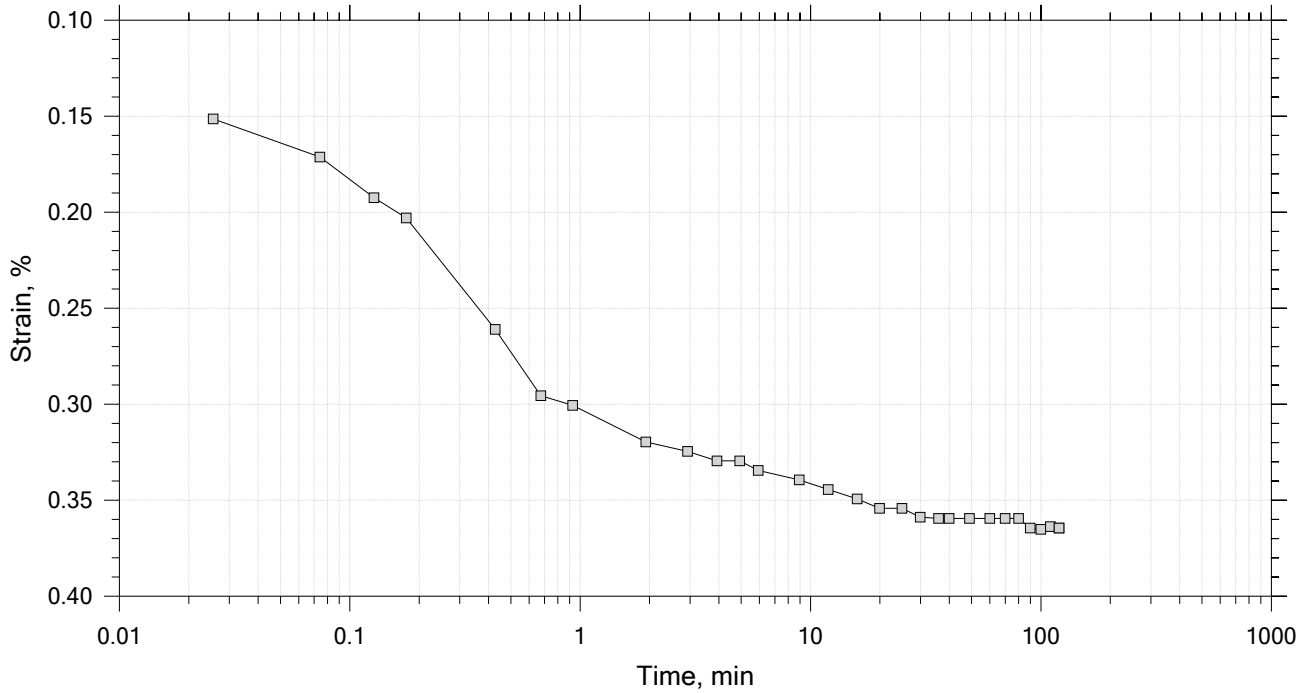
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

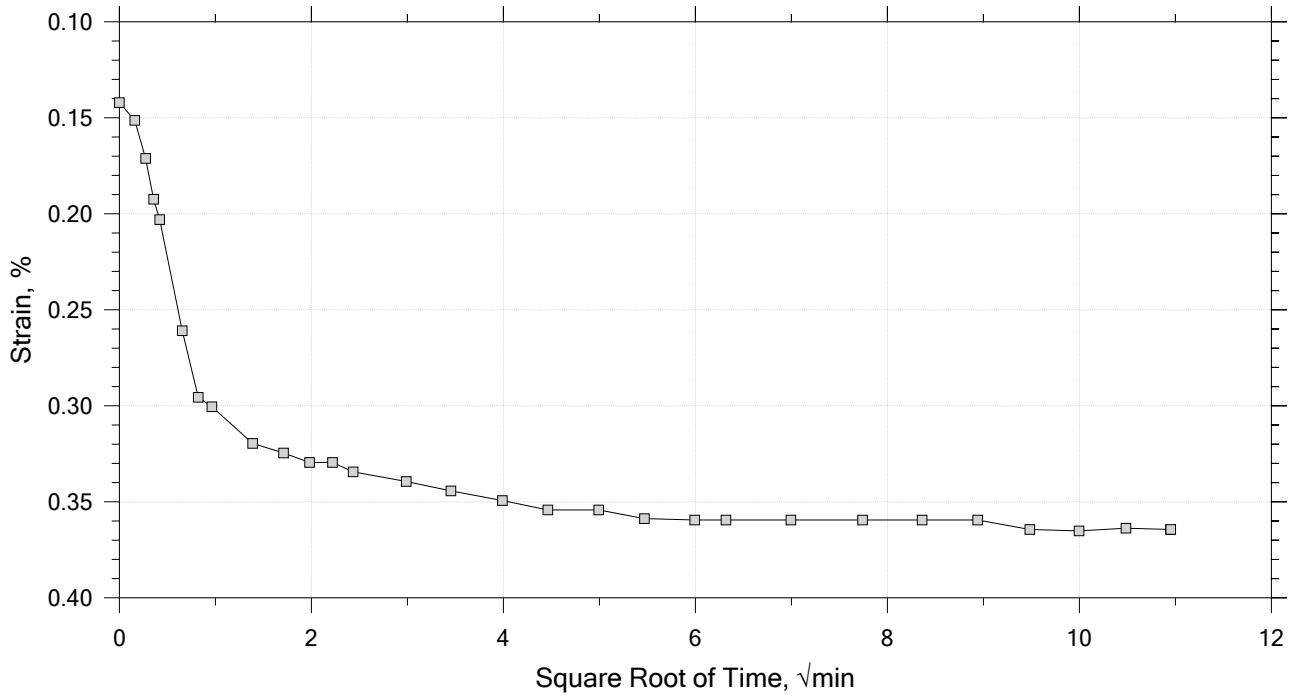
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 14

Constant Load Step

Stress: 0.25 tsf





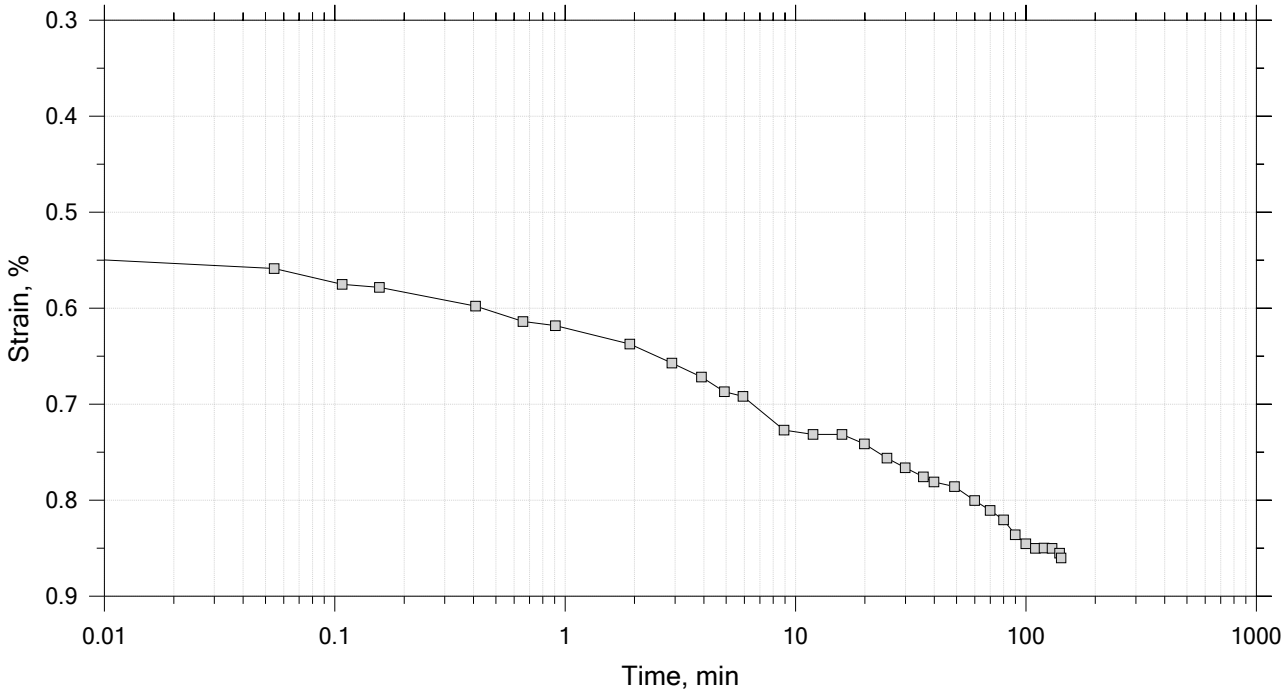
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

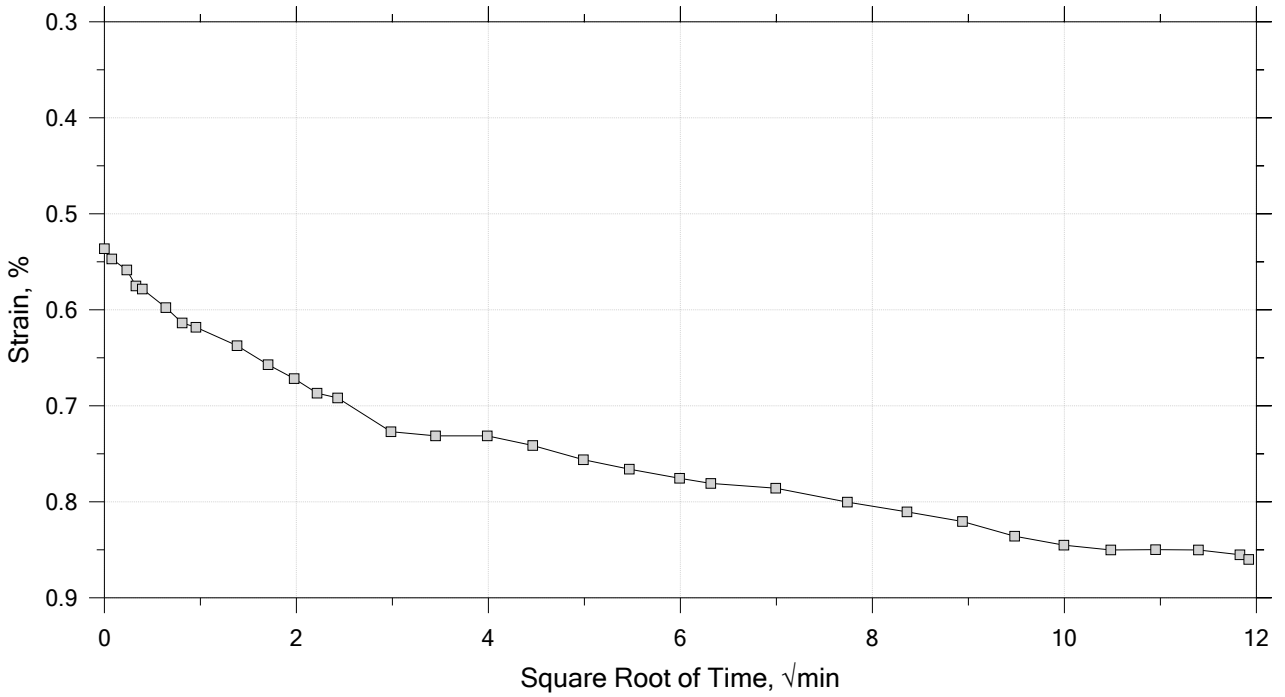
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 14

Constant Load Step

Stress: 0.5 tsf





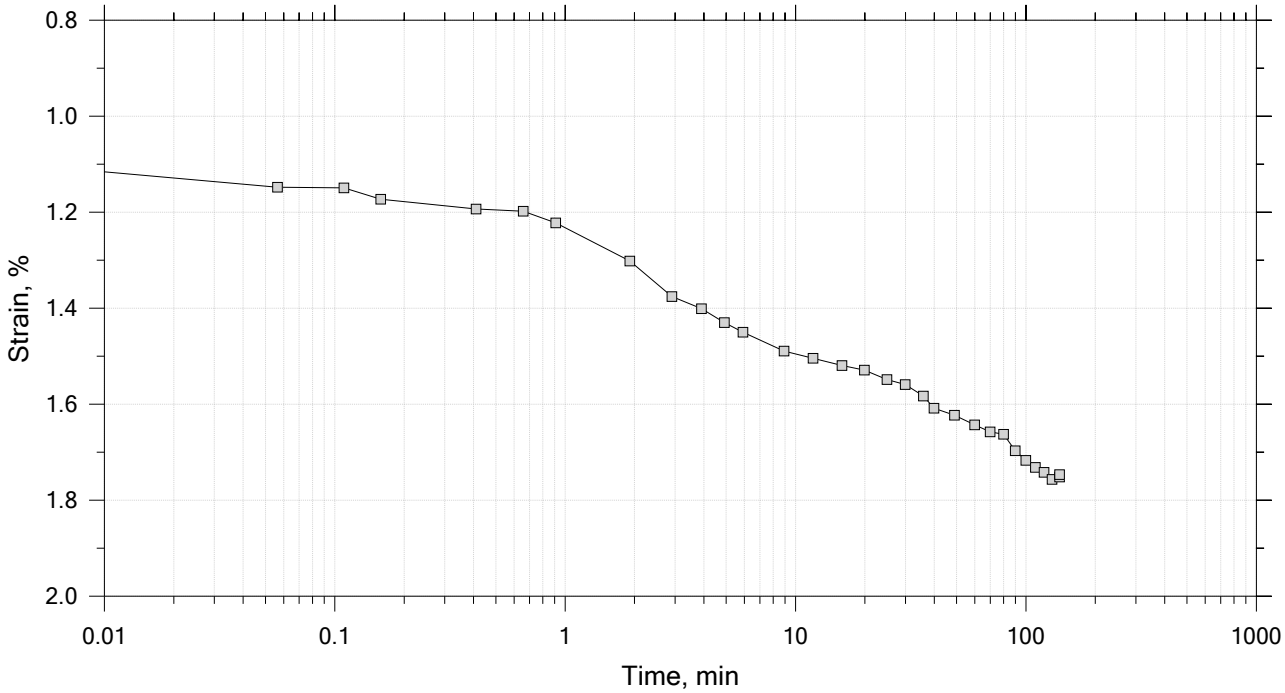
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

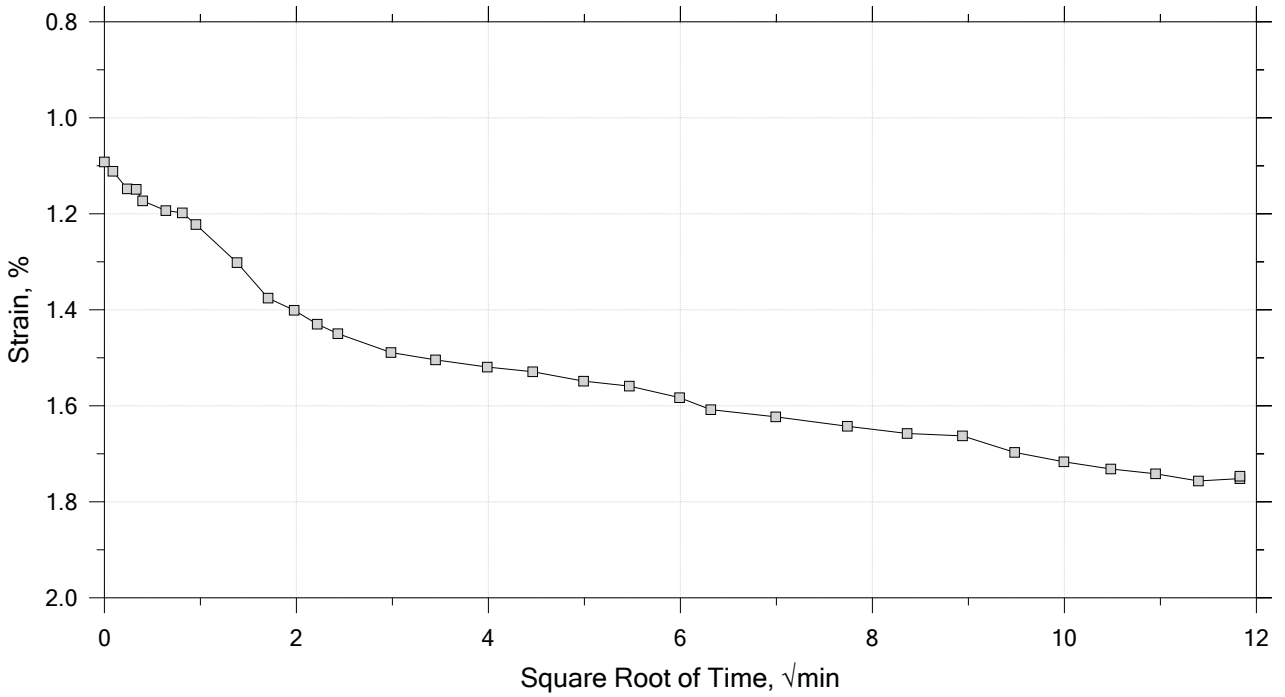
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 14

Constant Load Step

Stress: 1 tsf





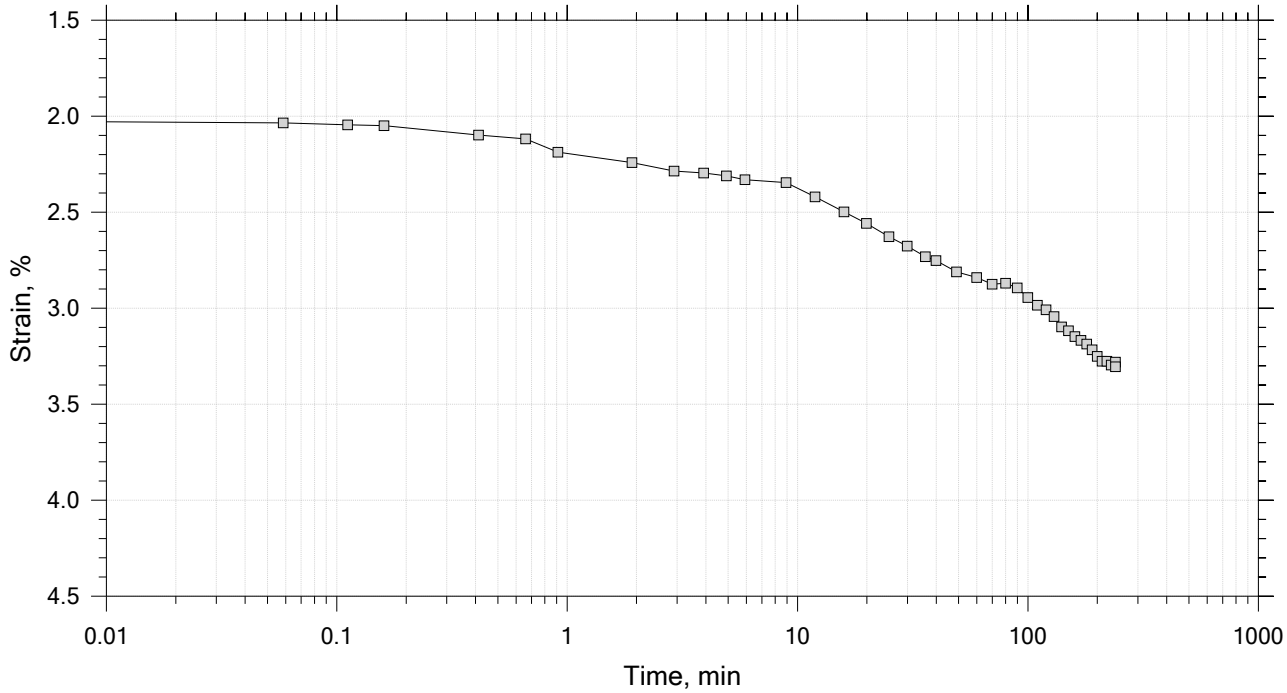
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

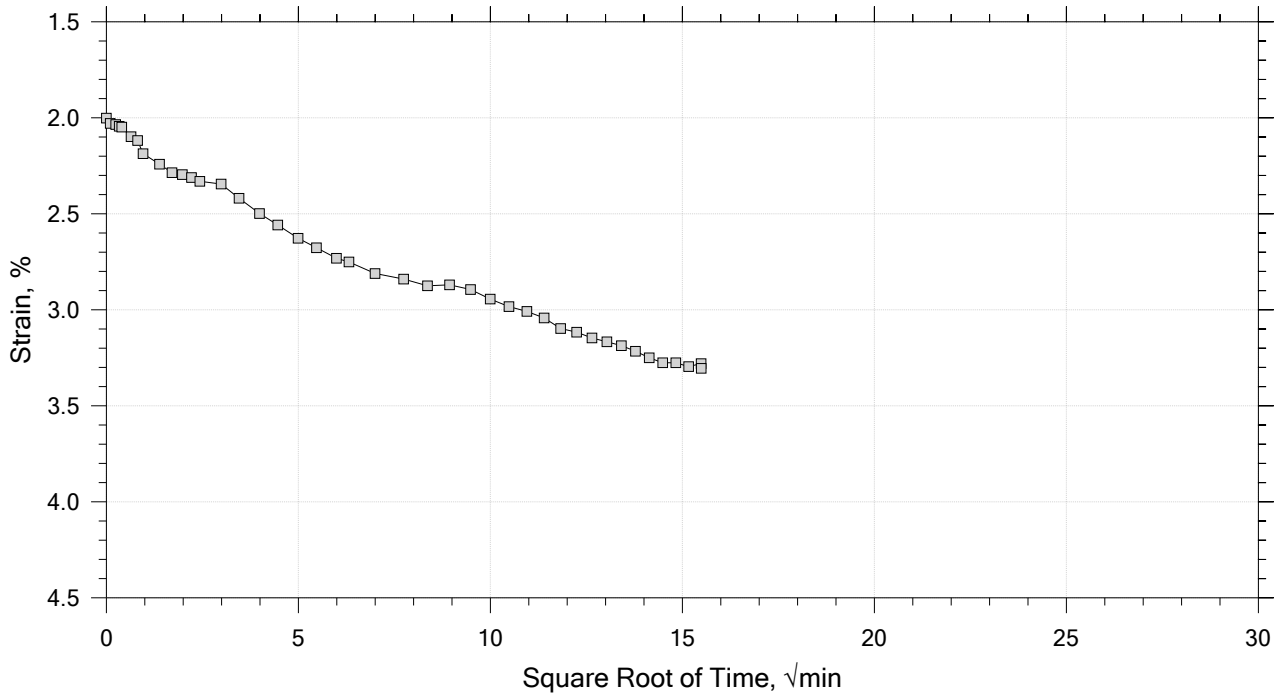
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 14

Constant Load Step

Stress: 2 tsf





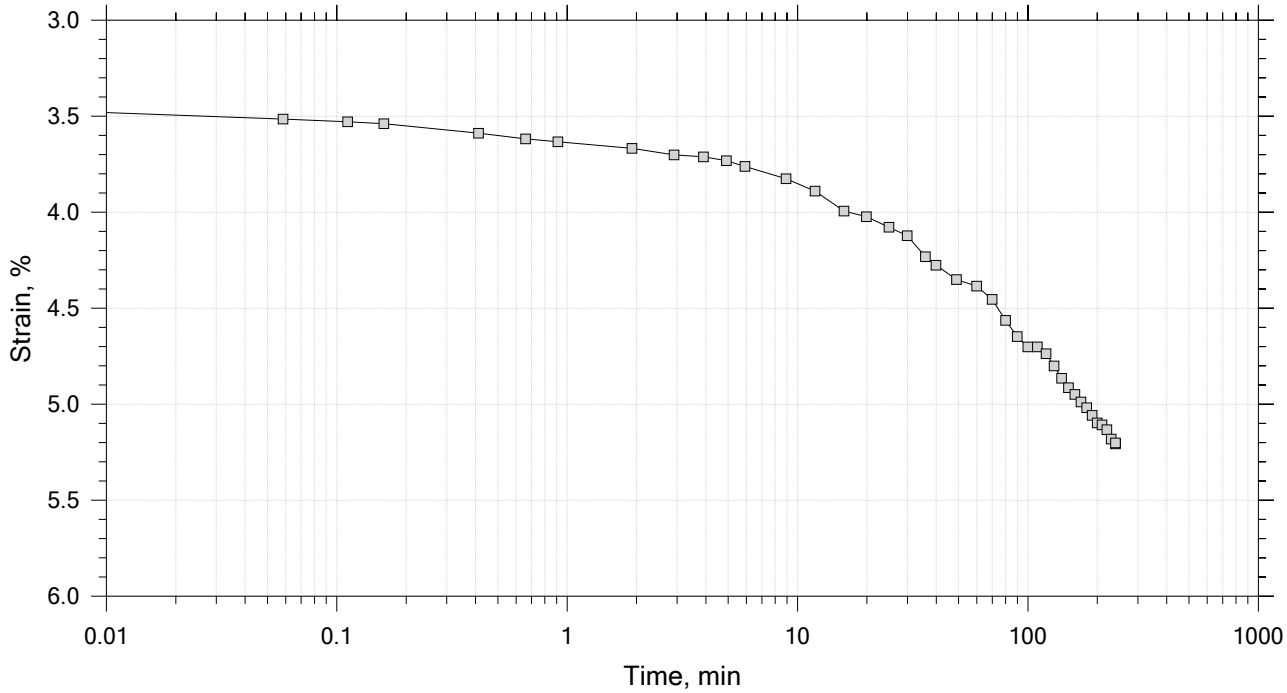
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

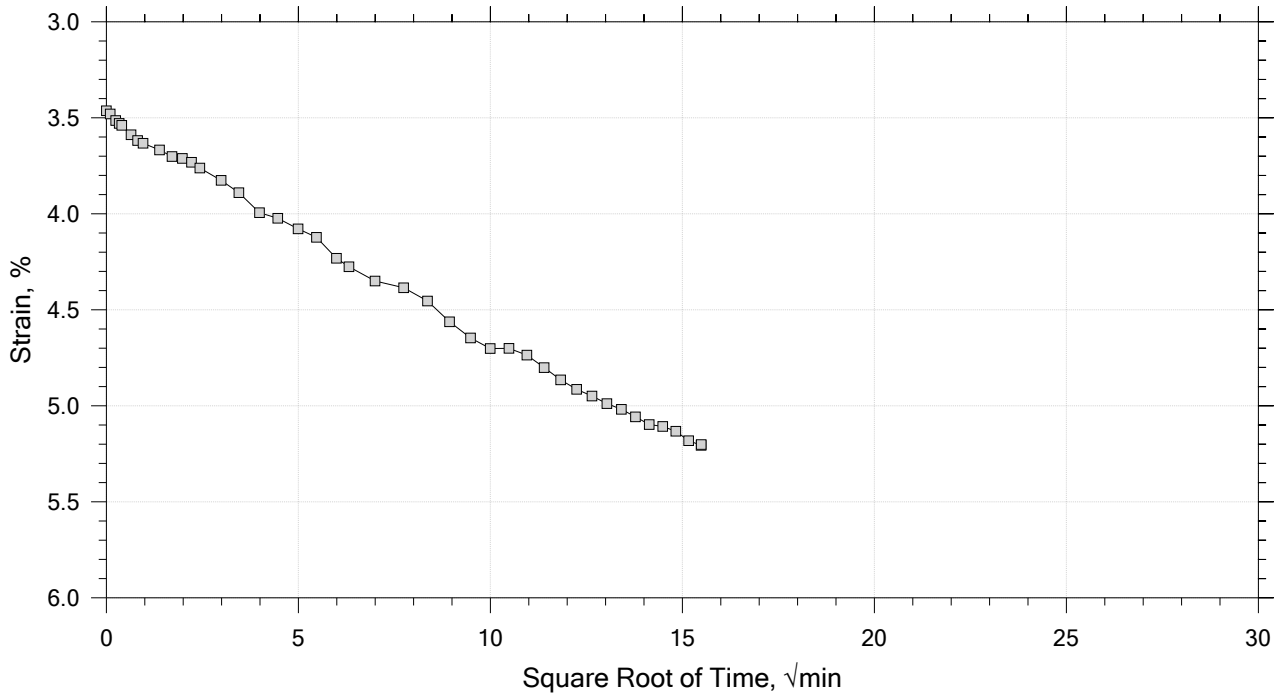
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 14

Constant Load Step

Stress: 4 tsf





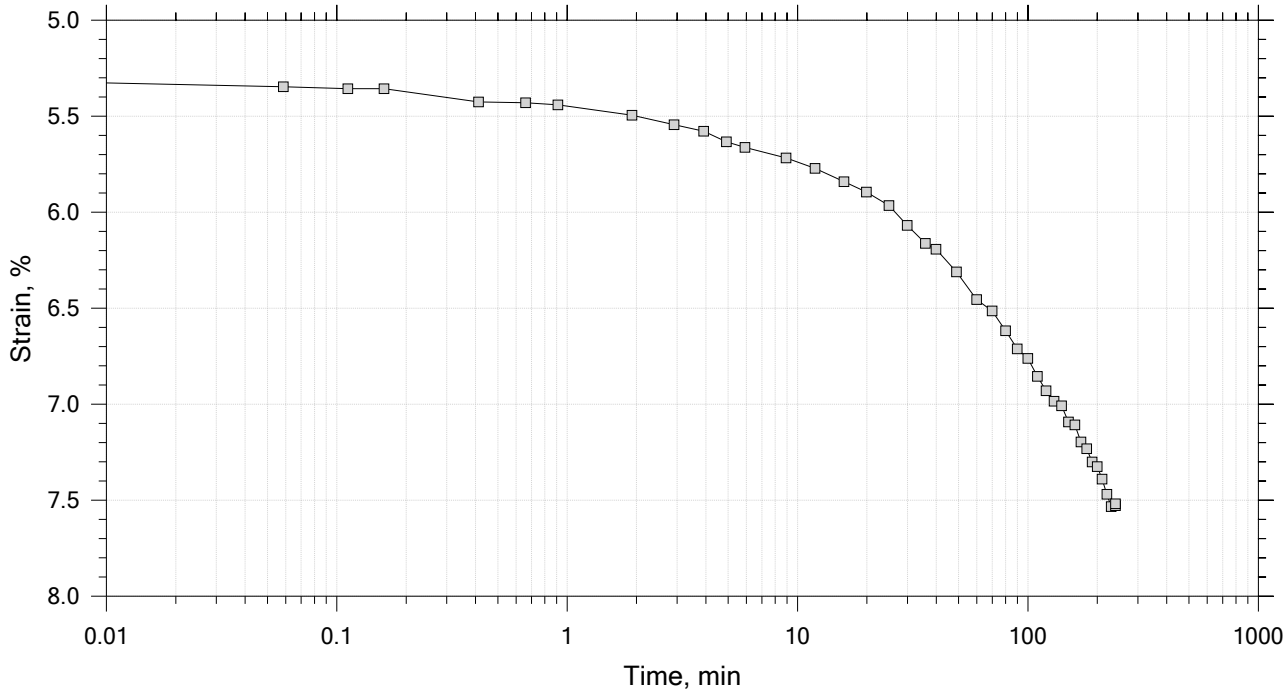
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

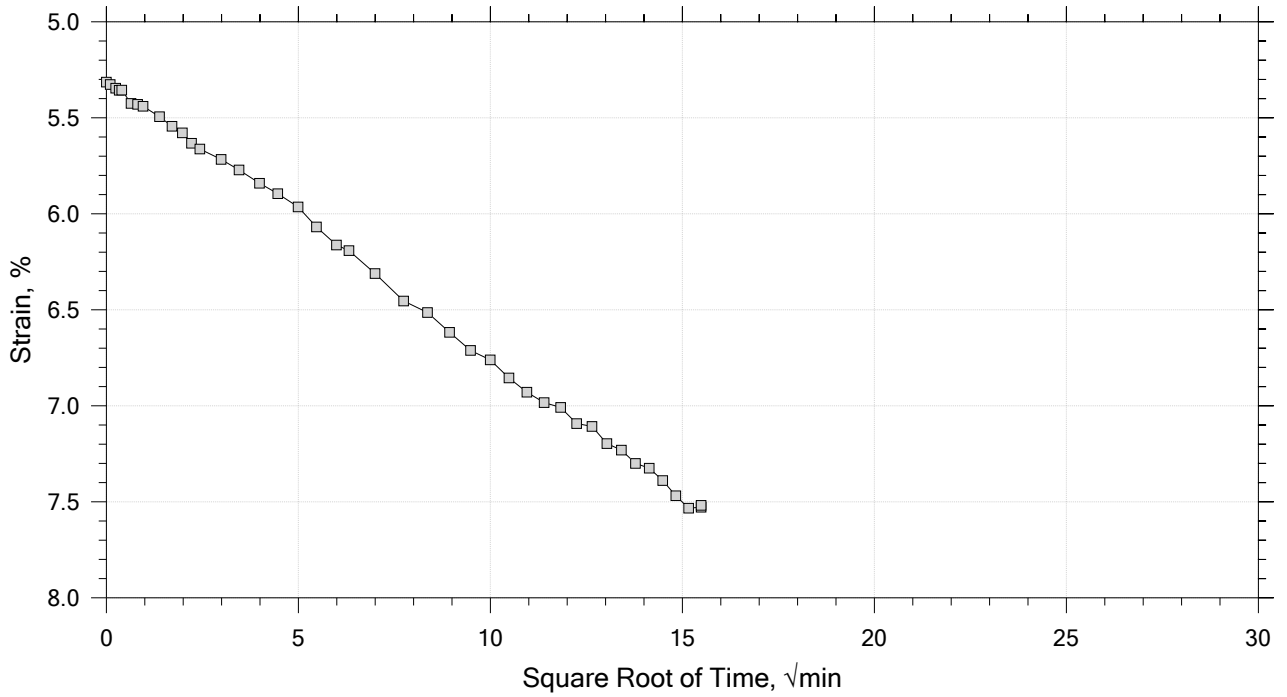
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 14

Constant Load Step

Stress: 8 tsf





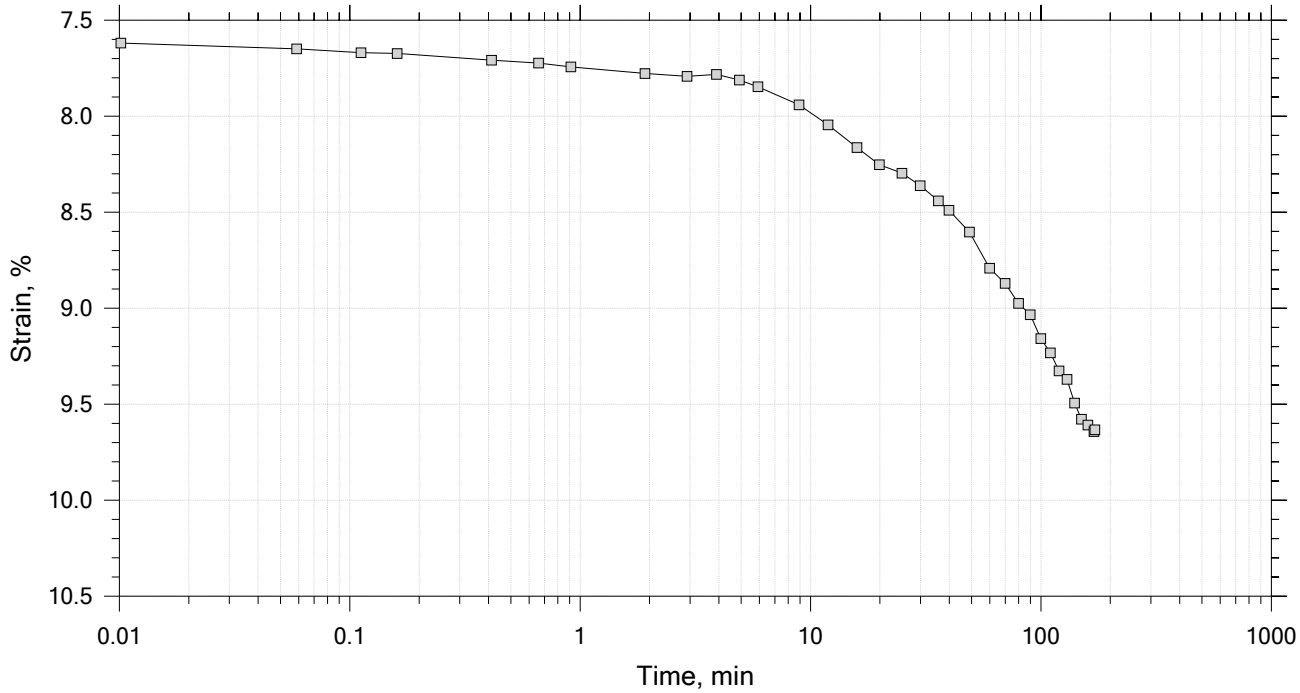
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

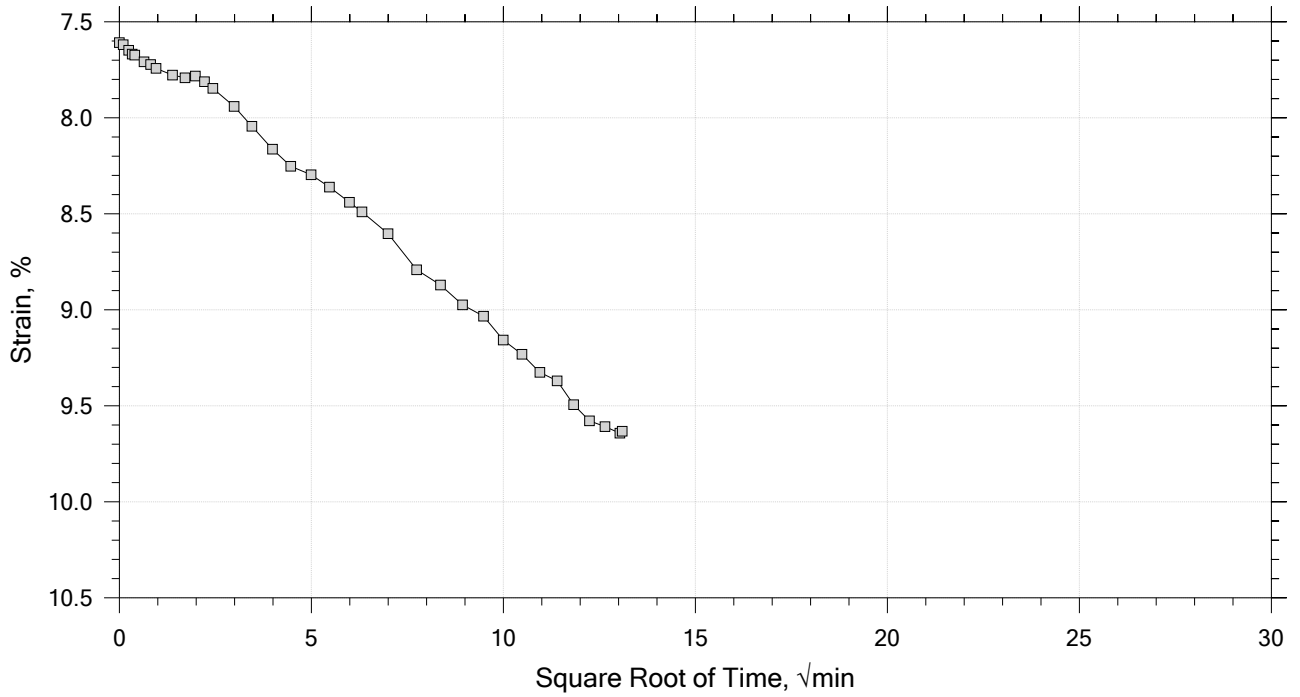
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 14

Constant Load Step

Stress: 16 tsf





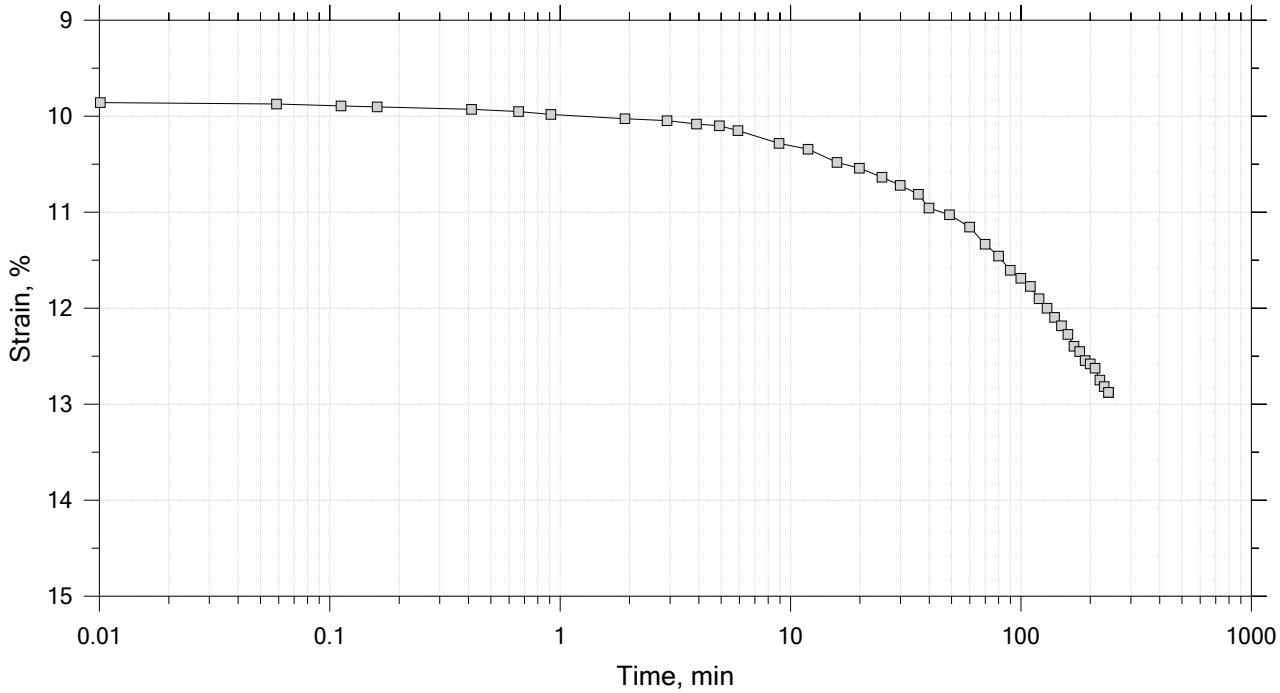
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

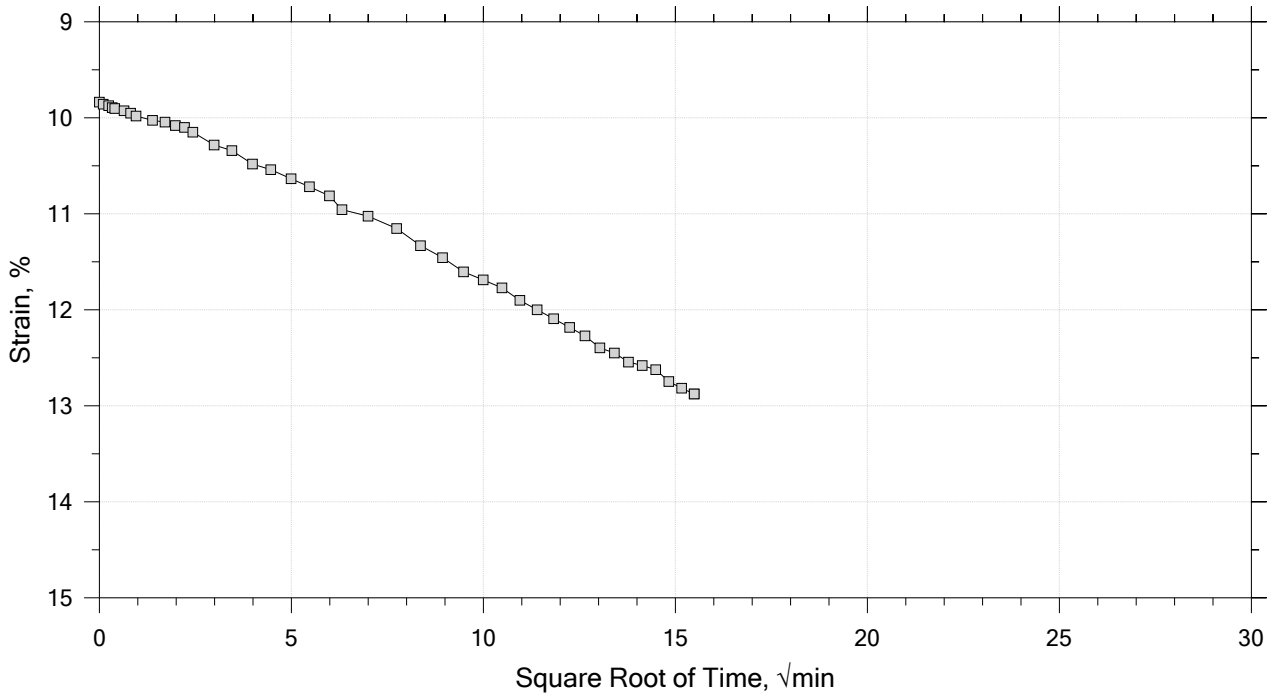
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 14

Constant Load Step

Stress: 32 tsf





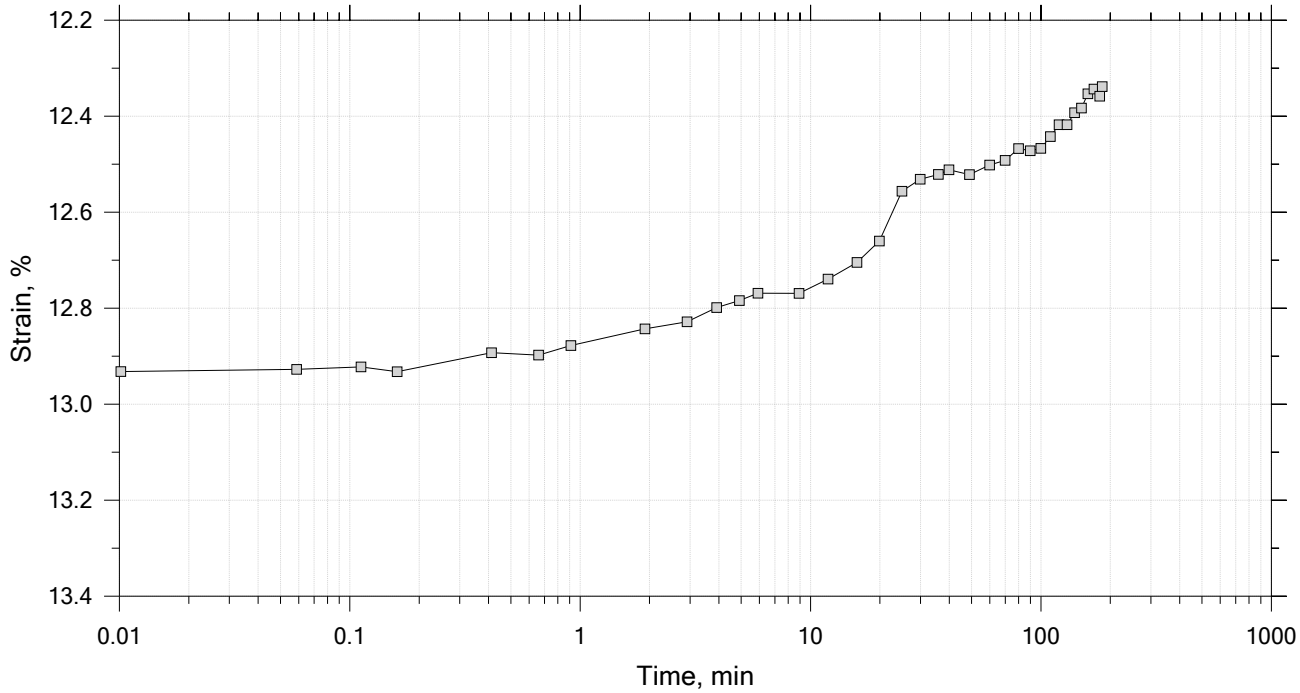
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

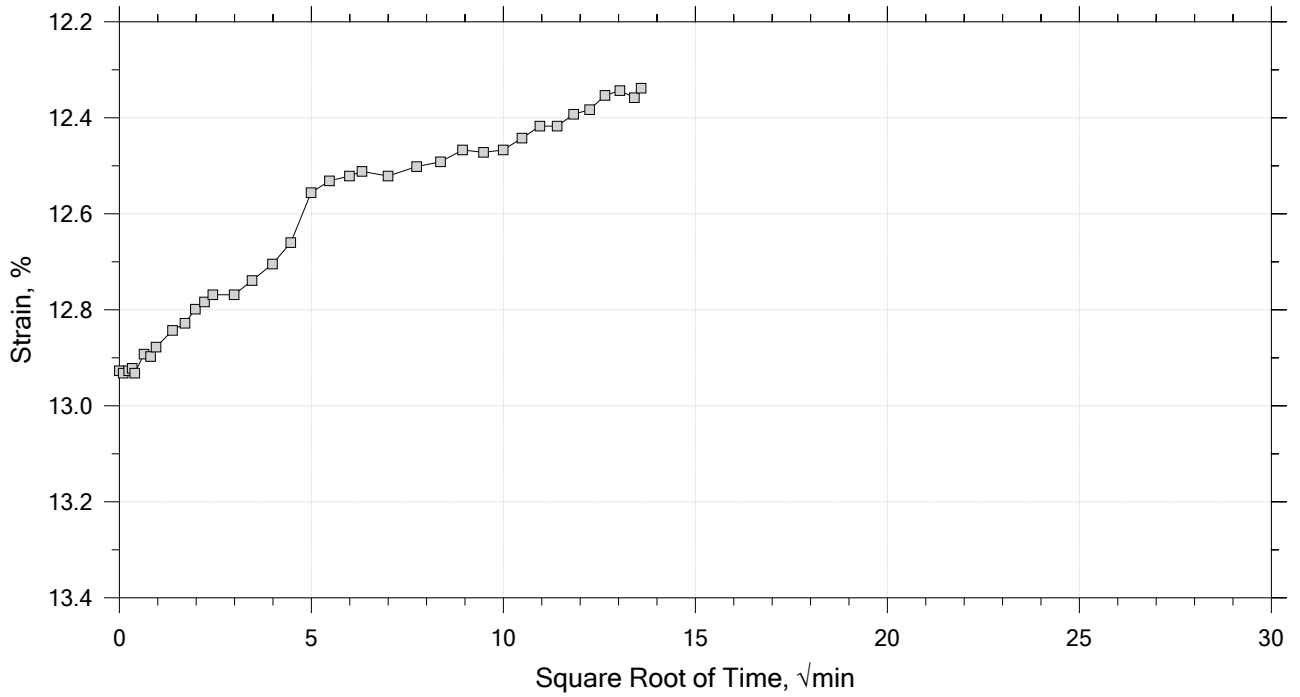
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 14

Constant Load Step

Stress: 8 tsf





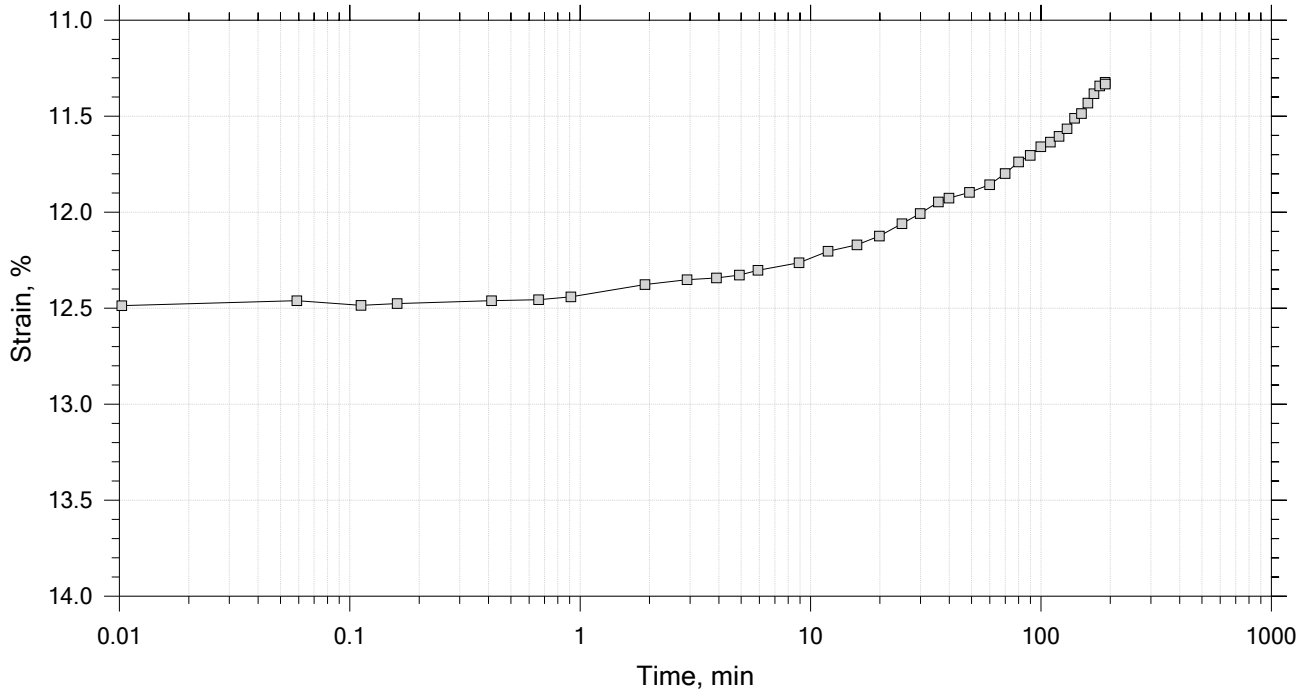
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

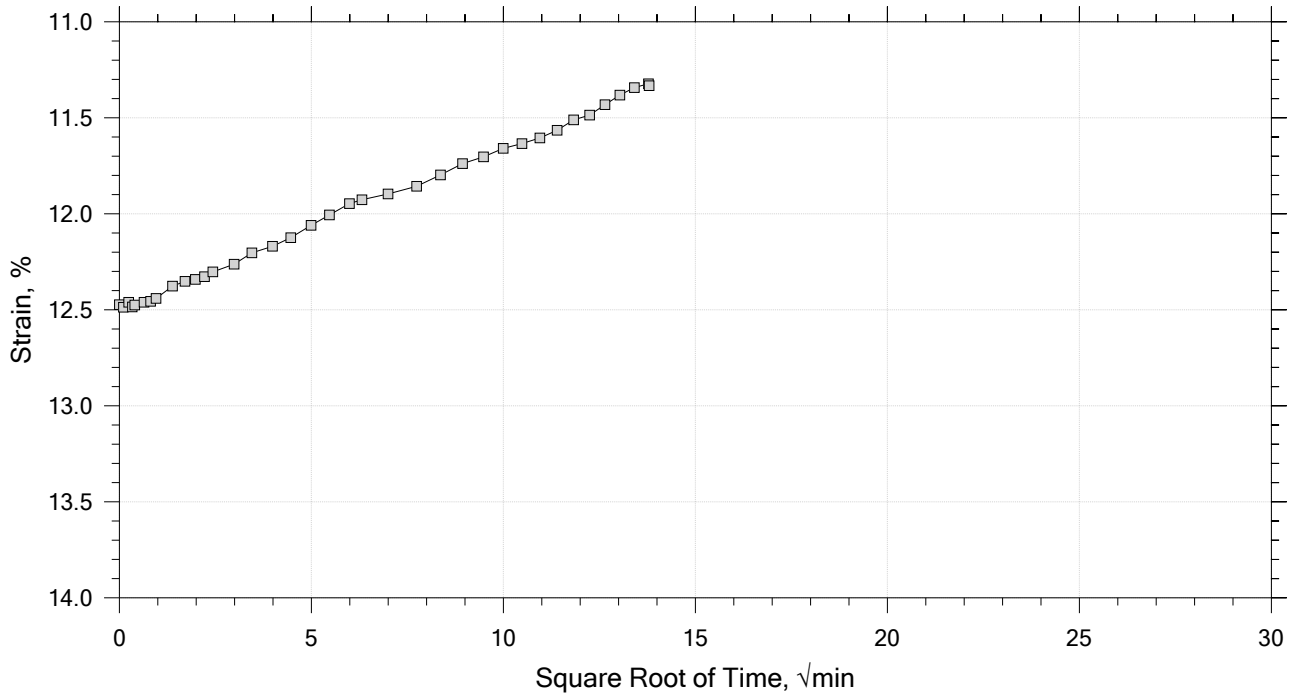
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 14

Constant Load Step

Stress: 2 tsf





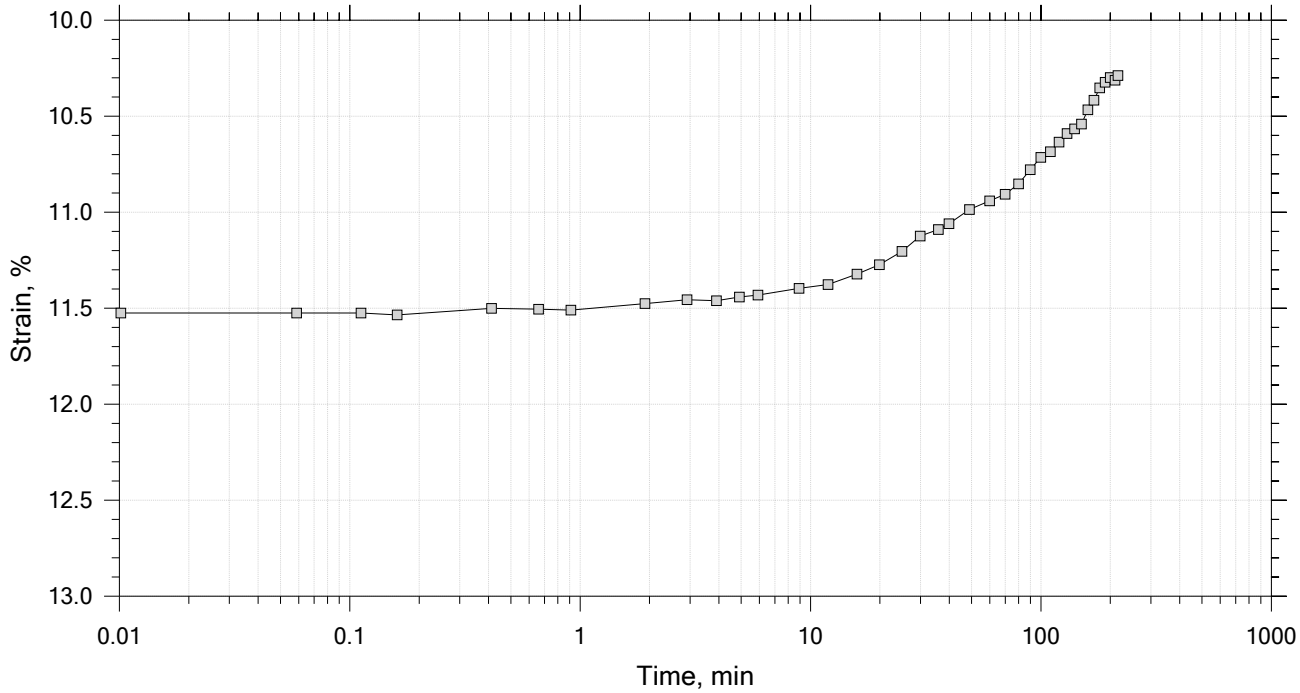
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

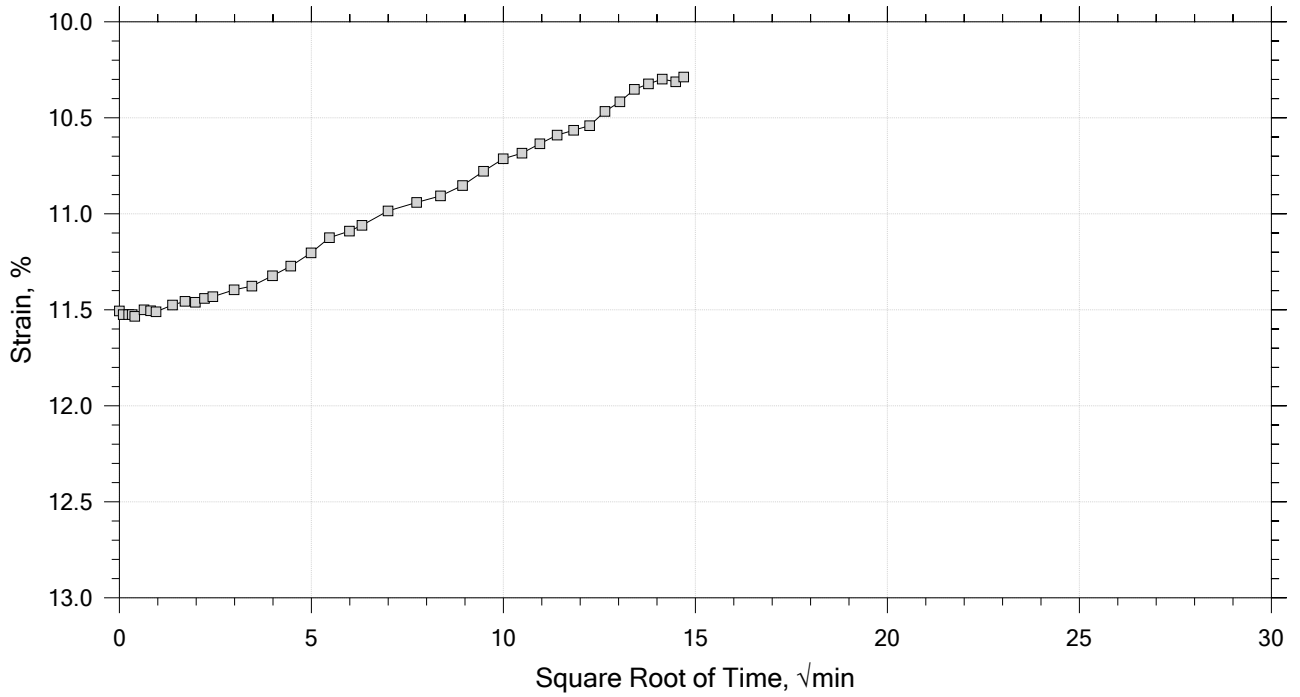
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 14

Constant Load Step

Stress: 0.5 tsf





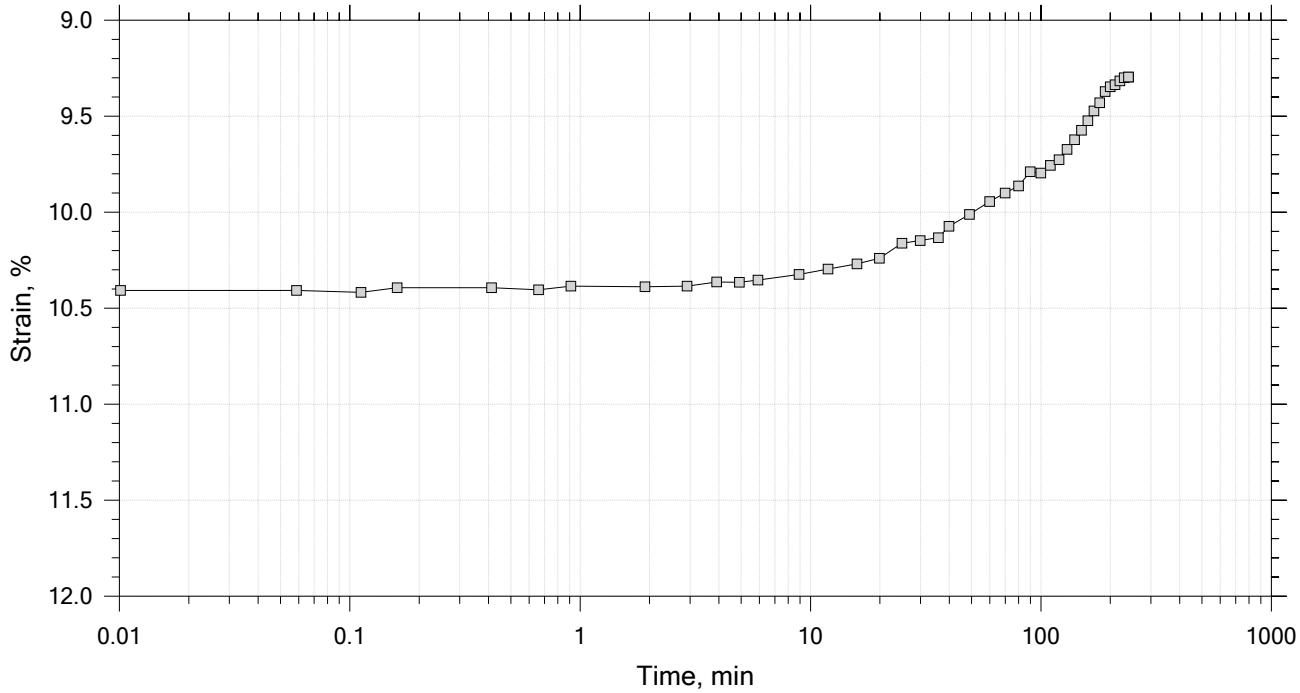
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

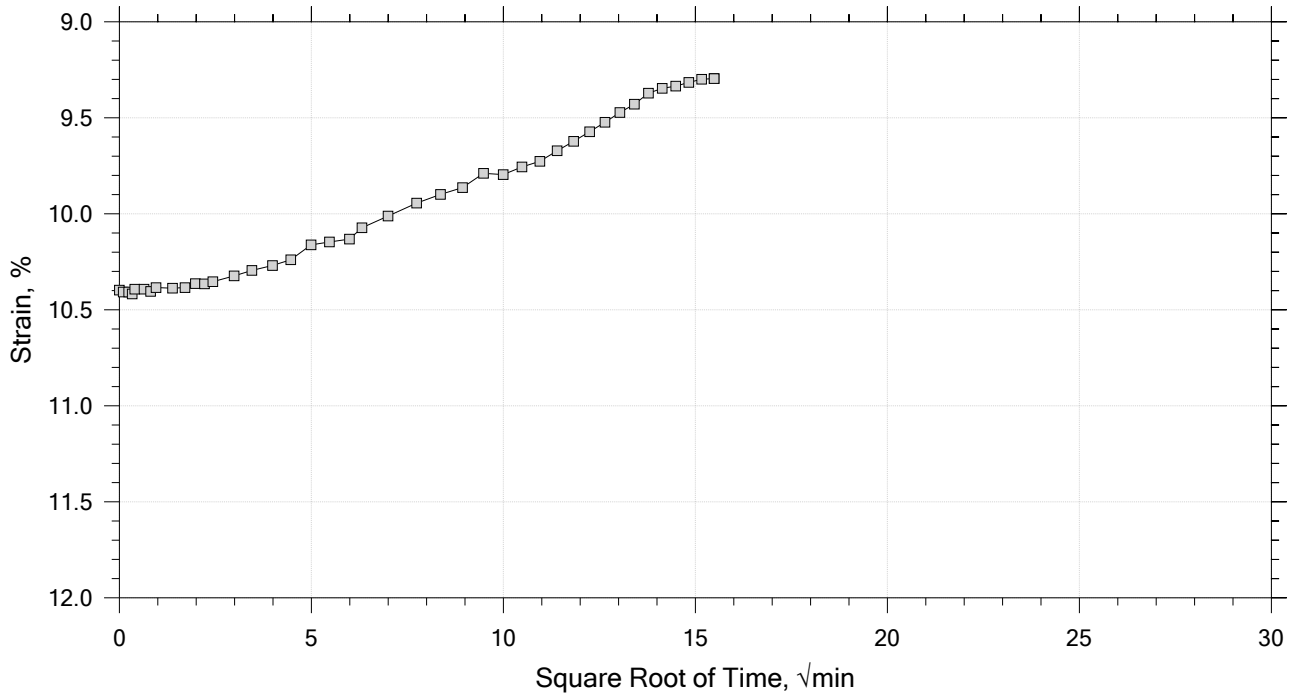
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 14

Constant Load Step

Stress: 0.125 tsf





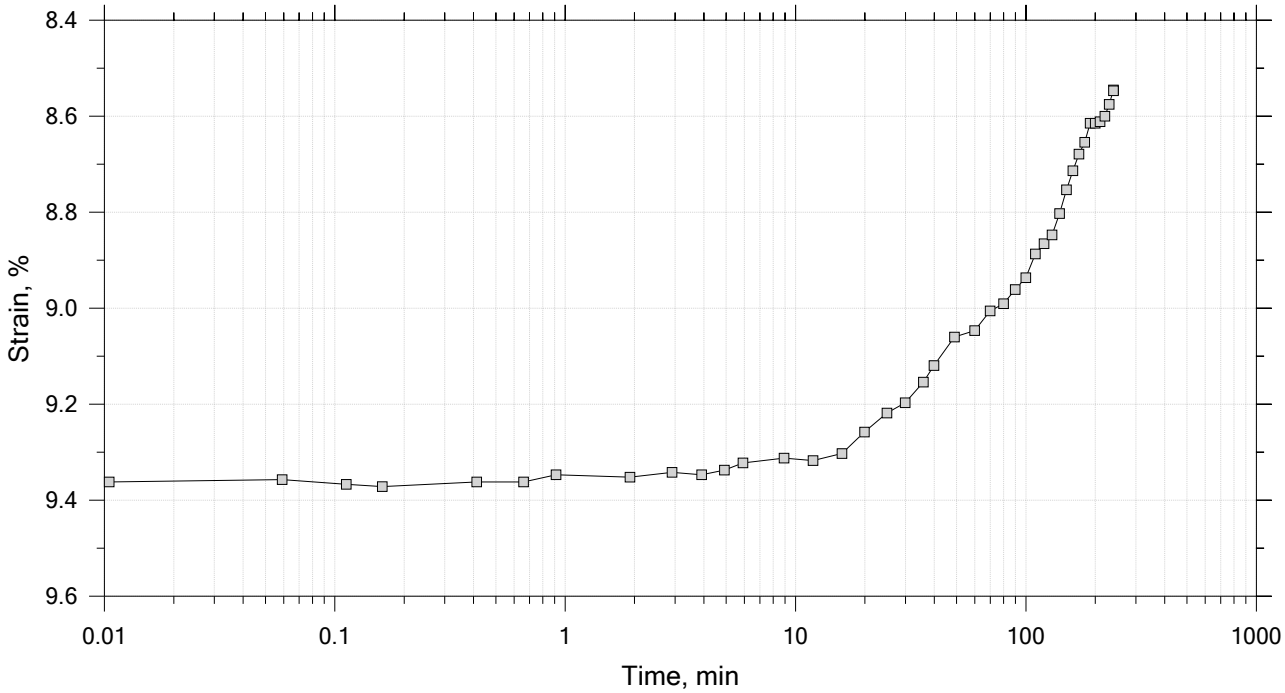
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

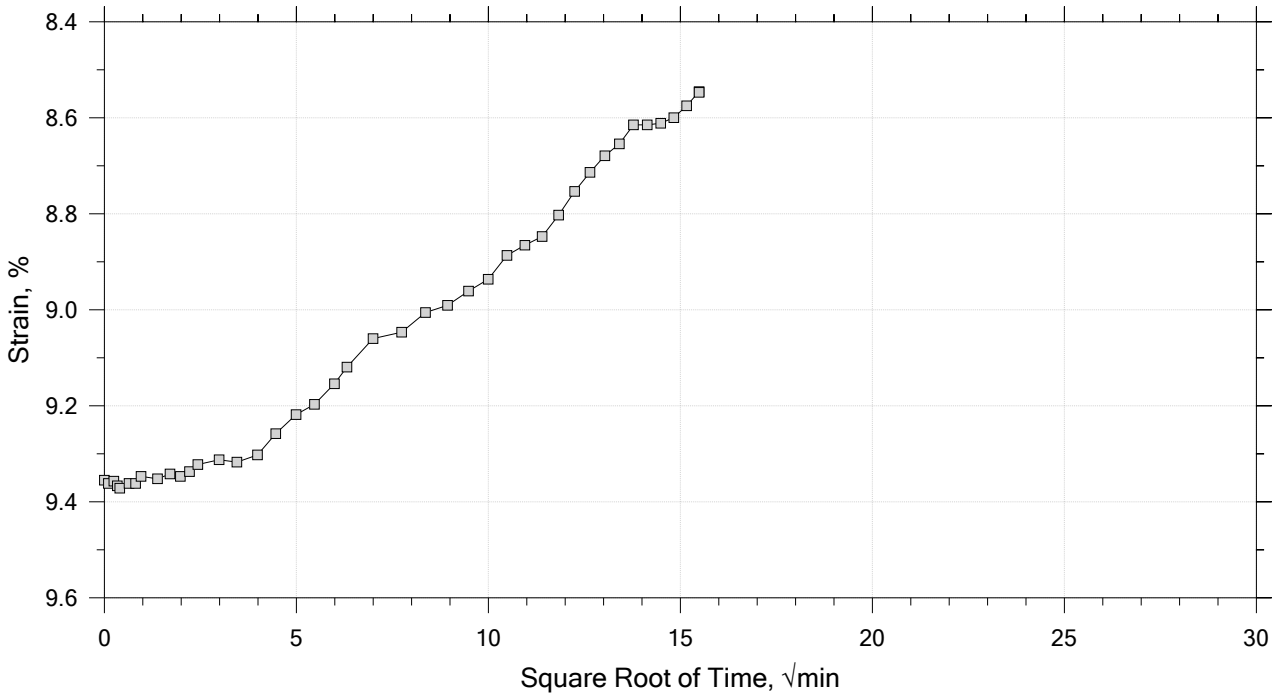
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 14

Constant Load Step

Stress: 0.0625 tsf





Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.70	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 0.614	Plastic Limit: ---
Final Height: 0.95 in	Final Void Ratio: 0.533	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-2457	RING		Z-0213
Mass Container, gm	8.24	111.27	111.27	8.13
Mass Container + Wet Soil, gm	243.31	276.07	272.19	168.54
Mass Container + Dry Soil, gm	200.7	245.61	245.61	142.04
Mass Dry Soil, gm	192.46	134.34	134.34	133.91
Water Content, %	22.14	22.68	19.79	19.79
Void Ratio	---	0.61	0.53	---
Degree of Saturation, %	---	99.54	100.00	---
Dry Unit Weight, pcf	---	104.26	109.74	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test.
Therefore, values may not represent actual values for the specimen.

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.176	0.001093	0.612	0.109	86.786	6.56e-08	6.23e-03	1.10e-06	0.00e+00
2	0.250	0.003645	0.608	0.364	0.000	0.00e+00	3.43e-02	0.00e+00	0.00e+00
3	0.500	0.008601	0.600	0.860	0.000	0.00e+00	1.98e-02	0.00e+00	0.00e+00
4	1.00	0.01747	0.586	1.75	0.000	0.00e+00	1.77e-02	0.00e+00	0.00e+00
5	2.00	0.03305	0.561	3.31	0.000	0.00e+00	1.56e-02	0.00e+00	0.00e+00
6	4.00	0.05202	0.530	5.20	0.000	0.00e+00	9.48e-03	0.00e+00	0.00e+00
7	8.00	0.07518	0.493	7.52	0.000	0.00e+00	5.79e-03	0.00e+00	0.00e+00
8	16.0	0.09633	0.459	9.63	0.000	0.00e+00	2.64e-03	0.00e+00	0.00e+00
9	32.0	0.1288	0.406	12.9	0.000	0.00e+00	2.03e-03	0.00e+00	0.00e+00
10	8.00	0.1234	0.415	12.3	0.000	0.00e+00	2.24e-04	0.00e+00	0.00e+00
11	2.00	0.1133	0.431	11.3	0.000	0.00e+00	1.68e-03	0.00e+00	0.00e+00
12	0.500	0.1029	0.448	10.3	0.000	0.00e+00	6.96e-03	0.00e+00	0.00e+00
13	0.125	0.09296	0.464	9.30	0.000	0.00e+00	2.65e-02	0.00e+00	0.00e+00
14	0.0625	0.08547	0.476	8.55	0.000	0.00e+00	1.20e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

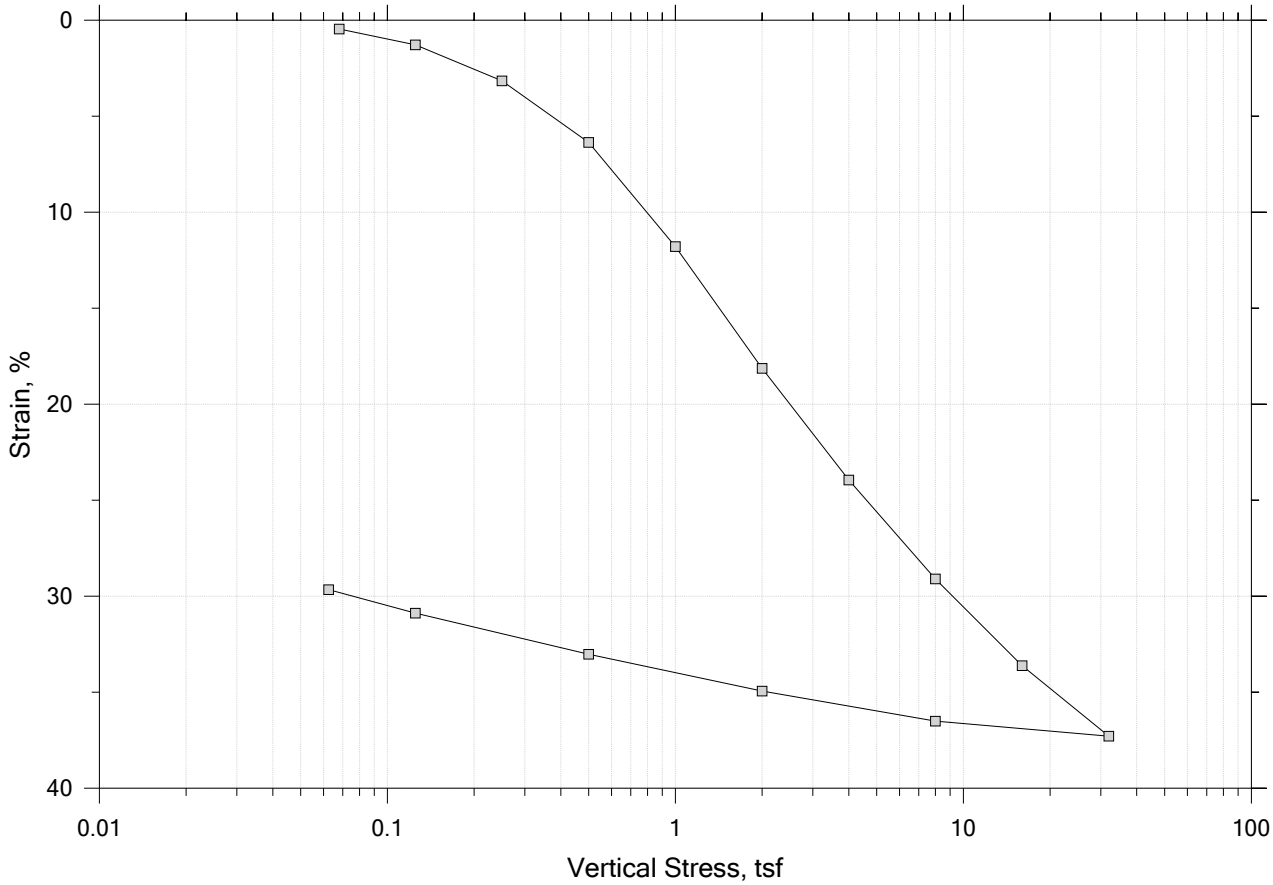
Square Root of Time Coefficients

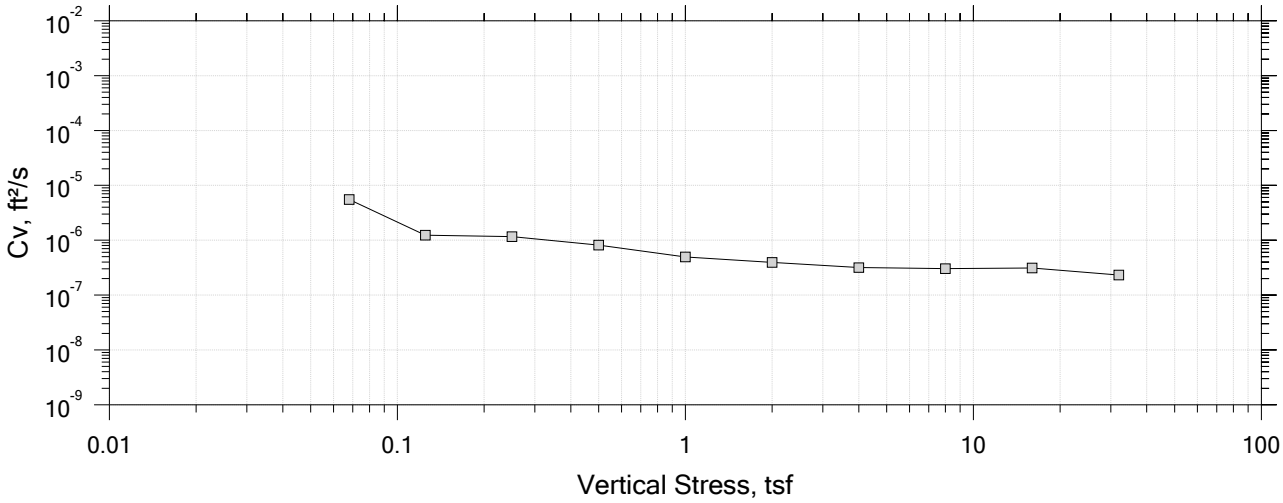
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.176	0.001093	0.612	0.109	134.307	1.82e-07	6.23e-03	3.06e-06
2	0.250	0.003645	0.608	0.364	2.424	1.01e-05	3.43e-02	9.32e-04
3	0.500	0.008601	0.600	0.860	51.117	4.74e-07	1.98e-02	2.54e-05
4	1.00	0.01747	0.586	1.75	66.429	3.60e-07	1.77e-02	1.72e-05
5	2.00	0.03305	0.561	3.31	189.697	1.23e-07	1.56e-02	5.16e-06
6	4.00	0.05202	0.530	5.20	198.474	1.13e-07	9.48e-03	2.90e-06
7	8.00	0.07518	0.493	7.52	0.000	0.00e+00	5.79e-03	0.00e+00
8	16.0	0.09633	0.459	9.63	0.000	0.00e+00	2.64e-03	0.00e+00
9	32.0	0.1288	0.406	12.9	0.000	0.00e+00	2.03e-03	0.00e+00
10	8.00	0.1234	0.415	12.3	140.239	1.34e-07	2.24e-04	8.08e-08
11	2.00	0.1133	0.431	11.3	0.000	0.00e+00	1.68e-03	0.00e+00
12	0.500	0.1029	0.448	10.3	0.000	0.00e+00	6.96e-03	0.00e+00
13	0.125	0.09296	0.464	9.30	182.122	1.10e-07	2.65e-02	7.82e-06
14	0.0625	0.08547	0.476	8.55	179.159	1.14e-07	1.20e-01	3.67e-05

GeoTesti EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





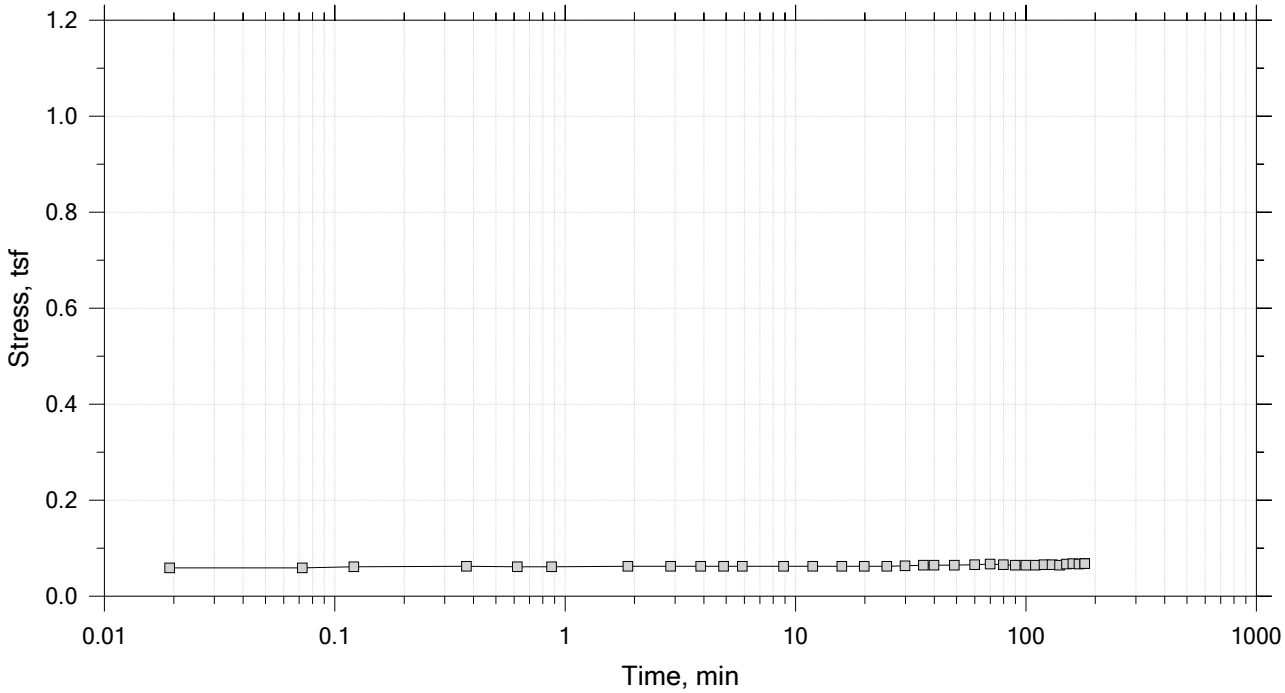
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		
Displacement at End of Increment		

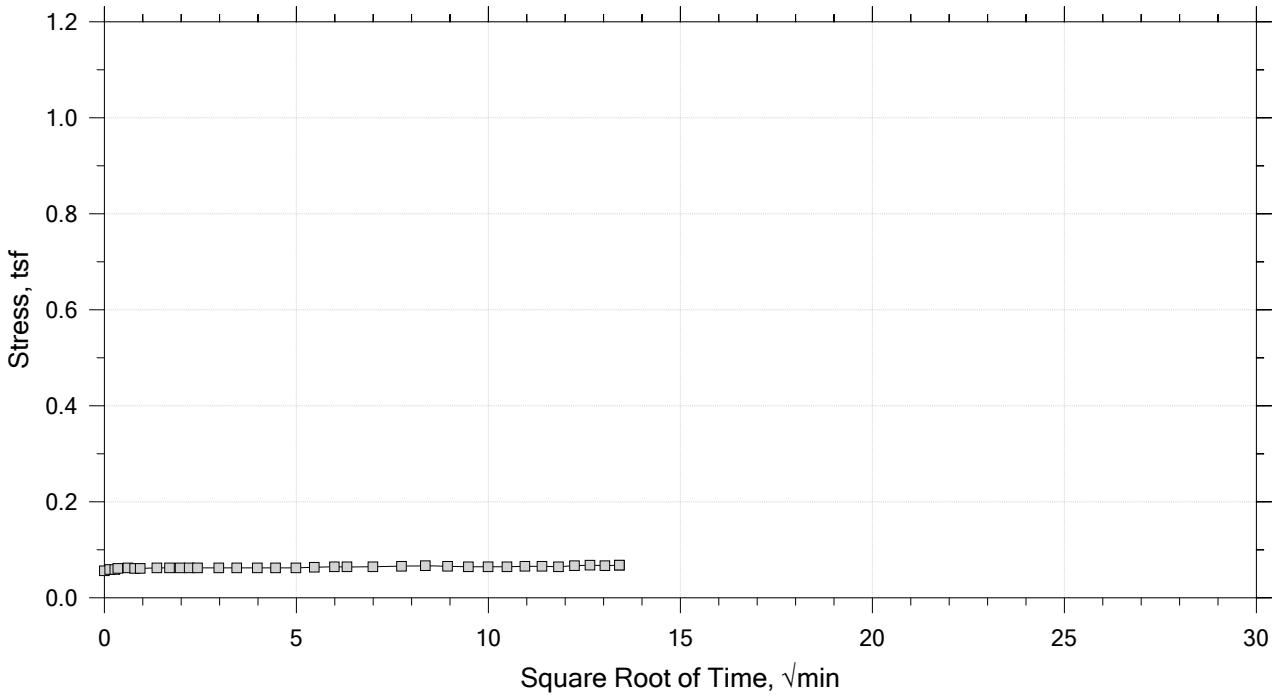
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15

Constant Volume Step

Stress: 0.068 tsf





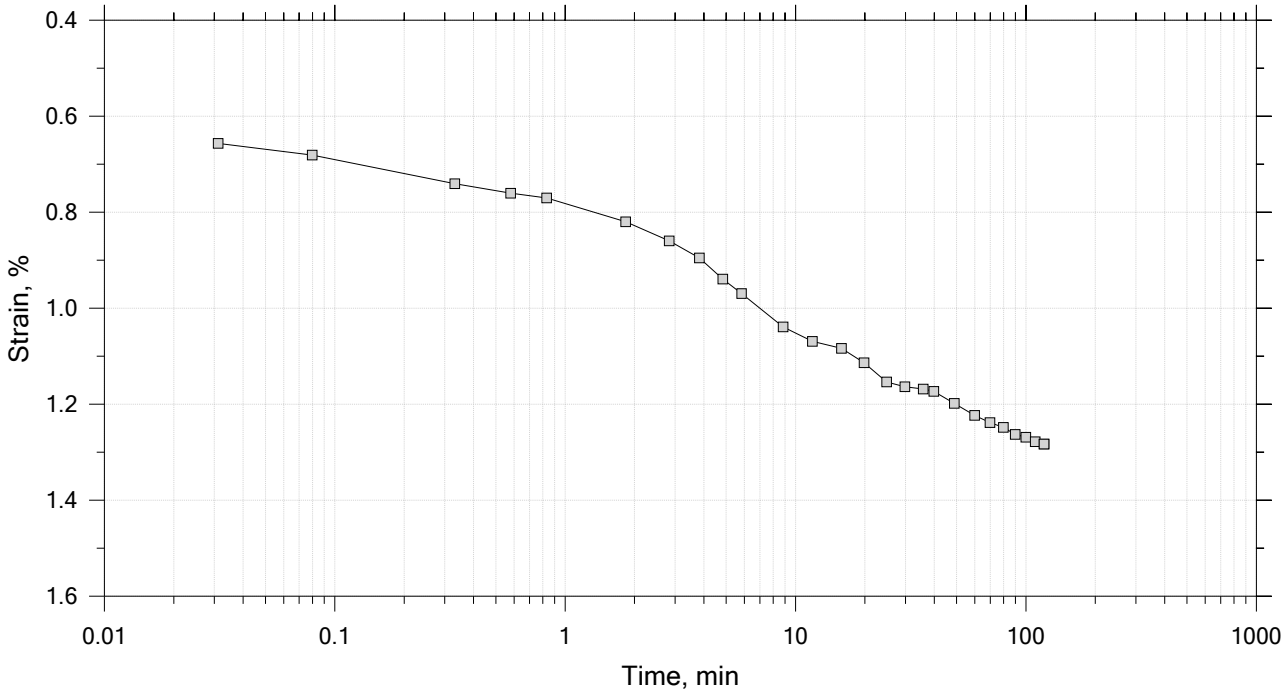
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

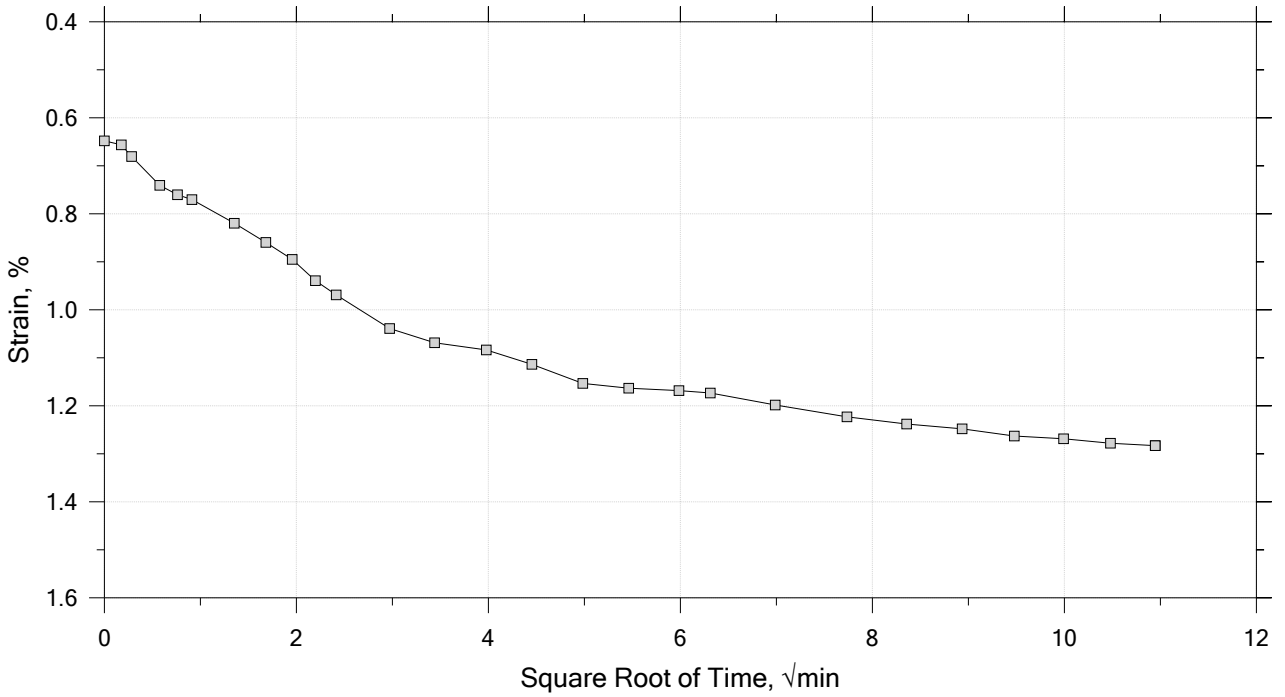
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf





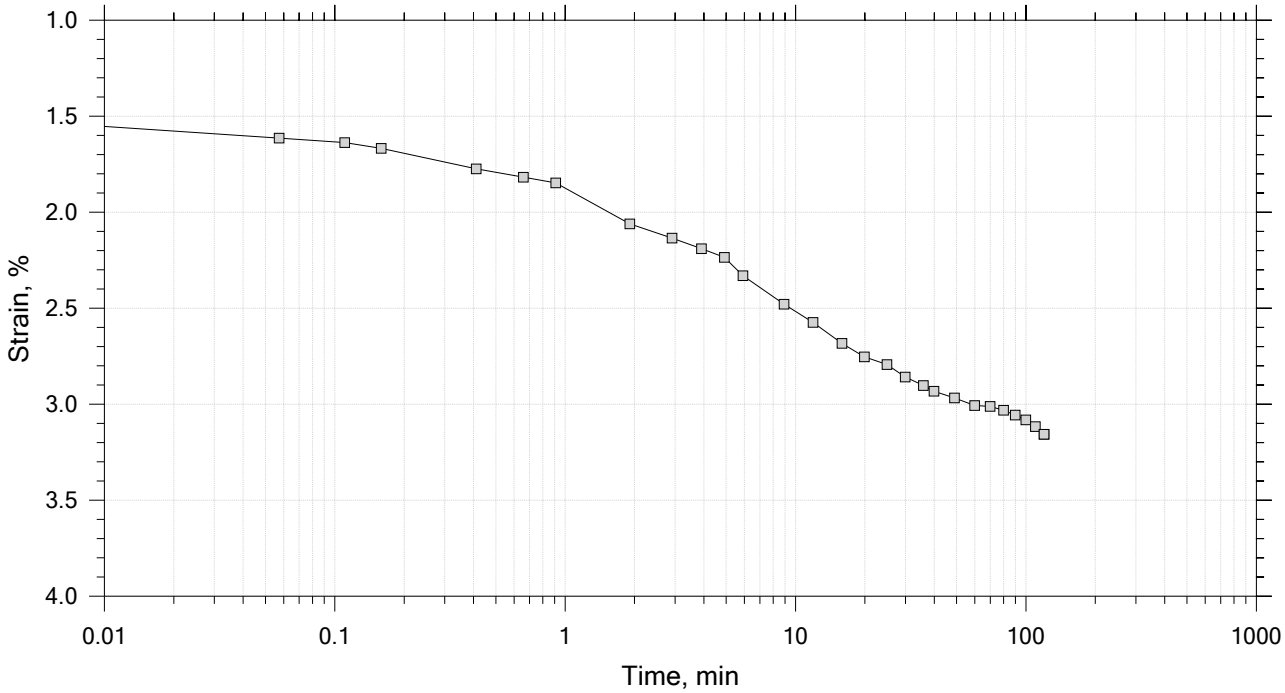
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

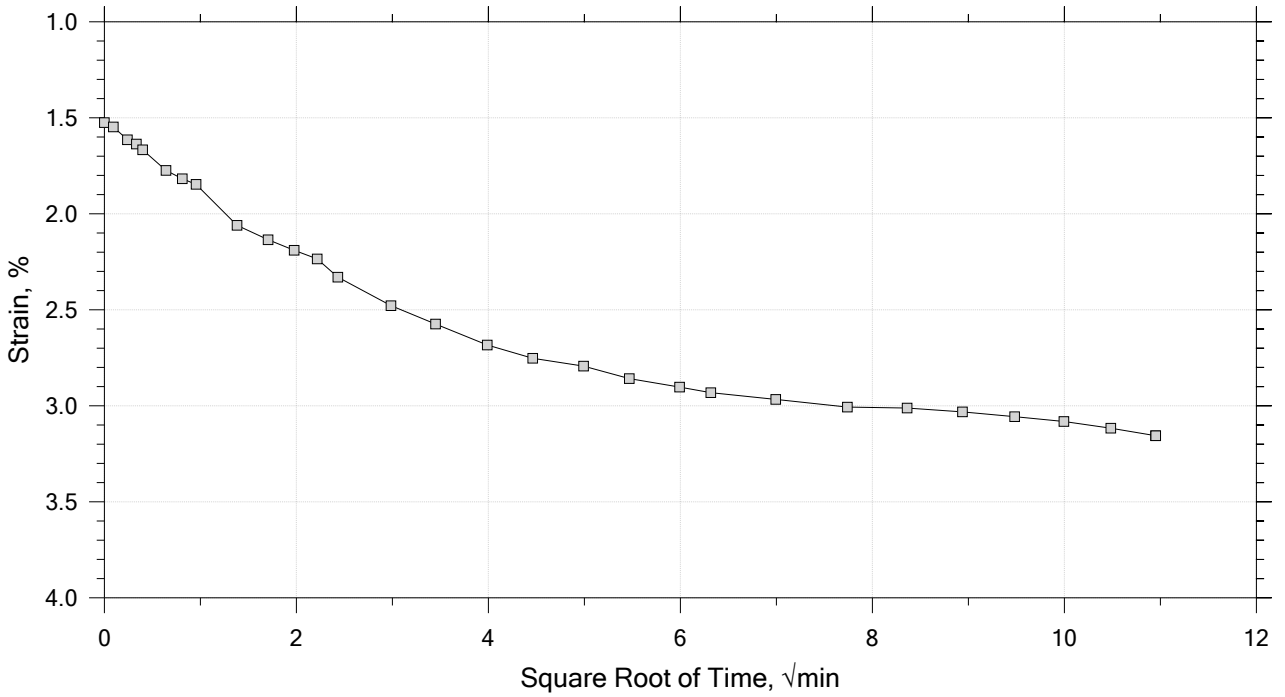
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf





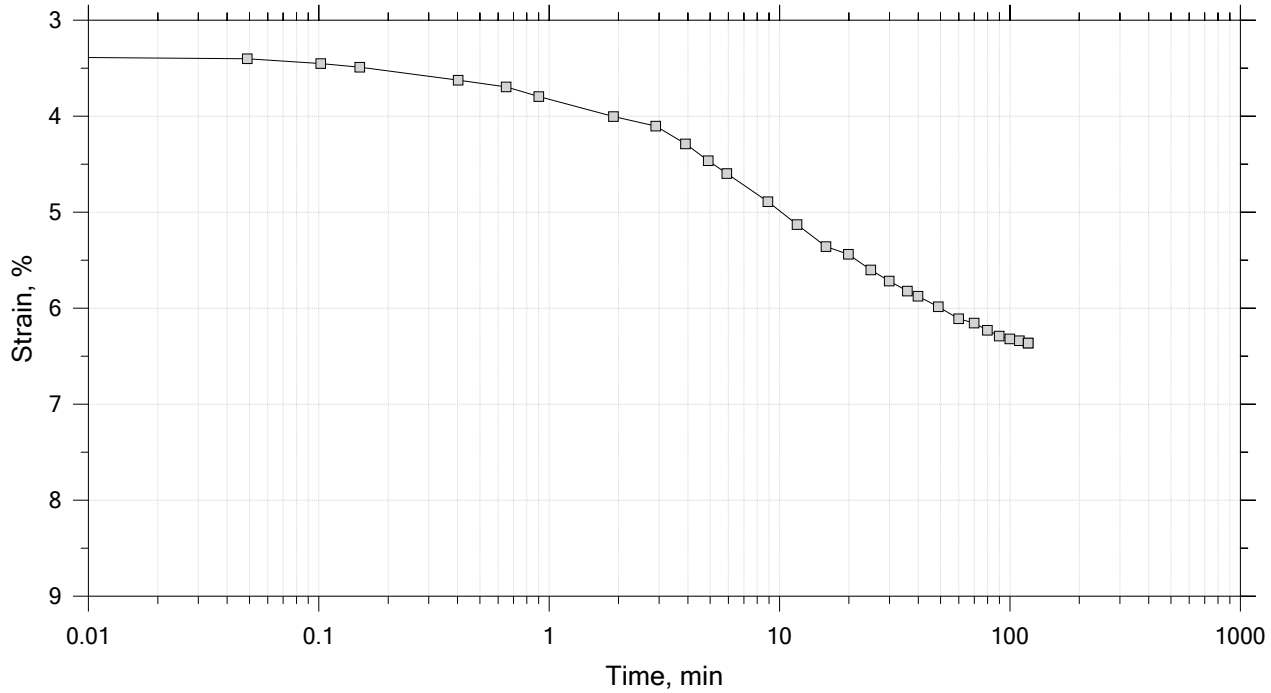
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

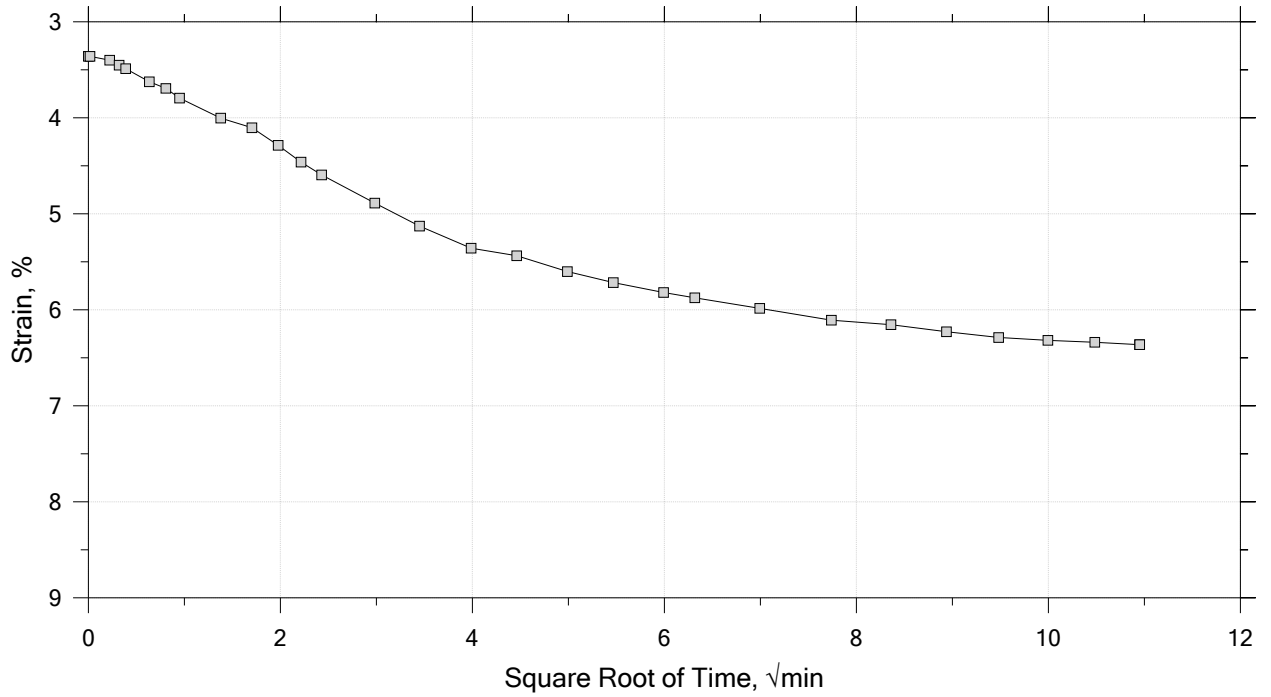
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





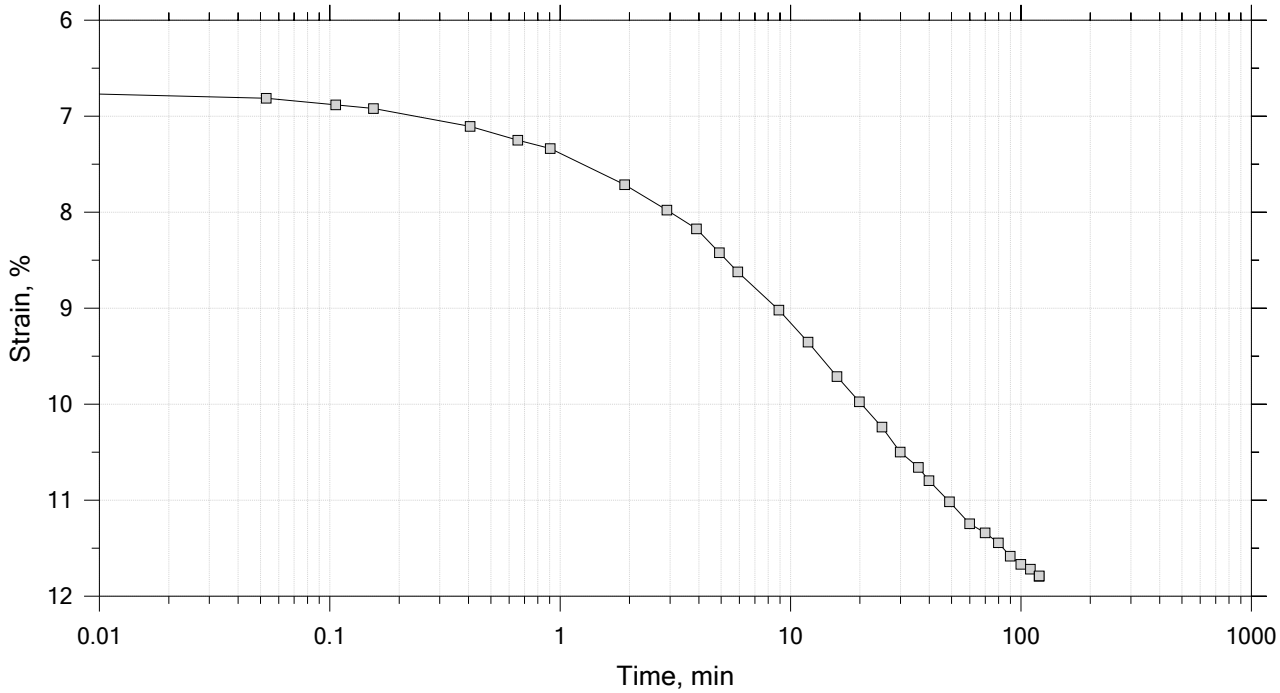
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

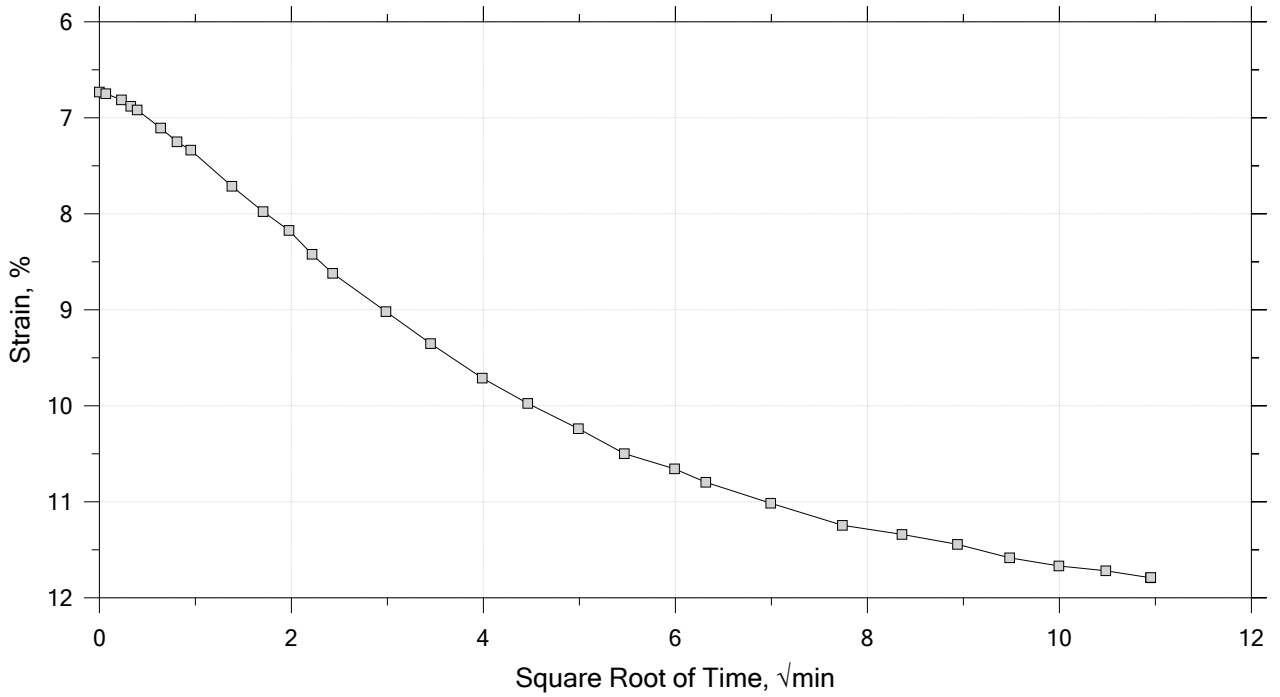
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





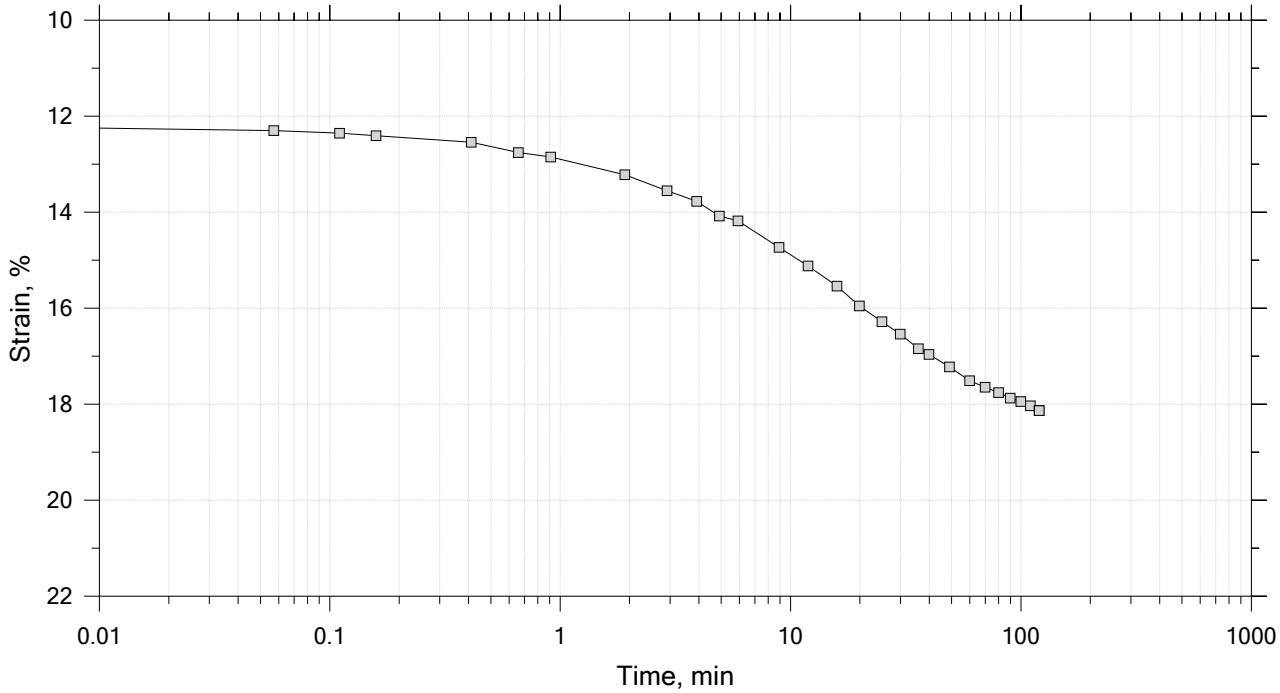
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

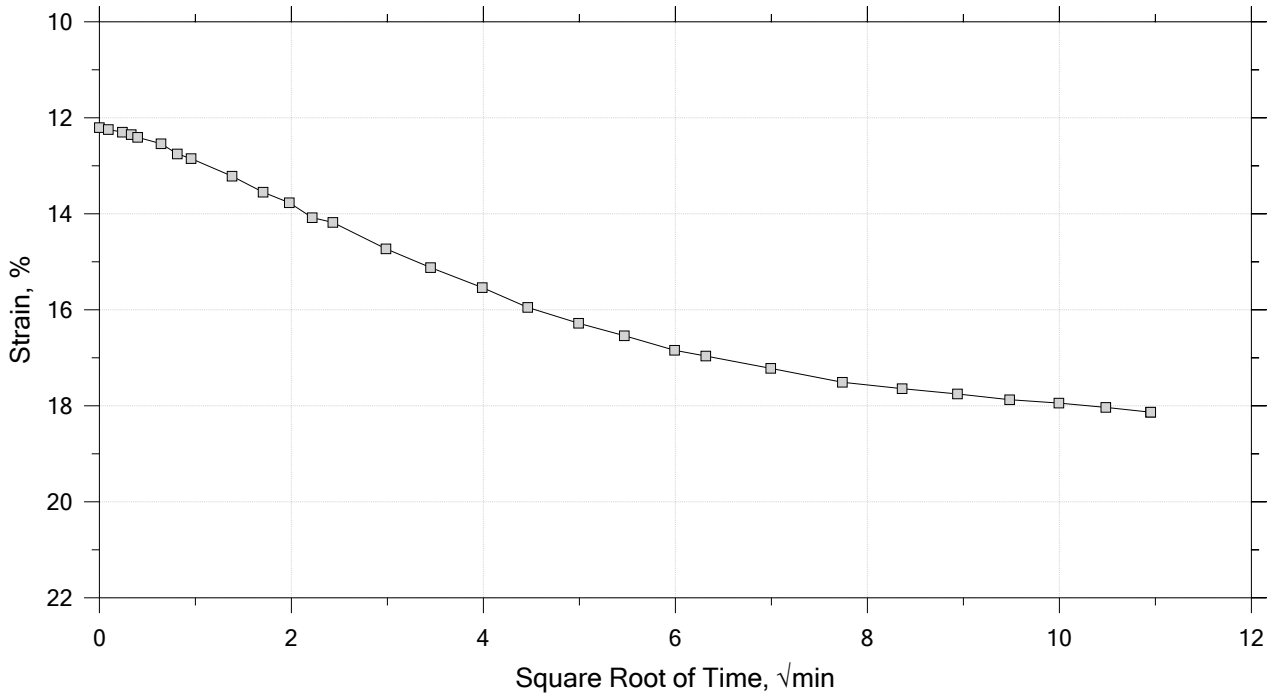
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





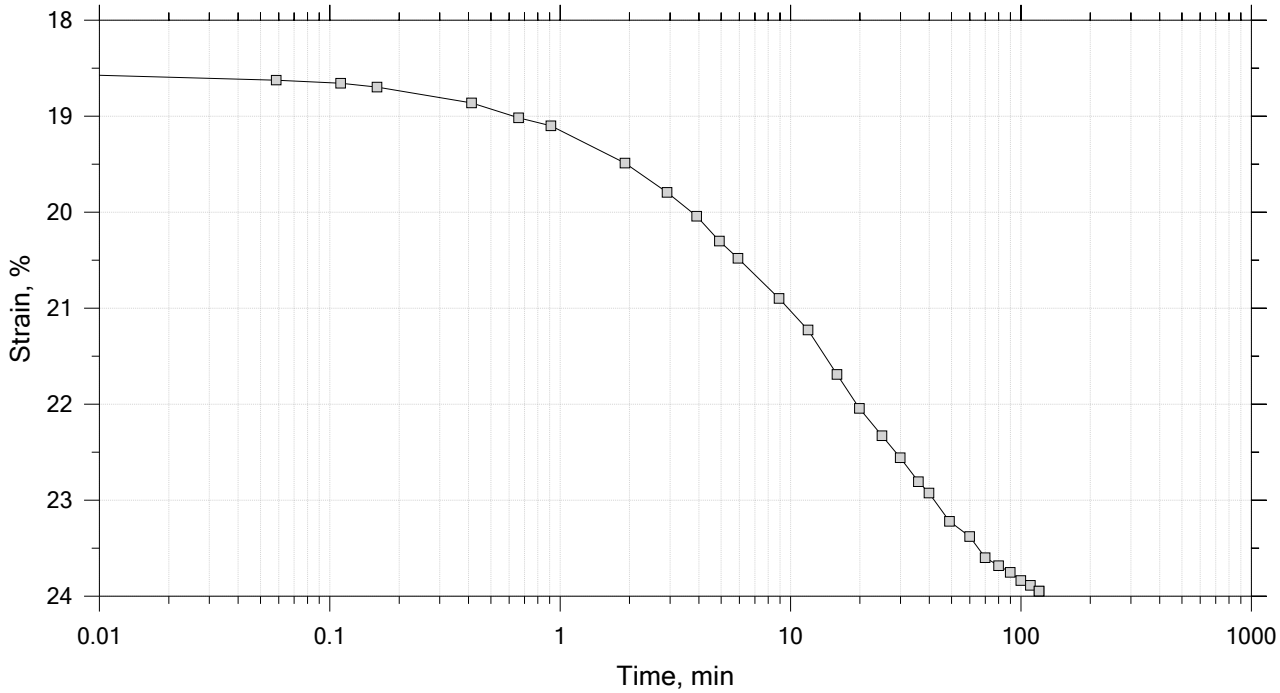
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

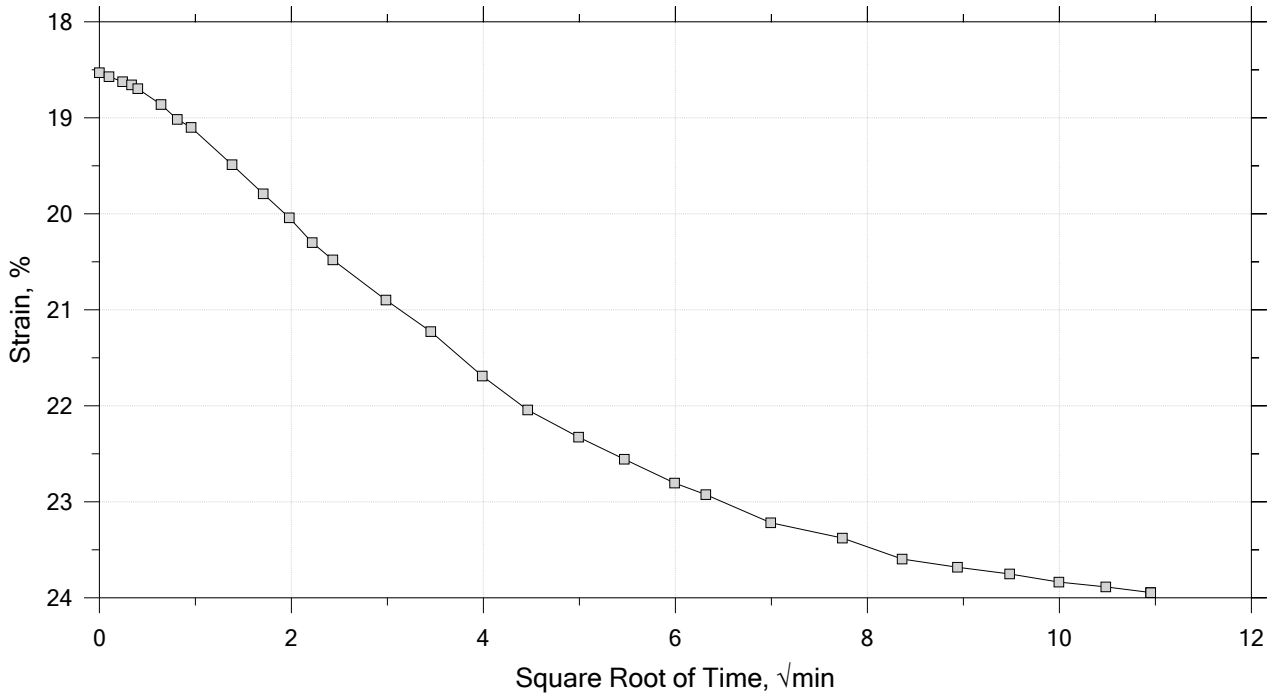
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





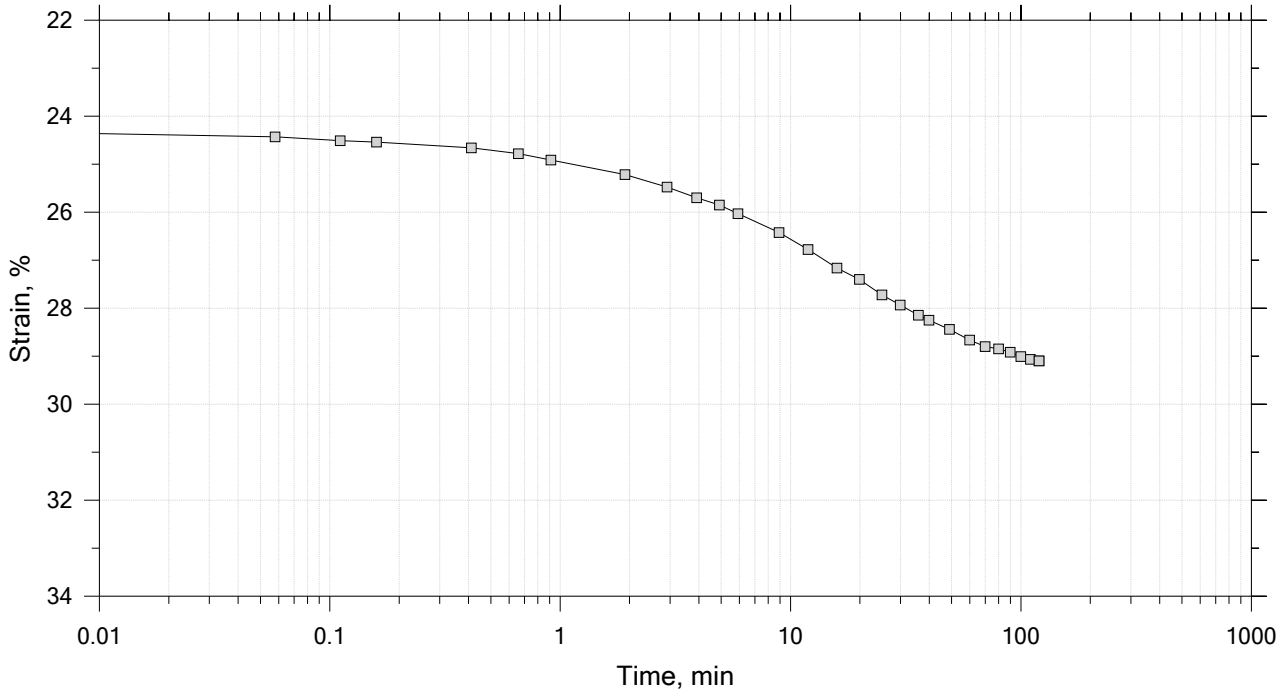
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

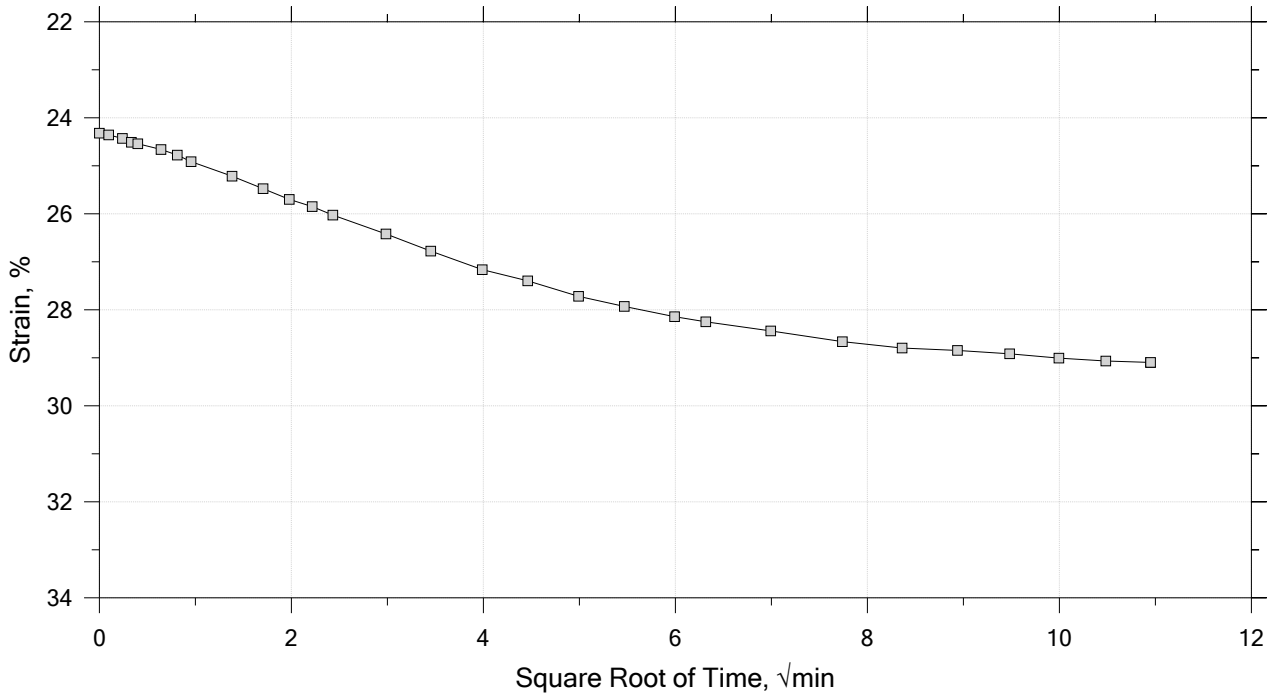
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





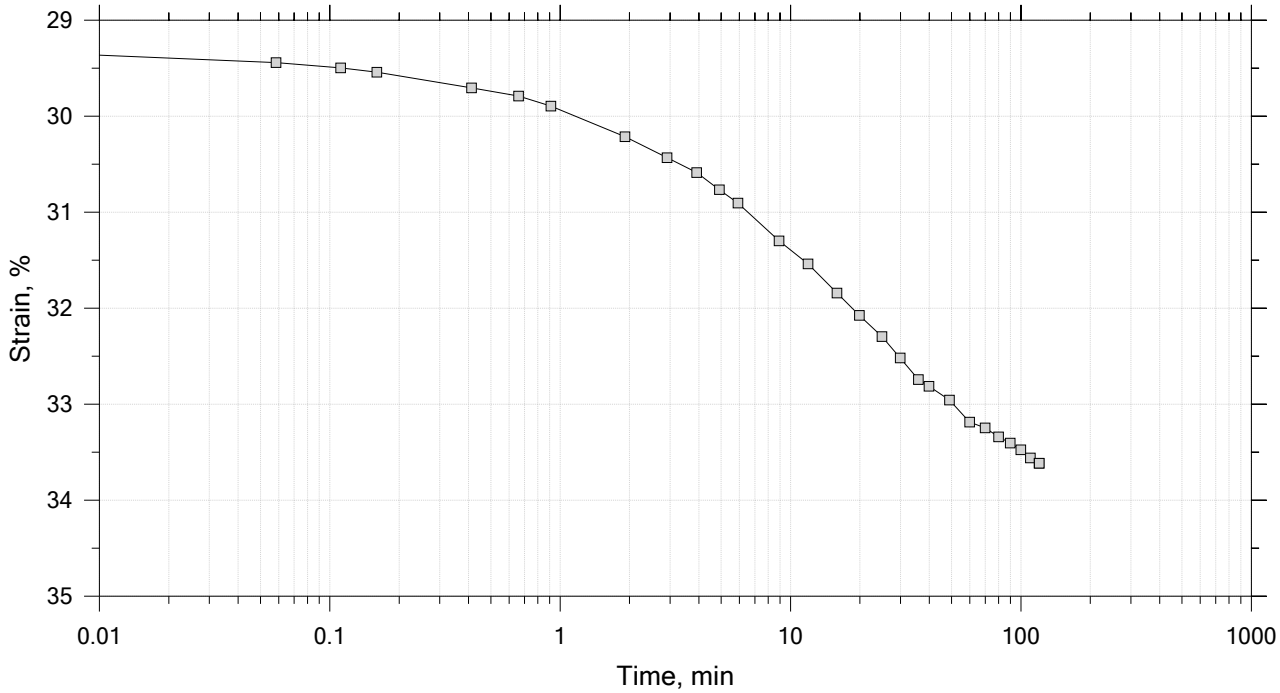
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

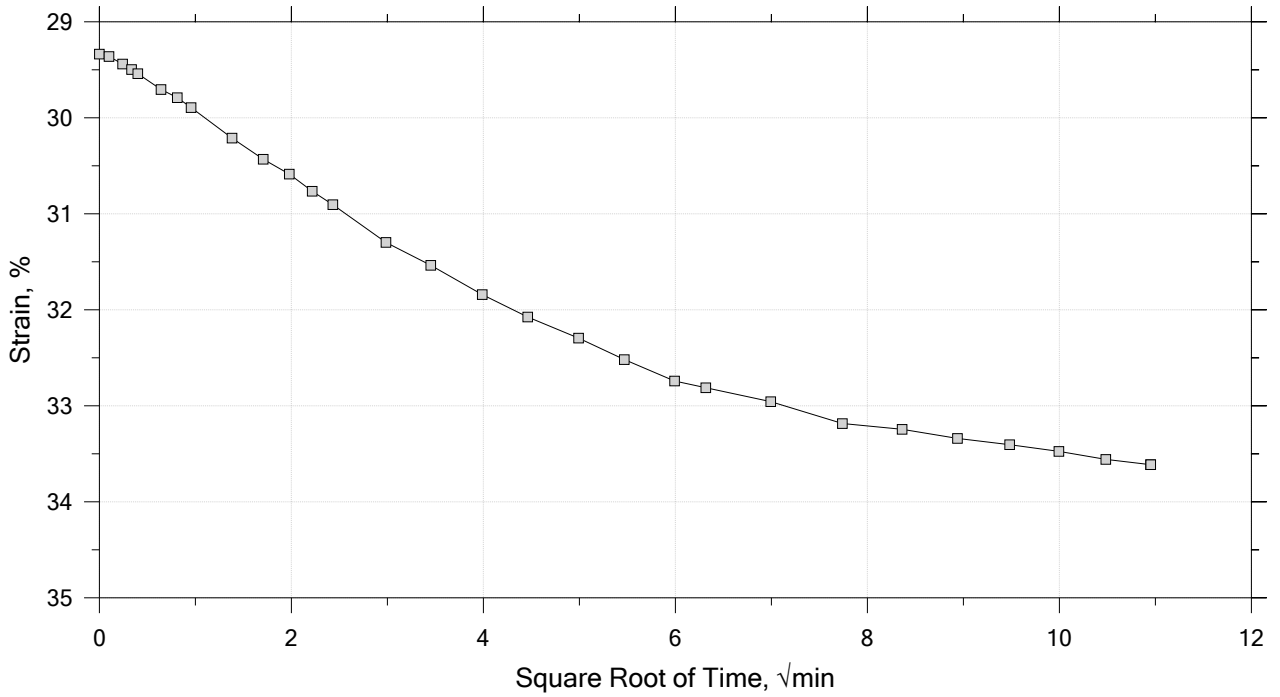
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





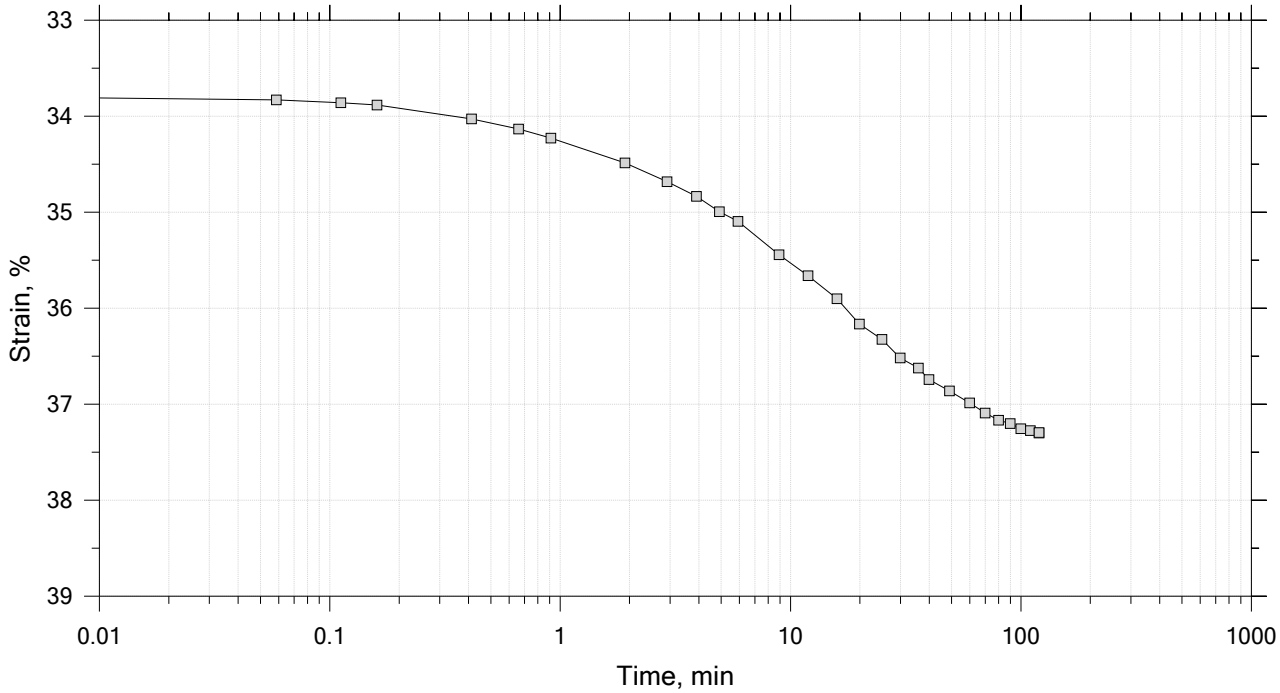
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

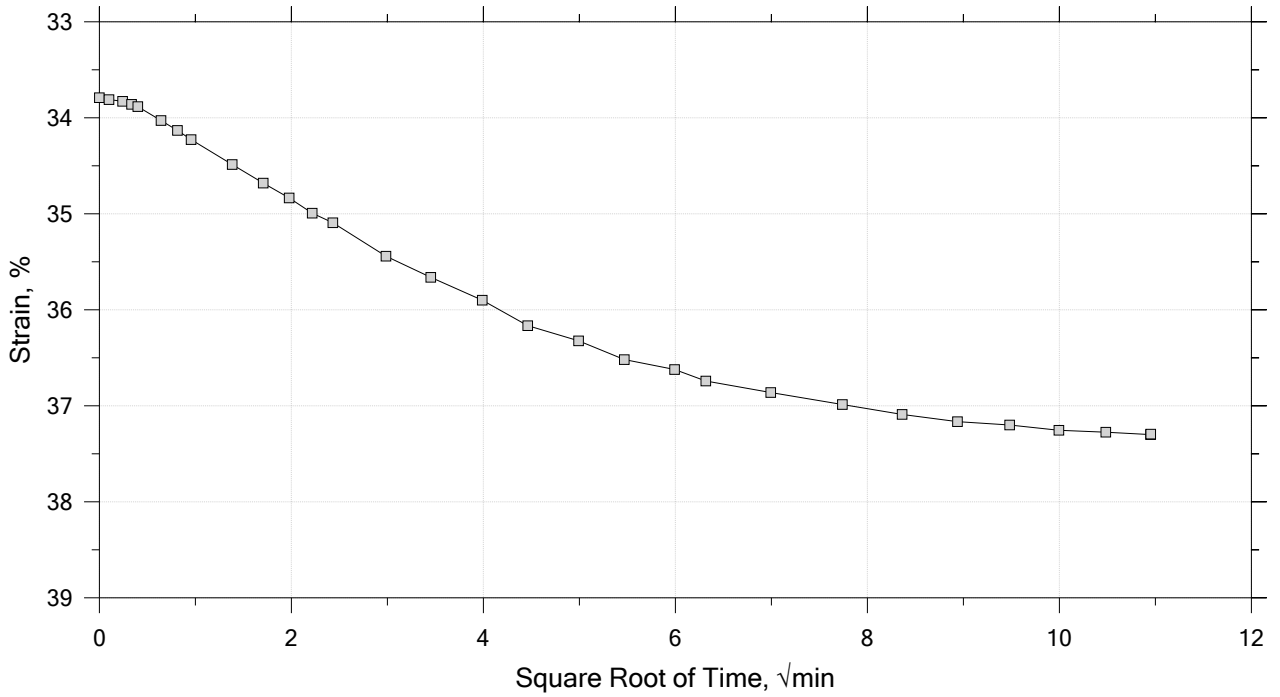
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf





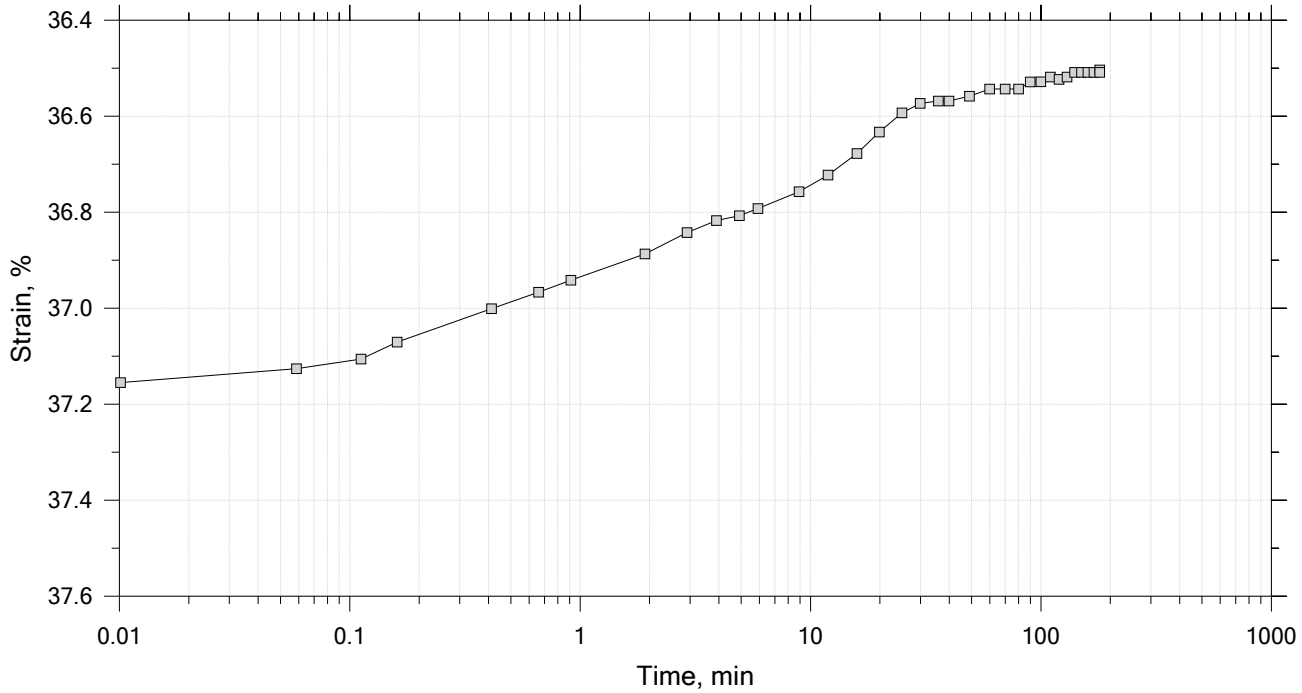
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

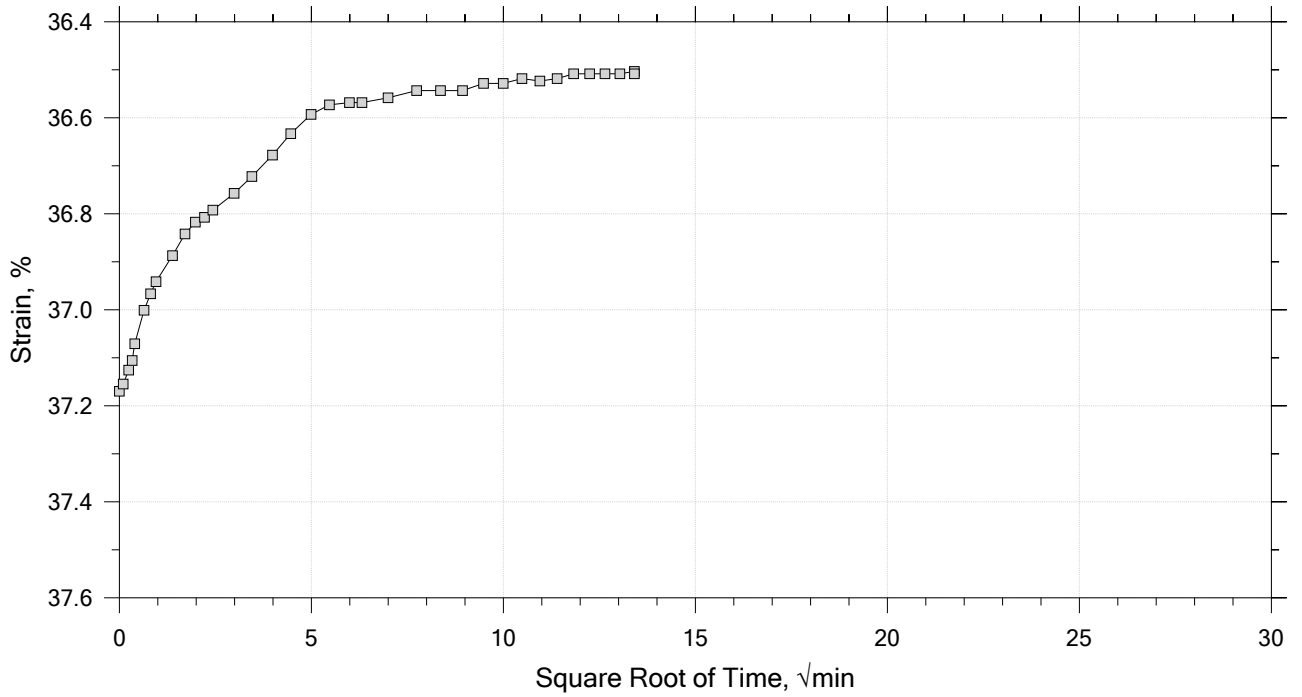
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf





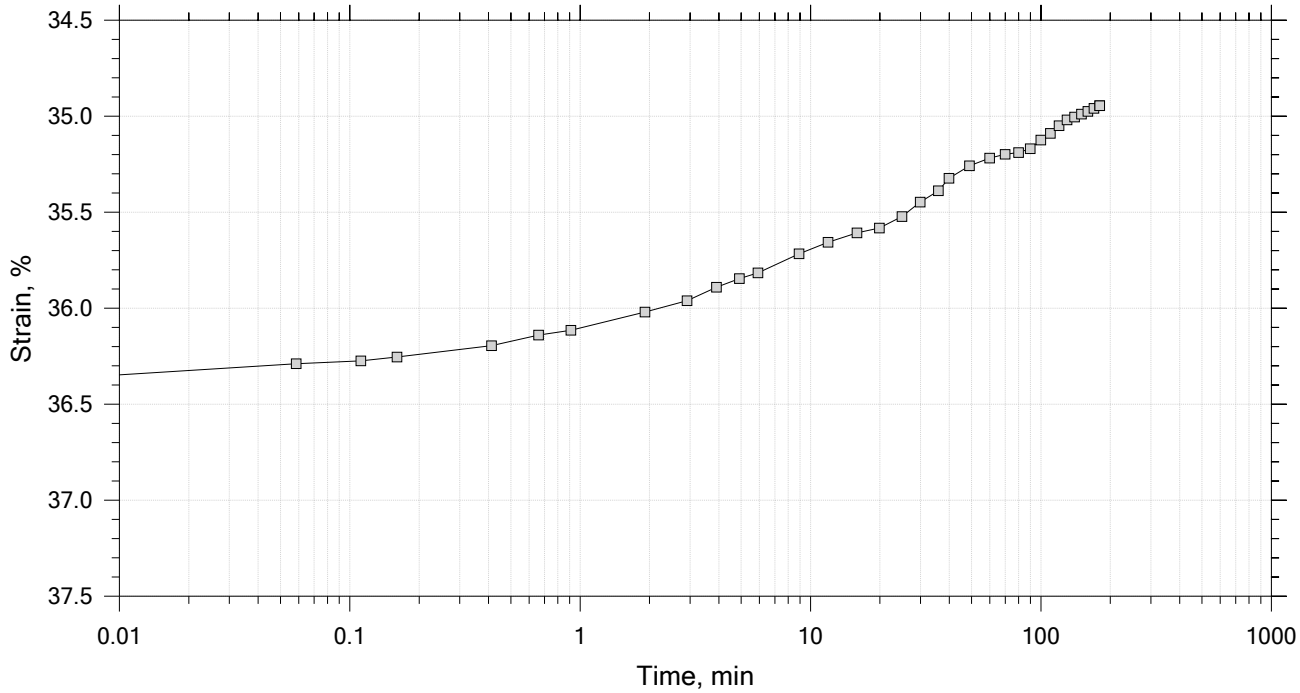
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

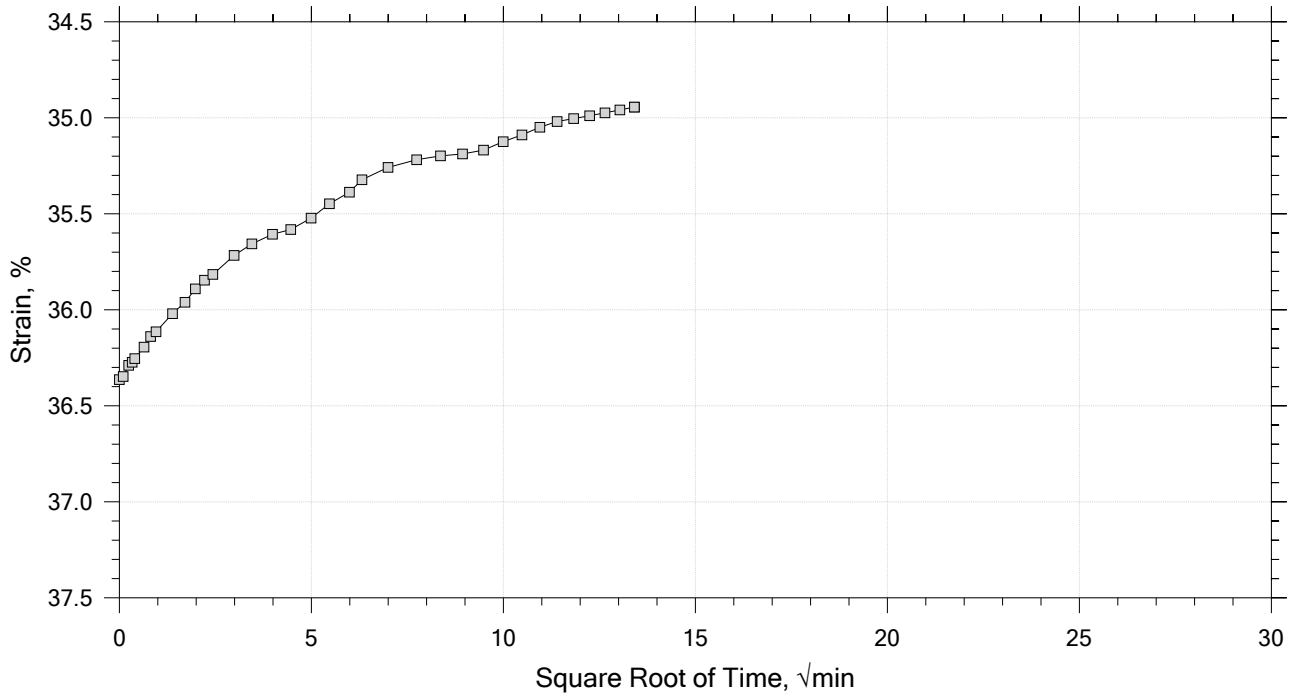
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf





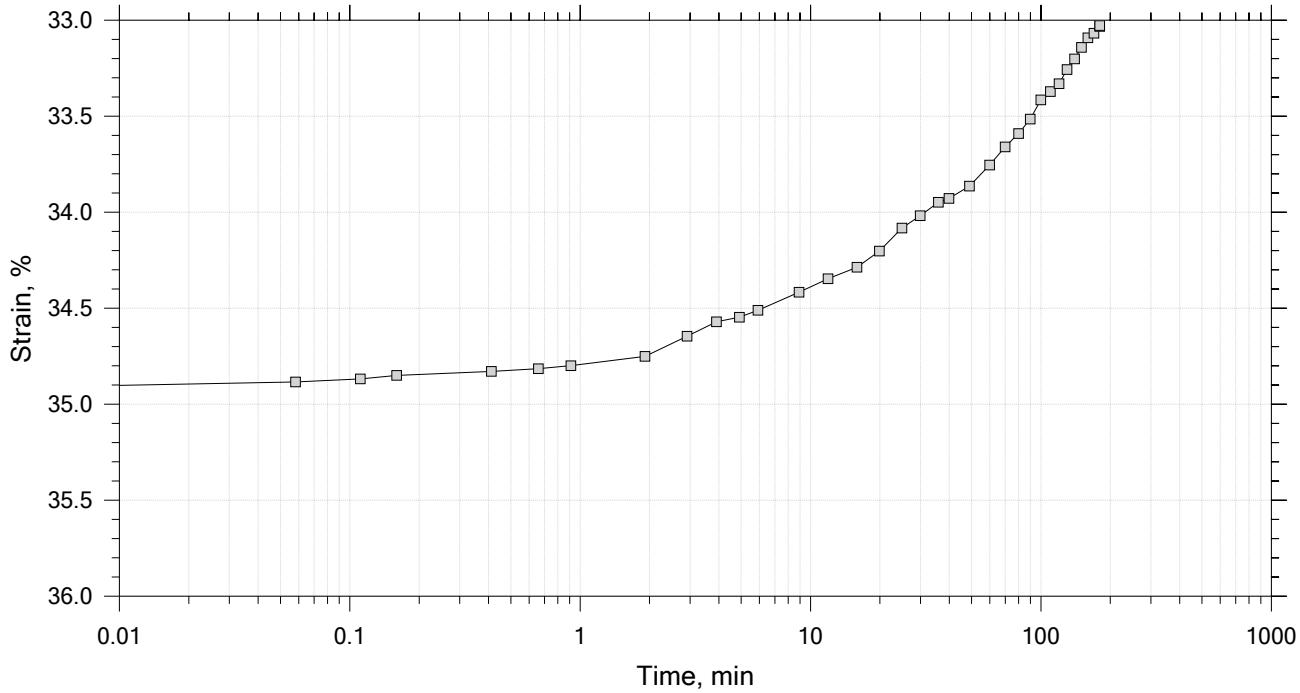
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

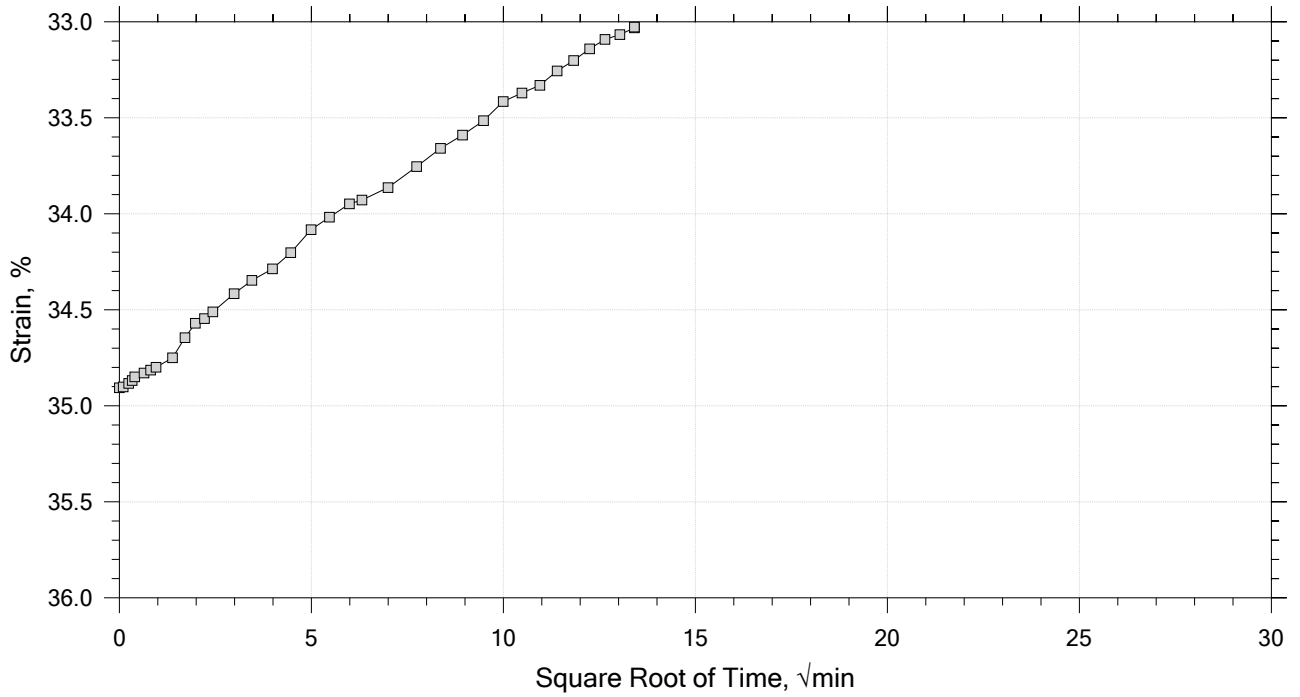
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf





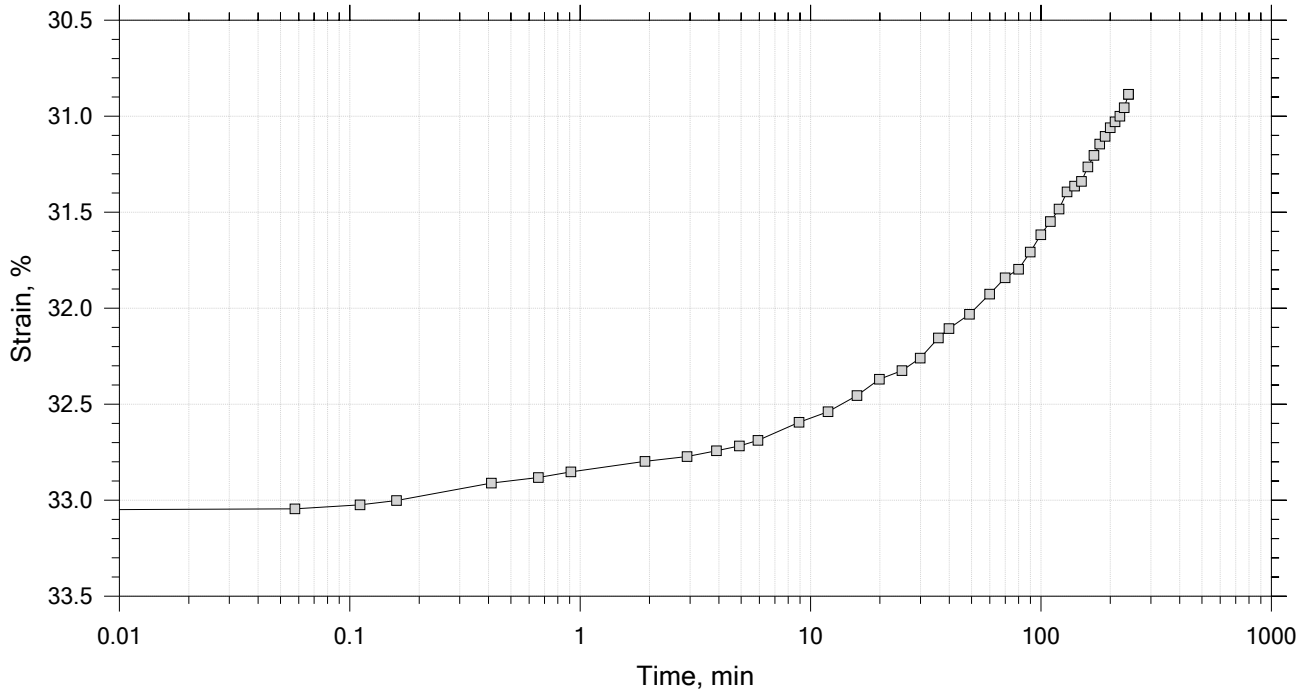
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

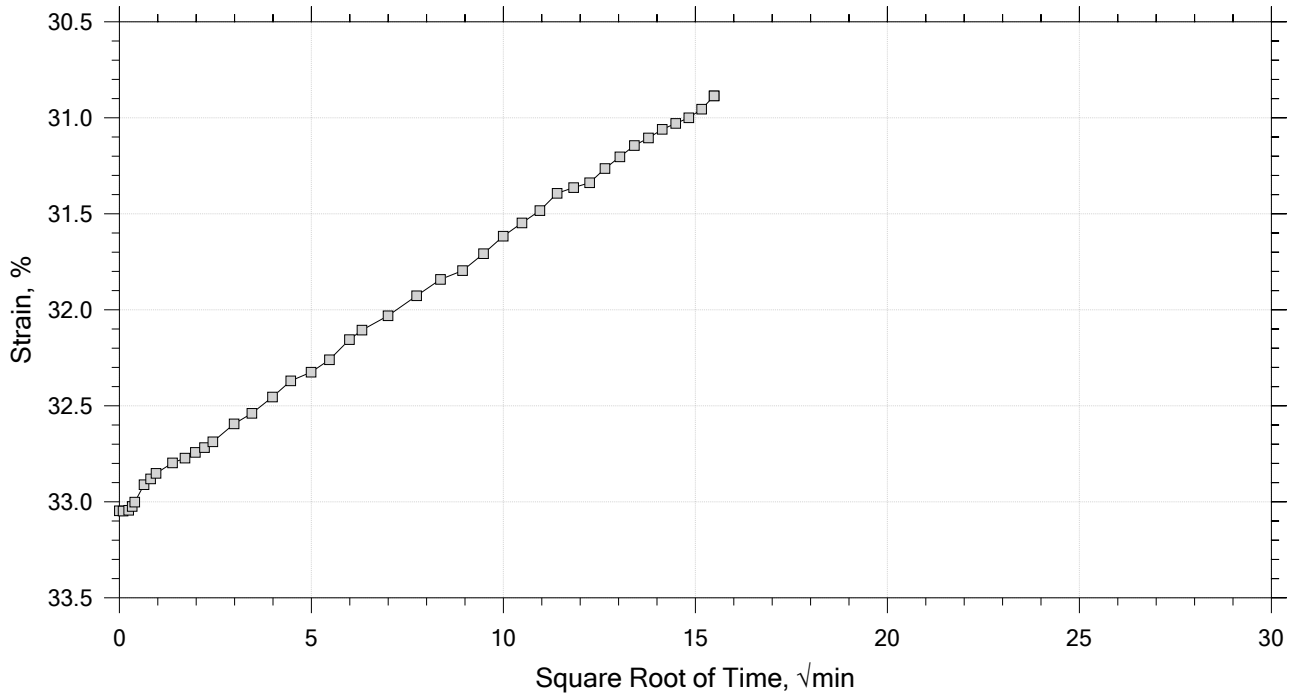
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf





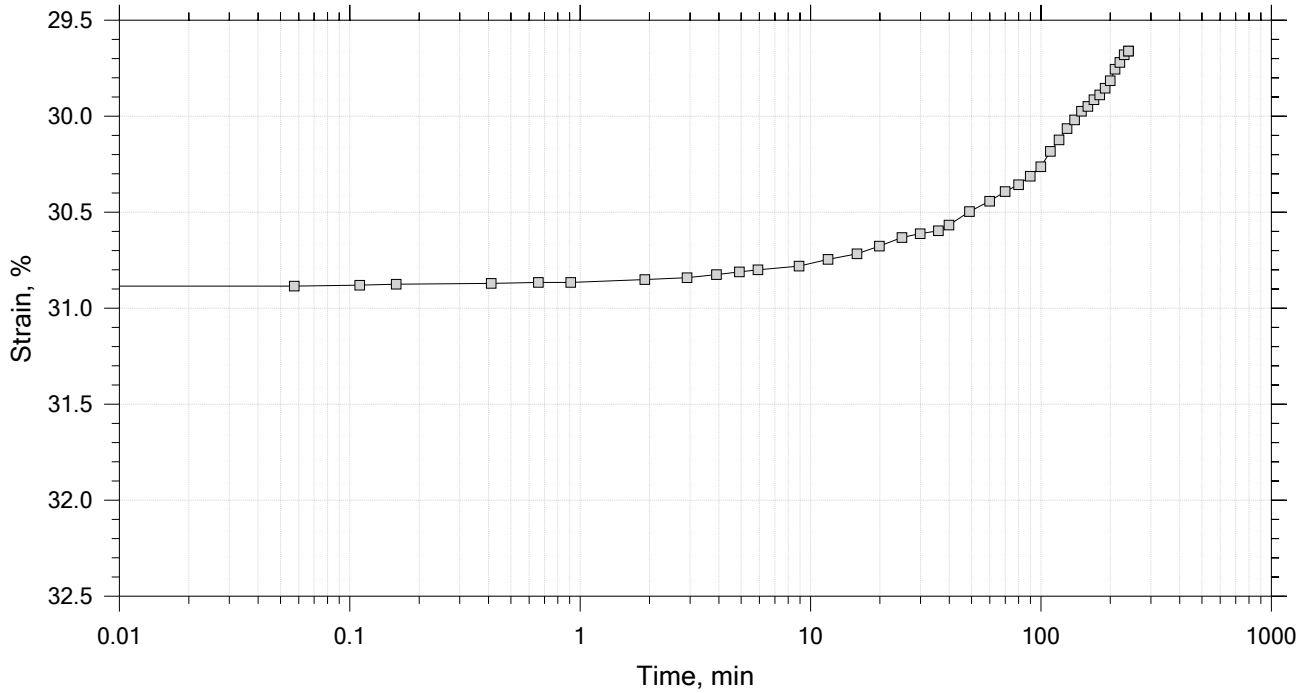
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

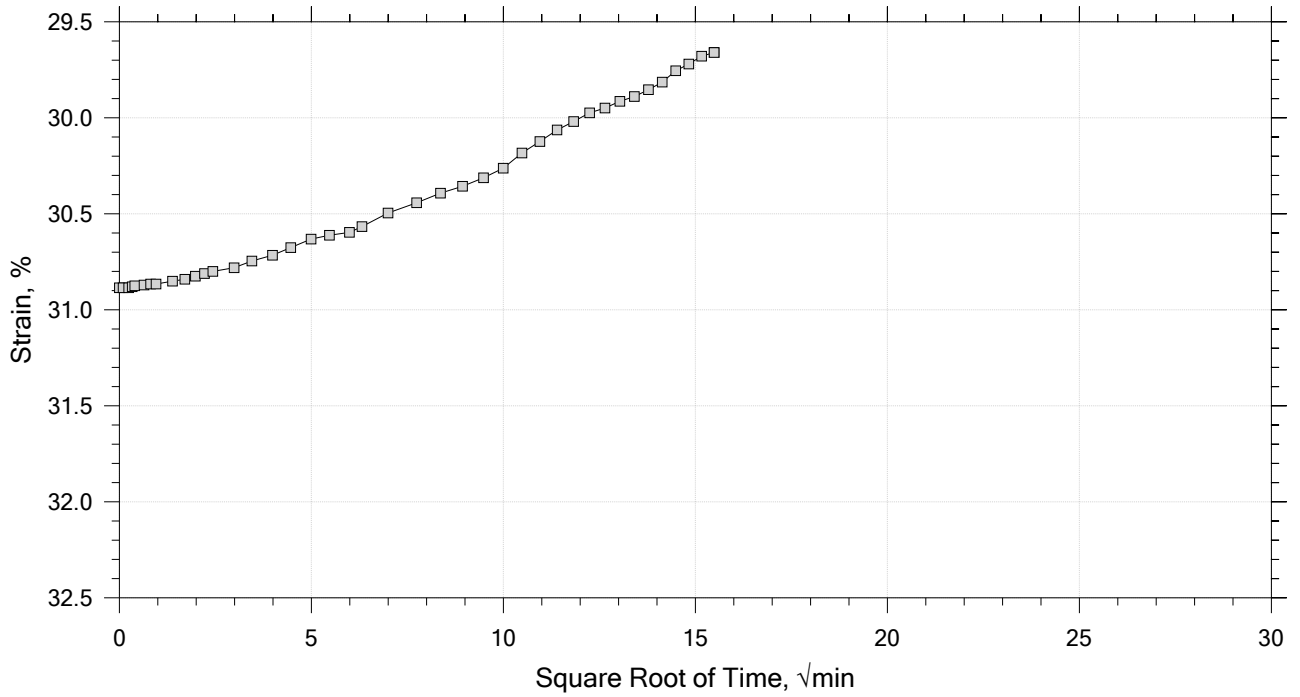
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf





Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.70	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 1.38	Plastic Limit: ---
Final Height: 0.72 in	Final Void Ratio: 0.711	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D-1518	RING		Z-0240
Mass Container, gm	8.28	110.04	110.04	8.4
Mass Container + Wet Soil, gm	255.54	246.78	225.55	123.48
Mass Container + Dry Soil, gm	180.37	201.48	201.48	99.5
Mass Dry Soil, gm	172.09	91.44	91.44	91.1
Water Content, %	43.68	49.54	26.32	26.32
Void Ratio	---	1.38	0.71	---
Degree of Saturation, %	---	97.22	100.00	---
Dry Unit Weight, pcf	---	70.965	98.563	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test.
Therefore, values may not represent actual values for the specimen.

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0680	0.004598	1.37	0.460	1.052	5.39e-06	6.76e-02	9.84e-04	0.00e+00
2	0.125	0.01283	1.35	1.28	4.591	1.22e-06	1.44e-01	4.75e-04	0.00e+00
3	0.250	0.03156	1.30	3.16	4.391	1.24e-06	1.50e-01	5.02e-04	0.00e+00
4	0.500	0.06364	1.23	6.36	6.133	8.43e-07	1.28e-01	2.92e-04	0.00e+00
5	1.00	0.1179	1.10	11.8	10.804	4.36e-07	1.08e-01	1.28e-04	0.00e+00
6	2.00	0.1813	0.946	18.1	10.043	4.10e-07	6.35e-02	7.02e-05	0.00e+00
7	4.00	0.2395	0.807	23.9	10.207	3.48e-07	2.91e-02	2.73e-05	0.00e+00
8	8.00	0.2910	0.685	29.1	9.732	3.16e-07	1.29e-02	1.10e-05	0.00e+00
9	16.0	0.3361	0.578	33.6	0.000	0.00e+00	5.65e-03	0.00e+00	0.00e+00
10	32.0	0.3730	0.490	37.3	11.065	2.15e-07	2.30e-03	1.33e-06	0.00e+00
11	8.00	0.3651	0.509	36.5	0.000	0.00e+00	3.28e-04	0.00e+00	0.00e+00
12	2.00	0.3494	0.546	34.9	0.000	0.00e+00	2.61e-03	0.00e+00	0.00e+00
13	0.500	0.3303	0.592	33.0	0.000	0.00e+00	1.28e-02	0.00e+00	0.00e+00
14	0.125	0.3089	0.643	30.9	0.000	0.00e+00	5.71e-02	0.00e+00	0.00e+00
15	0.0625	0.2966	0.672	29.7	0.000	0.00e+00	1.96e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

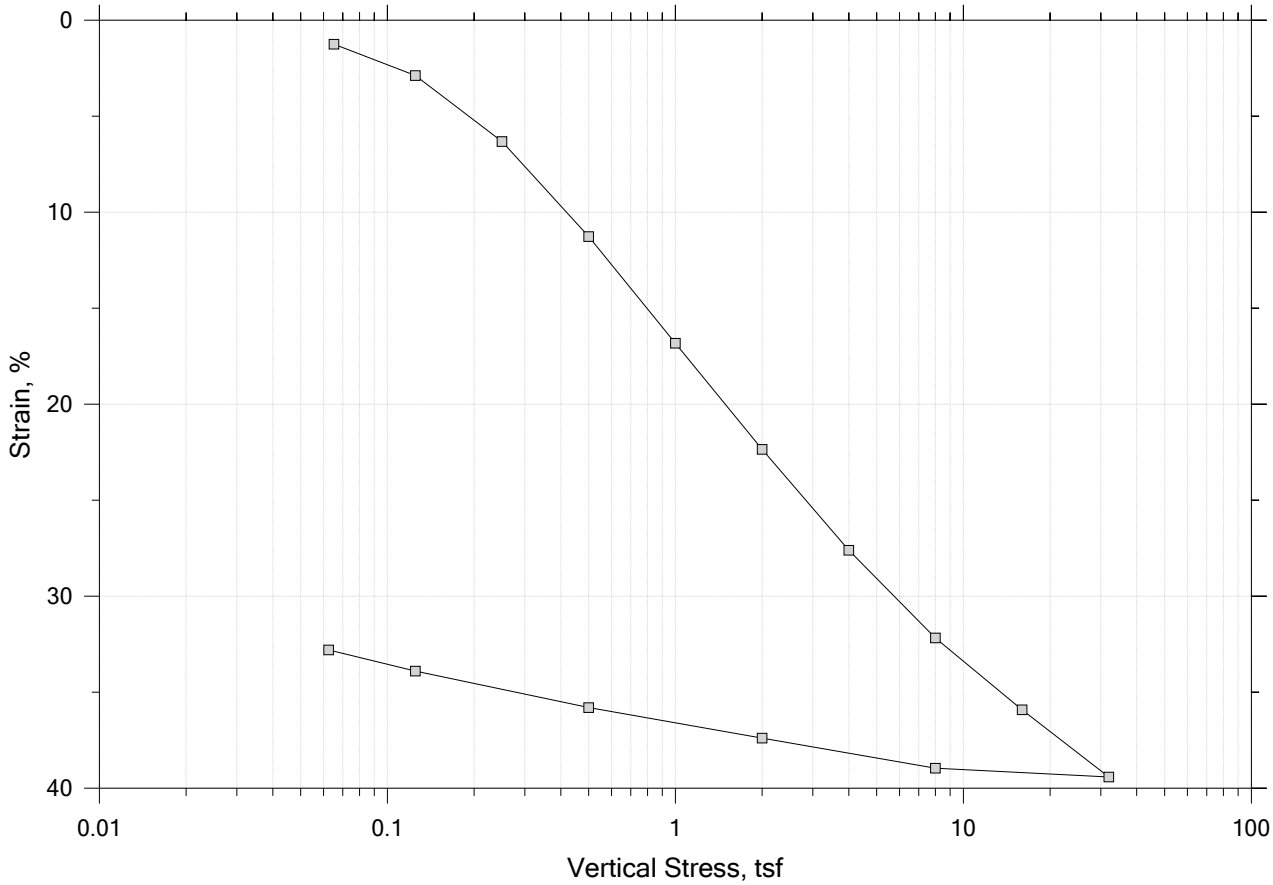
Square Root of Time Coefficients

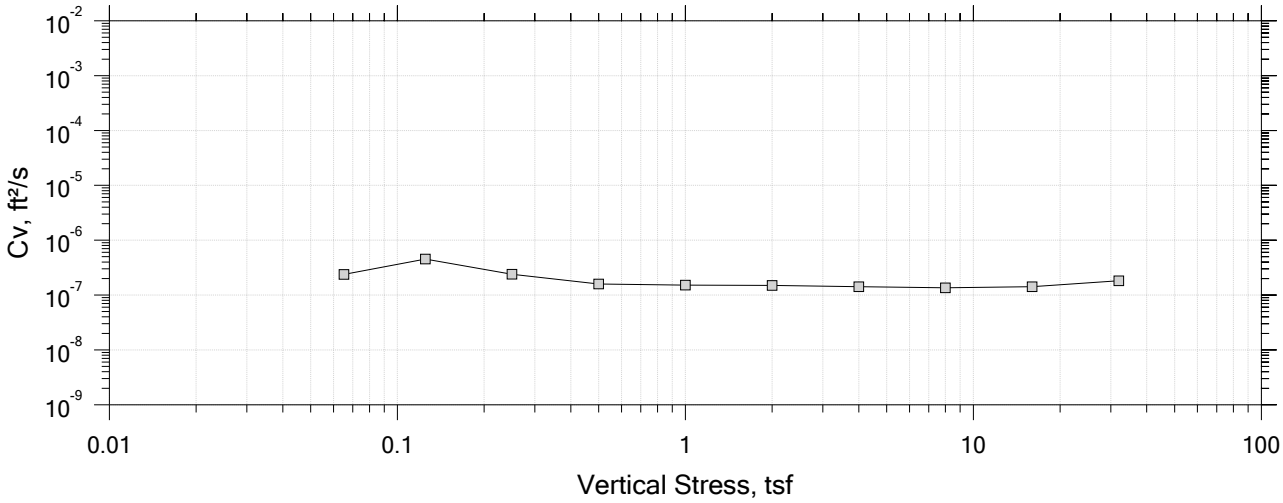
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0680	0.004598	1.37	0.460	4.741	5.15e-06	6.76e-02	9.40e-04
2	0.125	0.01283	1.35	1.28	17.245	1.40e-06	1.44e-01	5.45e-04
3	0.250	0.03156	1.30	3.16	20.331	1.15e-06	1.50e-01	4.66e-04
4	0.500	0.06364	1.23	6.36	27.914	7.97e-07	1.28e-01	2.76e-04
5	1.00	0.1179	1.10	11.8	35.443	5.72e-07	1.08e-01	1.67e-04
6	2.00	0.1813	0.946	18.1	46.813	3.79e-07	6.35e-02	6.49e-05
7	4.00	0.2395	0.807	23.9	51.081	2.99e-07	2.91e-02	2.35e-05
8	8.00	0.2910	0.685	29.1	45.375	2.92e-07	1.29e-02	1.01e-05
9	16.0	0.3361	0.578	33.6	38.323	3.02e-07	5.65e-03	4.59e-06
10	32.0	0.3730	0.490	37.3	42.053	2.43e-07	2.30e-03	1.51e-06
11	8.00	0.3651	0.509	36.5	20.804	4.70e-07	3.28e-04	4.15e-07
12	2.00	0.3494	0.546	34.9	72.455	1.40e-07	2.61e-03	9.83e-07
13	0.500	0.3303	0.592	33.0	172.403	6.20e-08	1.28e-02	2.14e-06
14	0.125	0.3089	0.643	30.9	179.686	6.32e-08	5.71e-02	9.74e-06
15	0.0625	0.2966	0.672	29.7	0.000	0.00e+00	1.96e-01	0.00e+00

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





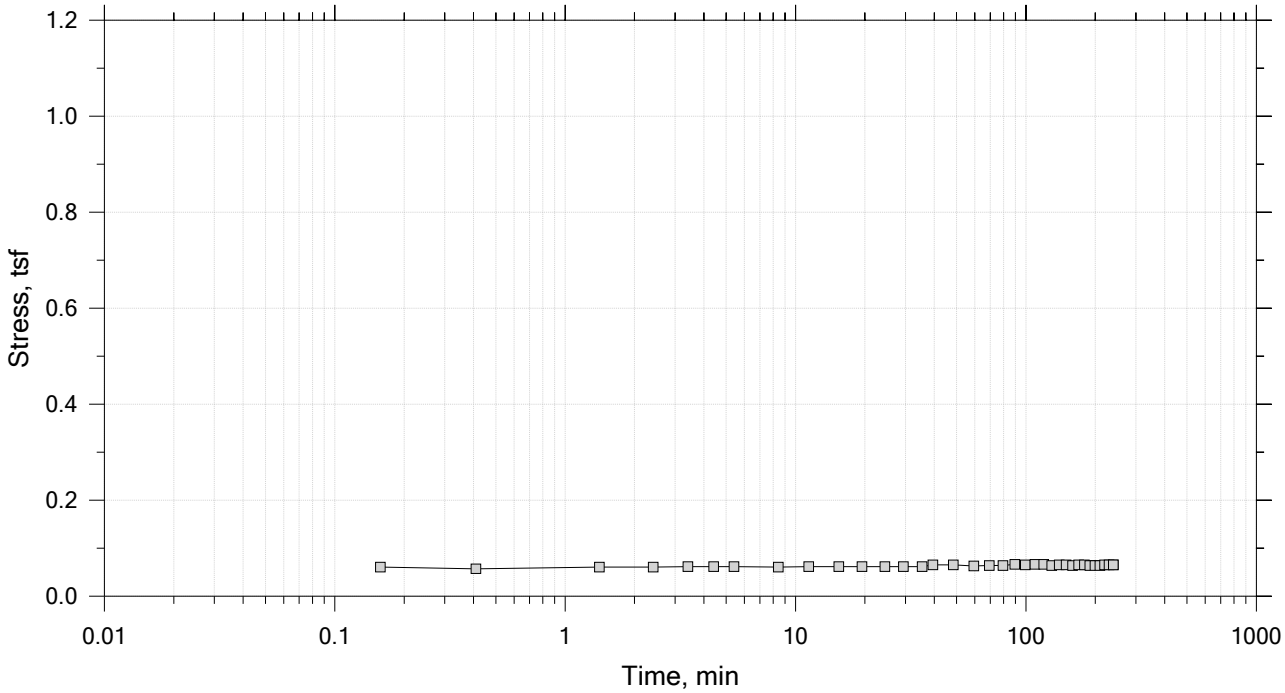
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		
Displacement at End of Increment		

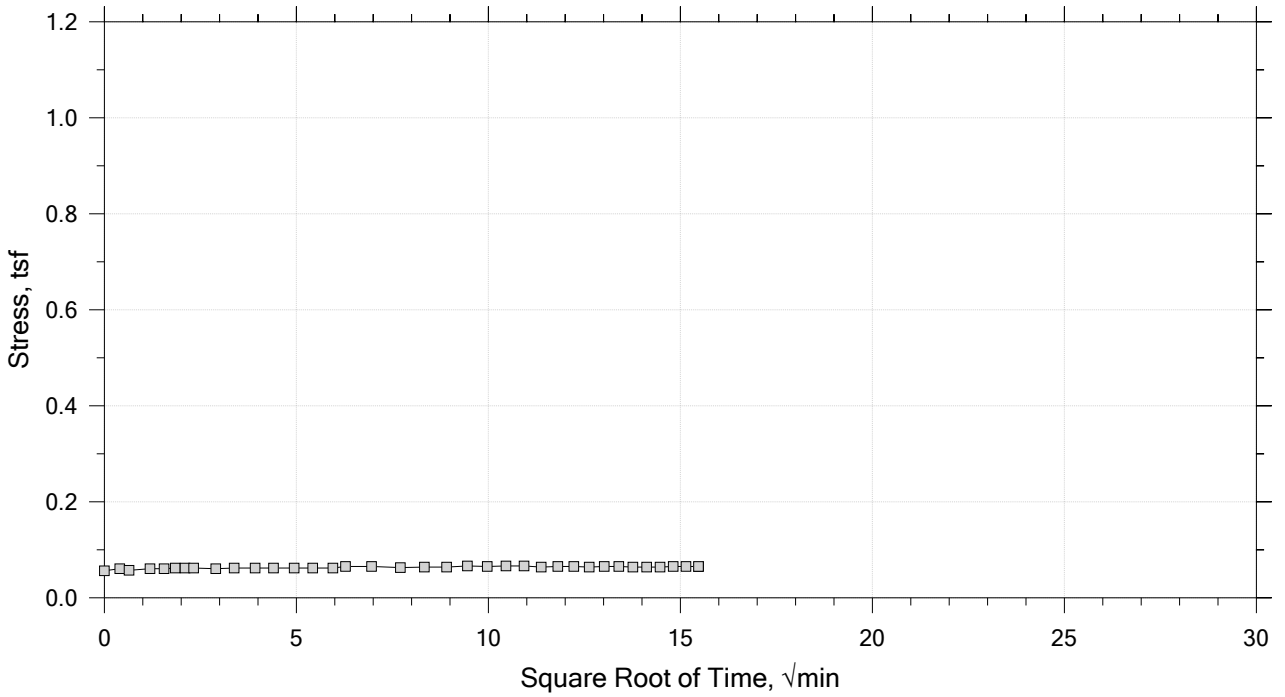
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15

Constant Volume Step

Stress: 0.0652 tsf





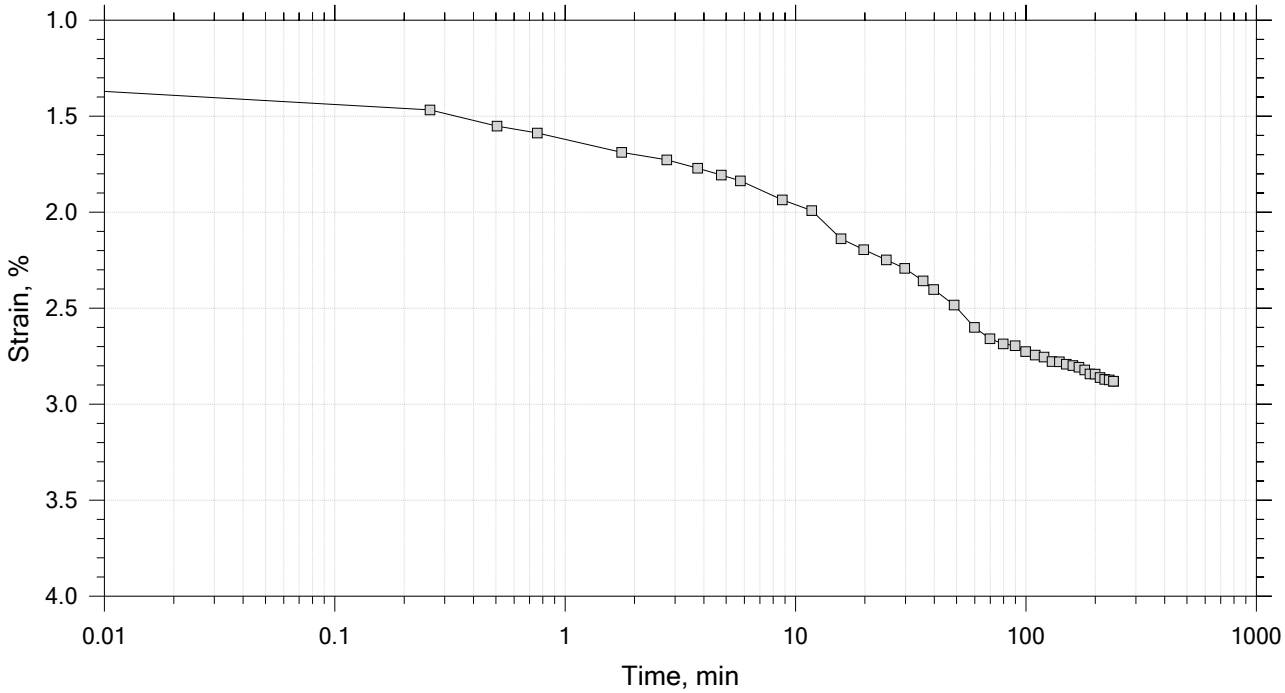
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

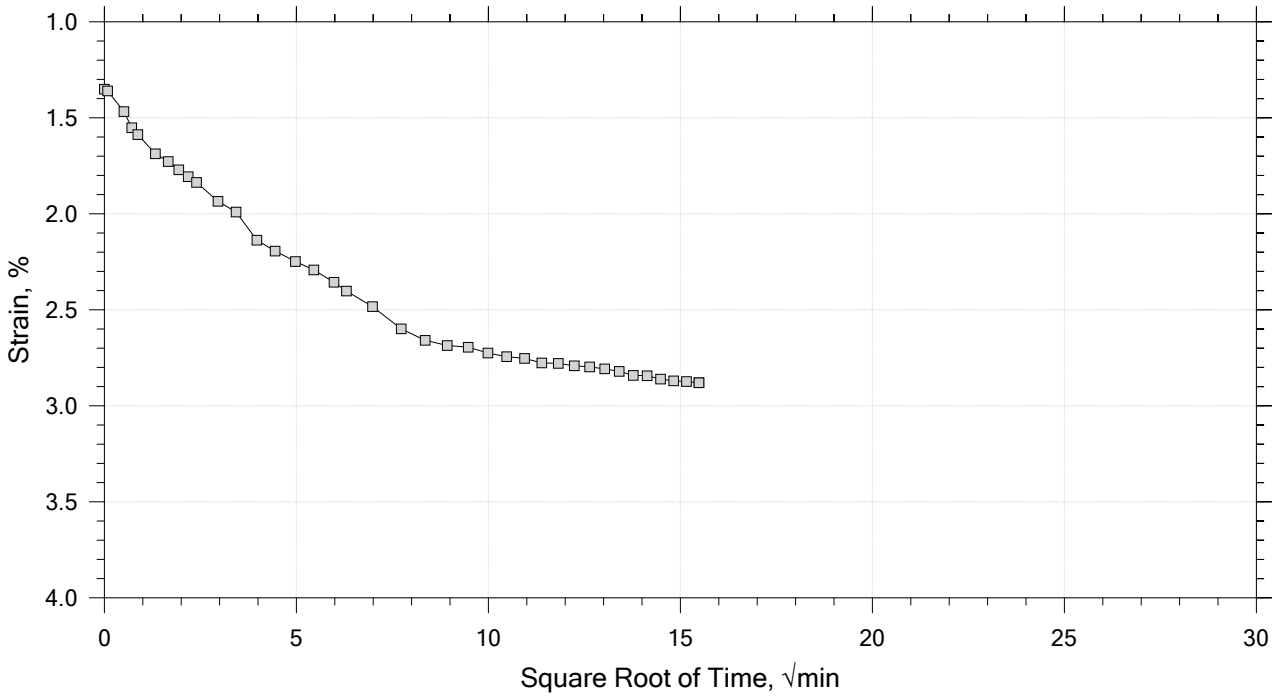
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf





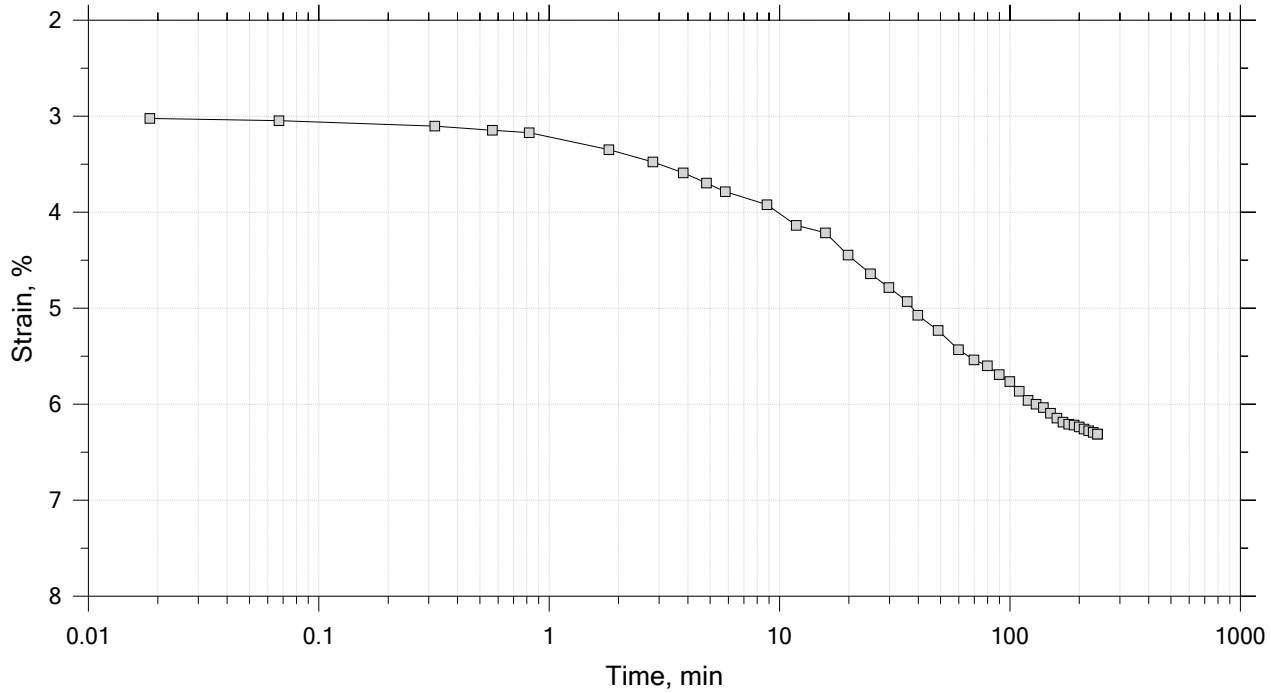
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

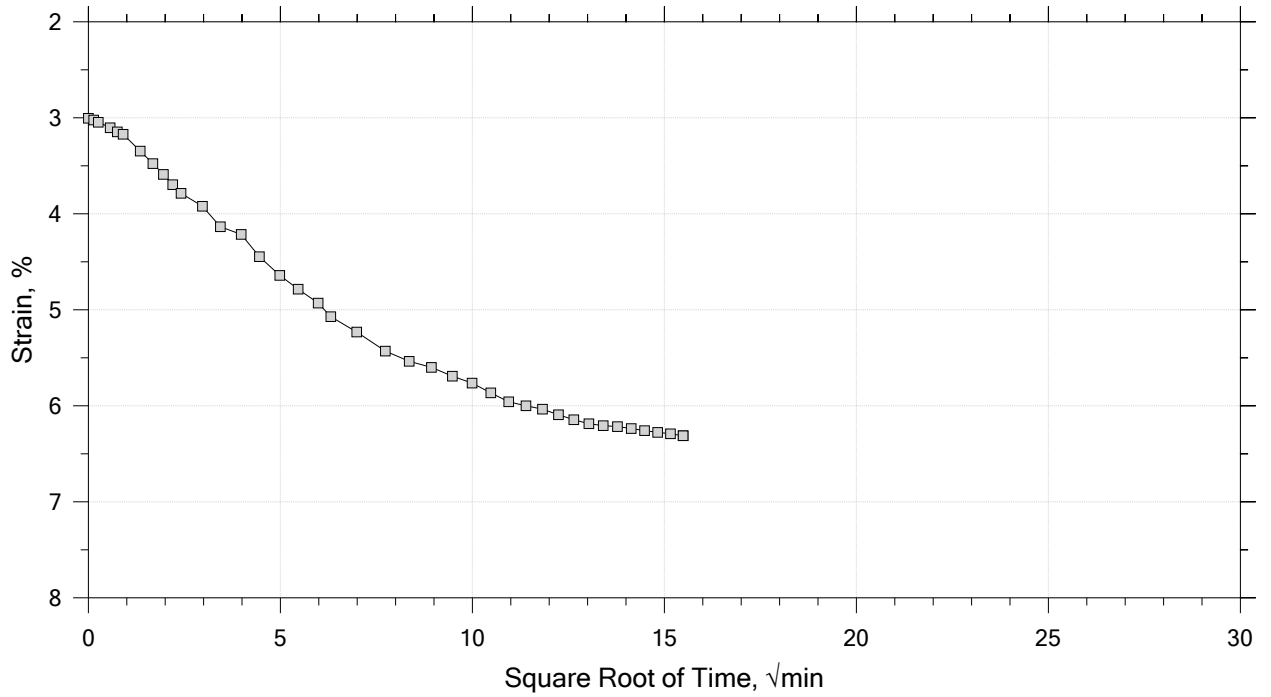
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf





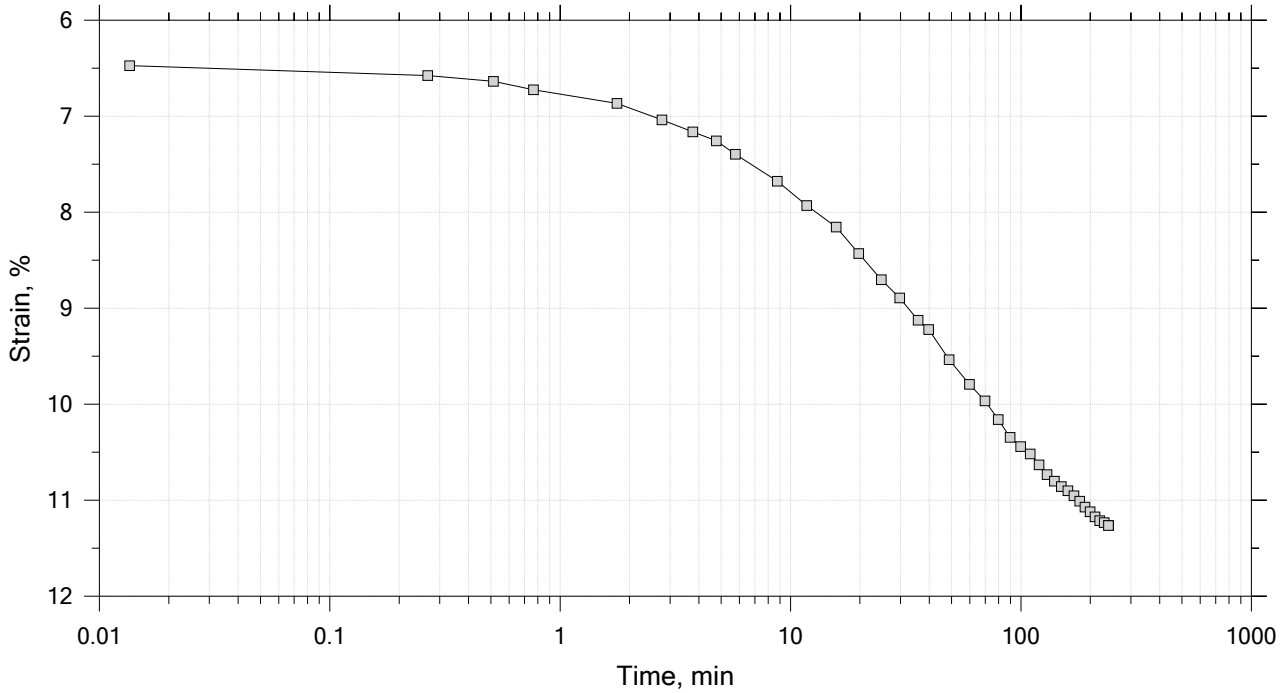
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

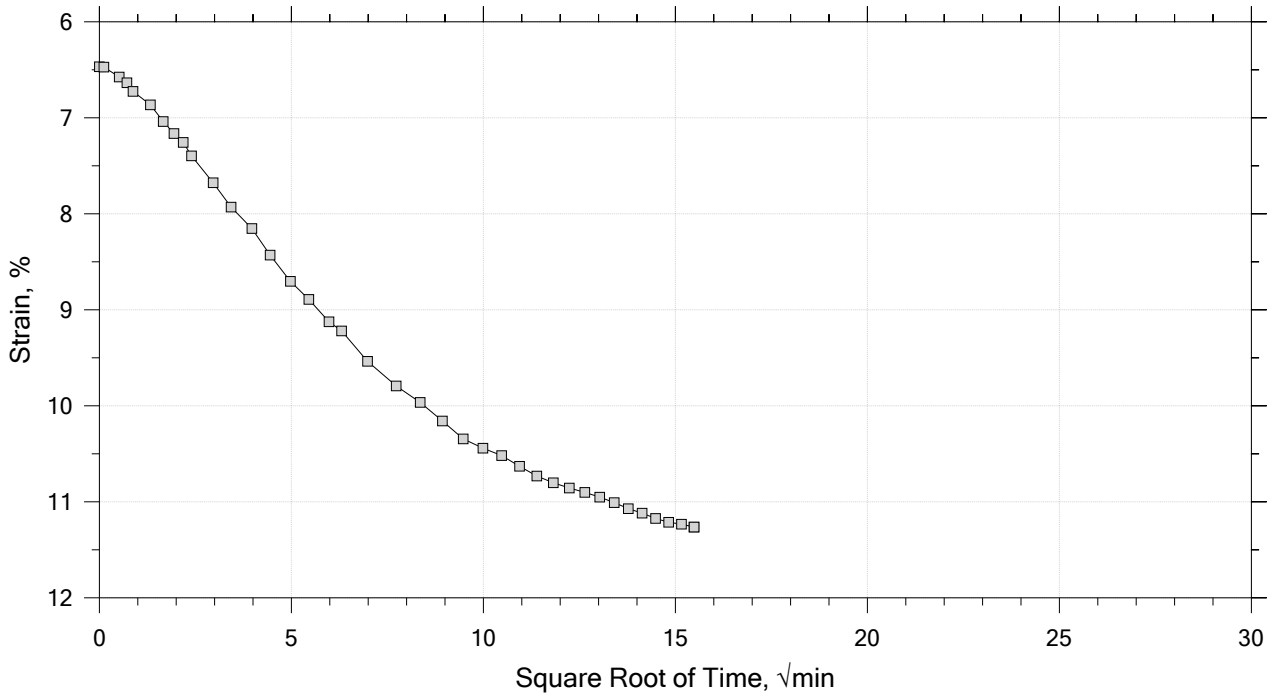
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





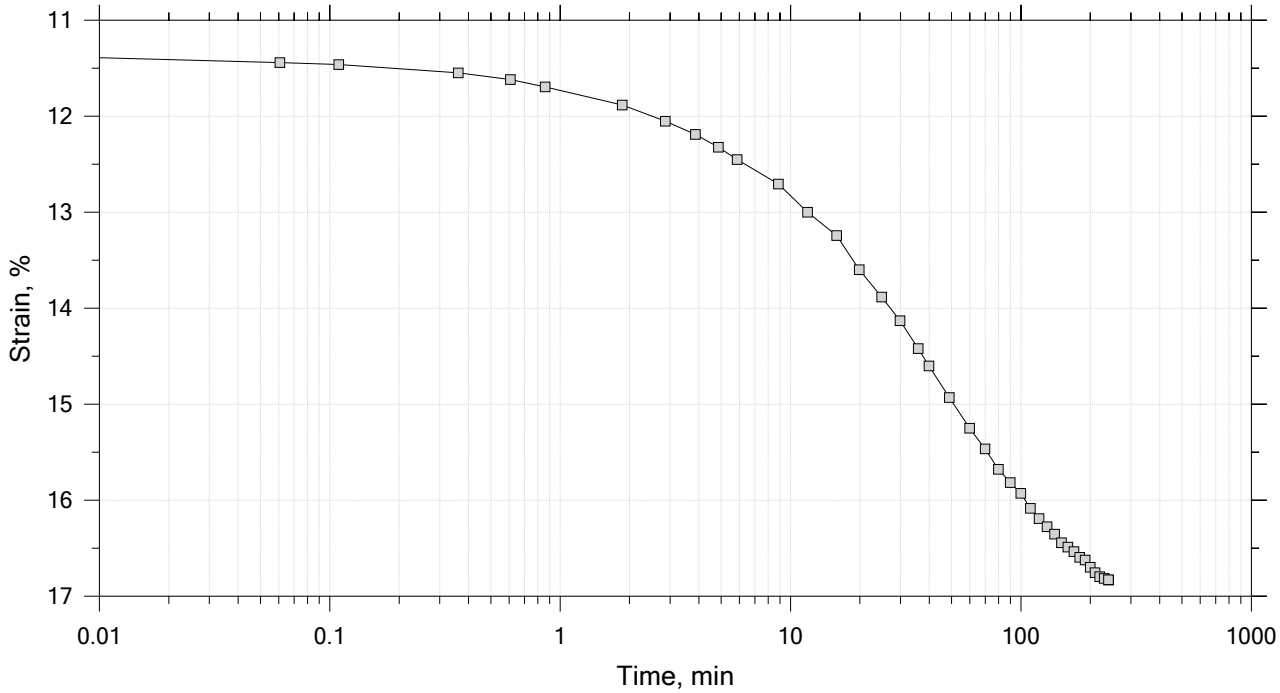
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

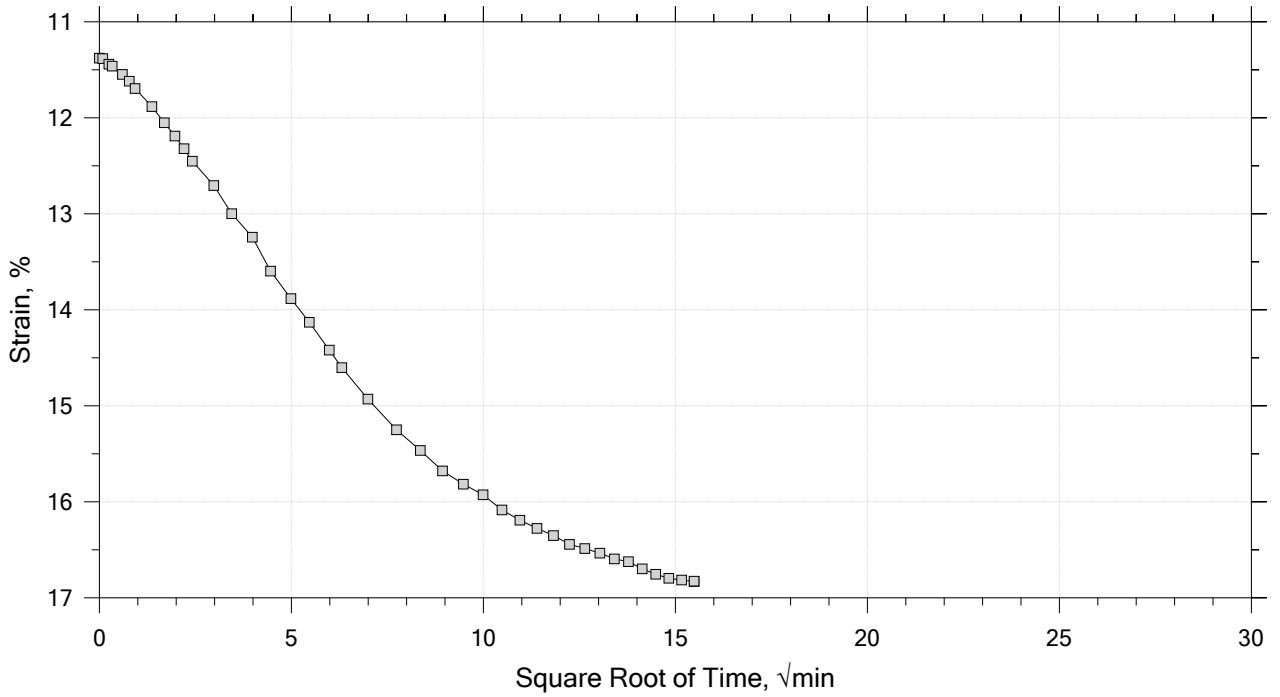
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





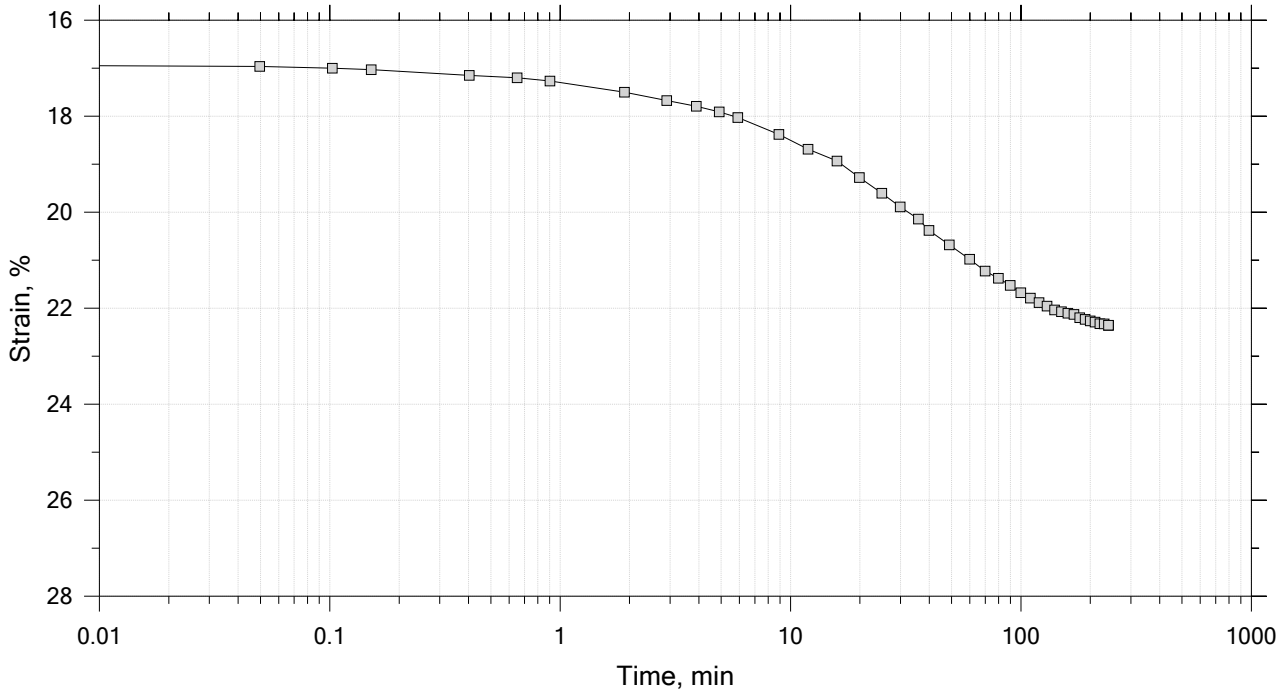
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

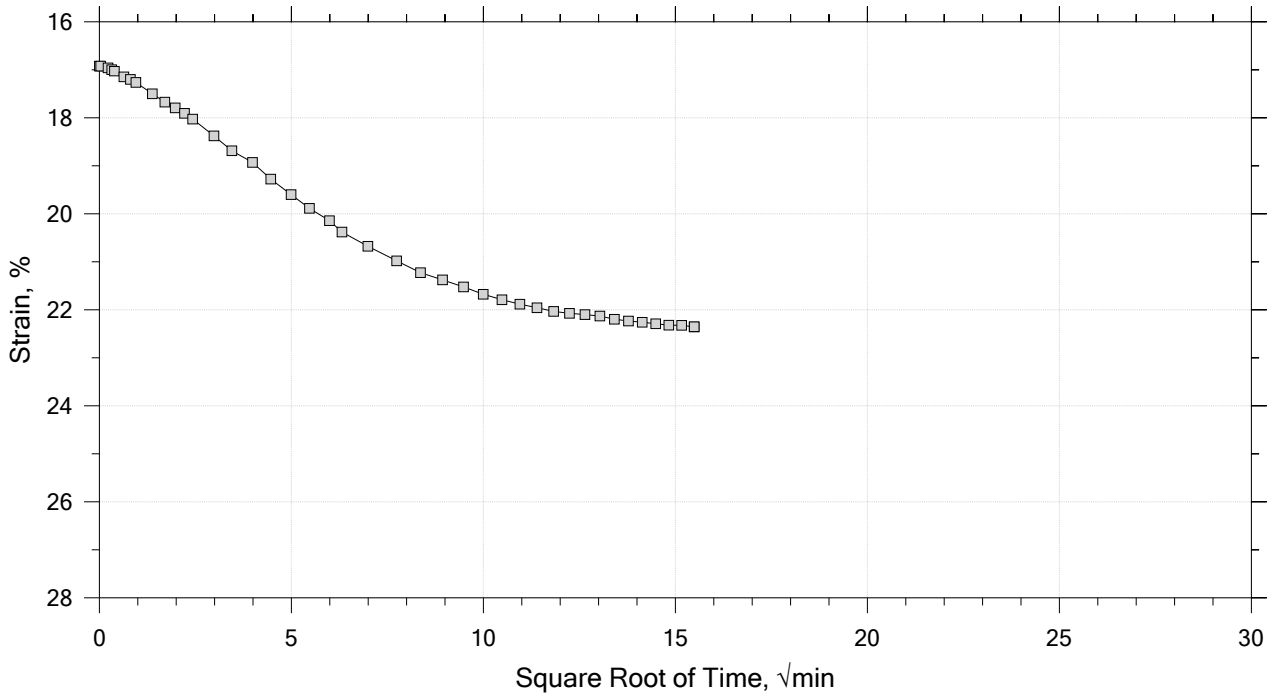
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





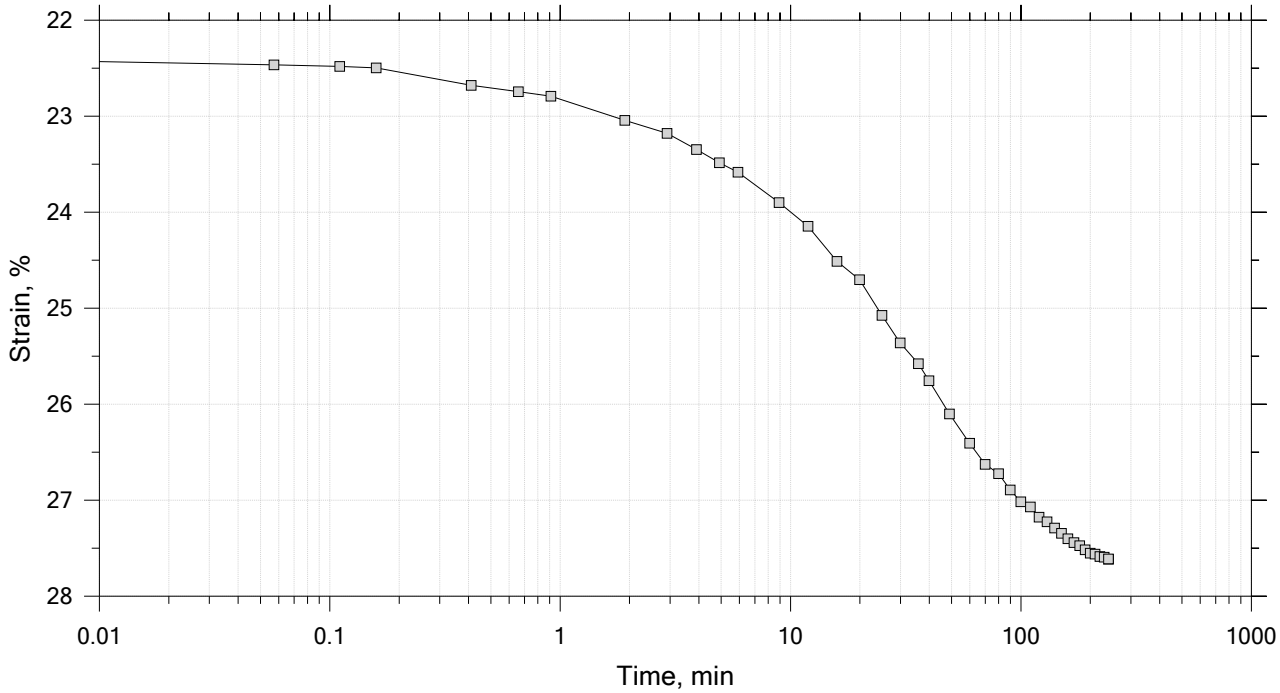
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

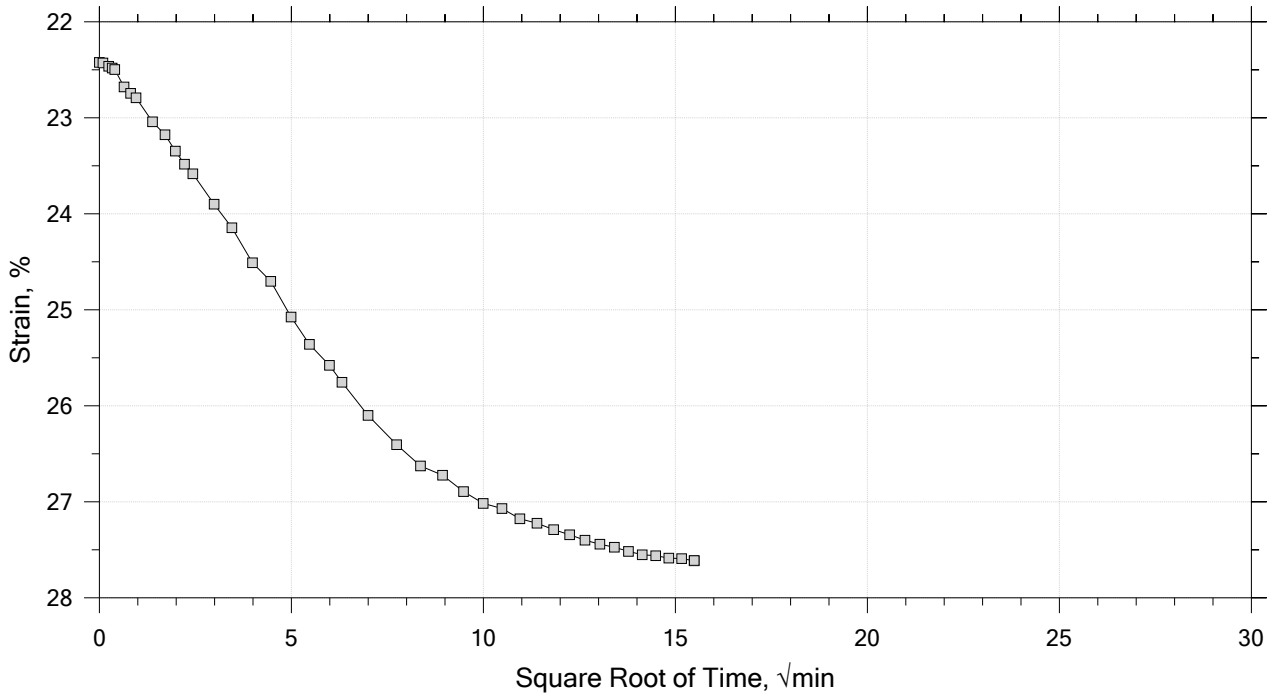
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





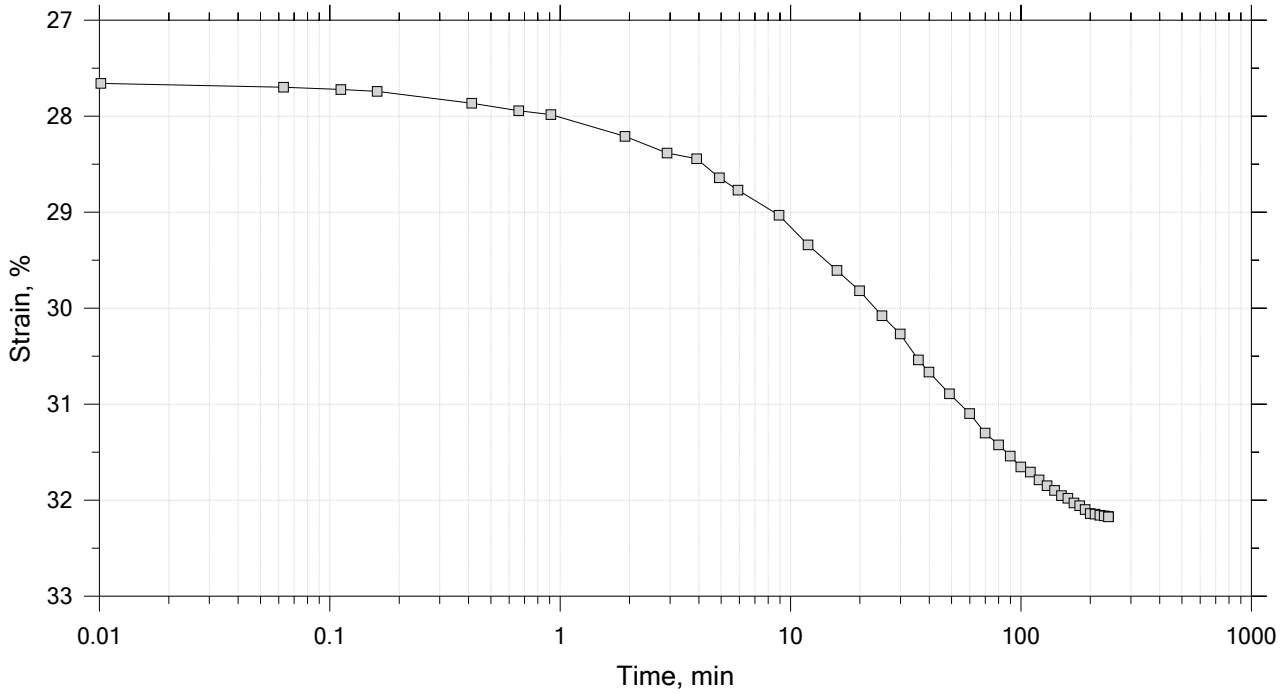
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

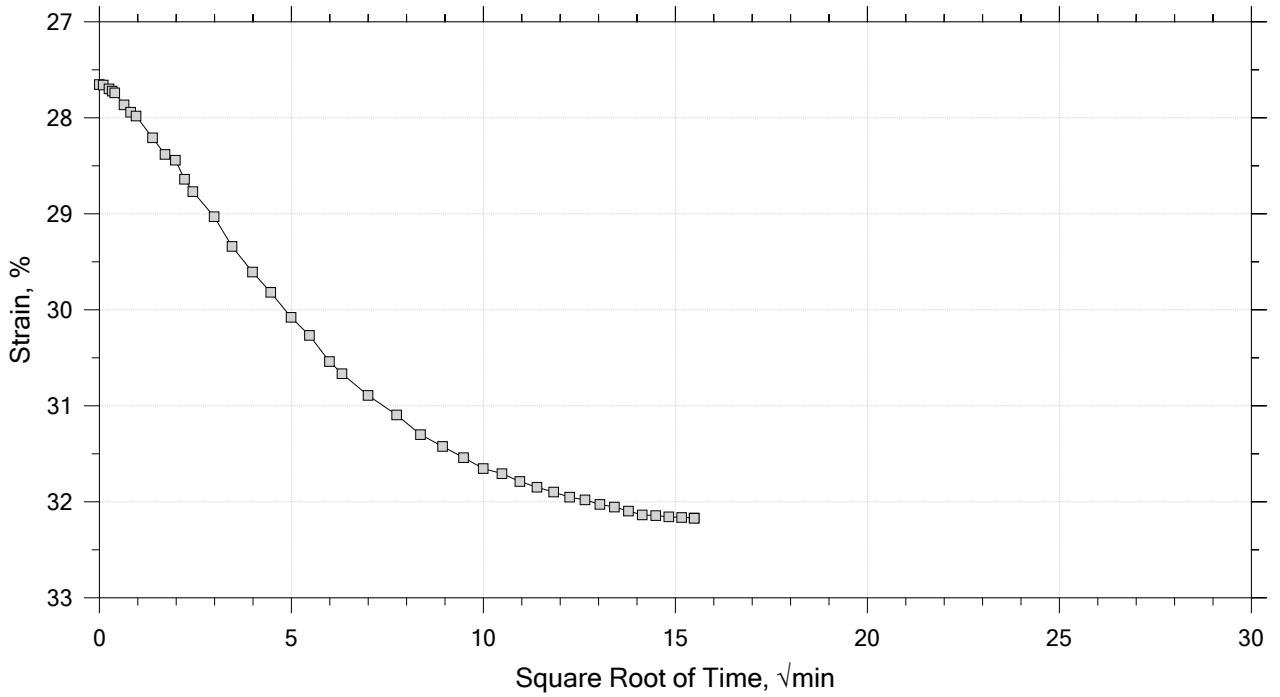
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





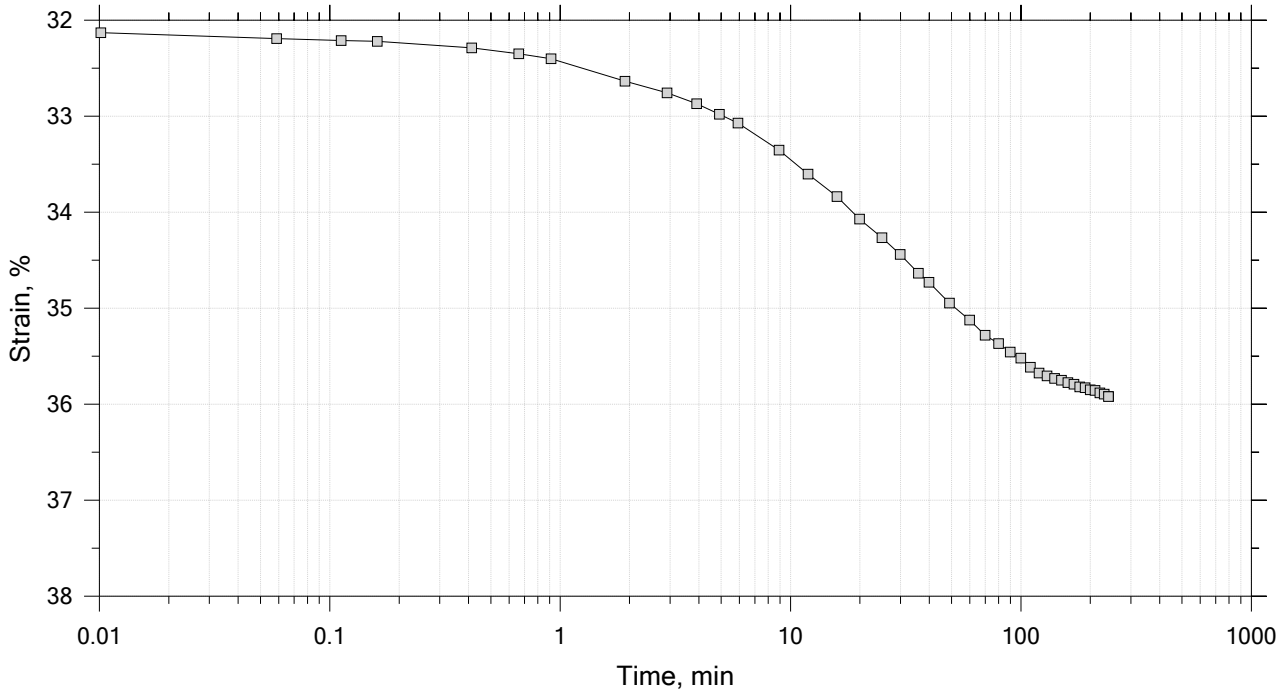
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

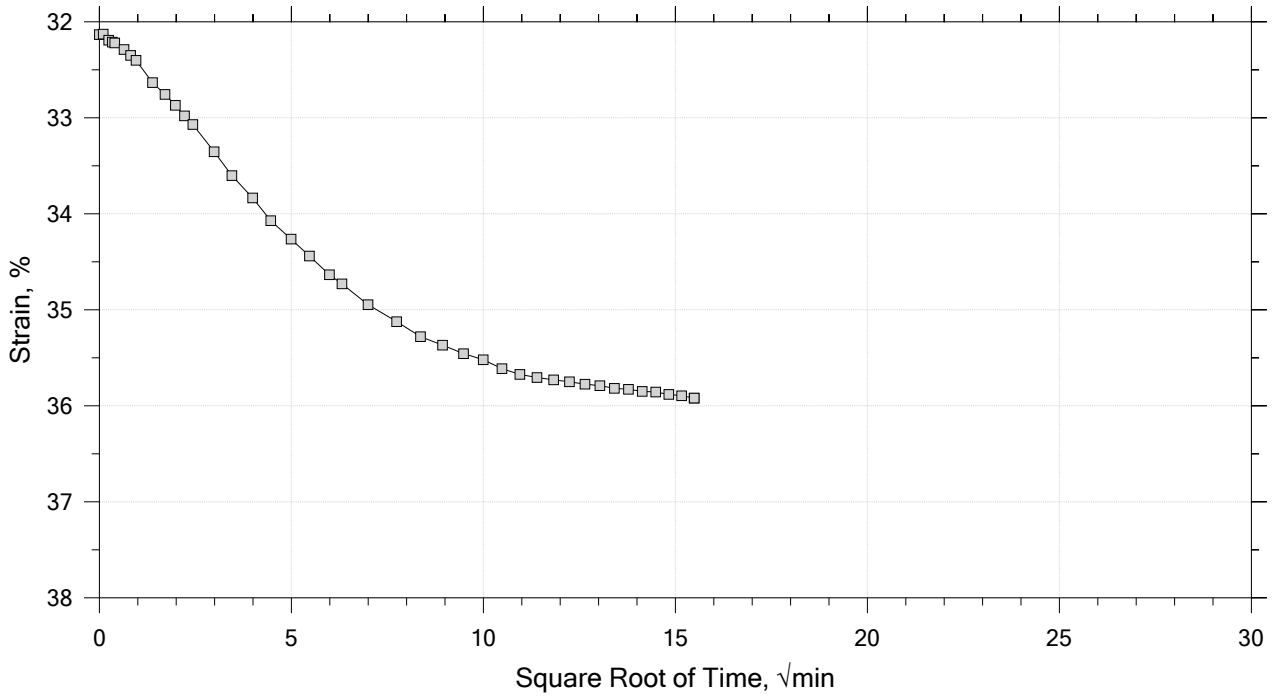
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





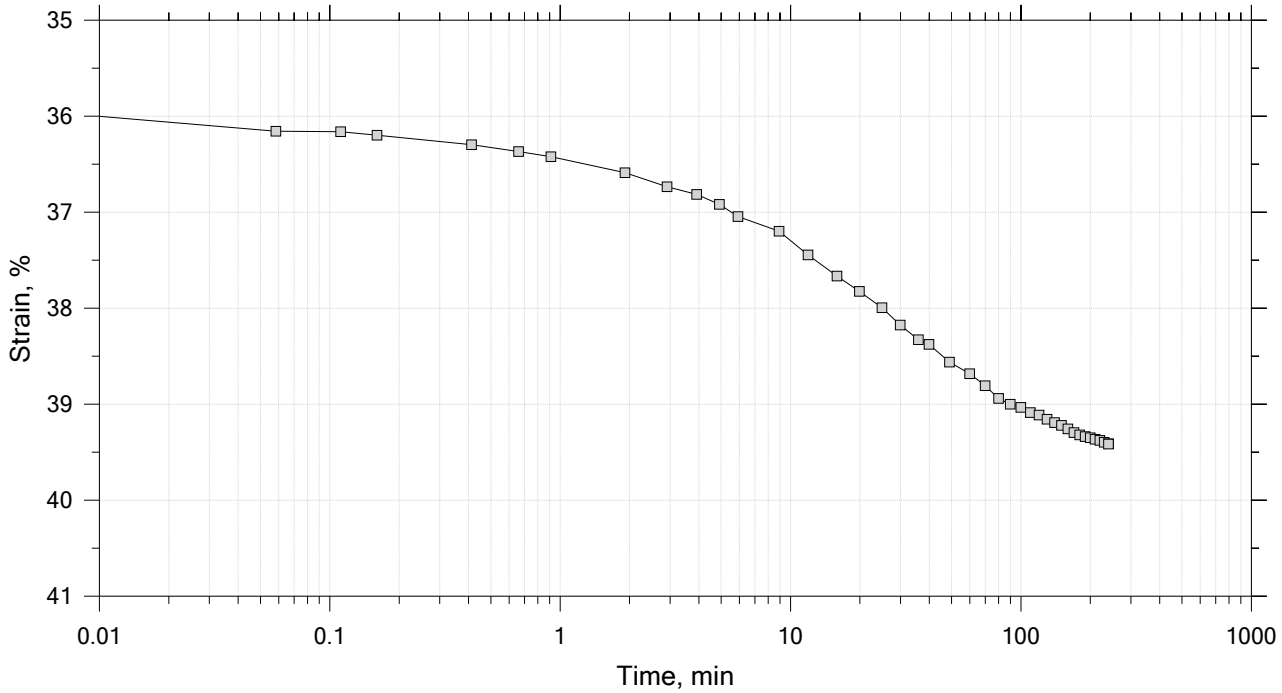
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

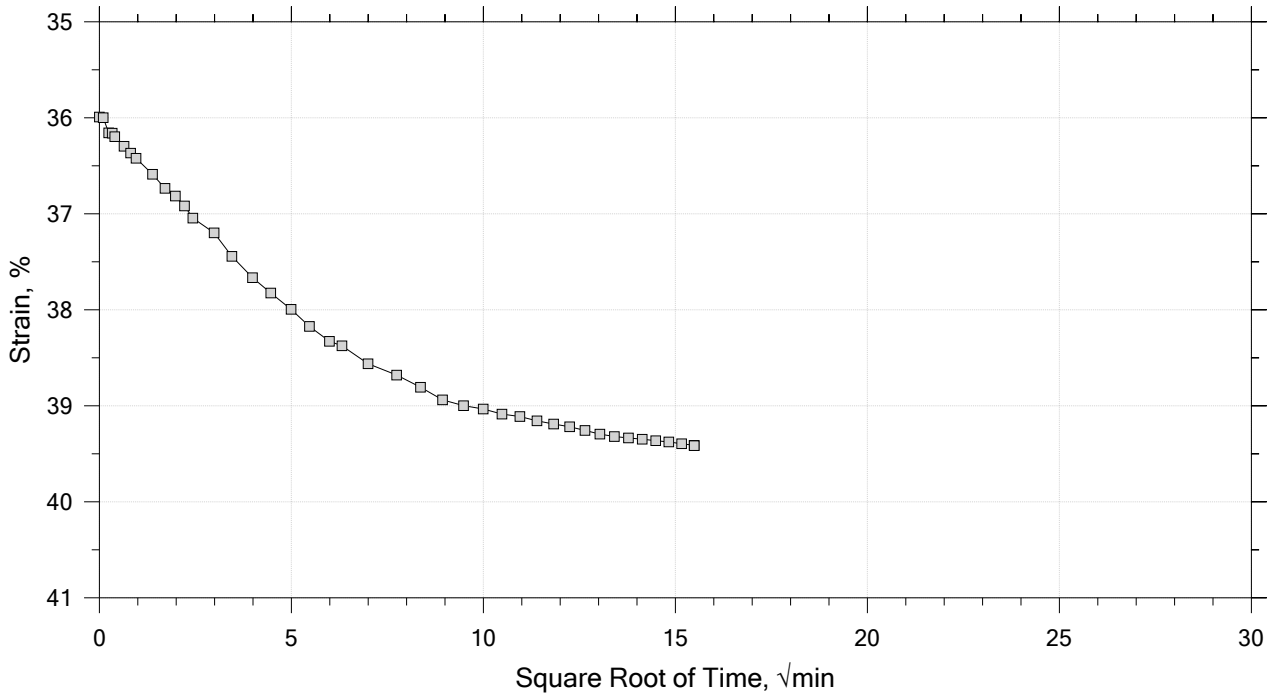
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf





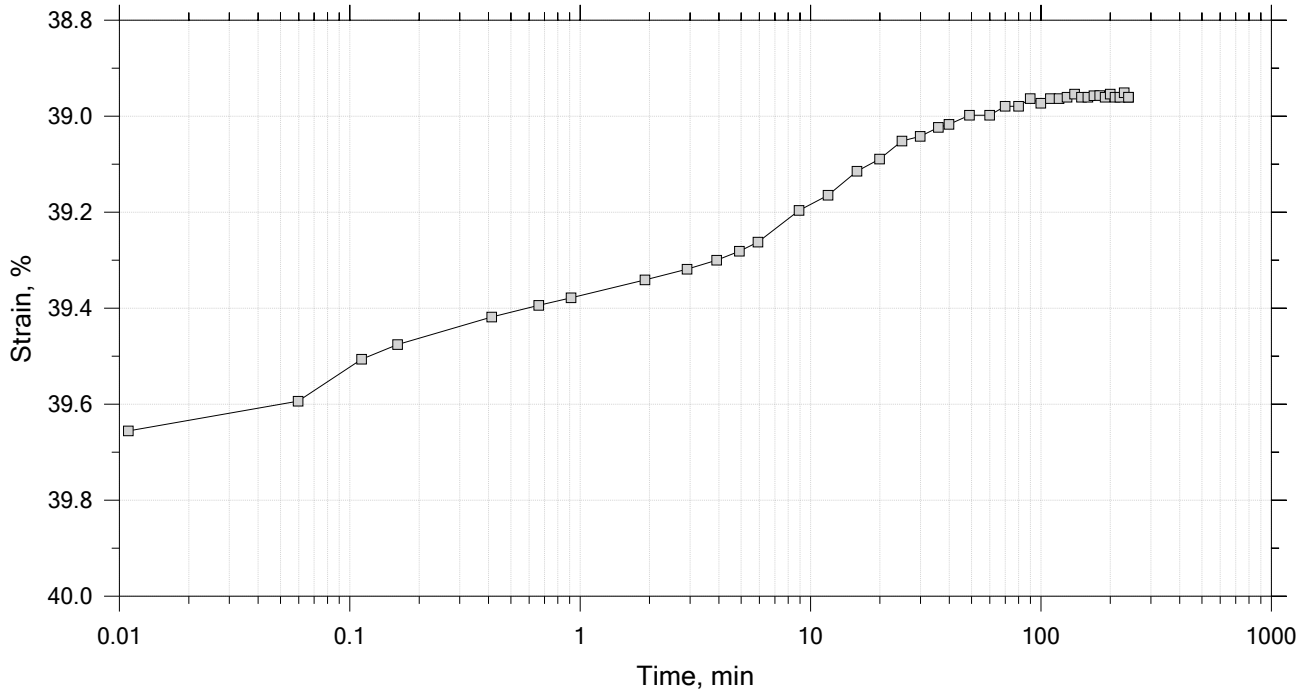
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

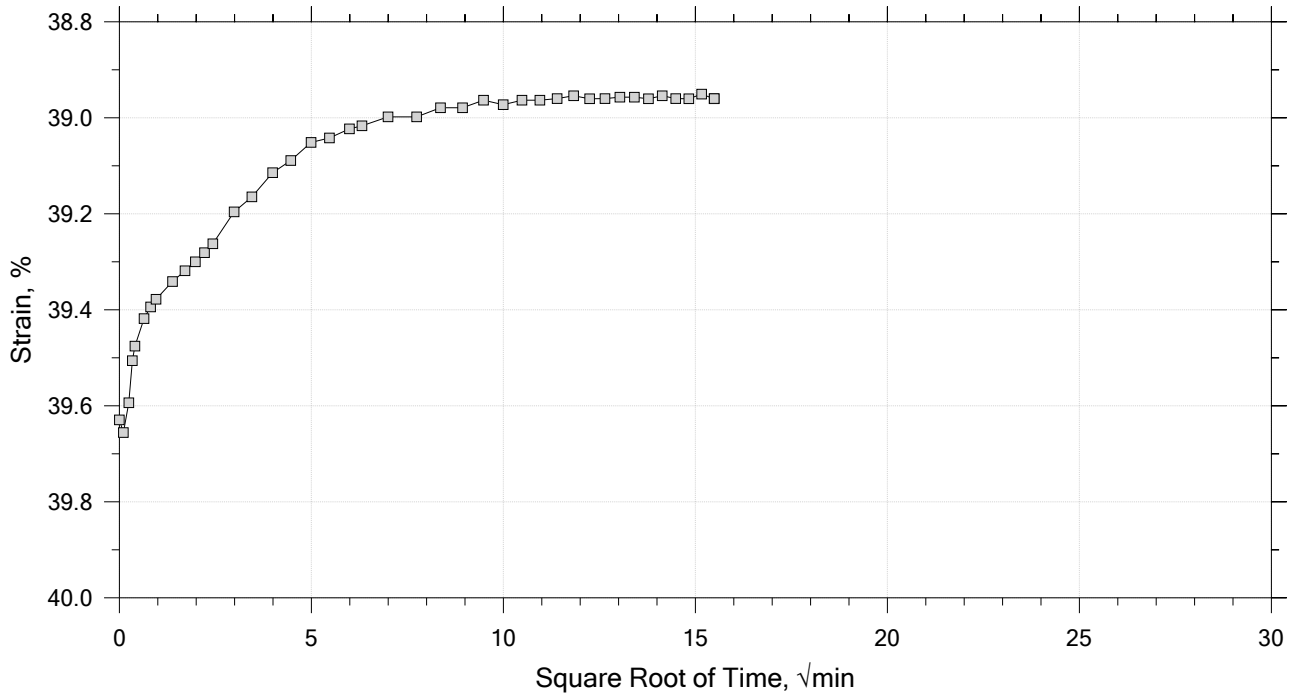
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf





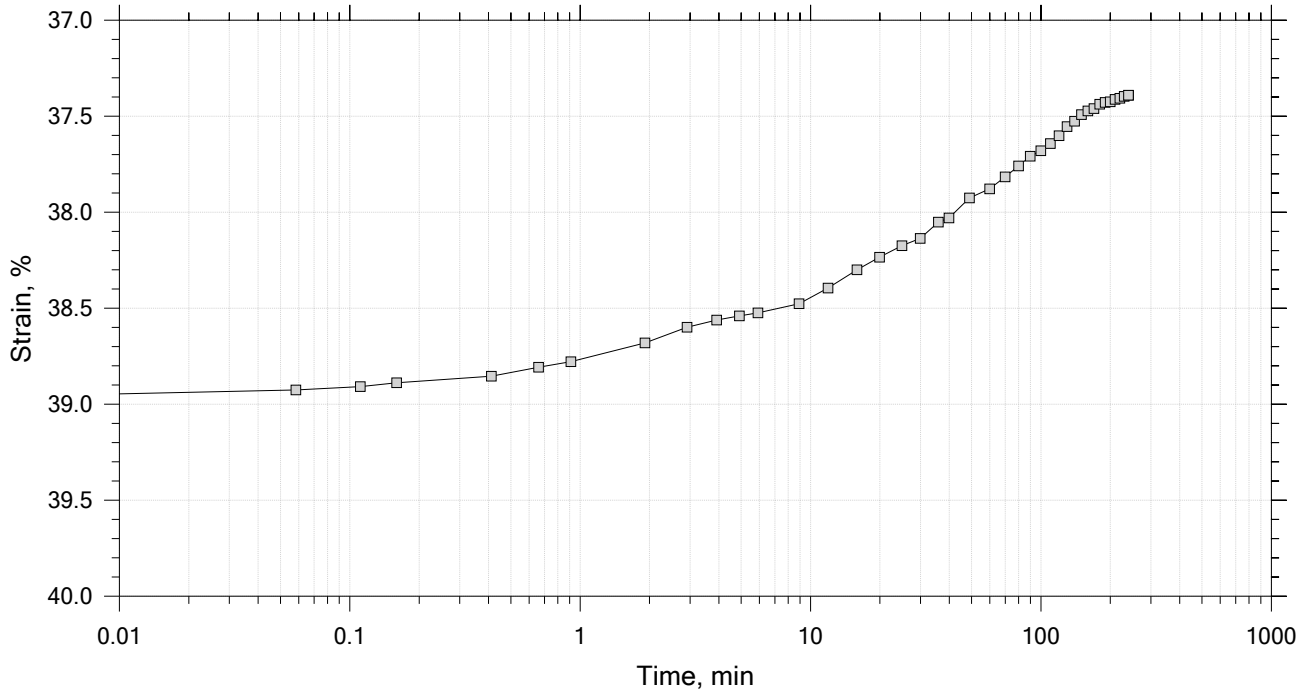
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

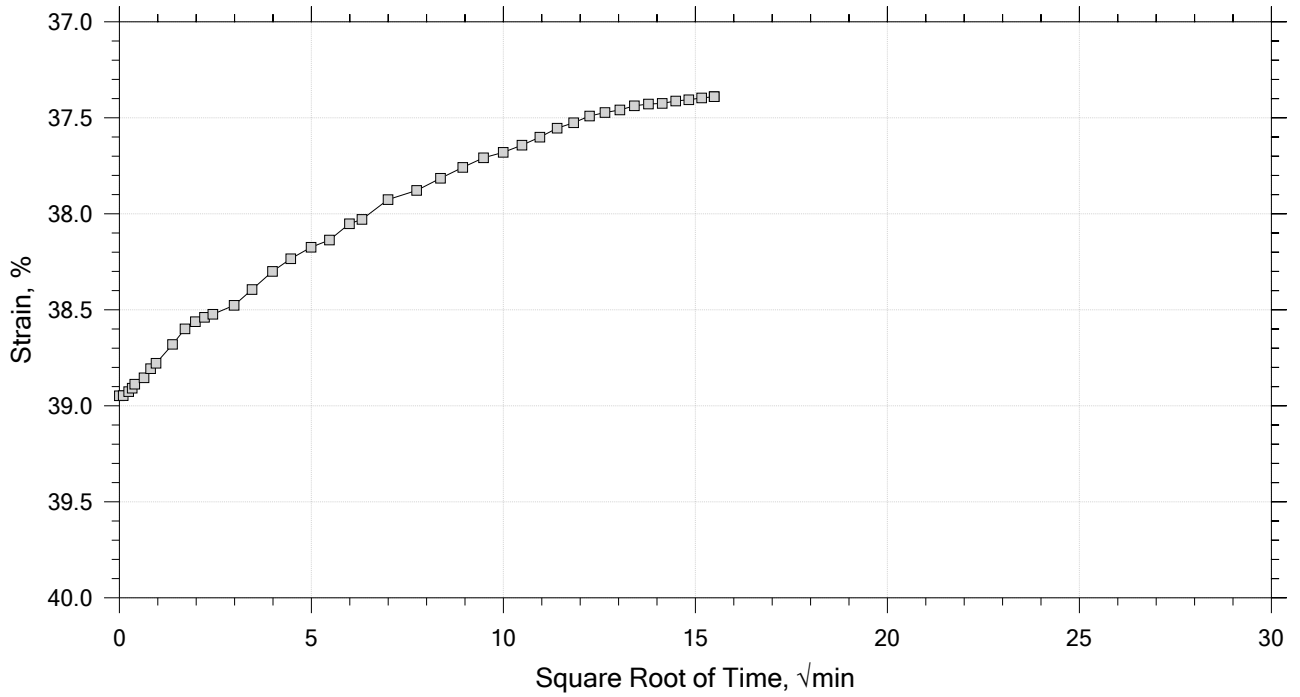
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf





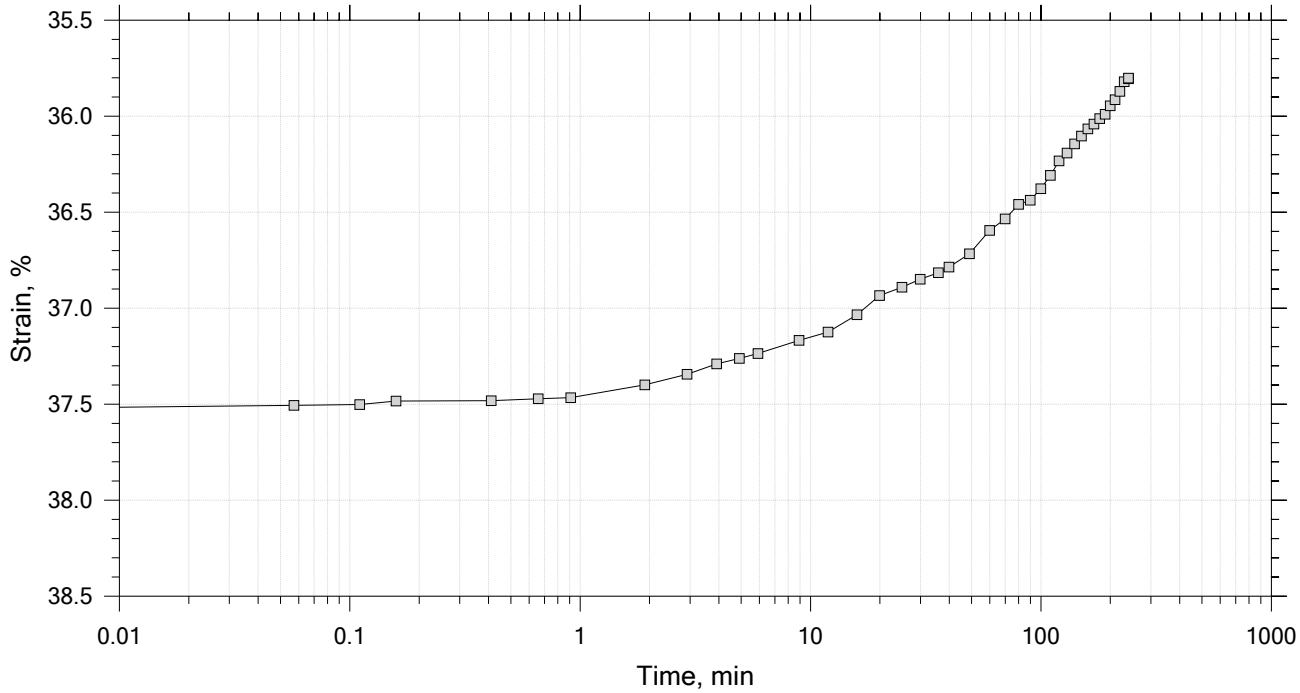
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

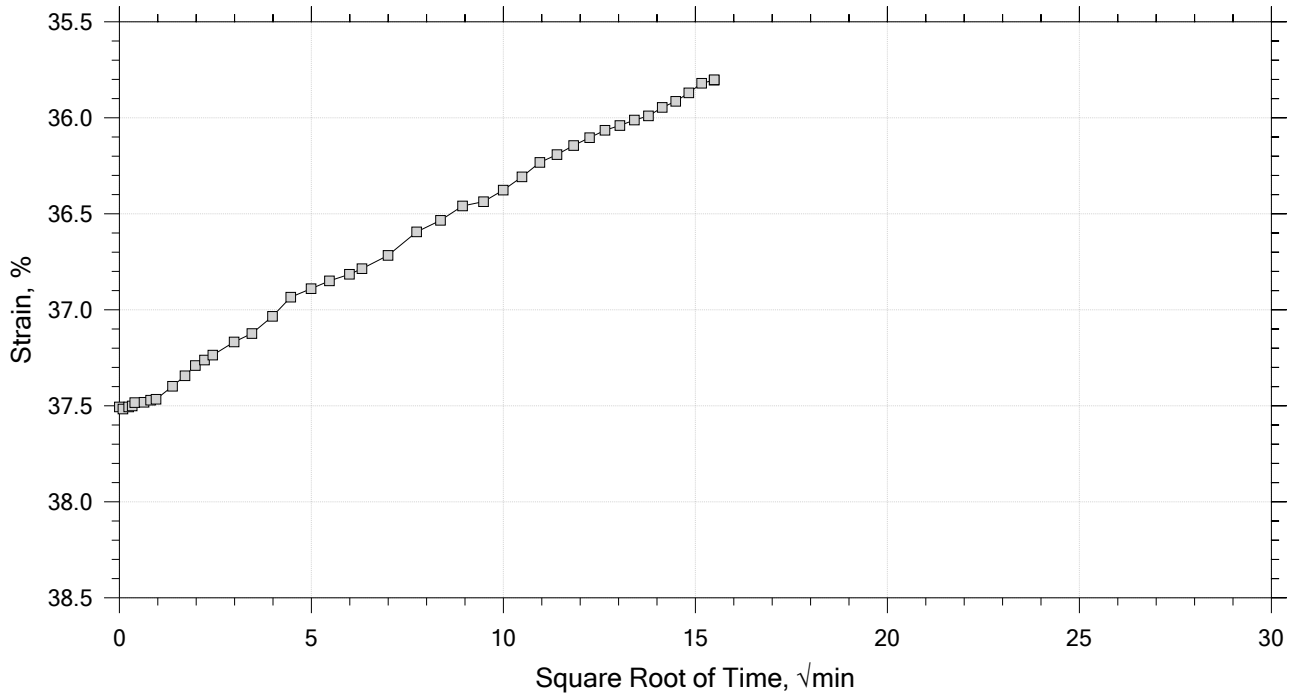
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf





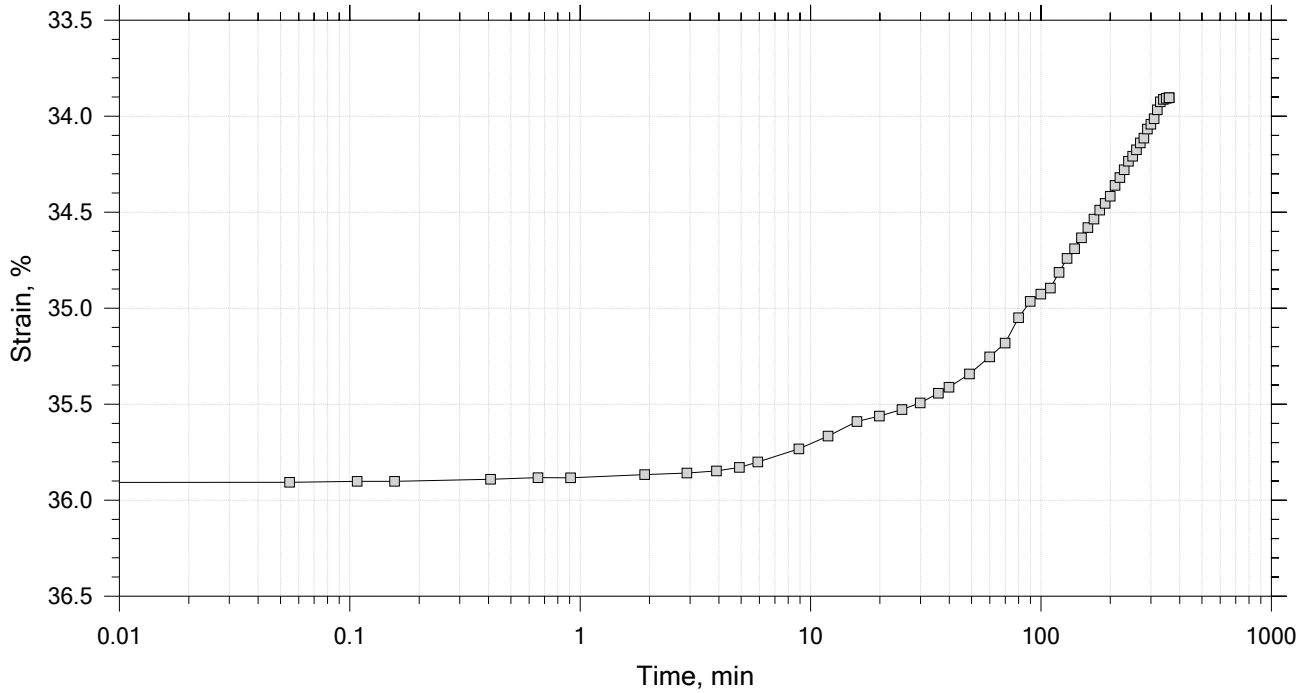
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

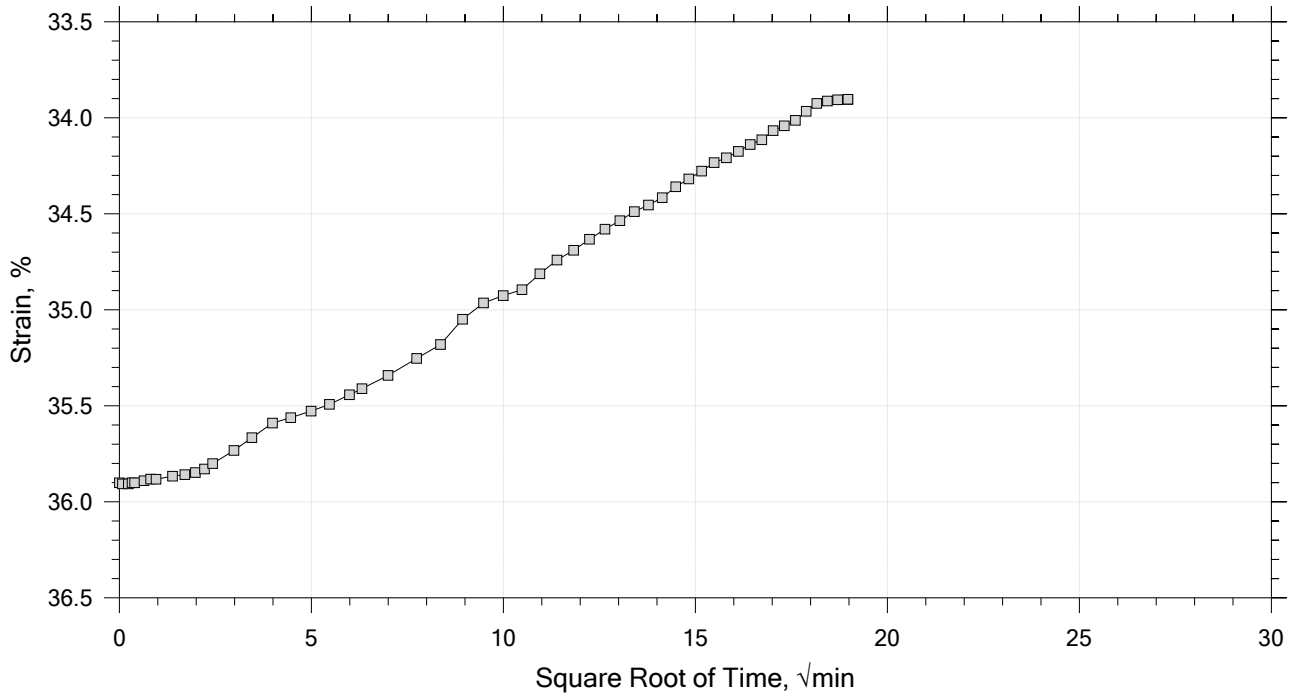
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf





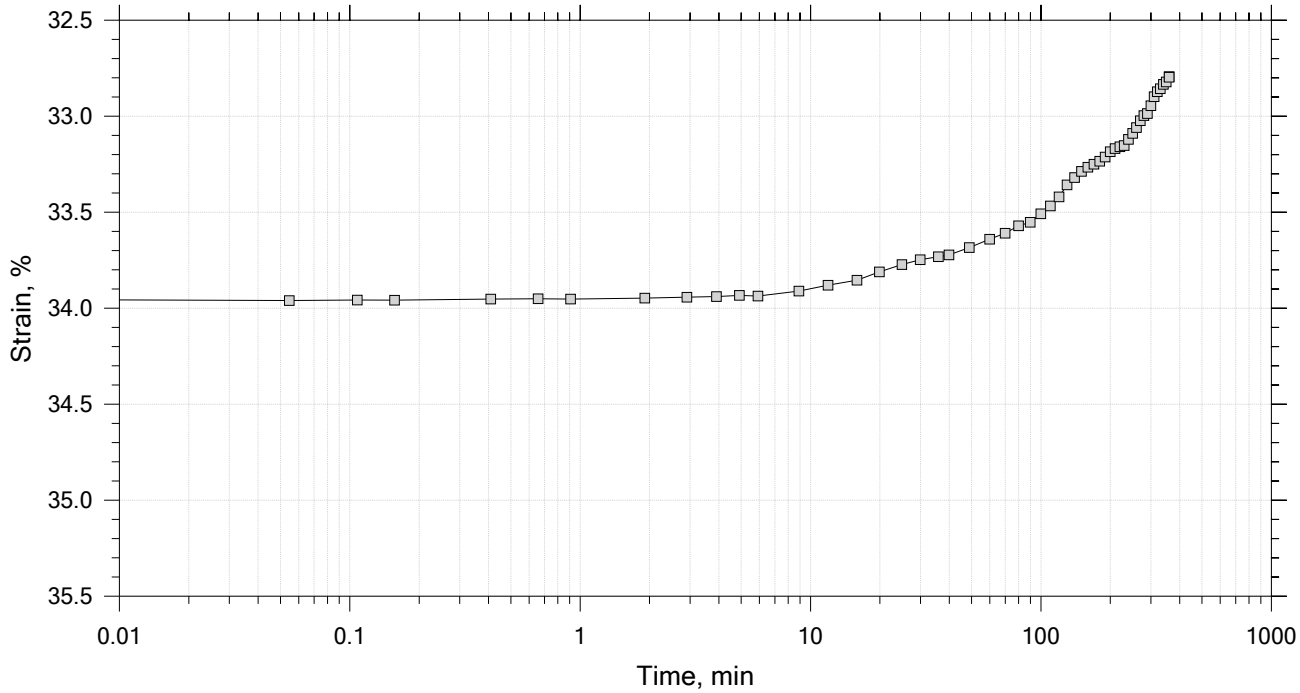
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

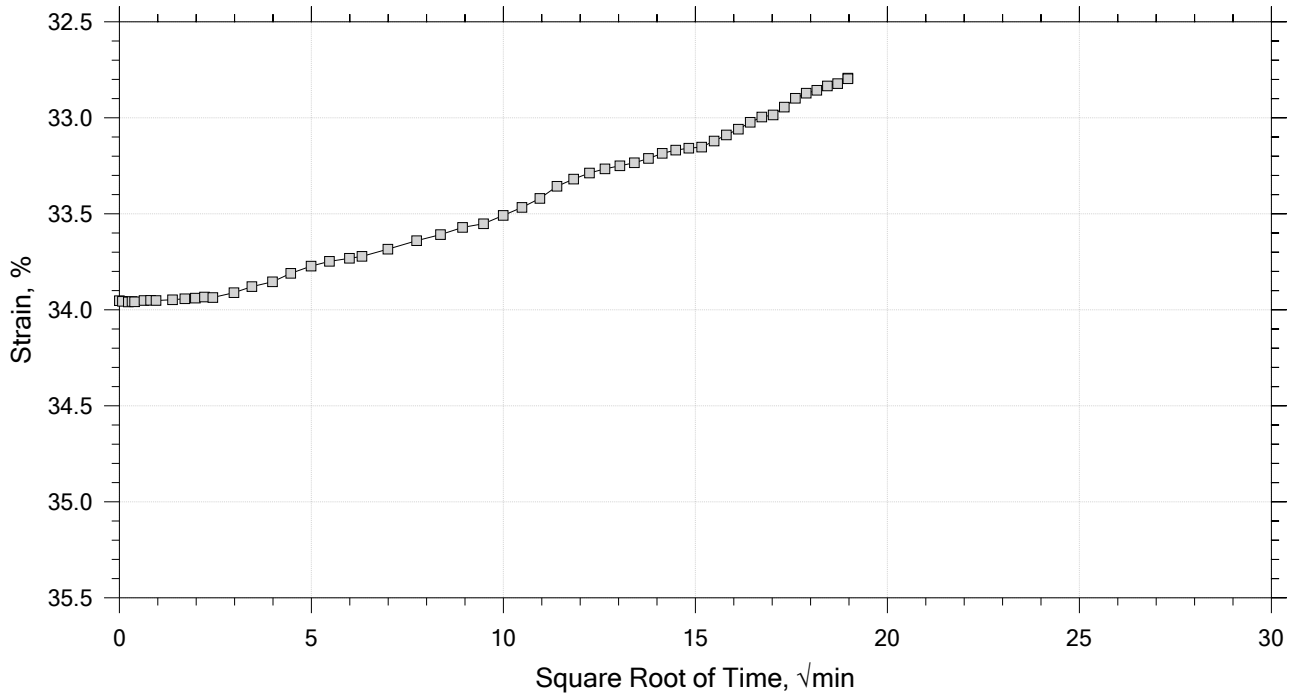
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf





Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.70	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 1.51	Plastic Limit: ---
Final Height: 0.70 in	Final Void Ratio: 0.756	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-2879	RING		D-2631
Mass Container, gm	8.34	112.4	112.4	8.31
Mass Container + Wet Soil, gm	175.43	247.41	223.28	116.9
Mass Container + Dry Soil, gm	115.34	199.03	199.03	93.15
Mass Dry Soil, gm	107	86.629	86.629	84.84
Water Content, %	56.16	55.85	27.99	27.99
Void Ratio	---	1.51	0.76	---
Degree of Saturation, %	---	100.00	100.00	---
Dry Unit Weight, pcf	---	67.231	96.045	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test.
Therefore, values may not represent actual values for the specimen.

GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0652	0.01249	1.48	1.25	0.000	0.00e+00	1.92e-01	0.00e+00	0.00e+00
2	0.125	0.02880	1.44	2.88	0.000	0.00e+00	2.73e-01	0.00e+00	0.00e+00
3	0.250	0.06312	1.35	6.31	20.753	2.50e-07	2.75e-01	1.85e-04	0.00e+00
4	0.500	0.1126	1.23	11.3	31.560	1.50e-07	1.98e-01	8.03e-05	0.00e+00
5	1.00	0.1683	1.09	16.8	25.477	1.65e-07	1.11e-01	4.96e-05	0.00e+00
6	2.00	0.2235	0.948	22.4	21.548	1.71e-07	5.53e-02	2.55e-05	0.00e+00
7	4.00	0.2761	0.816	27.6	21.161	1.52e-07	2.63e-02	1.07e-05	0.00e+00
8	8.00	0.3217	0.702	32.2	19.651	1.43e-07	1.14e-02	4.38e-06	0.00e+00
9	16.0	0.3592	0.608	35.9	17.225	1.44e-07	4.68e-03	1.82e-06	0.00e+00
10	32.0	0.3941	0.520	39.4	13.738	1.61e-07	2.18e-03	9.50e-07	0.00e+00
11	8.00	0.3896	0.532	39.0	0.000	0.00e+00	1.89e-04	0.00e+00	0.00e+00
12	2.00	0.3739	0.571	37.4	0.000	0.00e+00	2.62e-03	0.00e+00	0.00e+00
13	0.500	0.3580	0.611	35.8	0.000	0.00e+00	1.06e-02	0.00e+00	0.00e+00
14	0.125	0.3390	0.659	33.9	0.000	0.00e+00	5.06e-02	0.00e+00	0.00e+00
15	0.0625	0.3280	0.686	32.8	0.000	0.00e+00	1.77e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

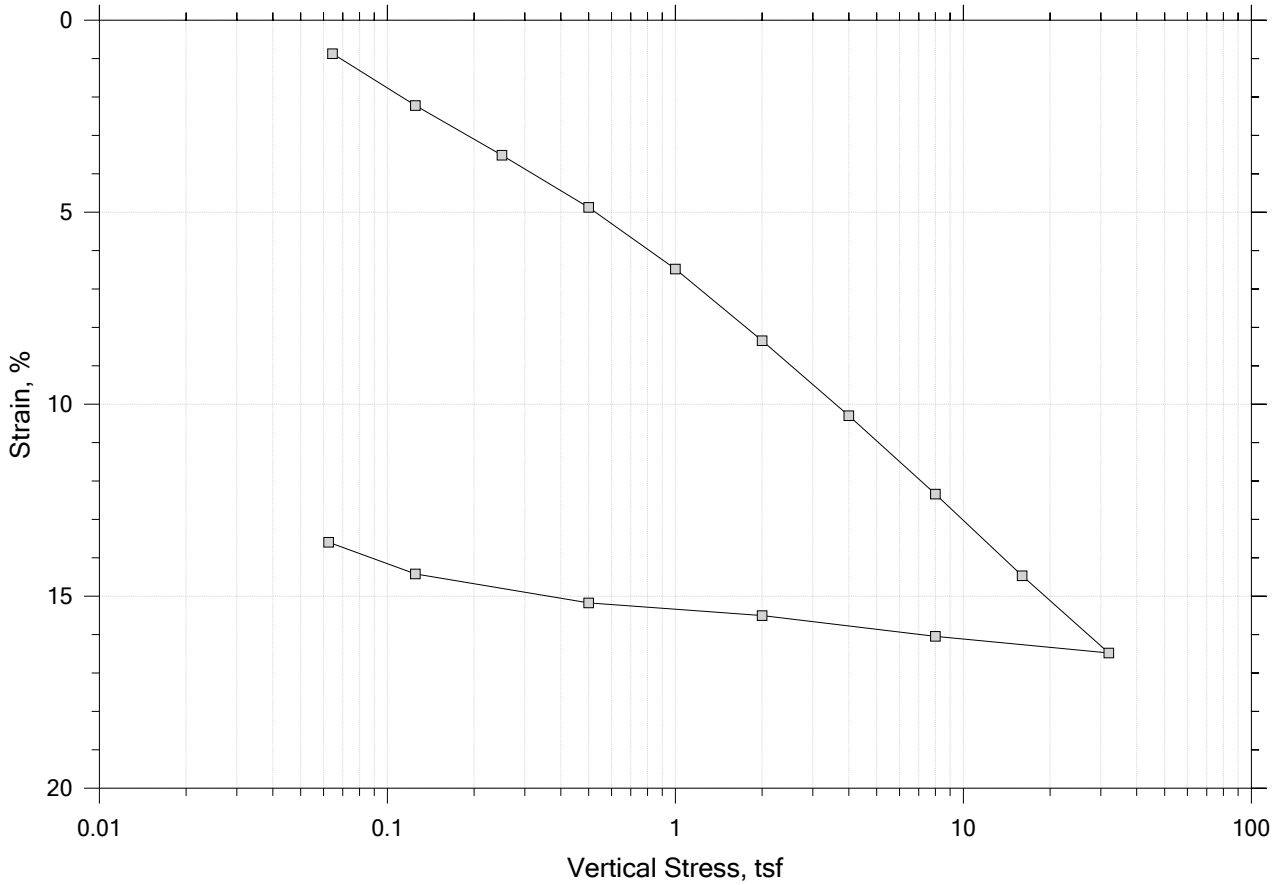
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0652	0.01249	1.48	1.25	96.629	2.51e-07	1.92e-01	1.30e-04
2	0.125	0.02880	1.44	2.88	47.949	4.91e-07	2.73e-01	3.61e-04
3	0.250	0.06312	1.35	6.31	97.171	2.30e-07	2.75e-01	1.70e-04
4	0.500	0.1126	1.23	11.3	121.893	1.67e-07	1.98e-01	8.95e-05
5	1.00	0.1683	1.09	16.8	127.922	1.42e-07	1.11e-01	4.25e-05
6	2.00	0.2235	0.948	22.4	119.701	1.33e-07	5.53e-02	1.98e-05
7	4.00	0.2761	0.816	27.6	103.320	1.34e-07	2.63e-02	9.48e-06
8	8.00	0.3217	0.702	32.2	94.051	1.28e-07	1.14e-02	3.94e-06
9	16.0	0.3592	0.608	35.9	79.373	1.34e-07	4.68e-03	1.70e-06
10	32.0	0.3941	0.520	39.4	41.670	2.29e-07	2.18e-03	1.35e-06
11	8.00	0.3896	0.532	39.0	11.565	7.85e-07	1.89e-04	4.01e-07
12	2.00	0.3739	0.571	37.4	88.400	1.06e-07	2.62e-03	7.49e-07
13	0.500	0.3580	0.611	35.8	193.701	5.09e-08	1.06e-02	1.45e-06
14	0.125	0.3390	0.659	33.9	275.794	3.78e-08	5.06e-02	5.16e-06
15	0.0625	0.3280	0.686	32.8	0.000	0.00e+00	1.77e-01	0.00e+00

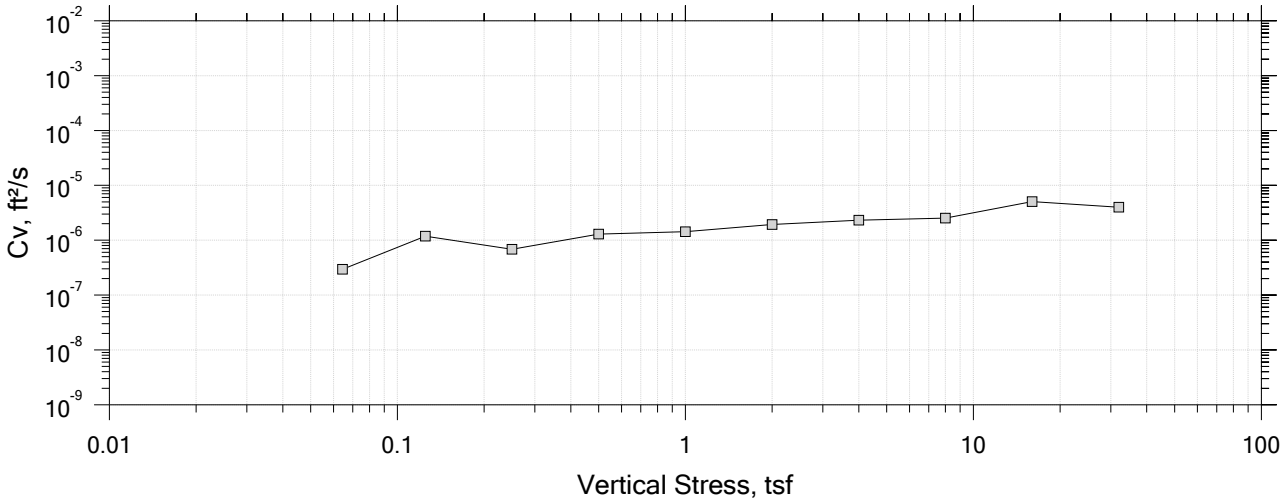
GeoTesting EXPRESS

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





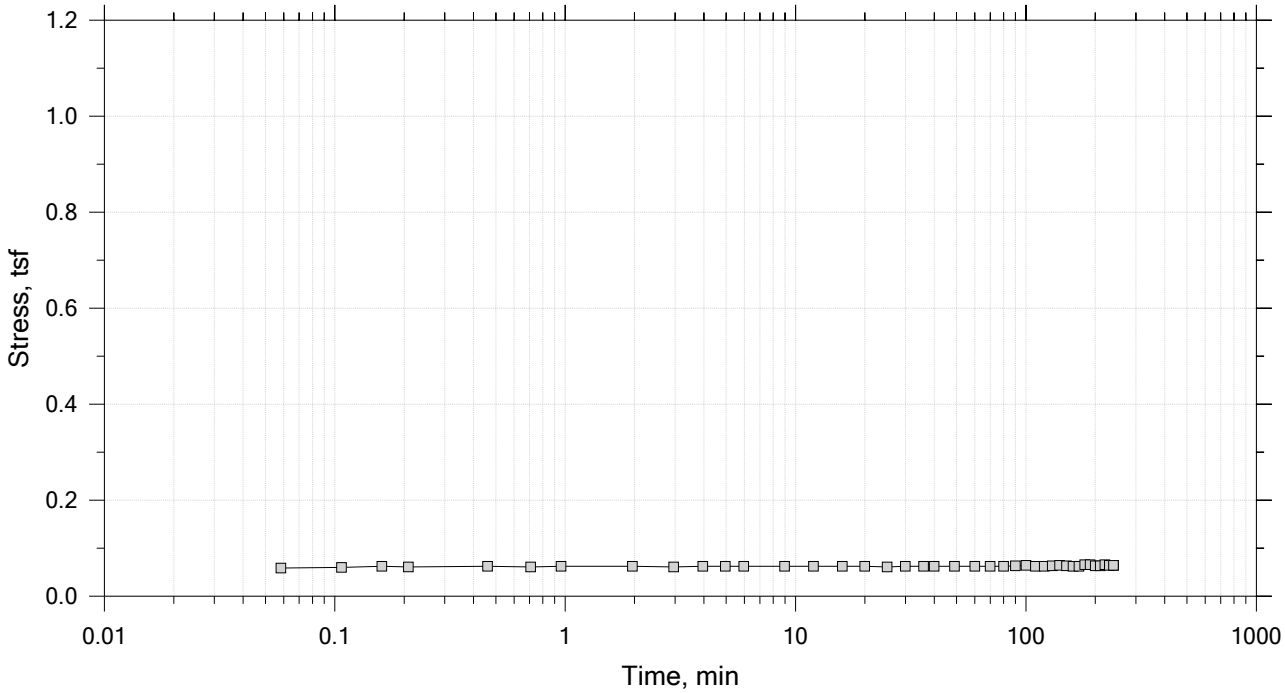
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		
Displacement at End of Increment		

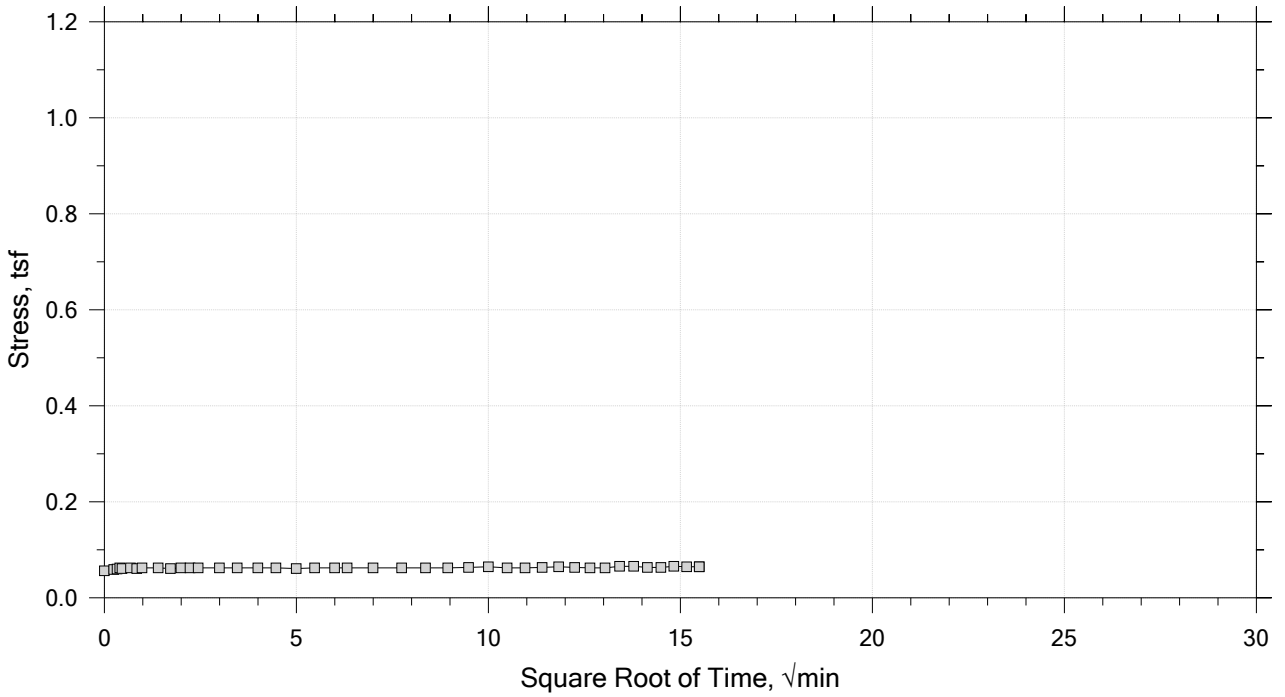
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15

Constant Volume Step

Stress: 0.0644 tsf





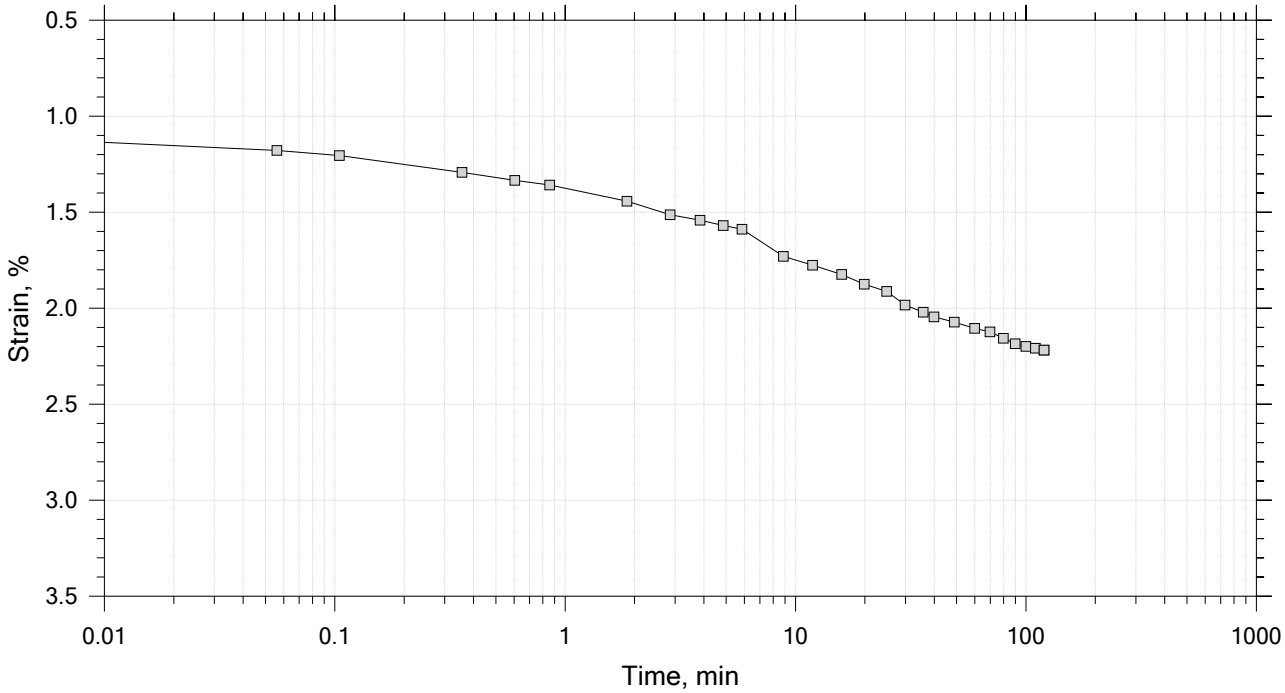
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

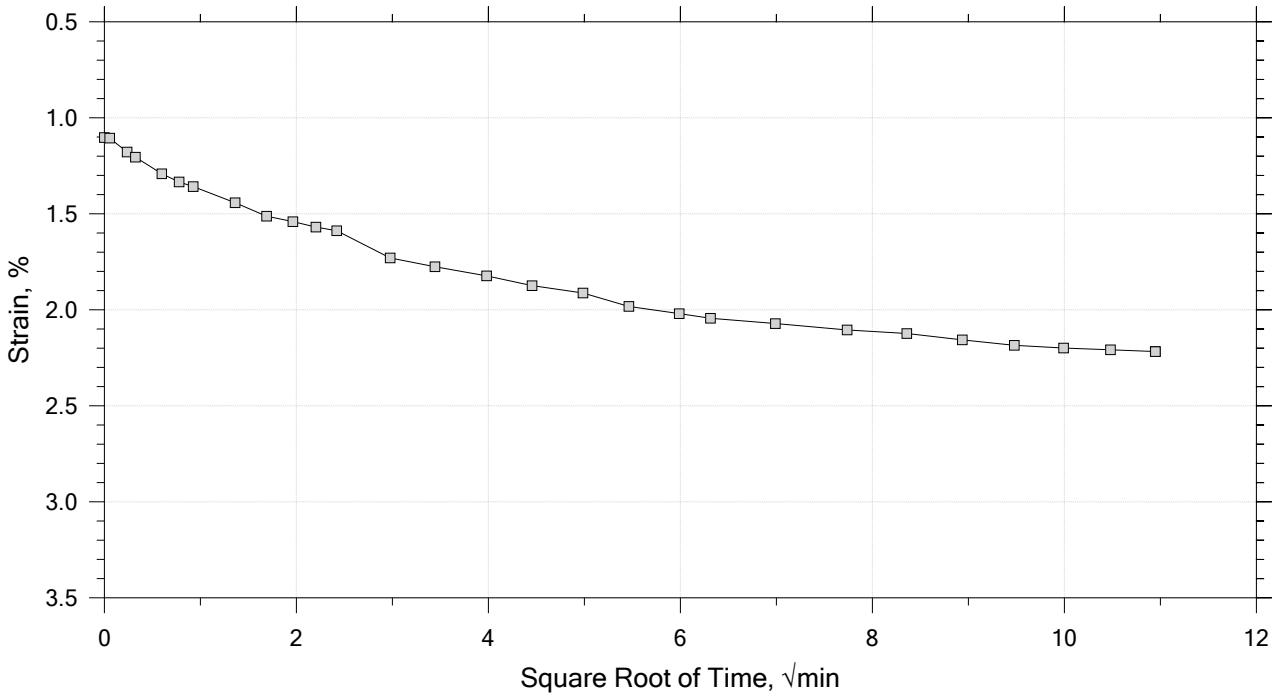
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf





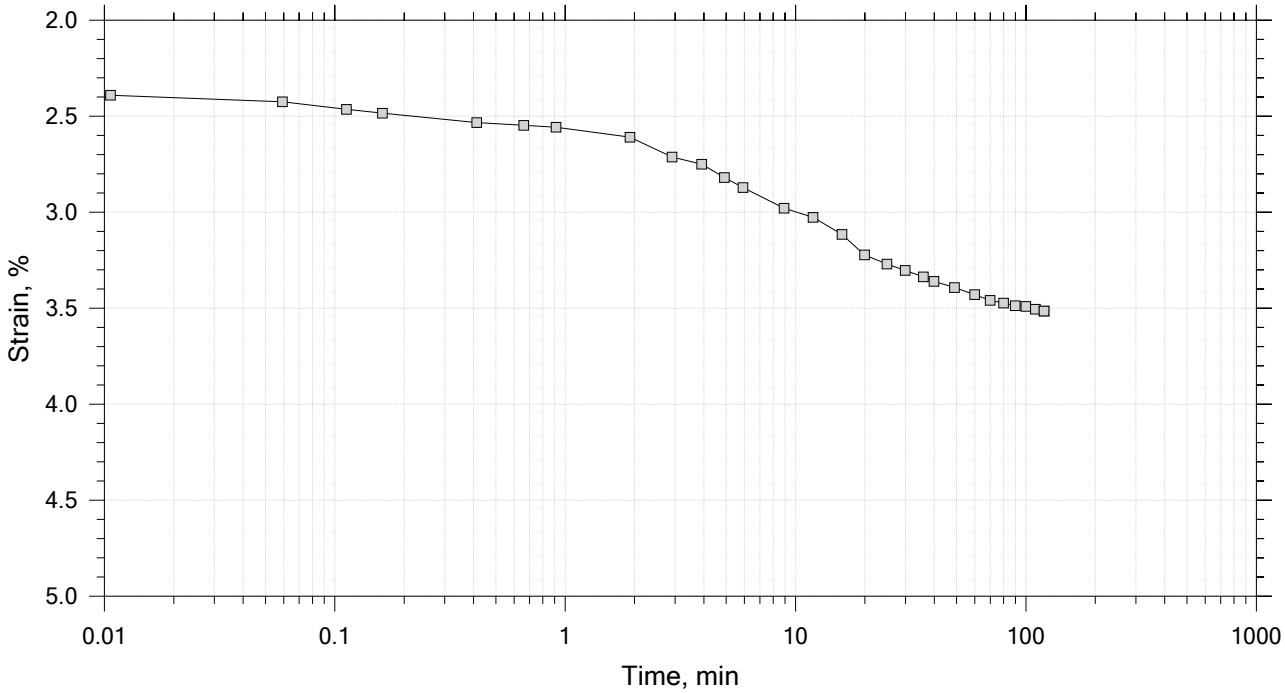
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

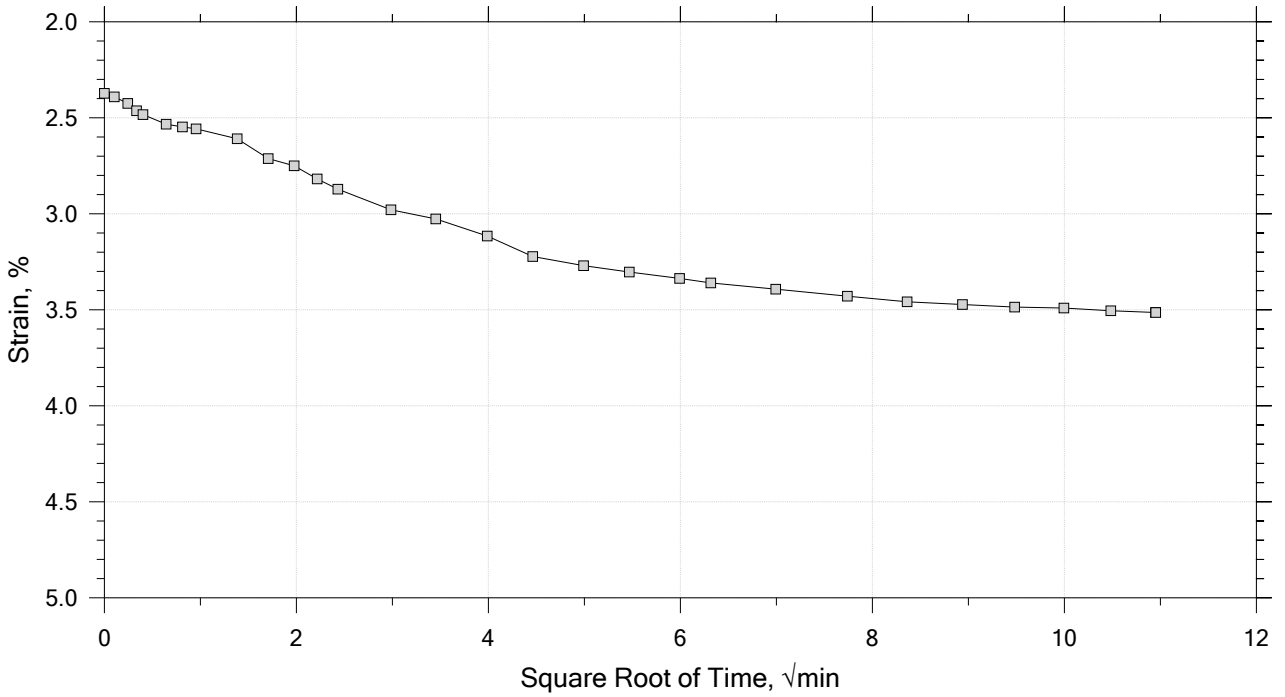
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf





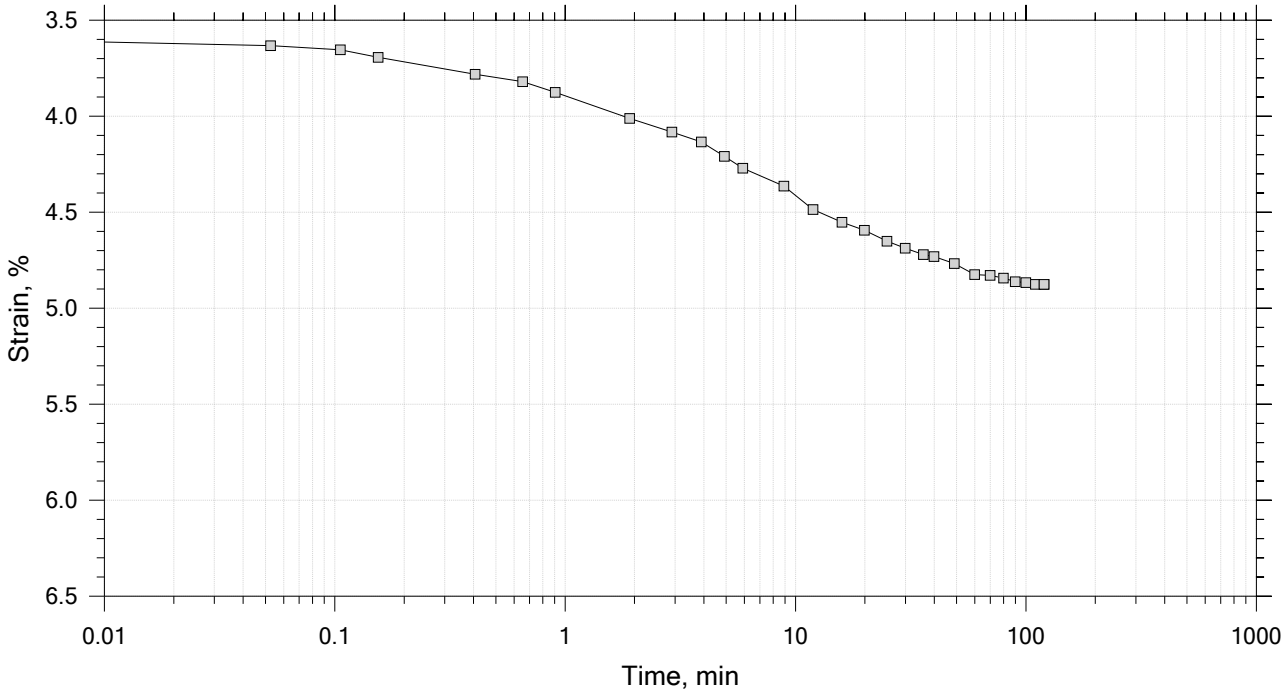
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

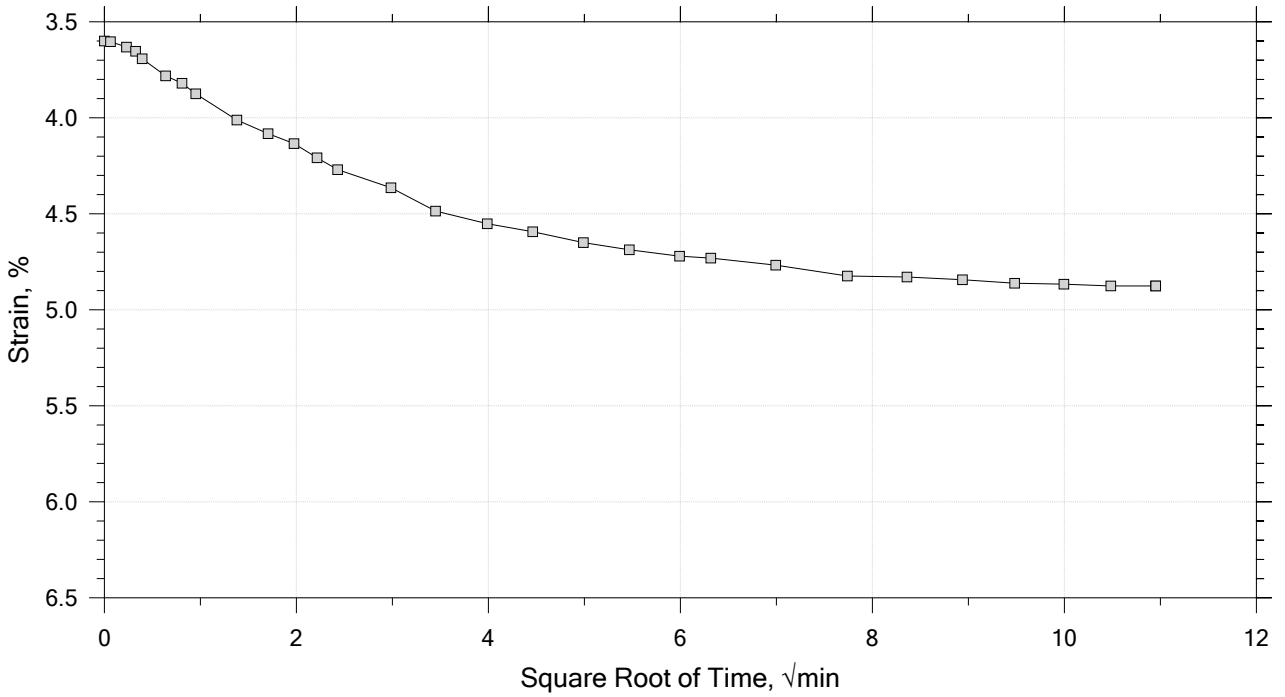
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





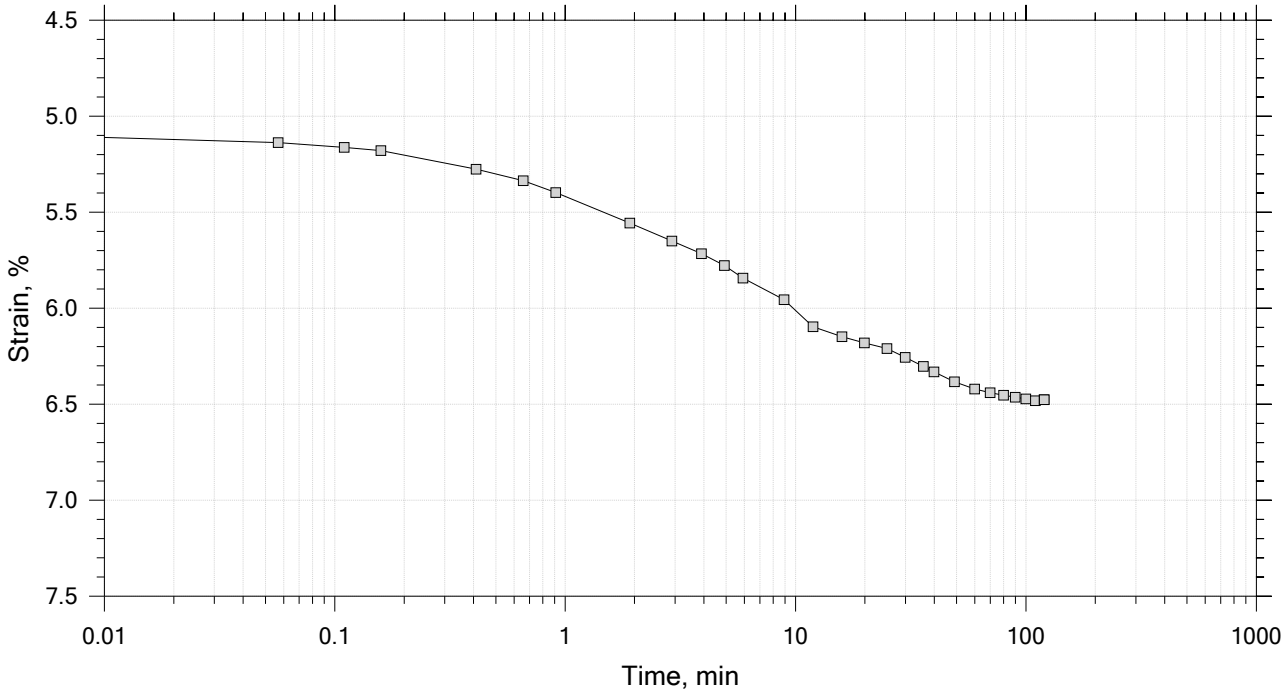
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

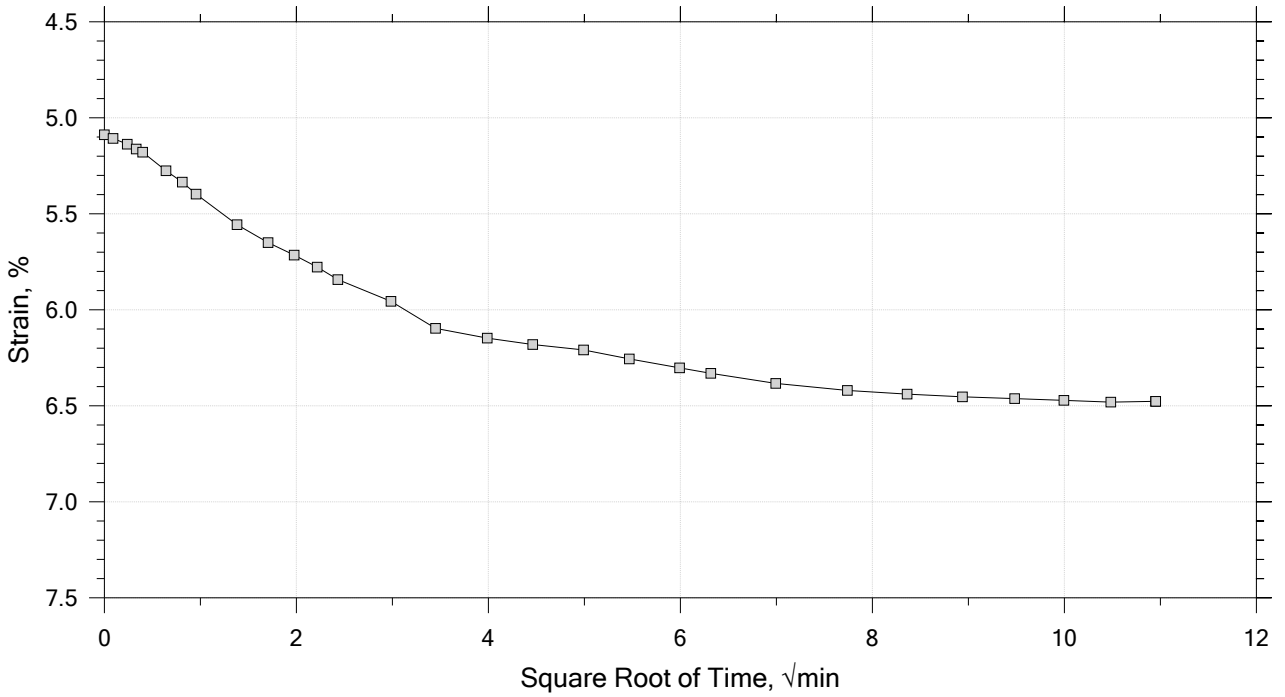
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





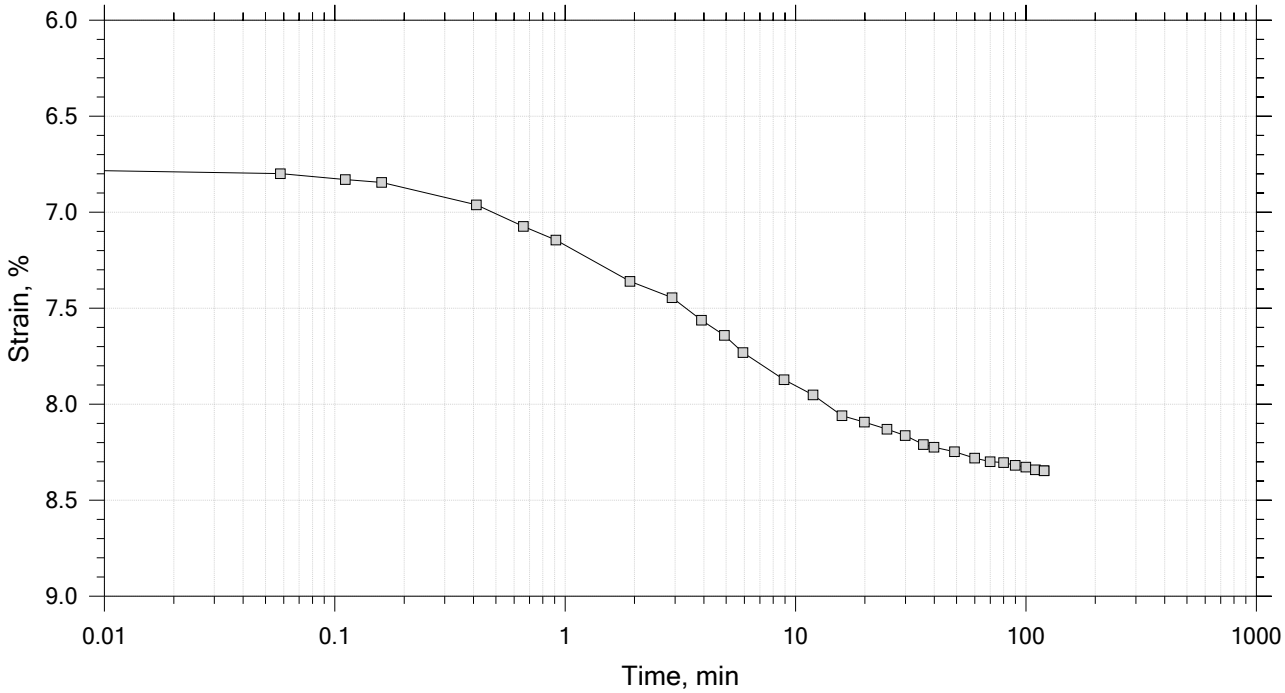
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

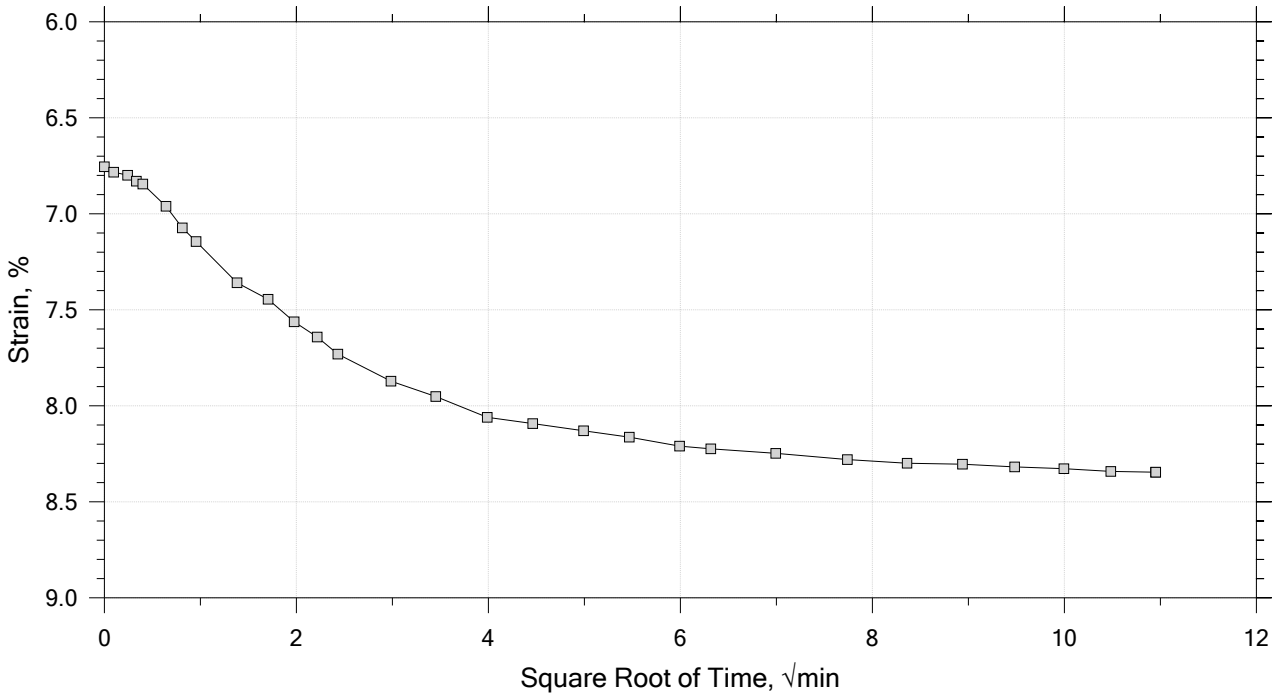
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





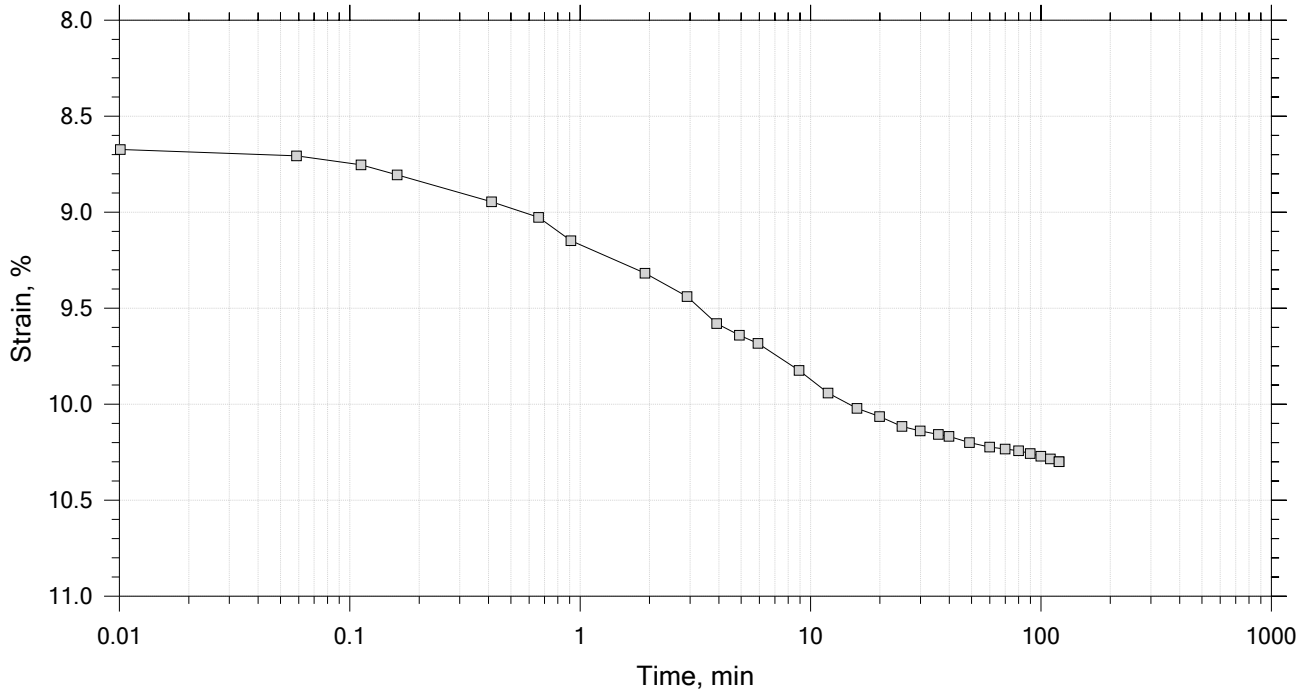
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

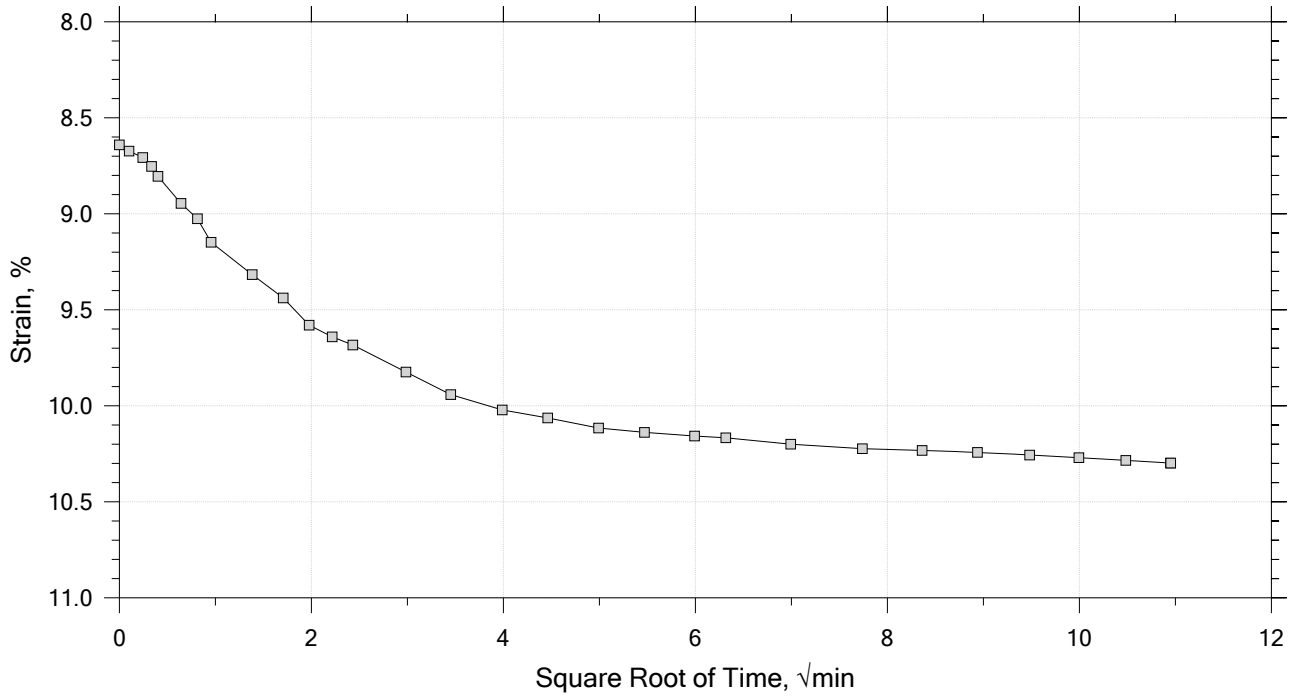
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





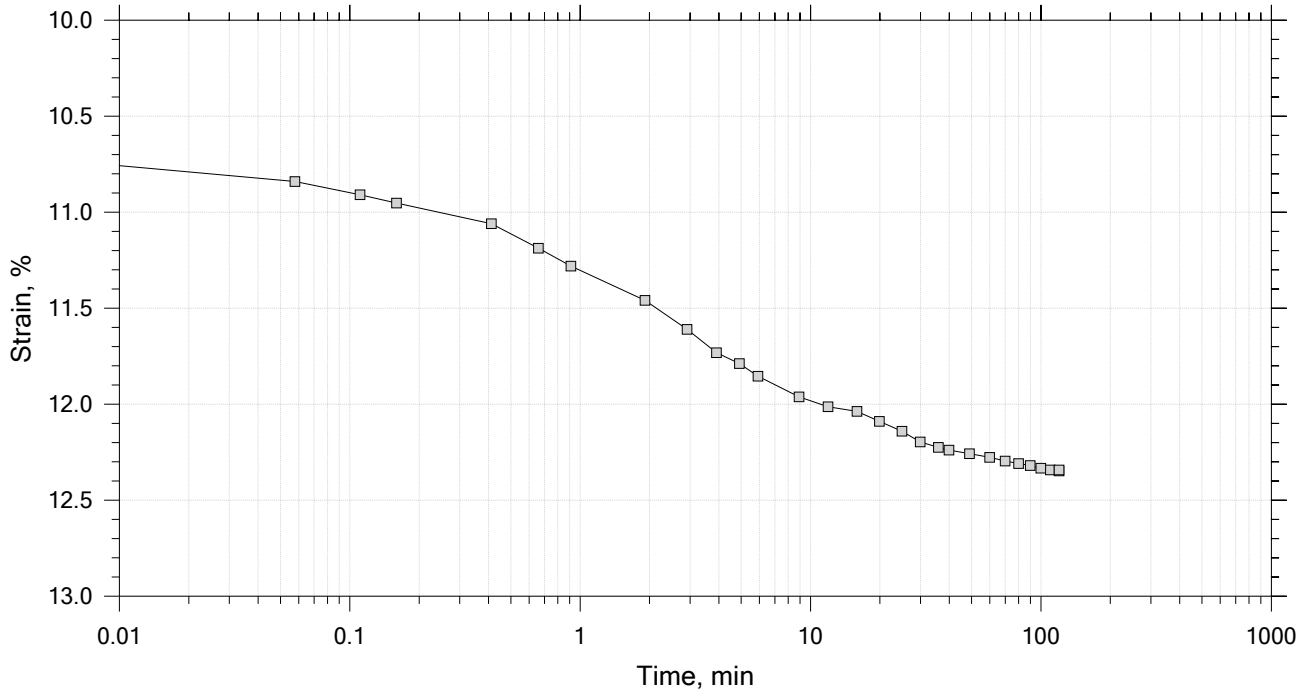
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

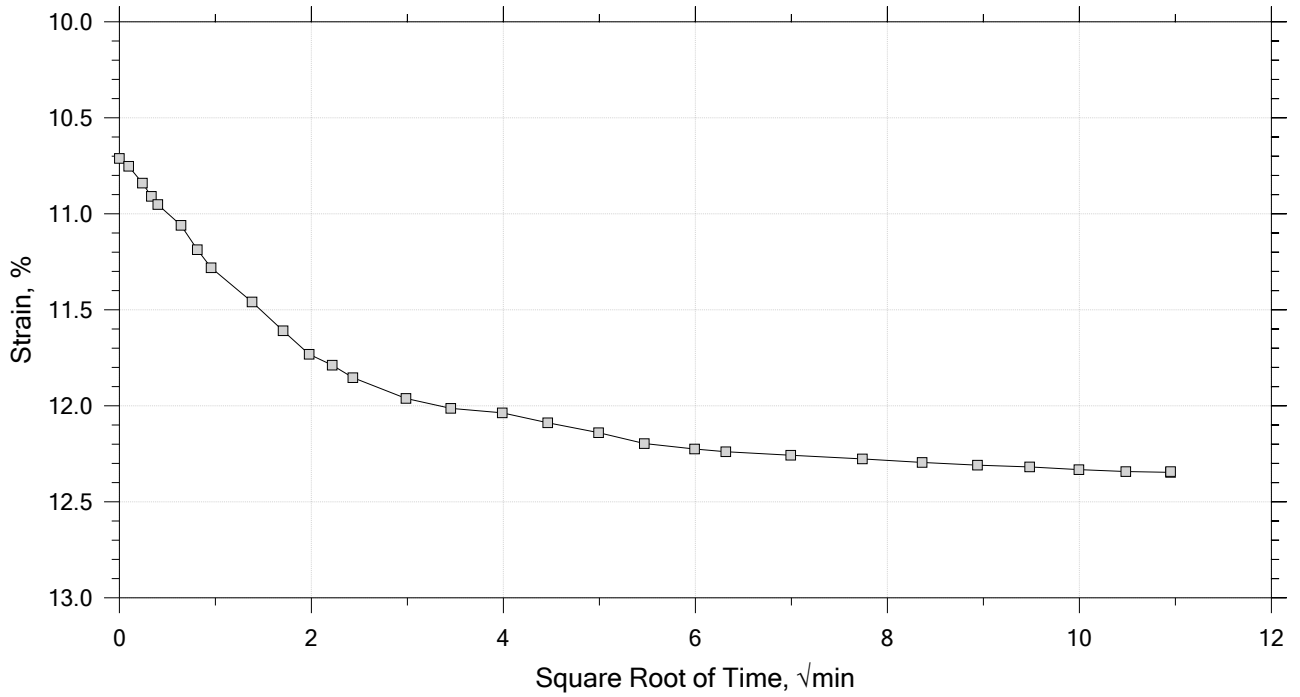
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





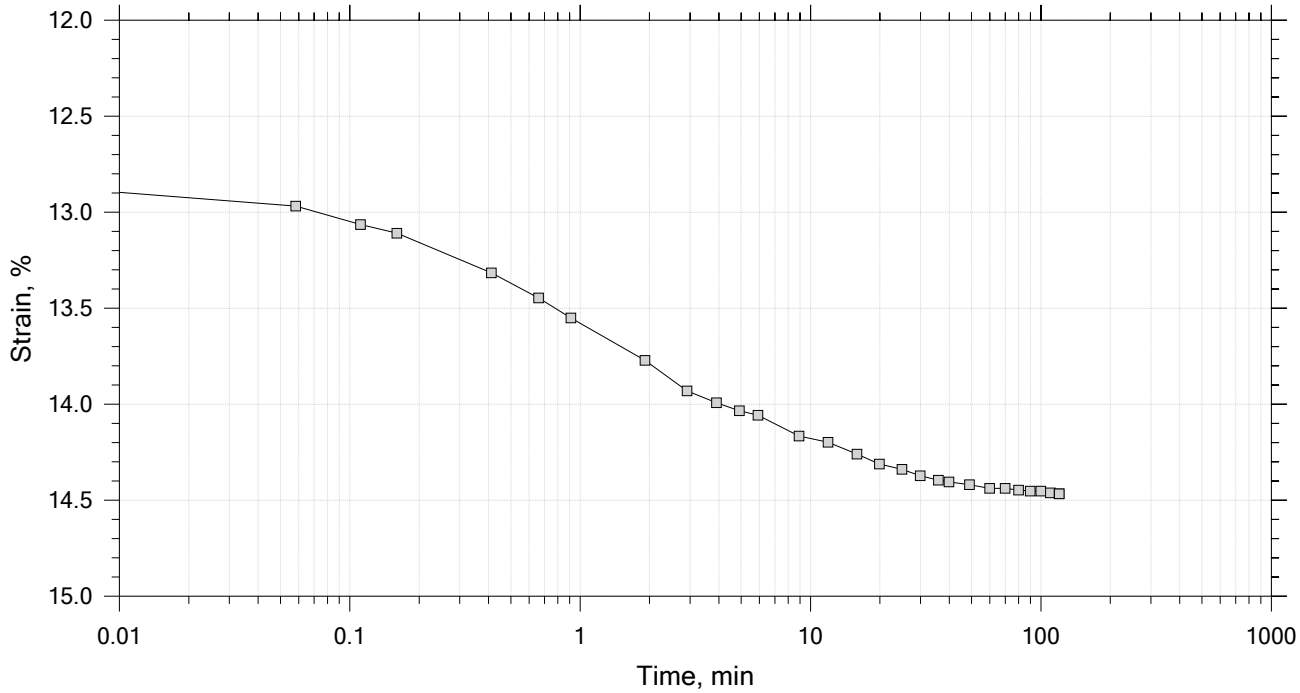
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

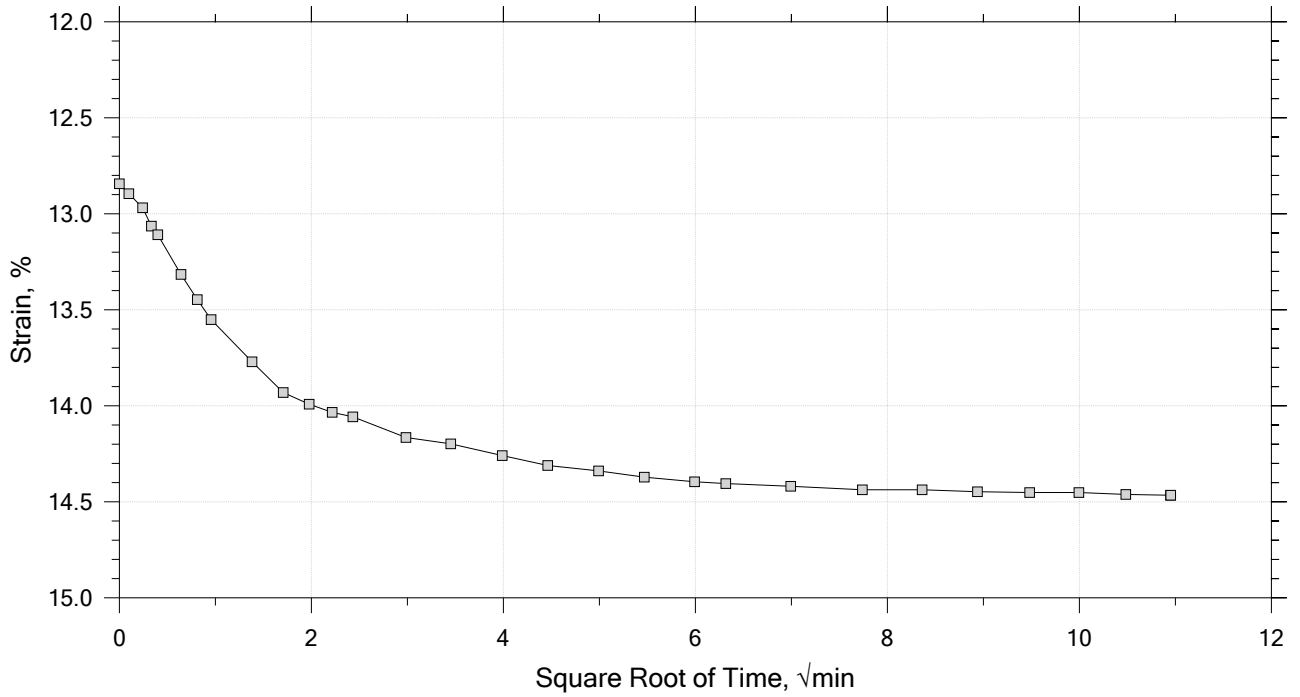
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





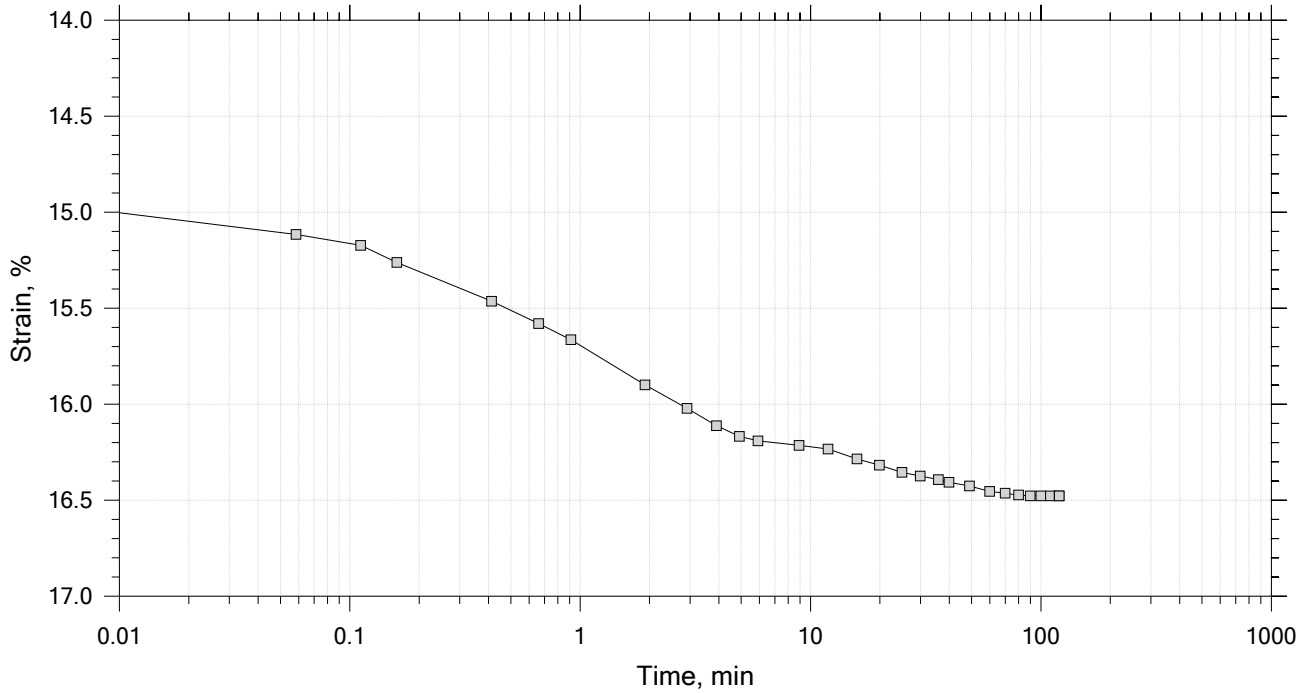
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

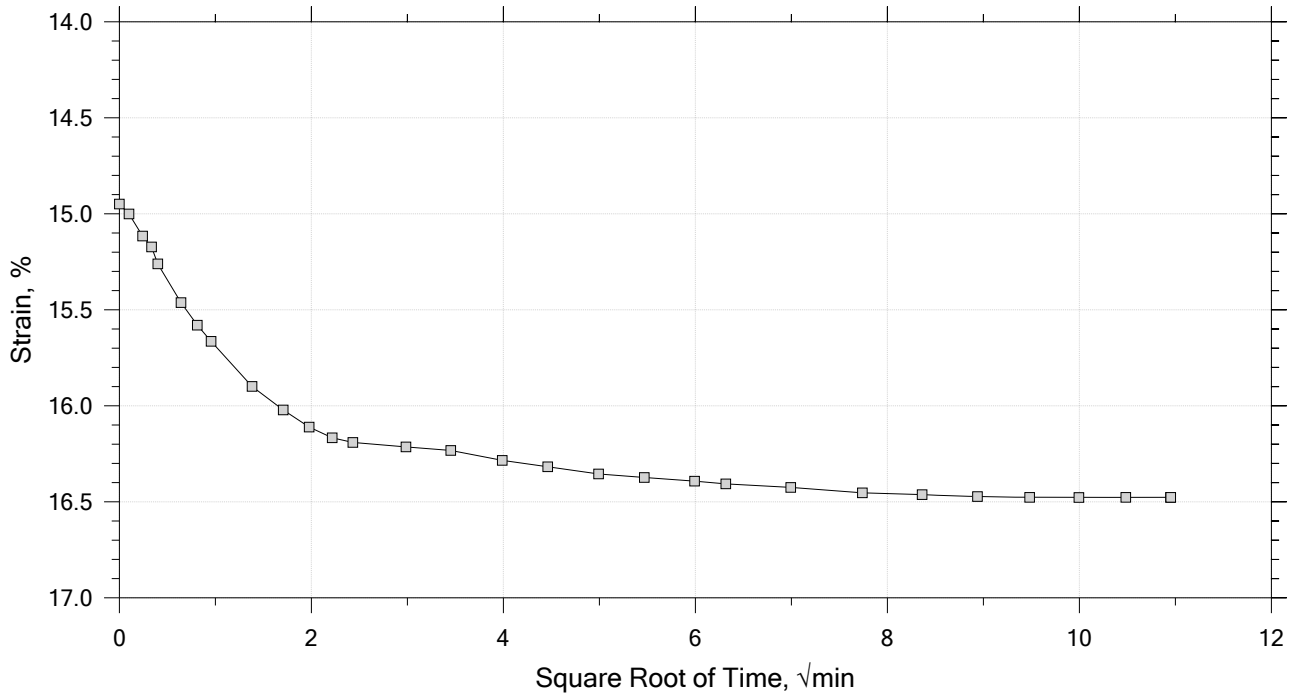
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf





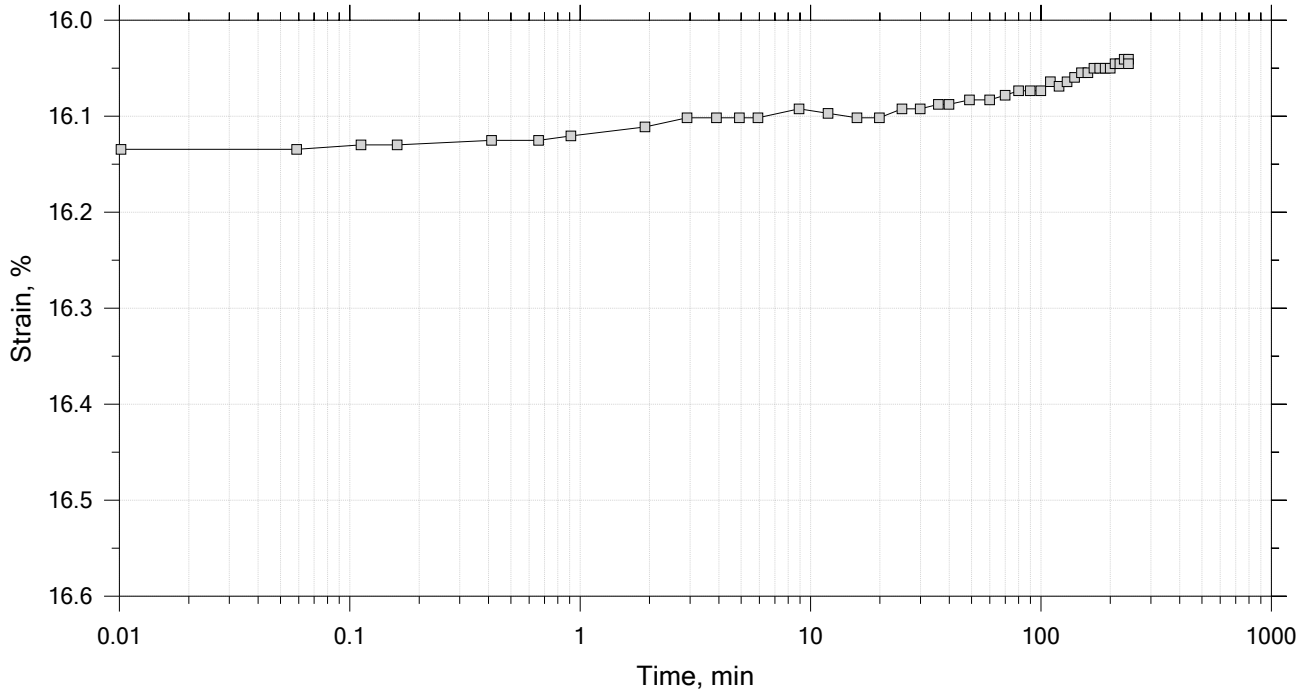
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

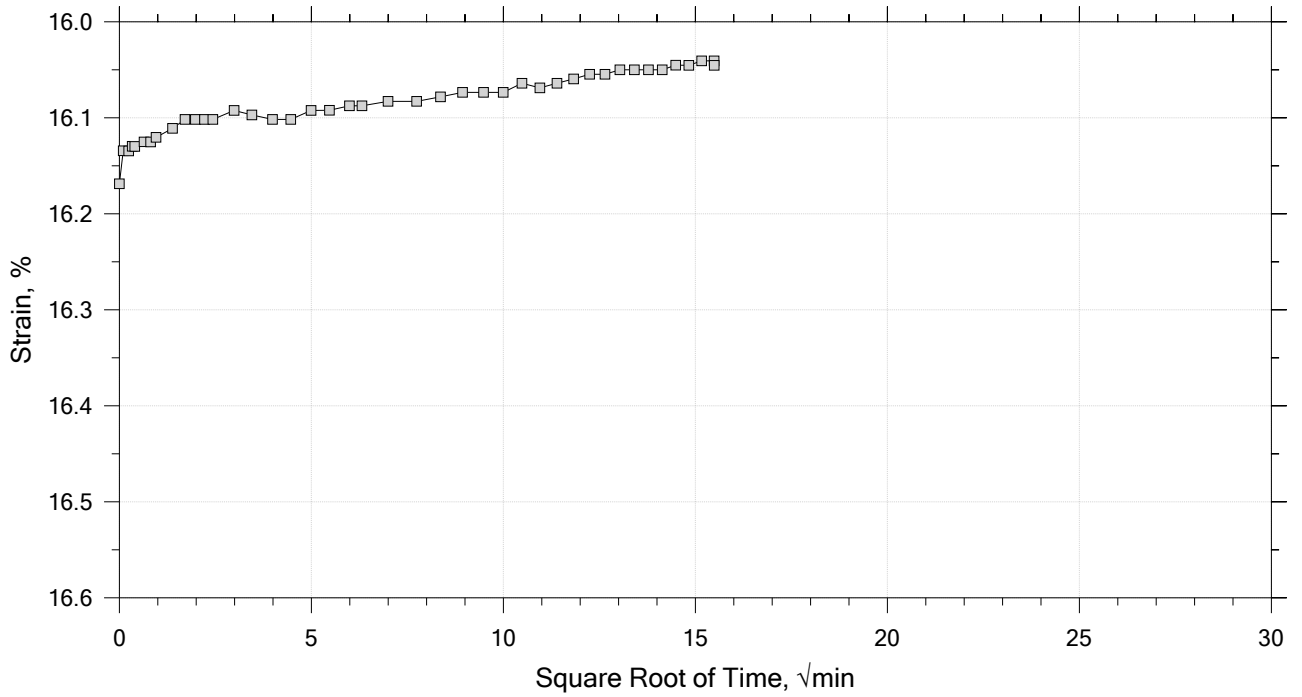
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf





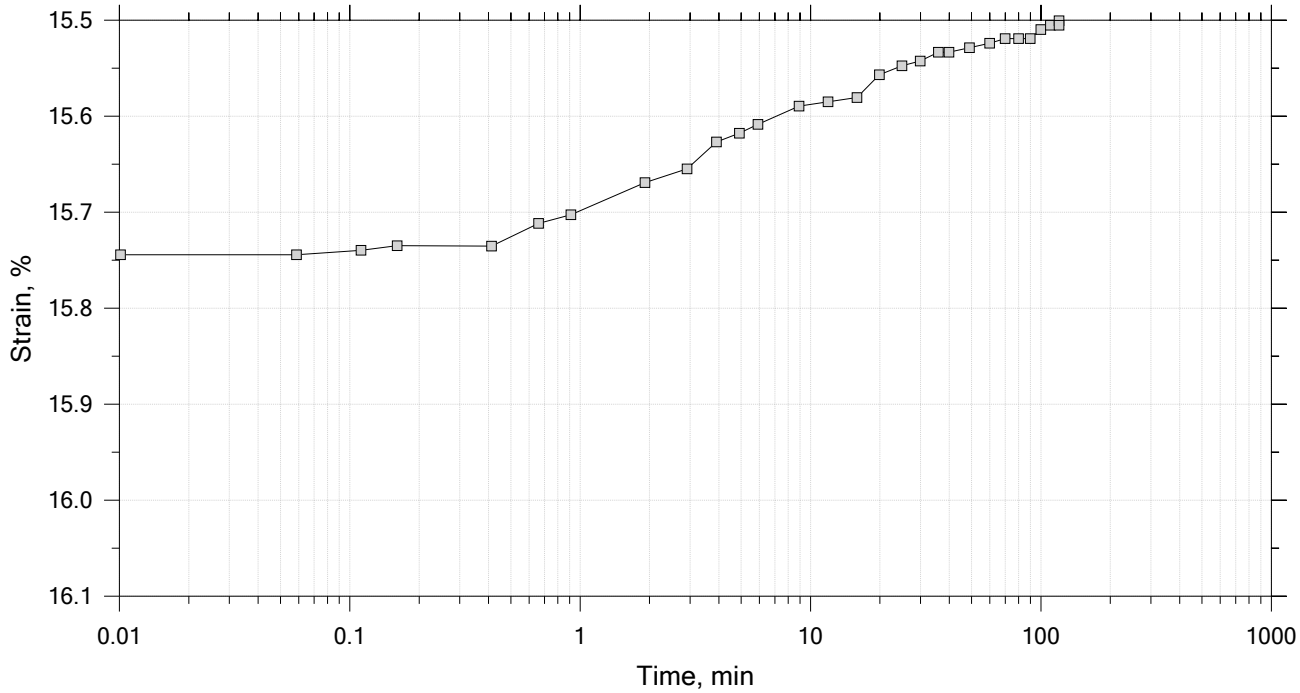
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

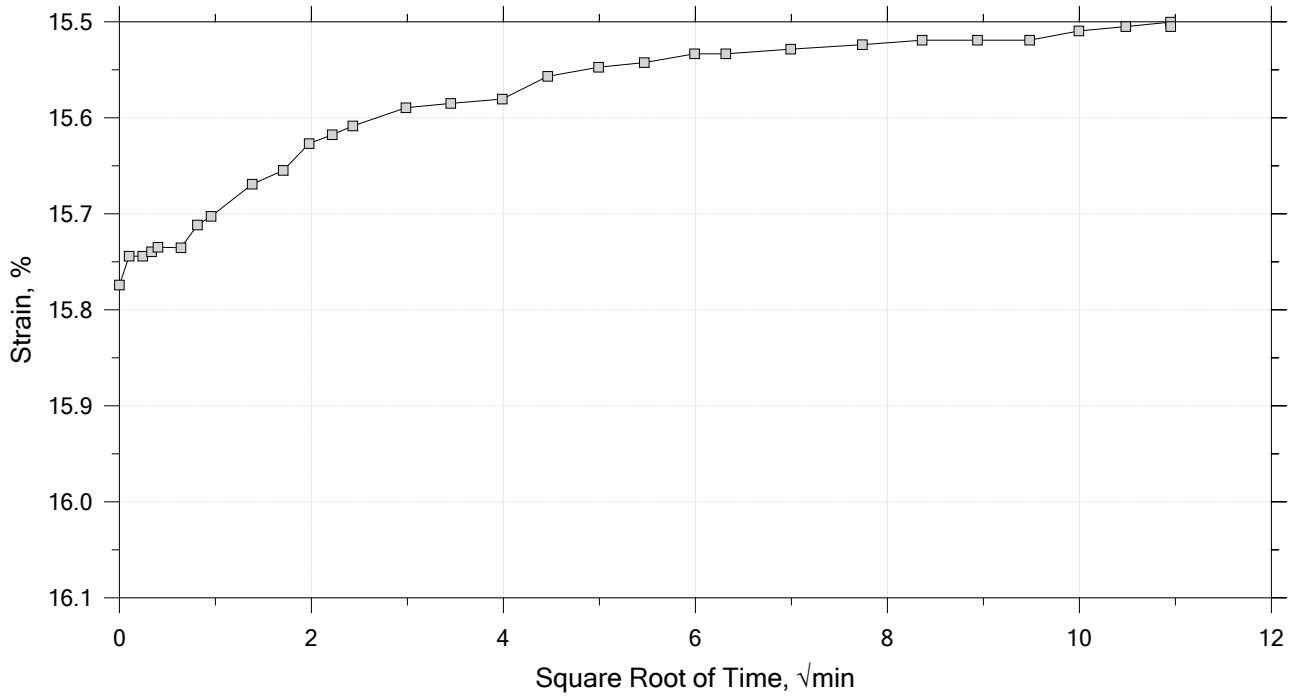
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf





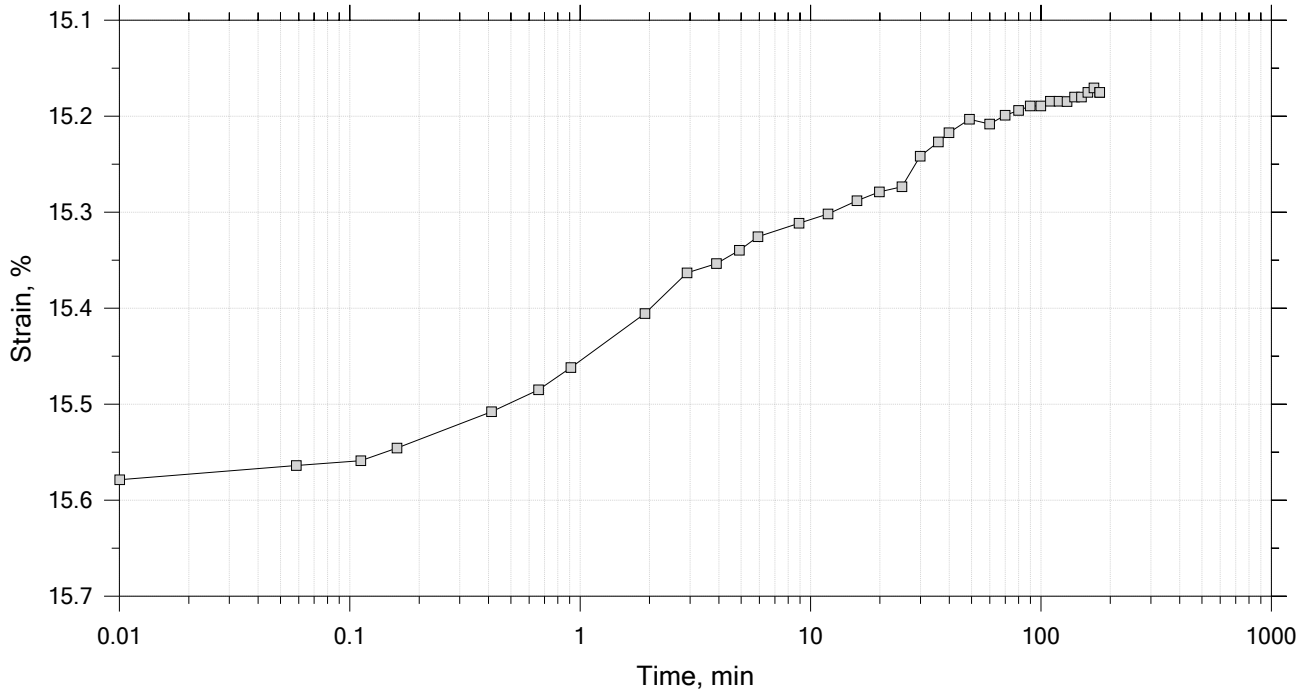
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

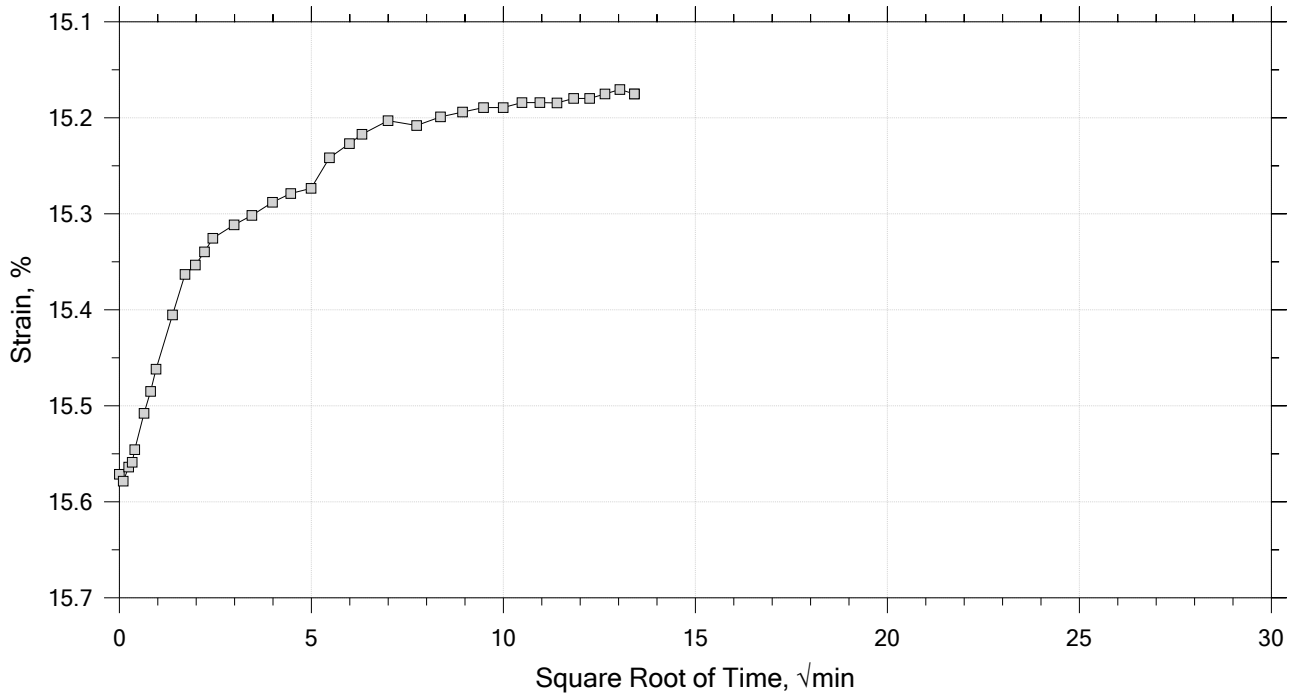
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf





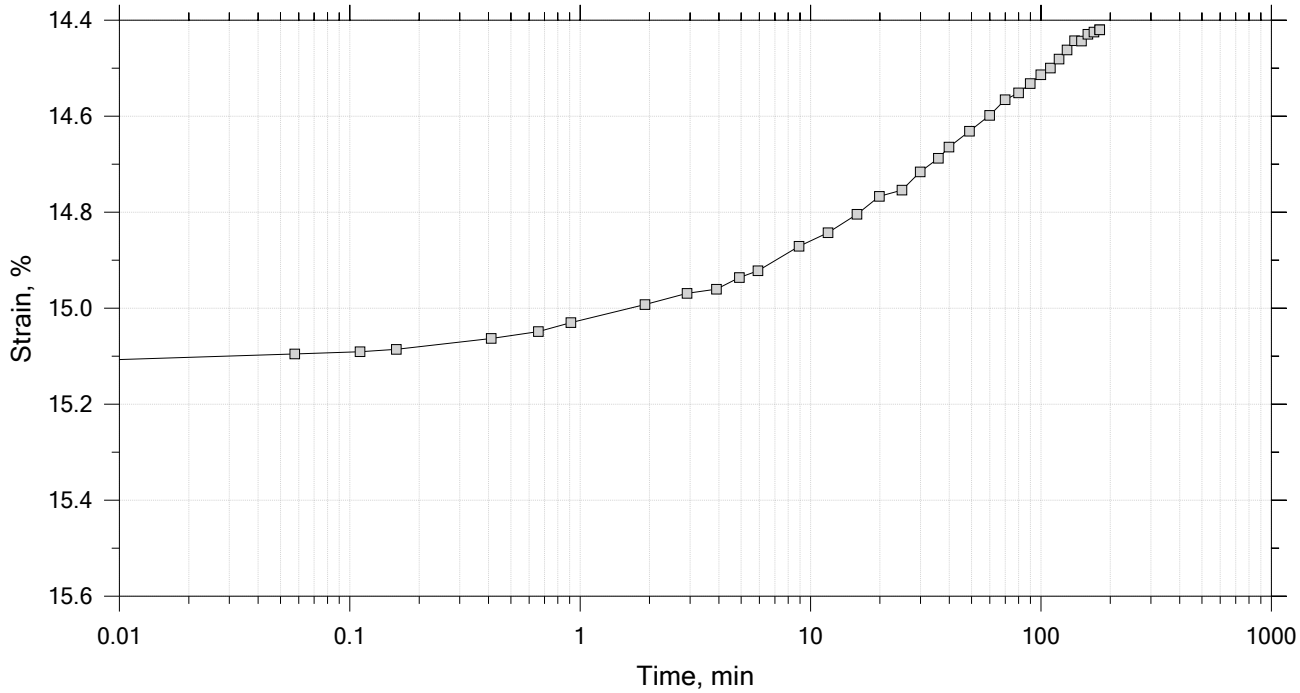
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

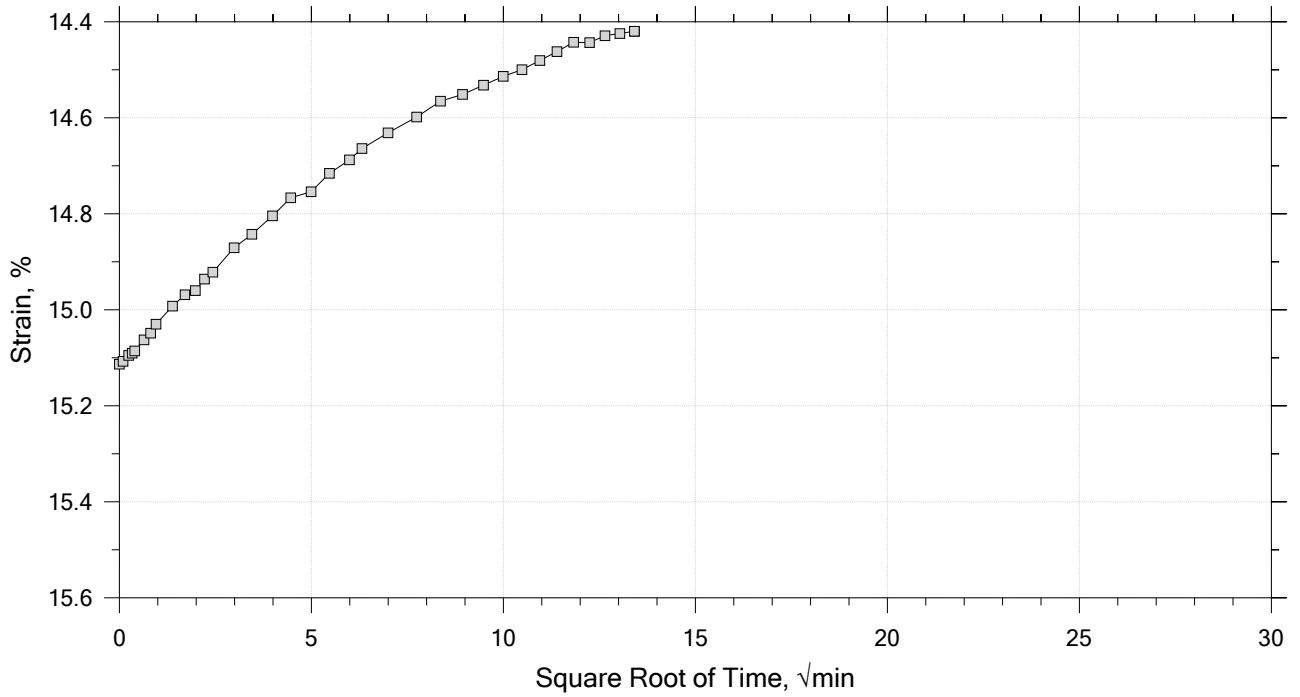
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf





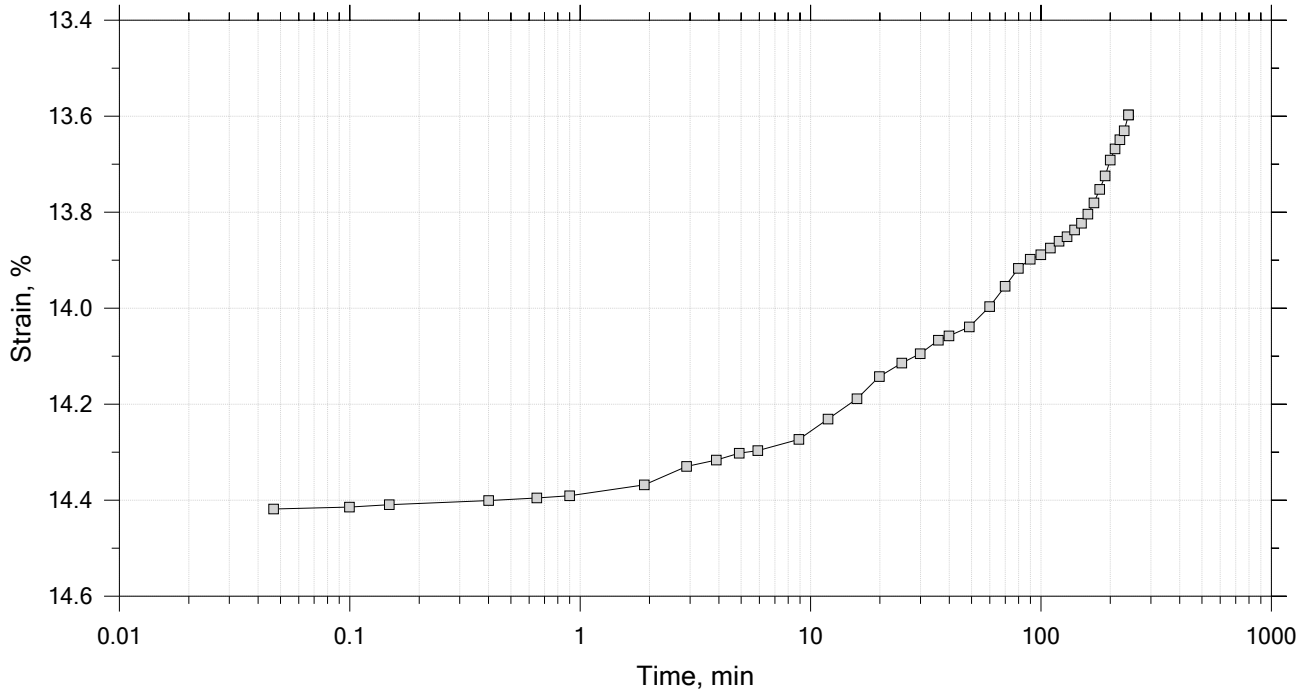
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

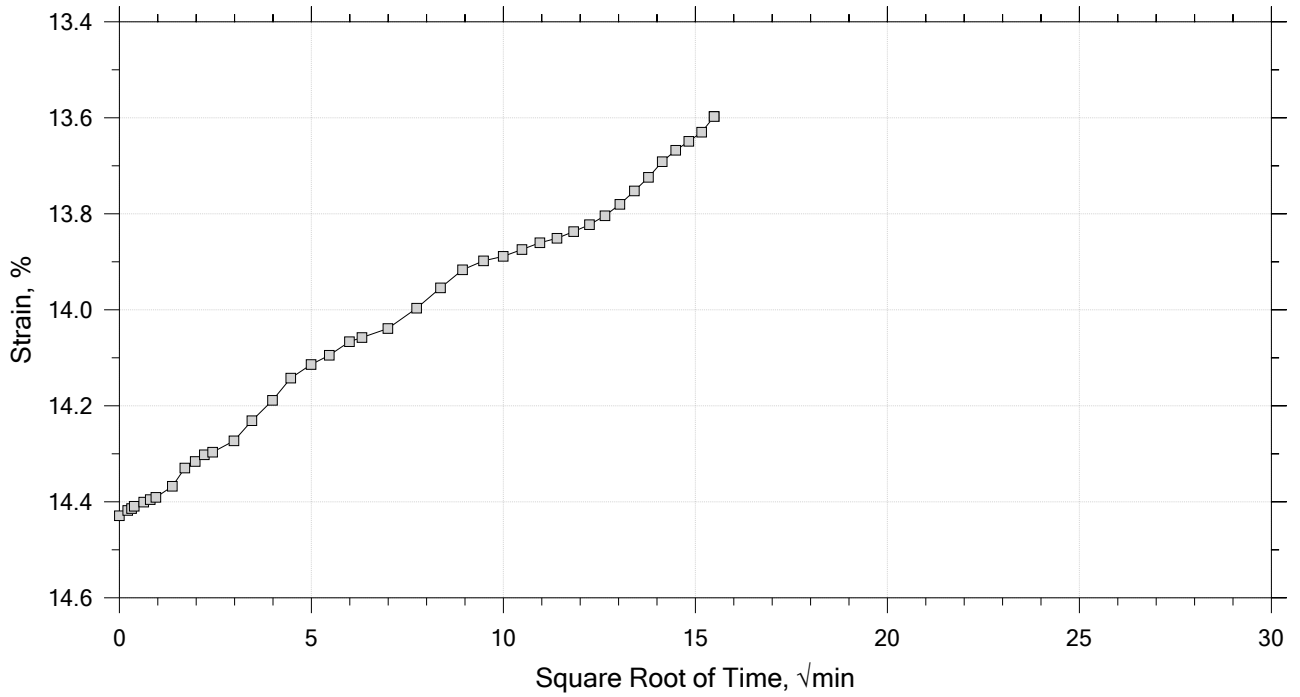
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf





Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.65	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 0.627	Plastic Limit: ---
Final Height: 0.90 in	Final Void Ratio: 0.464	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D-1465	RING		D-1501
Mass Container, gm	8.62	111.25	111.25	8.34
Mass Container + Wet Soil, gm	272.44	273	265.28	160.75
Mass Container + Dry Soil, gm	217.06	242.32	242.32	138.03
Mass Dry Soil, gm	208.44	131.07	131.07	129.69
Water Content, %	26.57	23.41	17.52	17.52
Void Ratio	---	0.63	0.46	---
Degree of Saturation, %	---	98.96	100.00	---
Dry Unit Weight, pcf	---	101.72	113.02	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test.
Therefore, values may not represent actual values for the specimen.

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0644	0.008683	0.613	0.868	14.352	3.94e-07	1.35e-01	1.43e-04	0.00e+00
2	0.125	0.02218	0.591	2.22	0.000	0.00e+00	2.23e-01	0.00e+00	0.00e+00
3	0.250	0.03515	0.570	3.51	0.000	0.00e+00	1.04e-01	0.00e+00	0.00e+00
4	0.500	0.04876	0.548	4.88	4.056	1.29e-06	5.45e-02	1.89e-04	0.00e+00
5	1.00	0.06477	0.522	6.48	3.867	1.31e-06	3.20e-02	1.13e-04	0.00e+00
6	2.00	0.08346	0.491	8.35	2.288	2.14e-06	1.87e-02	1.08e-04	0.00e+00
7	4.00	0.1030	0.460	10.3	1.937	2.42e-06	9.76e-03	6.37e-05	0.00e+00
8	8.00	0.1234	0.426	12.3	1.854	2.42e-06	5.11e-03	3.33e-05	0.00e+00
9	16.0	0.1447	0.392	14.5	0.831	5.14e-06	2.65e-03	3.68e-05	0.00e+00
10	32.0	0.1648	0.359	16.5	1.122	3.63e-06	1.26e-03	1.23e-05	0.00e+00
11	8.00	0.1605	0.366	16.0	0.000	0.00e+00	1.80e-04	0.00e+00	0.00e+00
12	2.00	0.1551	0.375	15.5	0.000	0.00e+00	9.00e-04	0.00e+00	0.00e+00
13	0.500	0.1518	0.380	15.2	0.000	0.00e+00	2.20e-03	0.00e+00	0.00e+00
14	0.125	0.1442	0.393	14.4	0.000	0.00e+00	2.01e-02	0.00e+00	0.00e+00
15	0.0625	0.1360	0.406	13.6	0.000	0.00e+00	1.32e-01	0.00e+00	0.00e+00

GeoTesti EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

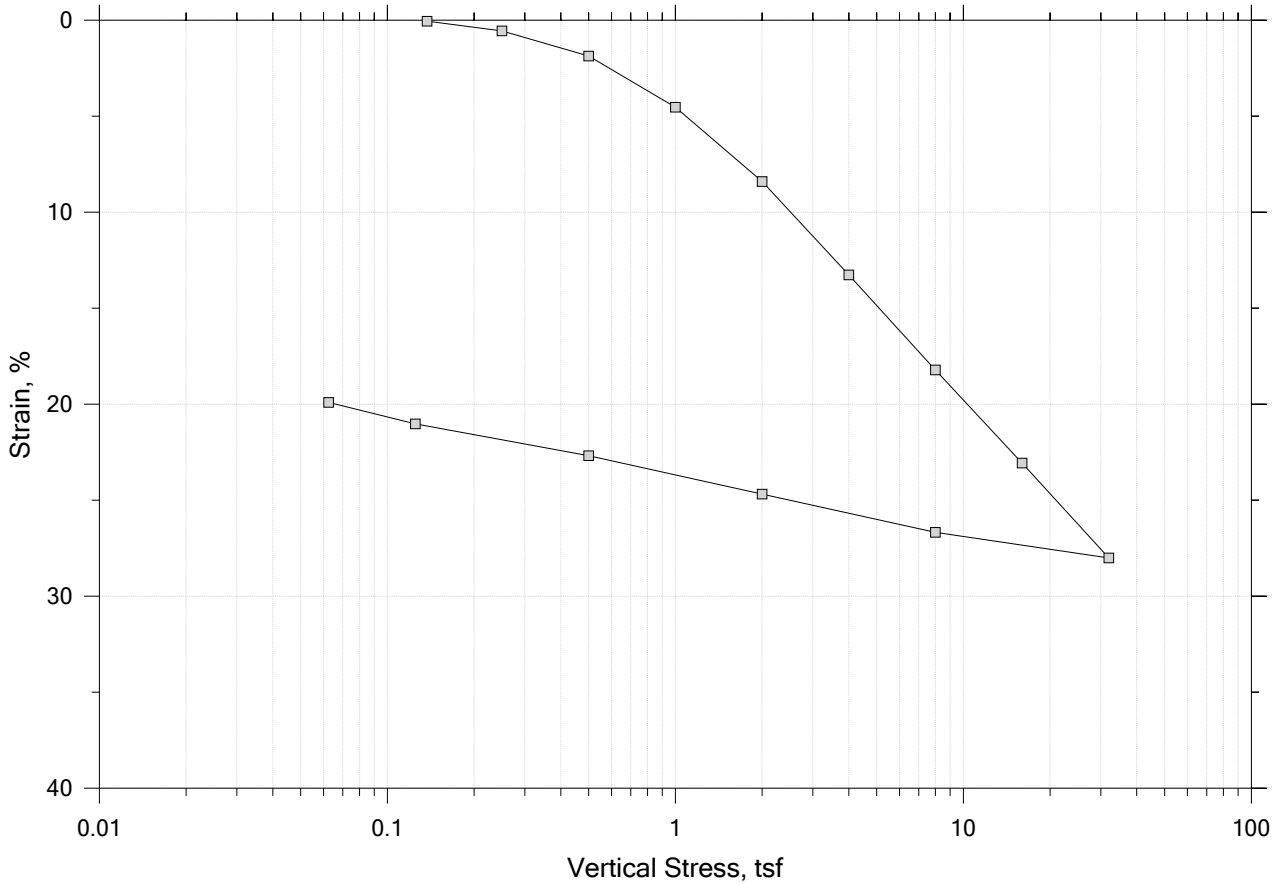
Square Root of Time Coefficients

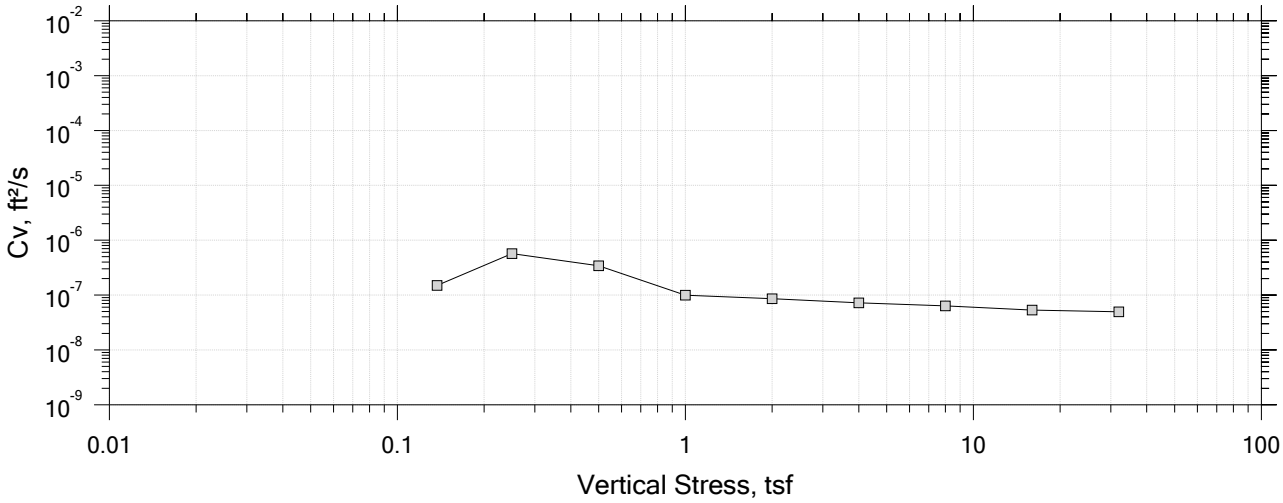
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0644	0.008683	0.613	0.868	101.978	2.39e-07	1.35e-01	8.67e-05
2	0.125	0.02218	0.591	2.22	20.692	1.15e-06	2.23e-01	6.91e-04
3	0.250	0.03515	0.570	3.51	35.822	6.46e-07	1.04e-01	1.81e-04
4	0.500	0.04876	0.548	4.88	16.684	1.35e-06	5.45e-02	1.98e-04
5	1.00	0.06477	0.522	6.48	13.926	1.57e-06	3.20e-02	1.35e-04
6	2.00	0.08346	0.491	8.35	11.941	1.76e-06	1.87e-02	8.88e-05
7	4.00	0.1030	0.460	10.3	8.888	2.27e-06	9.76e-03	5.98e-05
8	8.00	0.1234	0.426	12.3	7.297	2.64e-06	5.11e-03	3.64e-05
9	16.0	0.1447	0.392	14.5	3.960	4.65e-06	2.65e-03	3.33e-05
10	32.0	0.1648	0.359	16.5	4.062	4.32e-06	1.26e-03	1.46e-05
11	8.00	0.1605	0.366	16.0	168.249	1.02e-07	1.80e-04	4.96e-08
12	2.00	0.1551	0.375	15.5	40.157	4.33e-07	9.00e-04	1.05e-06
13	0.500	0.1518	0.380	15.2	45.769	3.84e-07	2.20e-03	2.28e-06
14	0.125	0.1442	0.393	14.4	58.791	3.03e-07	2.01e-02	1.65e-05
15	0.0625	0.1360	0.406	13.6	0.000	0.00e+00	1.32e-01	0.00e+00

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





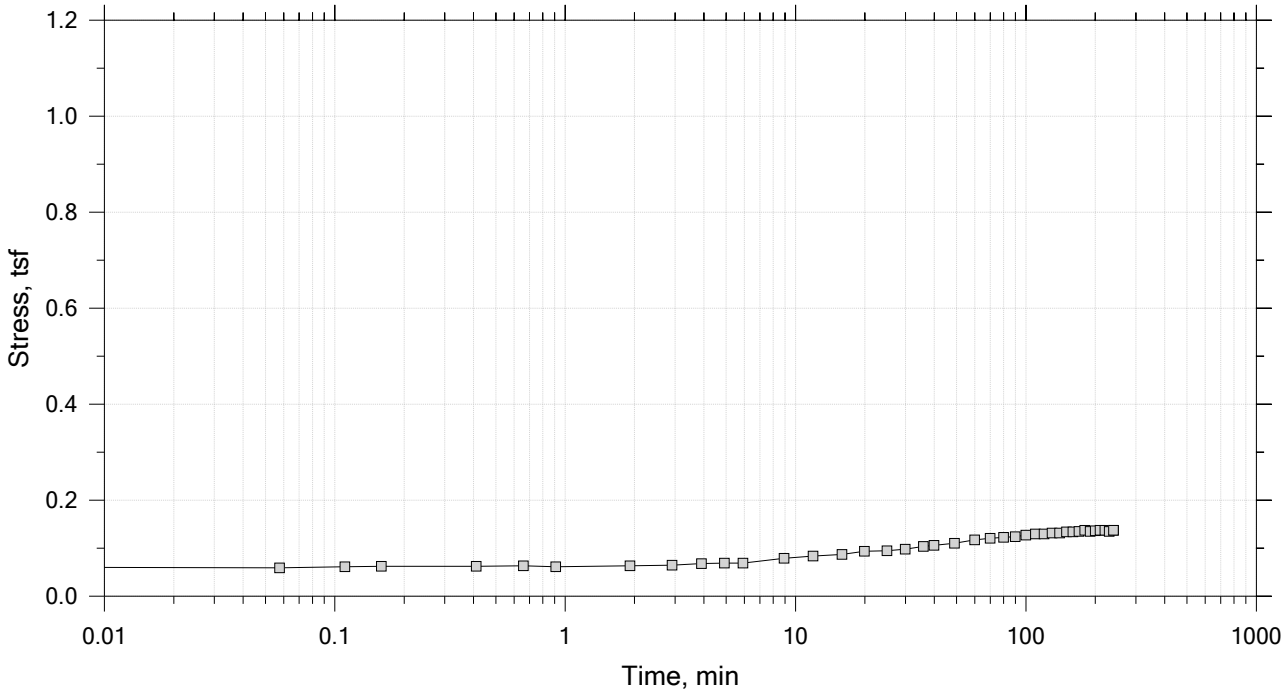
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		
Displacement at End of Increment		

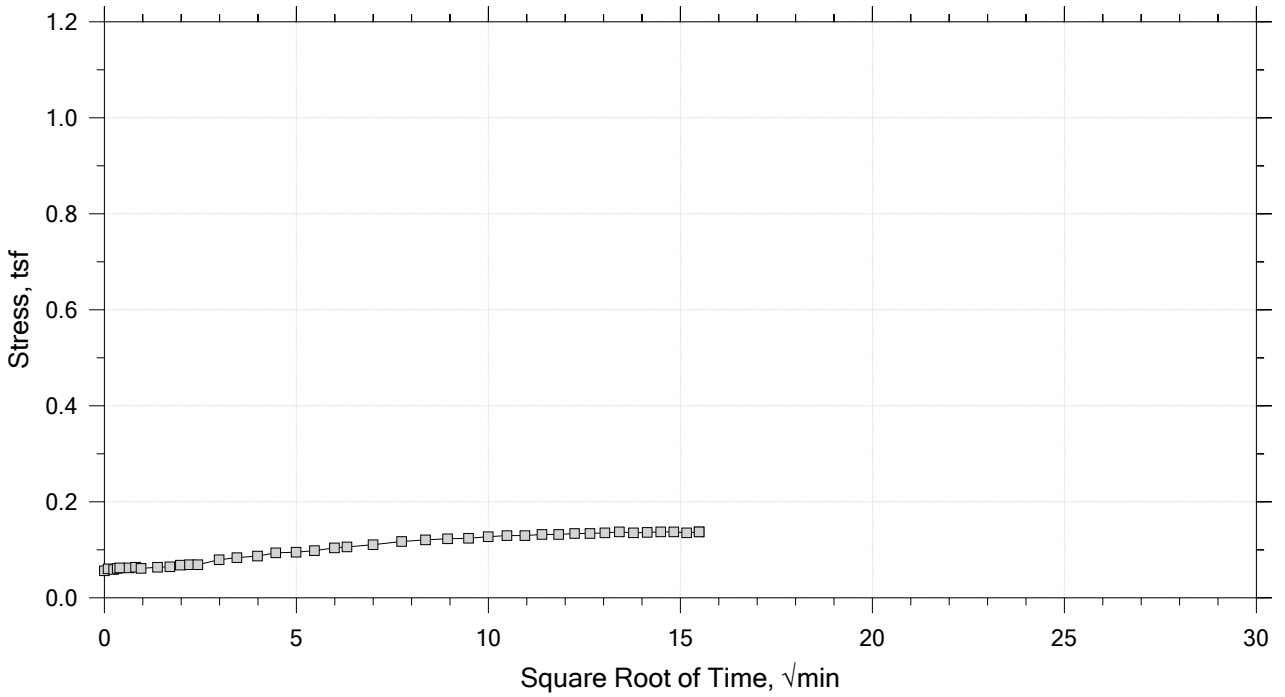
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 14

Constant Volume Step

Stress: 0.137 tsf





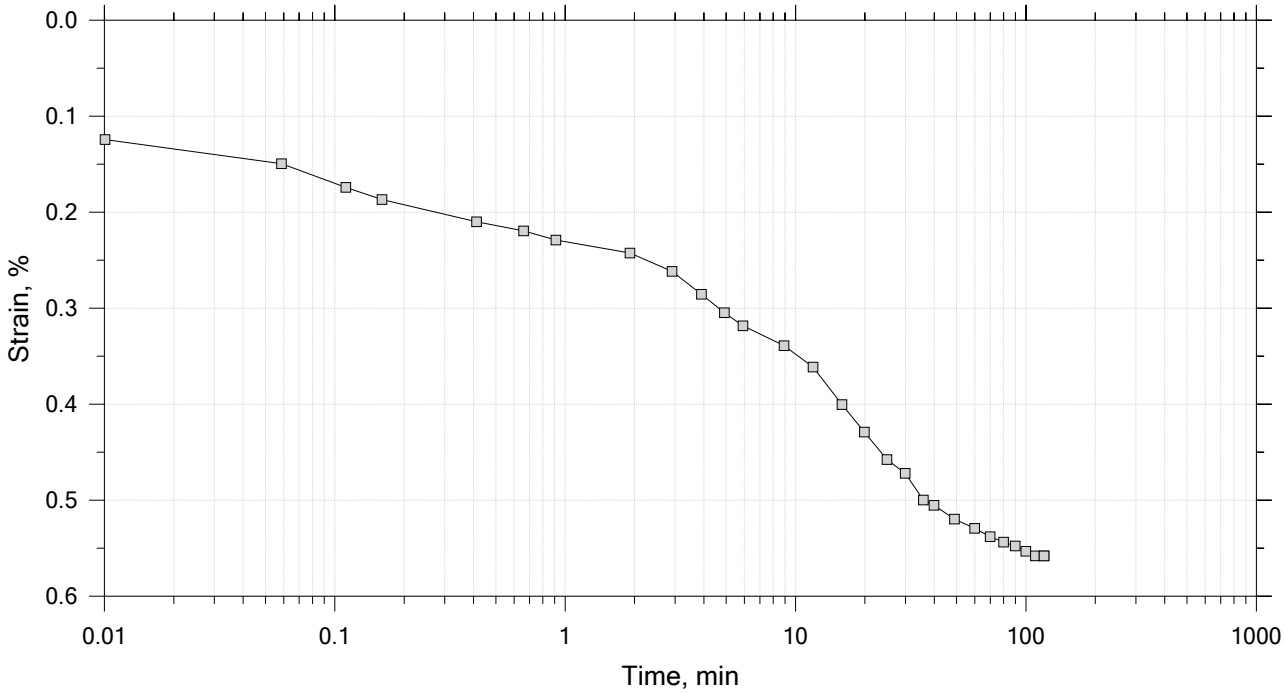
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

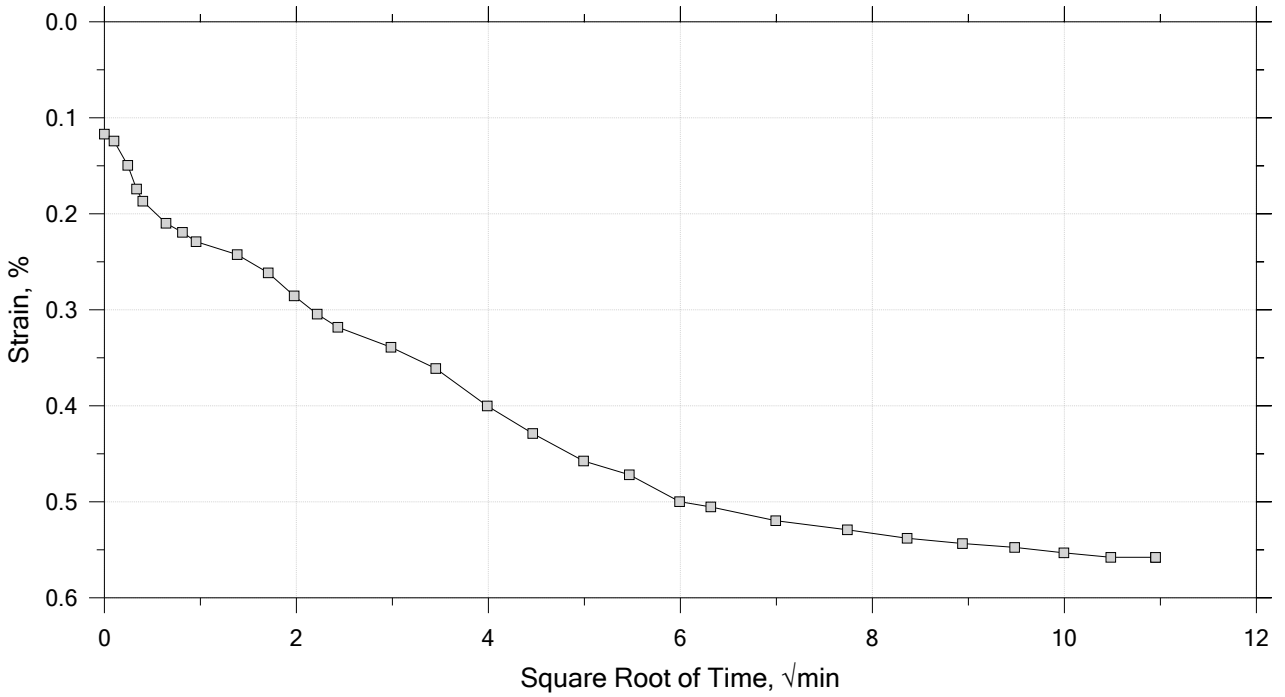
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 14

Constant Load Step

Stress: 0.25 tsf





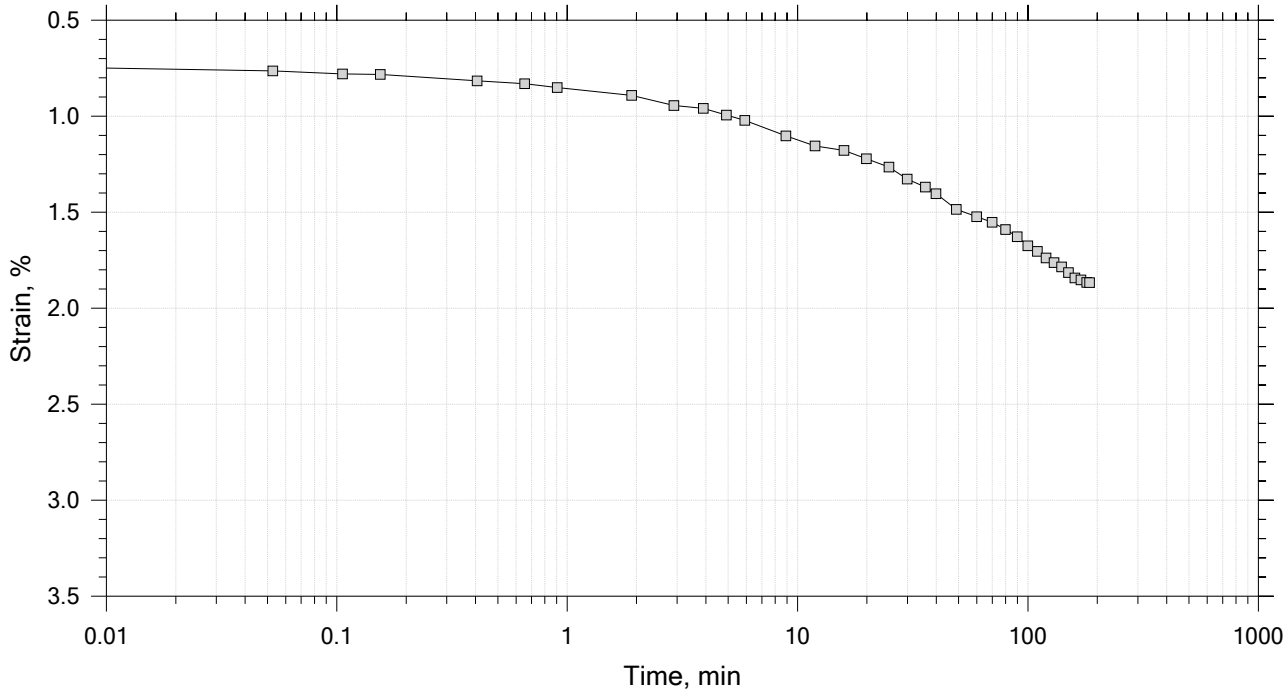
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

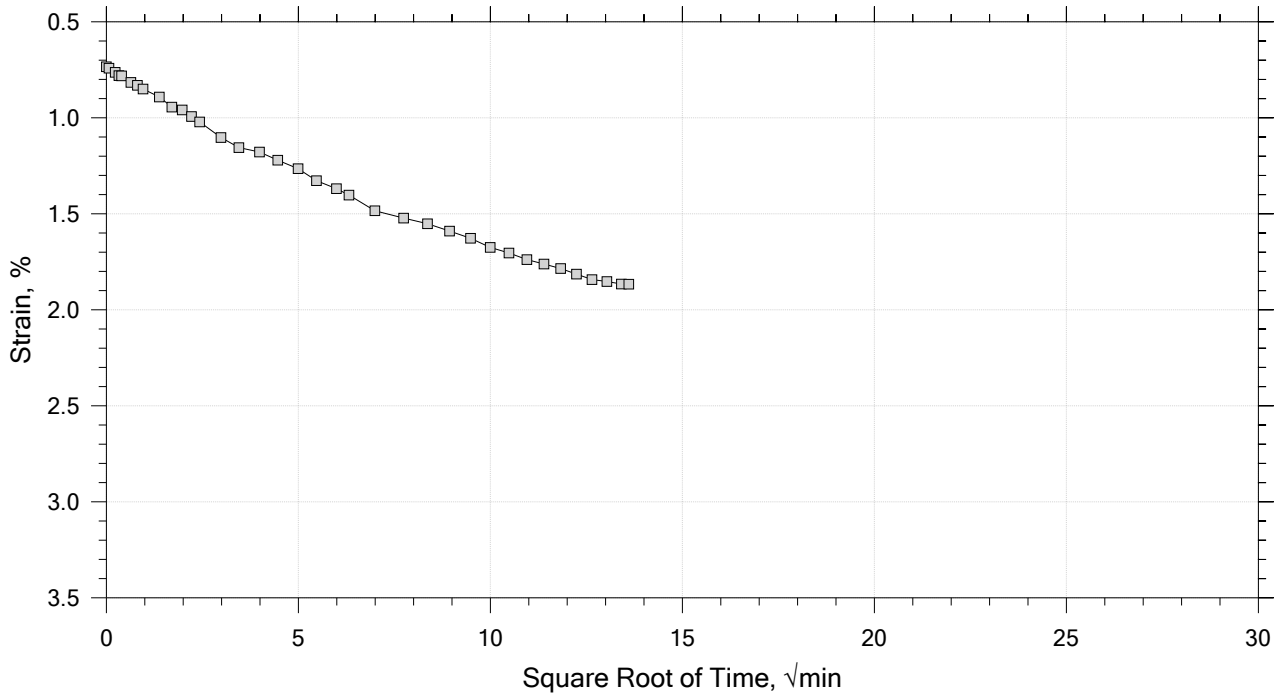
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 14

Constant Load Step

Stress: 0.5 tsf





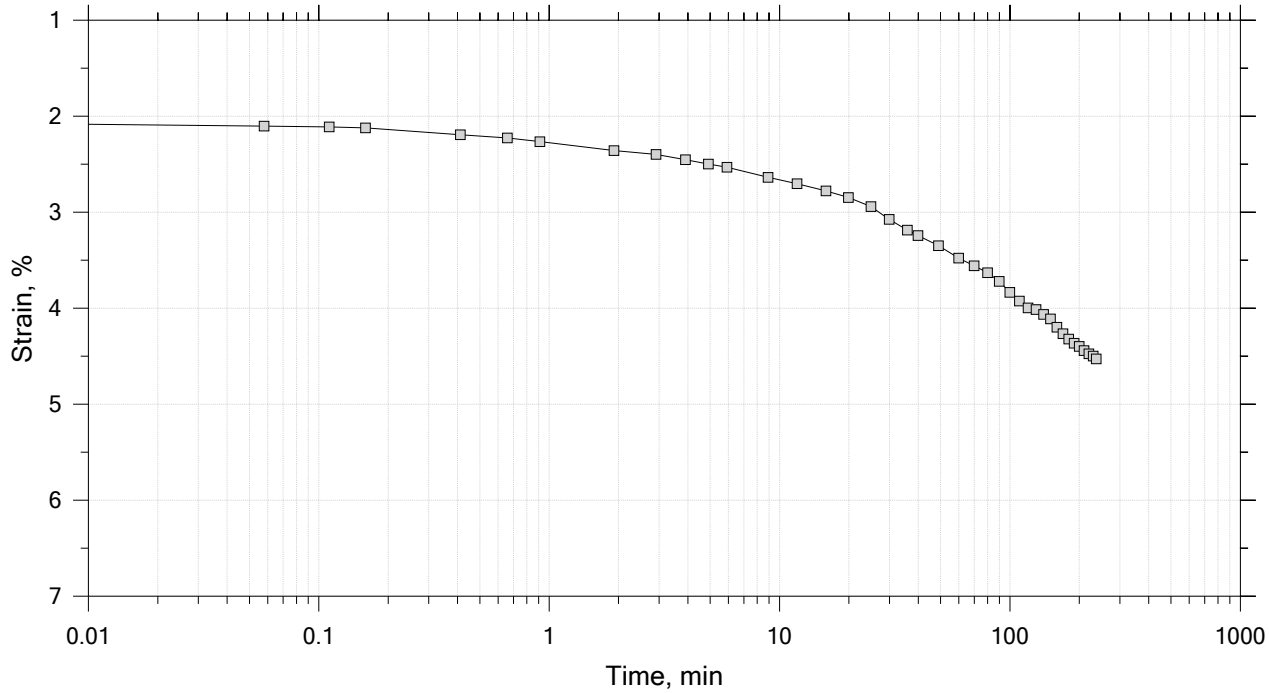
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

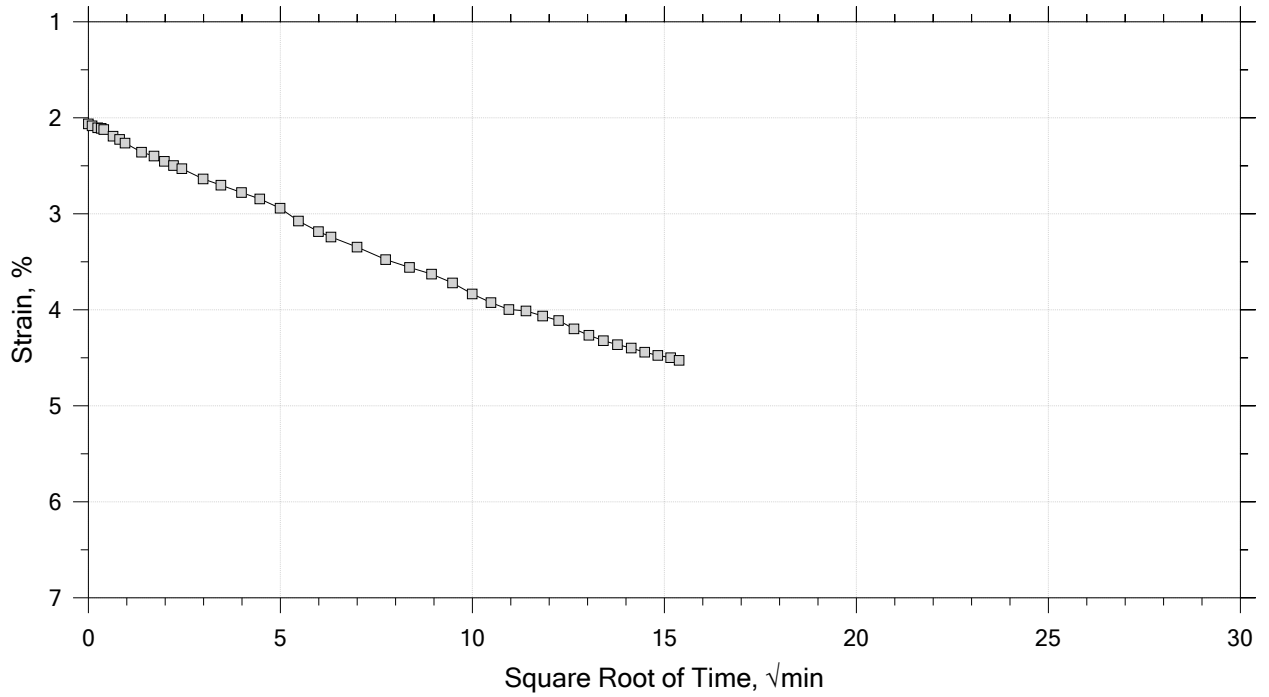
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 14

Constant Load Step

Stress: 1 tsf





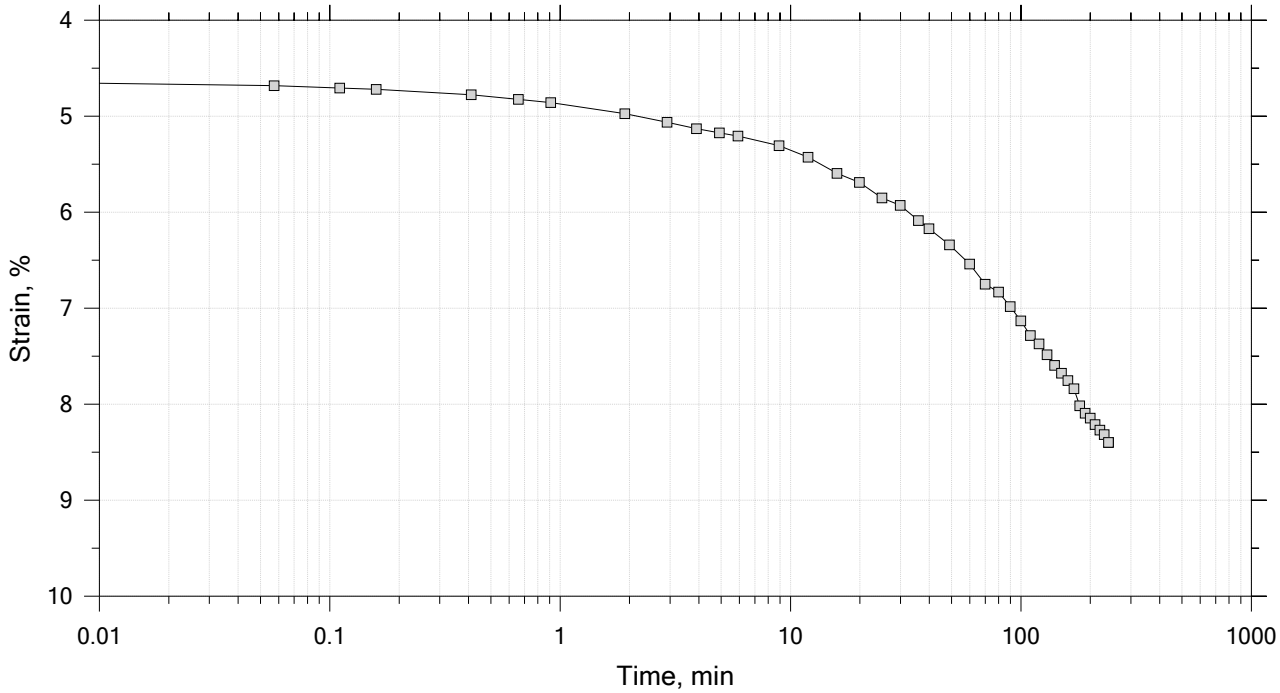
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

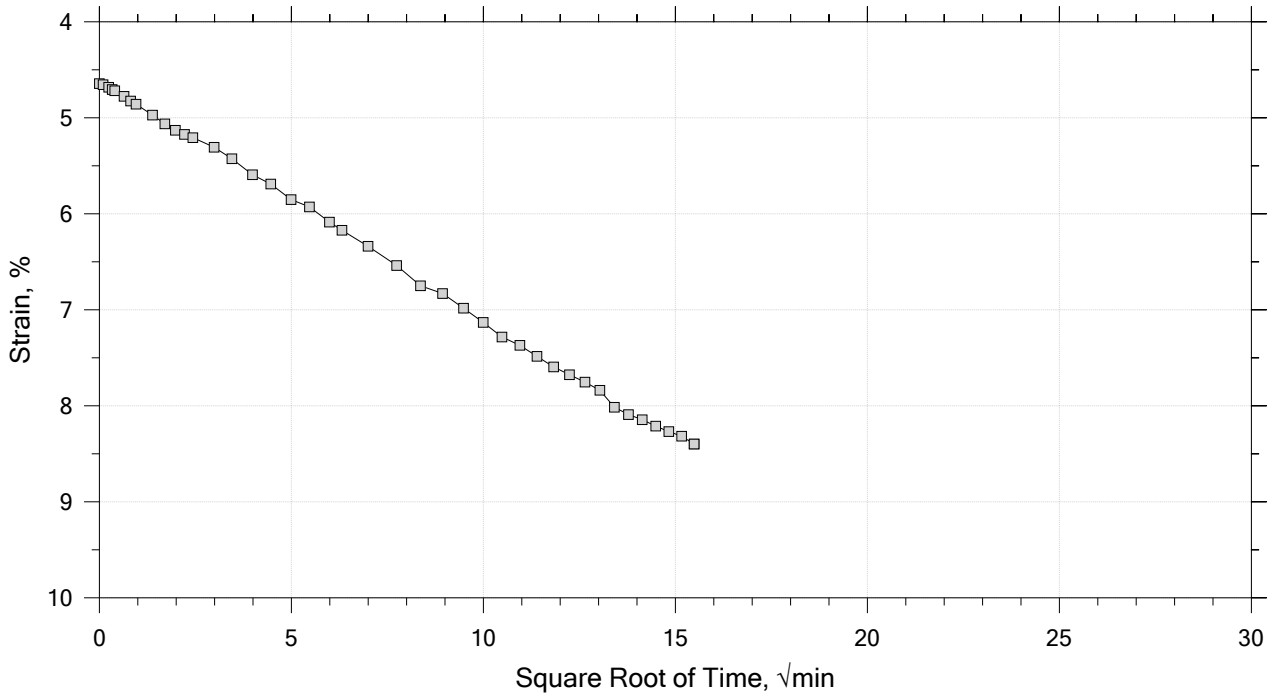
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 14

Constant Load Step

Stress: 2 tsf





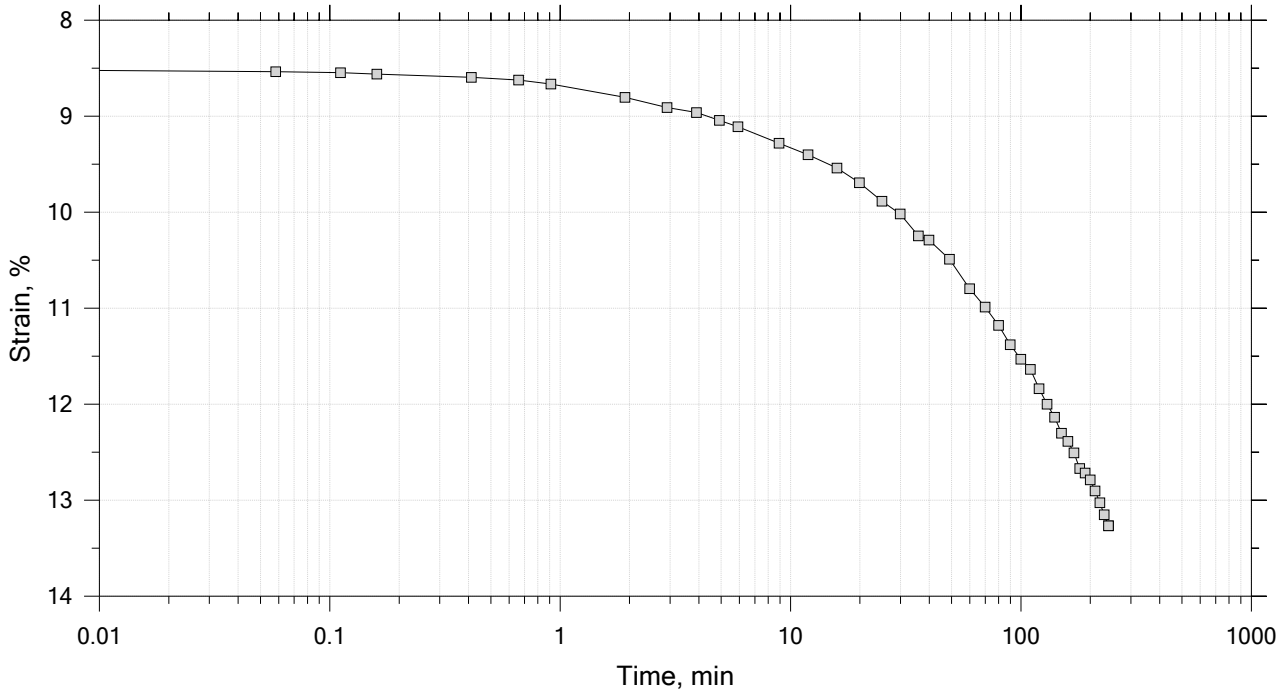
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

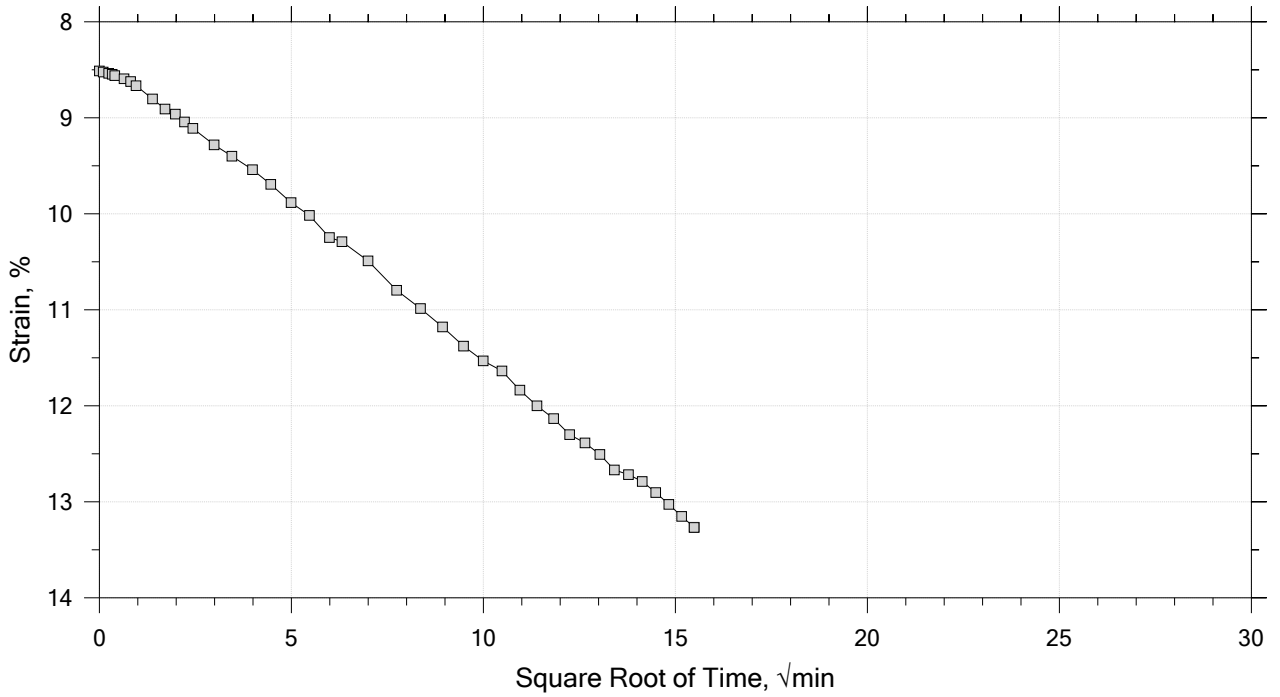
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 14

Constant Load Step

Stress: 4 tsf





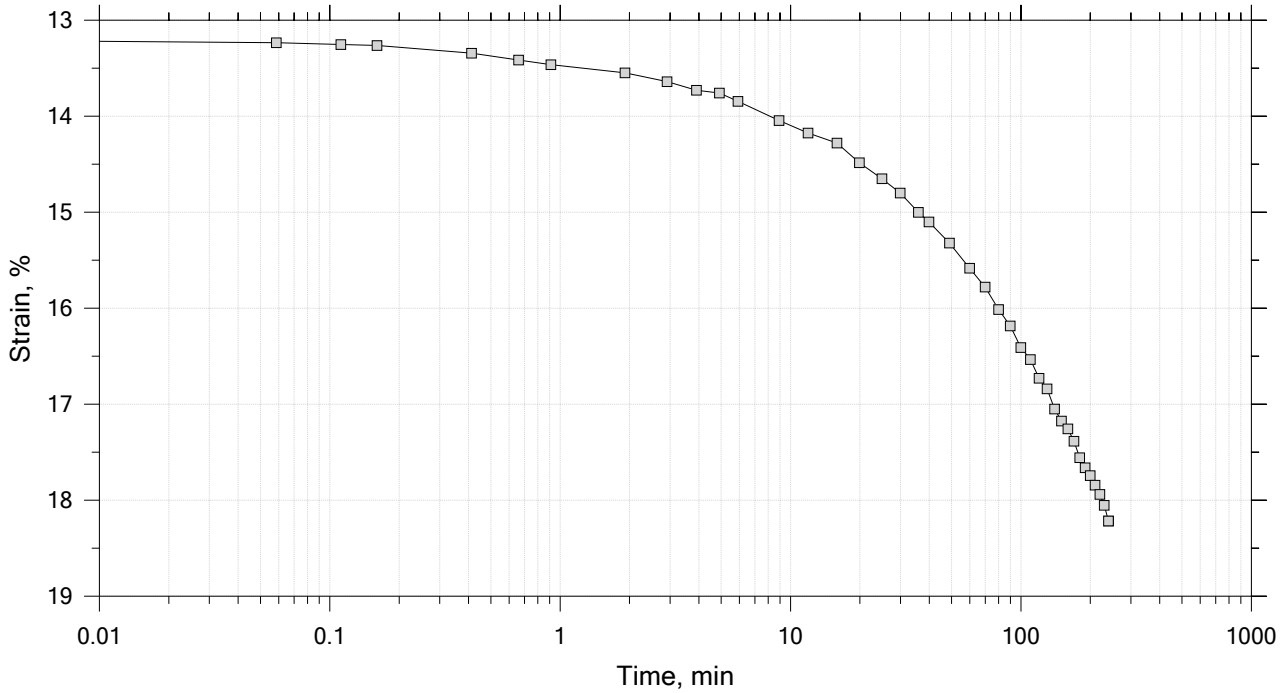
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

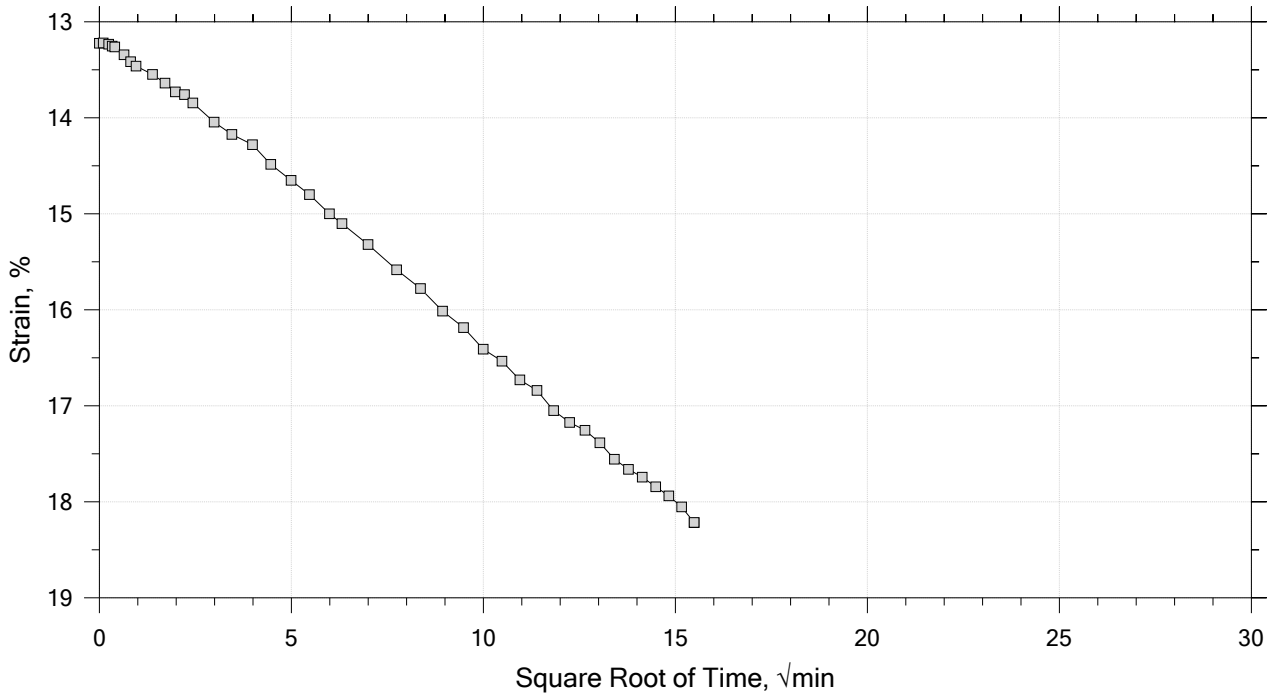
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 14

Constant Load Step

Stress: 8 tsf





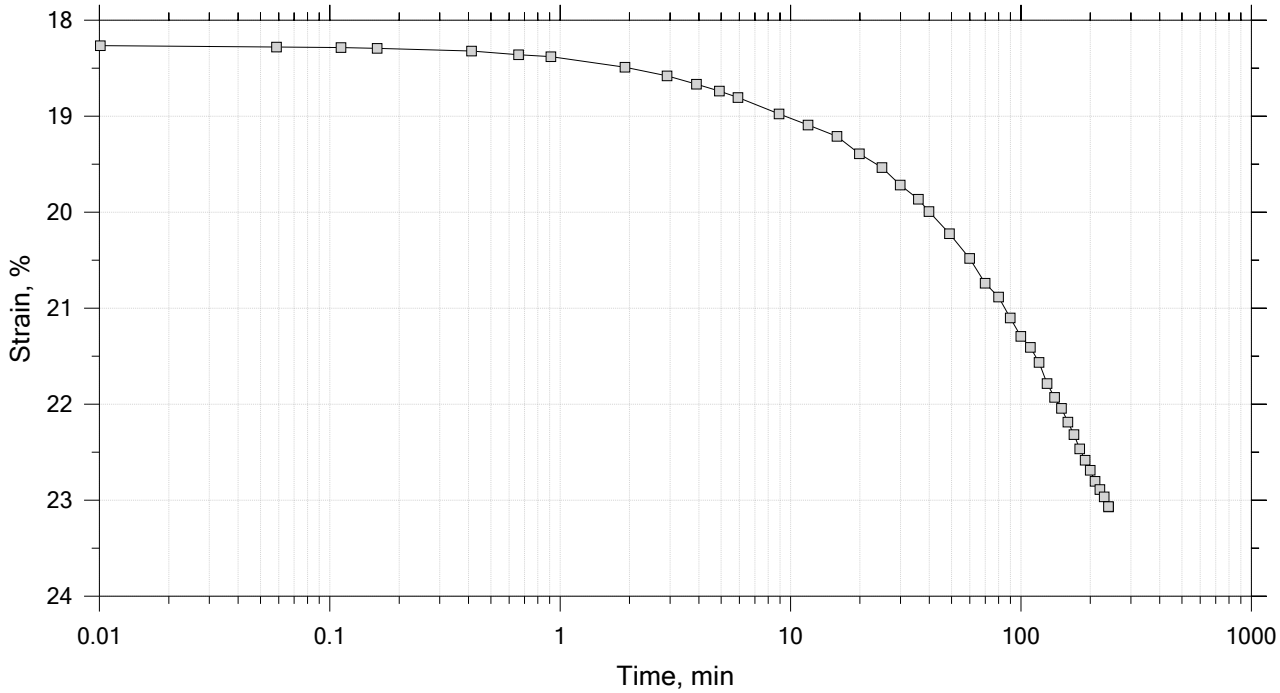
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

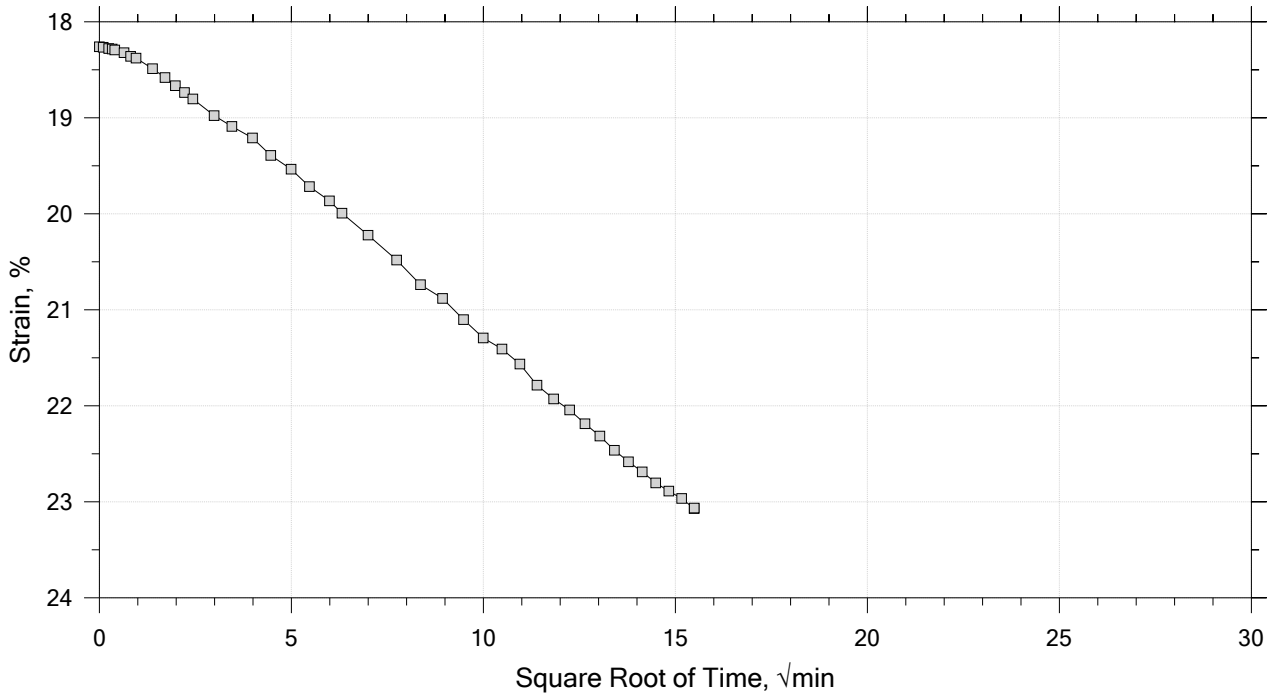
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 14

Constant Load Step

Stress: 16 tsf





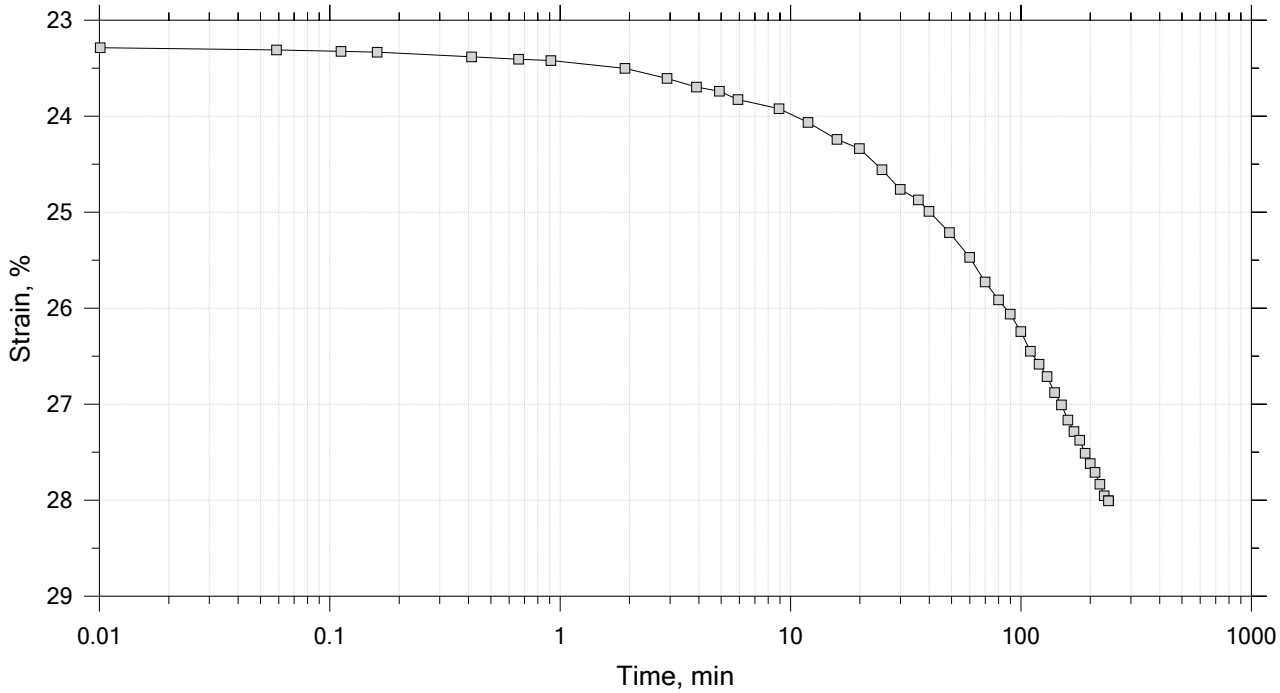
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

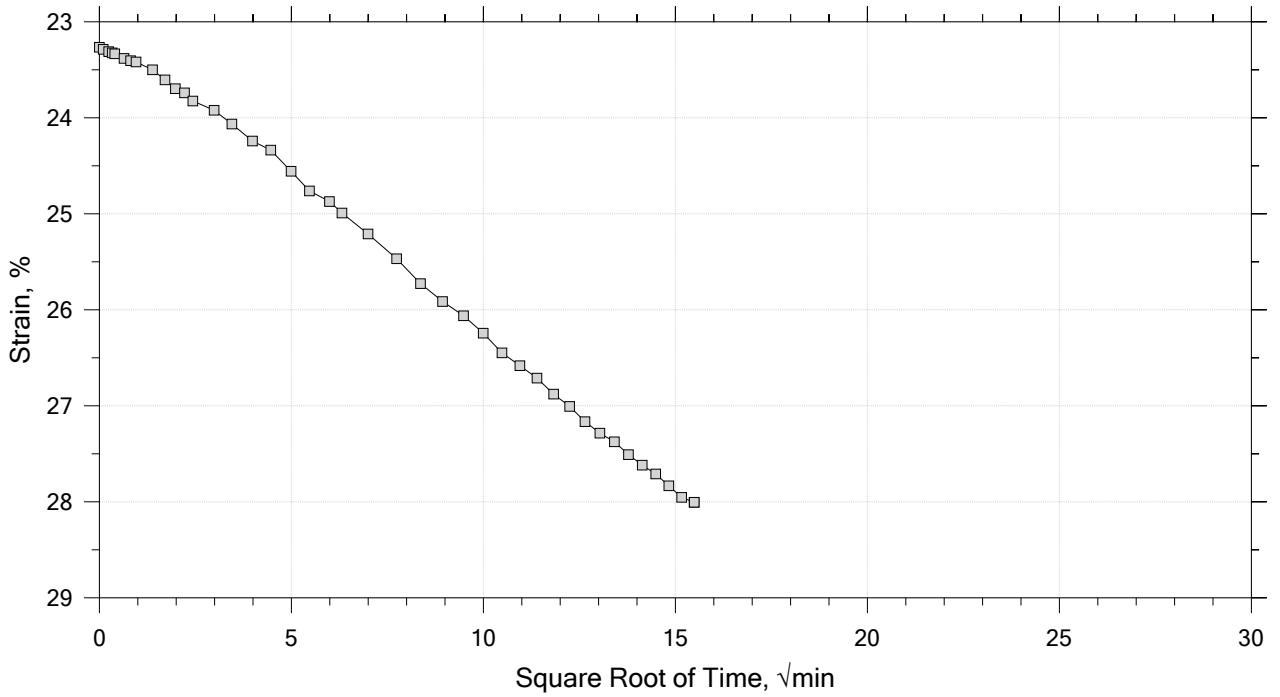
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 14

Constant Load Step

Stress: 32 tsf





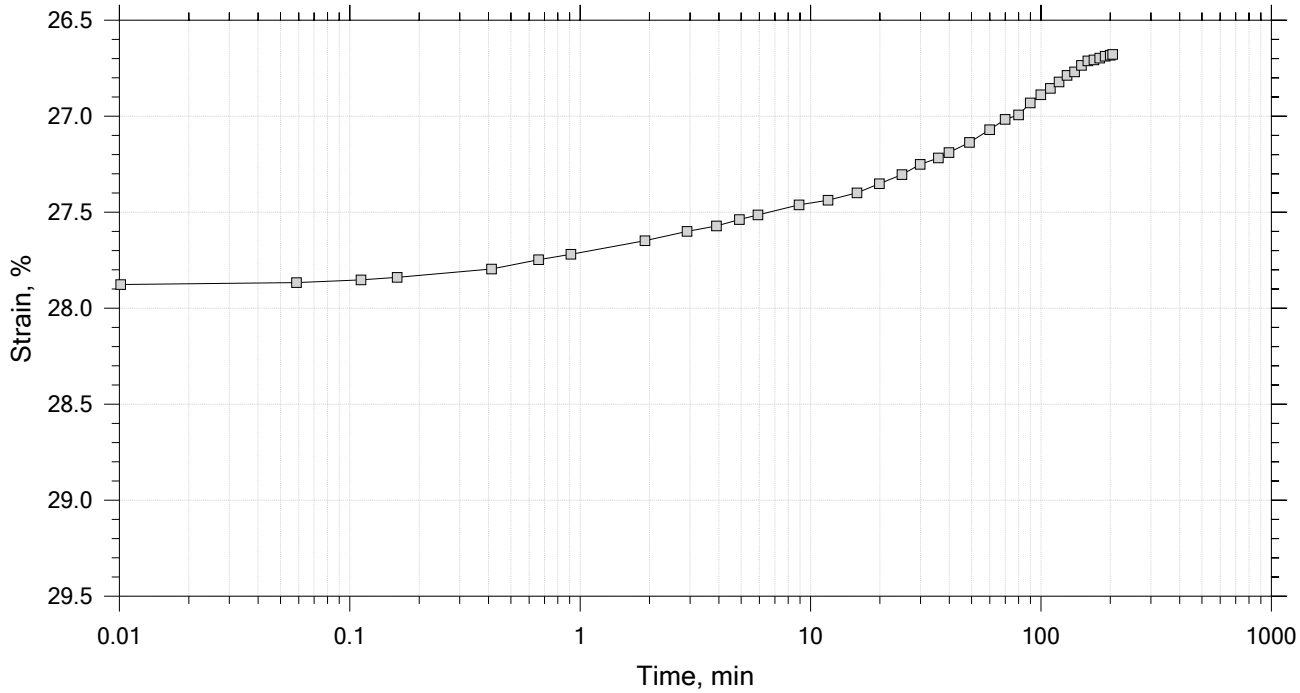
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

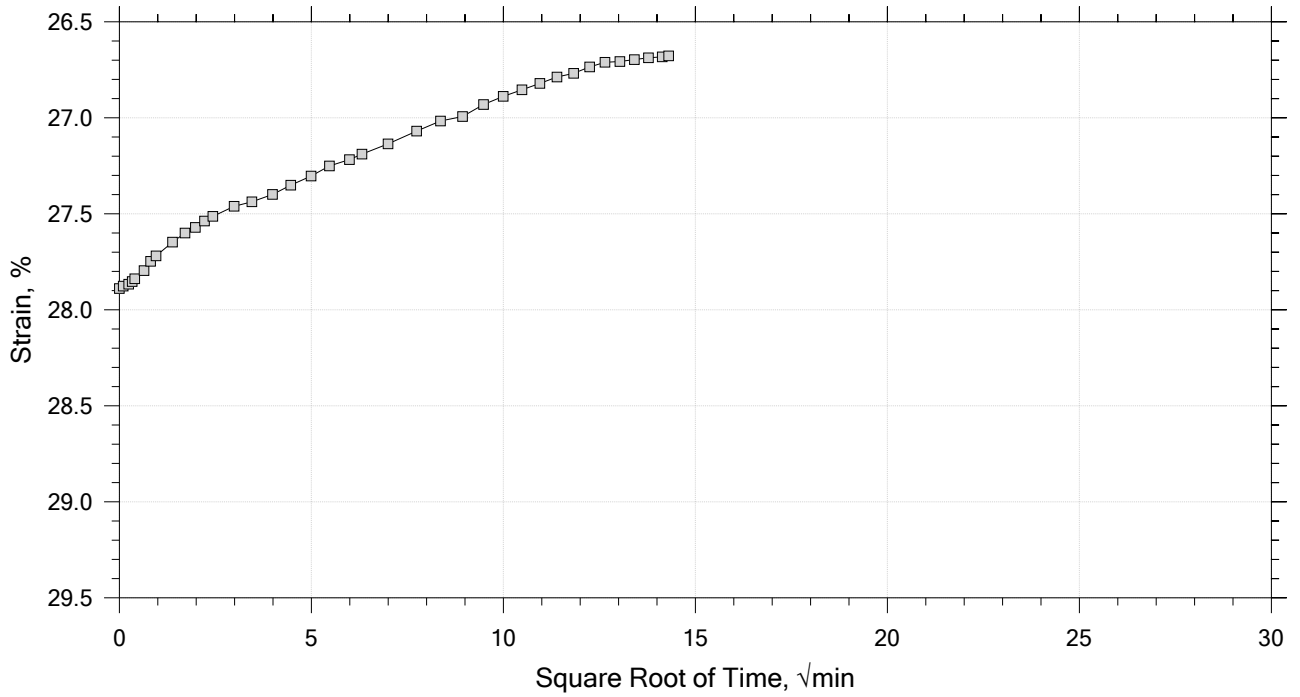
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 14

Constant Load Step

Stress: 8 tsf





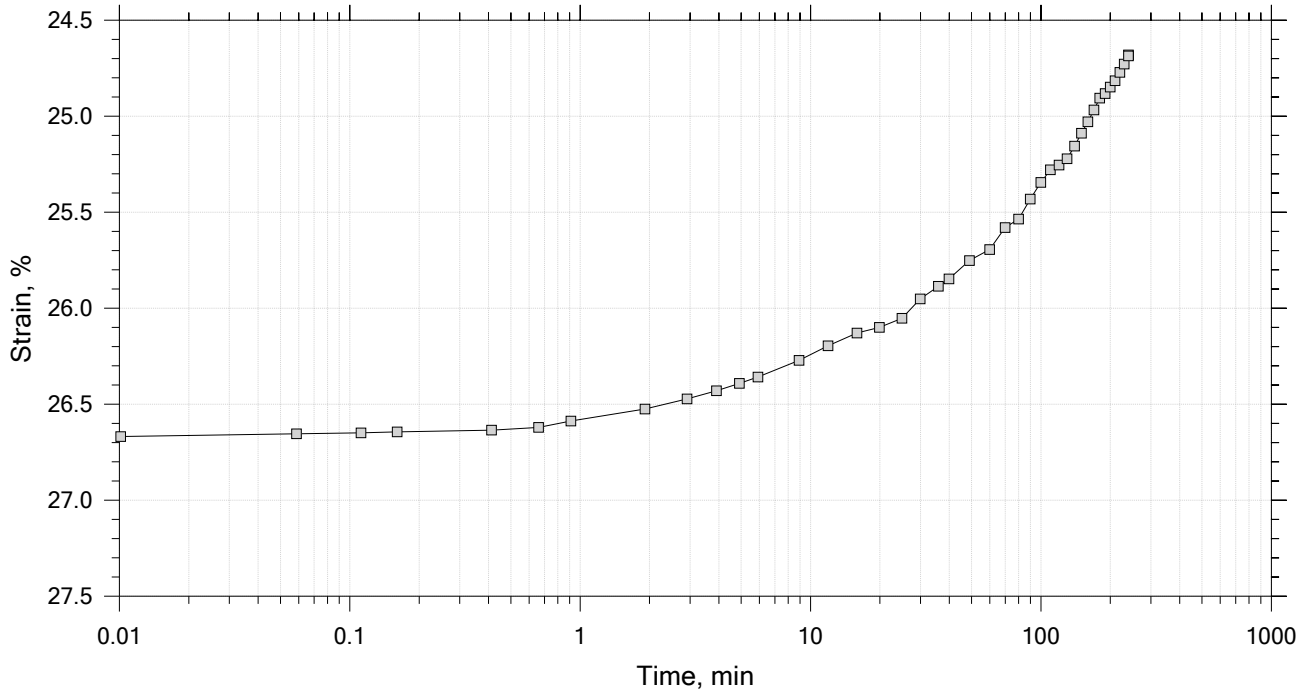
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

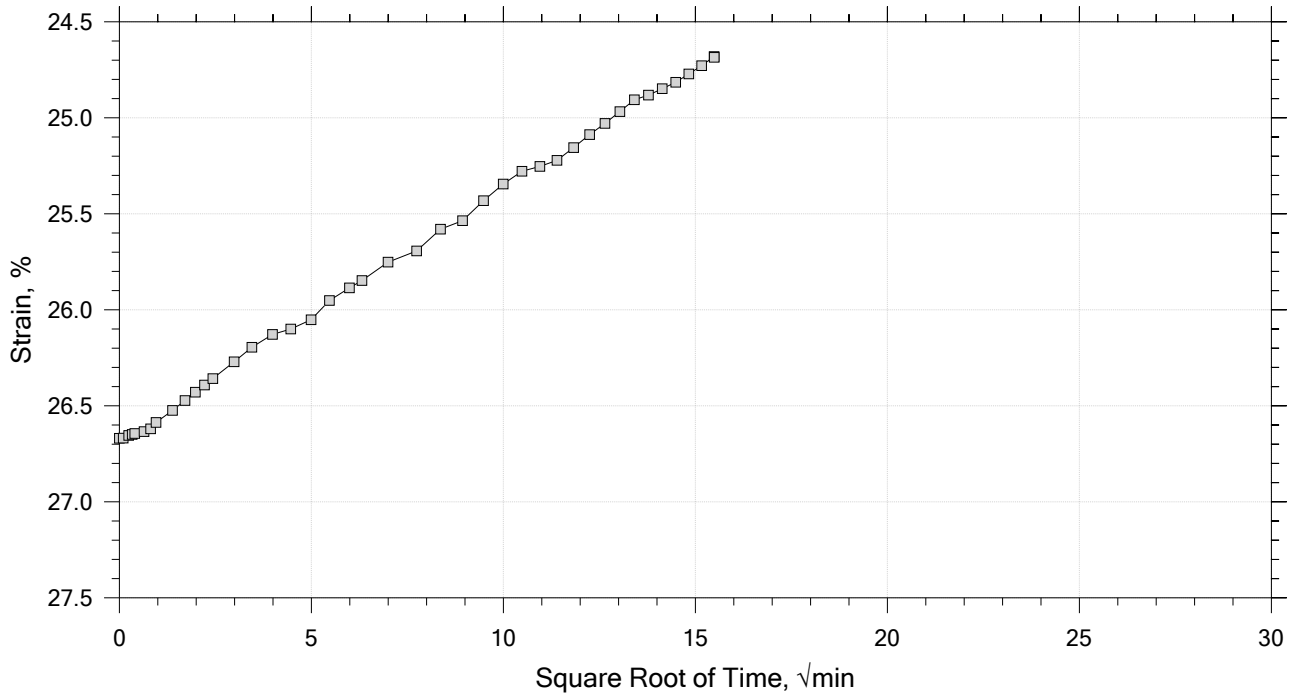
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 14

Constant Load Step

Stress: 2 tsf





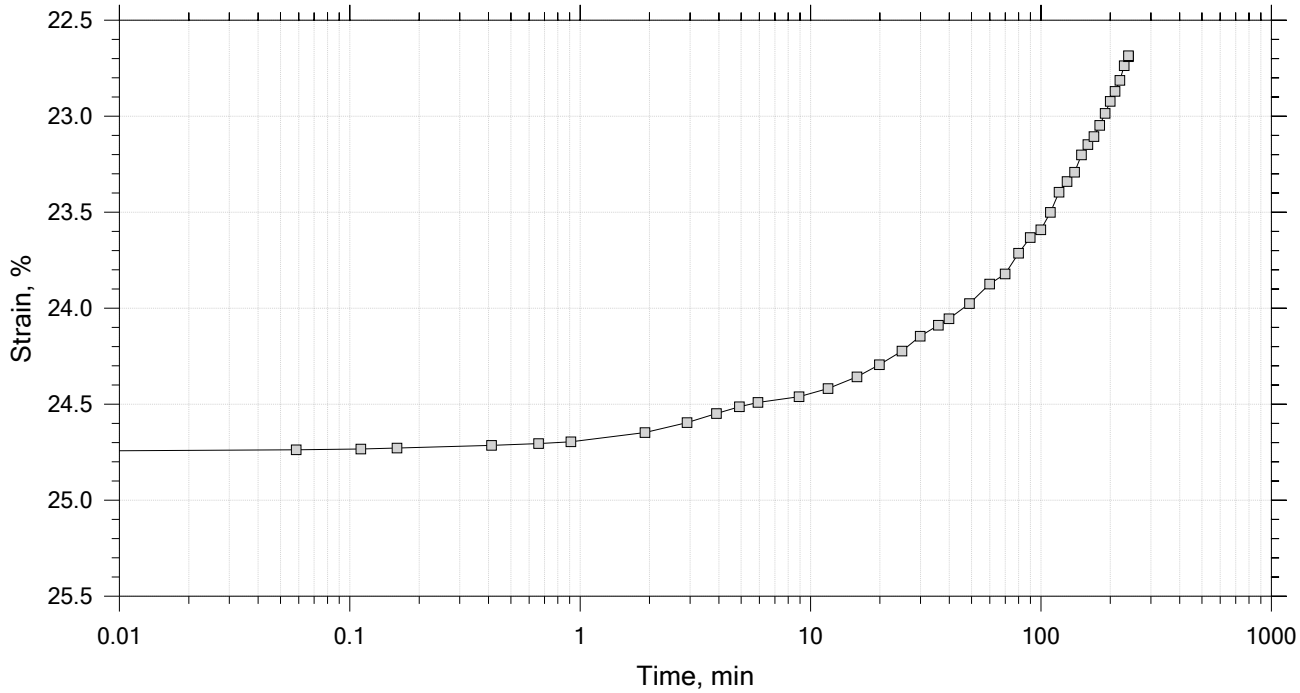
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

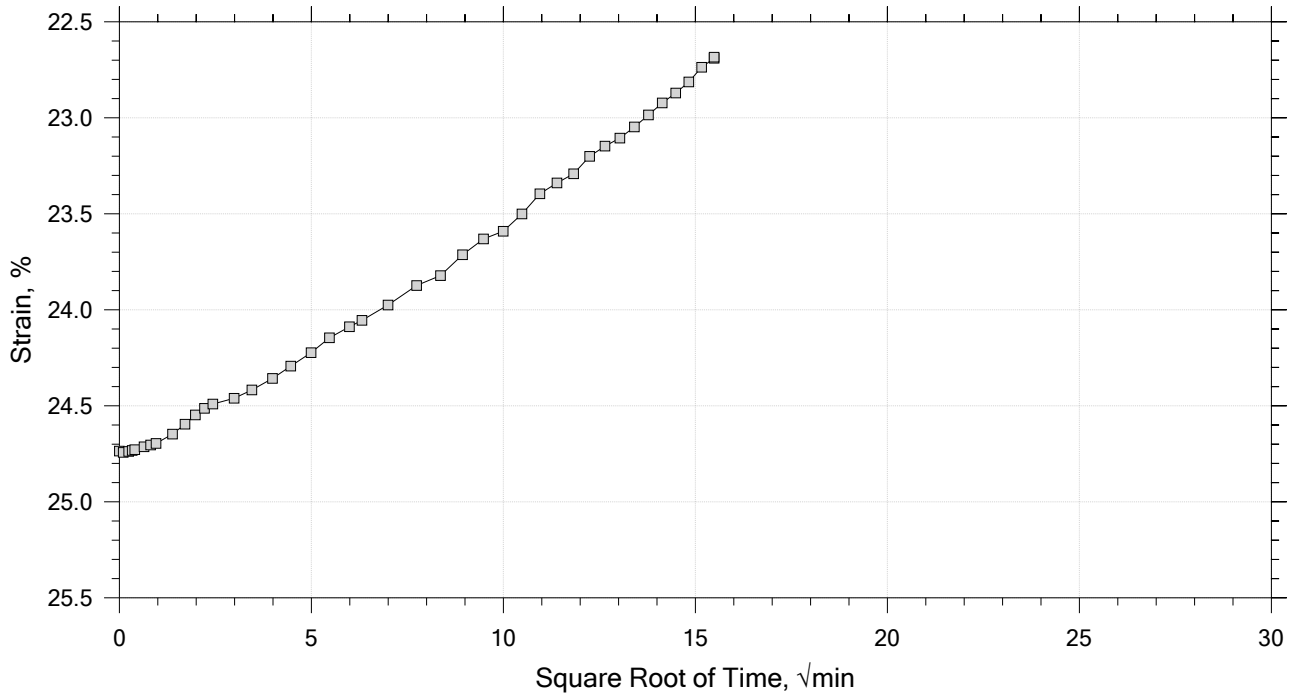
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 14

Constant Load Step

Stress: 0.5 tsf





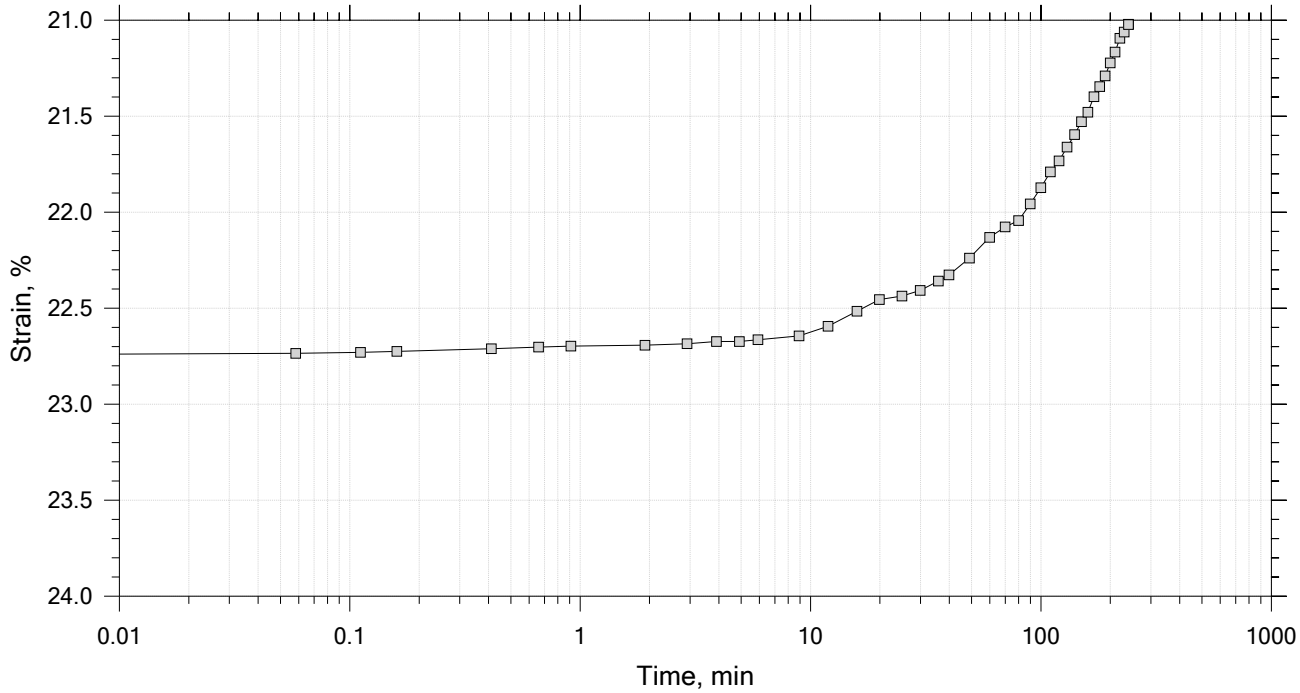
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

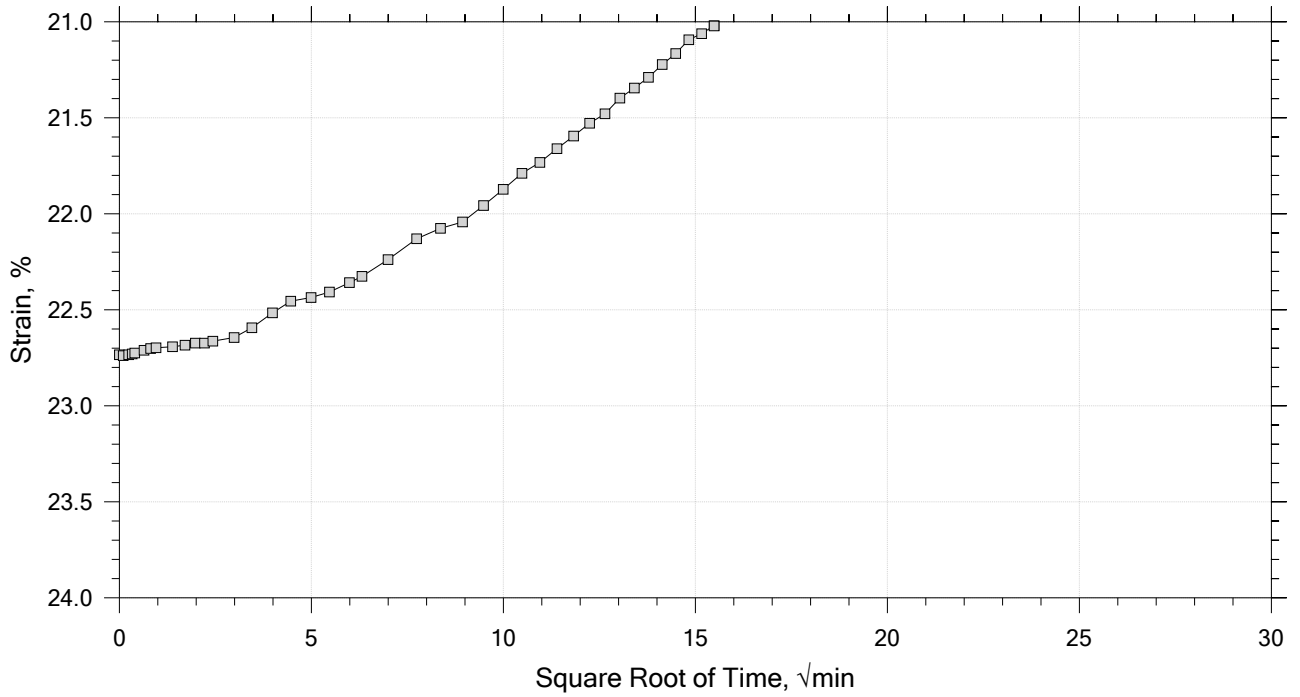
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 14

Constant Load Step

Stress: 0.125 tsf





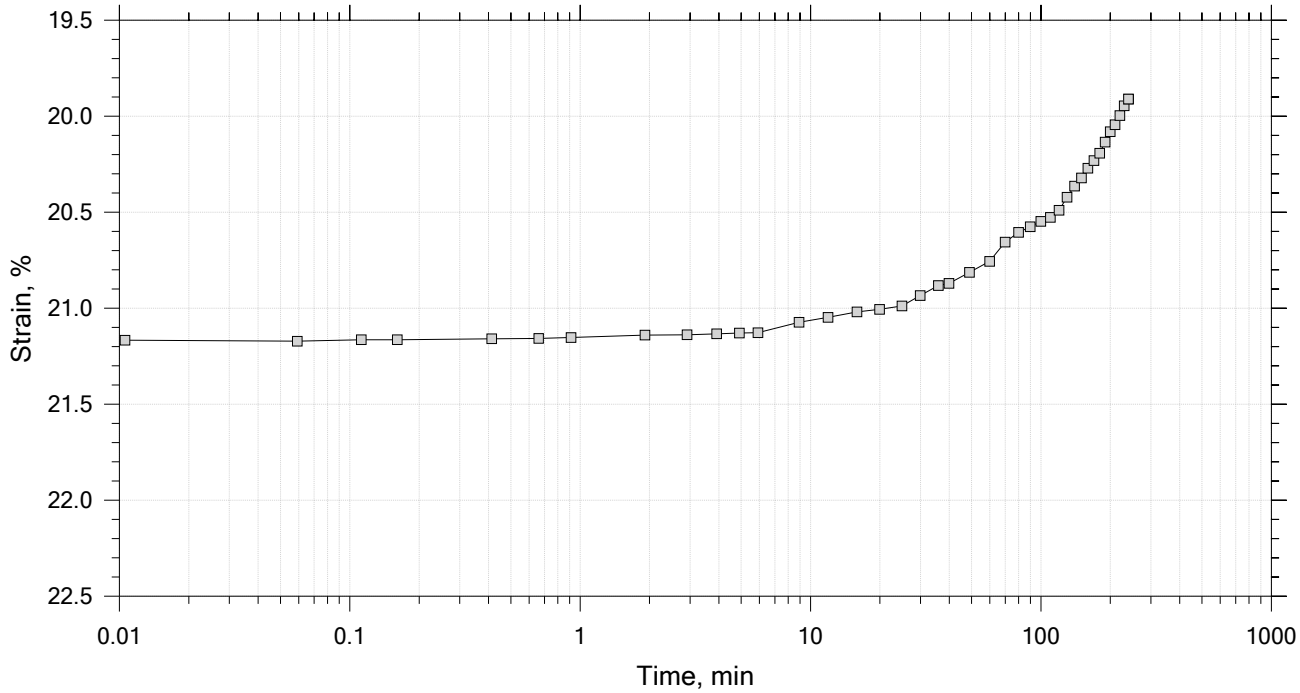
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

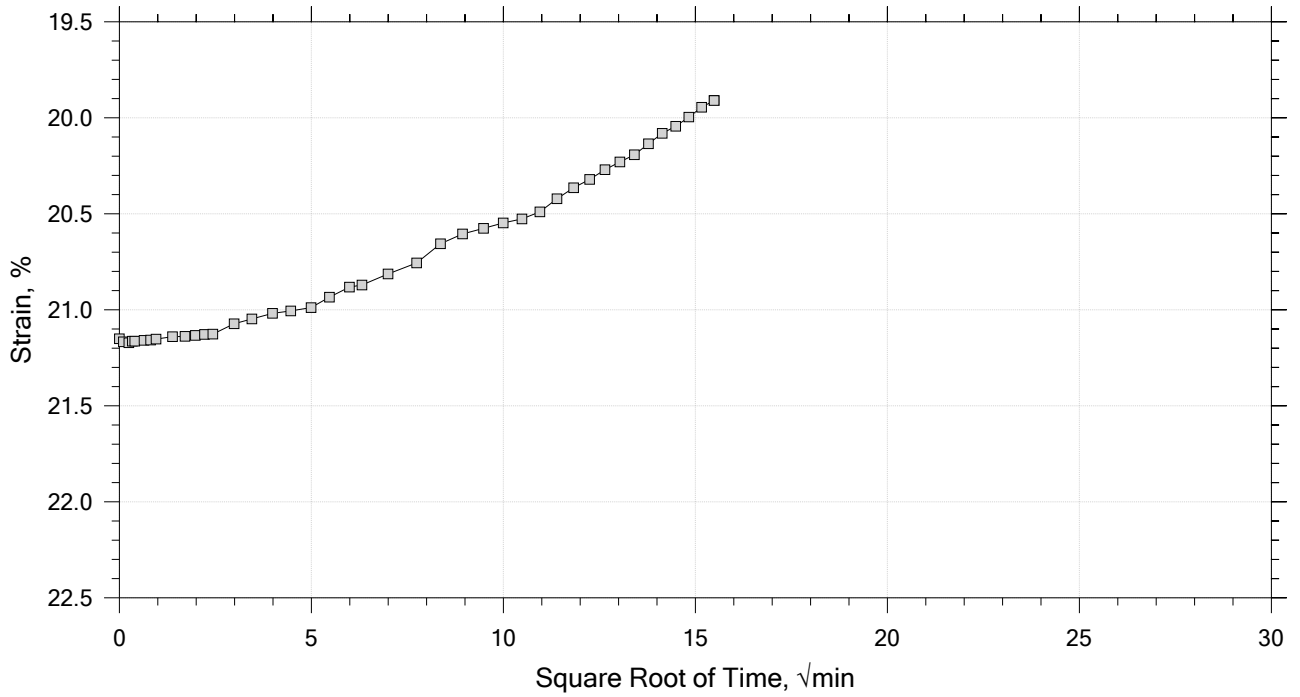
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 14

Constant Load Step

Stress: 0.0625 tsf





Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.80	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 1.21	Plastic Limit: ---
Final Height: 0.79 in	Final Void Ratio: 0.744	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C-164	RING		B-1998
Mass Container, gm	8.43	110.53	110.53	8.27
Mass Container + Wet Soil, gm	240.89	256.57	239.7	139.95
Mass Container + Dry Soil, gm	172.99	212.59	212.59	112.31
Mass Dry Soil, gm	164.56	102.06	102.06	104.04
Water Content, %	41.26	43.10	26.57	26.57
Void Ratio	---	1.21	0.74	---
Degree of Saturation, %	---	99.95	100.00	---
Dry Unit Weight, pcf	---	79.205	100.26	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test.
Therefore, values may not represent actual values for the specimen.

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Tested By: md	Checked By: njh
Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
Test No.: IP-3	Sample Type: intact	Elevation: ---
Description: Moist, black clay		
Remarks: System E, Swell Pressure = 0.137 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.137	0.0005068	1.21	0.0507	0.000	0.00e+00	3.69e-03	0.00e+00	0.00e+00
2	0.250	0.005579	1.20	0.558	9.256	6.12e-07	4.50e-02	7.44e-05	0.00e+00
3	0.500	0.01867	1.17	1.87	0.000	0.00e+00	5.24e-02	0.00e+00	0.00e+00
4	1.00	0.04528	1.11	4.53	0.000	0.00e+00	5.32e-02	0.00e+00	0.00e+00
5	2.00	0.08398	1.02	8.40	0.000	0.00e+00	3.87e-02	0.00e+00	0.00e+00
6	4.00	0.1327	0.915	13.3	0.000	0.00e+00	2.43e-02	0.00e+00	0.00e+00
7	8.00	0.1822	0.806	18.2	0.000	0.00e+00	1.24e-02	0.00e+00	0.00e+00
8	16.0	0.2307	0.699	23.1	0.000	0.00e+00	6.06e-03	0.00e+00	0.00e+00
9	32.0	0.2801	0.589	28.0	0.000	0.00e+00	3.09e-03	0.00e+00	0.00e+00
10	8.00	0.2668	0.619	26.7	0.000	0.00e+00	5.54e-04	0.00e+00	0.00e+00
11	2.00	0.2469	0.663	24.7	0.000	0.00e+00	3.32e-03	0.00e+00	0.00e+00
12	0.500	0.2268	0.707	22.7	0.000	0.00e+00	1.33e-02	0.00e+00	0.00e+00
13	0.125	0.2102	0.744	21.0	0.000	0.00e+00	4.43e-02	0.00e+00	0.00e+00
14	0.0625	0.1991	0.768	19.9	0.000	0.00e+00	1.78e-01	0.00e+00	0.00e+00

GeoTesti EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

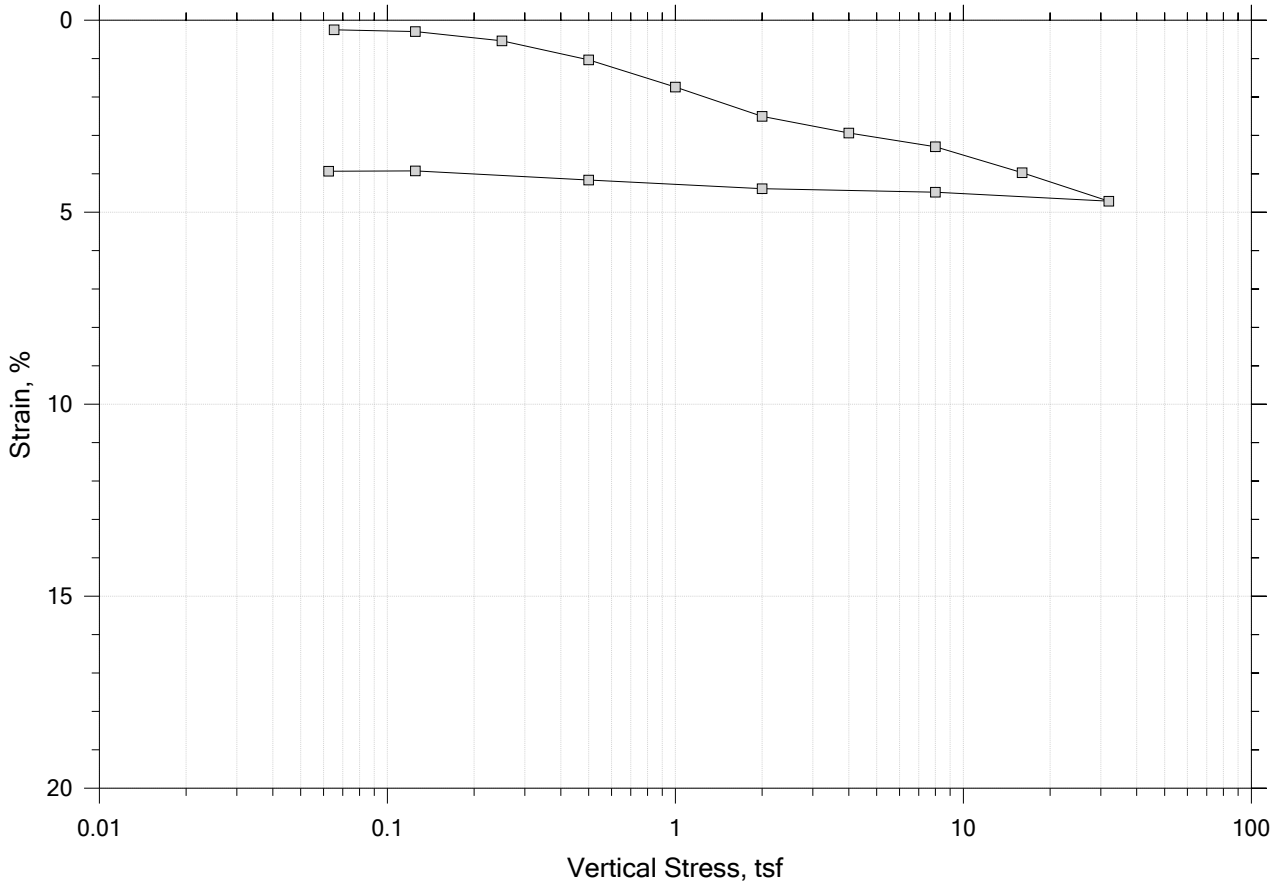
Square Root of Time Coefficients

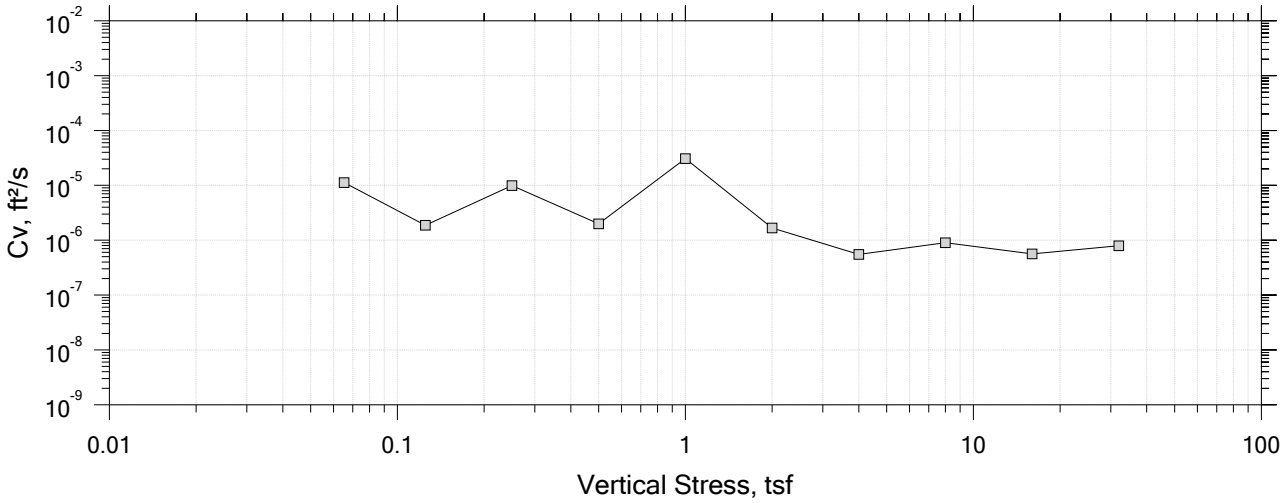
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.137	0.0005068	1.21	0.0507	97.980	2.50e-07	3.69e-03	2.49e-06
2	0.250	0.005579	1.20	0.558	45.482	5.36e-07	4.50e-02	6.51e-05
3	0.500	0.01867	1.17	1.87	63.155	3.79e-07	5.24e-02	5.35e-05
4	1.00	0.04528	1.11	4.53	203.581	1.13e-07	5.32e-02	1.62e-05
5	2.00	0.08398	1.02	8.40	178.049	1.21e-07	3.87e-02	1.26e-05
6	4.00	0.1327	0.915	13.3	177.706	1.10e-07	2.43e-02	7.21e-06
7	8.00	0.1822	0.806	18.2	179.019	9.73e-08	1.24e-02	3.25e-06
8	16.0	0.2307	0.699	23.1	180.850	8.54e-08	6.06e-03	1.40e-06
9	32.0	0.2801	0.589	28.0	182.440	7.46e-08	3.09e-03	6.21e-07
10	8.00	0.2668	0.619	26.7	182.867	7.08e-08	5.54e-04	1.06e-07
11	2.00	0.2469	0.663	24.7	176.543	7.68e-08	3.32e-03	6.87e-07
12	0.500	0.2268	0.707	22.7	0.000	0.00e+00	1.33e-02	0.00e+00
13	0.125	0.2102	0.744	21.0	0.000	0.00e+00	4.43e-02	0.00e+00
14	0.0625	0.1991	0.768	19.9	0.000	0.00e+00	1.78e-01	0.00e+00

GeoTesti EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





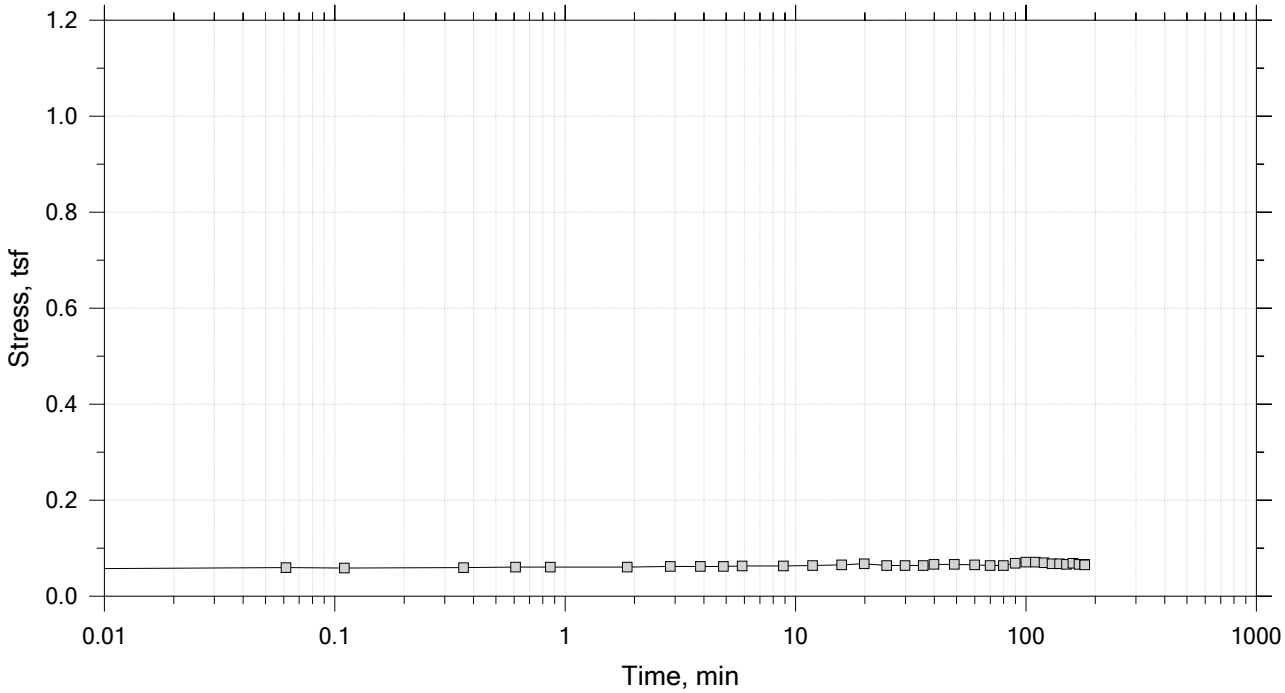
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		
Displacement at End of Increment		

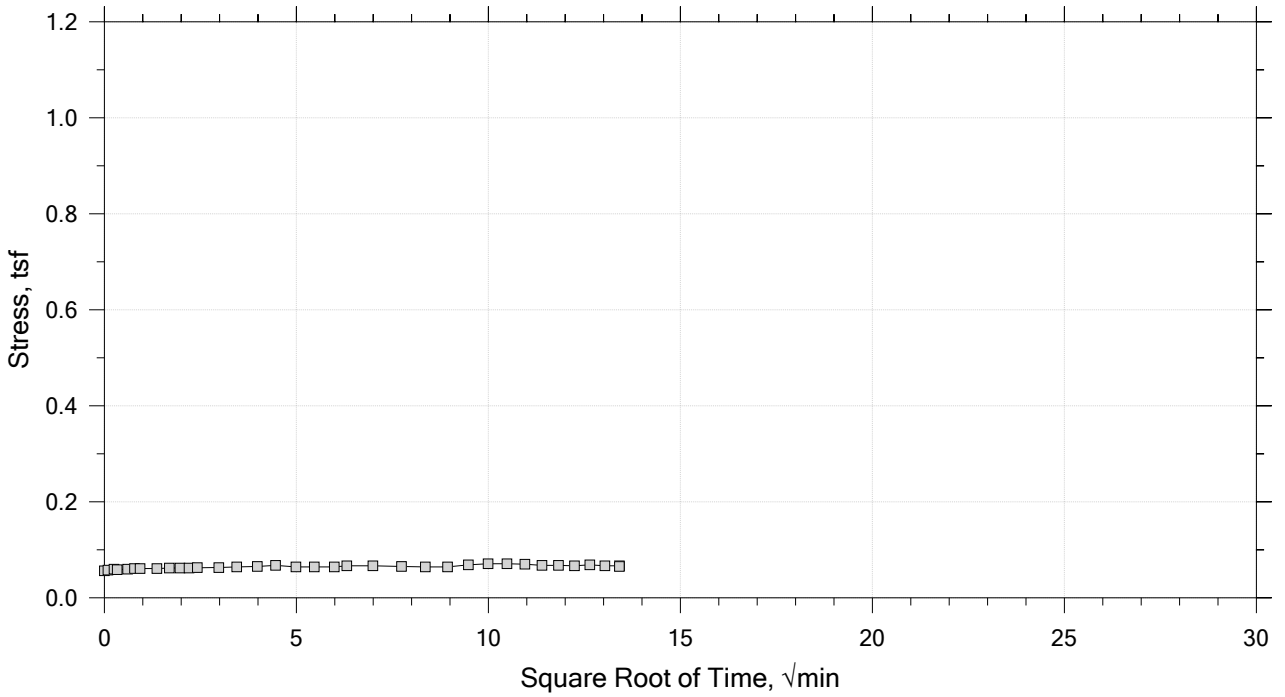
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15

Constant Volume Step

Stress: 0.0653 tsf





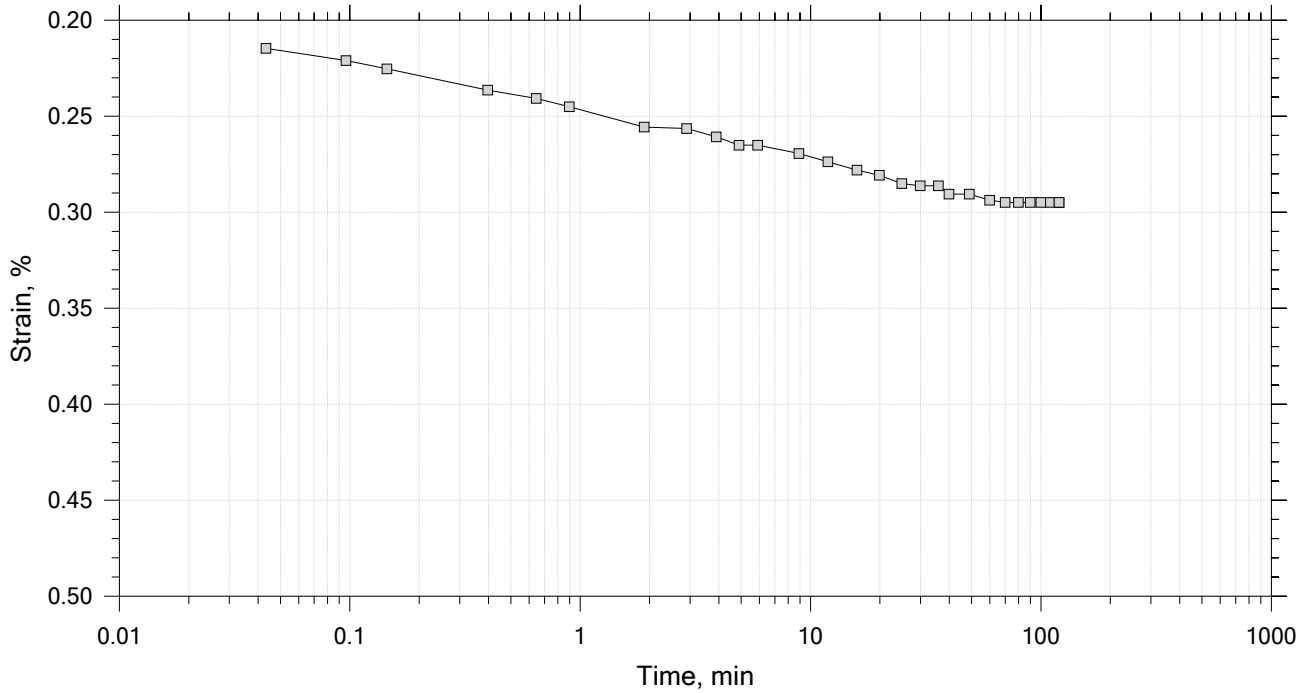
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

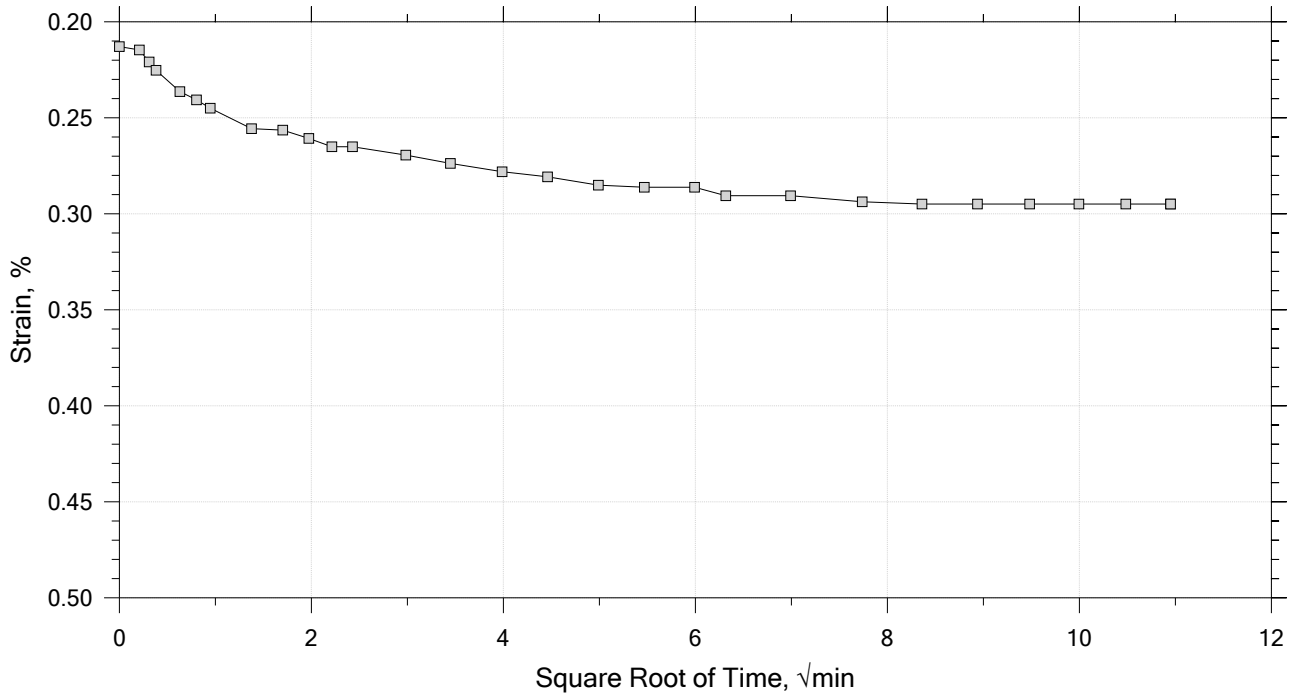
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf





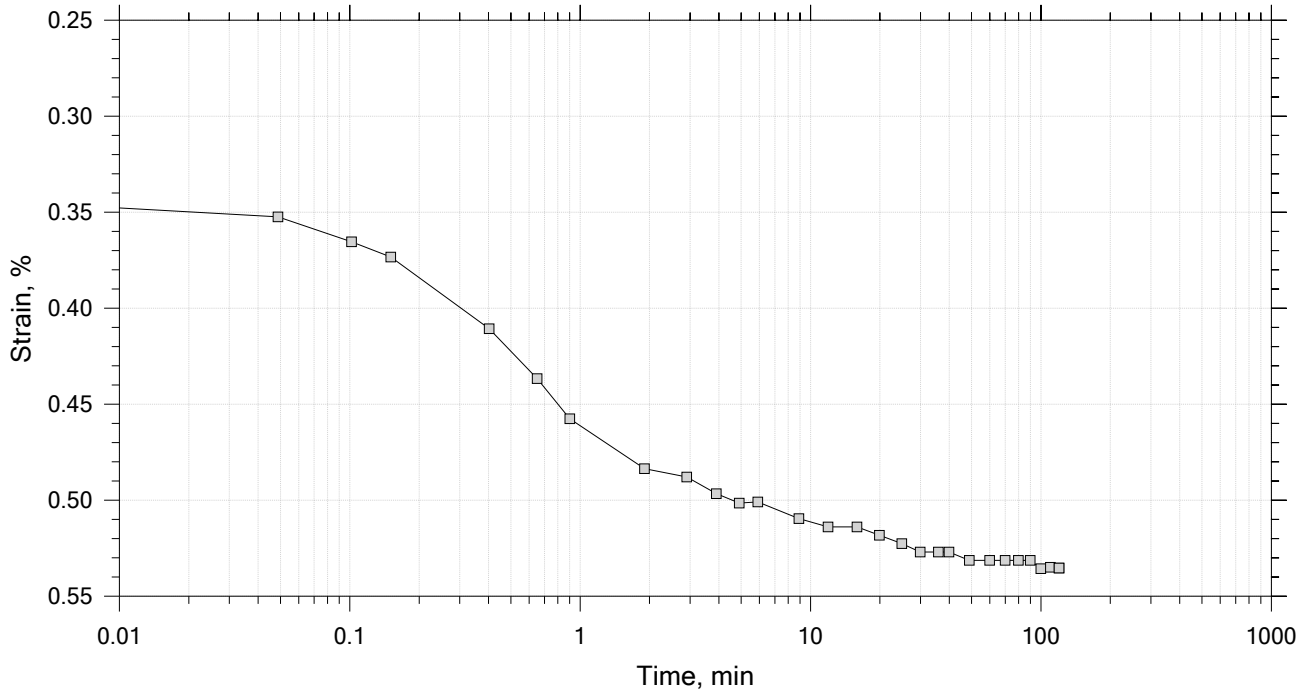
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

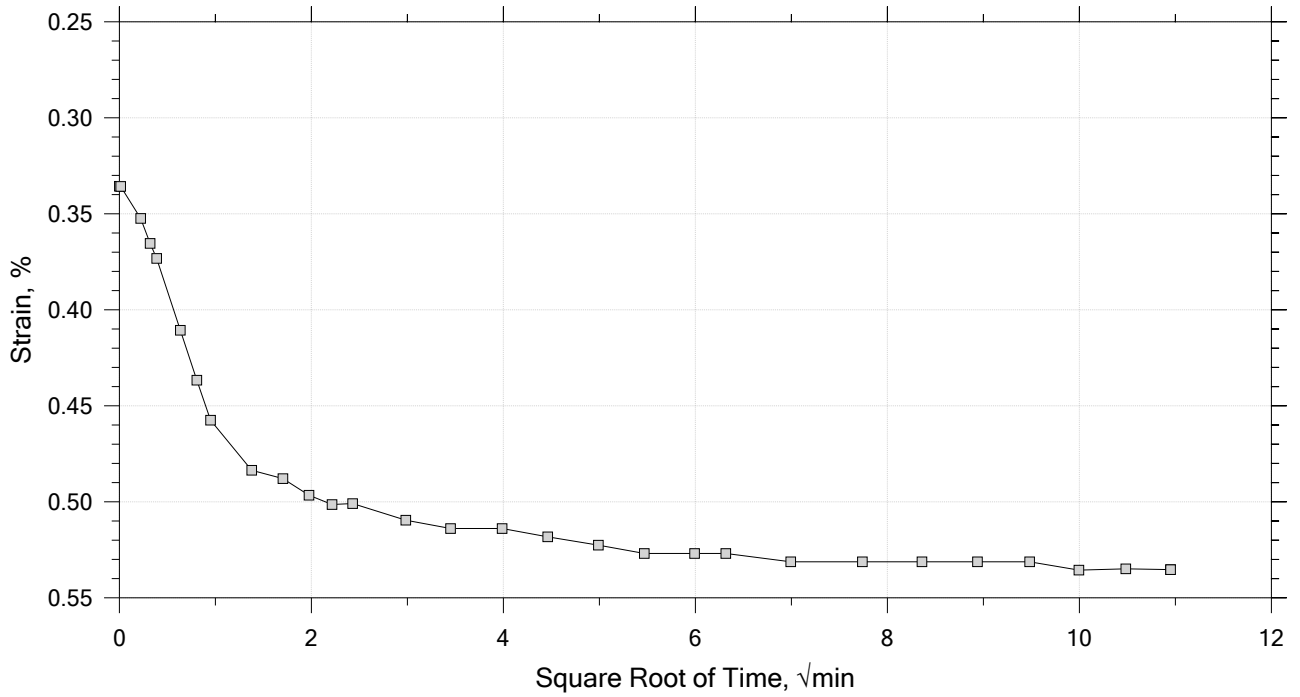
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf





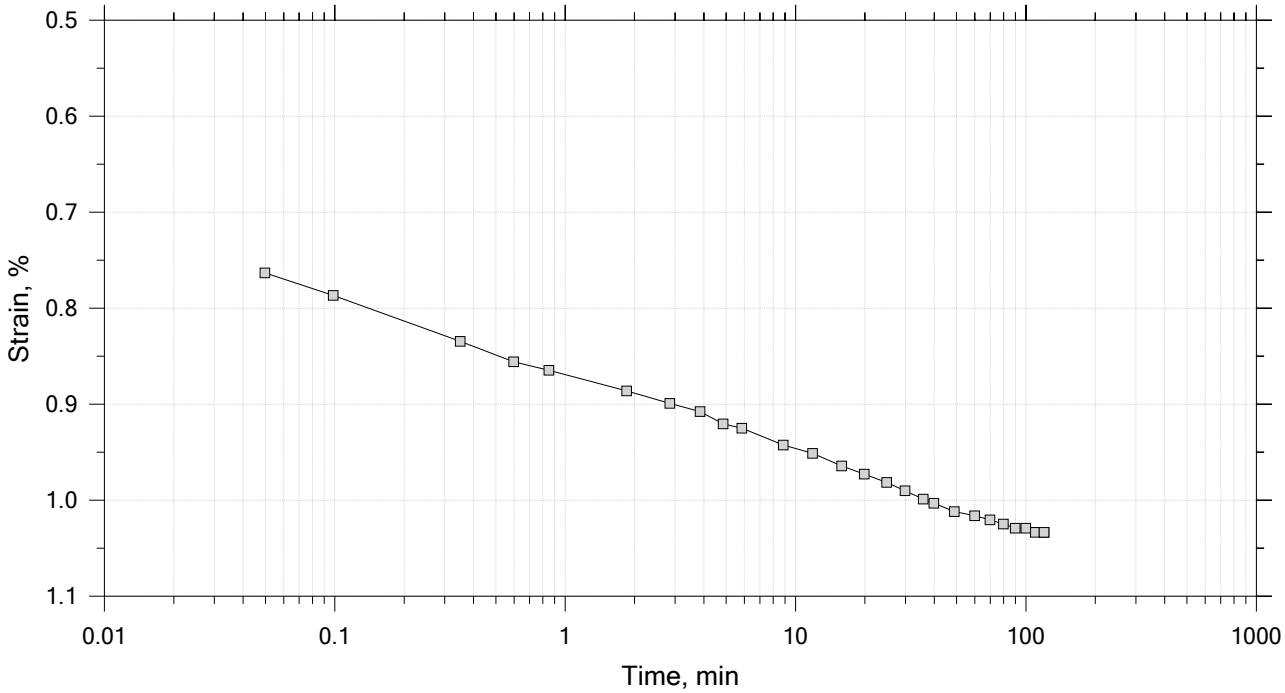
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

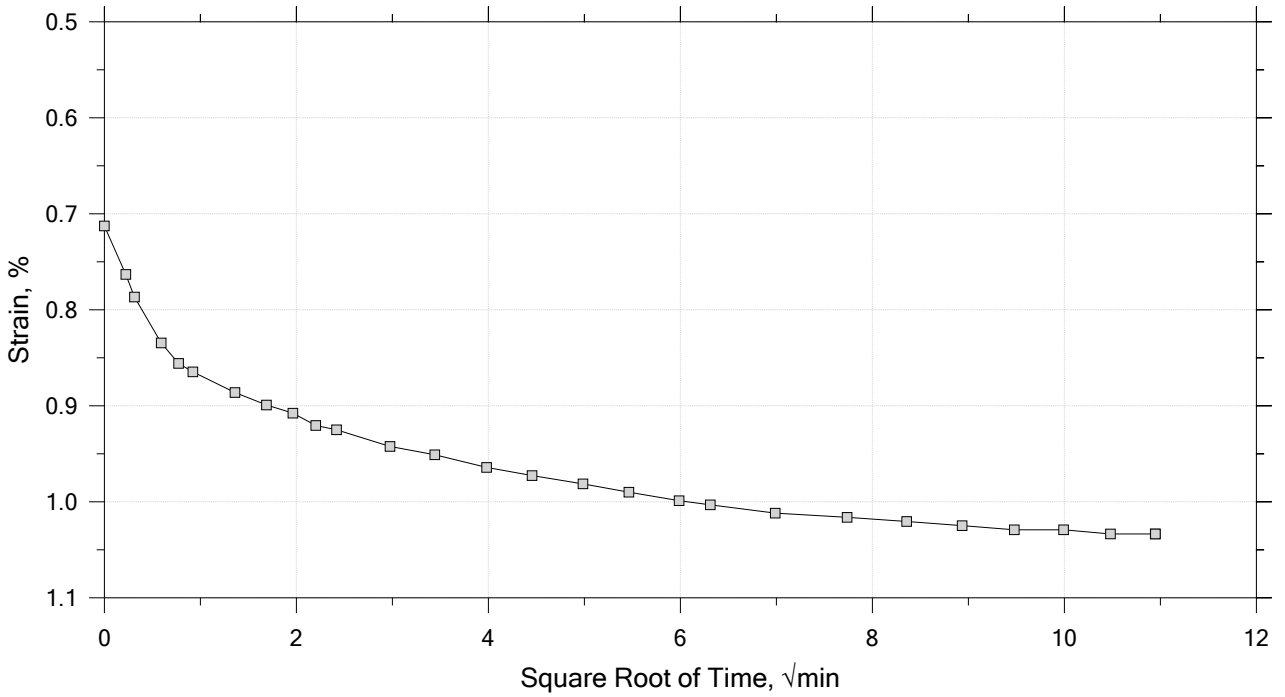
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





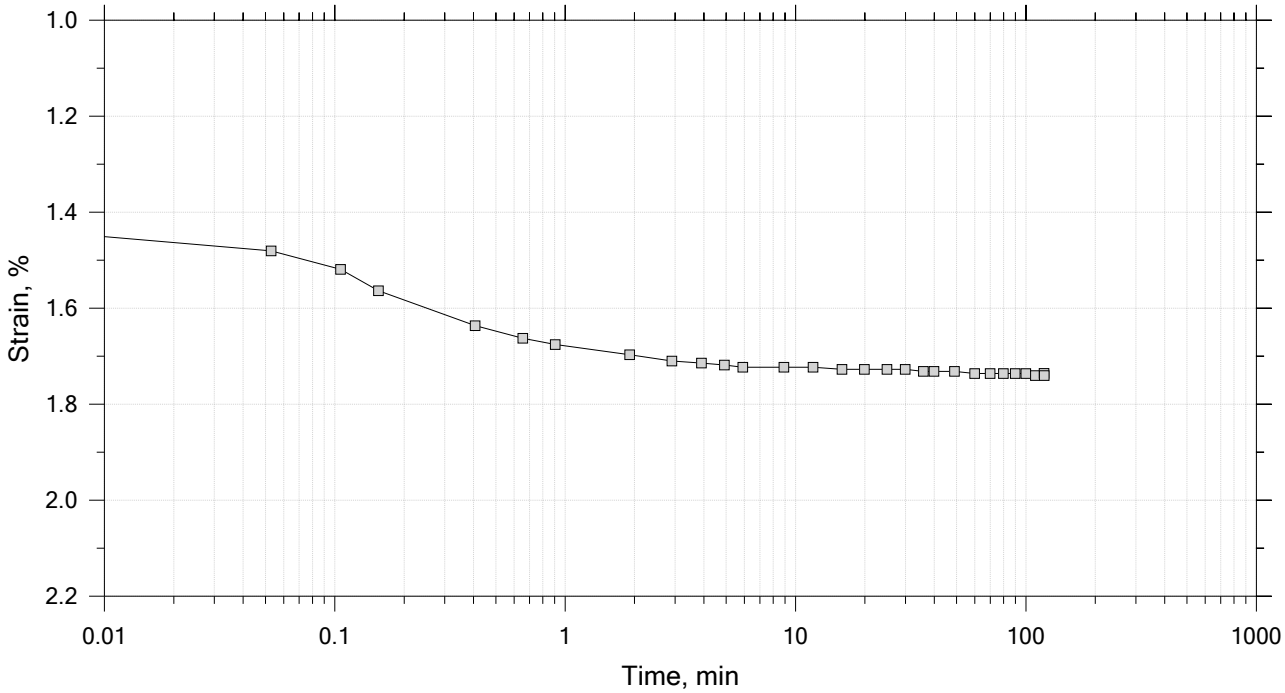
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

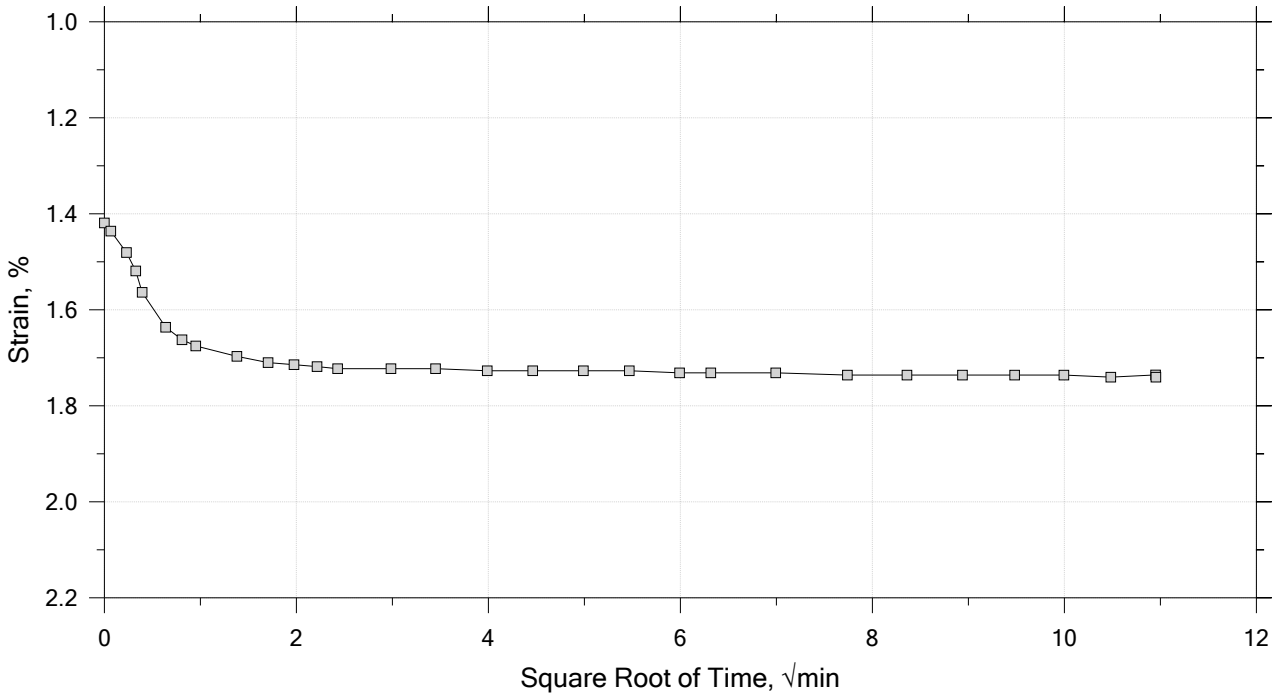
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





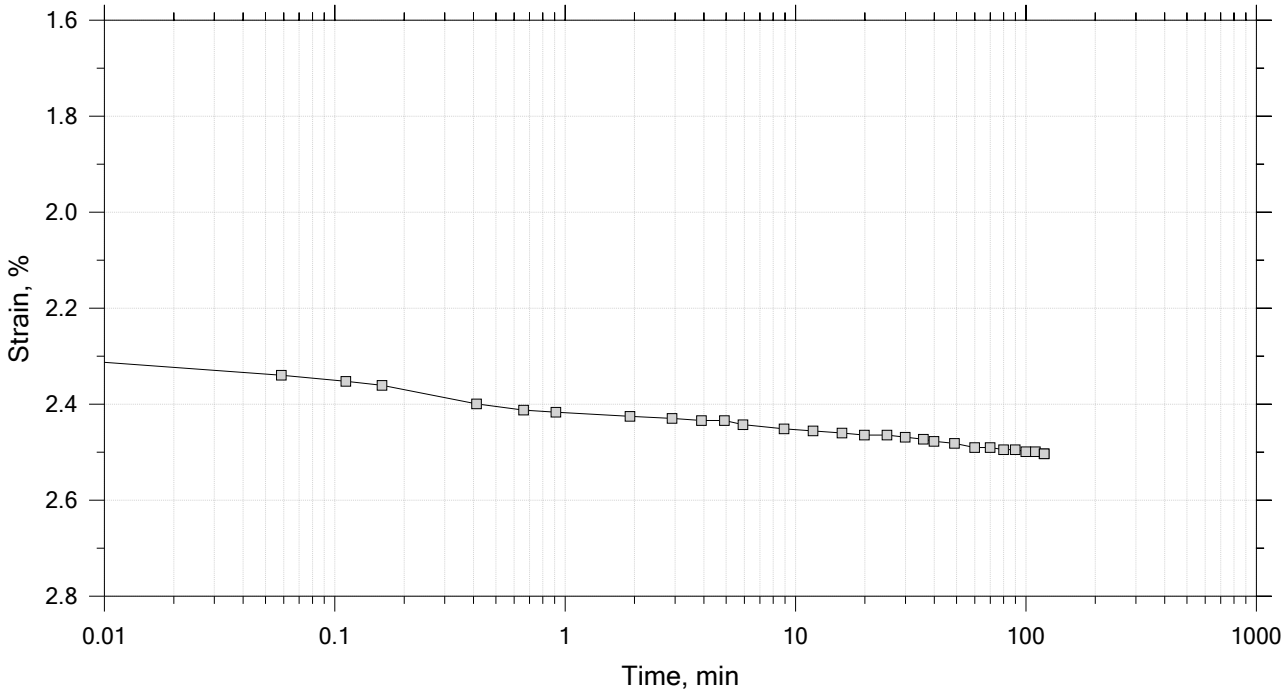
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

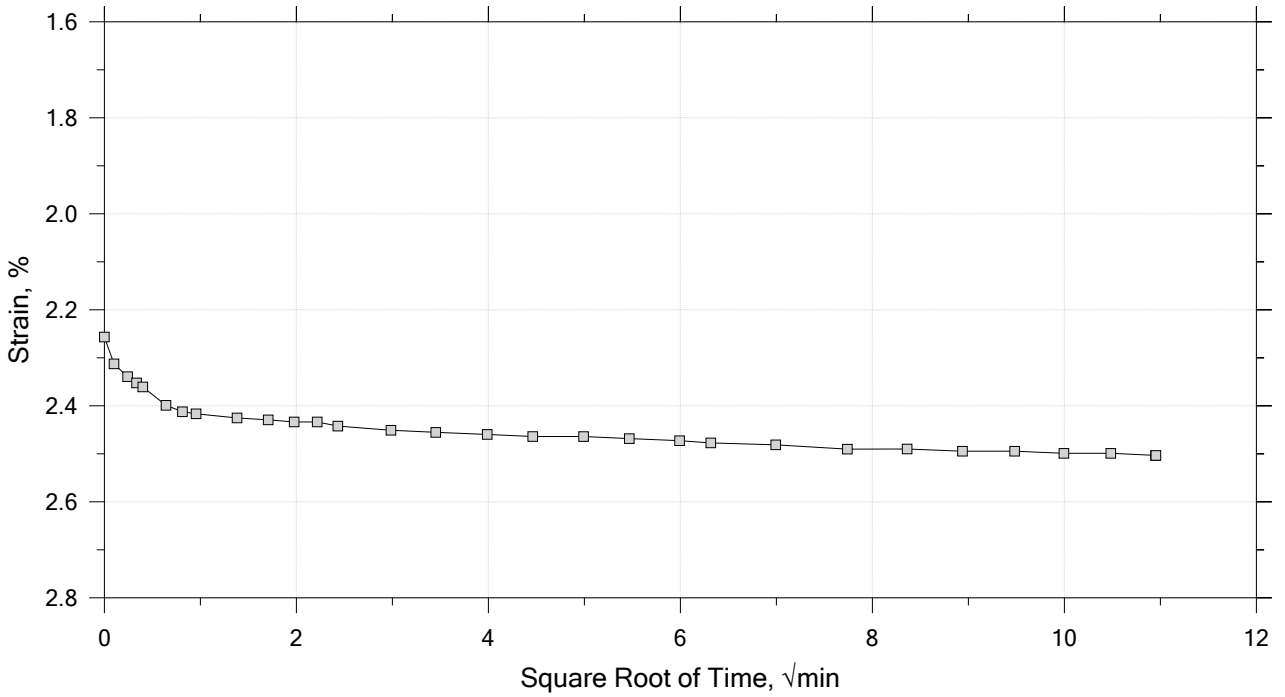
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





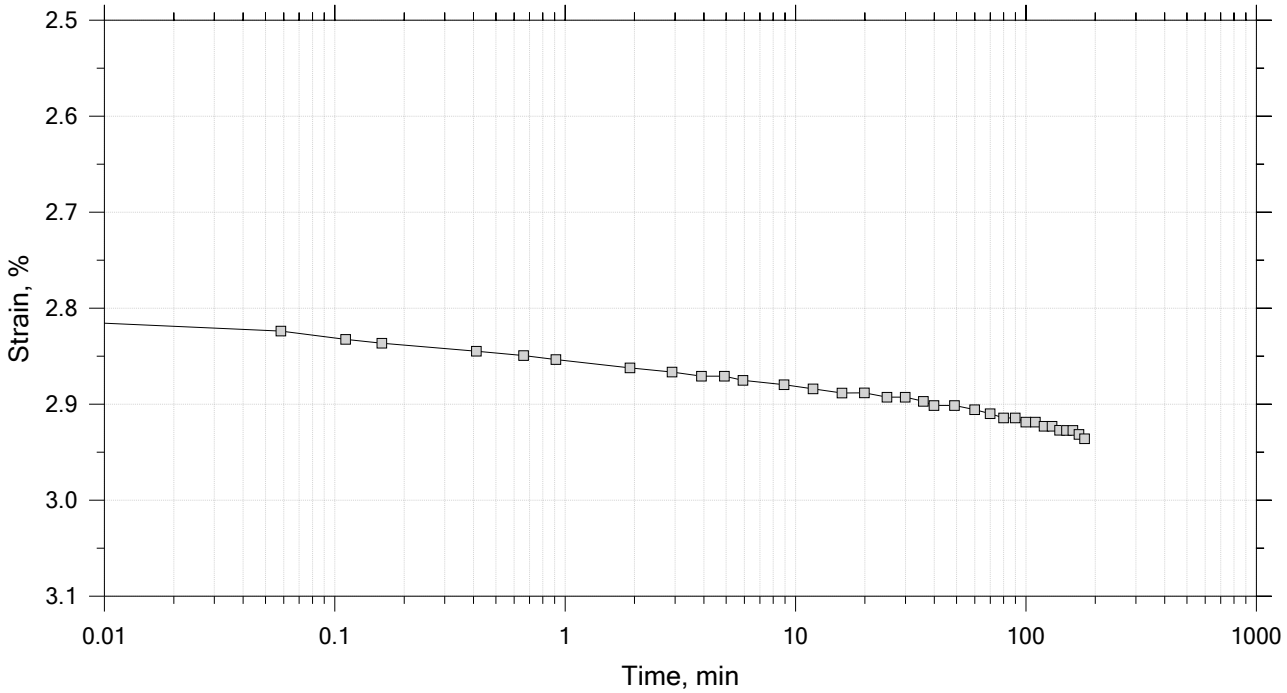
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

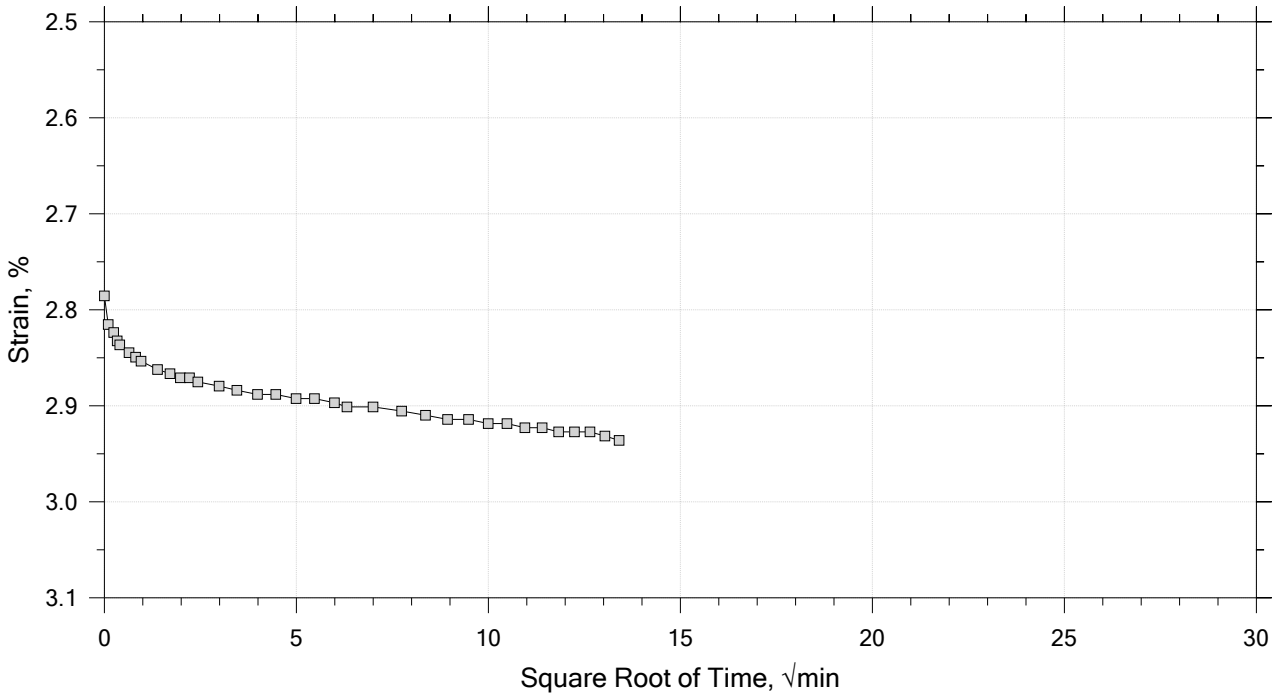
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





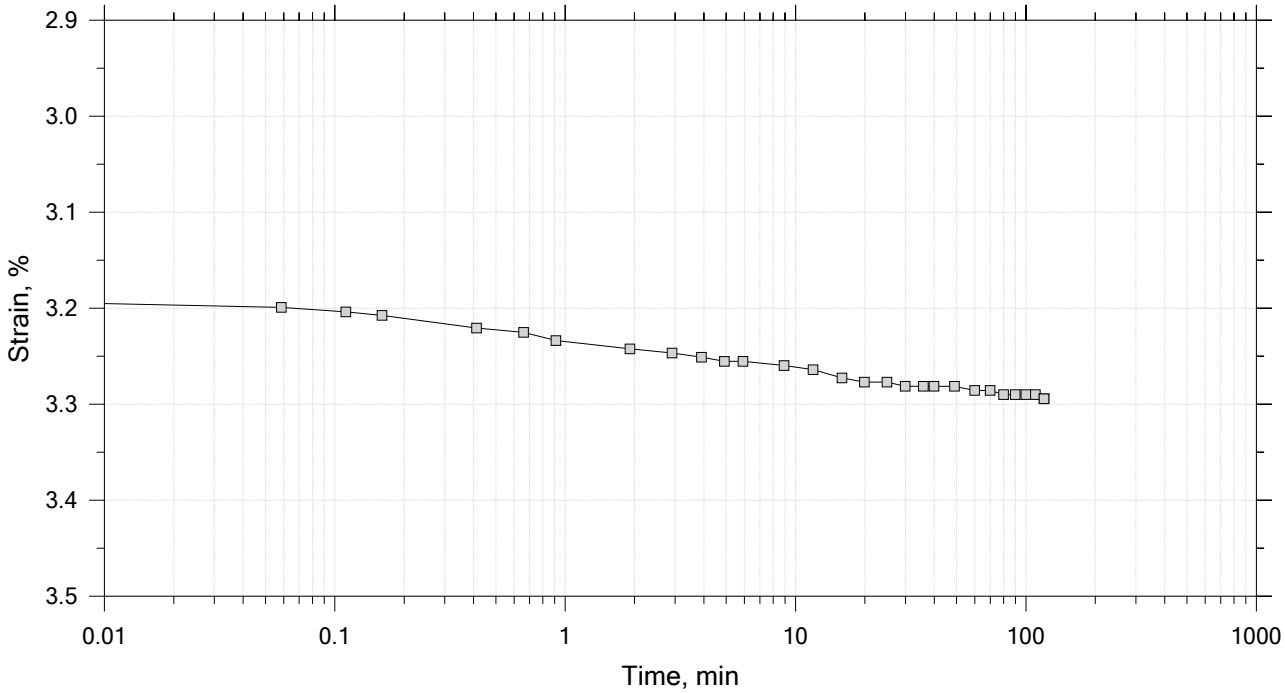
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

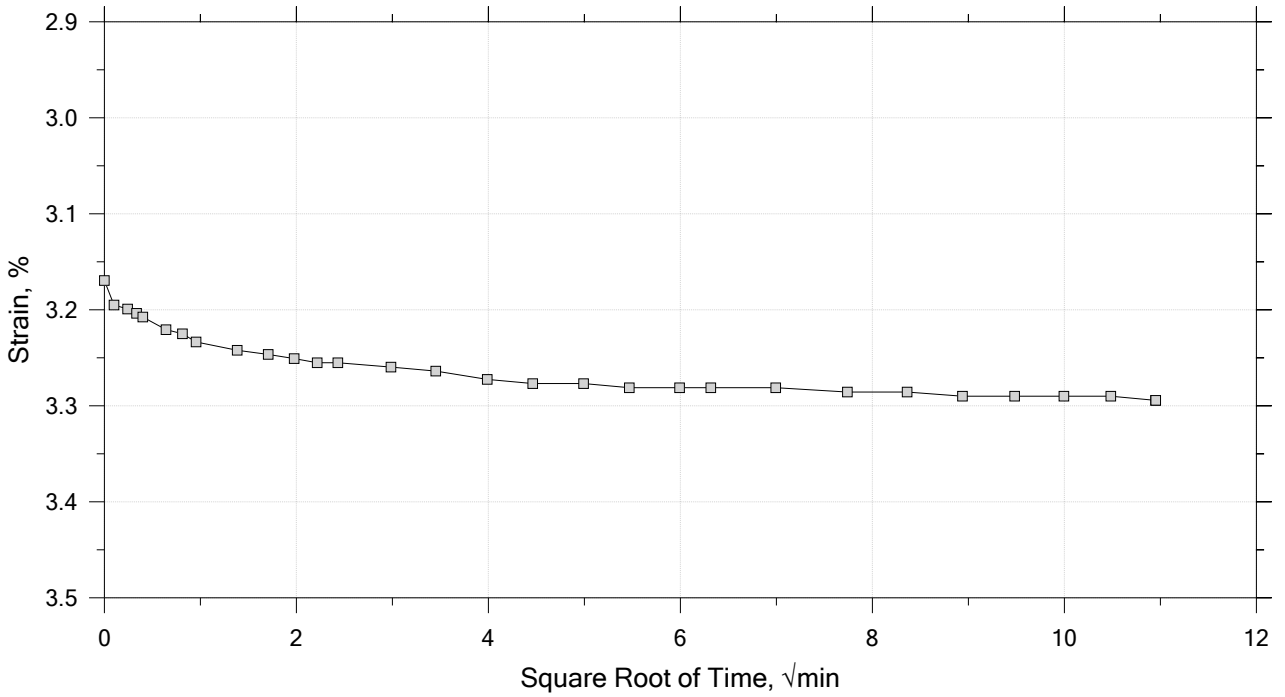
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





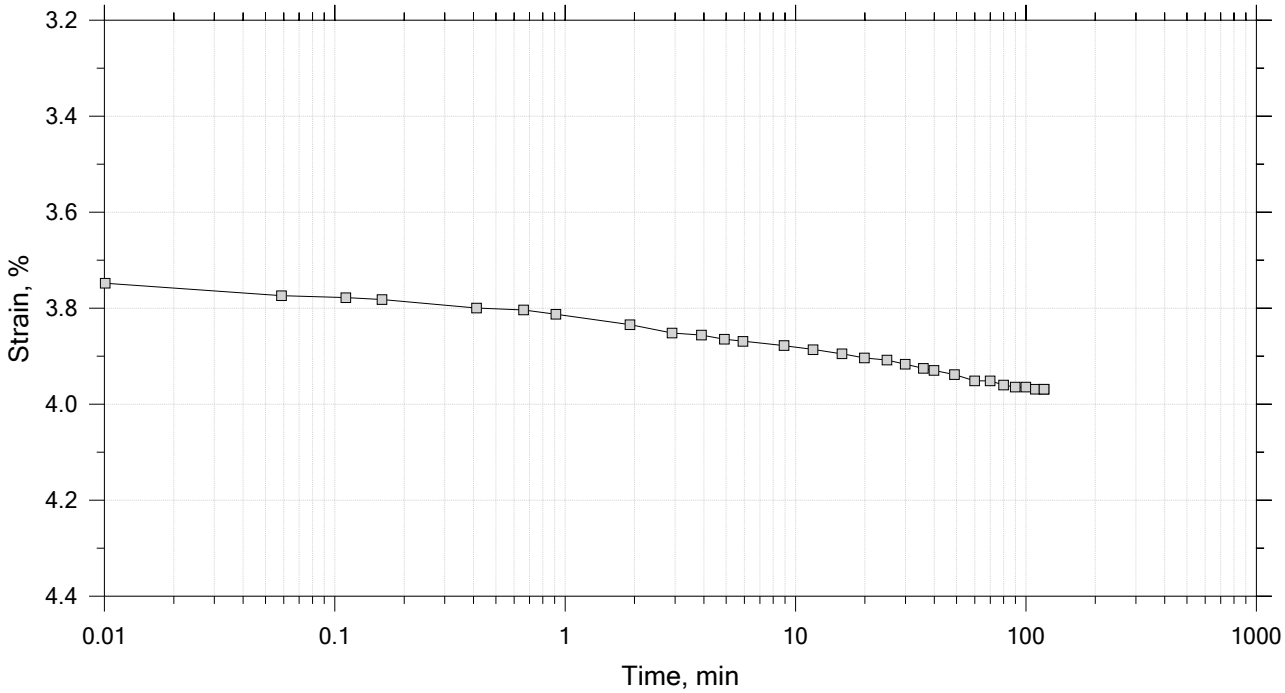
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

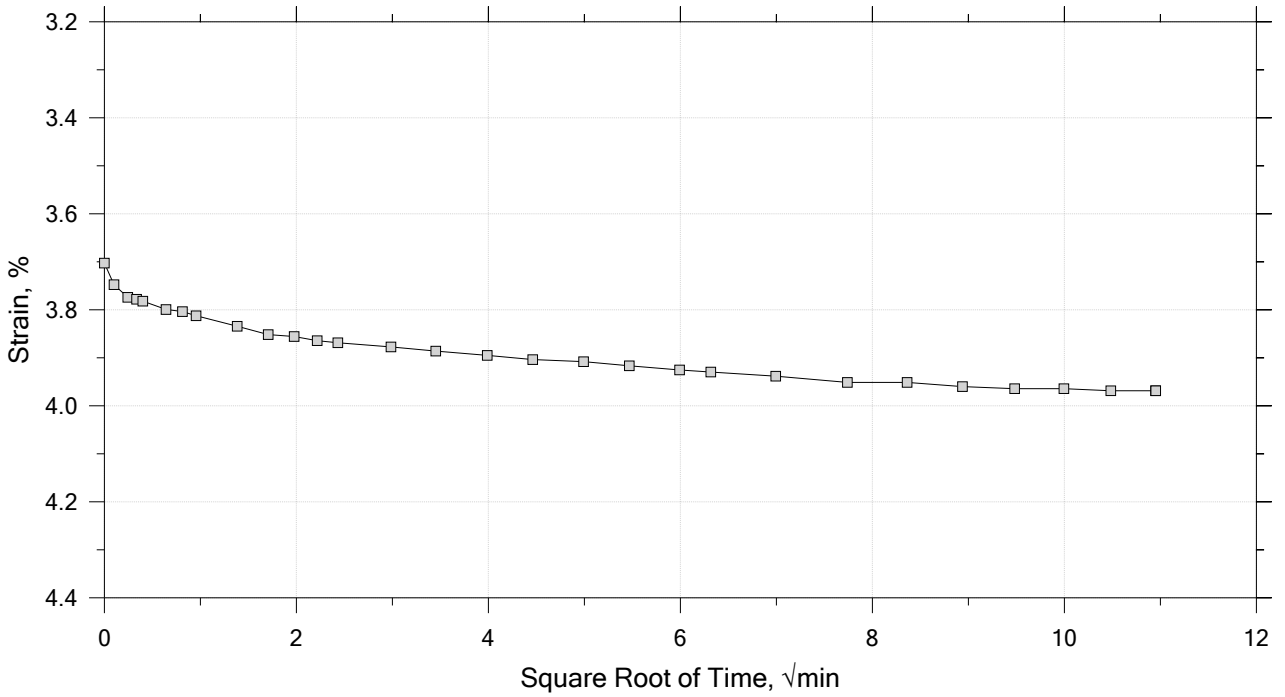
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





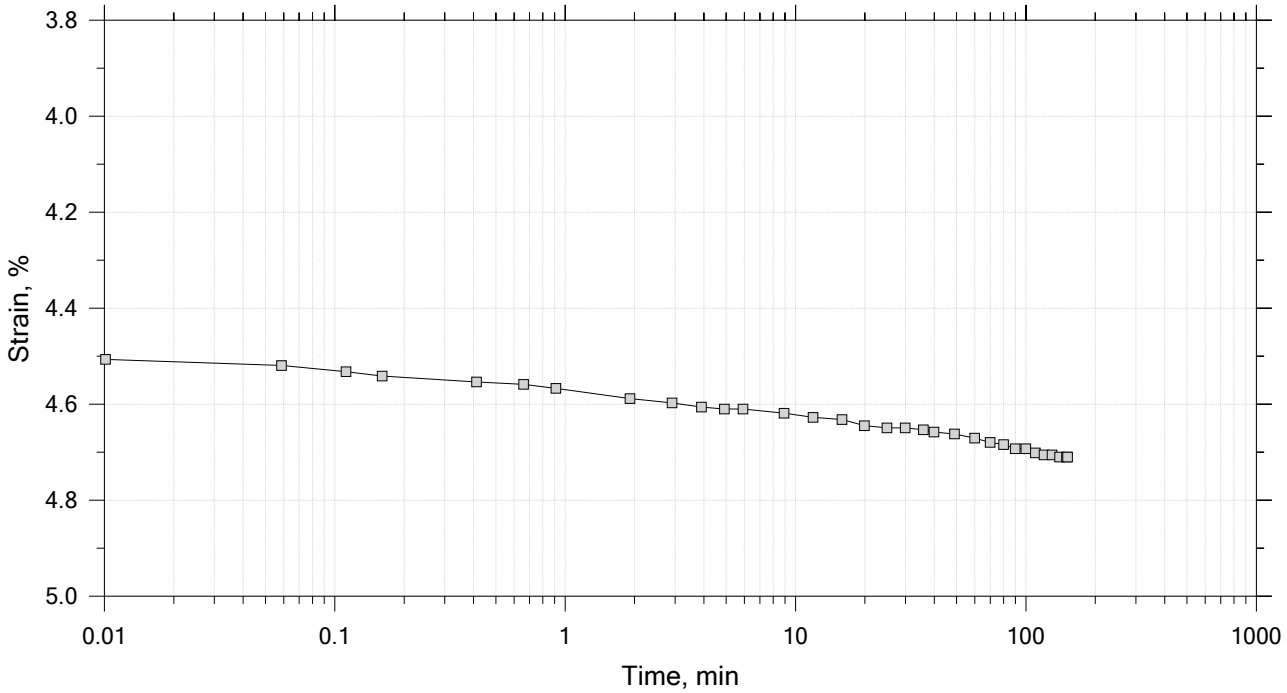
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

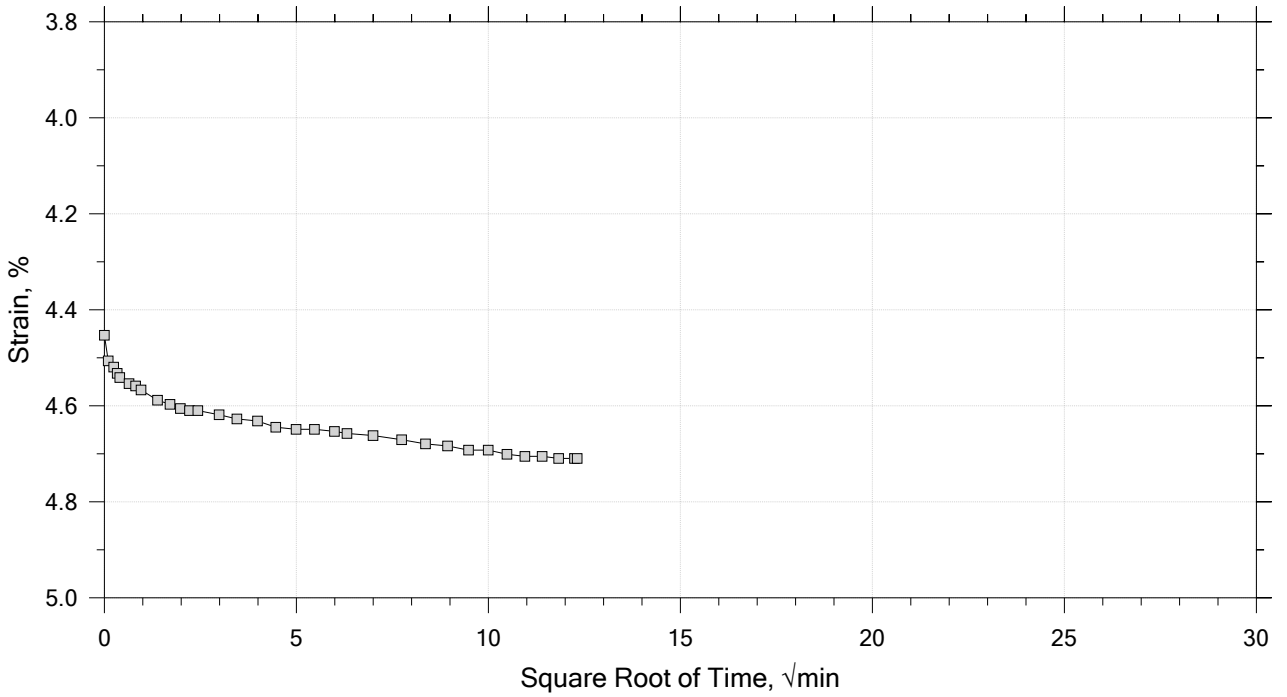
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf





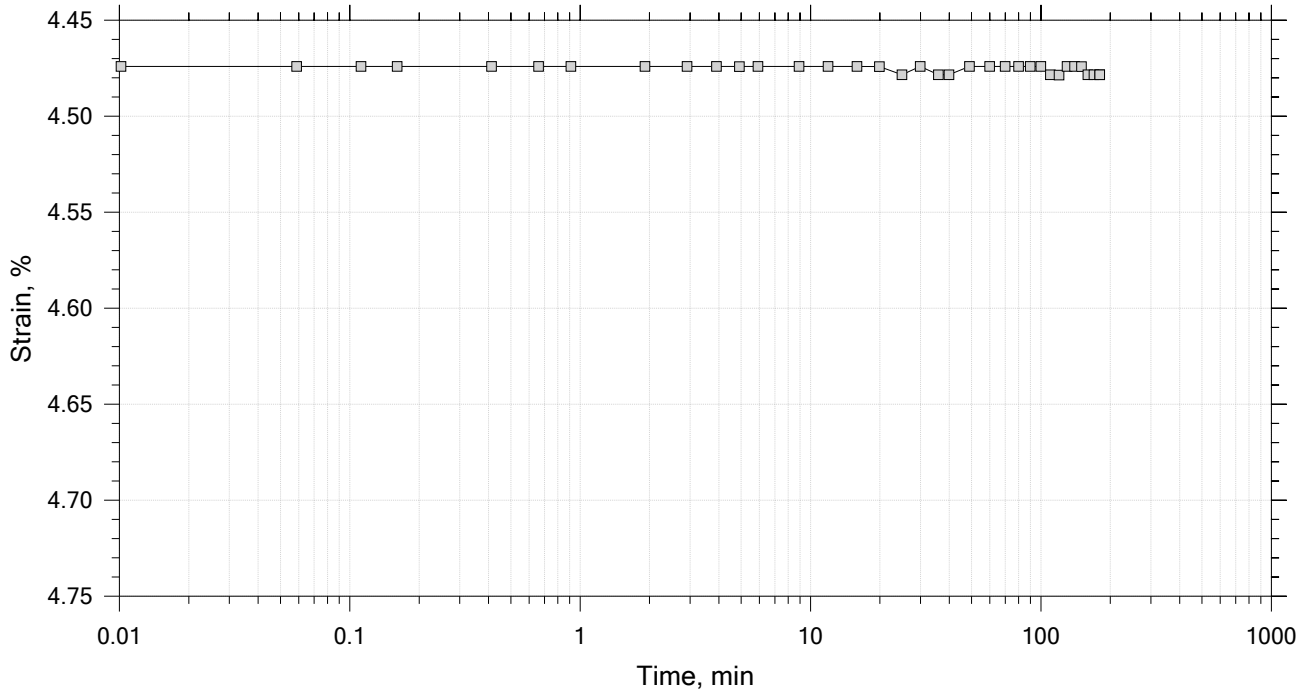
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

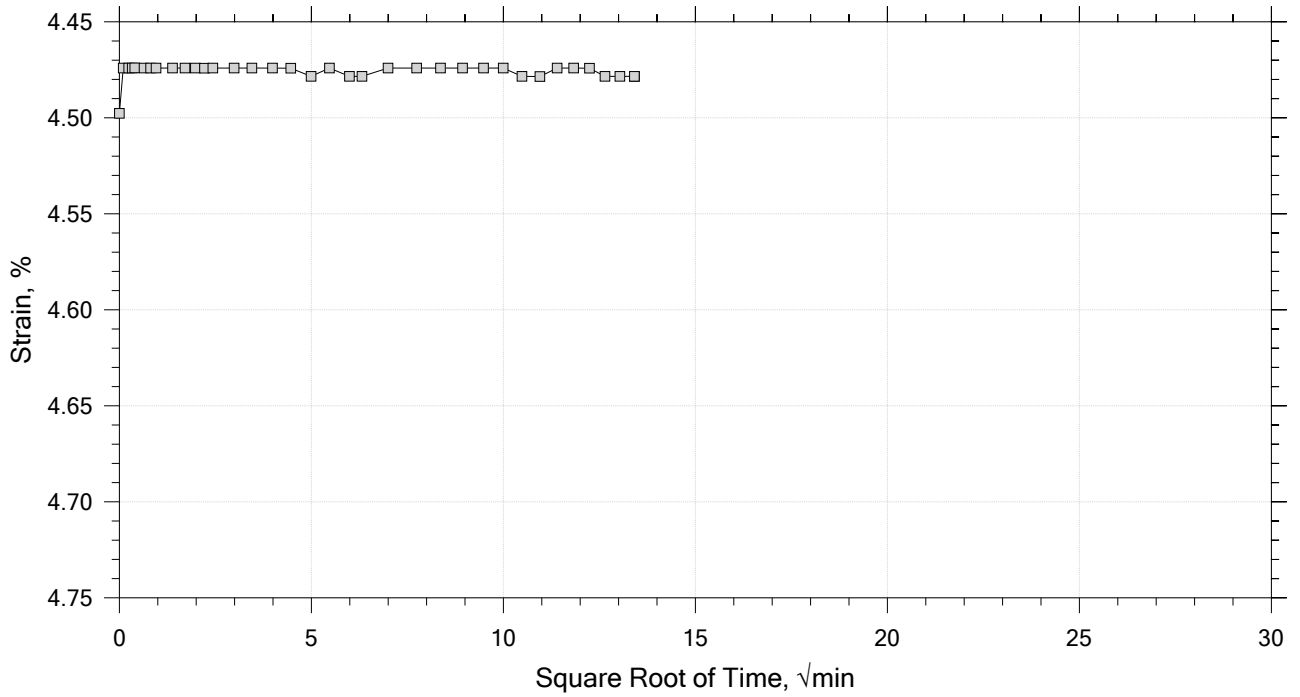
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf





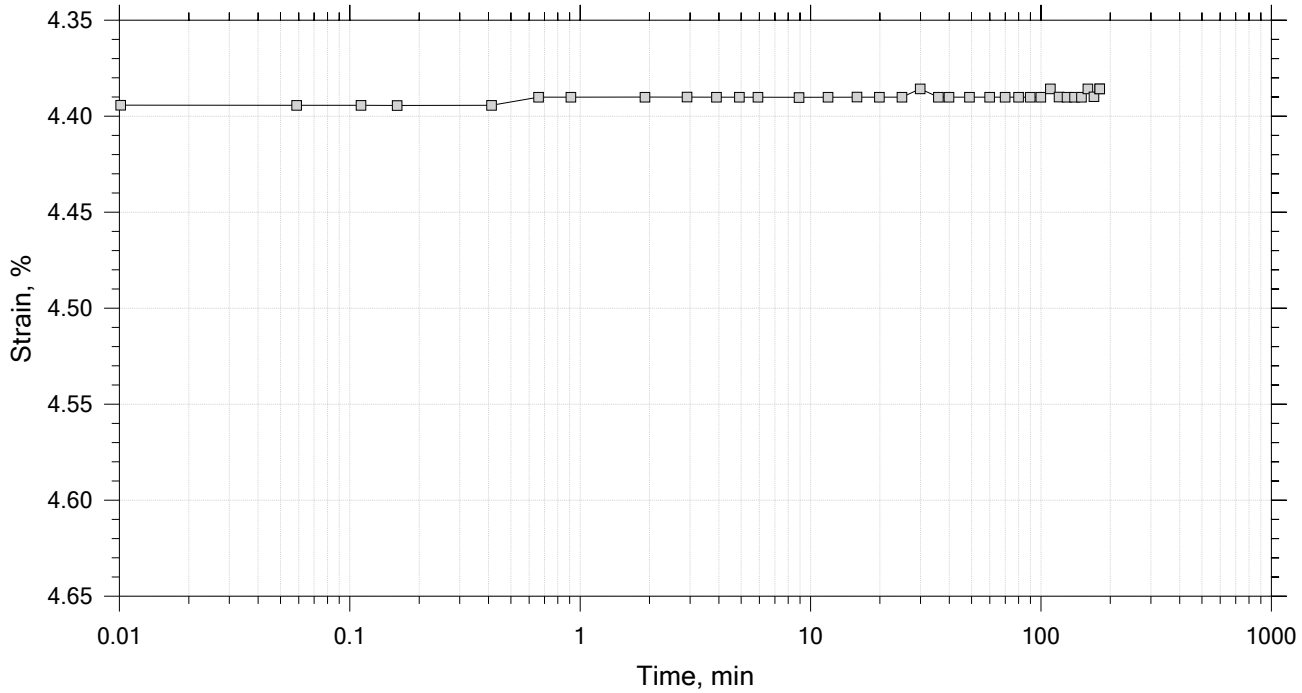
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

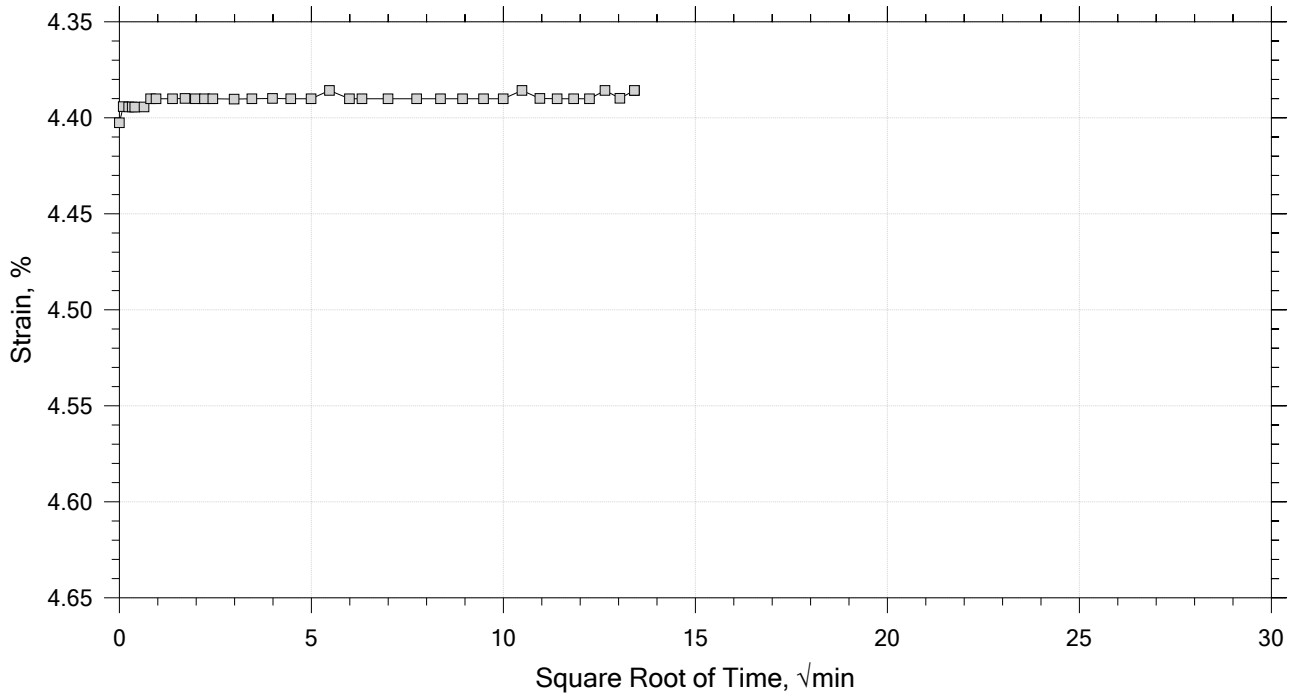
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf





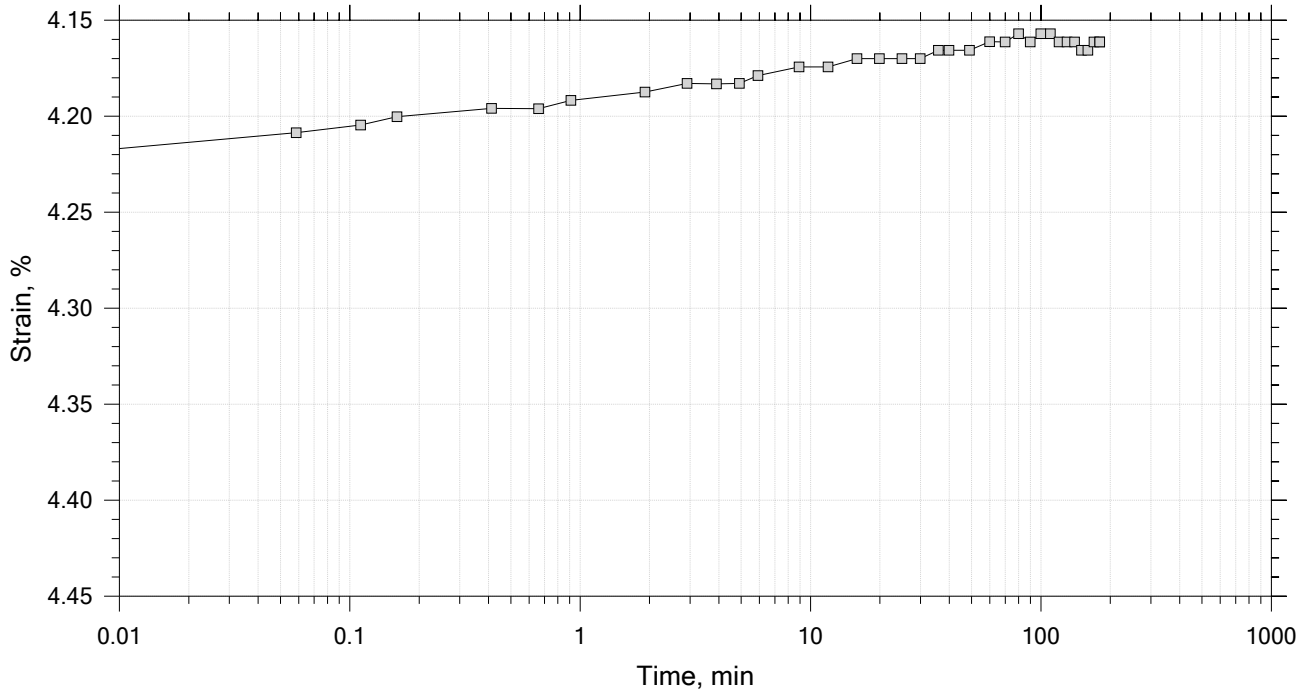
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

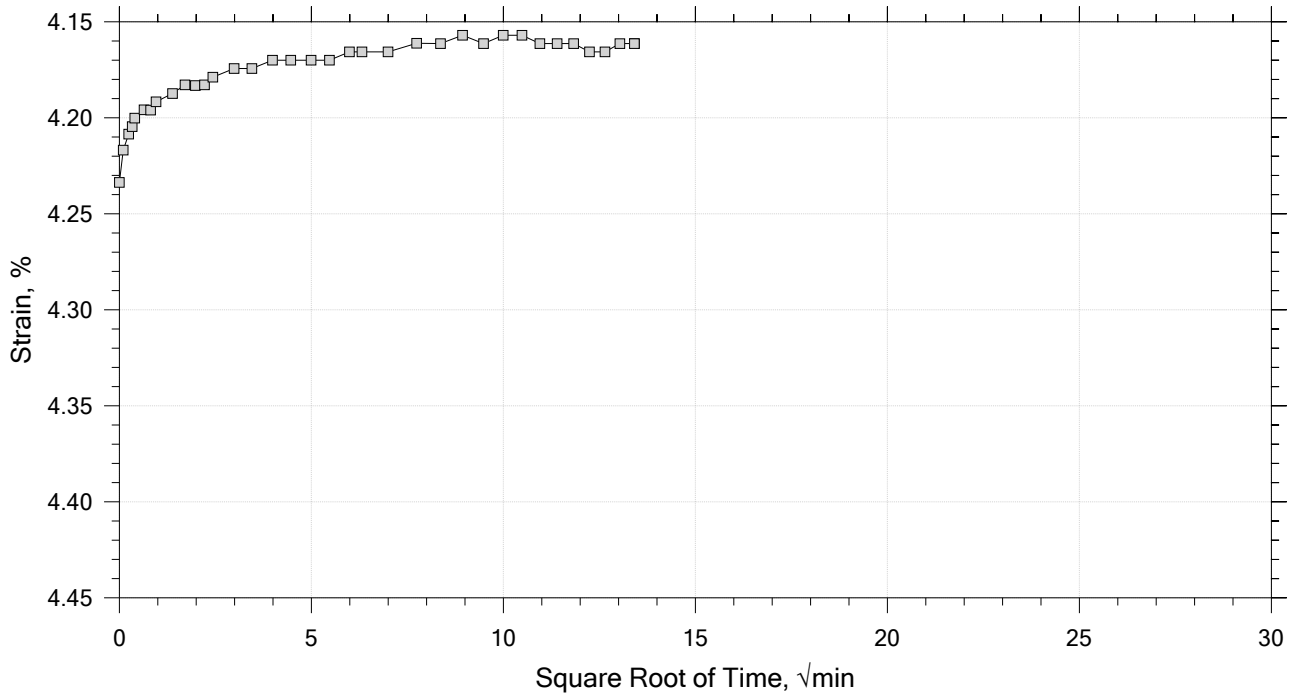
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf





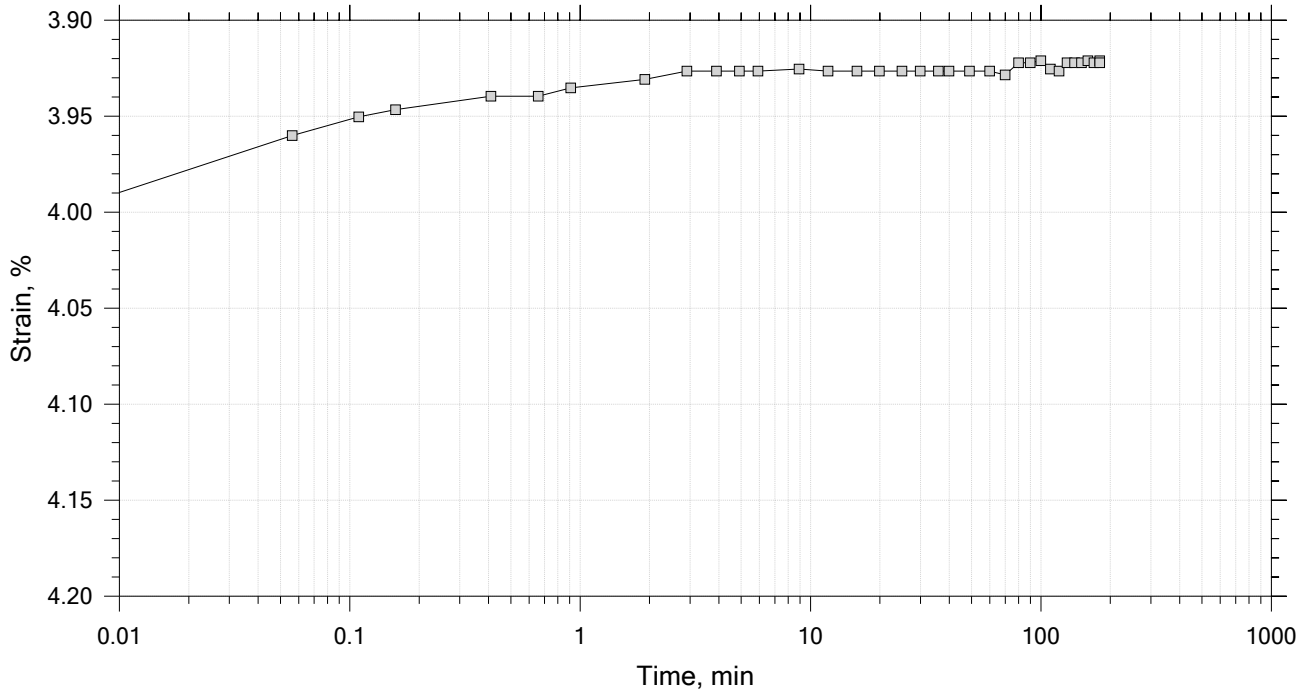
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

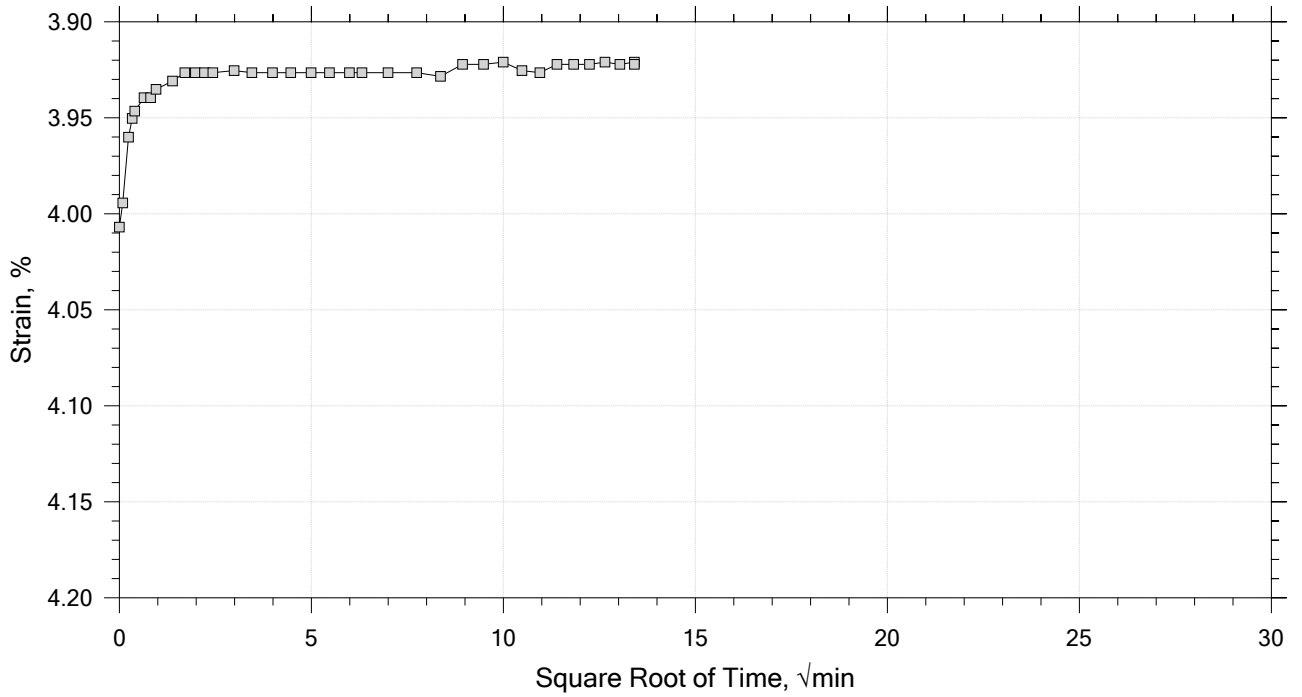
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf





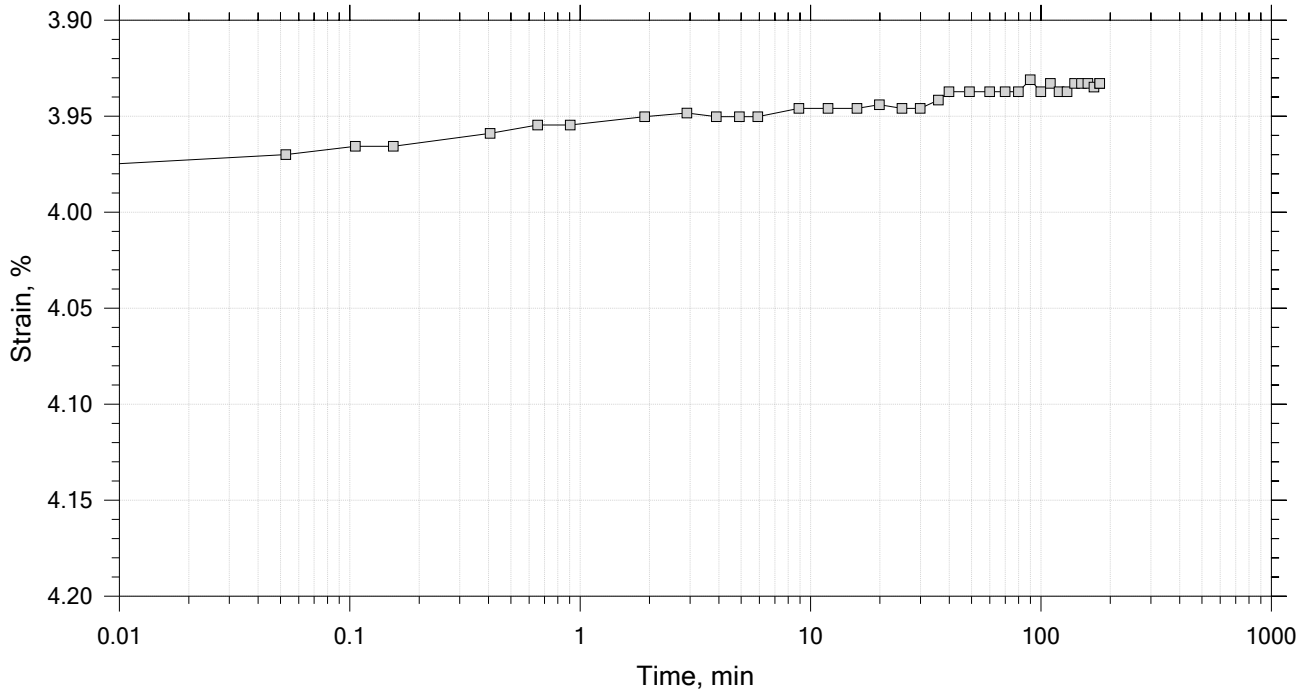
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

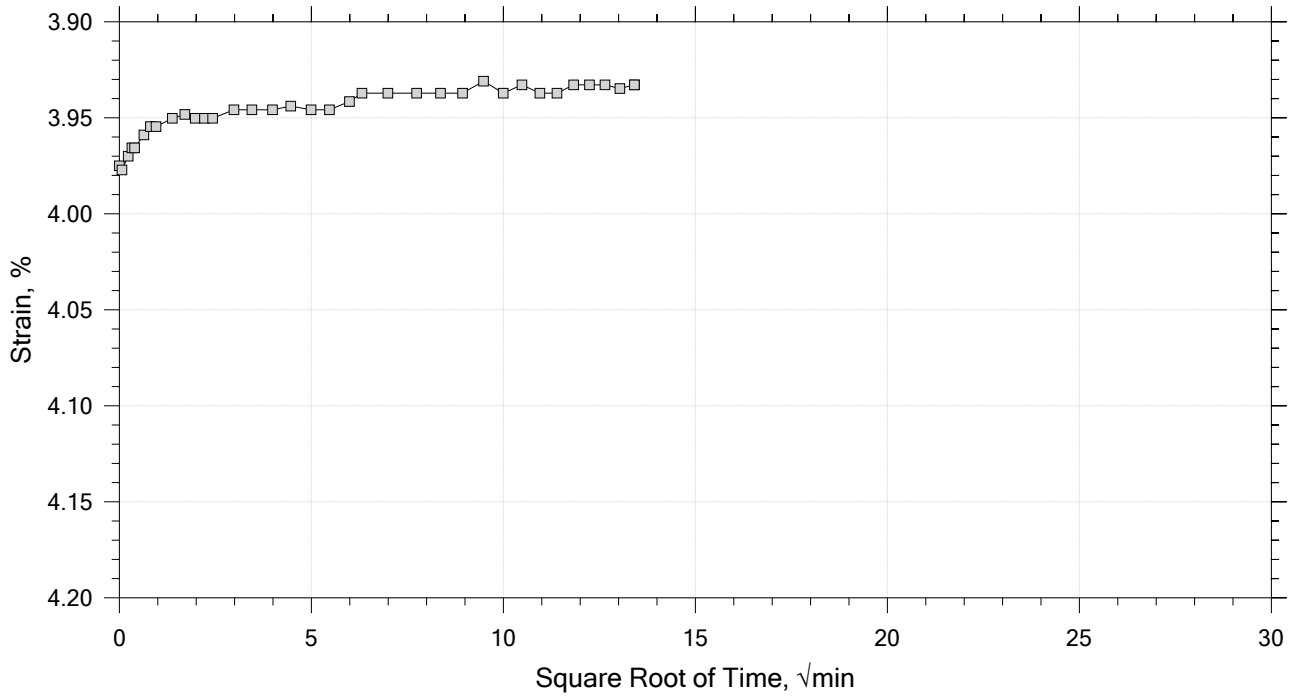
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf





Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.77	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 0.561	Plastic Limit: ---
Final Height: 0.95 in	Final Void Ratio: 0.483	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C-350	RING		A-2465
Mass Container, gm	8.39	109.53	109.53	8.16
Mass Container + Wet Soil, gm	138.52	277.67	277.1	175.22
Mass Container + Dry Soil, gm	118.18	252.21	252.21	150.41
Mass Dry Soil, gm	109.79	142.68	142.68	142.25
Water Content, %	18.53	17.84	17.44	17.44
Void Ratio	---	0.56	0.48	---
Degree of Saturation, %	---	88.06	100.00	---
Dry Unit Weight, pcf	---	110.73	116.56	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test.
Therefore, values may not represent actual values for the specimen.

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0653	0.002490	0.557	0.249	0.000	0.00e+00	3.81e-02	0.00e+00	0.00e+00
2	0.125	0.002949	0.556	0.295	0.000	0.00e+00	7.68e-03	0.00e+00	0.00e+00
3	0.250	0.005354	0.553	0.535	0.000	0.00e+00	1.92e-02	0.00e+00	0.00e+00
4	0.500	0.01034	0.545	1.03	0.000	0.00e+00	1.99e-02	0.00e+00	0.00e+00
5	1.00	0.01740	0.534	1.74	0.190	2.92e-05	1.41e-02	1.11e-03	0.00e+00
6	2.00	0.02503	0.522	2.50	0.000	0.00e+00	7.63e-03	0.00e+00	0.00e+00
7	4.00	0.02936	0.515	2.94	0.000	0.00e+00	2.16e-03	0.00e+00	0.00e+00
8	8.00	0.03294	0.510	3.29	0.000	0.00e+00	8.96e-04	0.00e+00	0.00e+00
9	16.0	0.03969	0.499	3.97	0.000	0.00e+00	8.43e-04	0.00e+00	0.00e+00
10	32.0	0.04710	0.487	4.71	0.000	0.00e+00	4.63e-04	0.00e+00	0.00e+00
11	8.00	0.04478	0.491	4.48	0.000	0.00e+00	9.64e-05	0.00e+00	0.00e+00
12	2.00	0.04386	0.493	4.39	0.000	0.00e+00	1.54e-04	0.00e+00	0.00e+00
13	0.500	0.04161	0.496	4.16	0.000	0.00e+00	1.50e-03	0.00e+00	0.00e+00
14	0.125	0.03922	0.500	3.92	0.000	0.00e+00	6.38e-03	0.00e+00	0.00e+00
15	0.0625	0.03933	0.500	3.93	0.000	0.00e+00	-1.71e-03	-0.00e+00	0.00e+00

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

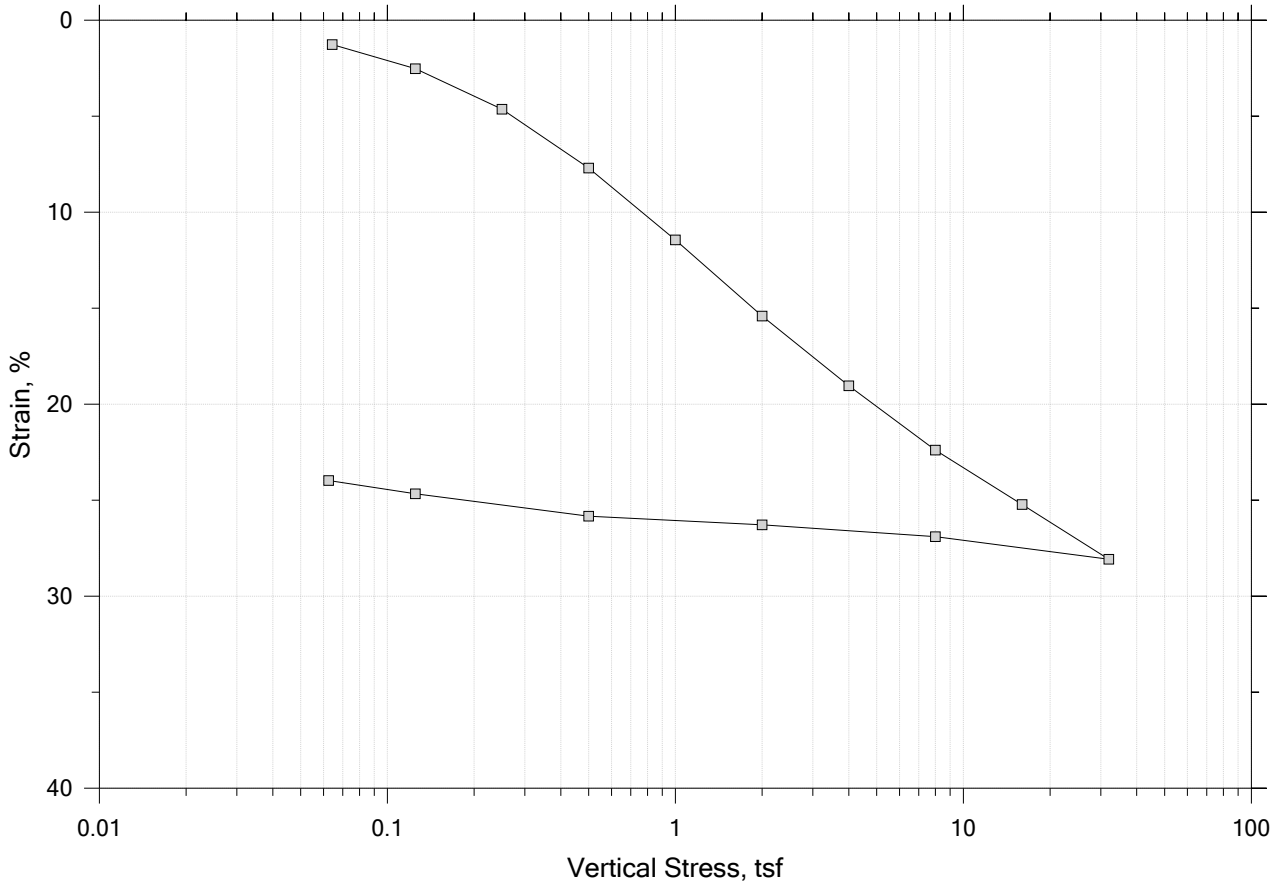
Square Root of Time Coefficients

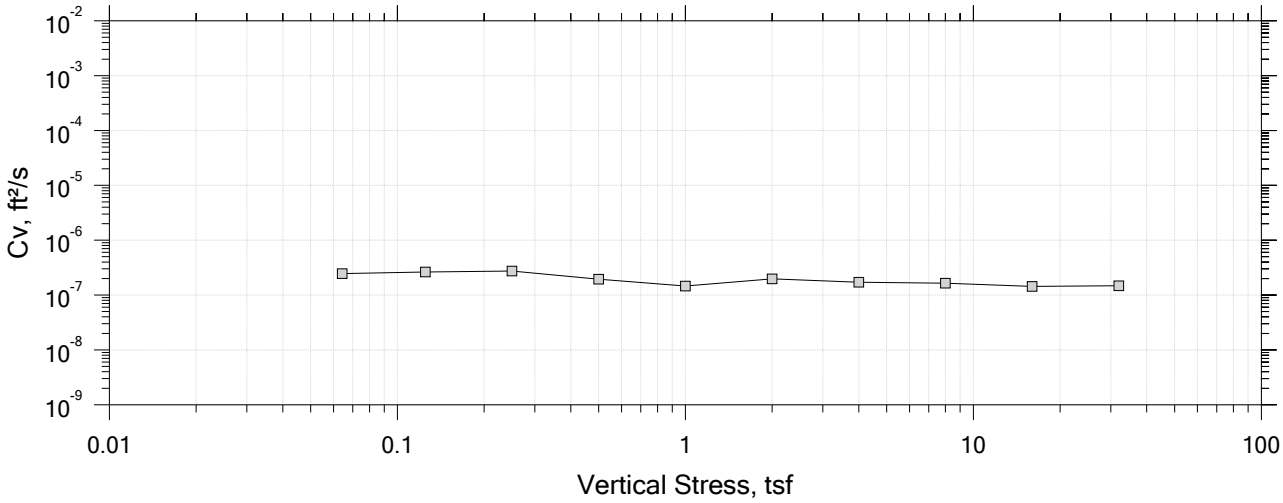
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0653	0.002490	0.557	0.249	3.227	7.59e-06	3.81e-02	7.80e-04
2	0.125	0.002949	0.556	0.295	12.428	1.96e-06	7.68e-03	4.07e-05
3	0.250	0.005354	0.553	0.535	2.426	1.00e-05	1.92e-02	5.20e-04
4	0.500	0.01034	0.545	1.03	12.207	1.98e-06	1.99e-02	1.06e-04
5	1.00	0.01740	0.534	1.74	0.877	2.72e-05	1.41e-02	1.04e-03
6	2.00	0.02503	0.522	2.50	15.578	1.51e-06	7.63e-03	3.11e-05
7	4.00	0.02936	0.515	2.94	39.909	5.82e-07	2.16e-03	3.39e-06
8	8.00	0.03294	0.510	3.29	29.911	7.70e-07	8.96e-04	1.86e-06
9	16.0	0.03969	0.499	3.97	38.679	5.89e-07	8.43e-04	1.34e-06
10	32.0	0.04710	0.487	4.71	24.912	9.01e-07	4.63e-04	1.13e-06
11	8.00	0.04478	0.491	4.48	0.000	0.00e+00	9.64e-05	0.00e+00
12	2.00	0.04386	0.493	4.39	0.000	0.00e+00	1.54e-04	0.00e+00
13	0.500	0.04161	0.496	4.16	8.912	2.52e-06	1.50e-03	1.02e-05
14	0.125	0.03922	0.500	3.92	0.410	5.51e-05	6.38e-03	9.48e-04
15	0.0625	0.03933	0.500	3.93	86.782	2.61e-07	-1.71e-03	-1.20e-06

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB033	Tested By: md	Checked By: njh
Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
Test No.: IP-1	Sample Type: intact	Elevation: ---
Description: Moist, light brown sandy clay		
Remarks: System Y, Swell Pressure = 0.0653 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





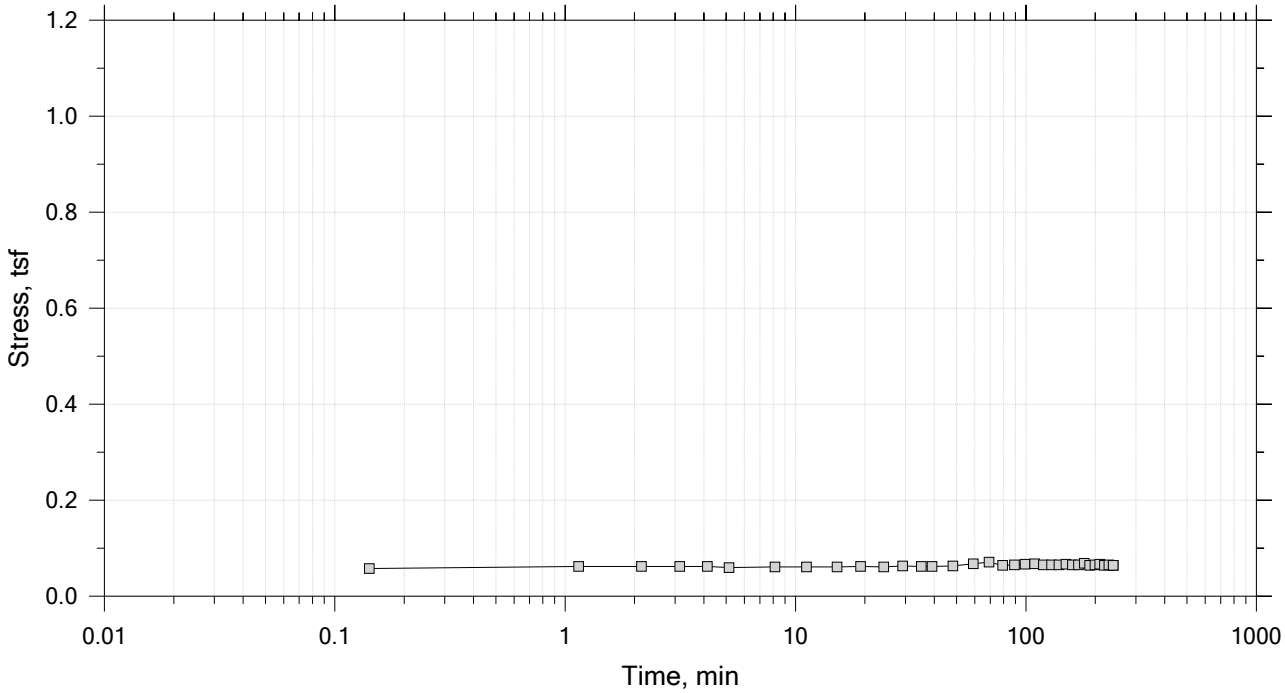
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		
	Displacement at End of Increment		

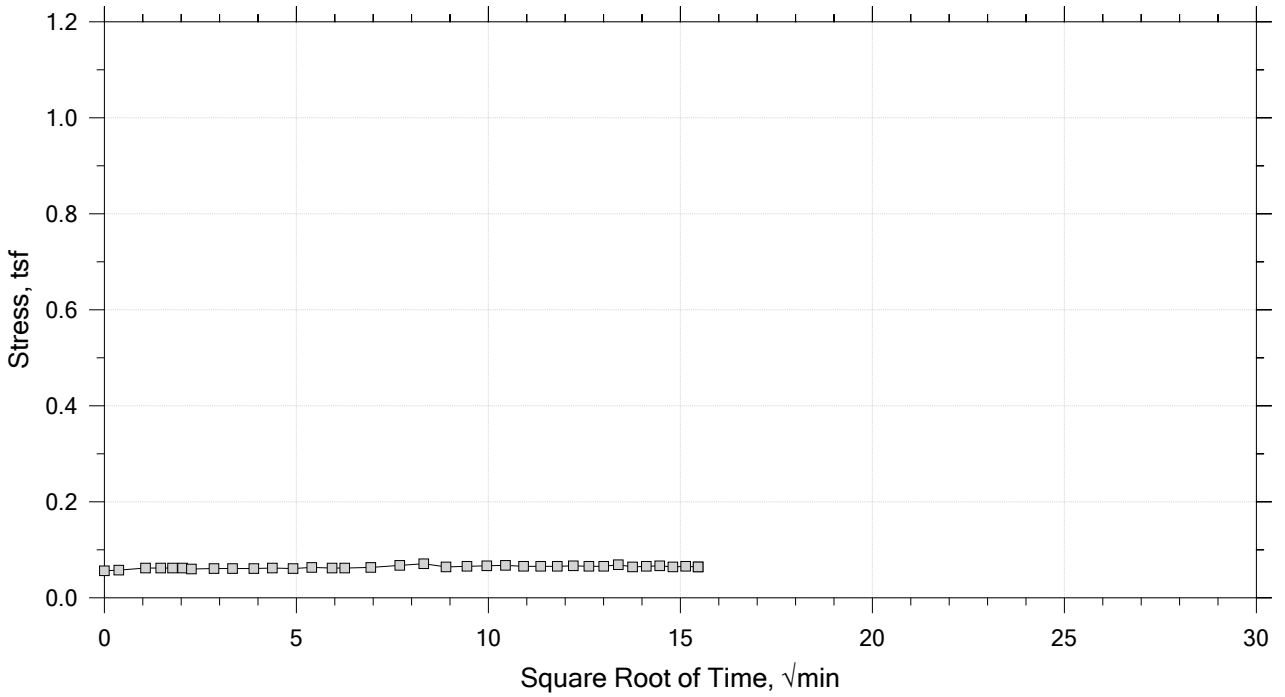
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15

Constant Volume Step

Stress: 0.0643 tsf





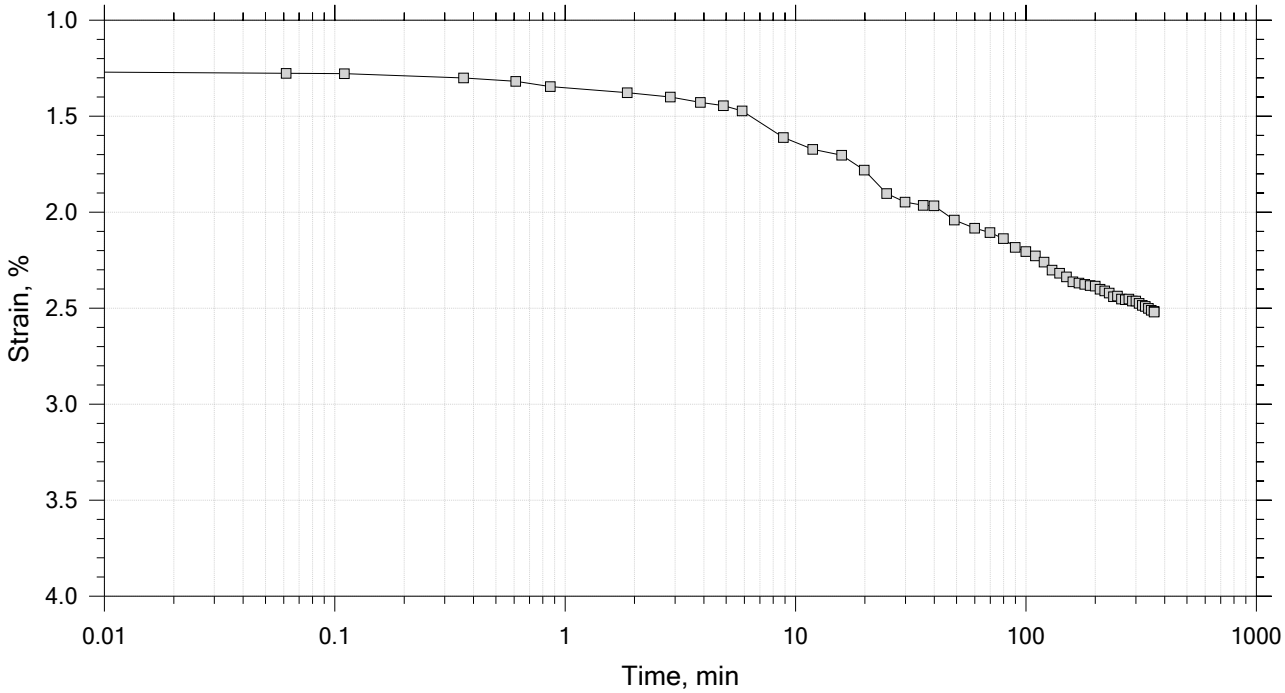
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

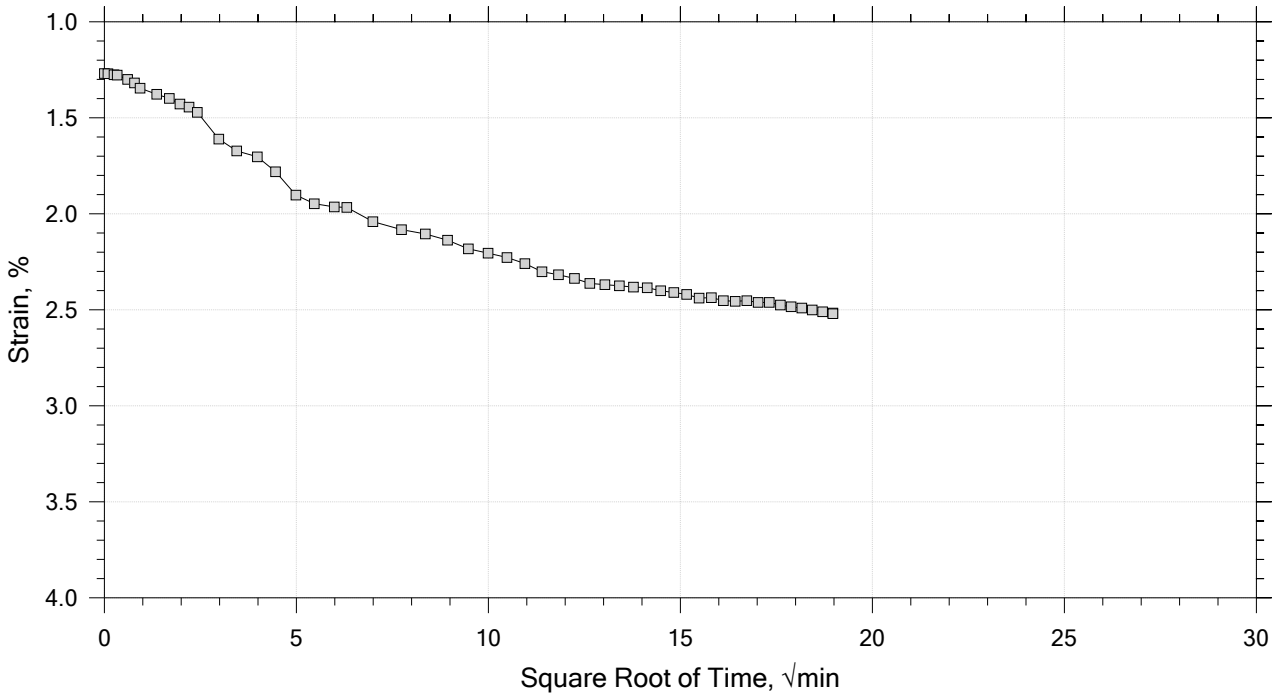
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf





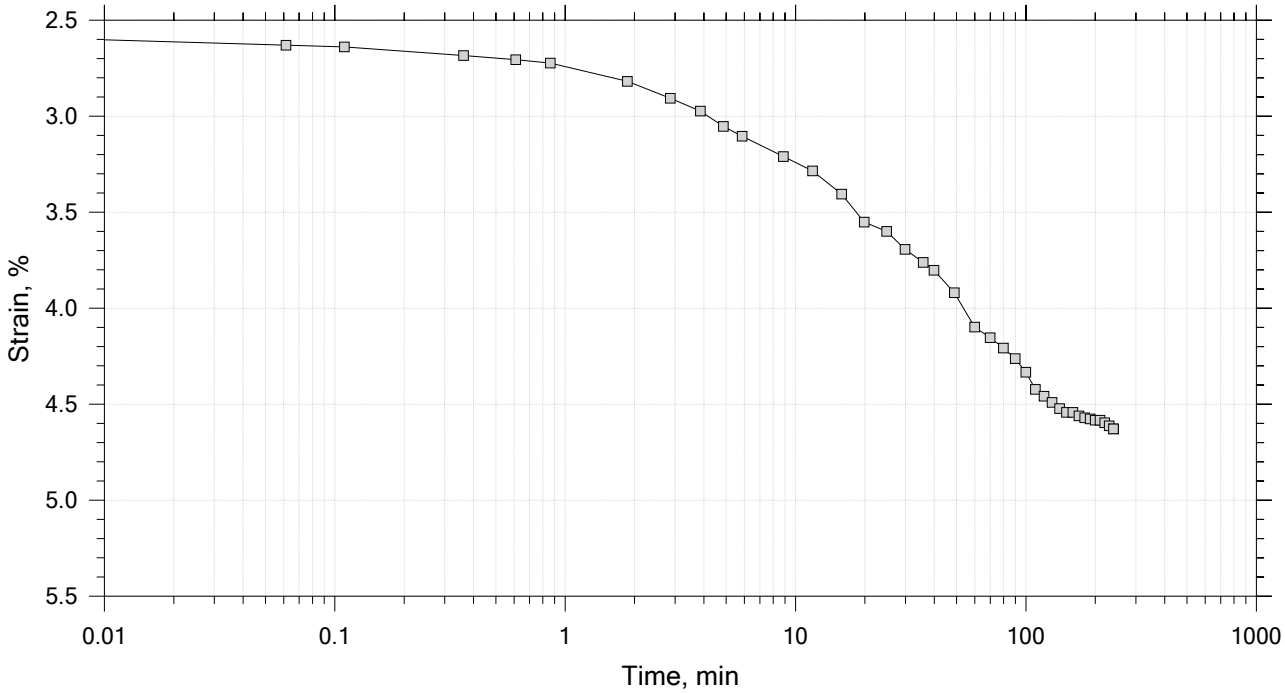
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

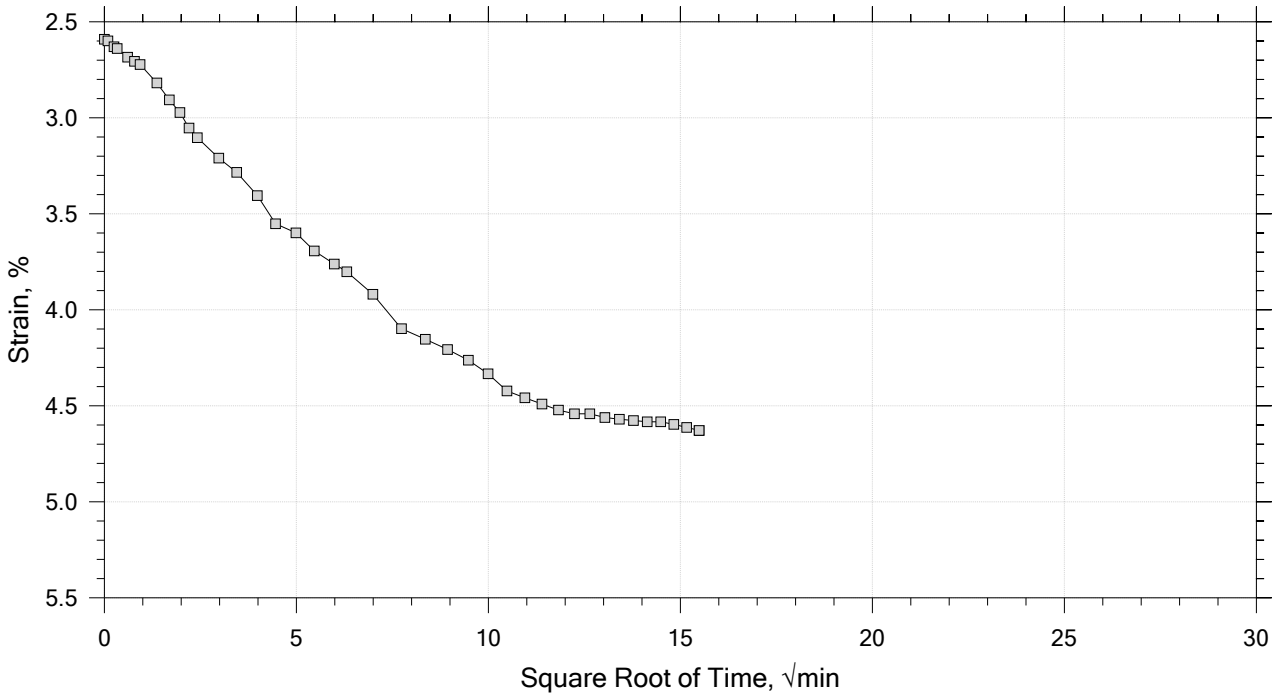
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf





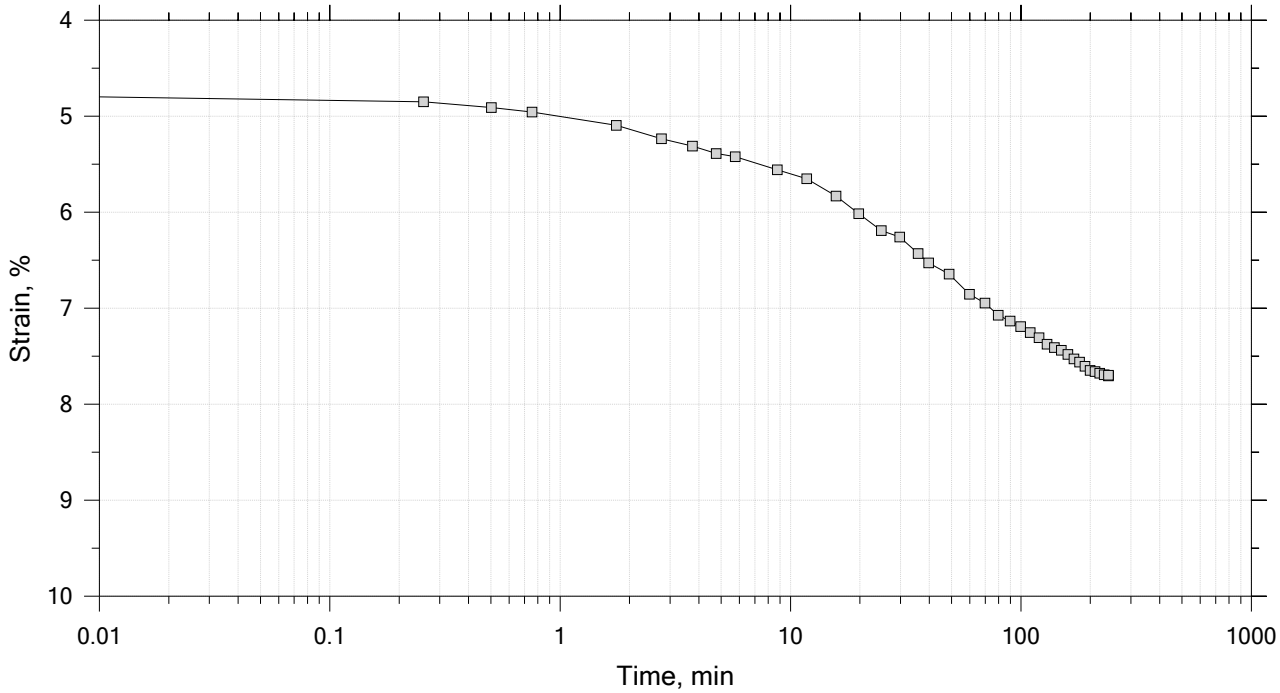
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

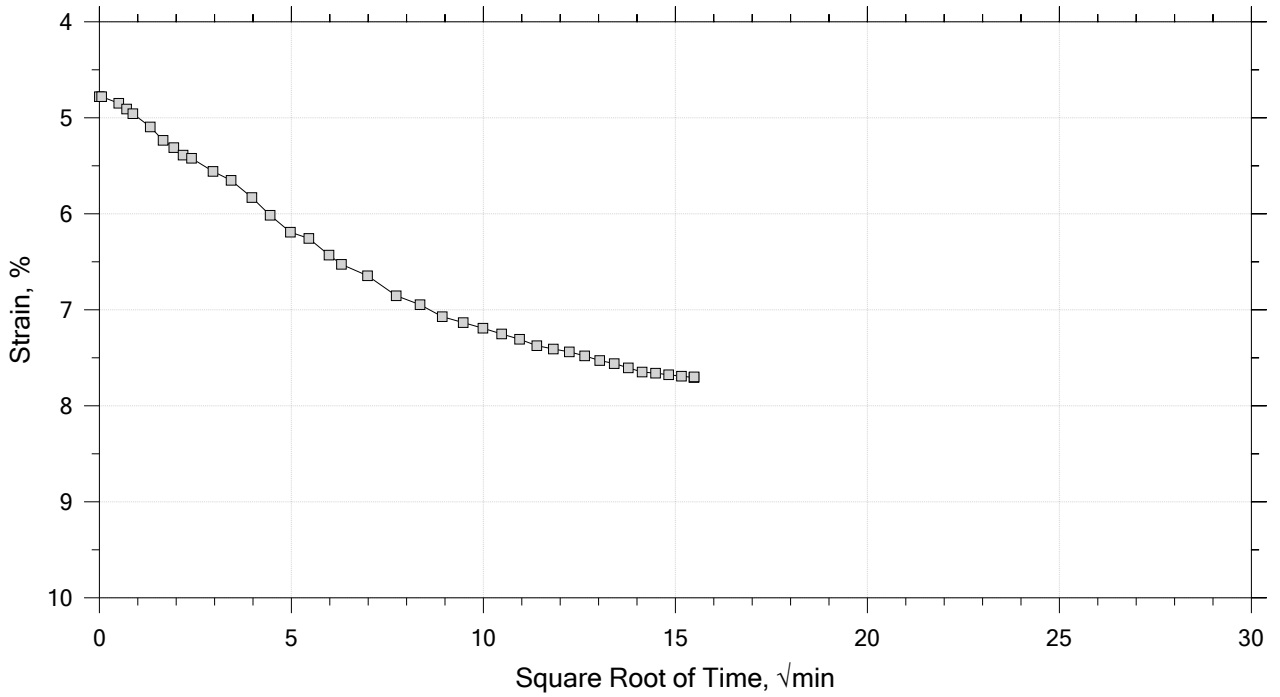
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





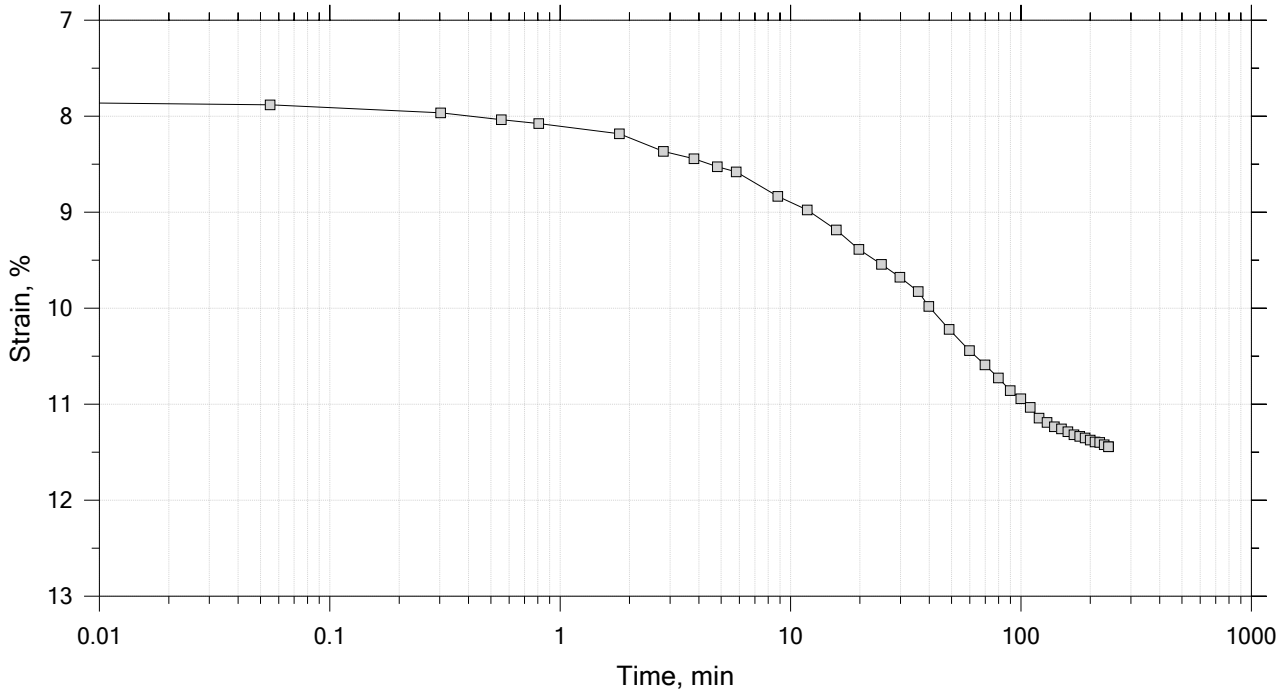
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

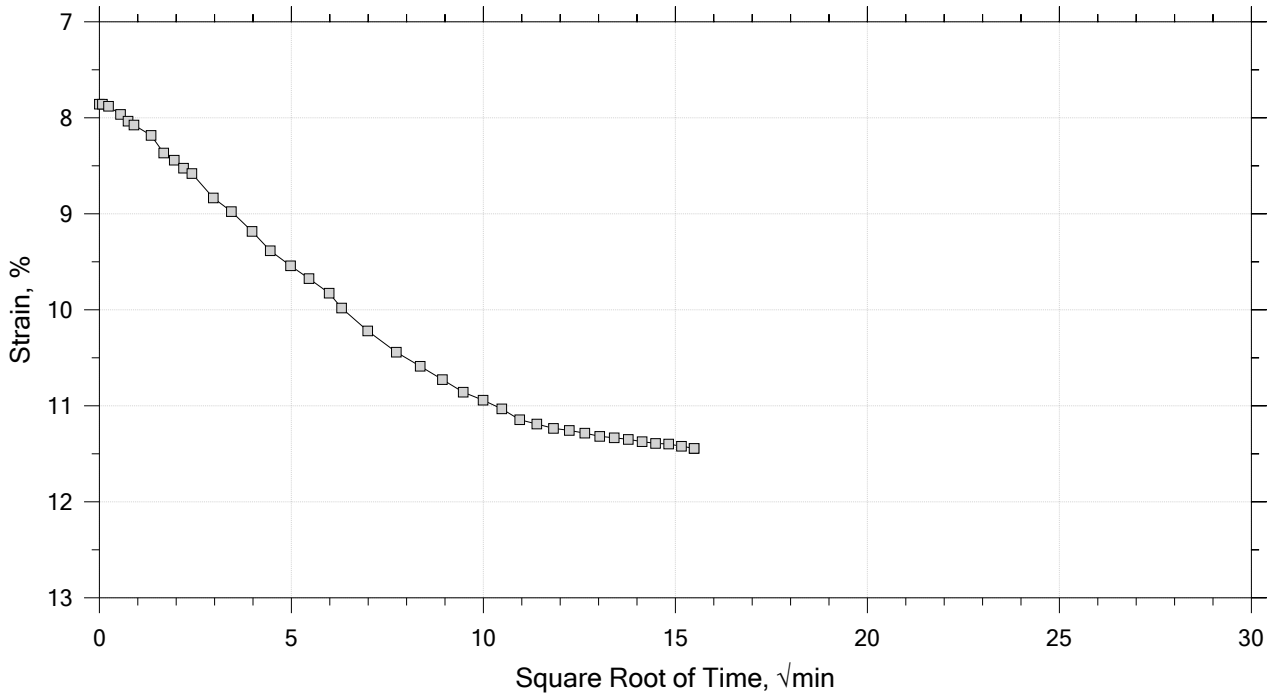
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





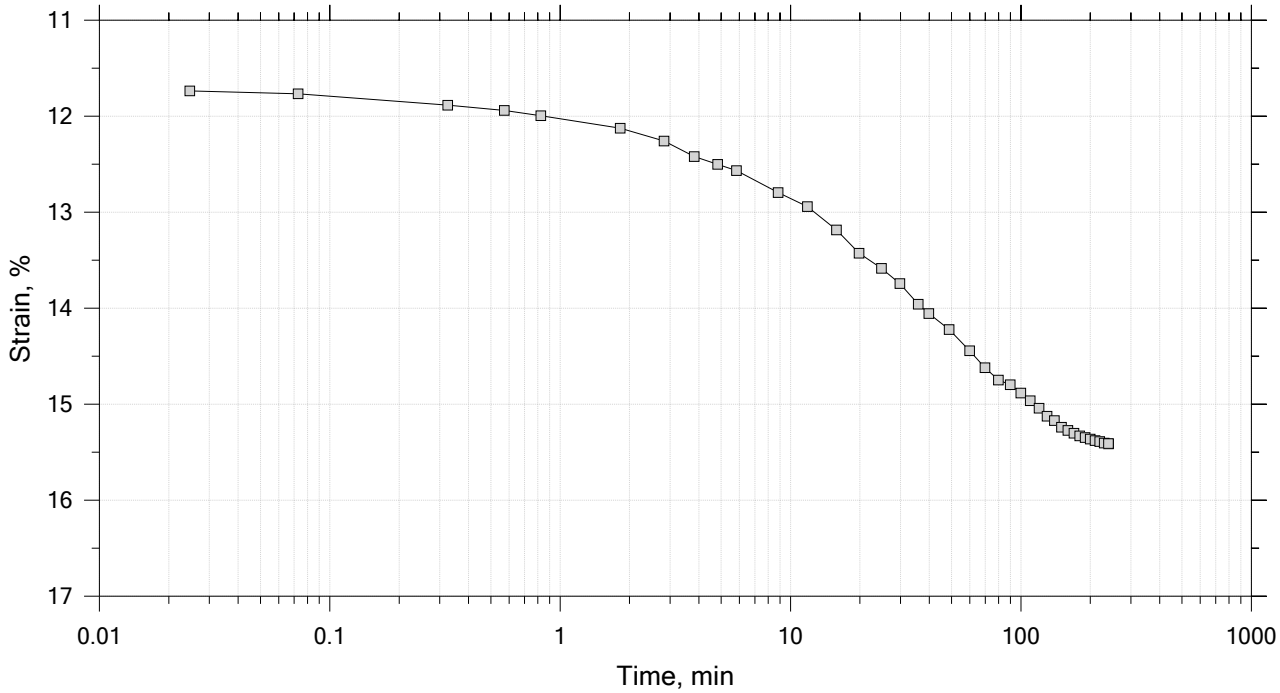
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

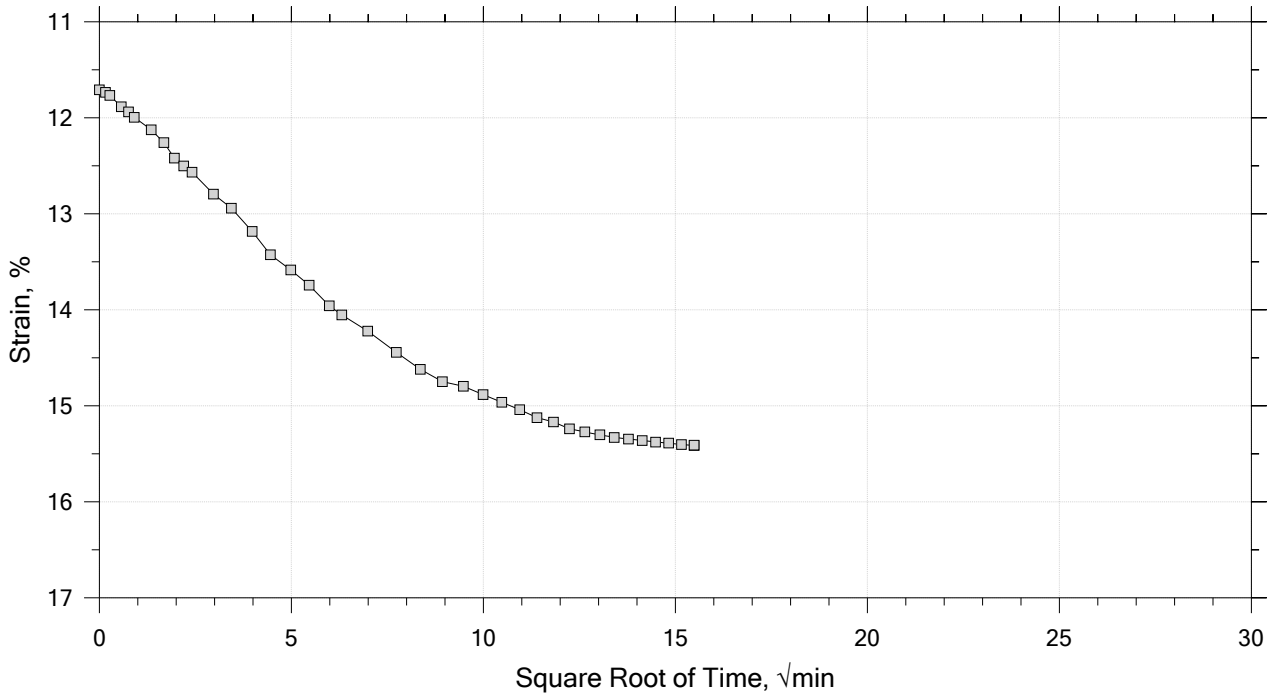
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





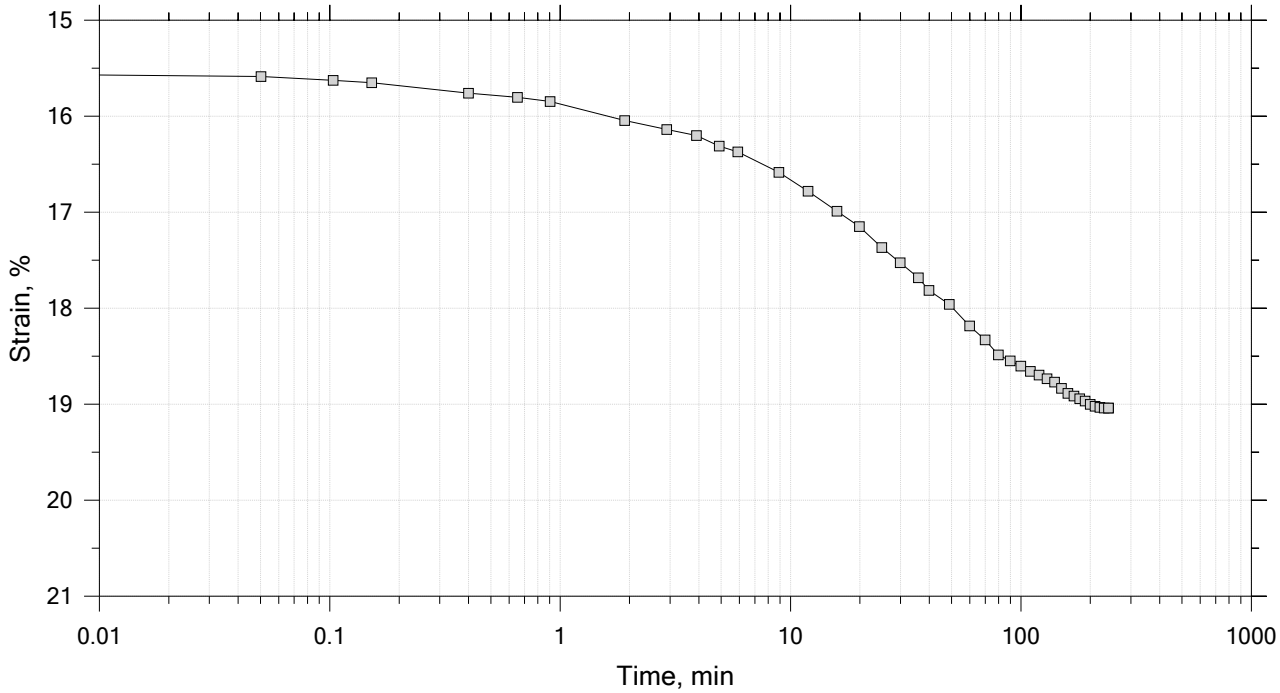
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

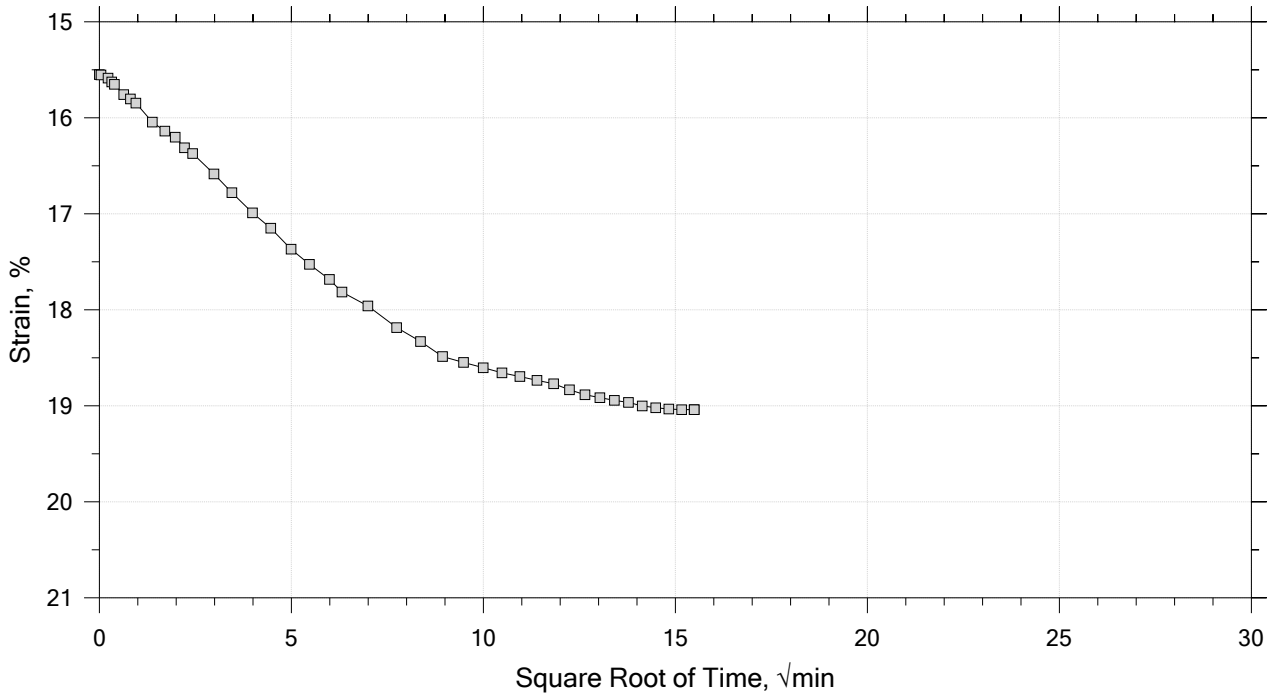
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





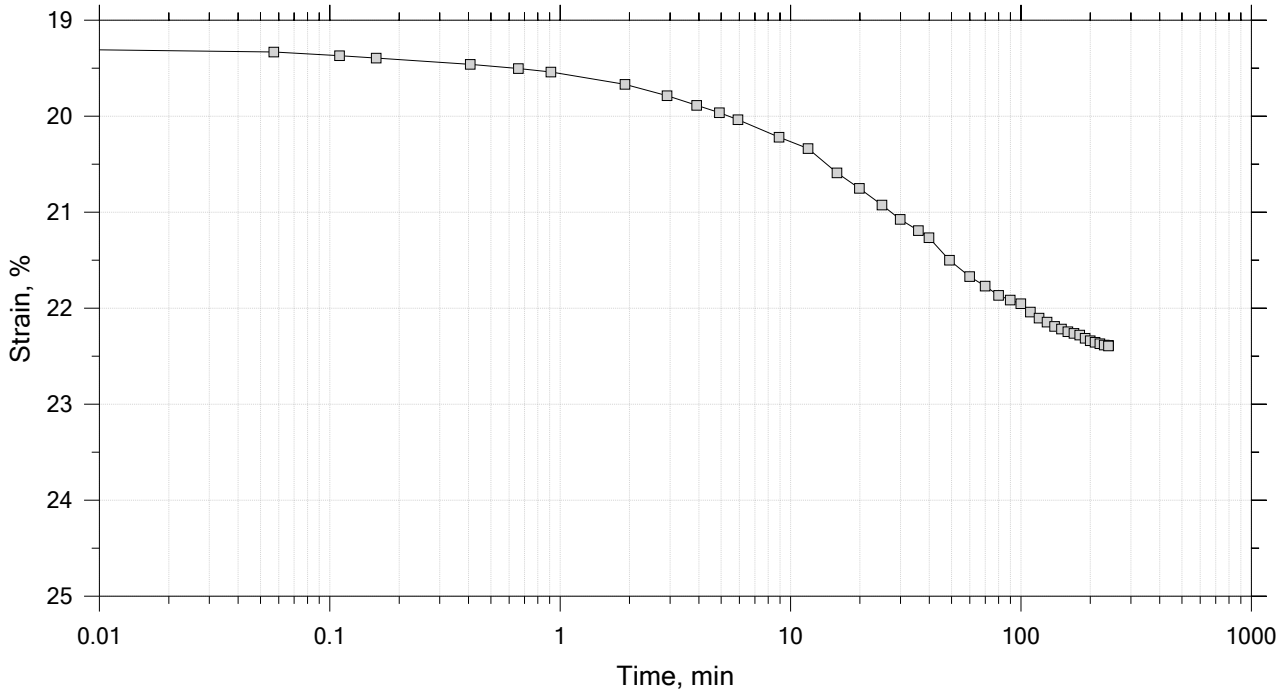
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

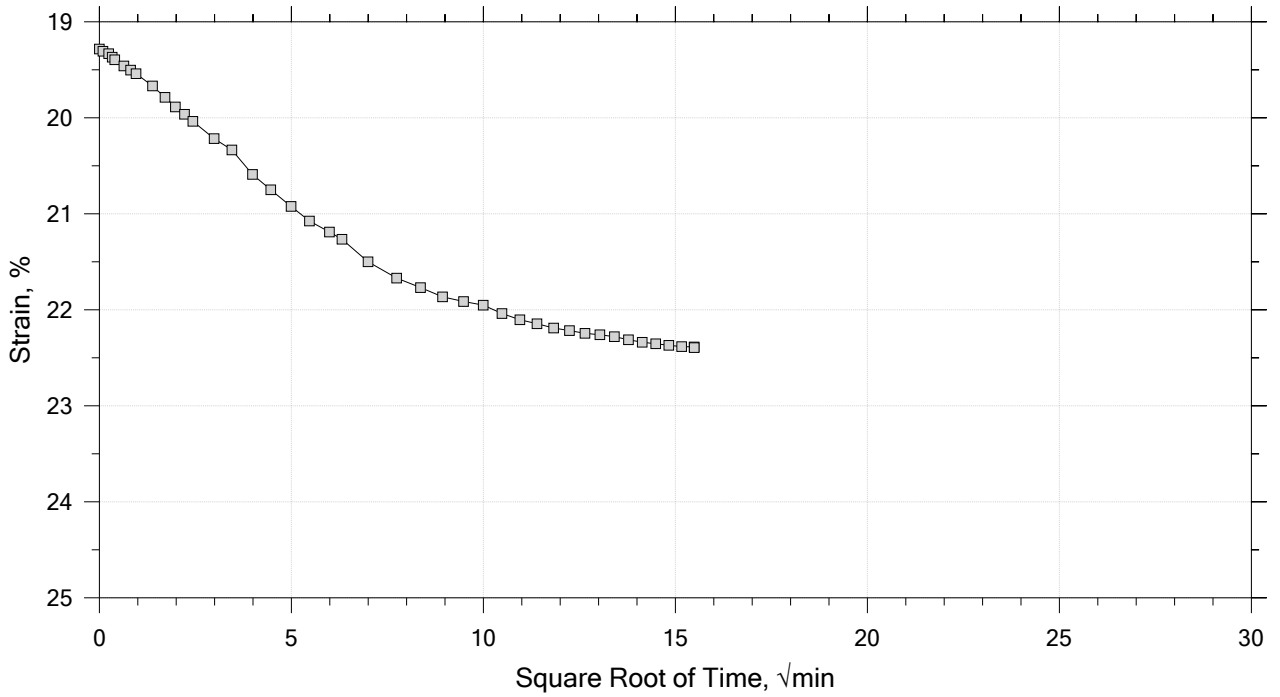
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





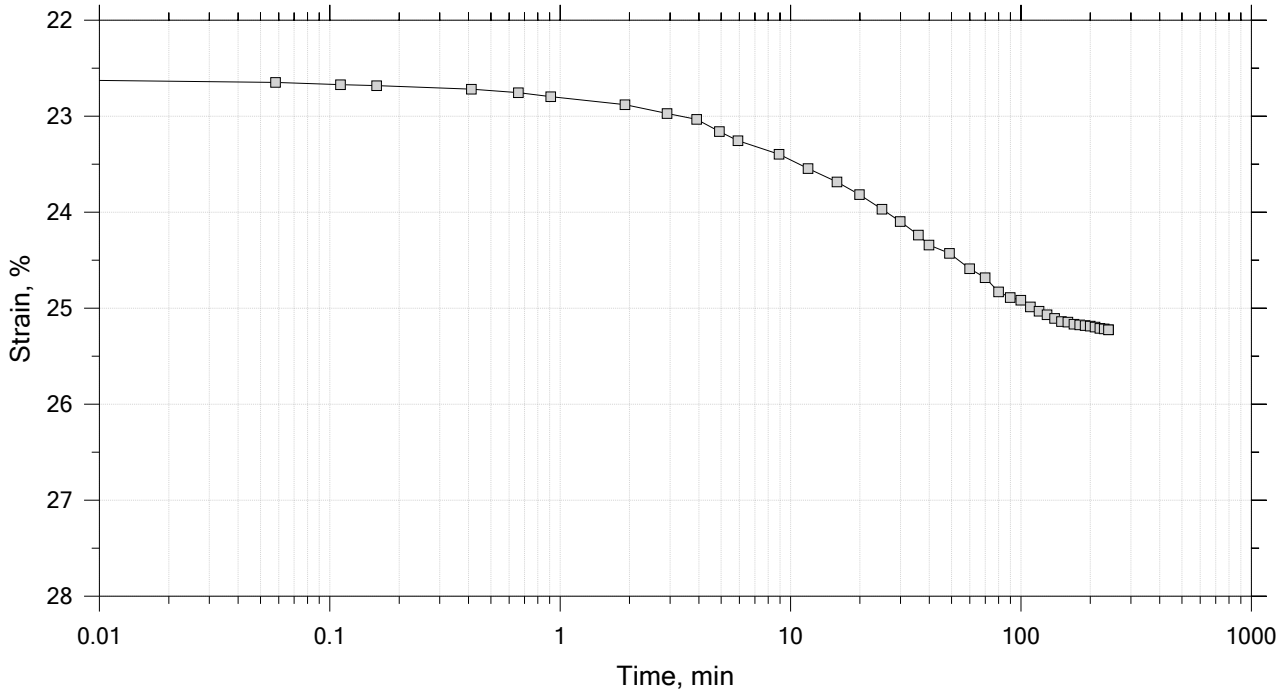
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

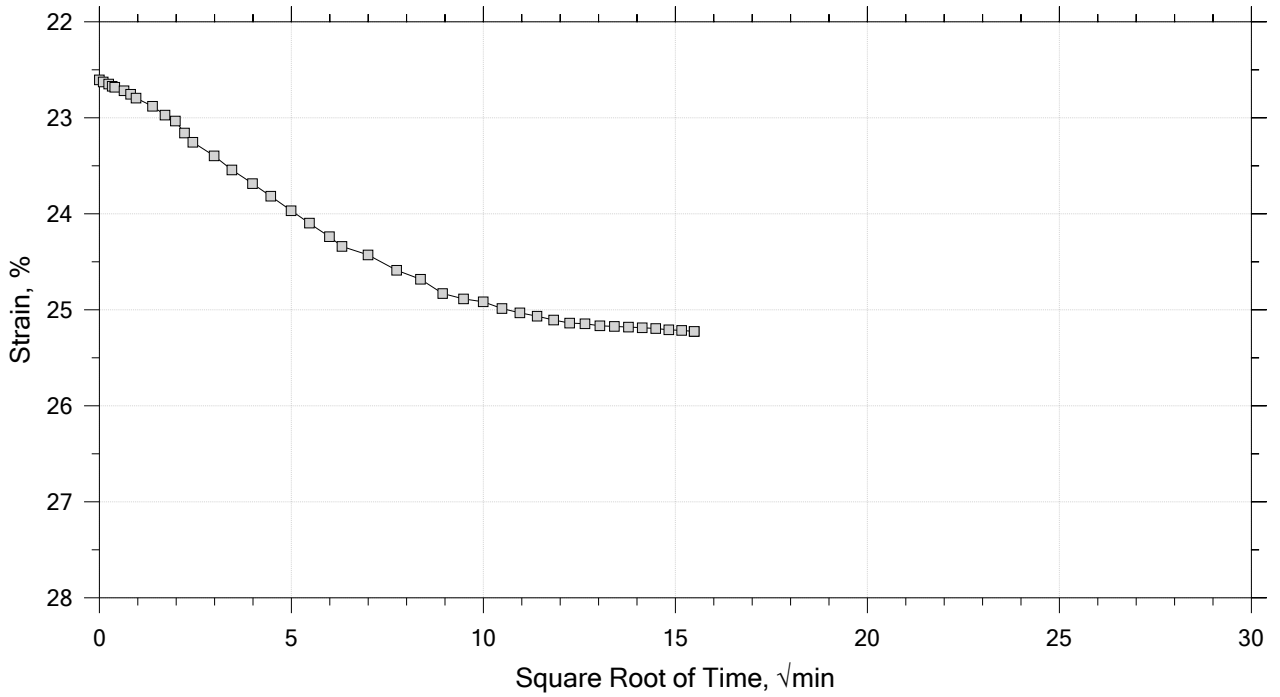
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





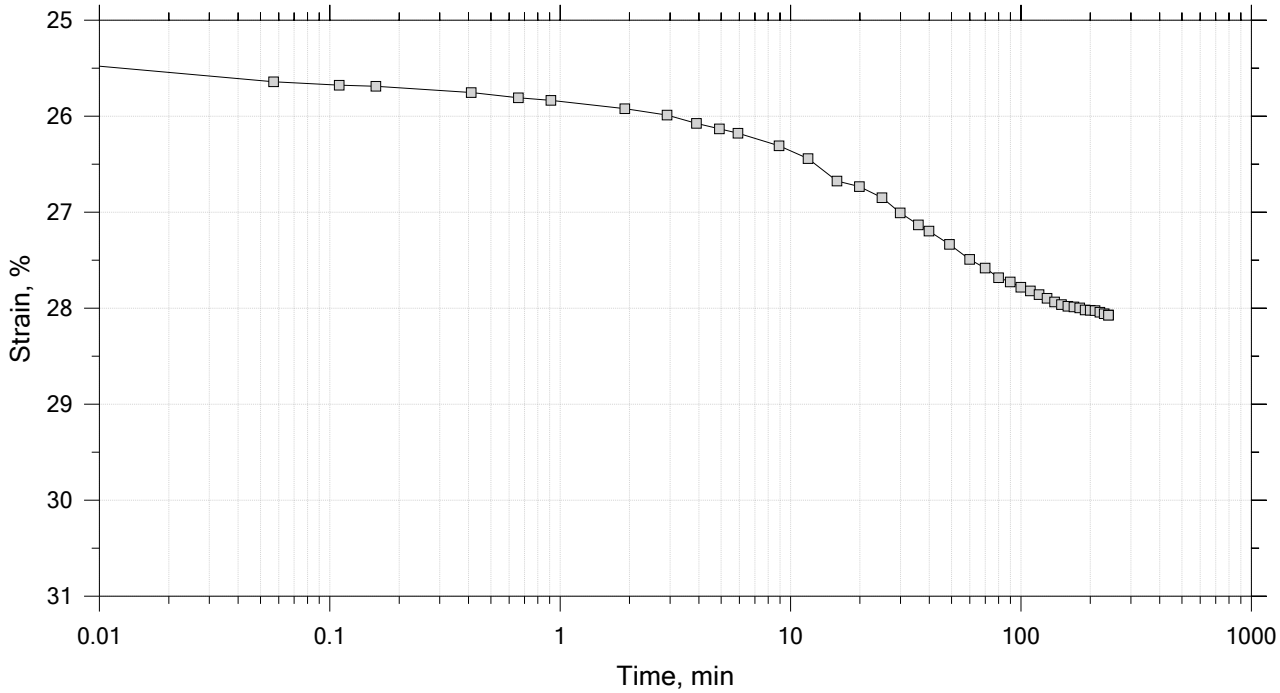
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

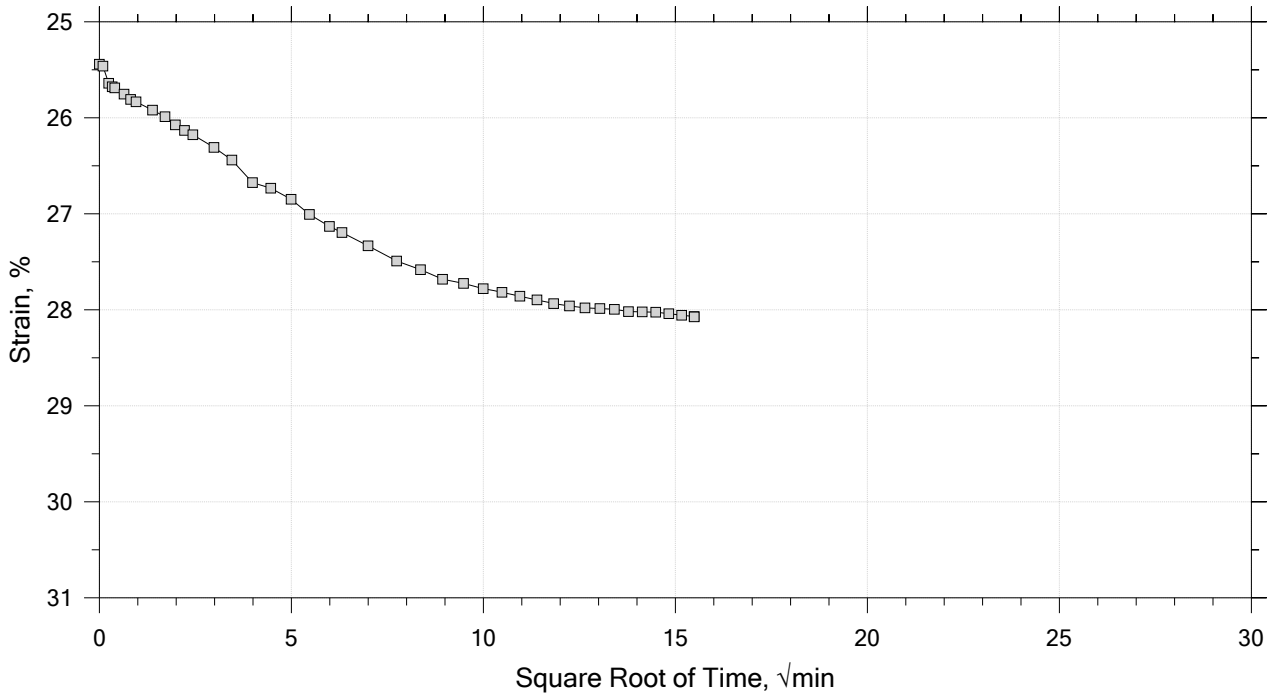
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf





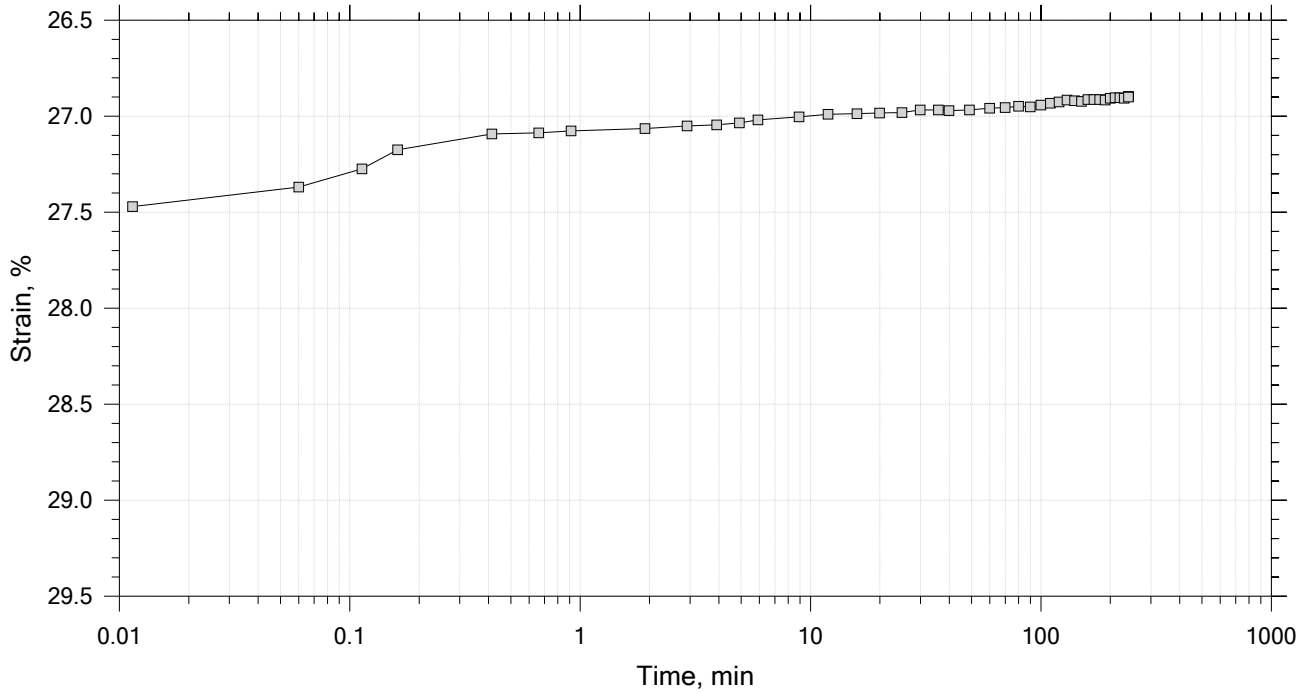
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

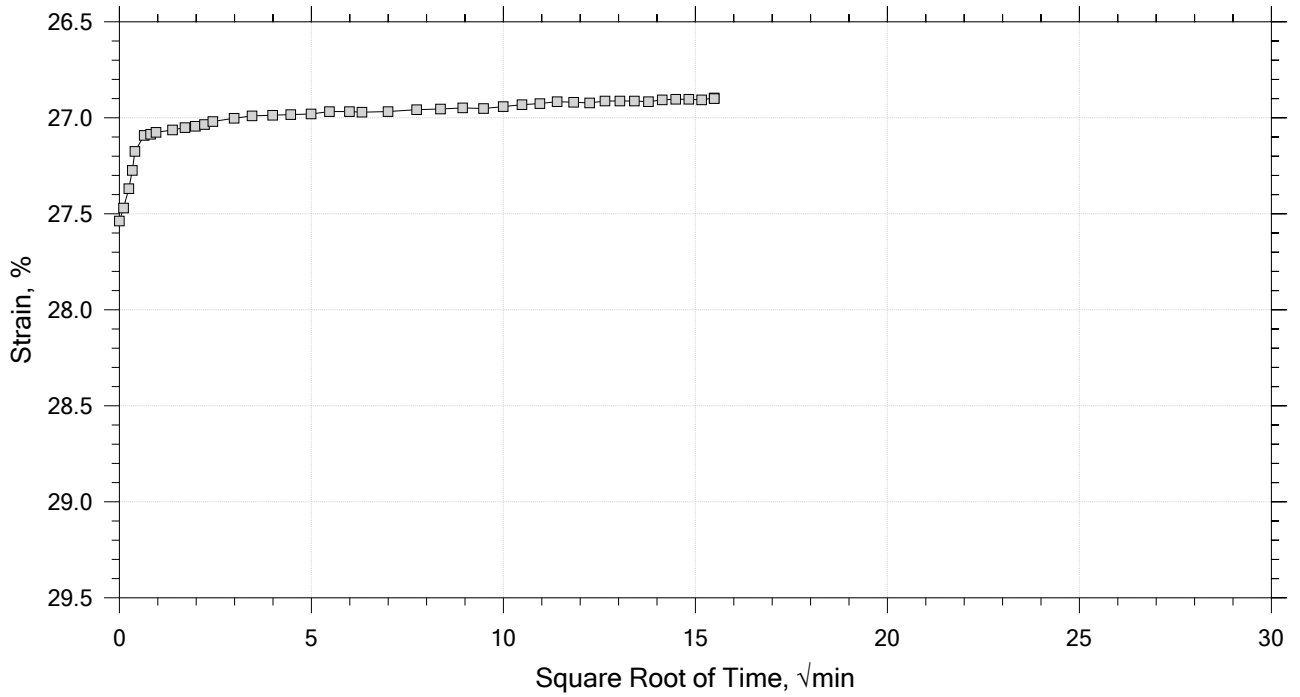
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf





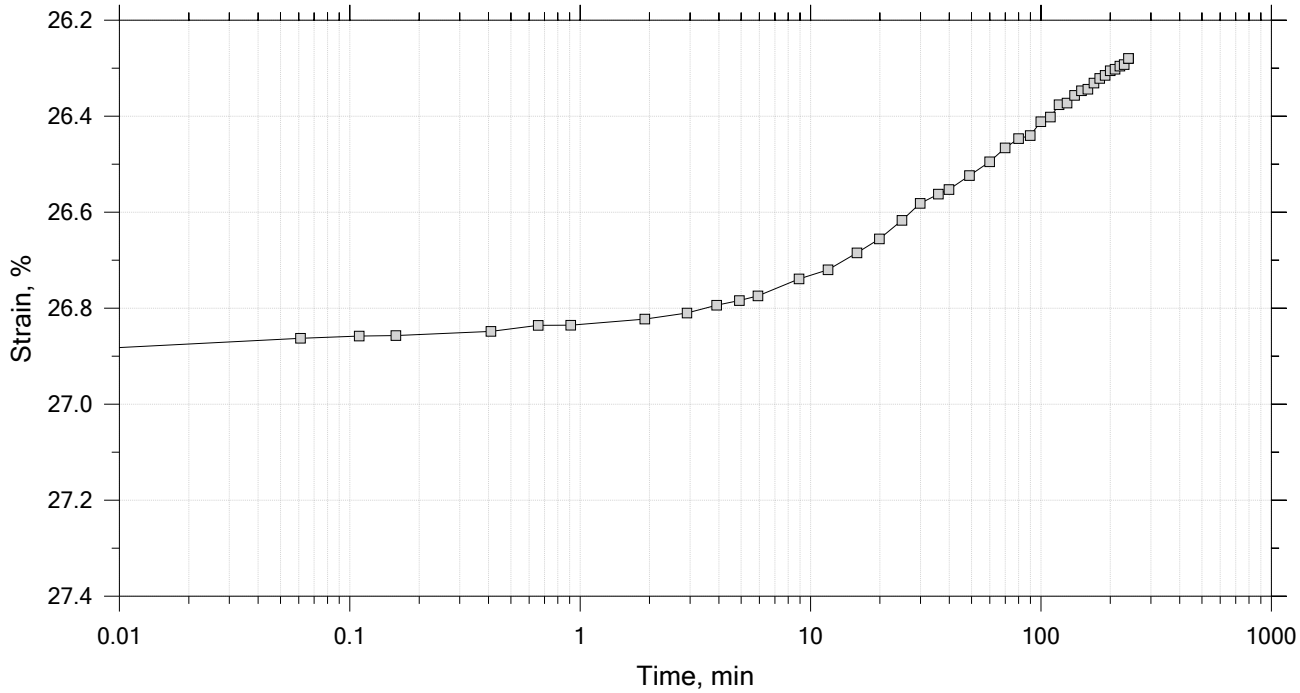
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

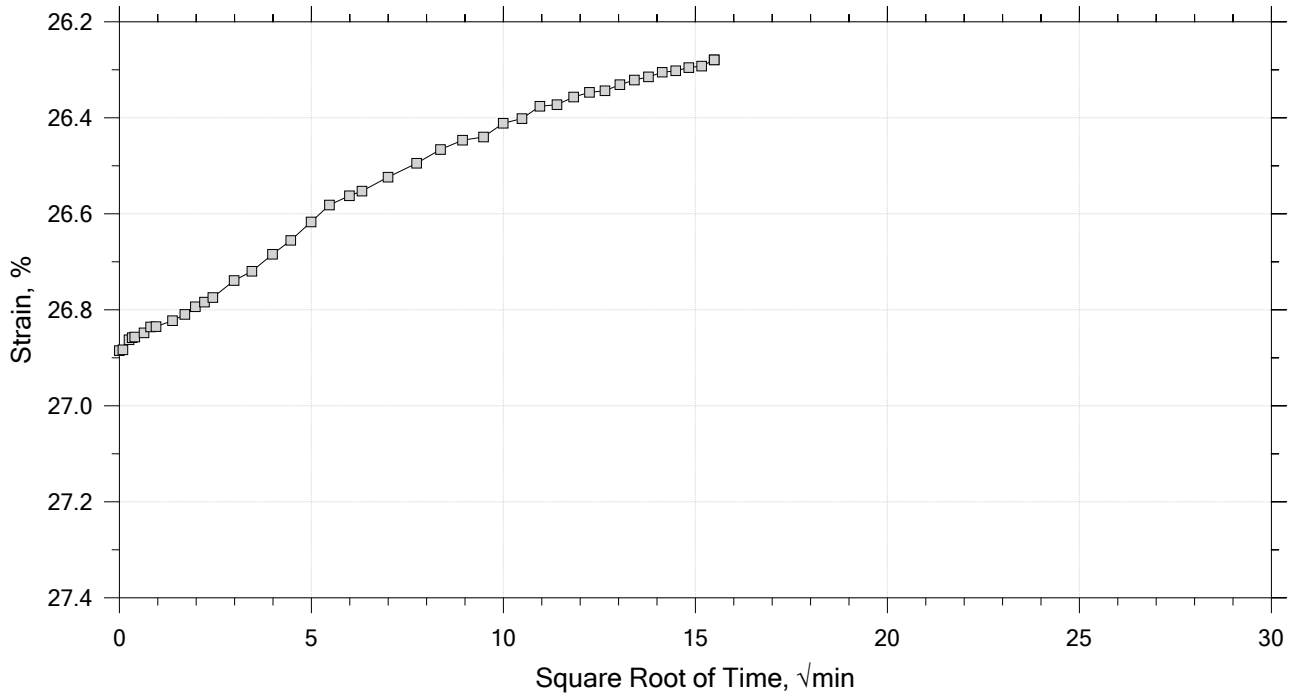
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf





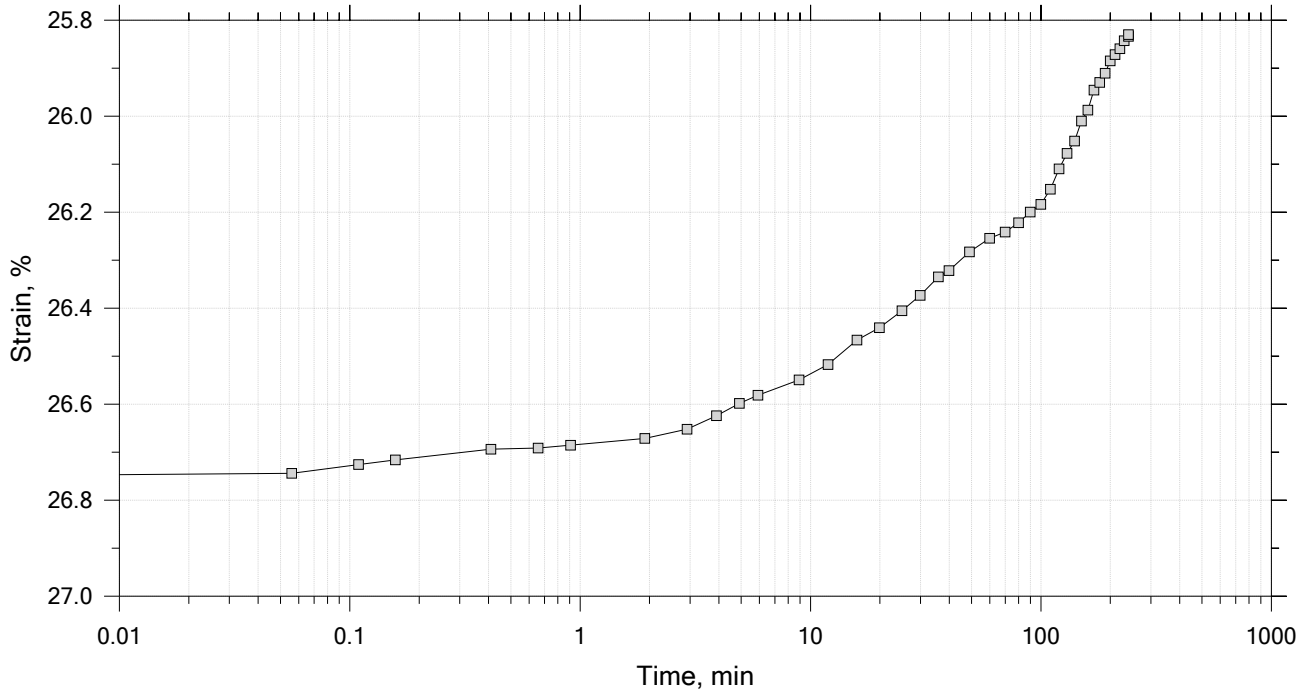
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

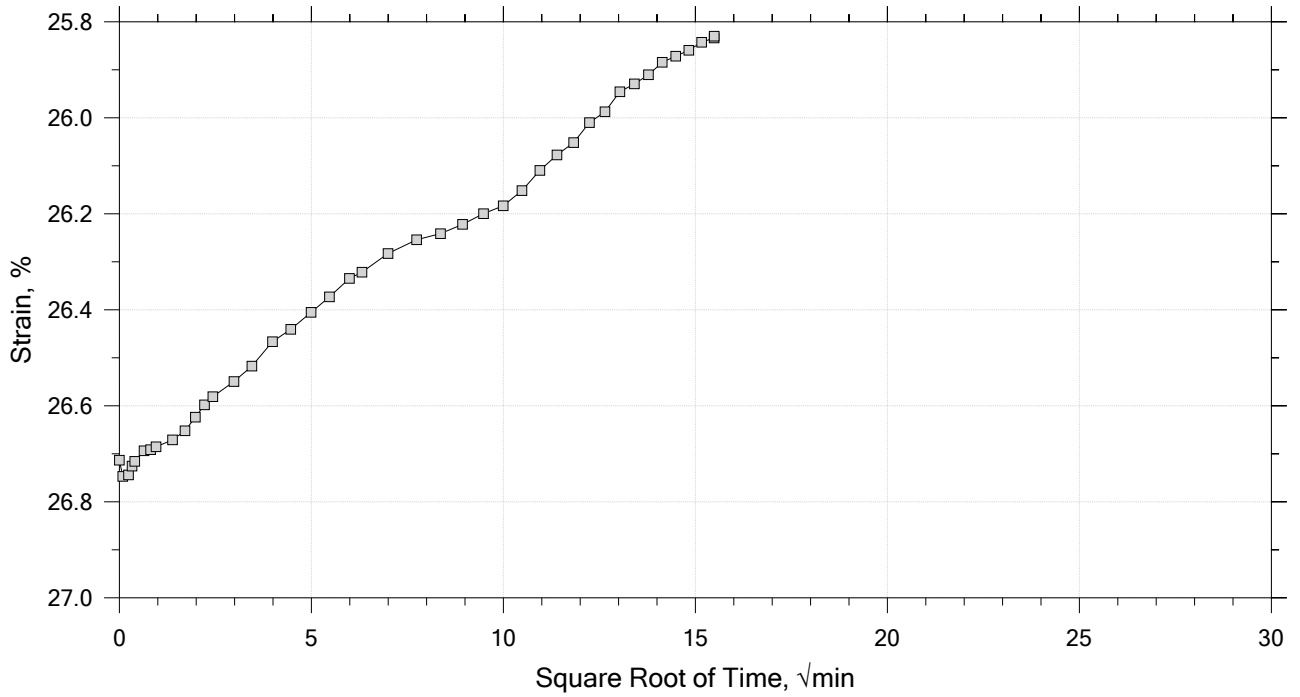
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf





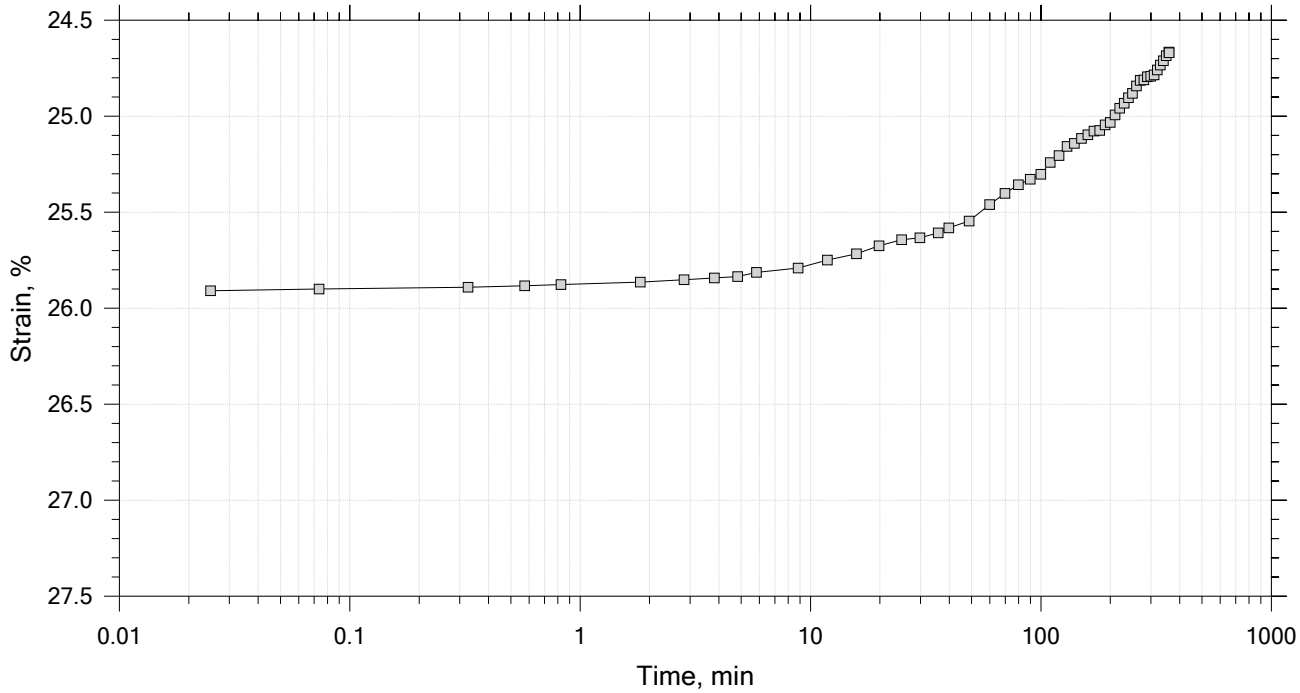
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

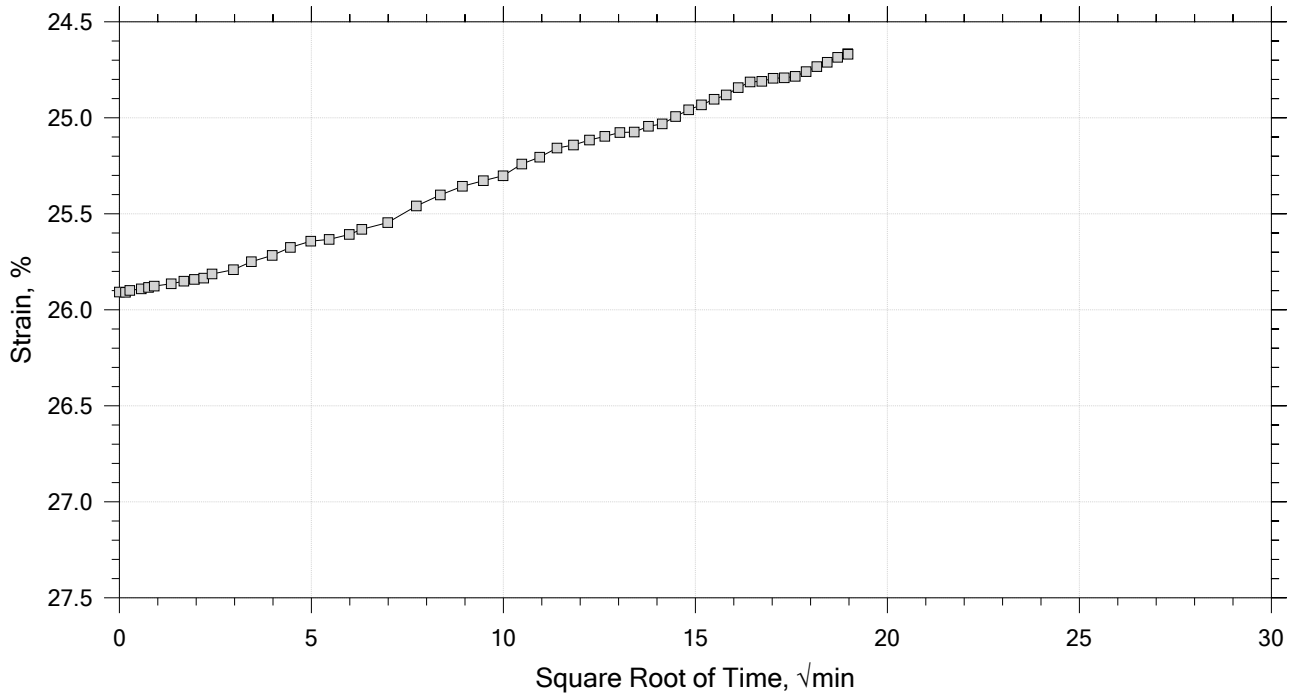
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf





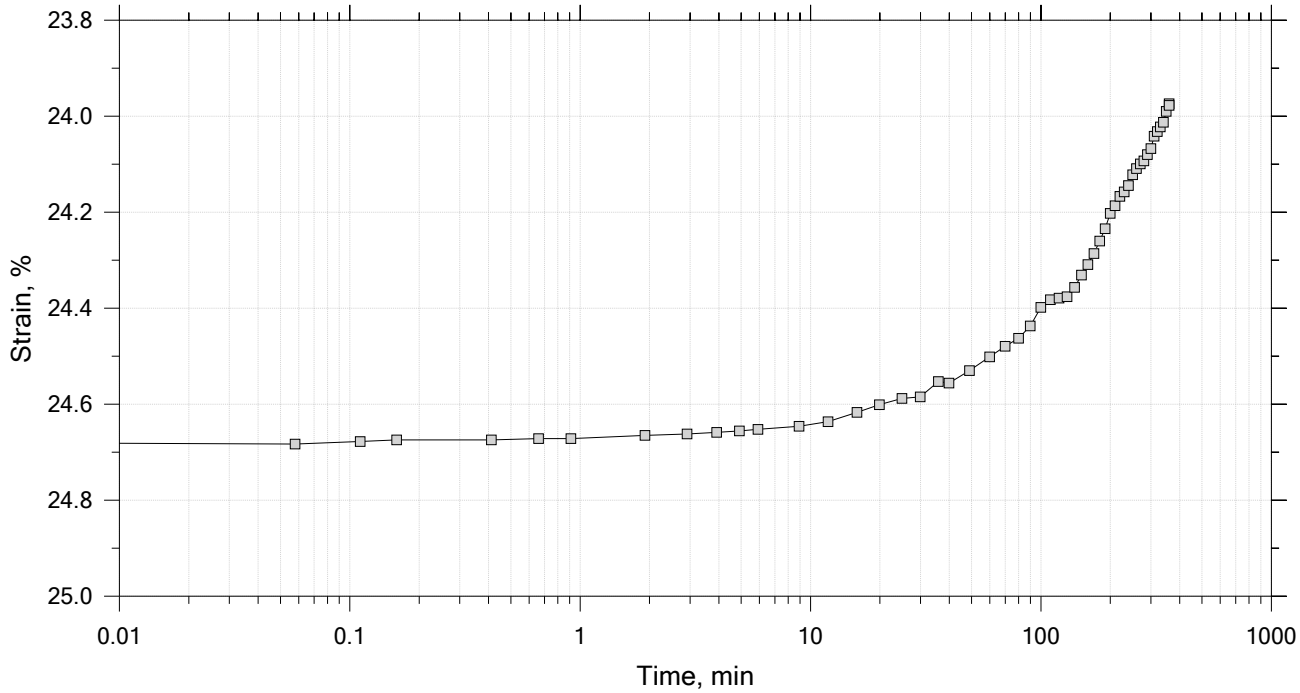
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

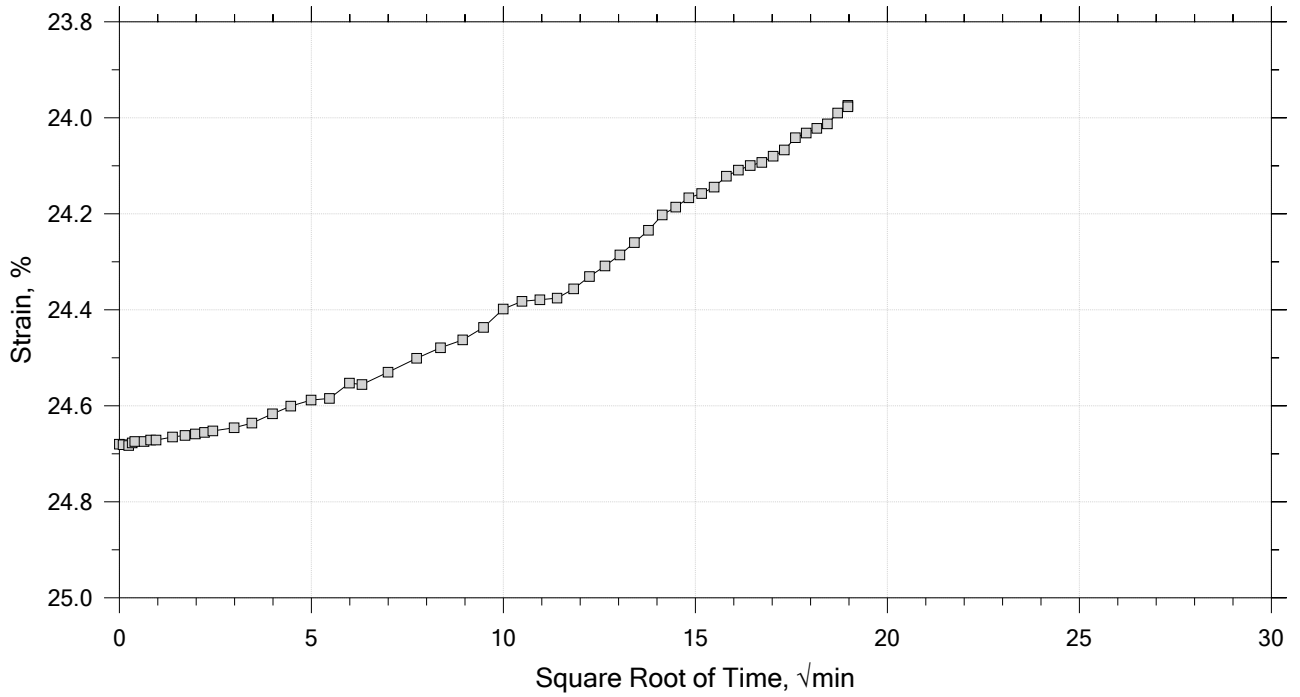
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf





Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.67	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 0.953	Plastic Limit: ---
Final Height: 0.77 in	Final Void Ratio: 0.504	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A2541	RING		A-1376
Mass Container, gm	8.24	110.88	110.88	8.21
Mass Container + Wet Soil, gm	238.58	259.95	241.45	138.22
Mass Container + Dry Soil, gm	181.51	220.69	220.69	117.55
Mass Dry Soil, gm	173.27	109.81	109.81	109.34
Water Content, %	32.94	35.75	18.90	18.90
Void Ratio	---	0.95	0.50	---
Degree of Saturation, %	---	100.00	100.00	---
Dry Unit Weight, pcf	---	85.222	110.68	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test.
Therefore, values may not represent actual values for the specimen.

GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0643	0.01265	0.929	1.26	20.960	2.69e-07	1.97e-01	1.42e-04	0.00e+00
2	0.125	0.02520	0.904	2.52	0.000	0.00e+00	2.07e-01	0.00e+00	0.00e+00
3	0.250	0.04628	0.863	4.63	0.000	0.00e+00	1.69e-01	0.00e+00	0.00e+00
4	0.500	0.07699	0.803	7.70	22.369	2.24e-07	1.23e-01	7.43e-05	0.00e+00
5	1.00	0.1144	0.730	11.4	30.831	1.51e-07	7.49e-02	3.05e-05	0.00e+00
6	2.00	0.1541	0.652	15.4	22.336	1.91e-07	3.97e-02	2.05e-05	0.00e+00
7	4.00	0.1904	0.581	19.0	22.559	1.73e-07	1.81e-02	8.47e-06	0.00e+00
8	8.00	0.2239	0.516	22.4	23.317	1.54e-07	8.38e-03	3.47e-06	0.00e+00
9	16.0	0.2523	0.461	25.2	22.954	1.44e-07	3.54e-03	1.38e-06	0.00e+00
10	32.0	0.2807	0.405	28.1	22.624	1.36e-07	1.78e-03	6.51e-07	0.00e+00
11	8.00	0.2690	0.428	26.9	0.147	2.03e-05	4.89e-04	2.68e-05	0.00e+00
12	2.00	0.2628	0.440	26.3	0.000	0.00e+00	1.03e-03	0.00e+00	0.00e+00
13	0.500	0.2583	0.449	25.8	0.000	0.00e+00	3.00e-03	0.00e+00	0.00e+00
14	0.125	0.2467	0.472	24.7	0.000	0.00e+00	3.10e-02	0.00e+00	0.00e+00
15	0.0625	0.2398	0.485	24.0	0.000	0.00e+00	1.11e-01	0.00e+00	0.00e+00

GeoTesting EXPRESS

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		
Displacement at End of Increment		

Attachment Figure A.4-312

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

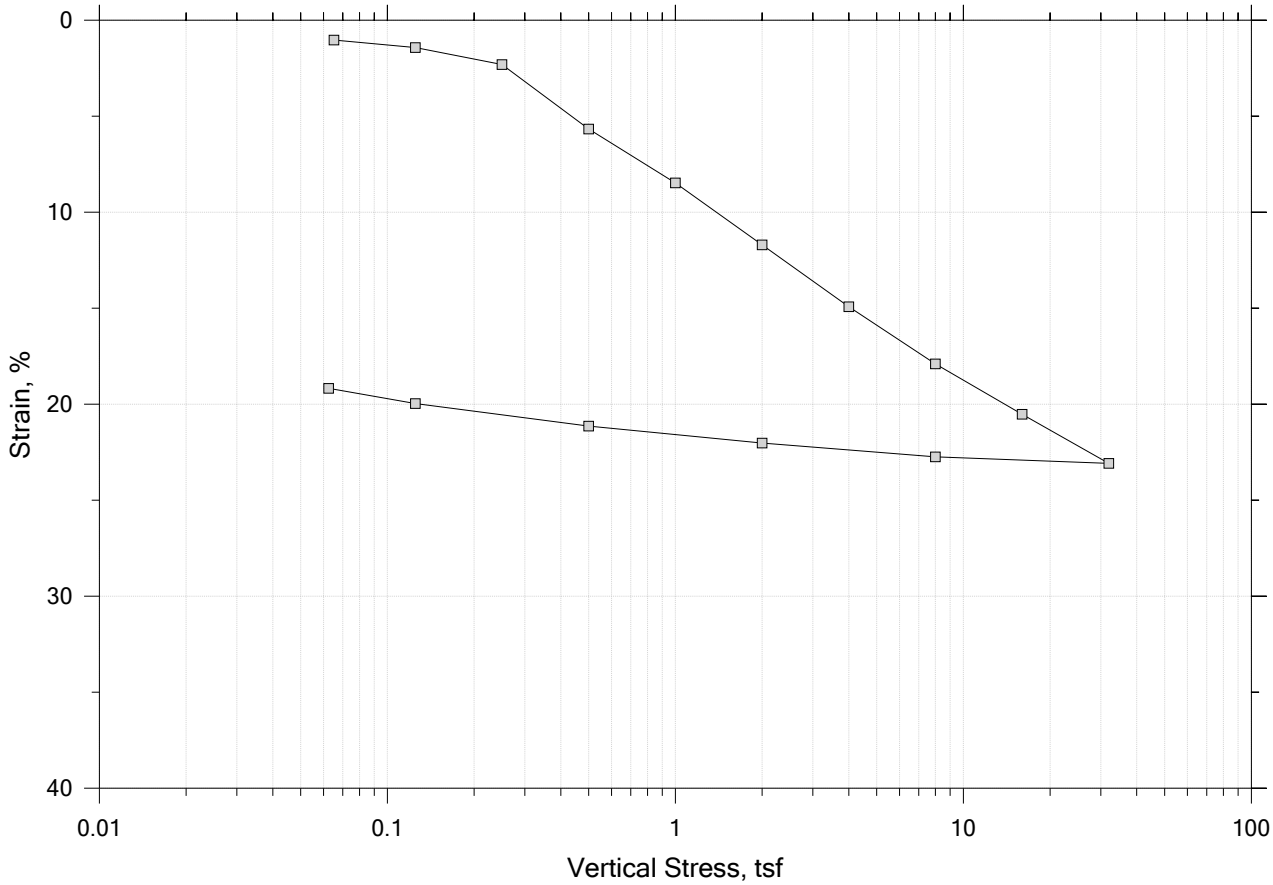
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0643	0.01265	0.929	1.26	100.137	2.42e-07	1.97e-01	1.28e-04
2	0.125	0.02520	0.904	2.52	92.019	2.57e-07	2.07e-01	1.43e-04
3	0.250	0.04628	0.863	4.63	91.011	2.51e-07	1.69e-01	1.14e-04
4	0.500	0.07699	0.803	7.70	120.783	1.79e-07	1.23e-01	5.92e-05
5	1.00	0.1144	0.730	11.4	138.043	1.45e-07	7.49e-02	2.94e-05
6	2.00	0.1541	0.652	15.4	93.298	1.97e-07	3.97e-02	2.11e-05
7	4.00	0.1904	0.581	19.0	100.794	1.67e-07	1.81e-02	8.16e-06
8	8.00	0.2239	0.516	22.4	90.617	1.70e-07	8.38e-03	3.85e-06
9	16.0	0.2523	0.461	25.2	99.063	1.44e-07	3.54e-03	1.37e-06
10	32.0	0.2807	0.405	28.1	81.349	1.62e-07	1.78e-03	7.79e-07
11	8.00	0.2690	0.428	26.9	1.429	9.03e-06	4.89e-04	1.19e-05
12	2.00	0.2628	0.440	26.3	135.930	9.73e-08	1.03e-03	2.71e-07
13	0.500	0.2583	0.449	25.8	179.034	7.49e-08	3.00e-03	6.06e-07
14	0.125	0.2467	0.472	24.7	264.522	5.18e-08	3.10e-02	4.33e-06
15	0.0625	0.2398	0.485	24.0	0.000	0.00e+00	1.11e-01	0.00e+00

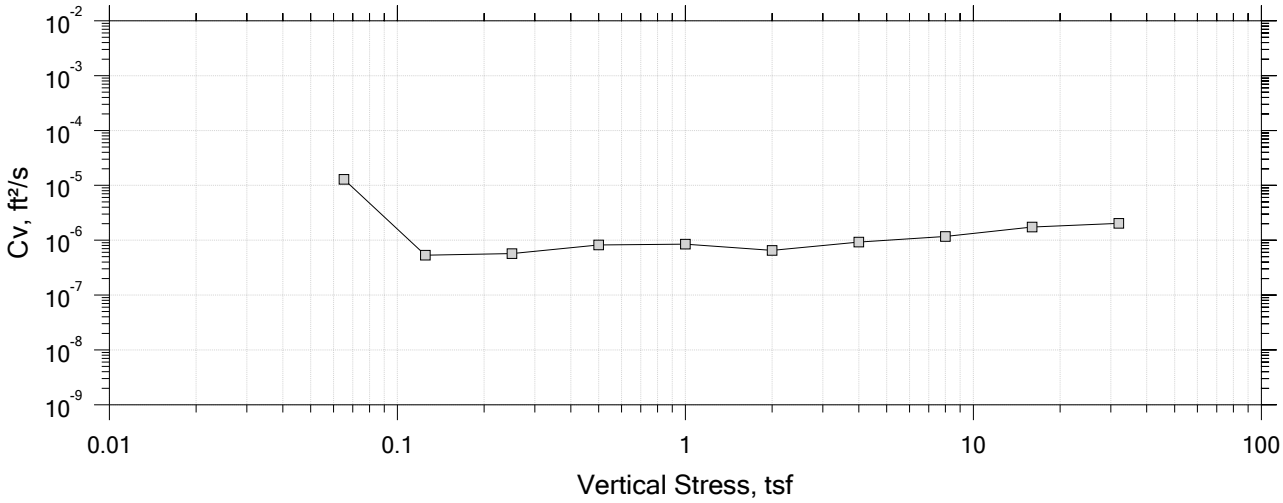
GeoTesting EXPRESS

Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





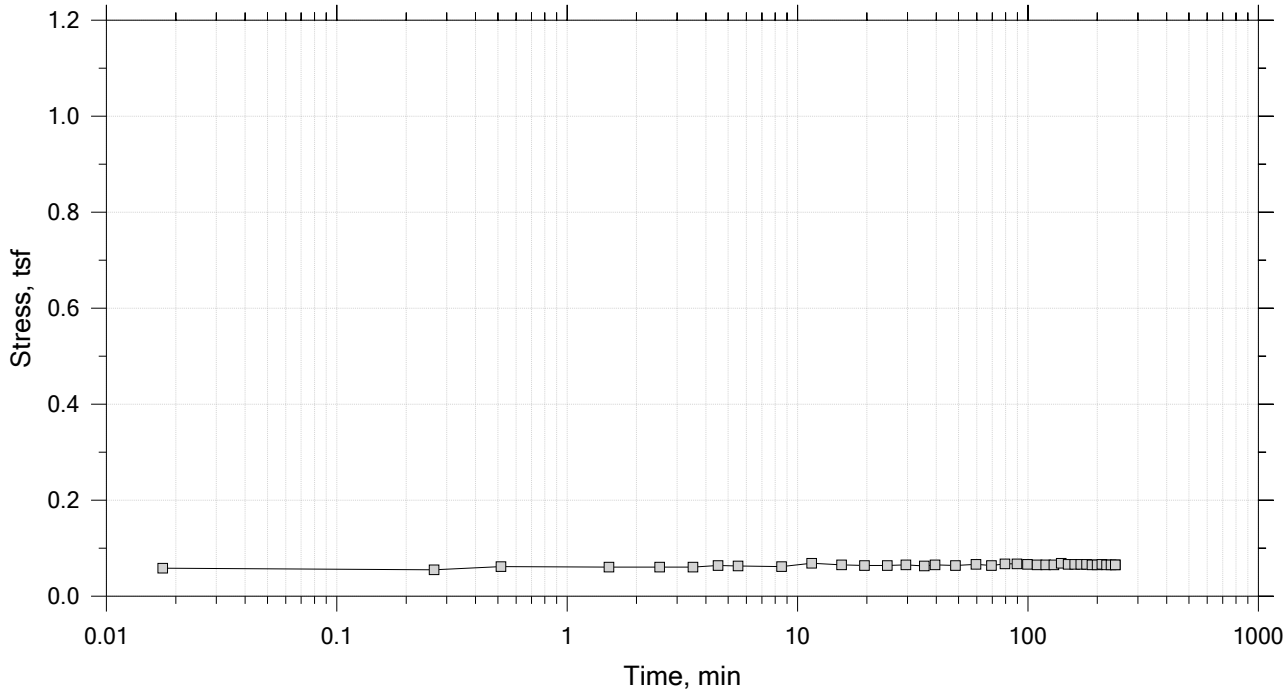
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		
	Displacement at End of Increment		

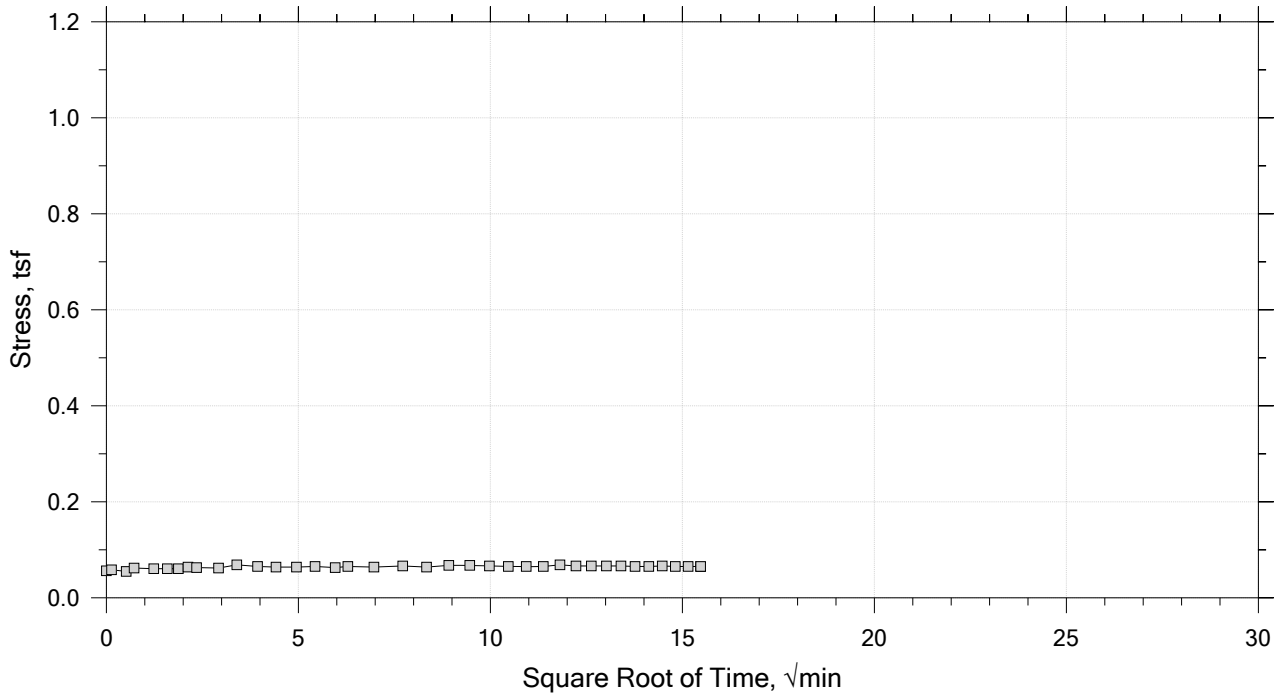
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15

Constant Volume Step

Stress: 0.0652 tsf





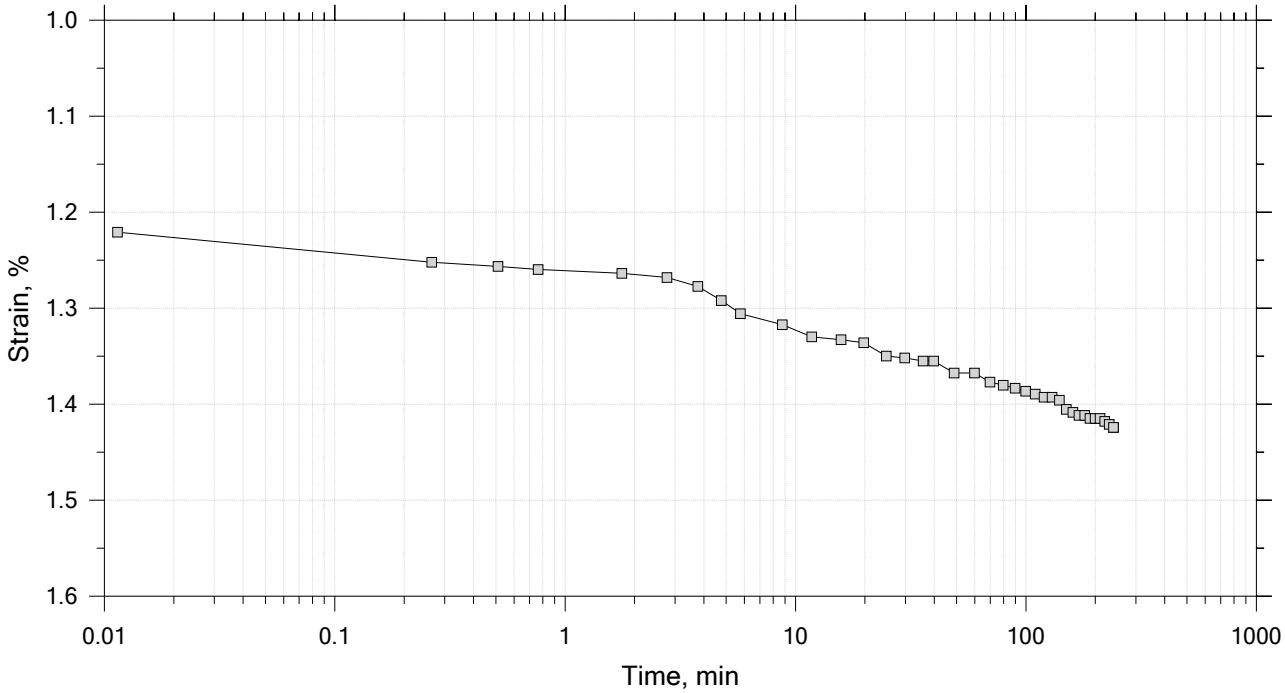
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

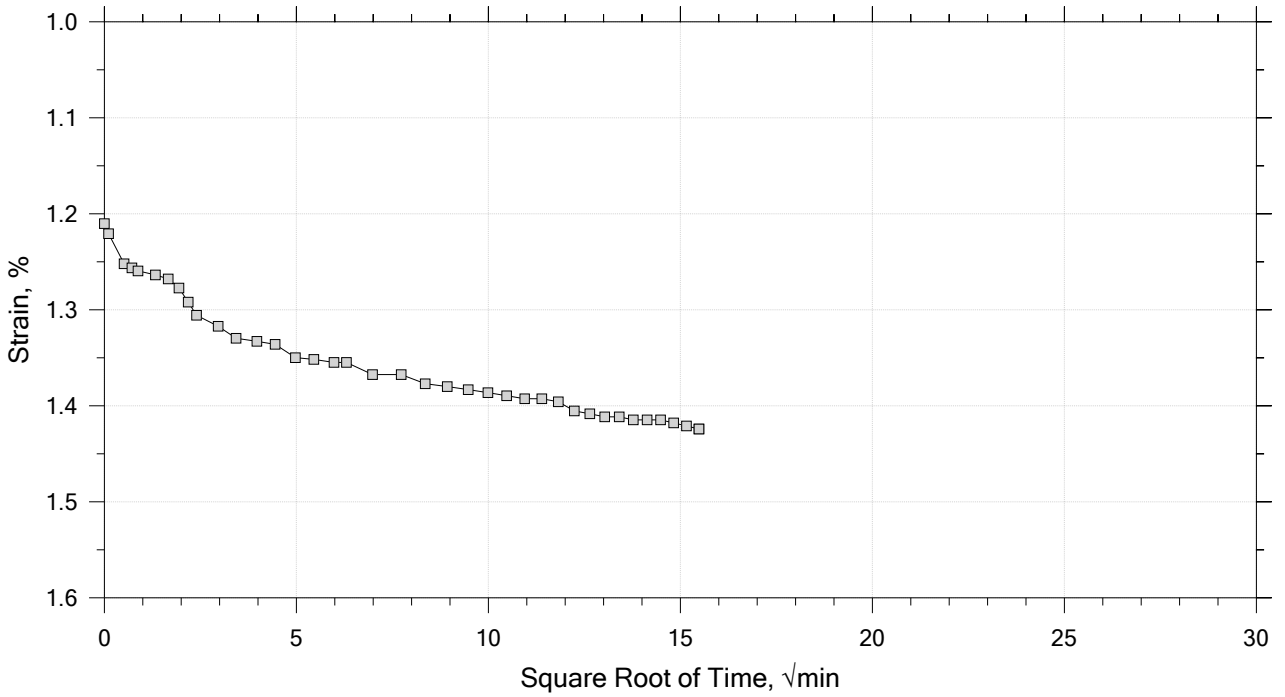
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf





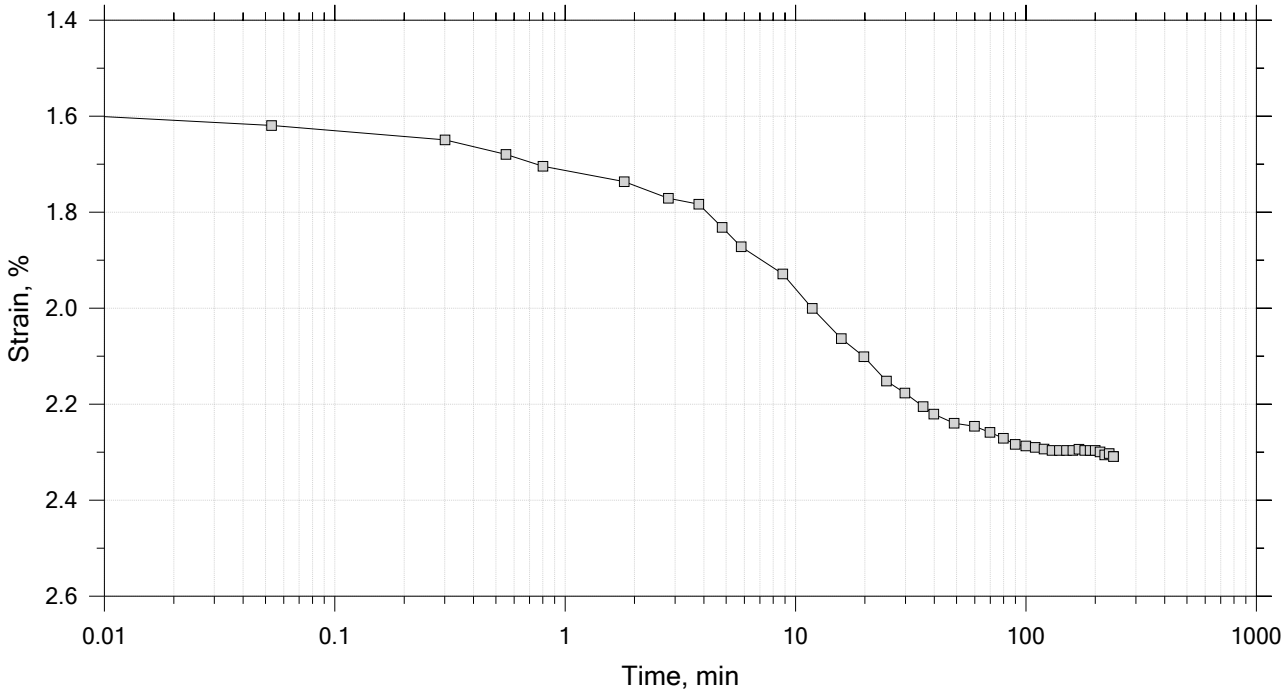
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

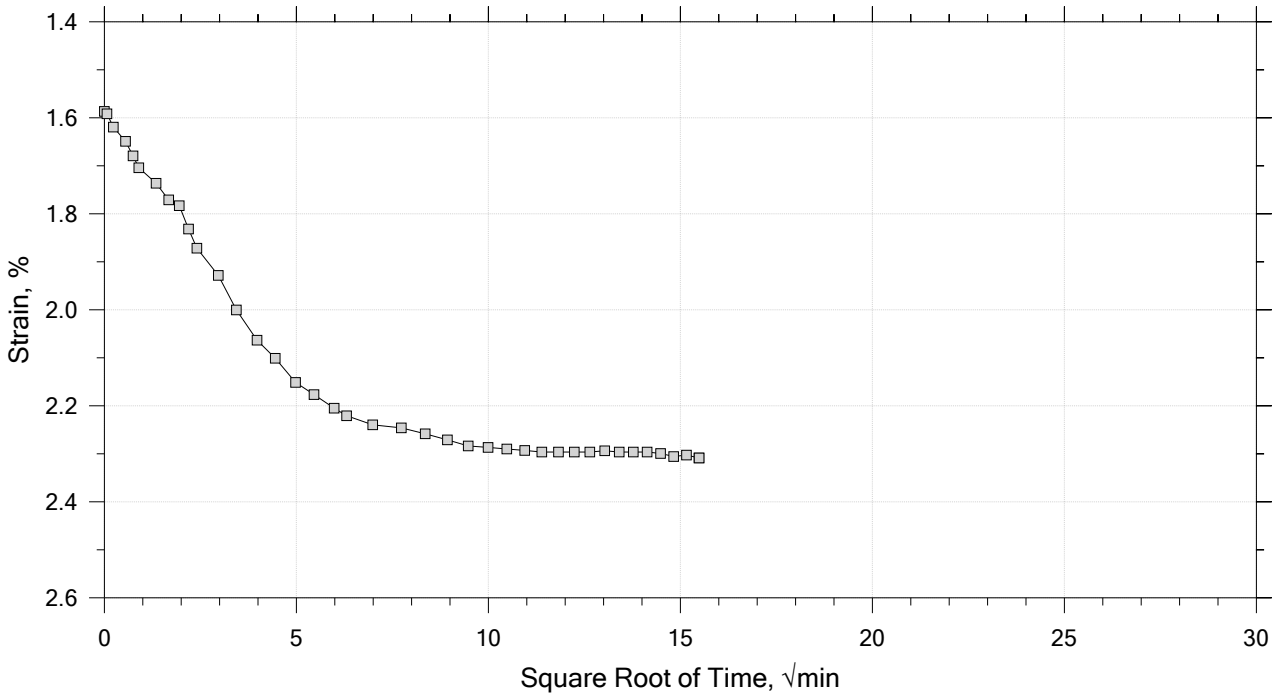
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf





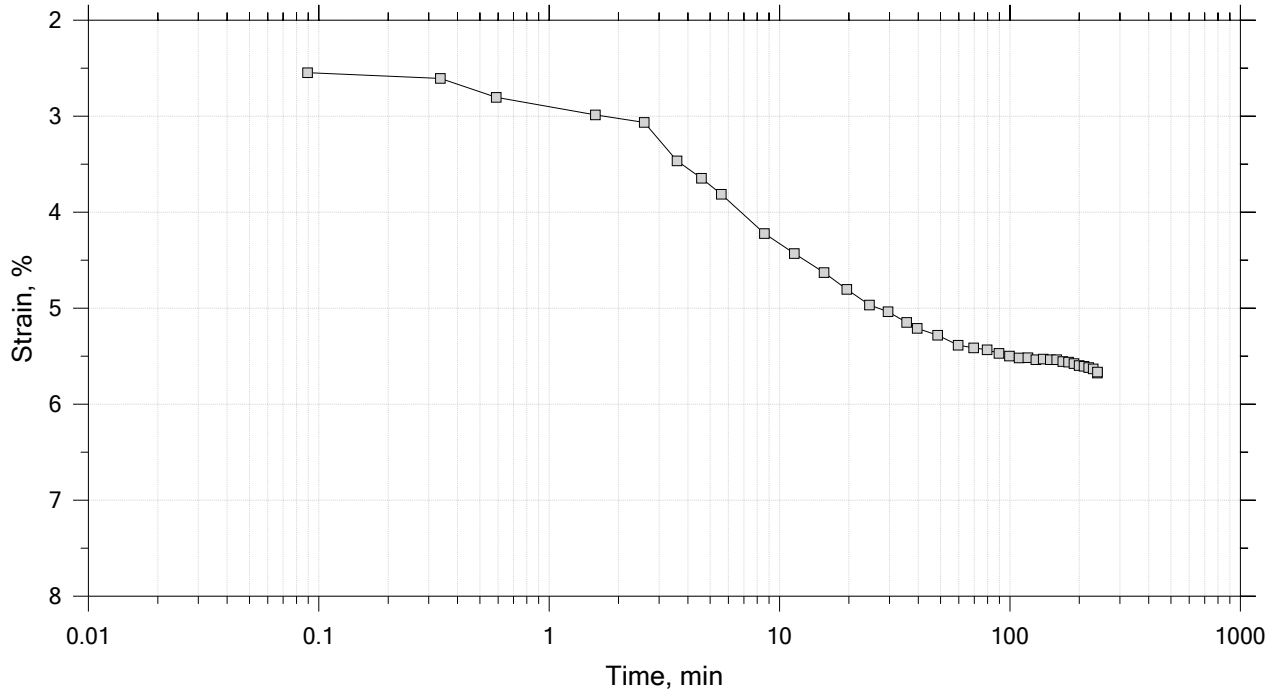
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

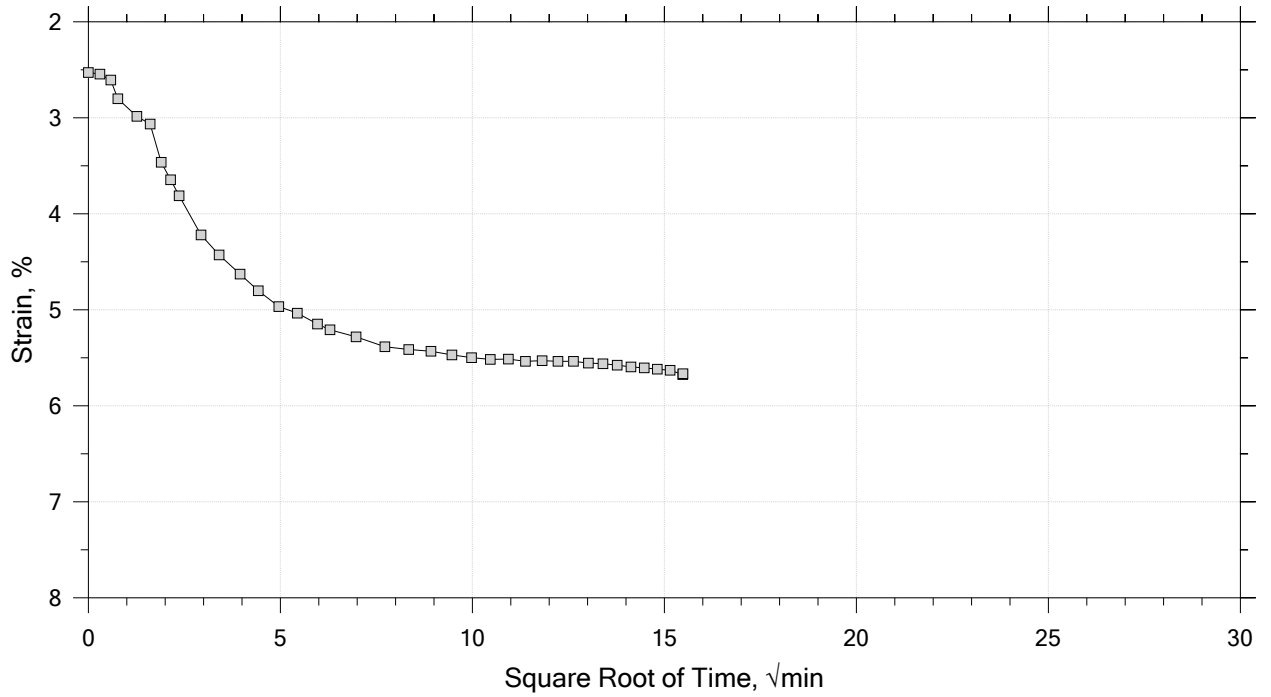
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





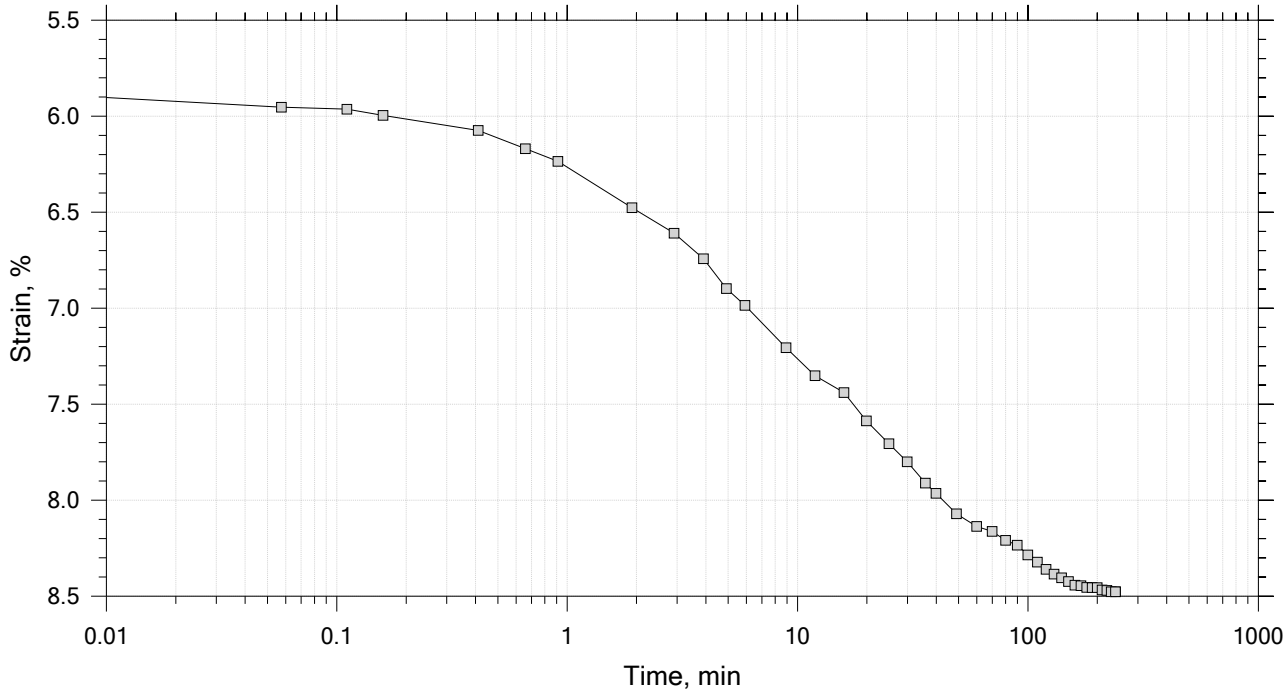
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

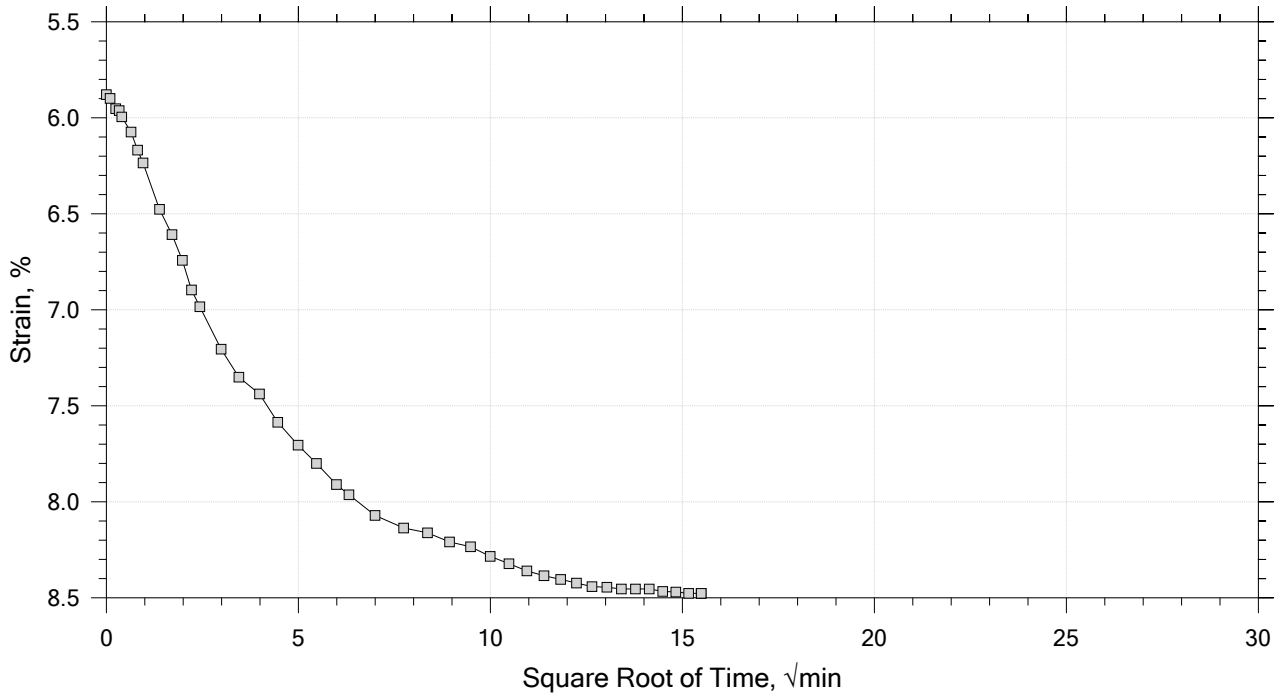
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





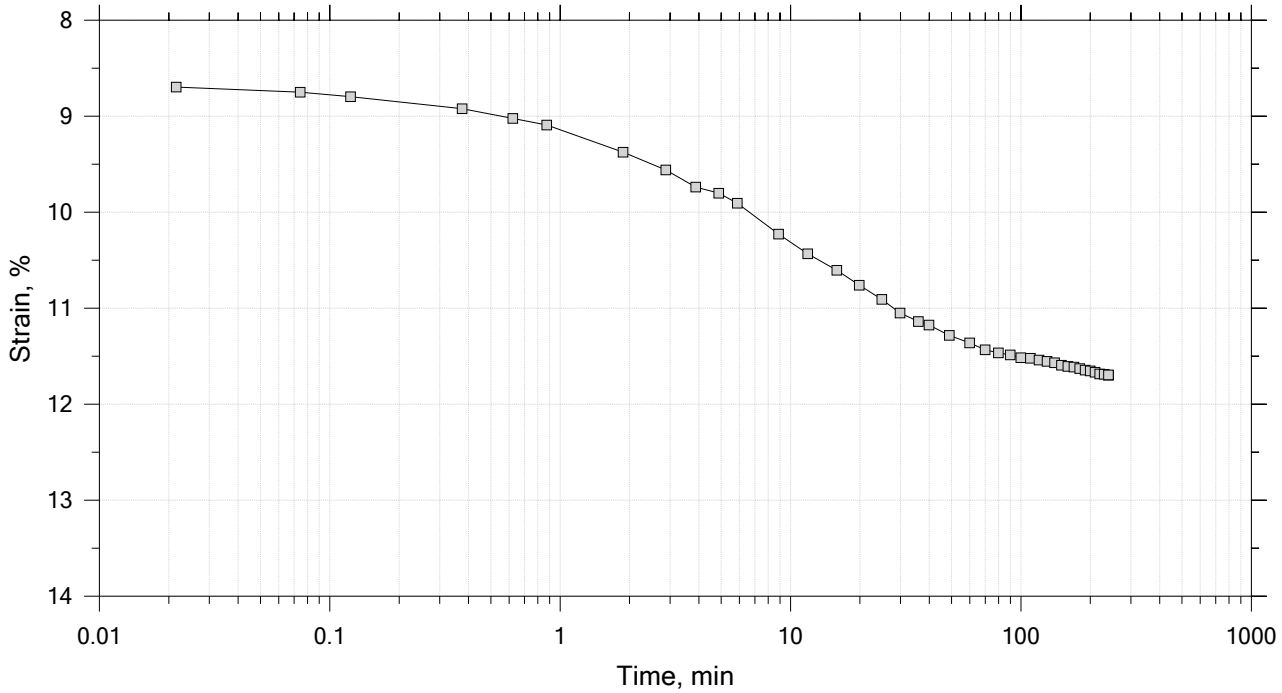
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

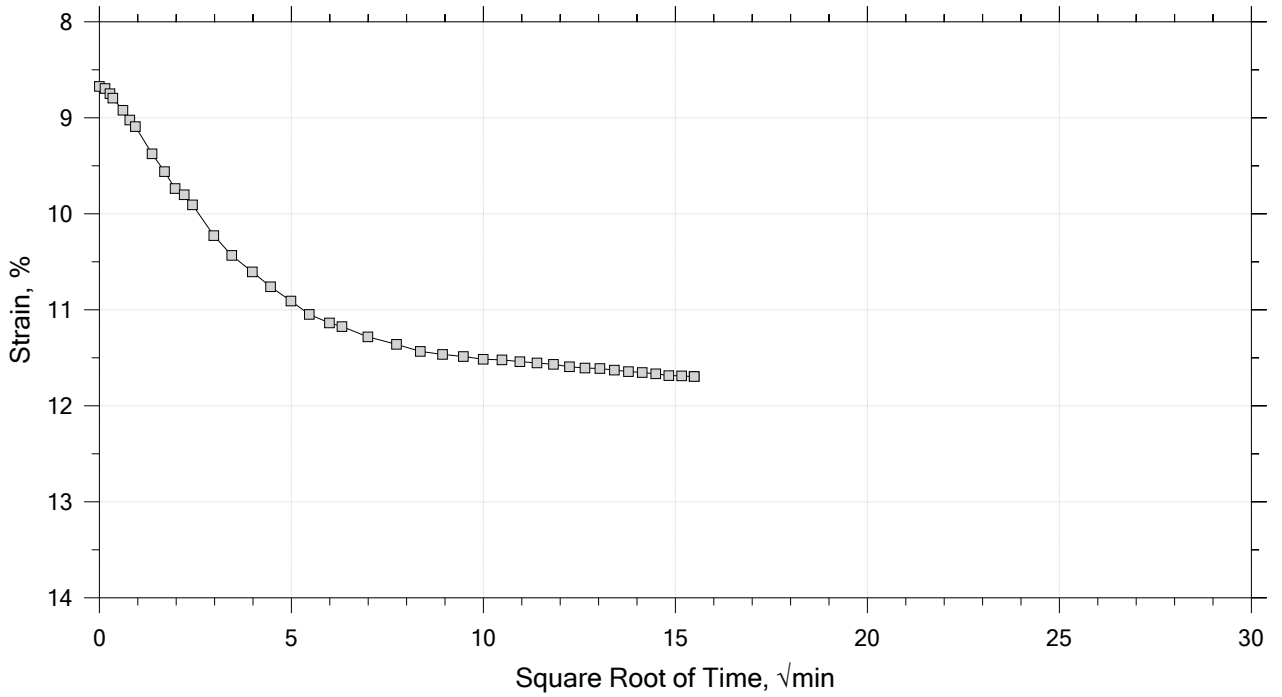
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





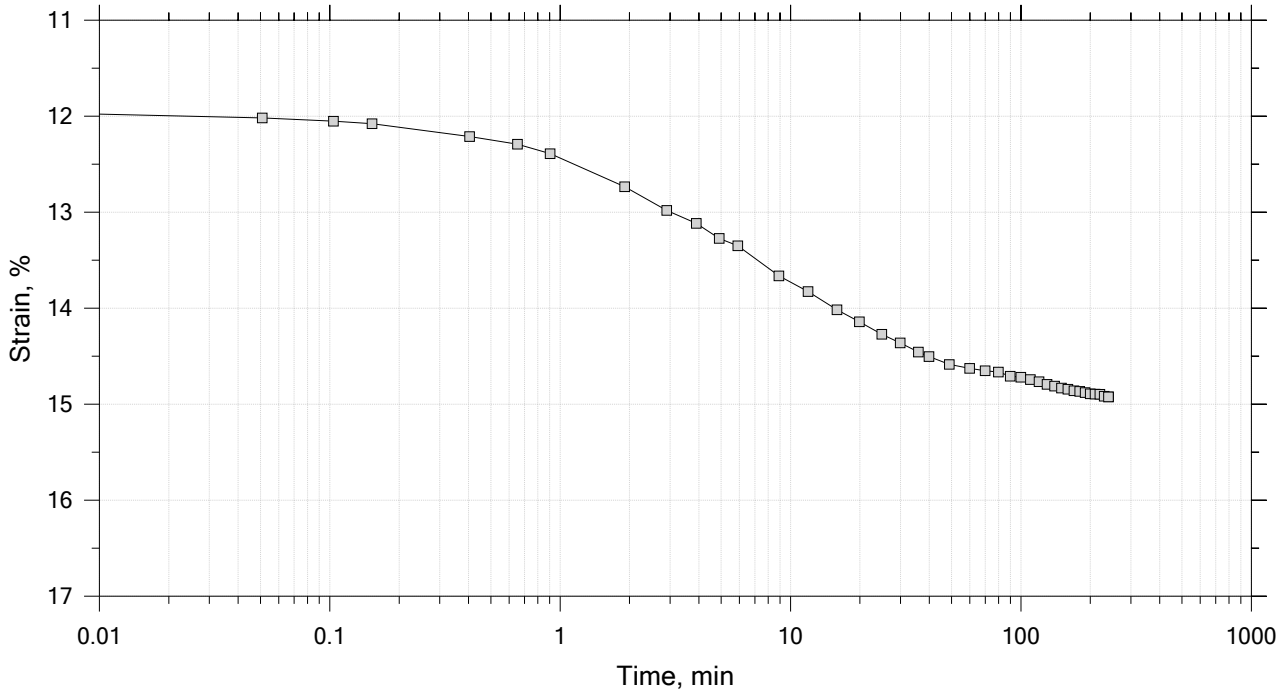
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

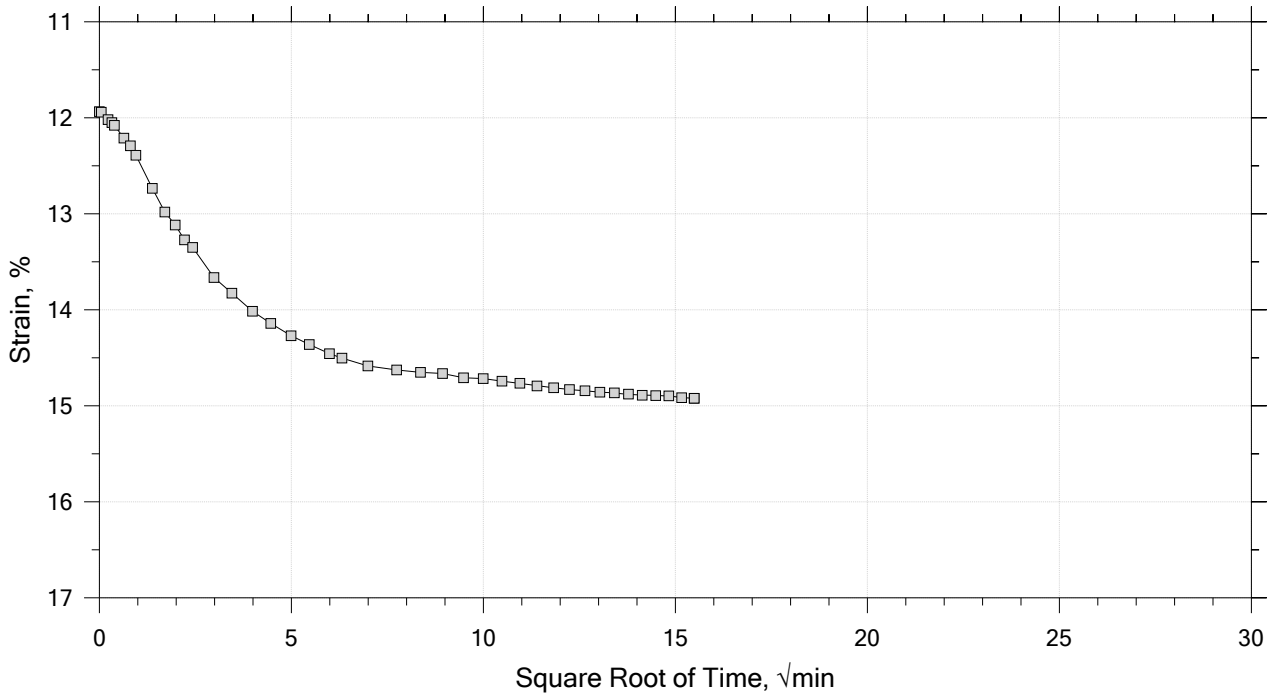
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





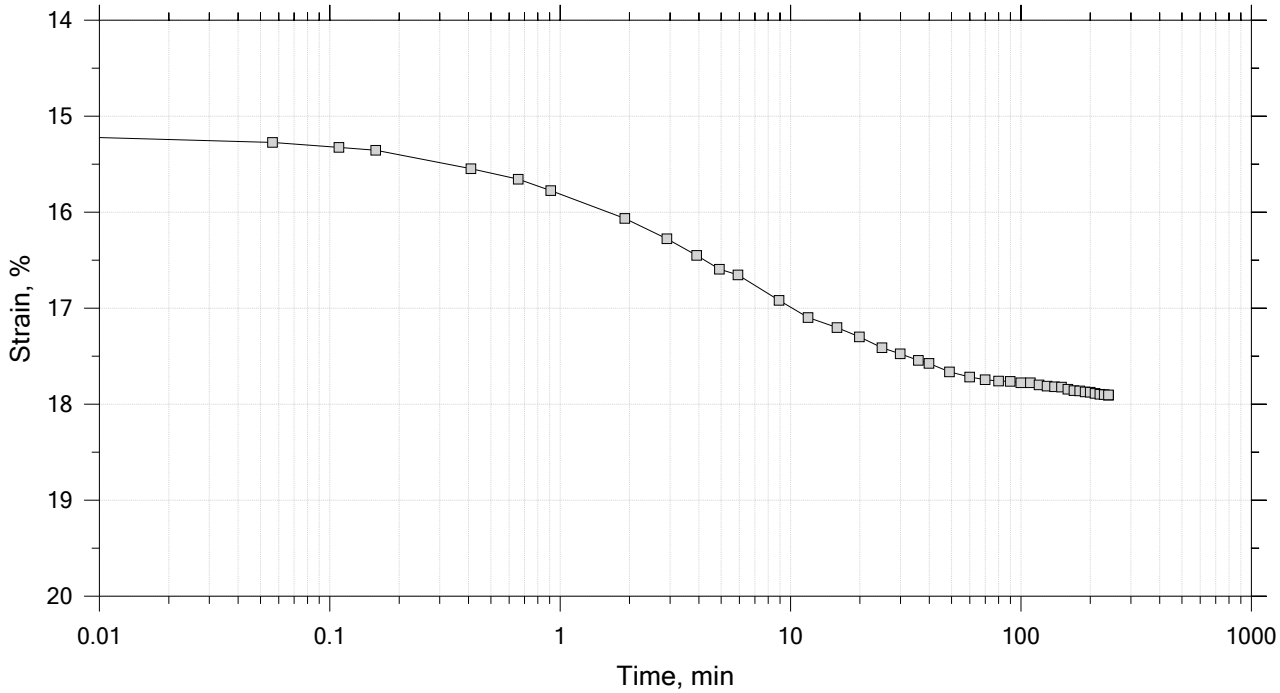
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

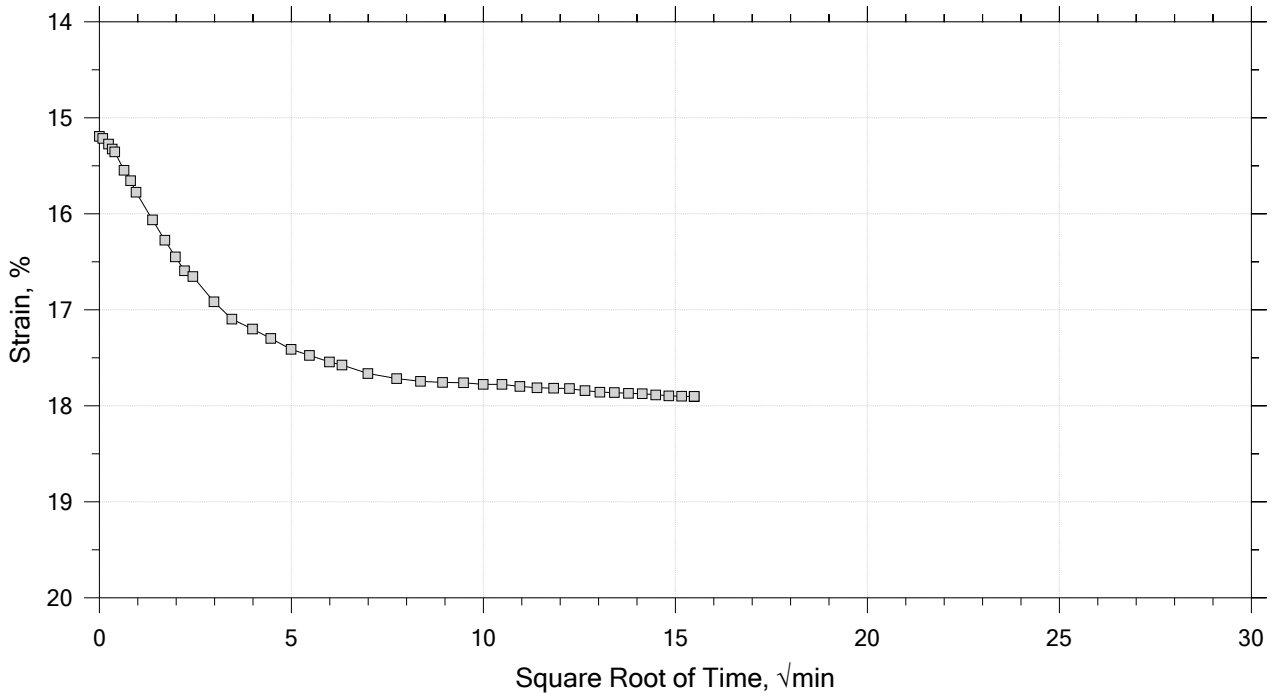
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





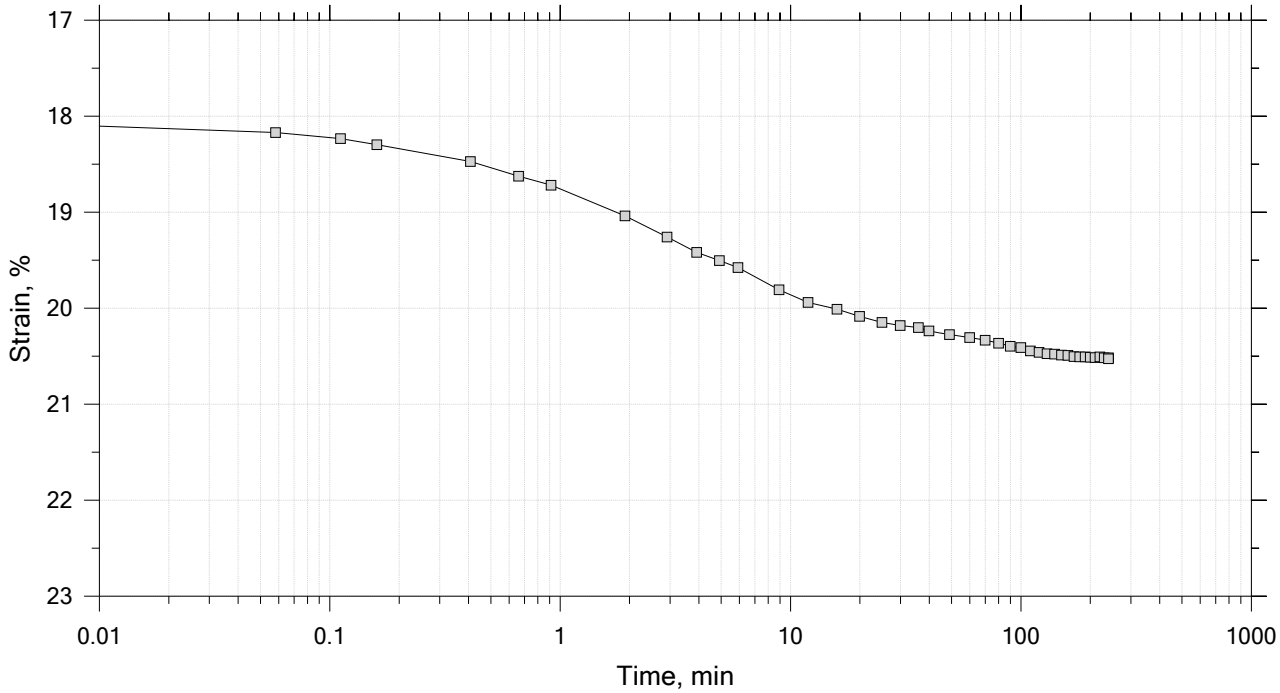
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

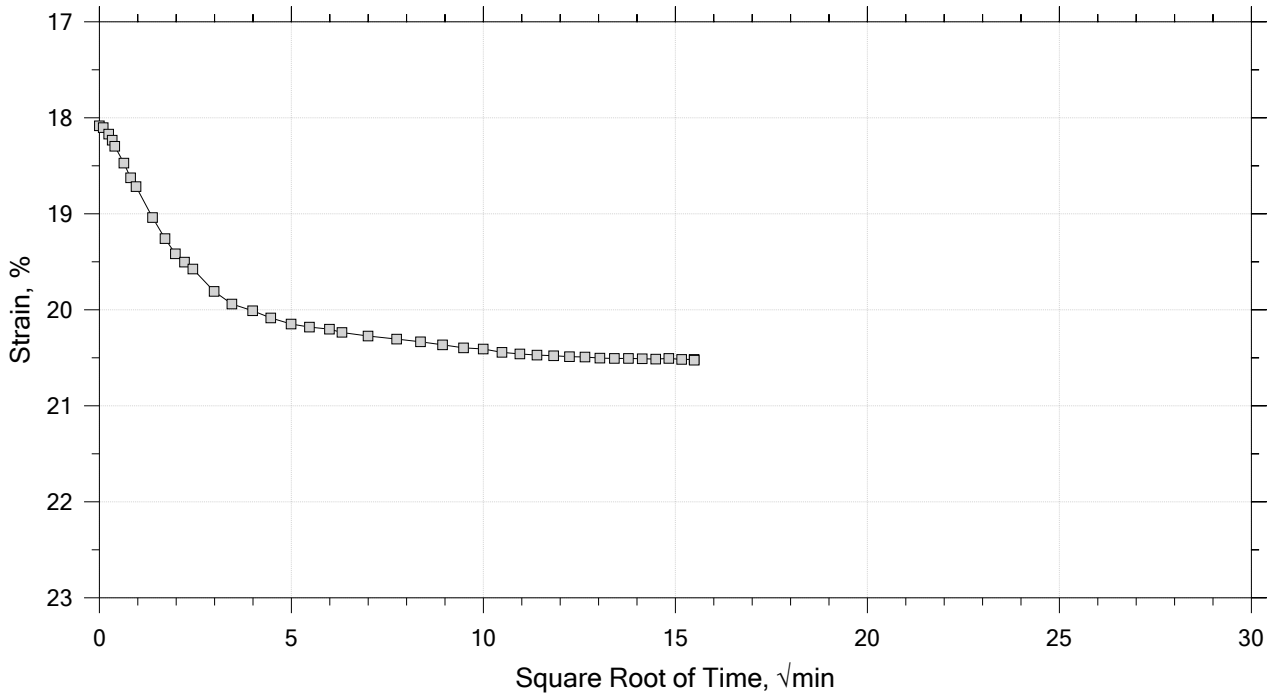
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





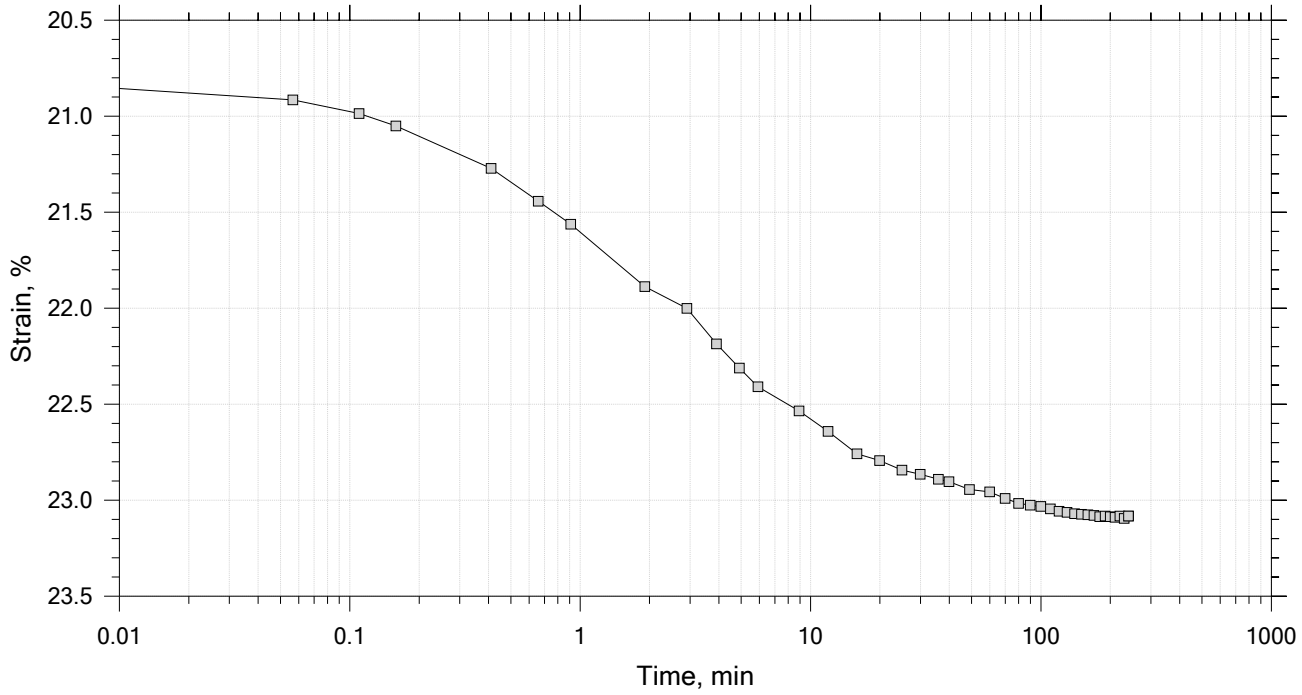
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

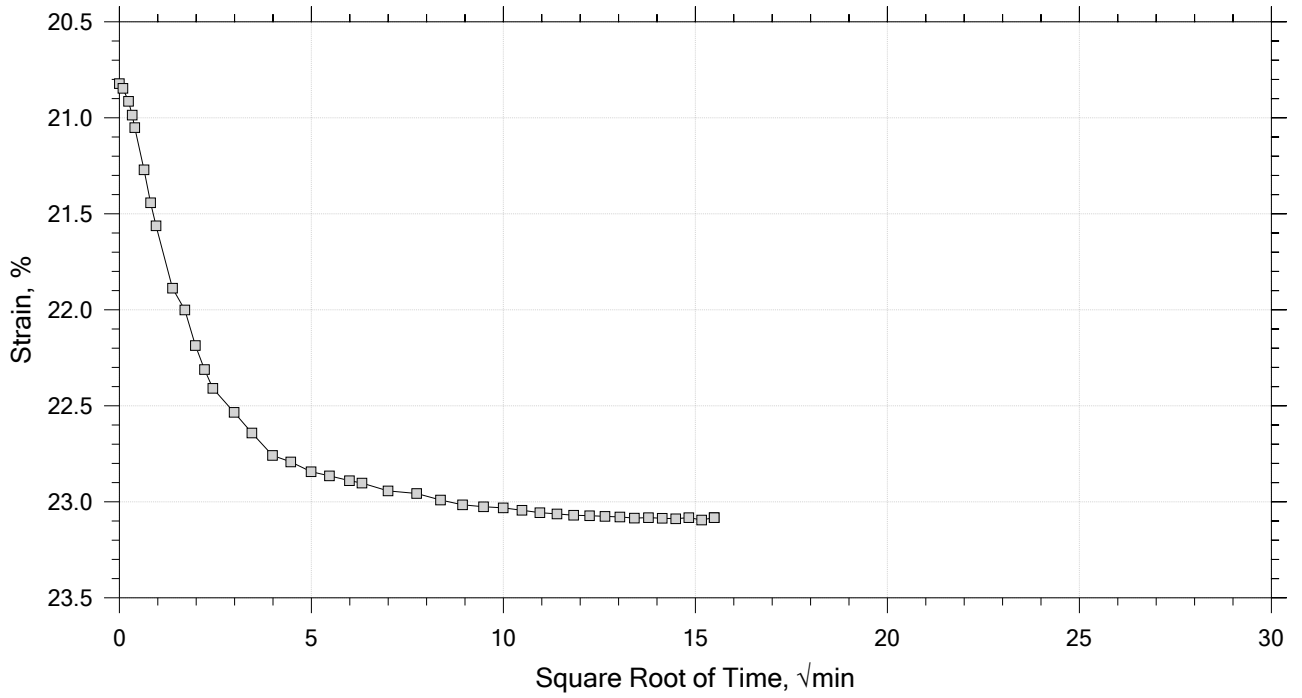
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf





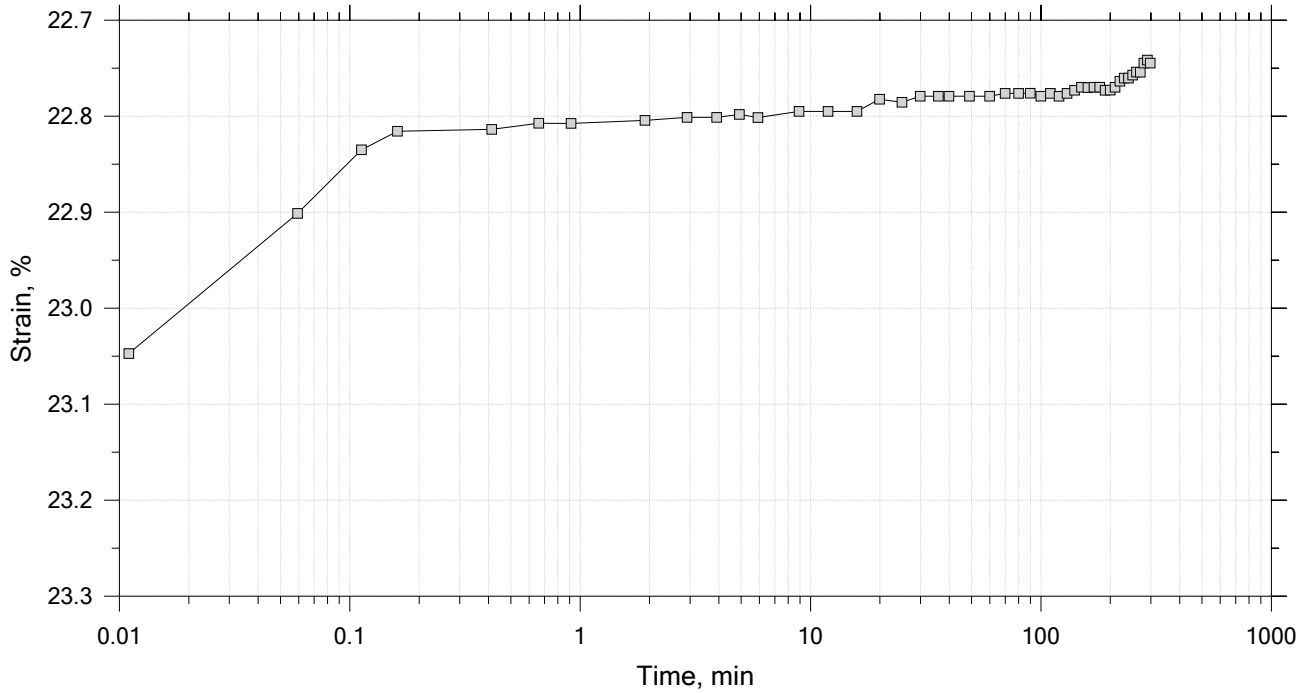
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

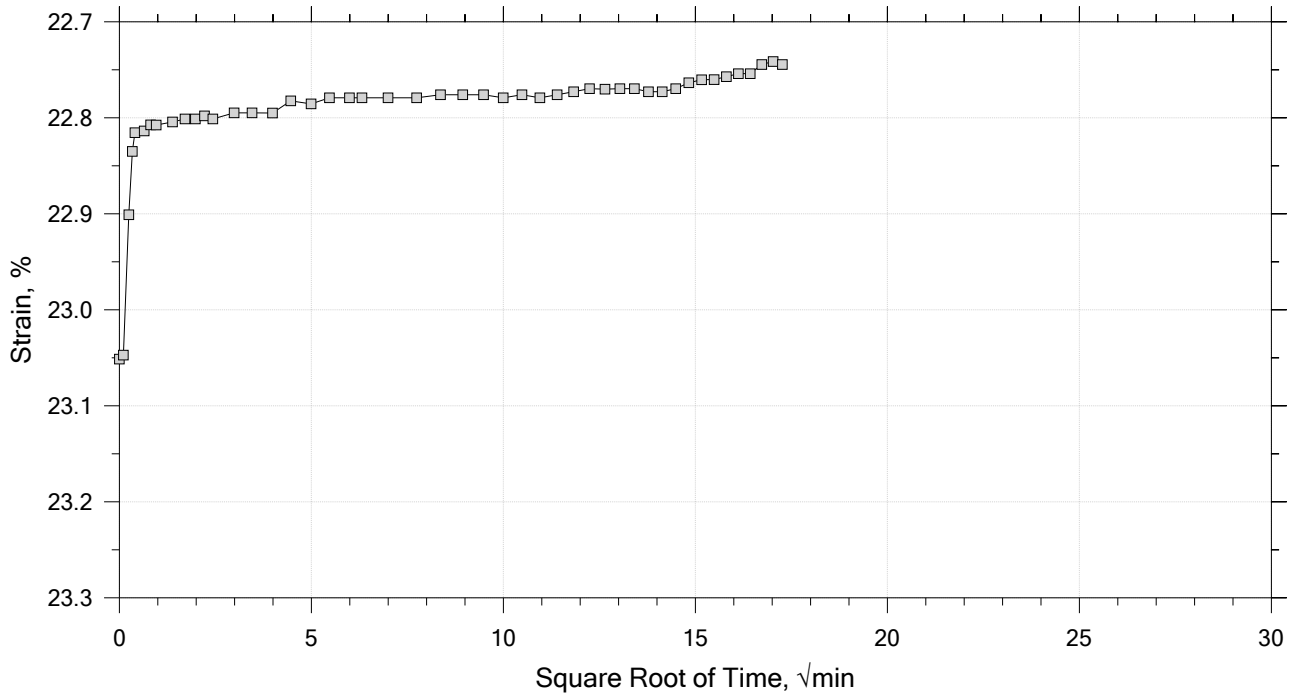
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf





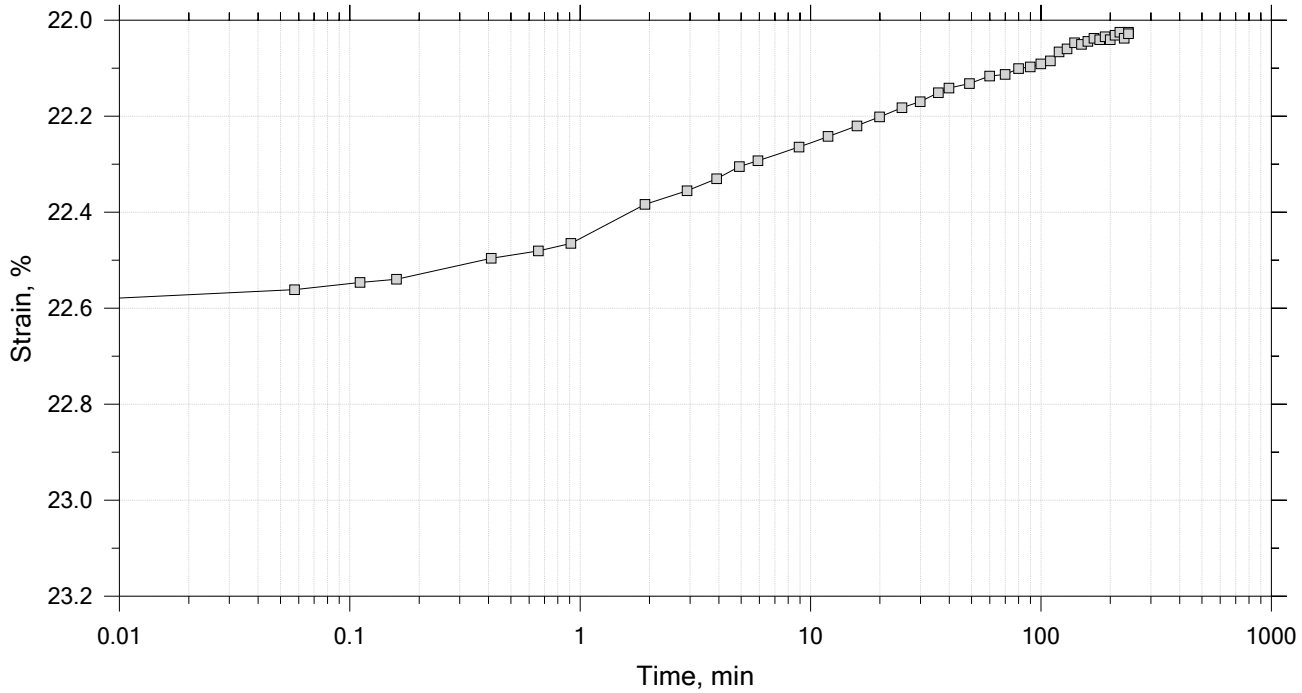
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

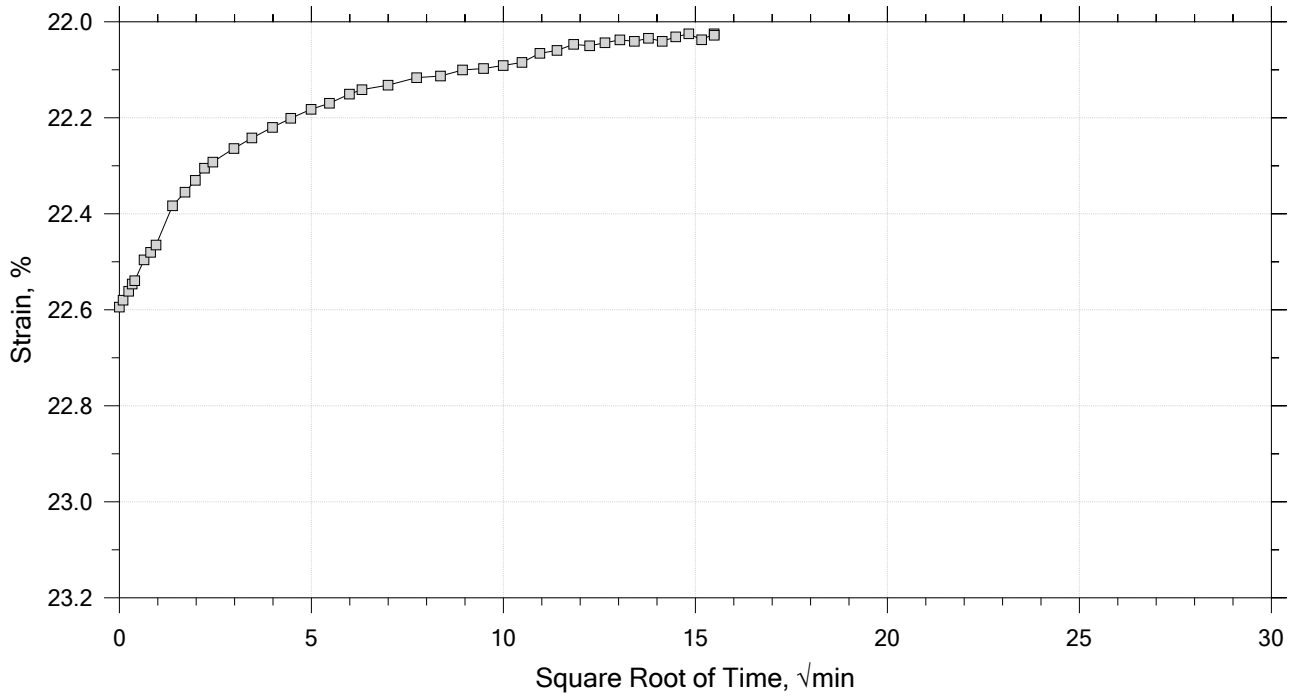
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf





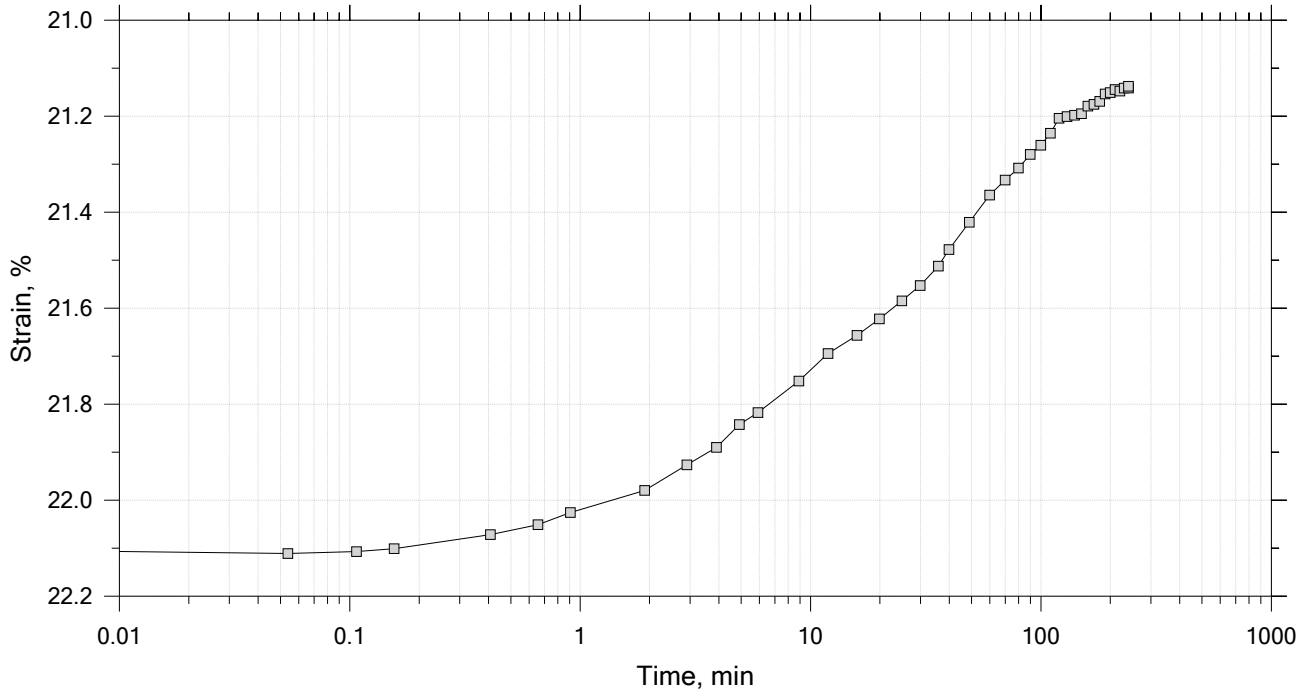
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

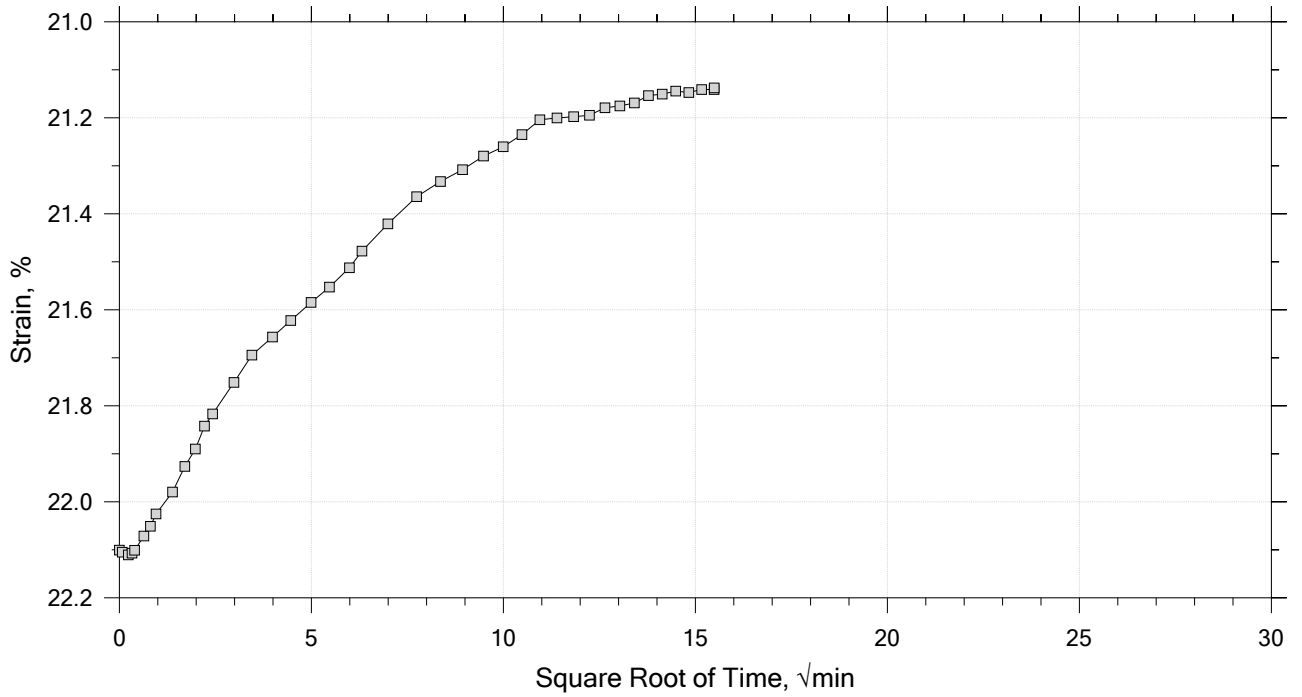
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf





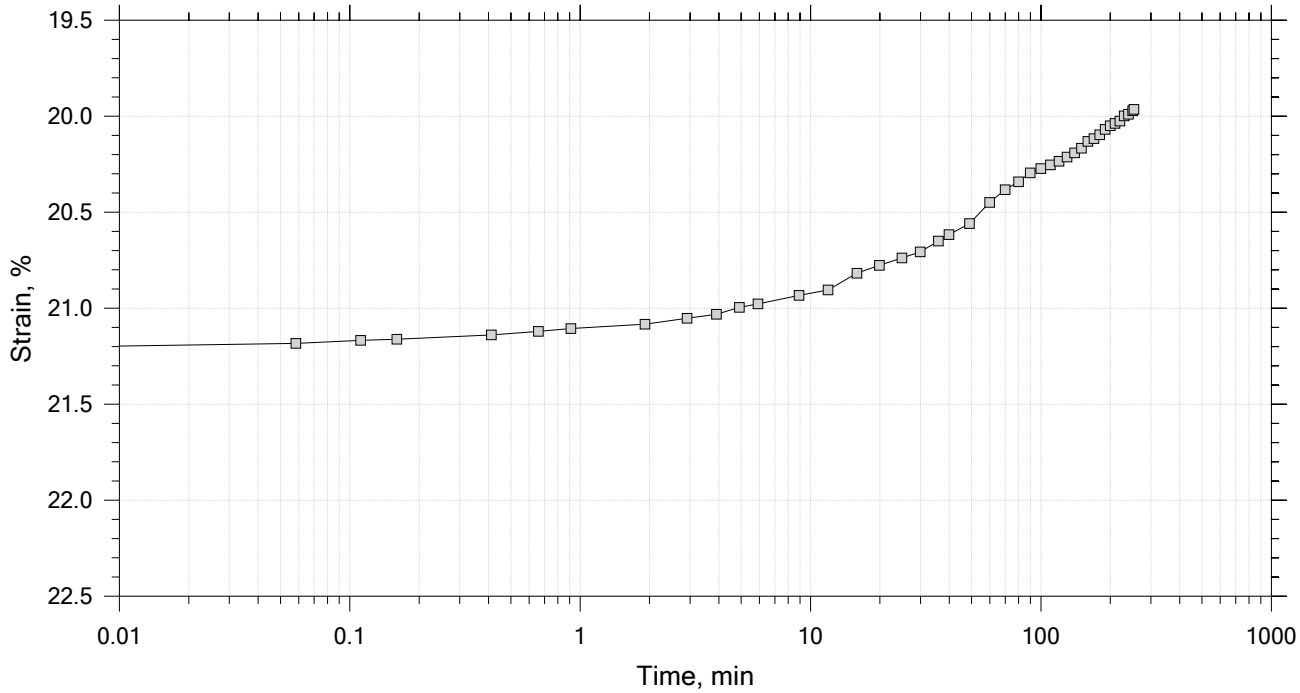
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

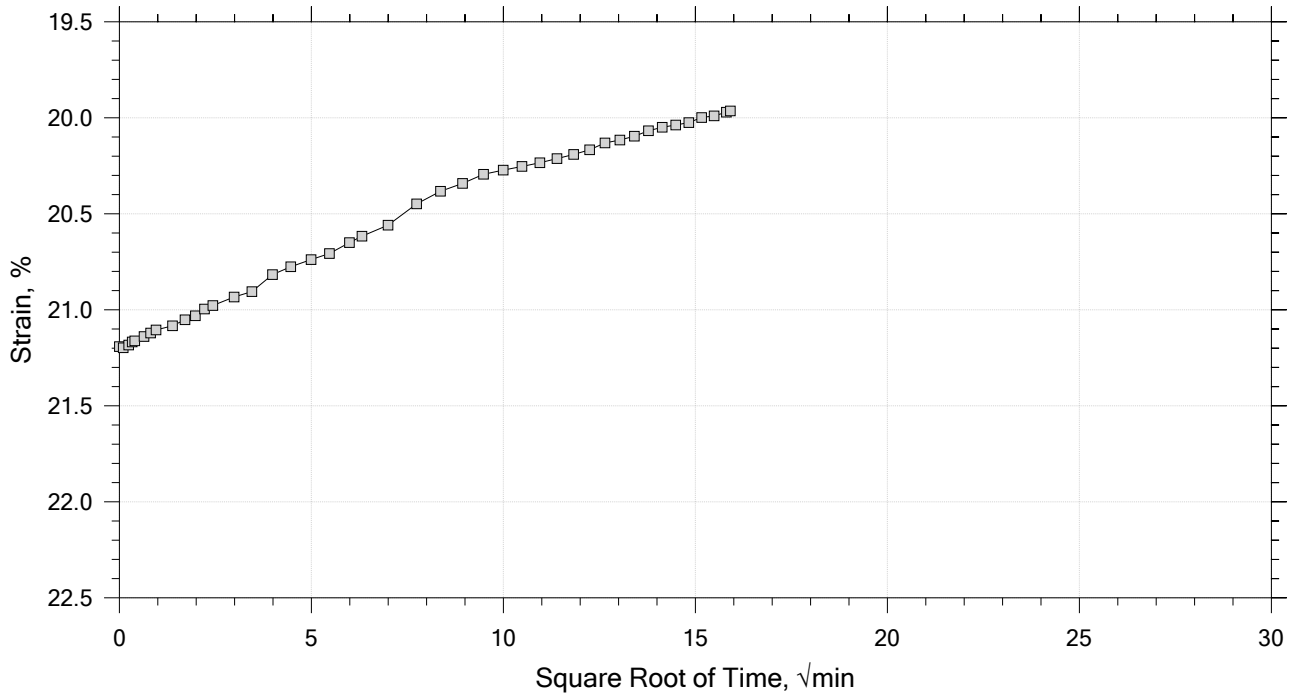
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf





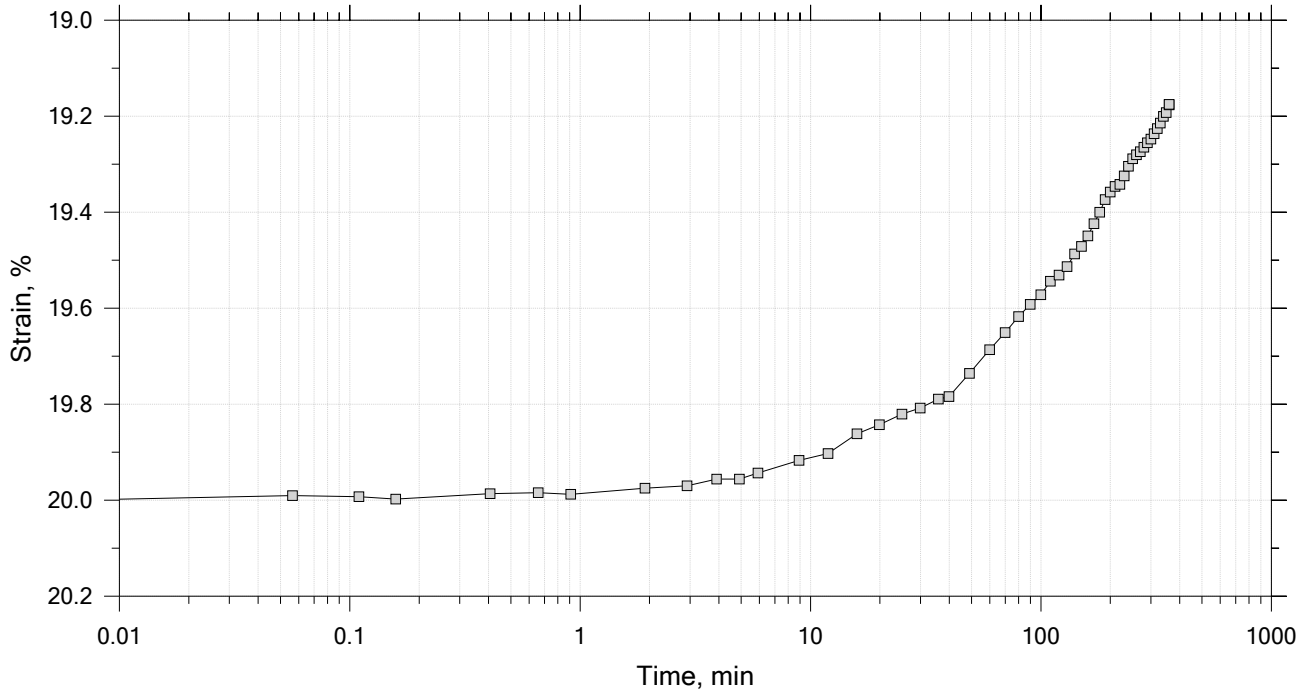
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

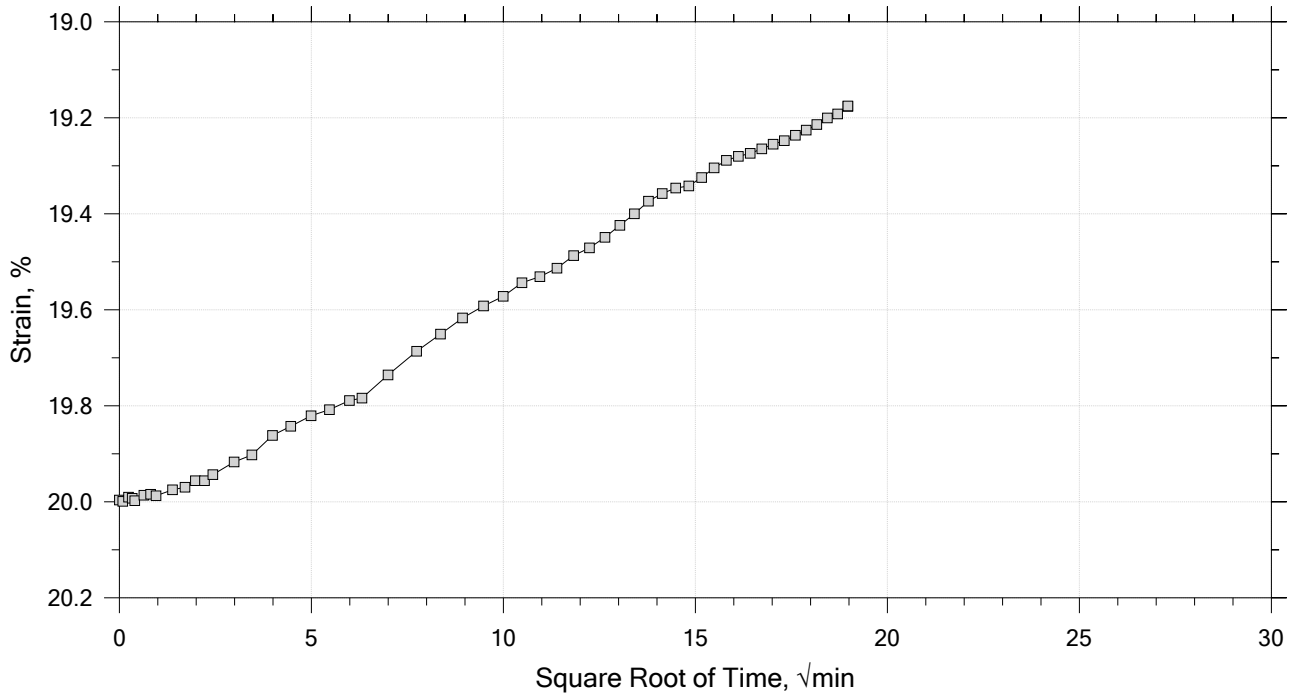
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 tsf





GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.70	Liquid Limit: ---
Initial Height: 1.00 in	Initial Void Ratio: 0.911	Plastic Limit: ---
Final Height: 0.81 in	Final Void Ratio: 0.548	Plasticity Index: ---

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A3073	RING		D1599
Mass Container, gm	8.35	108.06	108.06	8.59
Mass Container + Wet Soil, gm	232.79	257.49	244.6	144.76
Mass Container + Dry Soil, gm	194.74	221.53	221.53	121.75
Mass Dry Soil, gm	186.39	113.47	113.47	113.16
Water Content, %	20.41	31.69	20.33	20.33
Void Ratio	---	0.91	0.55	---
Degree of Saturation, %	---	93.76	100.00	---
Dry Unit Weight, pcf	---	88.06	108.72	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test.
Therefore, values may not represent actual values for the specimen.

GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0652	0.01031	0.892	1.03	0.000	0.00e+00	1.58e-01	0.00e+00	0.00e+00
2	0.125	0.01424	0.884	1.42	0.000	0.00e+00	6.58e-02	0.00e+00	0.00e+00
3	0.250	0.02309	0.867	2.31	0.000	0.00e+00	7.08e-02	0.00e+00	0.00e+00
4	0.500	0.05665	0.803	5.67	6.067	8.66e-07	1.34e-01	3.14e-04	0.00e+00
5	1.00	0.08477	0.749	8.48	0.000	0.00e+00	5.62e-02	0.00e+00	0.00e+00
6	2.00	0.1169	0.688	11.7	7.151	6.44e-07	3.22e-02	5.59e-05	0.00e+00
7	4.00	0.1492	0.626	14.9	5.089	8.42e-07	1.61e-02	3.66e-05	0.00e+00
8	8.00	0.1790	0.569	17.9	3.792	1.05e-06	7.45e-03	2.11e-05	0.00e+00
9	16.0	0.2053	0.519	20.5	2.160	1.72e-06	3.28e-03	1.52e-05	0.00e+00
10	32.0	0.2308	0.470	23.1	1.948	1.79e-06	1.60e-03	7.71e-06	0.00e+00
11	8.00	0.2274	0.477	22.7	0.000	0.00e+00	1.41e-04	0.00e+00	0.00e+00
12	2.00	0.2203	0.490	22.0	0.000	0.00e+00	1.19e-03	0.00e+00	0.00e+00
13	0.500	0.2114	0.507	21.1	0.000	0.00e+00	5.94e-03	0.00e+00	0.00e+00
14	0.125	0.1996	0.530	20.0	0.000	0.00e+00	3.13e-02	0.00e+00	0.00e+00
15	0.0625	0.1918	0.545	19.2	100.192	3.68e-08	1.26e-01	1.25e-05	0.00e+00

GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0652	0.01031	0.892	1.03	3.449	7.04e-06	1.58e-01	3.00e-03
2	0.125	0.01424	0.884	1.42	48.762	4.91e-07	6.58e-02	8.71e-05
3	0.250	0.02309	0.867	2.31	40.470	5.84e-07	7.08e-02	1.11e-04
4	0.500	0.05665	0.803	5.67	30.142	7.50e-07	1.34e-01	2.72e-04
5	1.00	0.08477	0.749	8.48	27.988	7.57e-07	5.62e-02	1.15e-04
6	2.00	0.1169	0.688	11.7	30.880	6.42e-07	3.22e-02	5.57e-05
7	4.00	0.1492	0.626	14.9	19.279	9.56e-07	1.61e-02	4.16e-05
8	8.00	0.1790	0.569	17.9	14.095	1.22e-06	7.45e-03	2.44e-05
9	16.0	0.2053	0.519	20.5	10.081	1.59e-06	3.28e-03	1.40e-05
10	32.0	0.2308	0.470	23.1	7.593	1.98e-06	1.60e-03	8.52e-06
11	8.00	0.2274	0.477	22.7	1.249	1.17e-05	1.41e-04	4.43e-06
12	2.00	0.2203	0.490	22.0	26.504	5.58e-07	1.19e-03	1.80e-06
13	0.500	0.2114	0.507	21.1	49.703	3.04e-07	5.94e-03	4.86e-06
14	0.125	0.1996	0.530	20.0	203.840	7.60e-08	3.13e-02	6.41e-06
15	0.0625	0.1918	0.545	19.2	284.207	5.59e-08	1.26e-01	1.90e-05

GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		
	Displacement at End of Increment		

Attachment B PDI-2 Boring Logs and Geotechnical Testing Results

This Attachment contains the following:

B.1 Lab Testing Data (Northern Impoundment) - TWE

B.2 Soil Boring Logs (Northern Impoundment) - Ardaman

SUMMARY OF LABORATORY TESTS

Project No. 19.15.131

Project: San Jacinto River Waste Pit Superfund Site

Boring No.	Sample No.	Depth (ft)	Pocket Pen. (tsf)	Torvane (tsf)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	pH	Lab Vane Shear (tsf)	Uc/UU. Compr. (tsf)	Failure Strain (%)	Conf. Pres. (psi)	Failure Type
SJGB024																		
		0-2			Brown LEAN CLAY with SAND	CL	18.6	103.7							1.31	9.3	0.3	Bulge
		2-4	1.50		Brown and black FAT CLAY	CH	27.8	89.0							0.91	14.6	1.0	Bulge
		4-6			Brown and black FAT CLAY	CH	29.2	90.1	86	31	55				0.56	11.6	1.7	Bulge
		6-8				CH	31.4		78	23	55	94.2						
		8-10	0.50		Brown CLAYEY SAND	SC	29.1	89.2				43.2			0.21	11.8	3.1	Bulge
		10-12	0.50		Brown FAT CLAY; organics	CH	75.3	53.7	133	51	82	91.0			3.34	8.3	3.8	Bulge
		12-14	0.50		Brown and black FAT CLAY	CH	31.7	82.6				76.2			0.22	14.8	4.5	Bulge
		14-16	0.25		Brown CLAYEY SAND	SC	26.5	91.7	32	19	13	44.4			0.44	14.9	5.2	Bulge
		18-20	0.50		Brown SILTY CLAYEY SAND	SC-SM	24.9	98.4				25.5			0.94	15.0	6.6	Bulge
		23-25	0.50		Brown FAT CLAY	CH	49.5	66.4				92.1			0.39	6.6	8.3	Bulge
		28-30	0.25		Brown FAT CLAY	CH	61.3	59.0	122	58	64				0.28	11.3	10.1	Bulge
SJGB025																		
		0-2				SM	13.5					24.8						
		2-4	4.50		Brown LEAN CLAY with SAND	CL	15.5	115.8	36	18	18	81.8			1.05	14.8	1.0	Bulge
		4-6	2.50		Gray SANDY LEAN CLAY		18.8	112.5	34	17	17				0.84	14.6	1.7	Multiple Shear
		6-8				SP	19.5											
		8-10	1.25		Gray LEAN CLAY with SAND	CL	20.1	107.0	43	16	27	84.2						Too Short
		10-12				SC	21.4					46.5						
		12-14	1.00		Brown SANDY LEAN CLAY	CL	18.6	114.9	33	17	16	55.6			1.68	15.0	4.5	Bulge
		14-16				ML	23.6					61.5						
		20-22				SM	21.7					21.9						
		22-24				SM	34.4					43.9						
		24-26				SP	33.6		NV	NP	NP							
		28-30				SM	23.4					30.9						
SJGB026																		
		0-2	1.25		Brown SILT with SAND	ML	13.4	111.4	NV	NP	NP	80.9						Too short
		2-4	1.50		Gray LEAN CLAY	CL	20.6	128.5				98.4						Too short
		4-6	1.50		Tan and Gray LEAN CLAY with SAND	CL	19.1	104.8	41	18	23	84.3			1.42	5.3	1.7	Vertical
		6-8	2.00		Gray LEAN CLAY	CL	19.1	104.8				96.9			0.69	3.5	2.4	Multiple Shear
		8-10	1.50		Gray and brown LEAN CLAY with SAND	CL	21.4	103.8	35	17	18	82.6			0.87	13.6	3.1	Multiple Shear
		10-12				SC	23.0					49.8						
		12-14	1.00		Tan and Gray SANDY SILT	ML	20.6	109.4	NV	NP	NP	65.5			1.72	14.9	4.5	Bulge
		20-22				ML	26.1					55.4						

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SUMMARY OF LABORATORY TESTS

Project No. 19.15.131

Project: San Jacinto River Waste Pit Superfund Site

Boring No.	Sample No.	Depth (ft)	Pocket Pen. (tsf)	Torvane (tsf)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	pH	Lab Vane Shear (tsf)	Uc/UU. Compr. (tsf)	Failure Strain (%)	Conf. Pres. (psi)	Failure Type
SJGB027																		
		0				GP-GM	10.6											
		2	0.50		Black FAT CLAY; Organics	CH	139.8	32.6	151	44	107	80.5			0.17	7.6	2.0	Bulge
		4	1.75		Gray CLAYEY SAND	SC	22.7	104.3	41	21	20	43.6			0.18	7.6	3.5	Bulge
		6	1.25		Gray SANDY LEAN CLAY	CL	20.3	107.6	37	17	20	55.5			1.15	14.8	4.0	Bulge
		8	1.25		Gray LEAN CLAY	CL	17.9	111.3	39	18	21				0.73	14.8	5.0	Bulge
		10				CL	22.5	106.8	30	17	13	80.6						
		12				CL	32.0		49	19	30	31.4						
		14				SM	26.9		24	16	8	27.3						
		16																
		18				SC-SM	28.3		NV	NP	NP	40.1						
		23				SP-SM	21.4		NV	NP	NP	7.8						
		28				SC-SM	21.9		26	16	10	11.3						
		33				SC	16.0		32	17	15	36.0						
		38	3.00			CL	19.5	107.4	40	18	22	79.1						
		43	3.00		Reddish-brown LEAN CLAY; calcareous	CL	32.3	89.5	49	19	30							
		48	3.50		Tan FAT CLAY	CH	31.2	92.1	59	21	38				1.95	6.3	21.0	Slickensid
SJGB028																		
		0				CL	16.2	112.2	37	16	21	57.4						
		2				SC	60.7	81.2	39	17	22	44.4						
		4	1.75		Black LEAN CLAY with SAND; sand seams and organics	SC	13.3	115.9	32	15	17	79.0			0.79	14.8	2.5	Bulge
		6				OH	198.4											
		8				OH	137.6											
		10				SM	27.6											
		12																
		14				CH	44.7		58	20	38	64.9						
		18	1.25		Gray SANDY LEAN CLAY	CL	27.8	94.3	41	18	23				0.72	14.8	8.3	Bulge
		23				SC-SM	25.9		NV	NP	NP	28.6						
		28			Gray poorly graded SAND with SILT	SP-SM	18.5					8.8						
		33			Gray poorly graded SAND with SILT	SP-SM	22.8					8.3						
		34																
		38			Gray poorly graded SAND with SILT	SP-SM	18.3					6.0						
		43			Gray poorly graded SAND	SP	19.6					4.6						
		48	3.75		Reddish-brown FAT CLAY	CH	26.1	97.8	70	23	47	98.4			2.00	3.2	20.8	Slickensid
		53	3.25		Reddish-brown FAT CLAY	CH	31.5	91.0	75	23	52	96.3			1.19	8.3	23.0	Slickensid
		58	3.25		Light gray and tan LEAN CLAY	CL	19.4	106.3	26	16	10	97.9						

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SUMMARY OF LABORATORY TESTS

Project No. 19.15.131

Project: San Jacinto River Waste Pit Superfund Site

Boring No.	Sample No.	Depth (ft)	Pocket Pen. (tsf)	Torvane (tsf)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	pH	Lab Vane Shear (tsf)	Uc/UU. Compr. (tsf)	Failure Strain (%)	Conf. Pres. (psi)	Failure Type
		63	3.75		Tan and gray LEAN CLAY with SAND	CL	16.6	115.4	30	16	14	75.8			4.22	14.8	27.0	Bulge
		68	4.50		Gray SANDY LEAN CLAY	CL	18.0	113.5	28	16	12	50.4			5.64	15.0	29.0	Multiple shear
		73				SC	22.8		26	17	9	39.3						
SJGB029																		
		1				GP-GM	12.5											
		2				CH	14.5	106.9	NV	NP	NP							
		4				CH	33.8											
		6				CL	36.6											
		8				CH	108.7		70	22	48							
		10				SC	36.7					36.6						
		12				CH	71.9		74	24	50							
		14	0.75		Gray and tan FAT CLAY; organics	CH	28.6	98.5	62	21	41							
		18				CL	25.7	95.4	45	17	28	77.7						
		23			Gray poorly graded SAND with SILT	SP-SM	29.3					8.6						
		28			Gray SILTY SAND	SM	61.5					13.2						
		33			Gray poorly graded SAND with SILT	SP-SM	19.8					6.9						
		38			Gray poorly graded SAND with SILT	SP-SM	19.6					6.1						
		43			Gray poorly graded SAND with SILT	SP-SM	20.6					7.7						
		48			Gray FAT CLAY	CH	27.3					99.6						
		53	4.25		Gray FAT CLAY	CH	26.4	100.0	70	22	48	99.2			2.33	5.5	22.5	Multiple shear
		58	4.50		Tan and gray LEAN CLAY	CL	16.8	111.6	33	17	16				1.85	9.1	24.5	Bulge
		63	4.50		Gray SANDY LEAN CLAY	CL	17.7	113.0	36	17	19				4.15	14.6	26.6	Vertical shear
		68				SC	20.3		29	16	13	38.4						
		73				CL	22.5		38	17	21	95.0						
SJGB047																		
		0				CL-ML	30.6					97.3						
		2				ML	36.7											
		4				ML	42.9					94.2						
		8			Dark gray SANDY LEAN CLAY	CL	29.5					70.0						
		10				CL	38.8		39	20	19	73.8						
		12				CL	64.1											
		14				ML	57.7					96.5						
		18	0.50		Dark gray SANDY FAT CLAY; sand pockets	CH	37.6	72.1	79	24	55	55.6			0.29	7.3	6.6	60 Degree
		23	2.00		Gray LEAN CLAY with SAND	CL	20.1	113.6	42	18	24	73.3			1.44	13.9	8.3	Bulge

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SUMMARY OF LABORATORY TESTS

Project No. 19.15.131

Project: San Jacinto River Waste Pit Superfund Site

Boring No.	Sample No.	Depth (ft)	Pocket Pen. (tsf)	Torvane (tsf)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	pH	Lab Vane Shear (tsf)	Uc/UU. Compr. (tsf)	Failure Strain (%)	Conf. Pres. (psi)	Failure Type
		28			Reddish-brown SANDY SILTY CLAY	CL-ML	15.6	107.1	27	21	6	59.6						
		33	4.00		Reddish Brown FAT CLAY	CH	29.0	96.5	59	39	20	98.4			1.00	1.3	11.8	60 degree
		38	3.75		Reddish Brown FAT CLAY	CH	31.3	96.0	74	34	40	99.5			1.73	14.6	13.5	Slickensli
		43	4.00		Gray LEAN CLAY with SAND	CL	18.6	116.0	42	18	24	84.3			3.36	14.8	15.3	Bulge
		48			Gray LEAN CLAY with SAND	CL	17.9		30	19	11	75.5						
		53				ML	20.4					92.9						
		58				ML	23.0					91.5						
		63				ML	27.4		NV	NP	NP	93.4						
		68				ML	25.9					97.5						
		73				ML	22.6					81.7						
		78				ML	21.8					68.4						
		83				SM	19.3		NV	NP	NP	46.4						
		88				SM	18.4					39.2						
		93				SM	17.6		NV	NP	NP	26.3						
		98	3.50		Tan and gray FAT CLAY	CH	21.4	98.0	73	23	50				0.33	5.3	35.0	Multiple shear
SJGB050																		
		0-2				CH	100.4					98.1						
		2-4				SC	81.8					41.2						
		4-6	0.50		Dark gray FAT CLAY	SC	28.6	85.0	32	16	16				0.30	14.8	1.7	Bulge
		6-8	0.50		Dark gray CLAYEY SAND	SC	32.8	85.3	34	17	17	43.3			0.08	12.6	2.4	Bulge
		8-10				CL	55.8					86.3						
		10-12				CL	48.5		41	18	23	82.6						
		12-14				CL	46.7					70.4						
		14-16				ML	22.6					51.5						
		18-20				SP-SM	36.9					9.8						
SJGB053																		
		0				SC	31.0					41.0						
		2				CL	57.0											
		4				CL	65.5											
		6				CH	60.8		55	22	33	59.8						
		8				SC	44.2		36	20	16							
		10				CL	41.7											
		12				CL	70.9					77.9						
		14				SC	31.2					47.2						
		18	4.25		Gray LEAN CLAY with SAND	CL	17.3	116.3	45	22	23				3.27	14.3	6.6	Bulge
		23	4.00		Tan LEAN CLAY with SAND	CL	17.3	116.2	46	21	25				3.32	12.1	8.3	Bulge

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SUMMARY OF LABORATORY TESTS

Project No. 19.15.131

Project: San Jacinto River Waste Pit Superfund Site

Boring No.	Sample No.	Depth (ft)	Pocket Pen. (tsf)	Torvane (tsf)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	pH	Lab Vane Shear (tsf)	Uc/UU. Compr. (tsf)	Failure Strain (%)	Conf. Pres. (psi)	Failure Type
		28	3.00			CL	16.4											
		33	4.25		Reddish-brown FAT CLAY	CH	28.4	96.0	70	37	33				1.43	2.0	11.8	Slickenslic
		38	4.50		Tan FAT CLAY	CH	23.5		69	24	45	99.6						
		43	3.75		Gray FAT CLAY	CH	27.0	96.9	71	35	36				1.87	3.6	15.3	Slickenslic
		48	2.00		Gray LEAN CLAY	CL	20.5	106.7	47	21	26				1.87	3.9	16.9	60 degree
		53	3.00			CL	17.7											
		58			Tan CLAYEY SAND	SC	24.2					41.6						
		63				SC	23.8					34.3						
		68				SM	20.9					15.0						
		73				SC	23.5					46.8						
		78			Gray CLAYEY SAND	SC	18.0					42.9						
		83				SC	18.1					35.1						
		88				CL	24.7		64	24	40	62.3						
		93	3.25		Black FAT CLAY	MH	111.5	41.7	144	78	66	89.5			3.33	4.8	32.6	Bulge
		98	2.25		Gray FAT CLAY	CH	24.3	101.6	71	23	48				2.59	10.1	34.4	Bulge
SJGB057																		
		0				SC	109.2		102	64	38	46.0						
		2				SC	94.2		51	24	27	28.4						
		4				SC	59.9					18.3						
		6				SC	37.3		66	21	45	18.7						
		8				CL	89.0											
		10				SC	23.1					49.2						
		12	3.50		Gray and brown FAT CLAY	CH	20.4	111.0	66	23	43	85.1			2.29	15.0	3.8	Bulge
		14	0.75			SC	11.8	109.0										
		18	3.75		Tan SANDY LEAN CLAY	CL	18.7	112.8	45	16	29	67.7			2.27	14.6	6.6	60 degree
		23	3.00			CL	17.5	114.8										
		28	4.00			CH	28.2											
		33	4.00		Reddish Brown FAT CLAY	CH	26.8	98.3	65	22	43	99.7			2.31	3.5	10.8	Slickenslic
		38	4.50			CH	25.9	100.7										
		43	4.00		Gray FAT CLAY	CH	20.7	105.2	56	19	37	97.5			3.70	3.8	13.6	Slickenslic
		48	2.25		Gray FAT CLAY	CH	35.6	92.5	52	19	33	98.2			1.67	5.1	15.0	Slickenslic
		53				CL	26.9											
		58	1.25		Gray FAT CLAY with SAND	CH	24.4	106.0	52	20	32	84.4			1.49	10.6	20.5	Bulge
		63				SM	19.1					24.7						
		68				SC	23.0					34.6						

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SUMMARY OF LABORATORY TESTS

Project No. 19.15.131

Project: San Jacinto River Waste Pit Superfund Site

Boring No.	Sample No.	Depth (ft)	Pocket Pen. (tsf)	Torvane (tsf)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	pH	Lab Vane Shear (tsf)	Uc/UU. Compr. (tsf)	Failure Strain (%)	Conf. Pres. (psi)	Failure Type
		73				CL-ML	22.2		23	18	5	64.6						
		78				CL	19.5					54.4						
		83				CL	19.6					71.4						
		88				OH	95.3		169	92	77	43.5						
		93	2.00		Gray LEAN CLAY	CL	26.1	100.3	41	18	23	97.8			1.67	9.8	32.6	Bulge
		98	3.50			CH	22.1					98.8						
SJGB058																		
		0-2	0.50			SP	14.9											
		2-4	1.00			CL	65.6		30	16	14	53.3						
		4-6	1.50		Dark brown LEAN CLAY	CL	25.5	89.3				97.1			0.92	14.6	1.7	Bulge
		6-8	1.50		Dark brown LEAN CLAY	CL	34.9	86.7	42	18	24	95.5			1.21	8.8	2.6	Multiple shear
		8-10	0.50		Dark brown FAT CLAY	CL	30.5	87.8				96.0			0.85	10.3	3.1	Bulge
		10-12				CL	32.9		44	17	27	93.4						
		12-14				SM	24.2		NV	NP	NP	41.7						
		14-16				SM	24.2		NV	NP	NP	43.3						
		18-20				SM	19.8					43.7						
SJRF-01																		
		0				CL	19.6											
		2				SM	9.0											
		4				SC-SM	15.0											
		6				CL	16.5	116.9										
		8				SP-SM	20.3											
		13				CL	21.2											
		18				CL	17.3											
		23				SC	25.0					32.0						
		28				SP-SM	25.2					10.1						
		33				SP-SM	22.2					6.9						
		38				SM	22.1					21.7						
		43				CL	33.6					55.7						
		48	4.25		Reddish-brown FAT CLAY	CH	24.9	102.2	60	25	35	95.3			0.26	1.7	20.8	Slickensid
		53	3.00		Tan and light gray FAT CLAY	CH	28.5	94.4	63	26	37	99.7						
		58	4.25		Gray and reddish-brown LEAN CLAY	CL	20.5	106.2	45	17	28	90.7			0.35	7.6	25.0	Slickensid
		63	2.50			CL	16.8					53.6						
		68				CL	21.2		28	16	12	78.1						
		73	4.50			CL	14.9		36	17	19	96.2						
SJRF-																		

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Tolunay-Wong Engineers, Inc.

Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
ASTM D 2974 (Method C)

Project No.: 19.15.131

Project Name: San Jacinto River Waste Pit Superfund Site

	Boring No.	SJGB053			
	Sample No.				
	Depth	93-95'			
	Soil Description	CH			
Water Content	Tare No.	70			
	Wet Weight + Tare (a), g	93.32			
	Dry Weight + Tare (b), g	60.46			
	Tare Weight (c), g	30.98			
Organic Content	Tare No.	A			
	Oven Dried + Tare (d), g	63.11			
	Ash+ Tare (e), g	54.50			
	Tare Weight, gm (f), g	33.63			
Summary	Furnace Temperature, C	440	440	440	440
	Ash Content (h), % ((e-f)*100)/(d-f)	70.8			
	Organic Content (g), % 100-d	29.2			
	Water, % by dry mass ((a-b)/(b-c))*100	111			
	Water, % by total mass ((a-b)/a-c))*100	52.7			

Tested By:	LO				
Date:	2/8/20	Scale	Ohaus	E1821119172-	743
Computed By:	TB	Oven	Quincy Lab	B-0001	
Date:	2/13/20	Furance	FURN-1-10	1049000031735	-8-14
Checked By:	EEH				
Date:	2/13/20				

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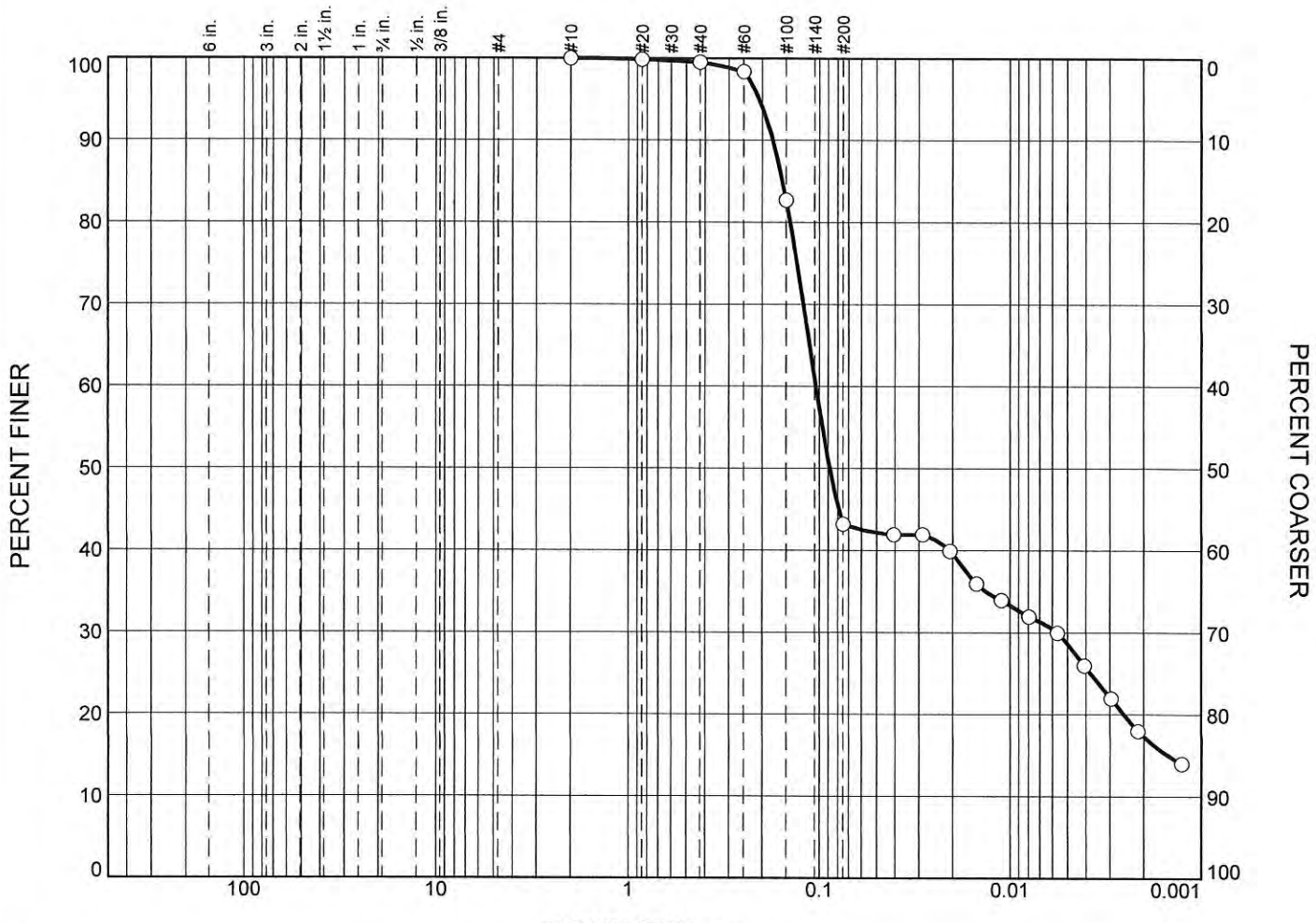
ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.5	56.3	14.6	28.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB024		8-10	Brown CLAYEY SAND	SC

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Houston, Texas

Client:

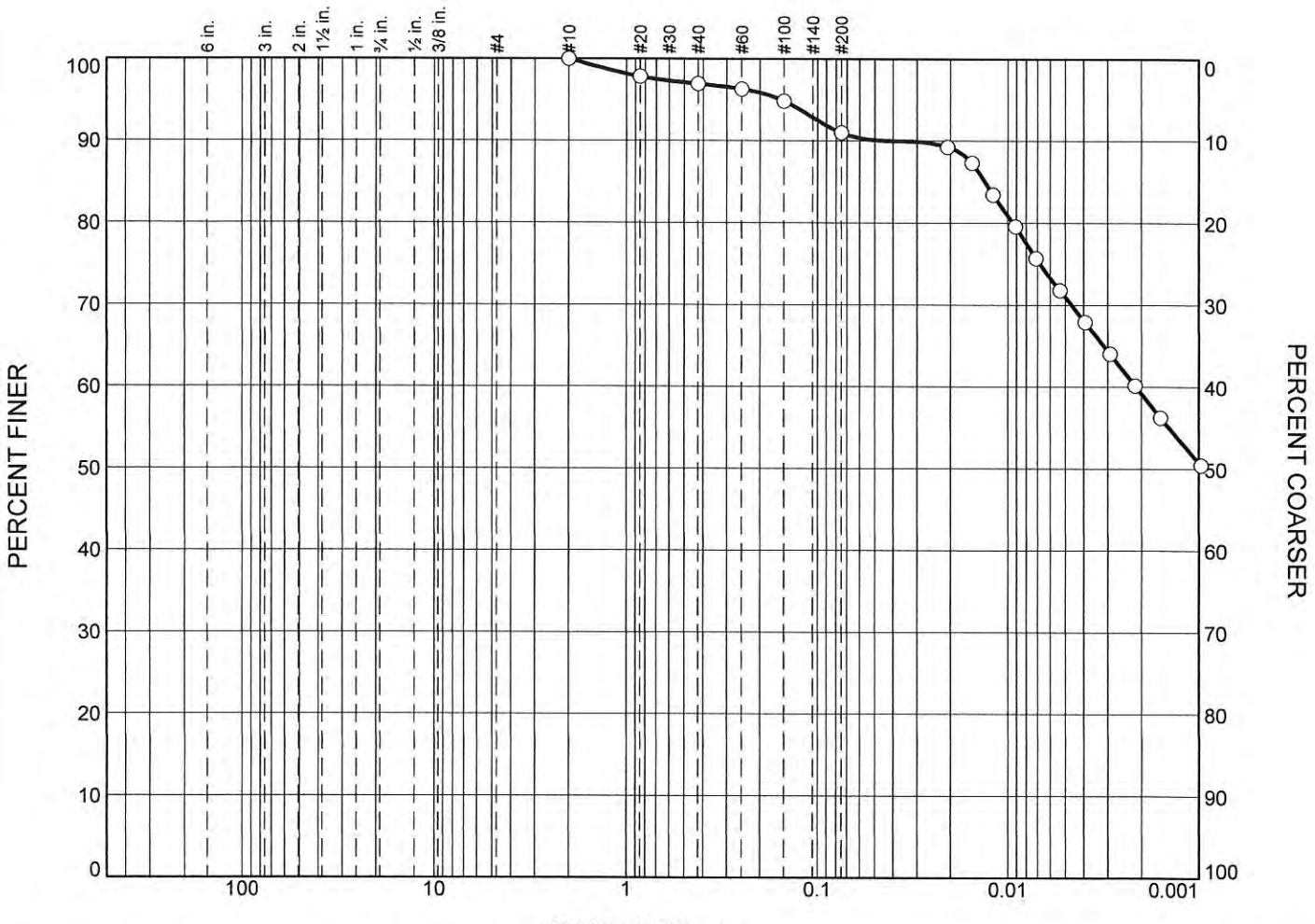
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

Attachment Figure B.2-8

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	3.1	5.9	20.0	71.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB024		10-12	Brown FAT CLAY	CH

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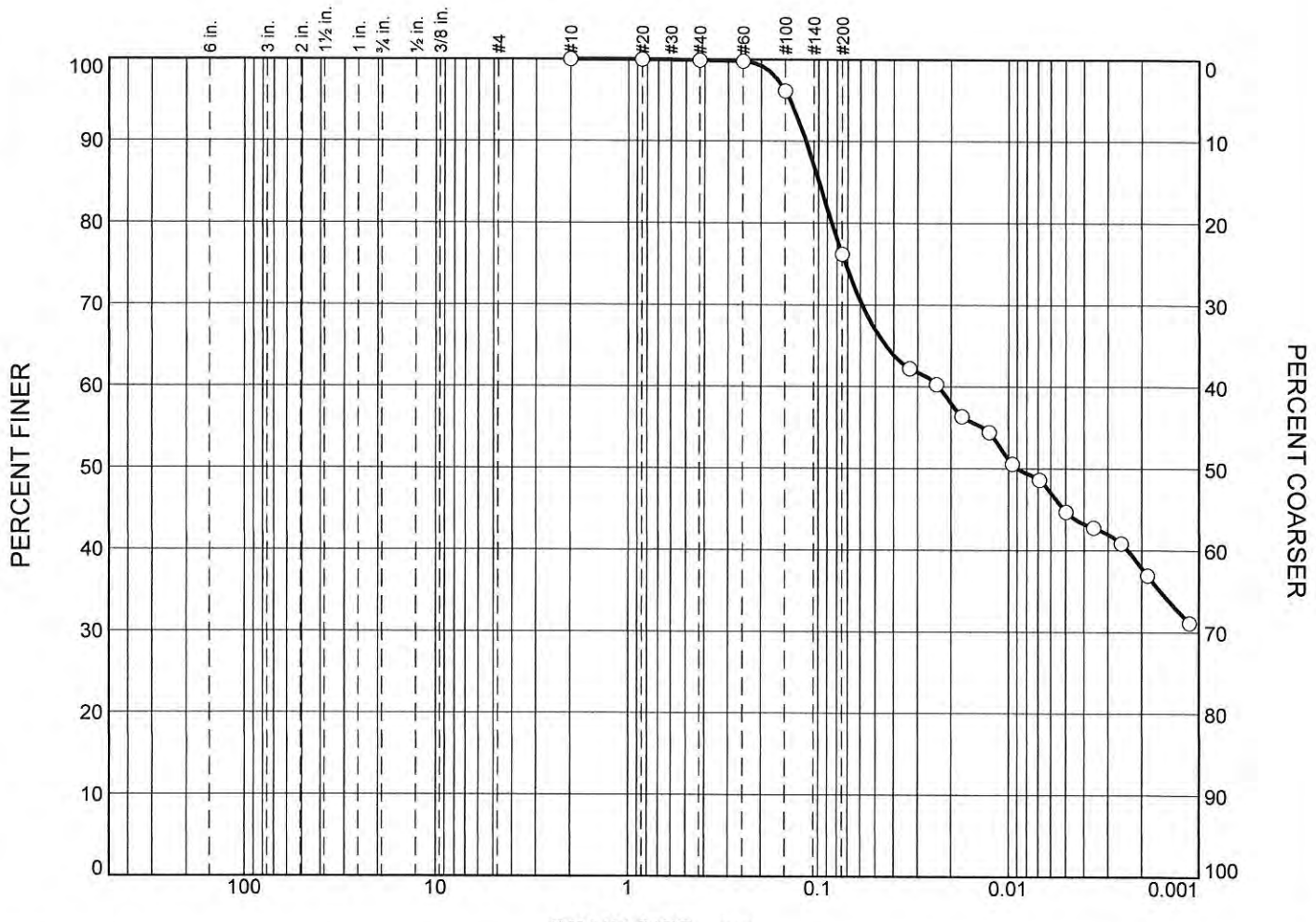
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

Attachment Figure B.2-9

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	23.7	31.4	44.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB024		12-14	Brown and black LEAN CLAY	CH

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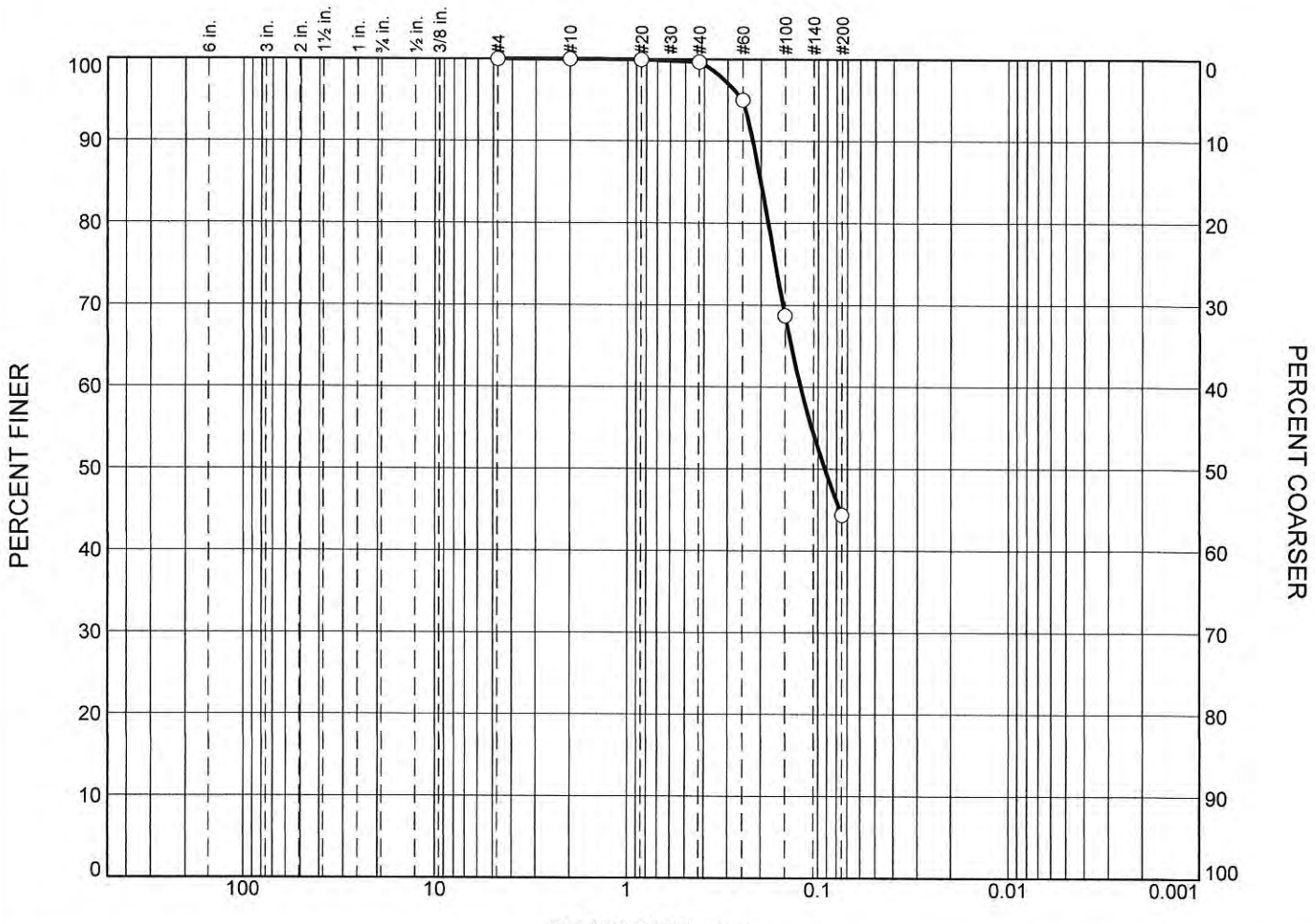
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

Attachment Figure B.2-10

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.3	55.3	44.4	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB024		14-16	Brown CLAYEY SAND	SC

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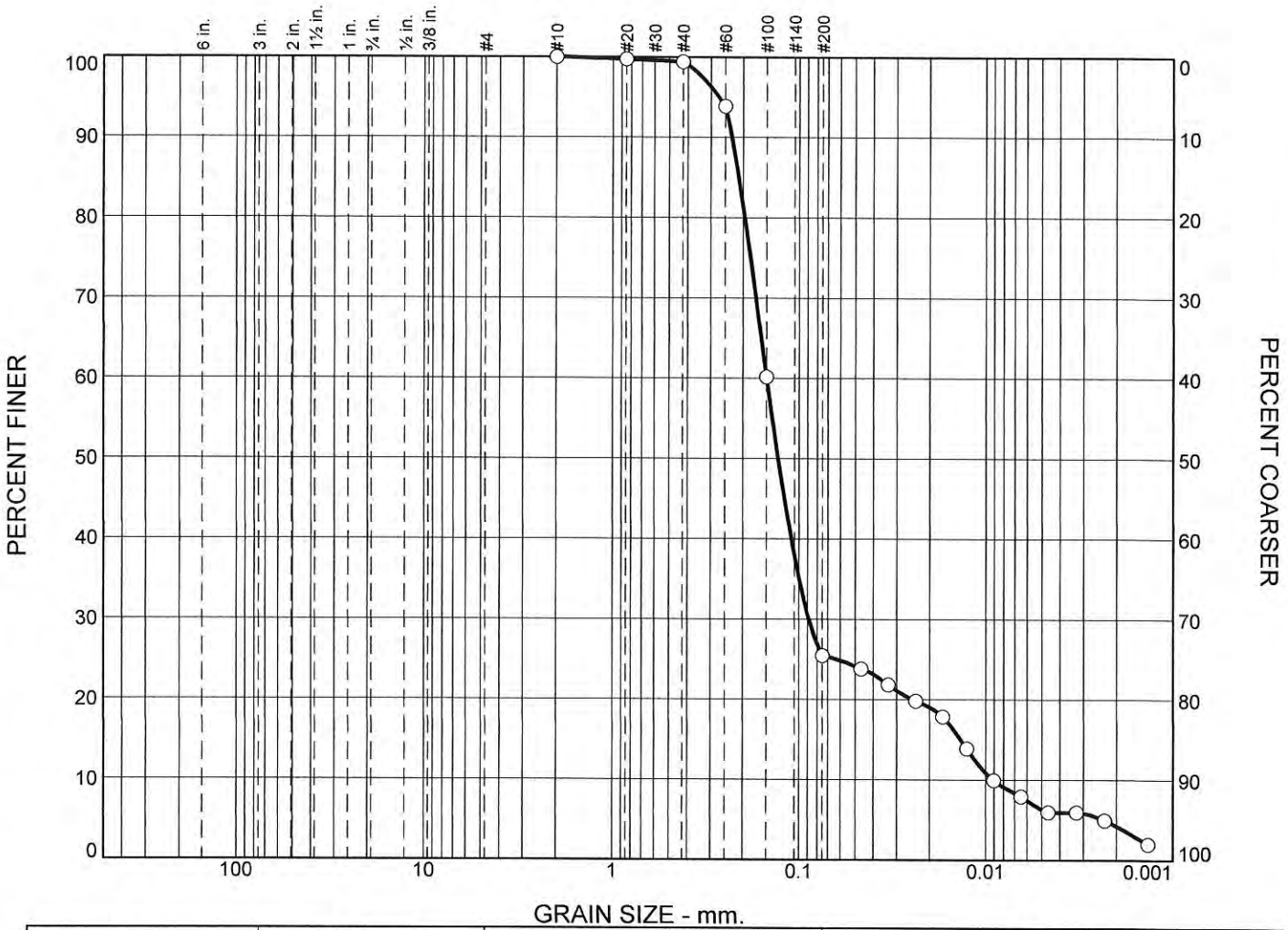
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

Attachment Figure B.2-11

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.6	73.9	19.2	6.3

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB024		18-20	Brown SILTY CLAYEY SAND	SC-SM

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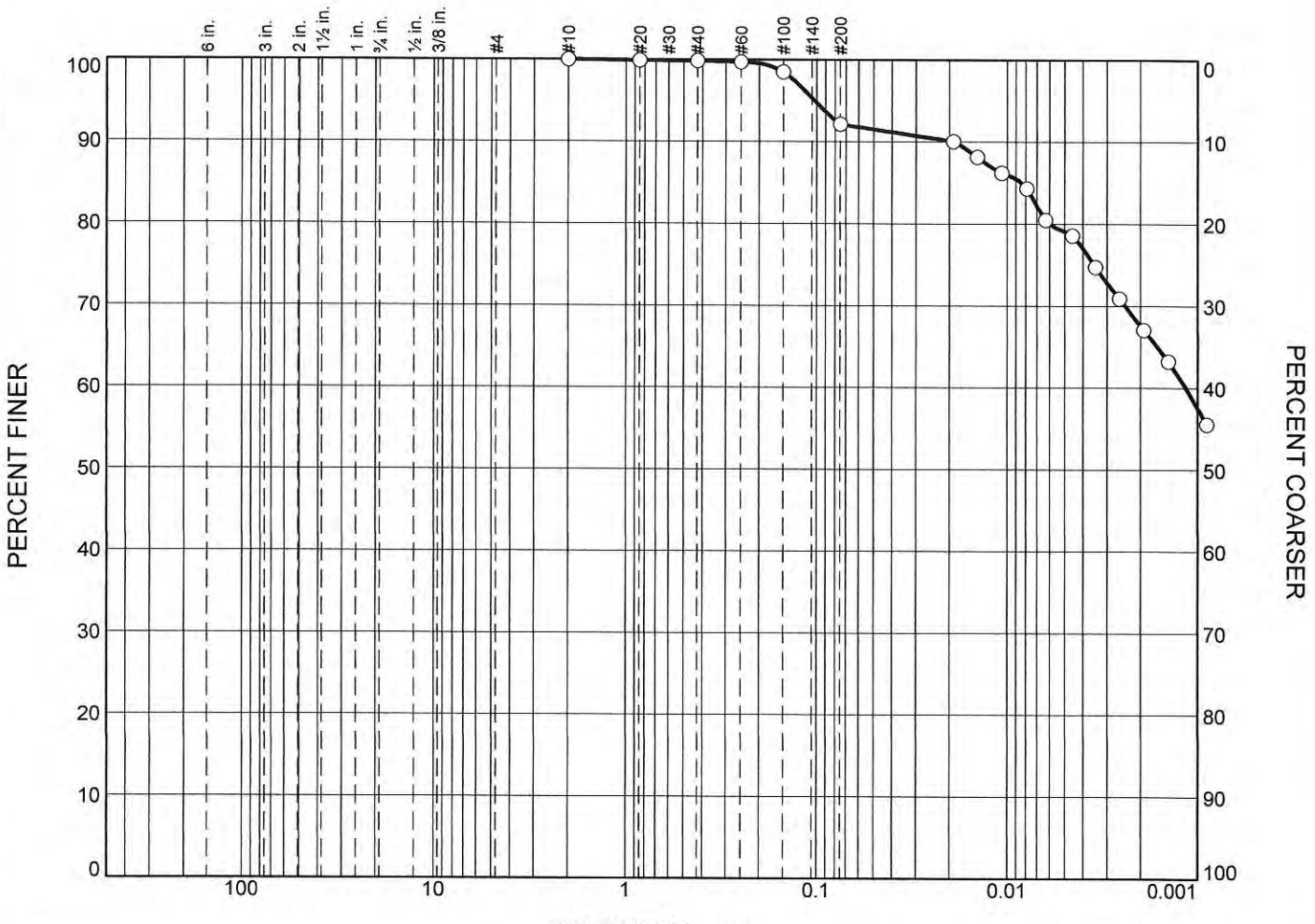
Project No.: 19.15.131

Figure

Attachment Figure B.2-12

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	7.7	13.0	79.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB024		23-25	Brown FAT CLAY	CH

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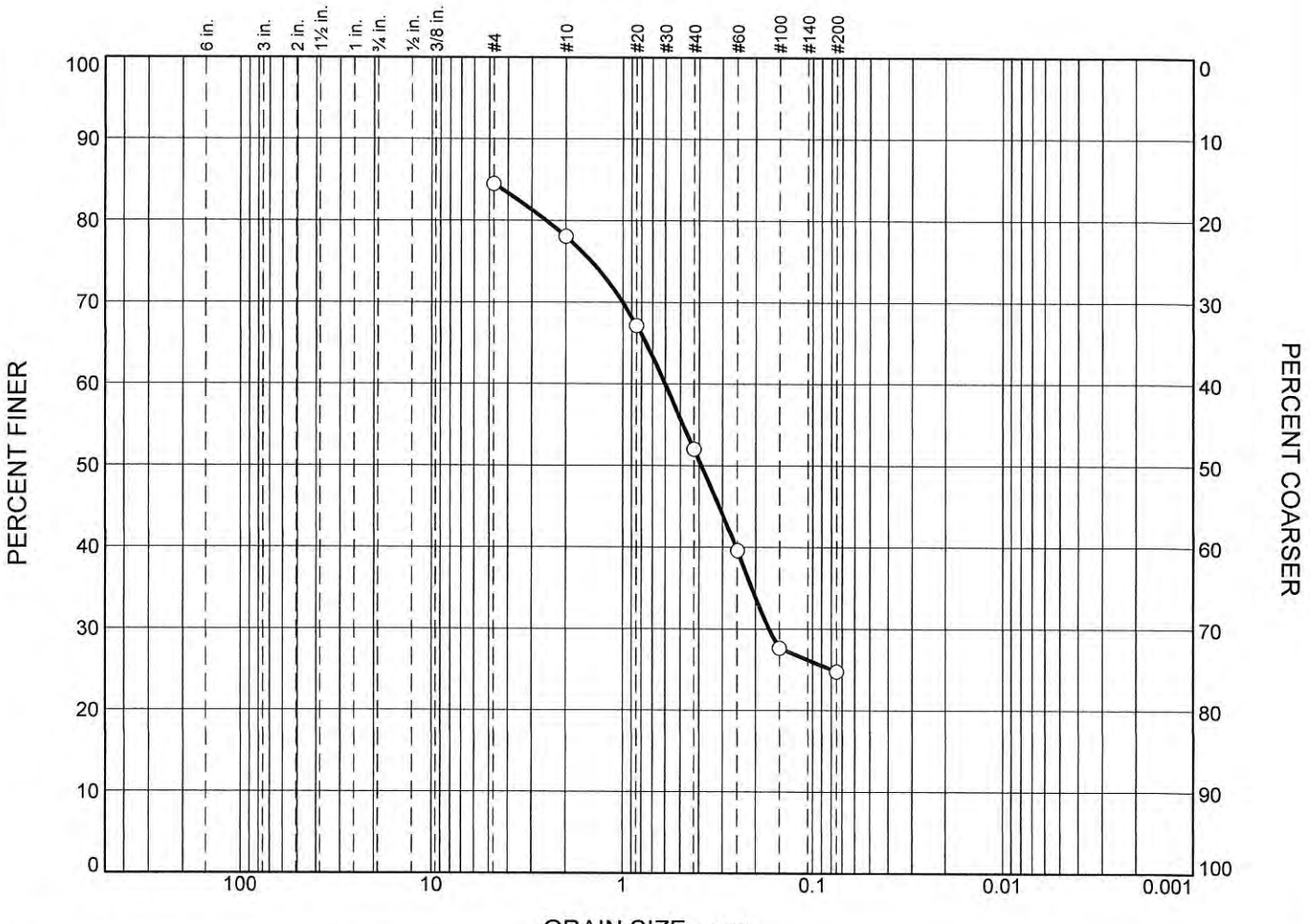
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				6.5	26.0	27.2	24.8	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		0-2		SM

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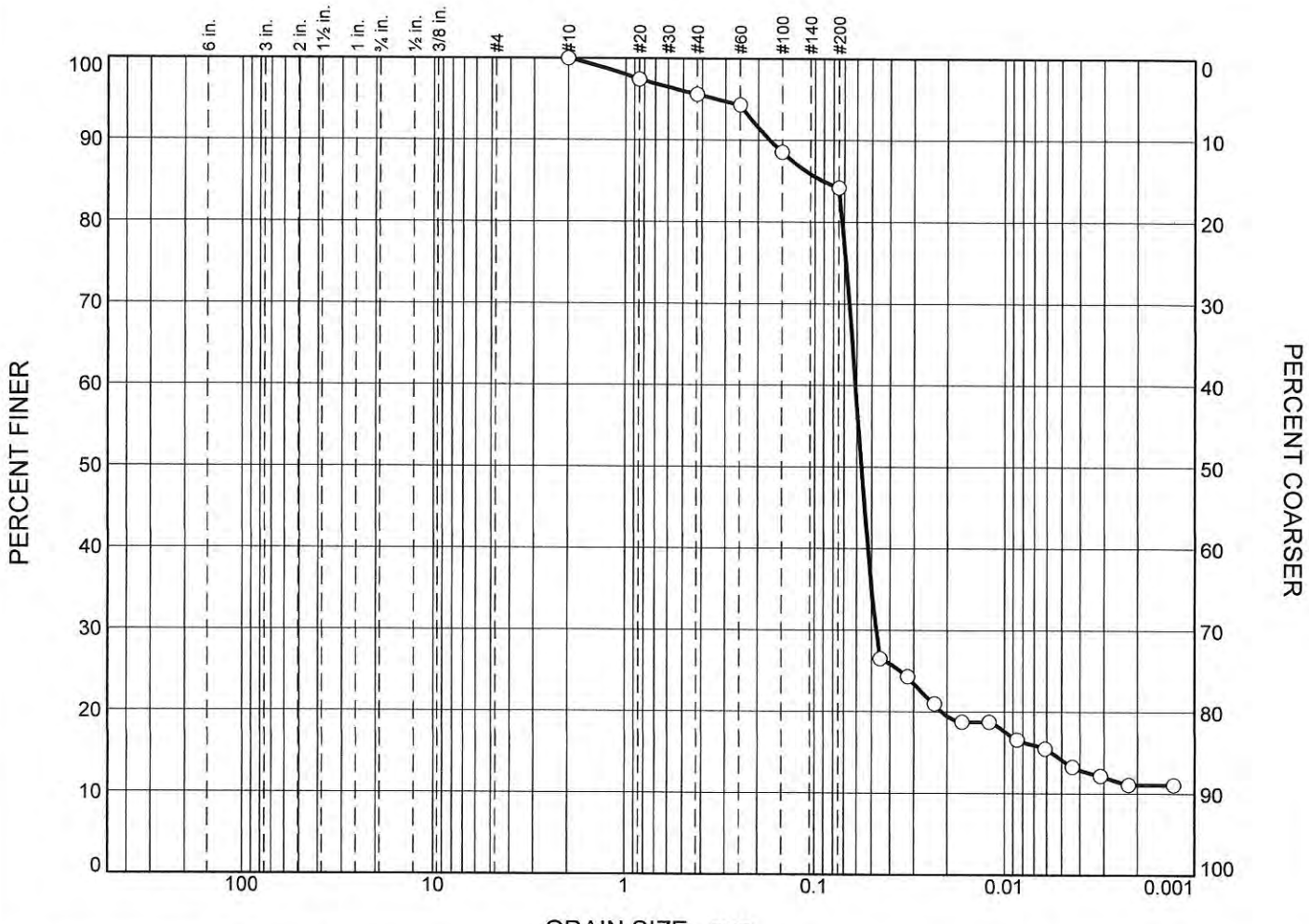
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

Attachment Figure B.2-14

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	4.4	11.4	70.1	14.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		8-10	Gray LEAN CLAY with SAND	CL

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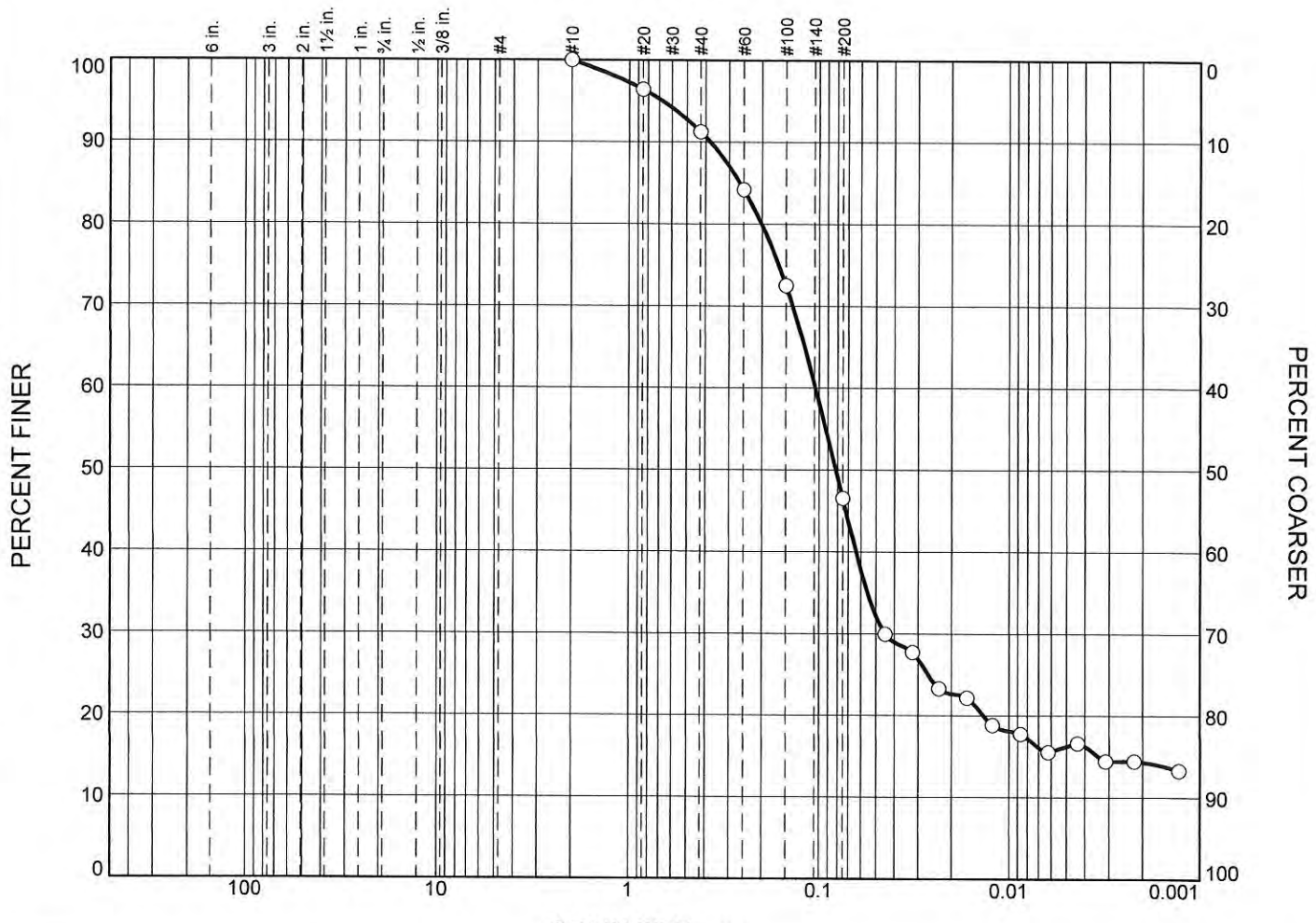
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

Attachment Figure B.2-15

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	8.8	44.7	30.3	16.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		10-12		SC

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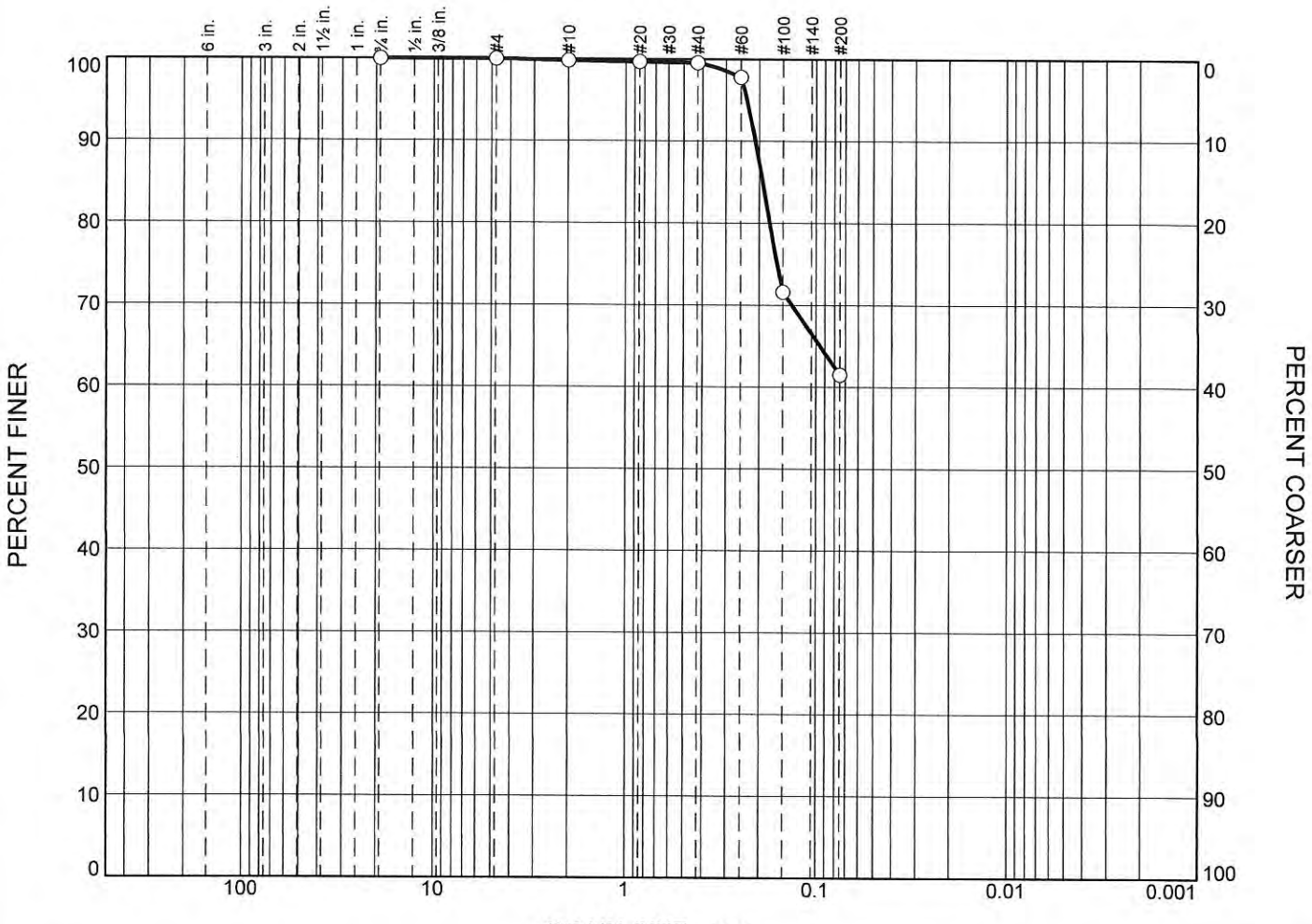
Project No.: 19.15.131

Figure

Attachment Figure B.2-16

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	0.3	38.0	61.5	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		14-16		ML

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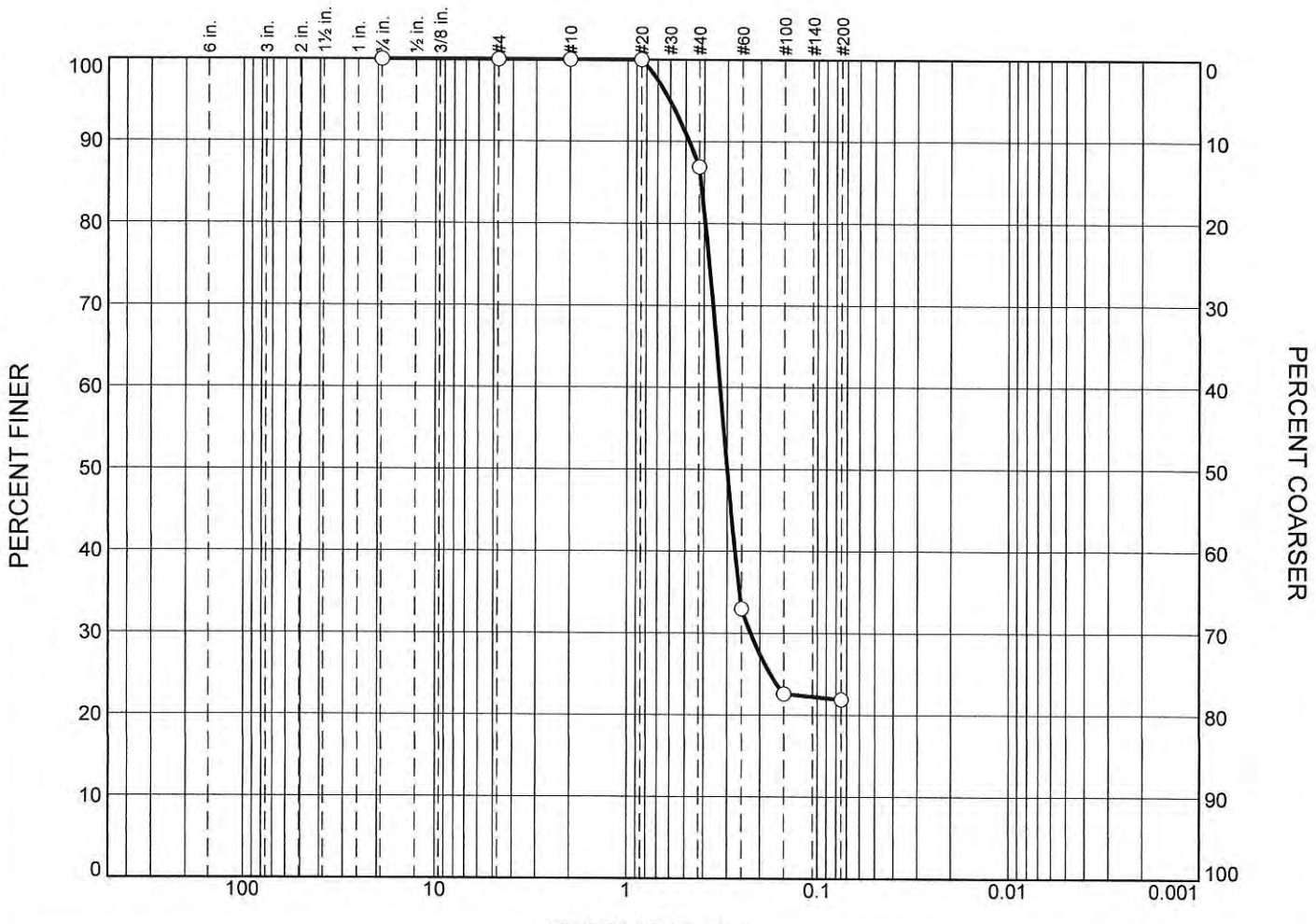
Project No.: 19.15.131

Figure

Attachment Figure B.2-17

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	13.1	65.0	21.9	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		20-22		SM

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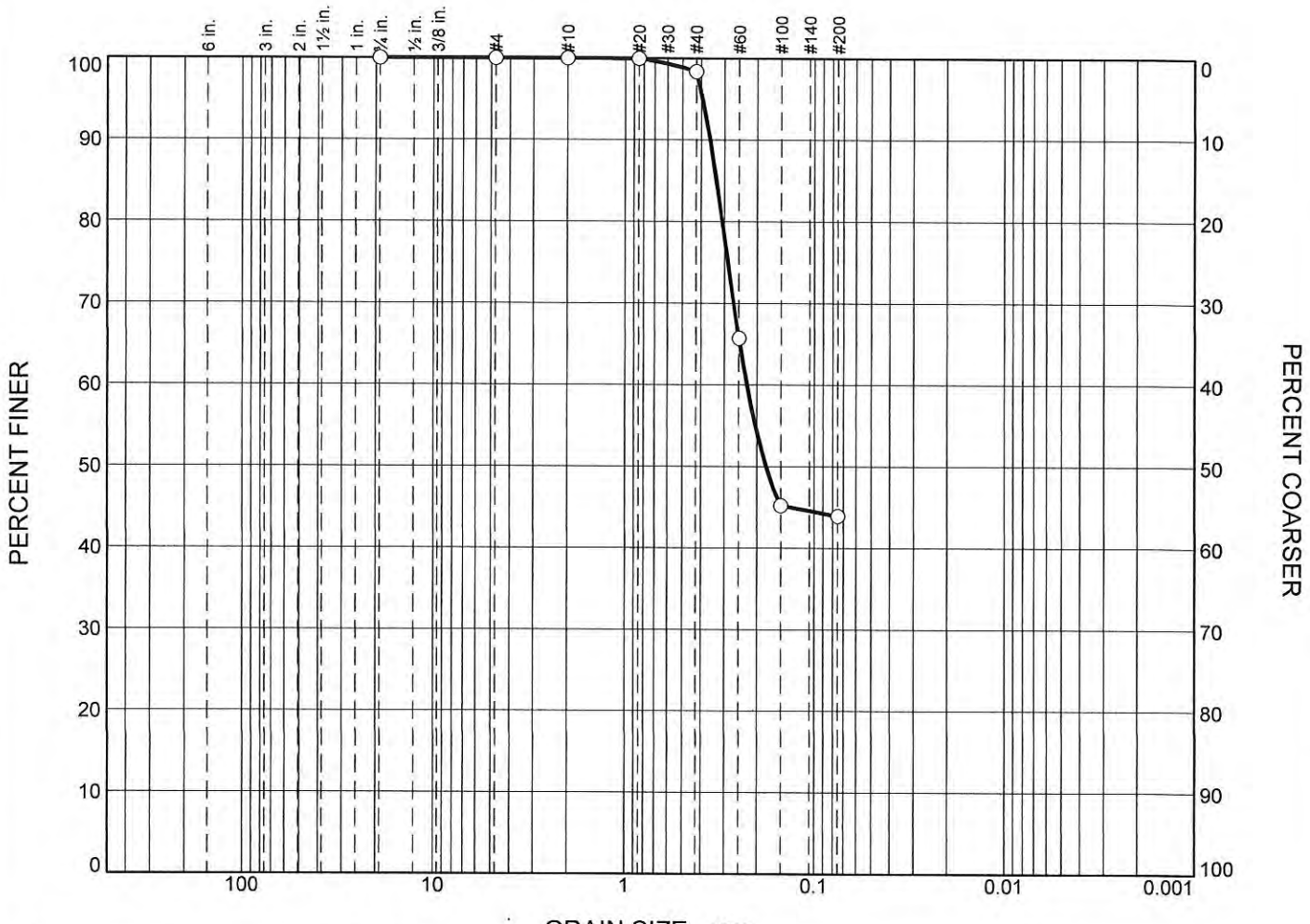
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.6	54.5	43.9	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		22-24		SM

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Houston, Texas

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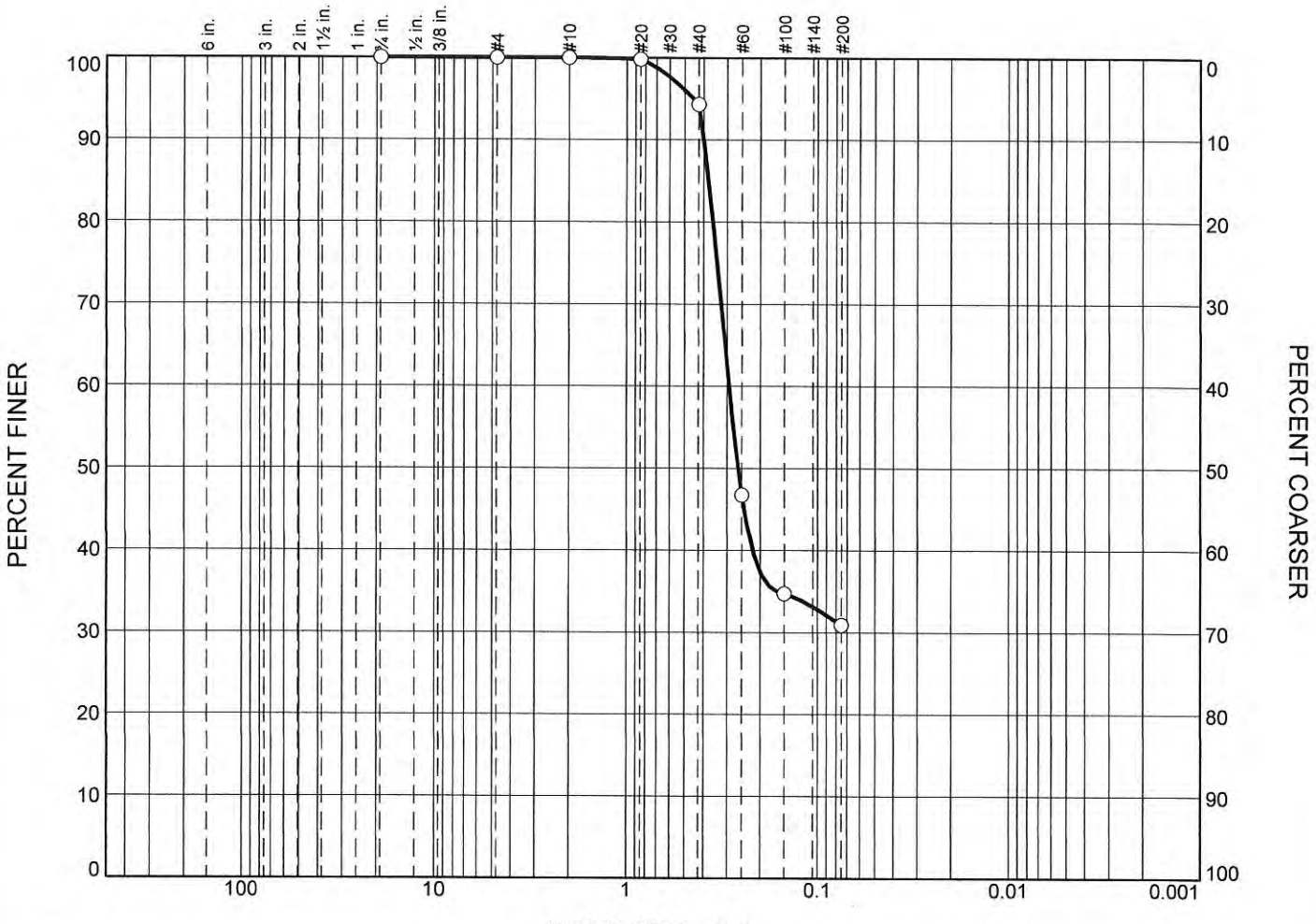
Figure

Attachment Figure B.2-19

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	5.7	63.4	30.9	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		28-30		SM

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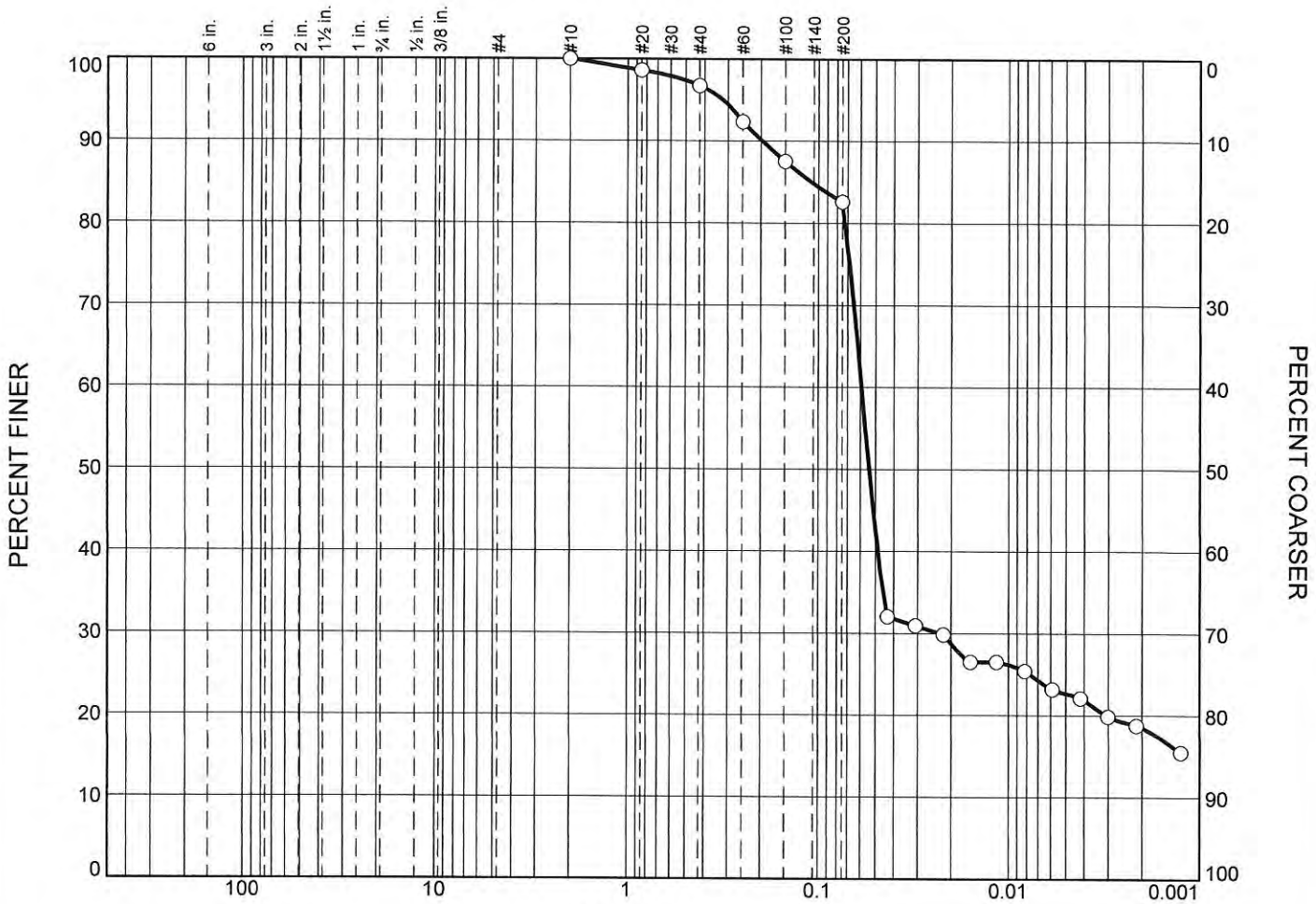
Figure

Attachment Figure B.2-20

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	3.3	14.1	59.9	22.7

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB026		8-10	Gray and brown LEAN CLAY with SAND	CL

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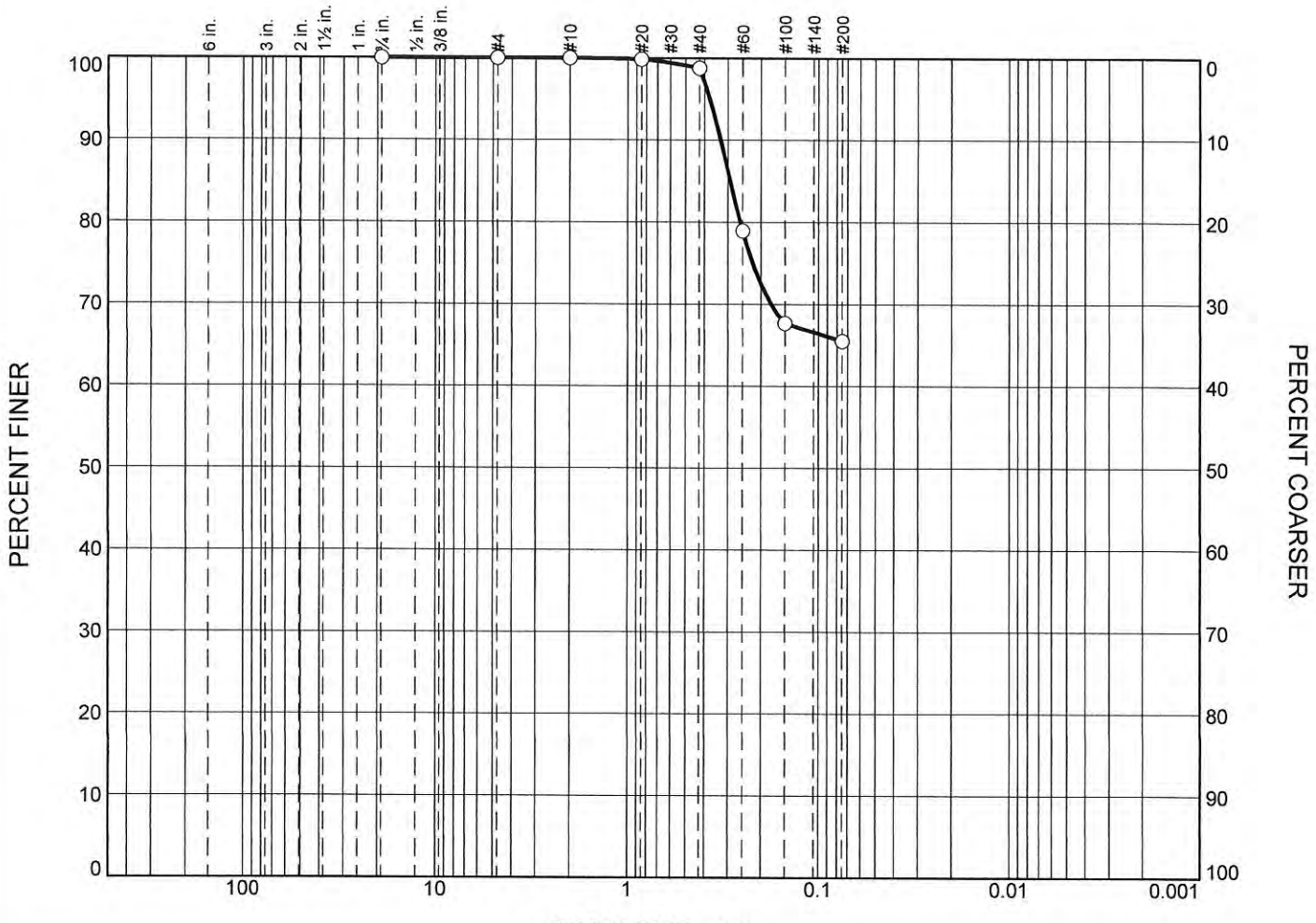
Project No.: 19.15.131

Figure

Attachment Figure B.2-21

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.2	33.3	65.5	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB026		12-14	Tan and Gray SAND	ML

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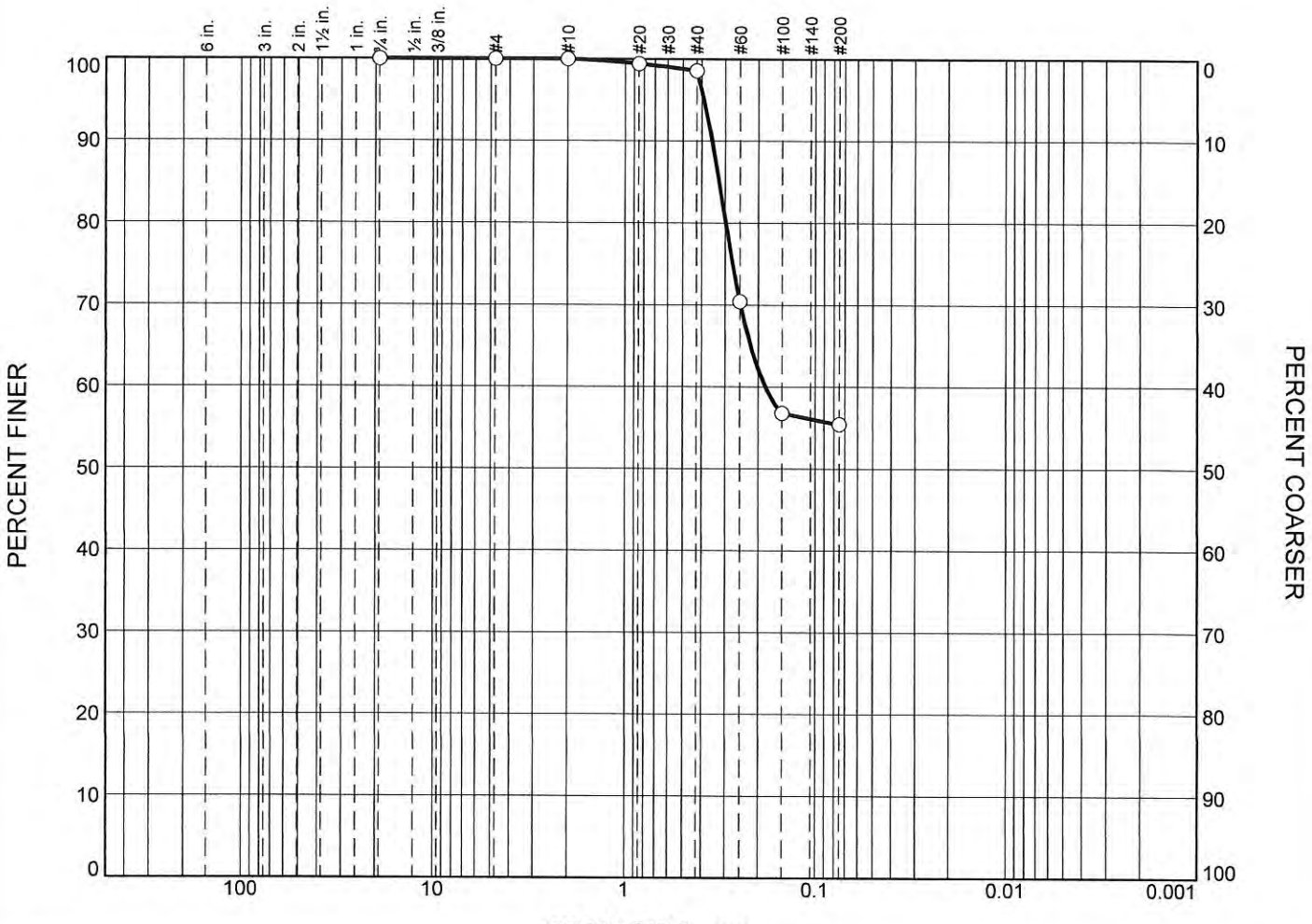
Project No.: 19.15.131

Figure

Attachment Figure B.2-22

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.4	43.2	55.4	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB026		20-22		ML

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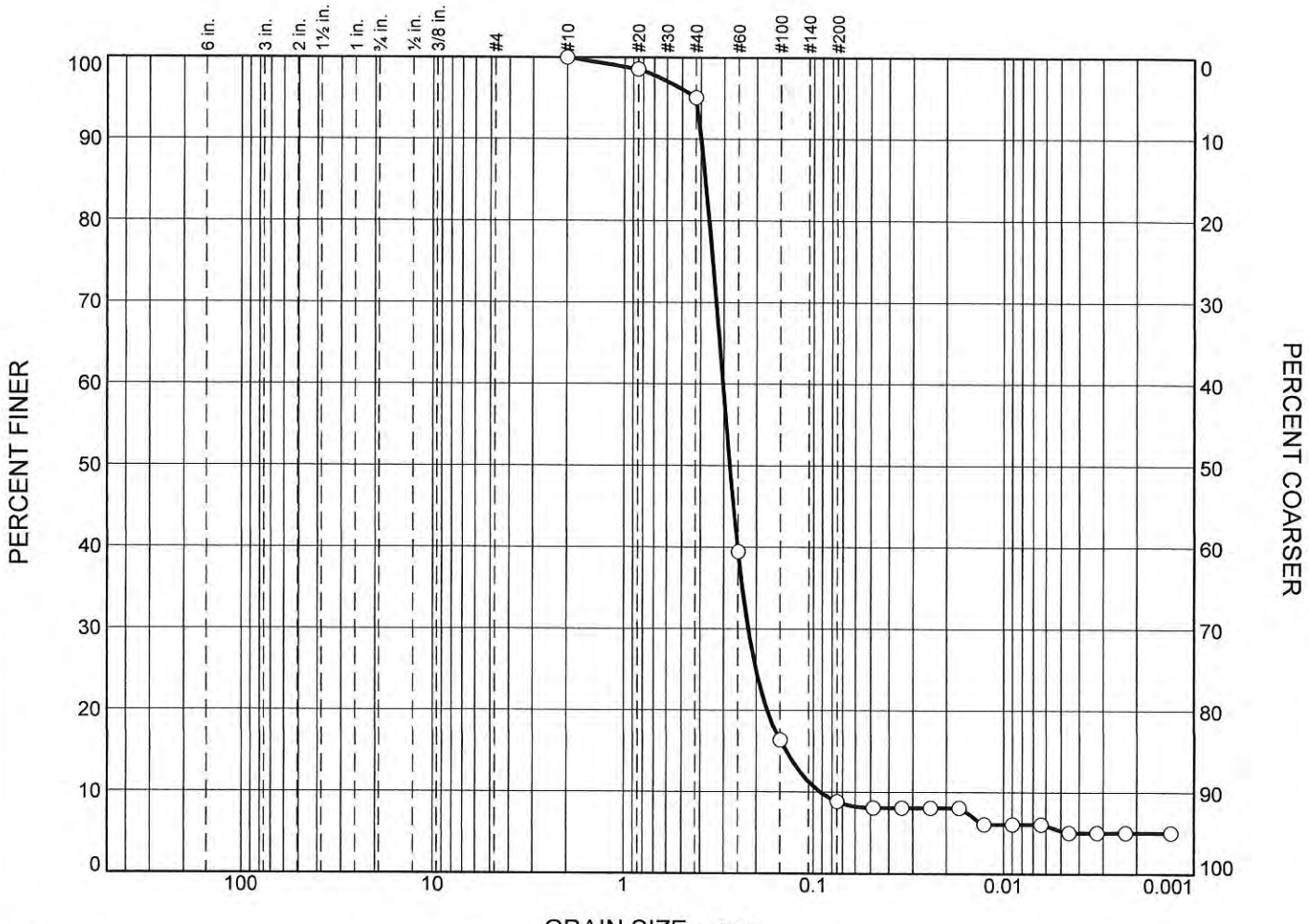
Figure

Attachment Figure B.2-23

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	4.9	86.3	3.5	5.3

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB028		28	Gray poorly graded SAND with SILT	SP-SM

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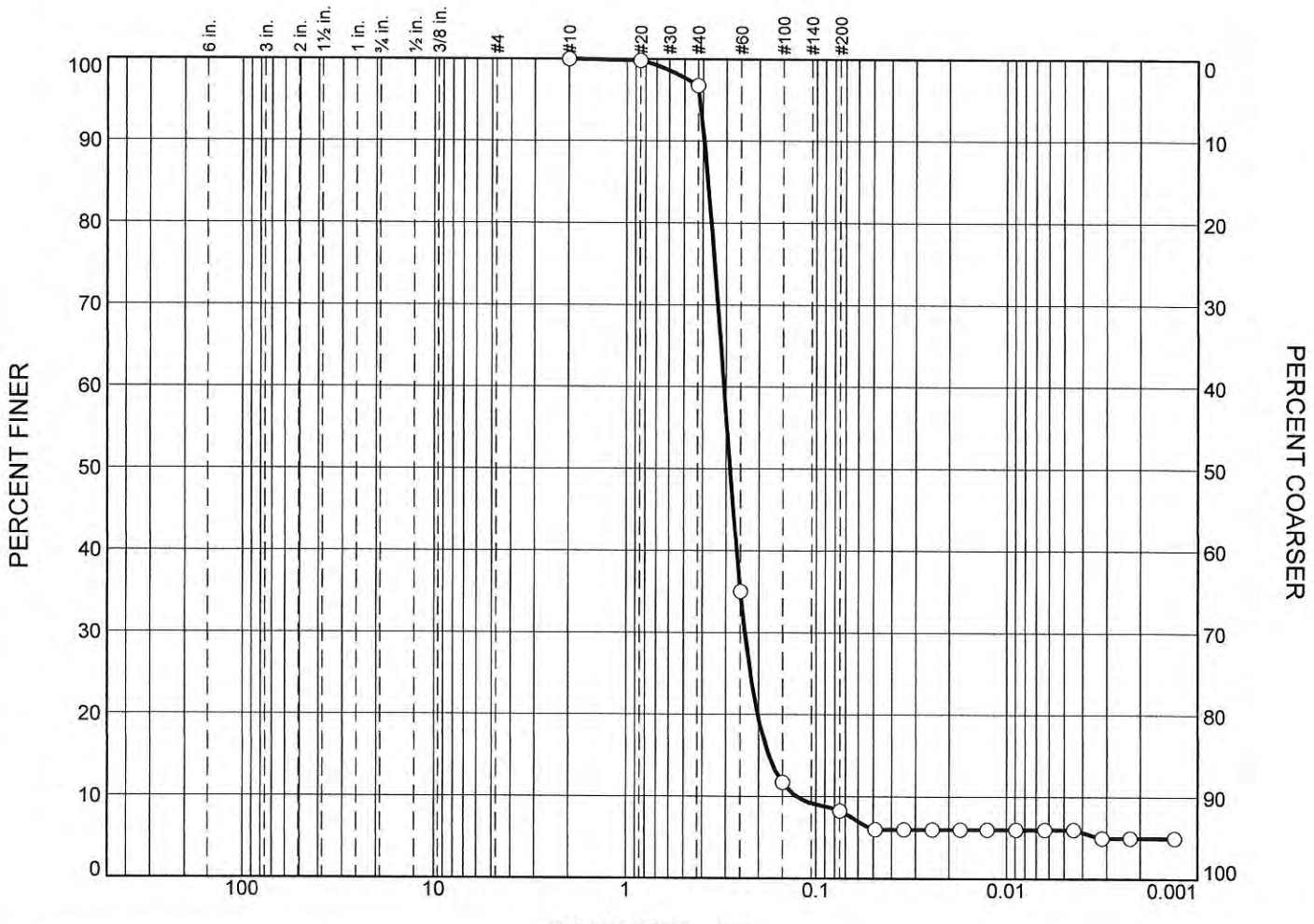
Project No.: 19.15.131

Figure

Attachment Figure B.2-24

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	3.2	88.5	3.3	5.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB028		33	Gray poorly graded SAND with SILT	SP-SM

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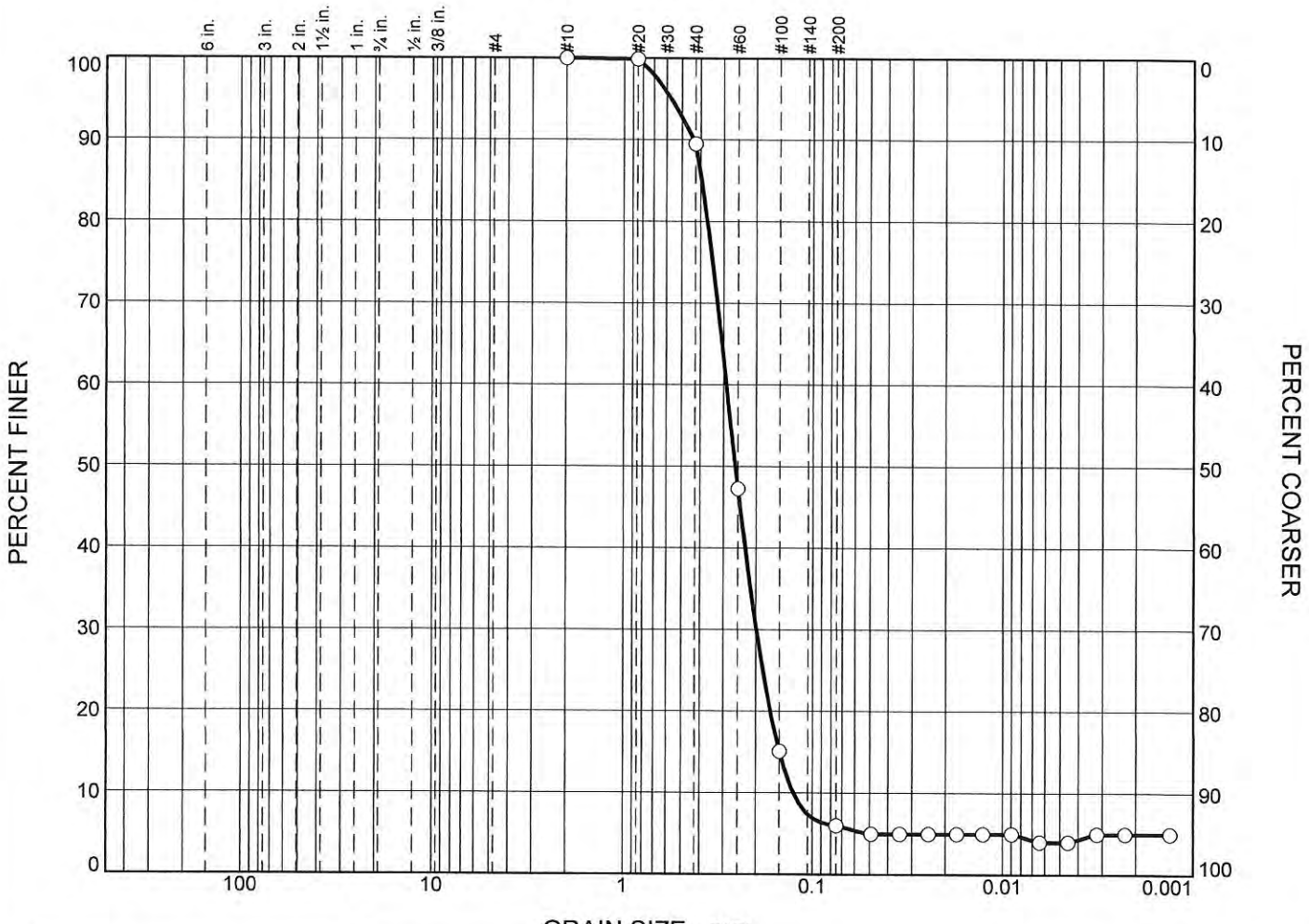
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	10.5	83.5	1.0	5.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB028		38	Gray poorly graded SAND with SILT	SP-SM

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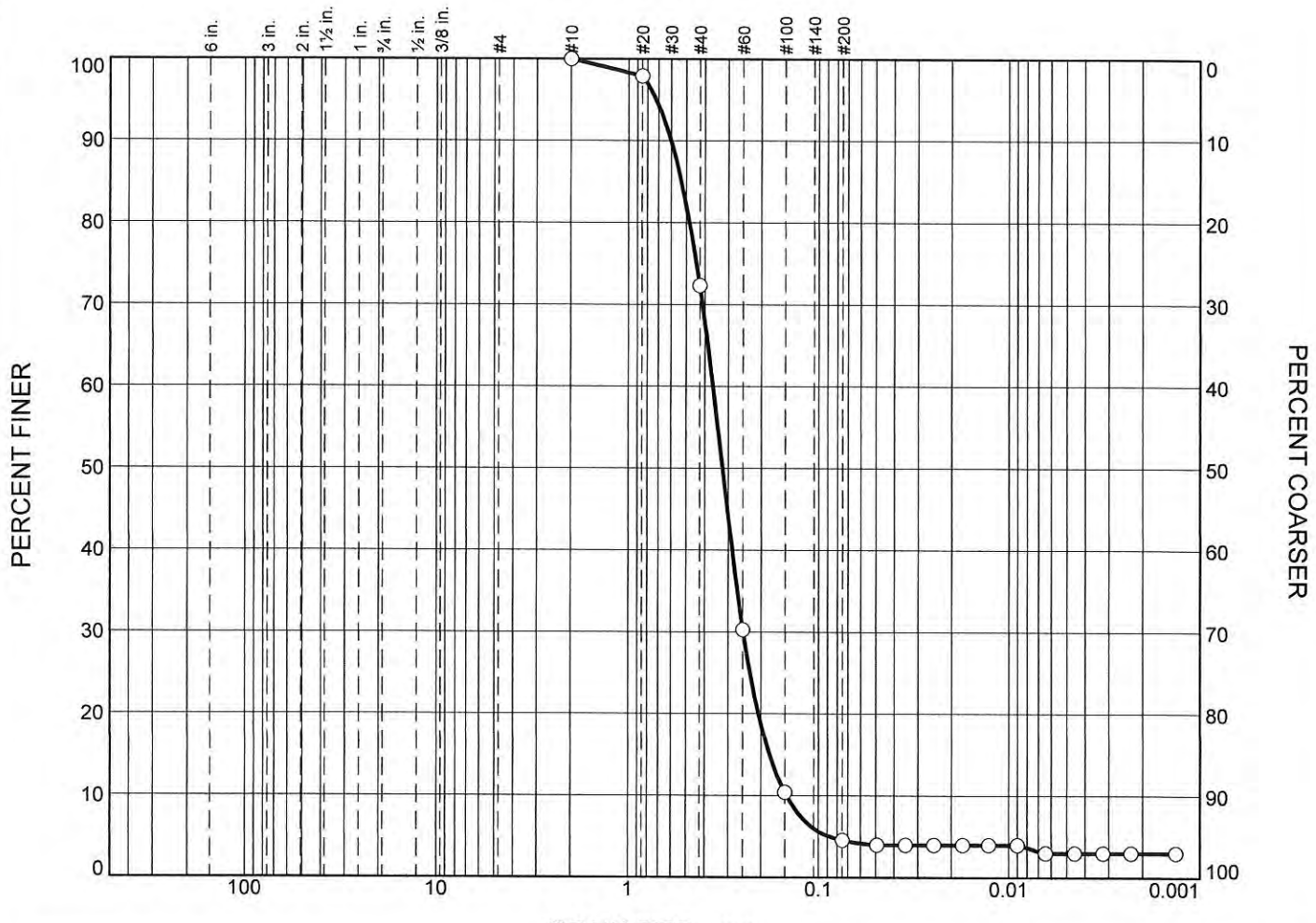
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	27.7	67.7	1.6	3.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB028		43	Gray poorly graded SAND	SP

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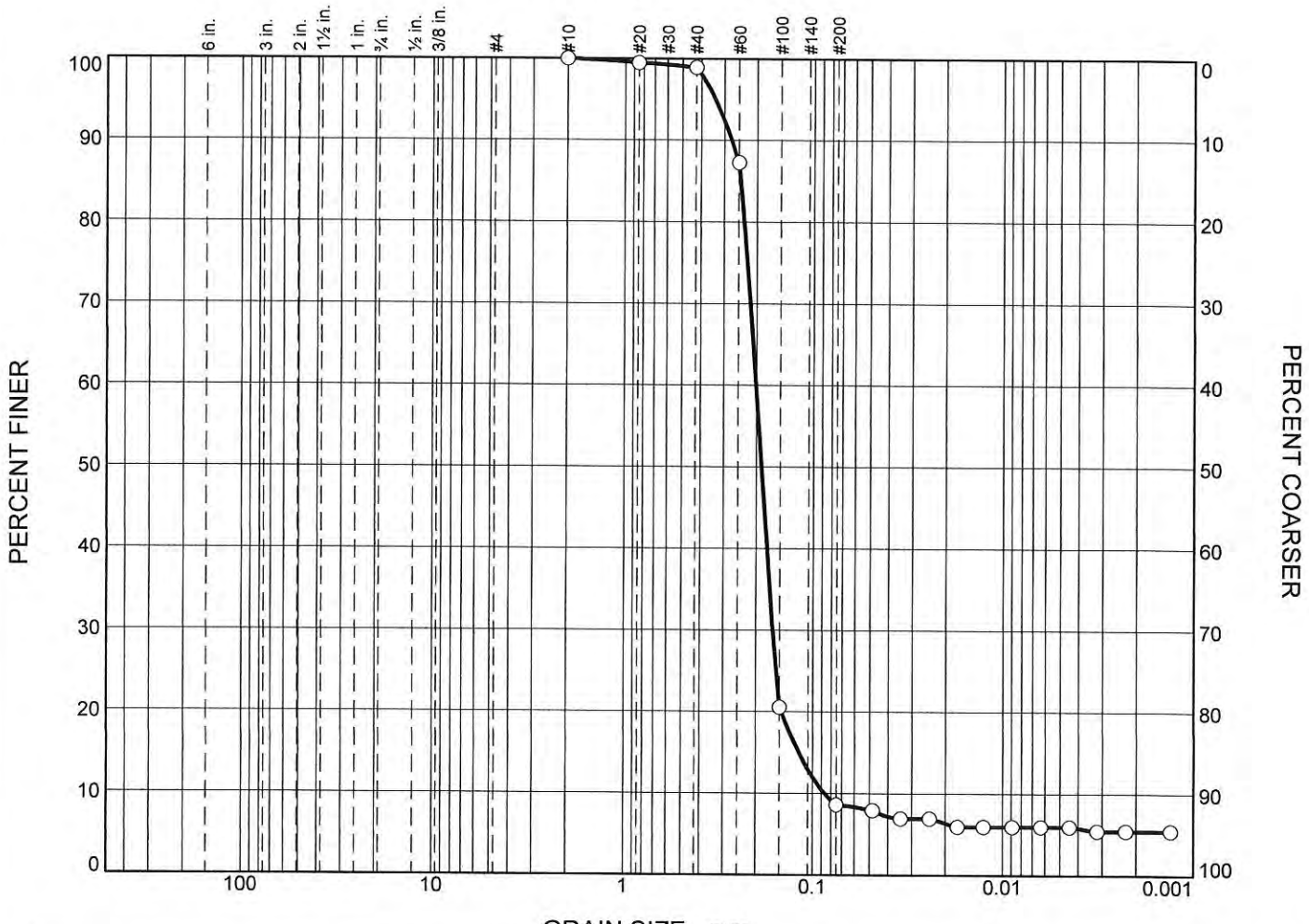
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.1	90.3	3.2	5.4

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		23	Gray poorly graded SAND with SILT	SP-SM

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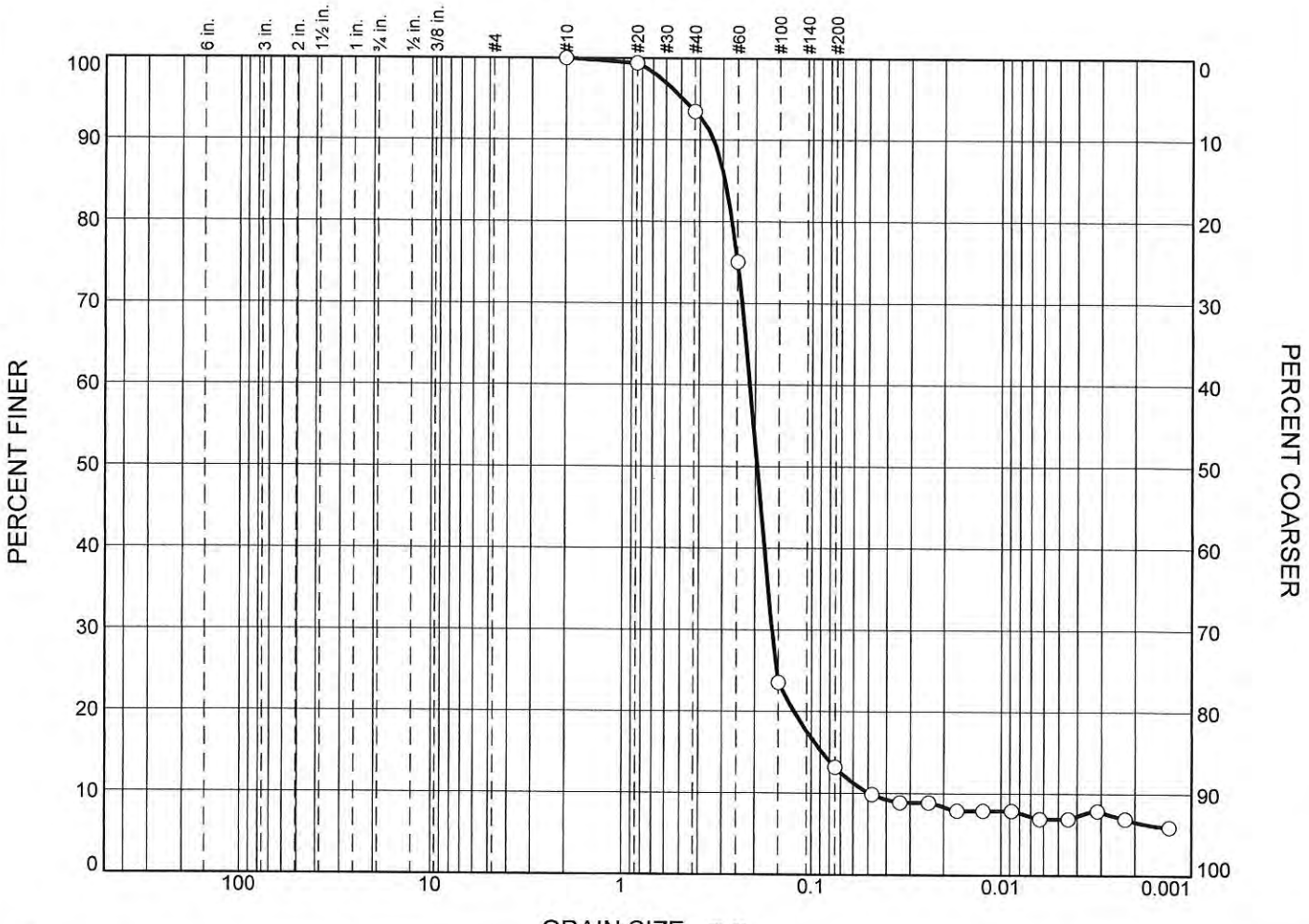
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	6.5	80.3	6.7	6.5

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		28	Gray SILTY SAND	SM

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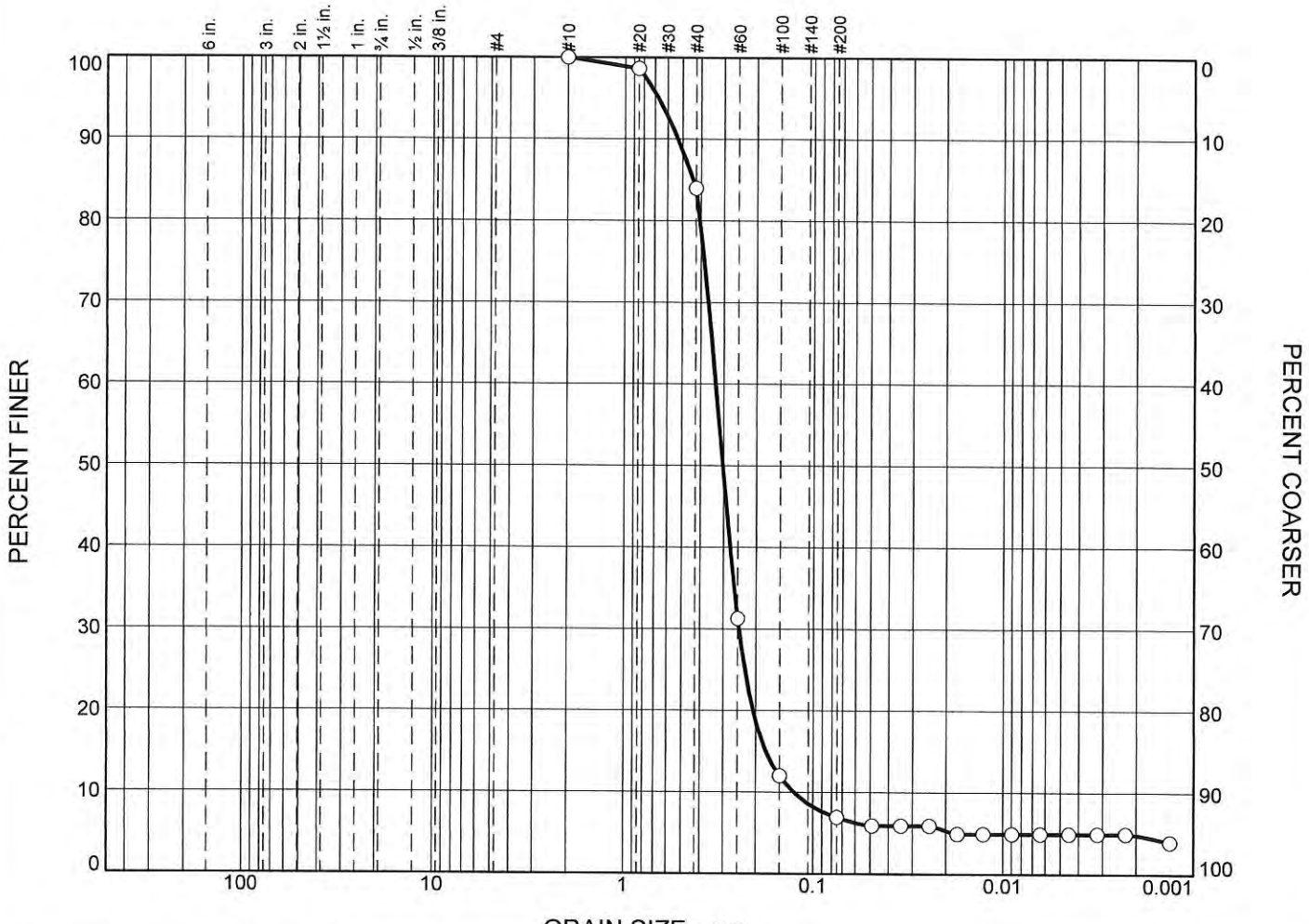
Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	16.0	77.1	2.1	4.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		33	Gray poorly graded SAND with SILT	SP-SM

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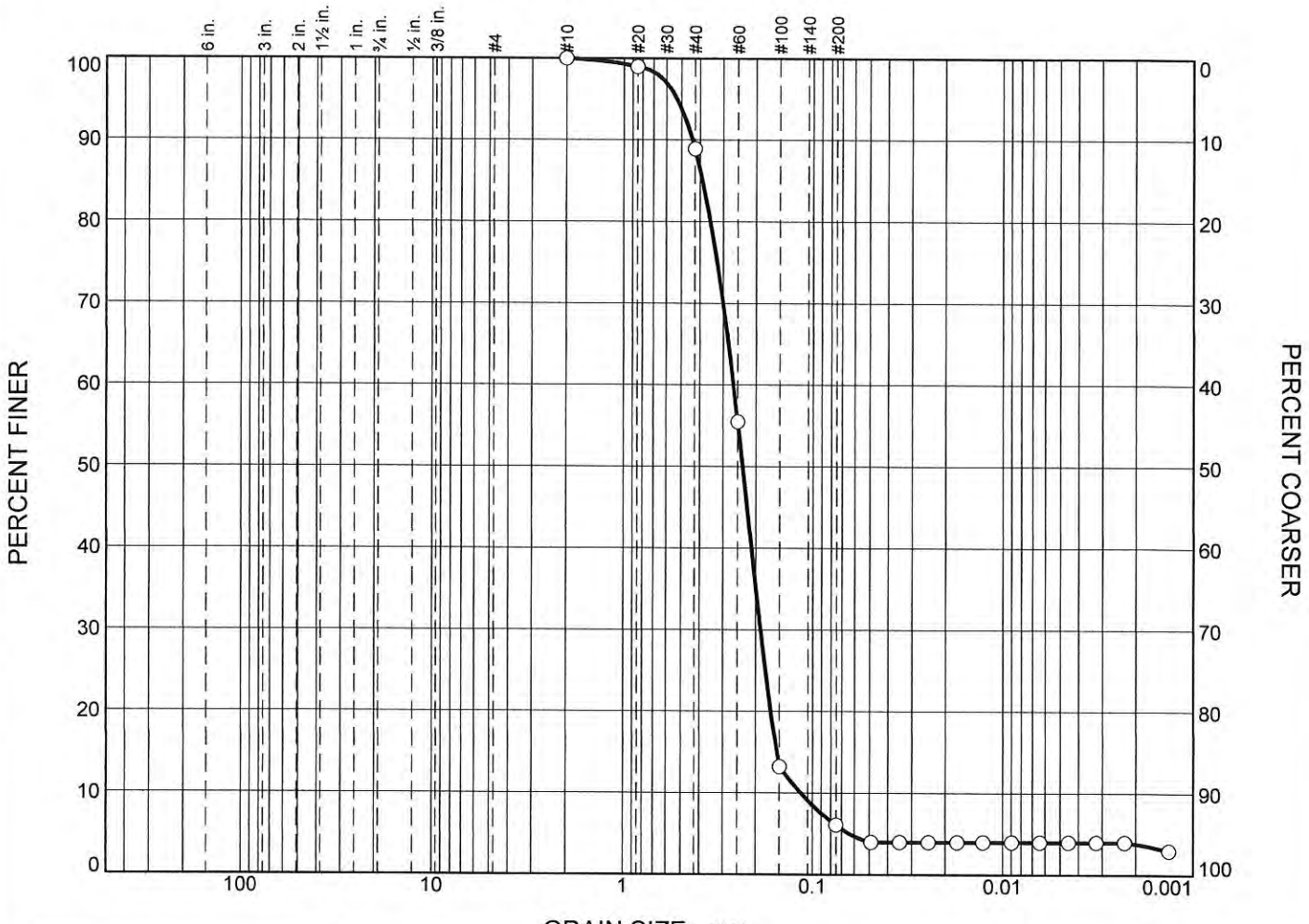
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	11.1	82.8	2.3	3.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		38	Gray poorly graded SAND with SILT	SP-SM

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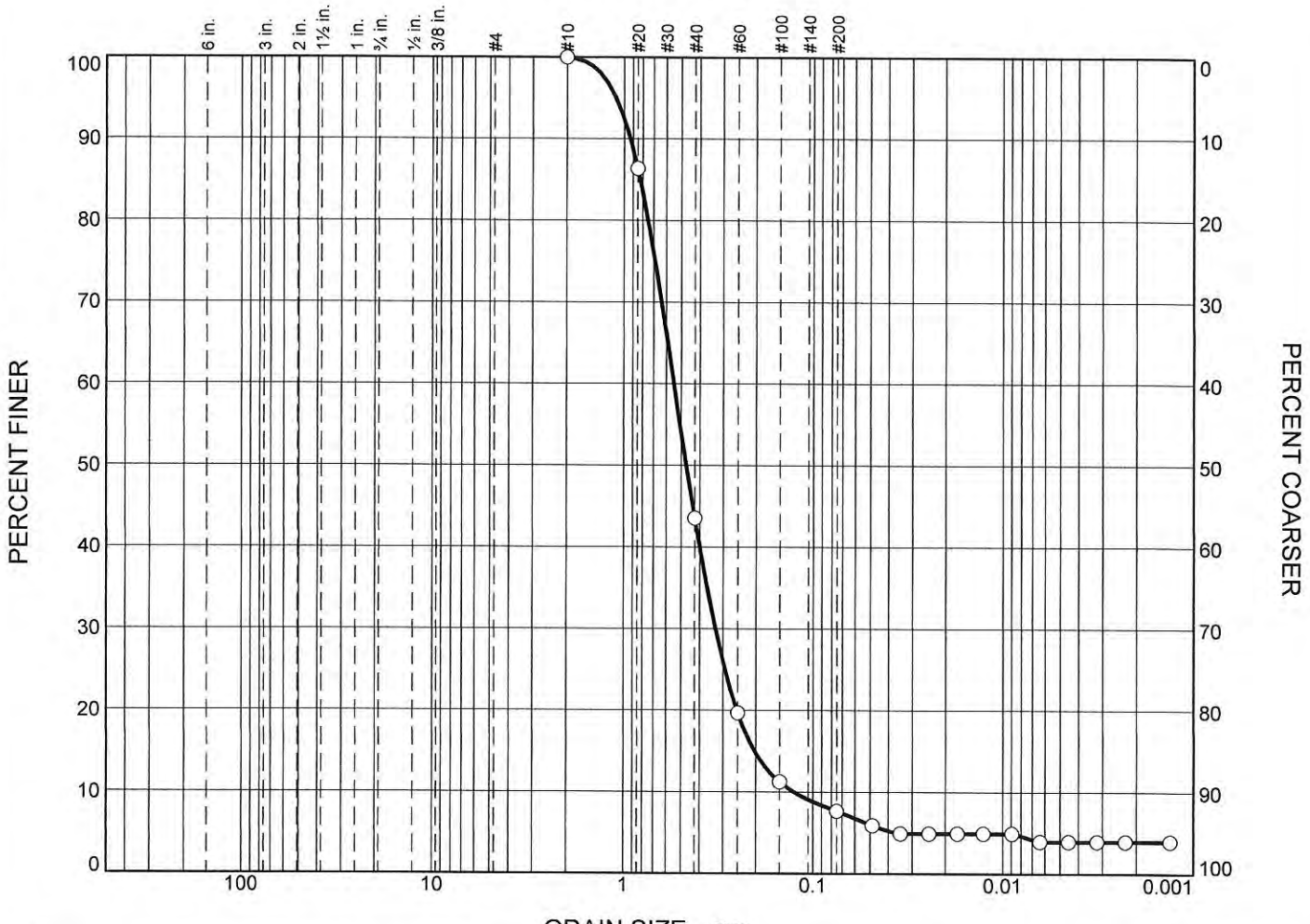
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	56.5	35.8	3.8	3.9

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		43	Gray poorly graded SAND with SILT	SP-SM

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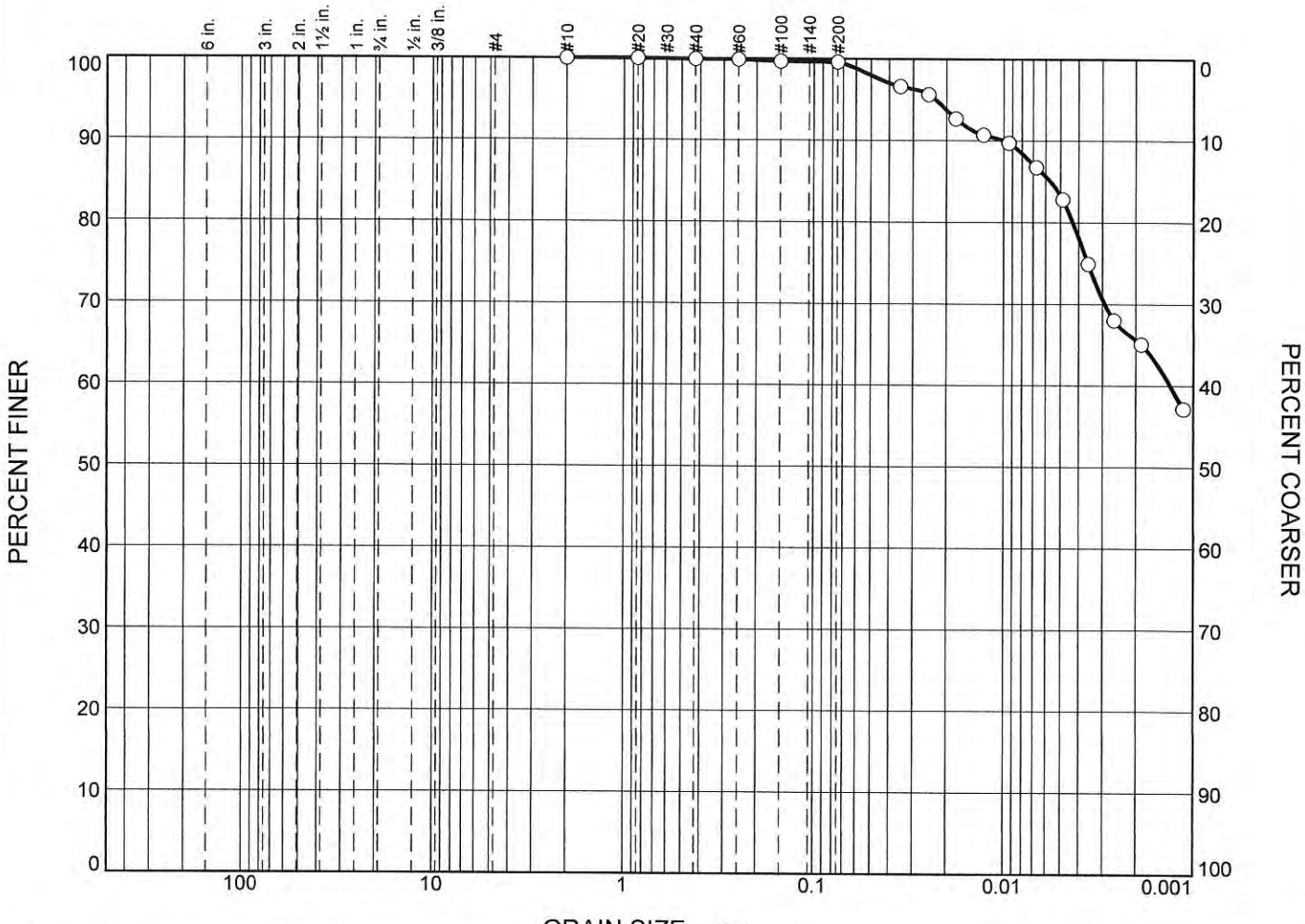
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	0.3	34.0	65.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		48	Gray FAT CLAY	CH

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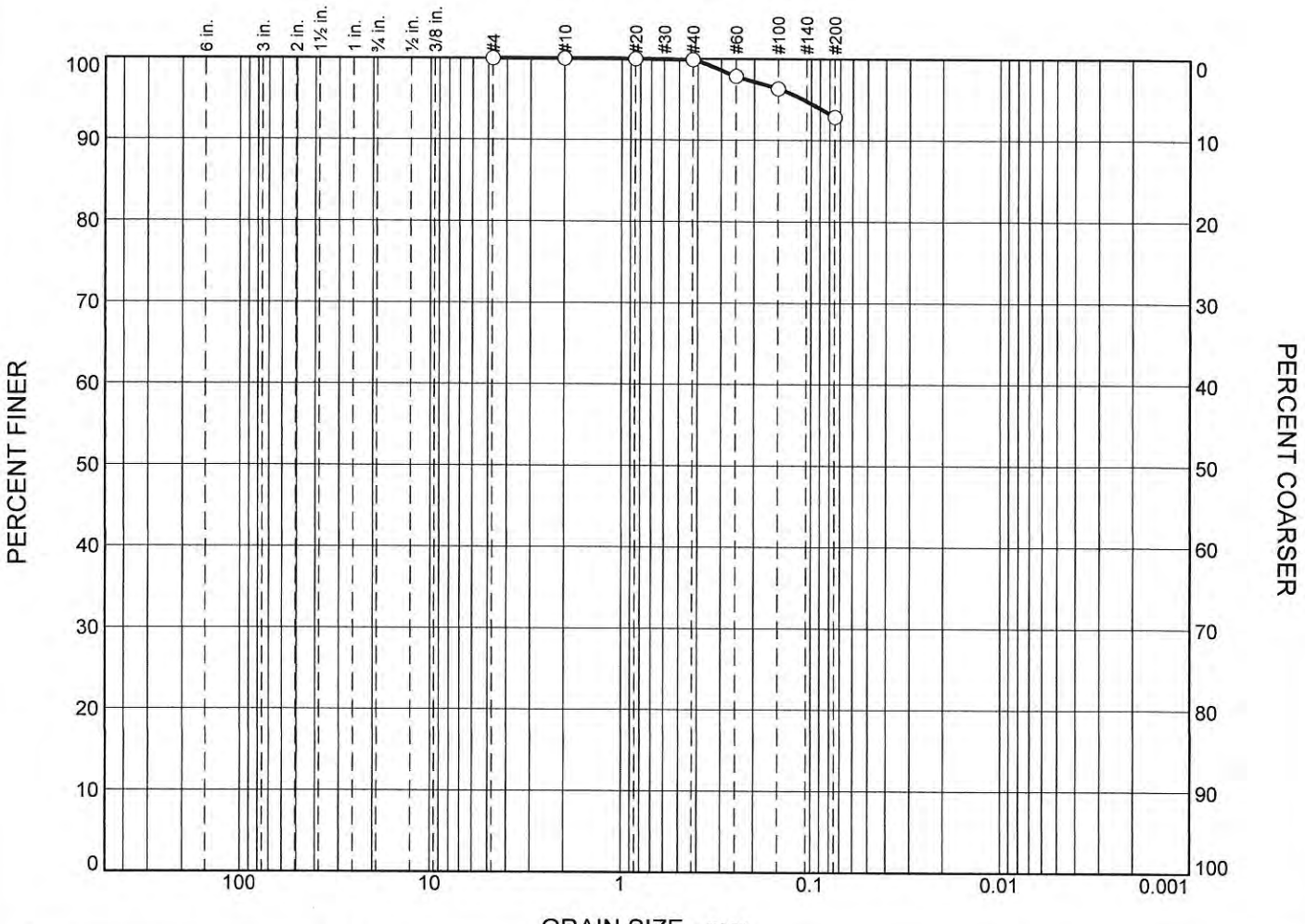
Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	7.0	92.9	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB047		53		ML

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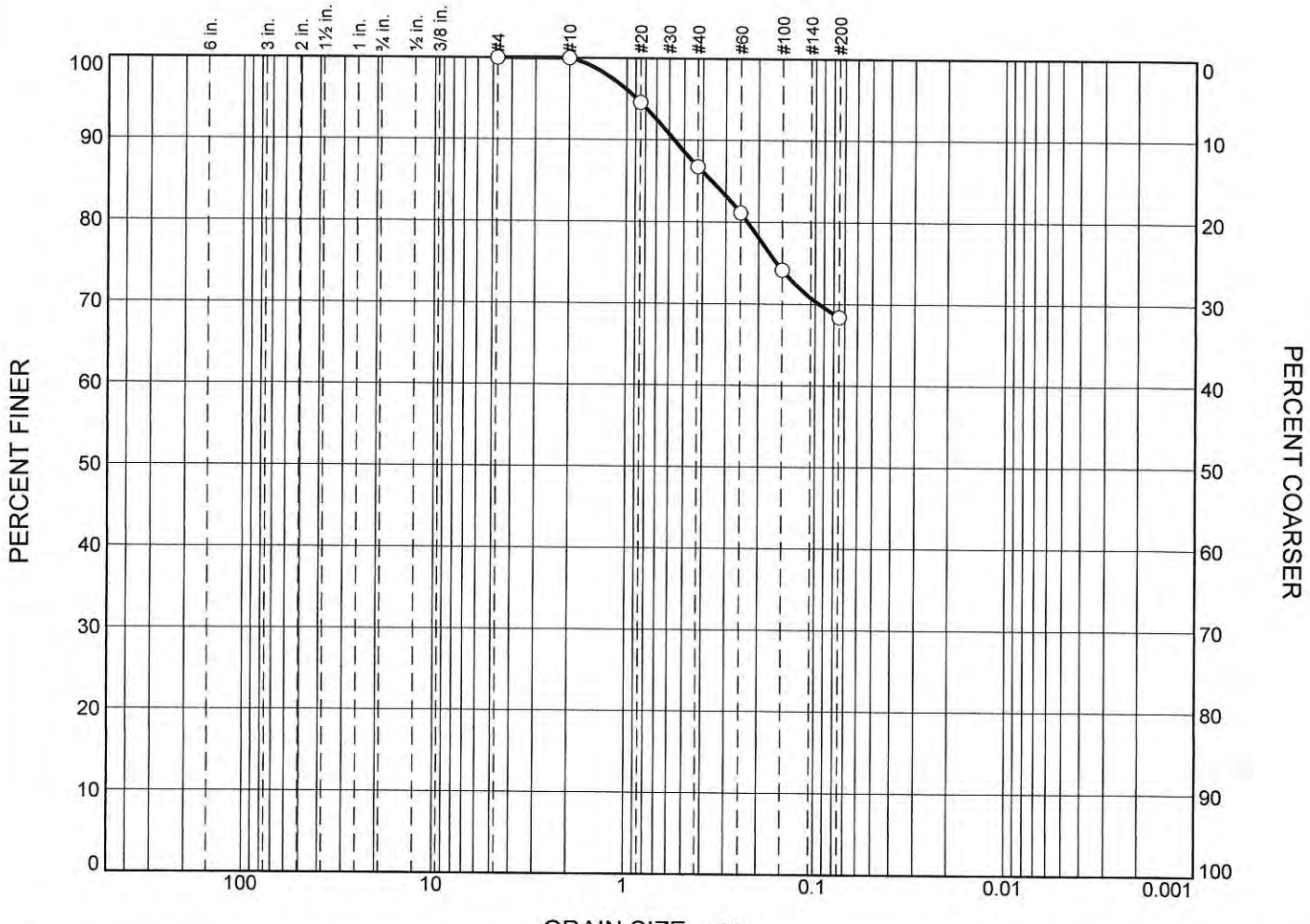
Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	13.2	18.4	68.4	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB047		78		ML

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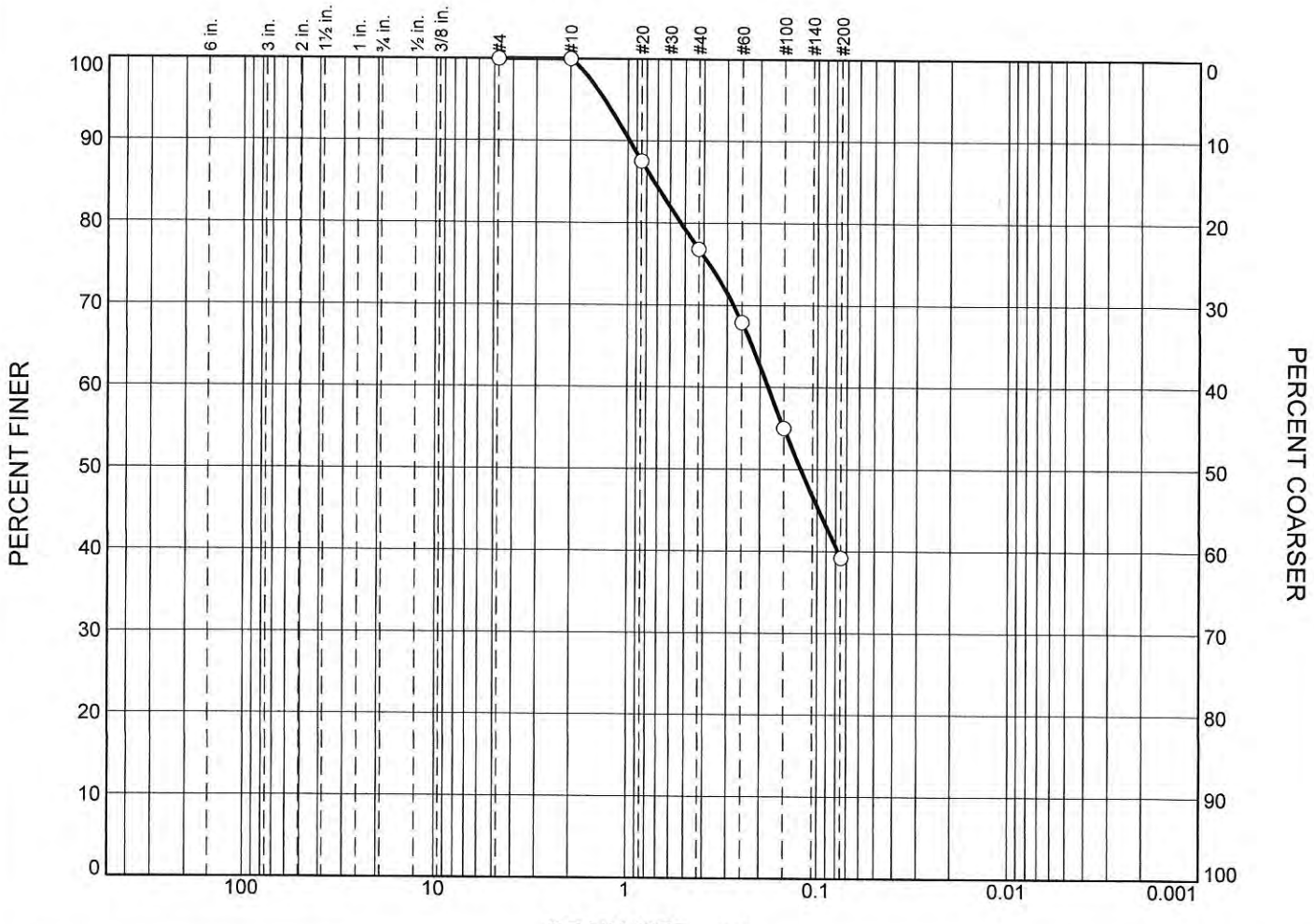
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	23.2	37.6	39.2	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB047		88		SM

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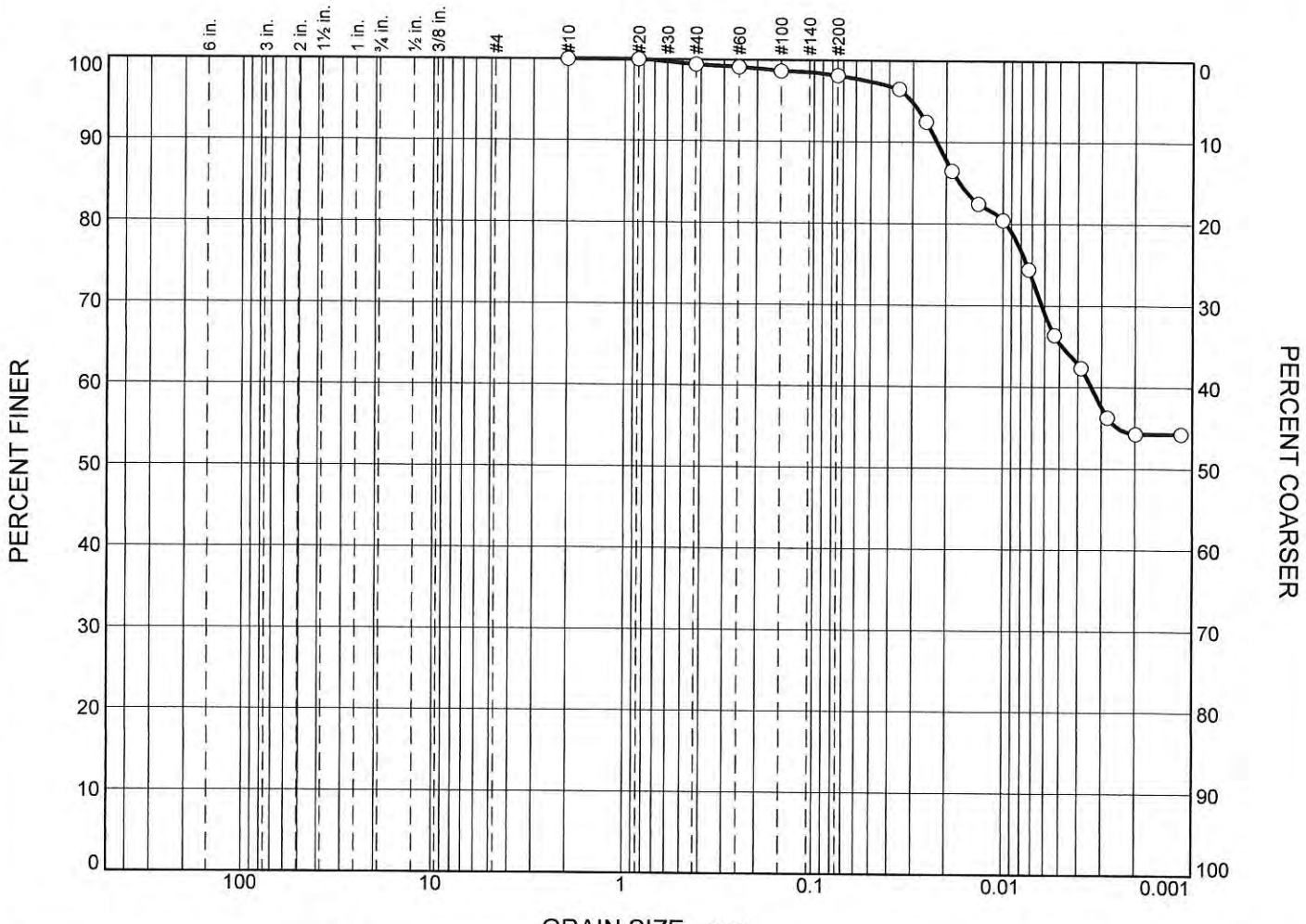
Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.6	1.3	32.7	65.4

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB050		0-2		CH

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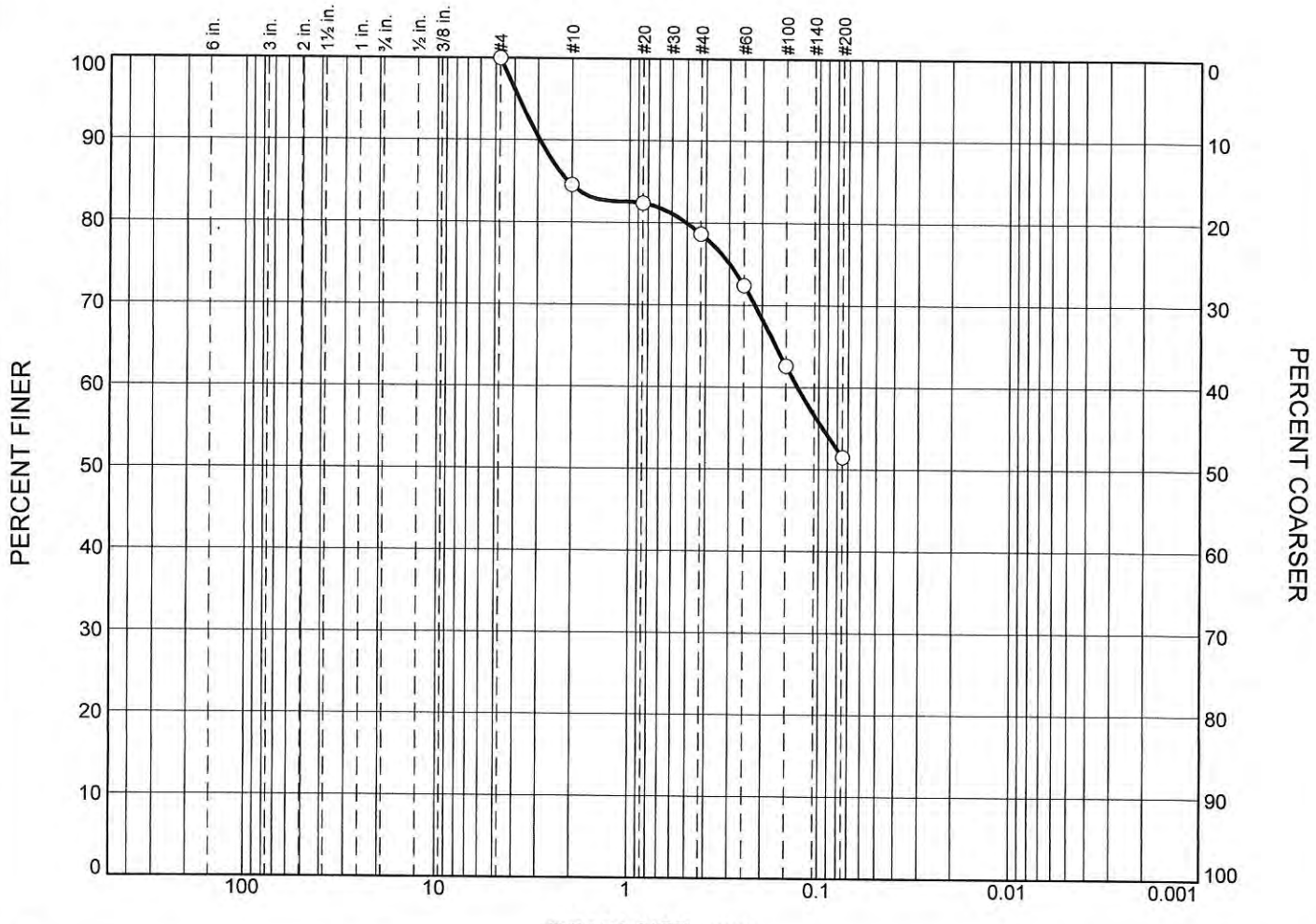
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	15.4	5.9	27.2	51.5	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB050		14-16		ML

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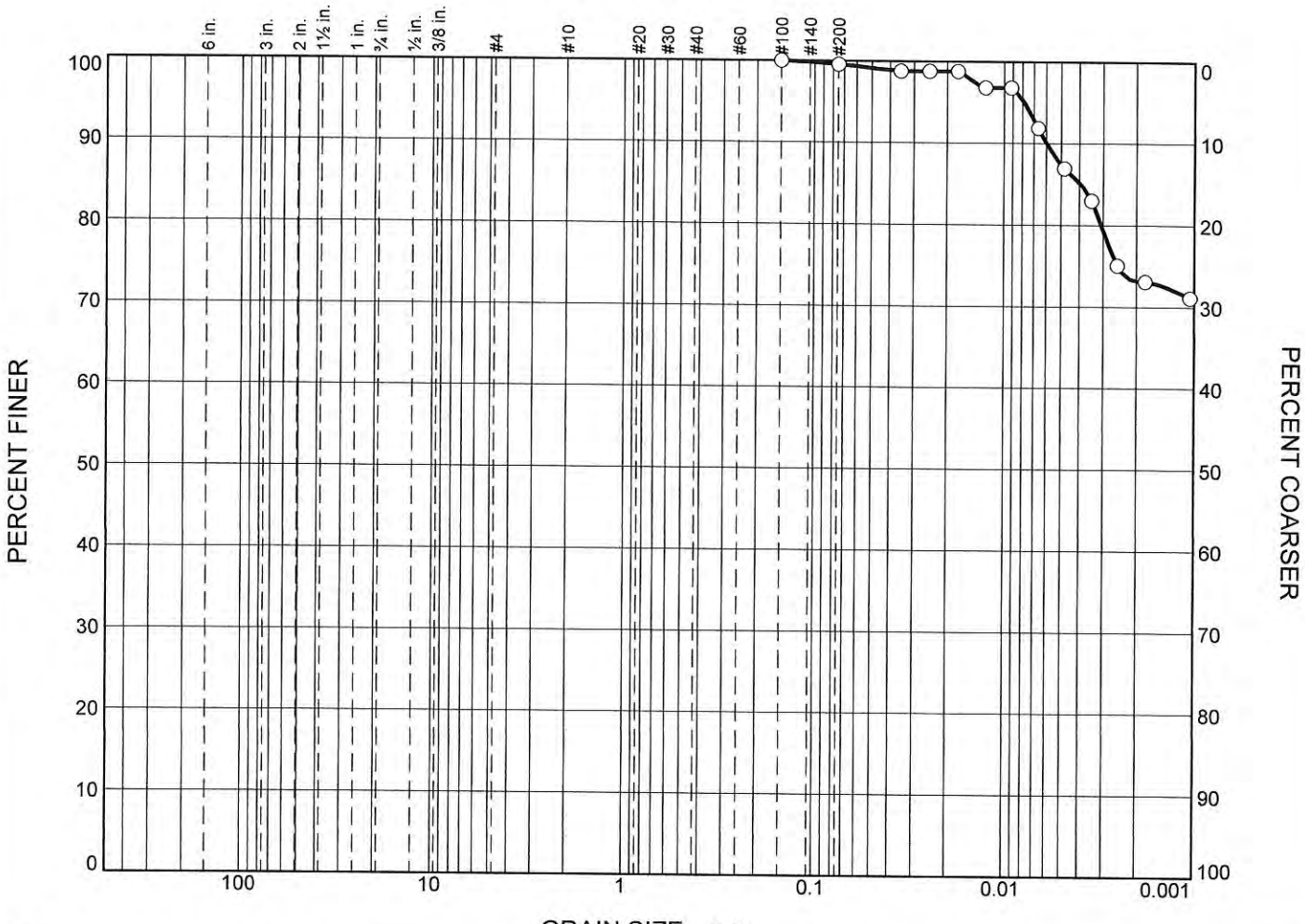
Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	0.4	26.4	73.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB053		38	Tan FAT CLAY	CH

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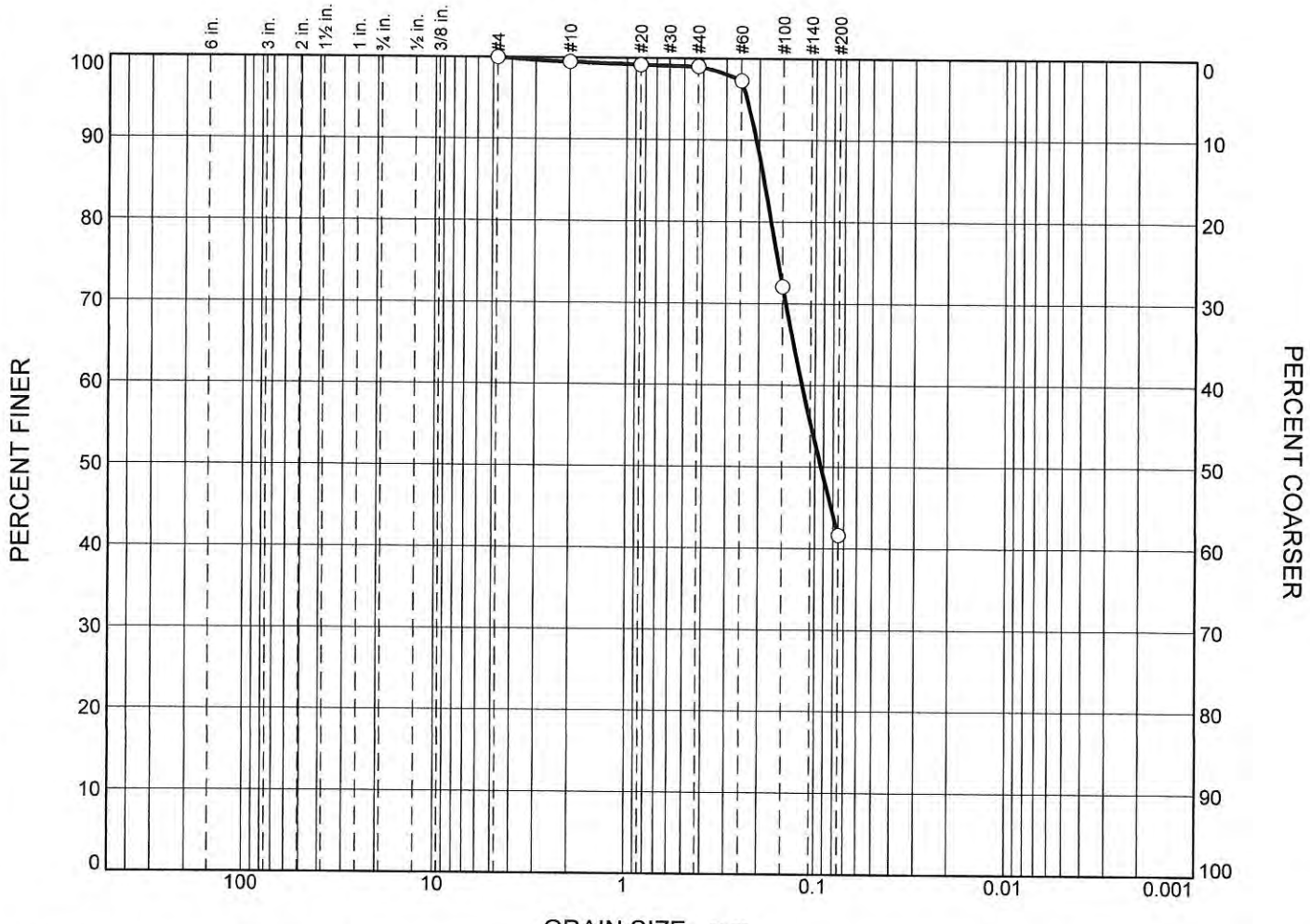
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.5	0.5	57.4	41.6	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB053		58	Tan CLAYEY SAND	SC

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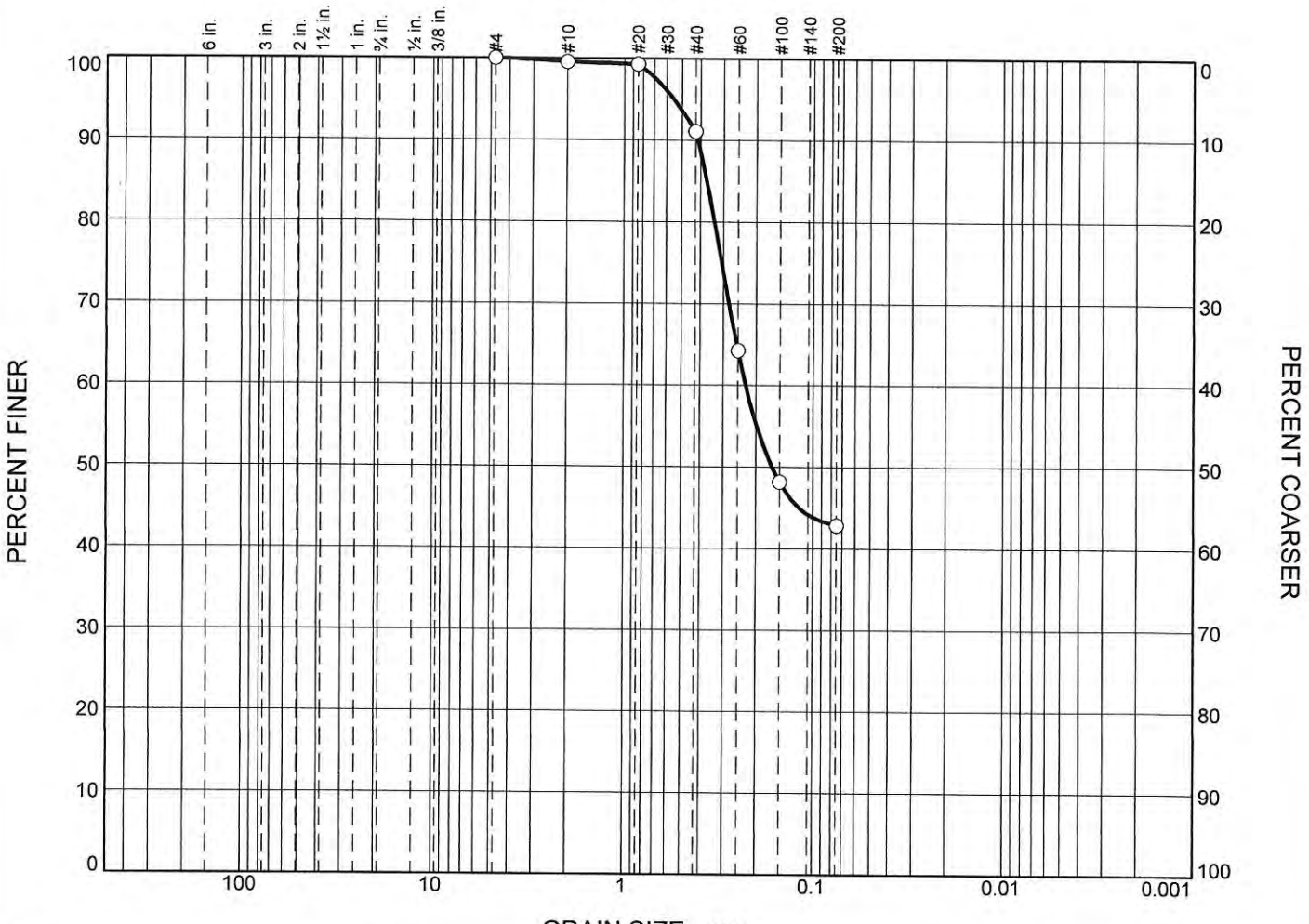
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.4	8.5	48.2	42.9	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB053		78	Gray CLAYEY SAND	SC

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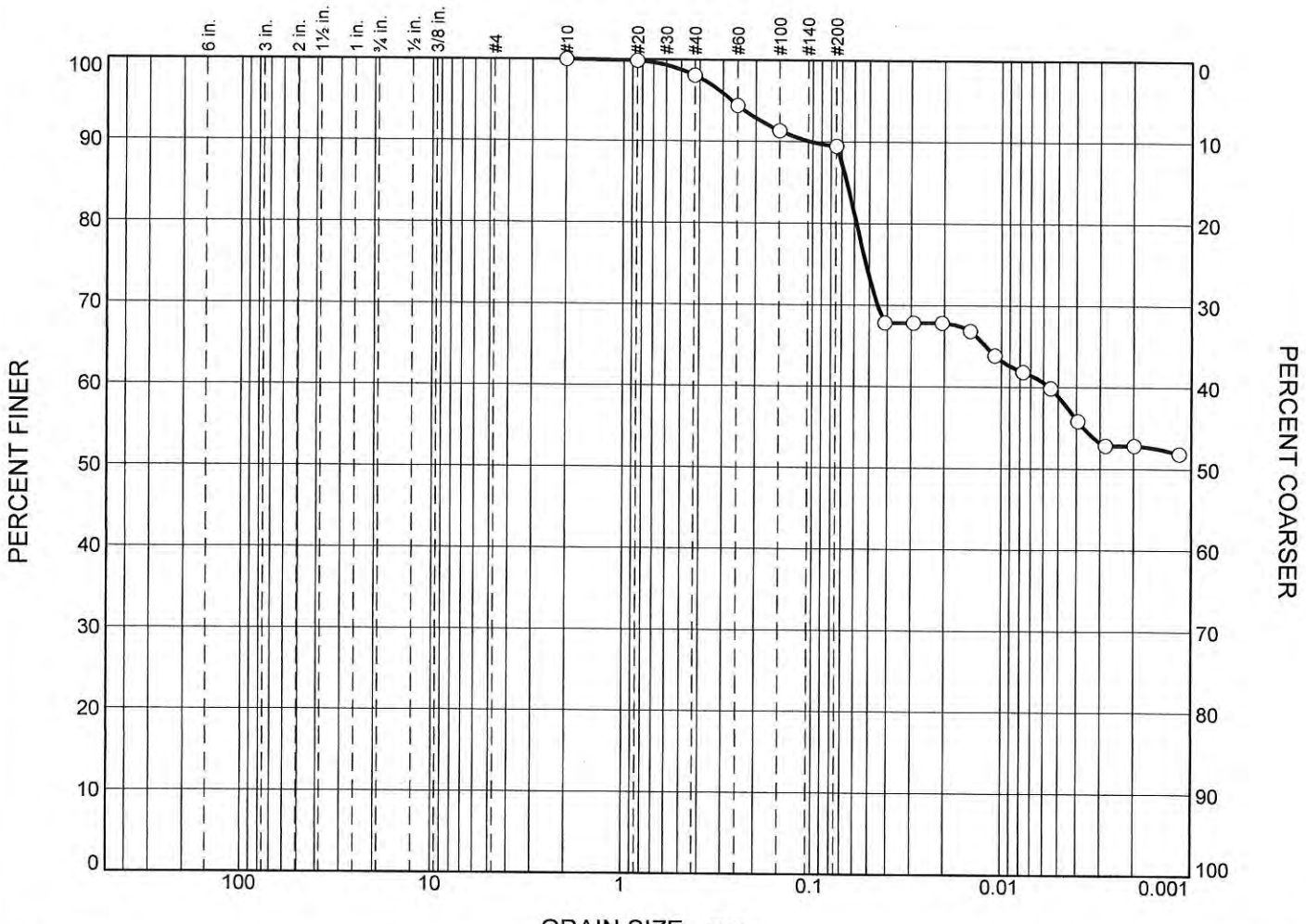
Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.9	8.6	36.6	52.9

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB053		93	Black FAT CLAY; organics	MH

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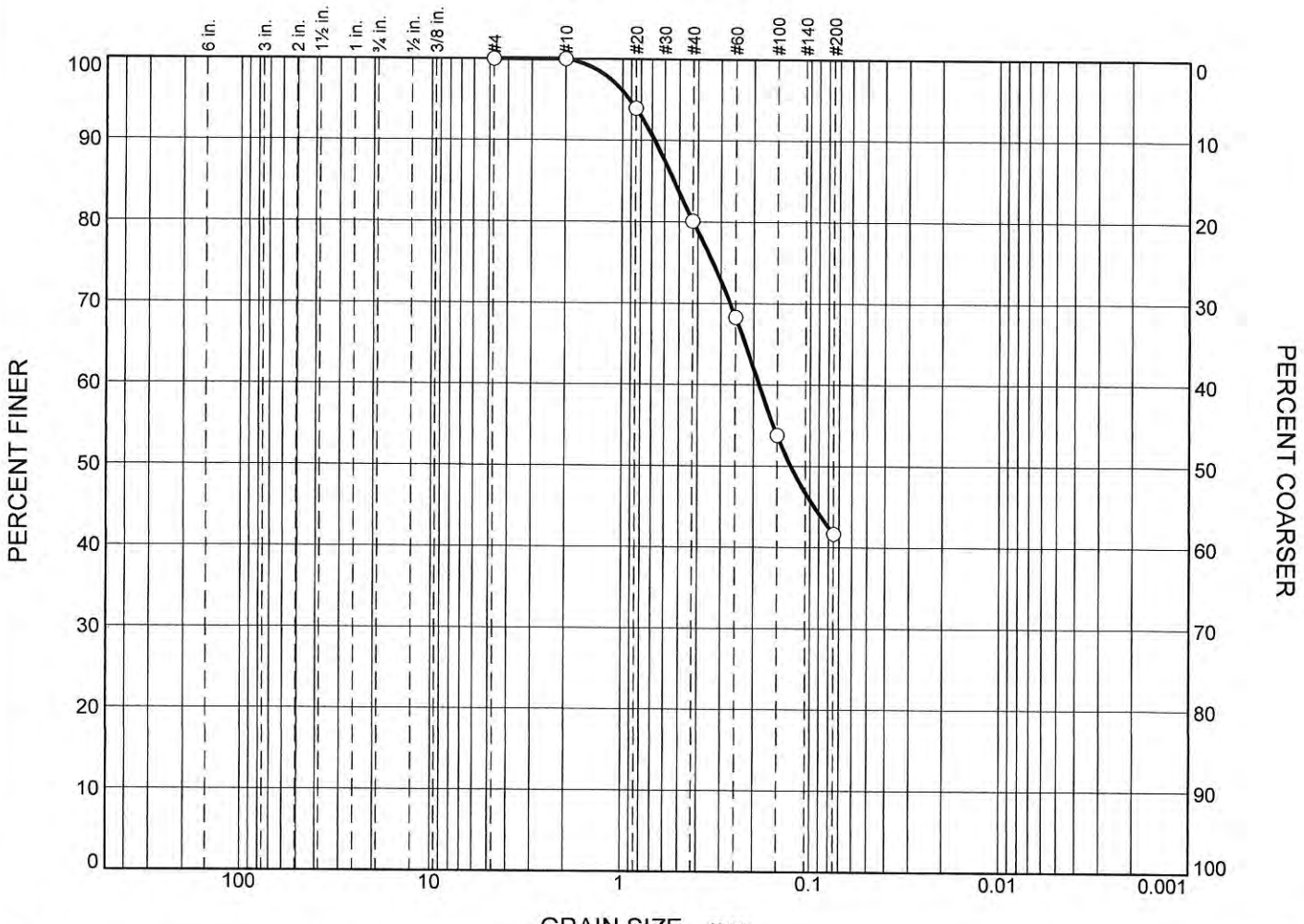
Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	19.9	38.4	41.7	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB058		12-14		SM

Tolunay-Wong Engineers, Inc.
Houston, Texas

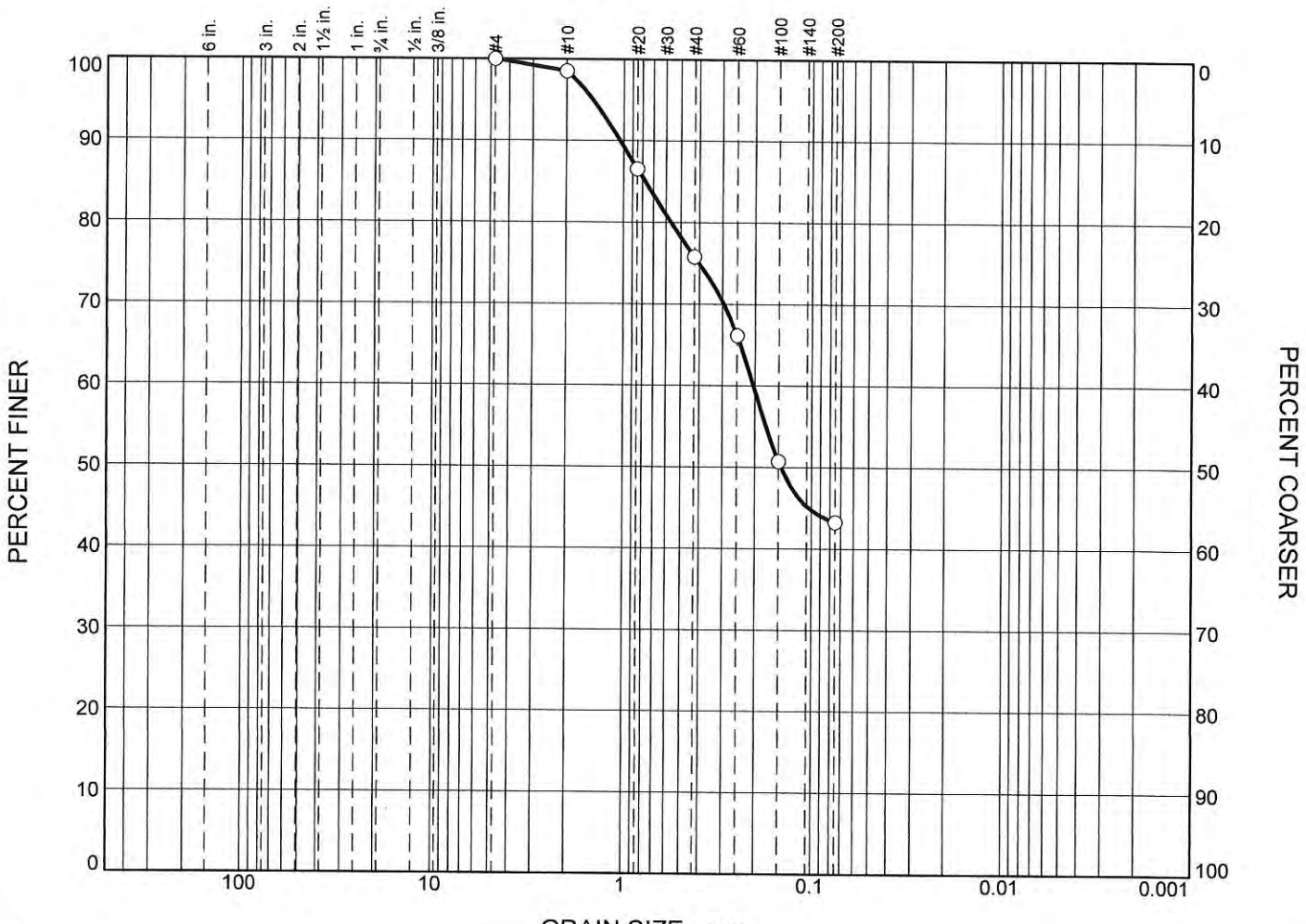
Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.5	22.7	32.5	43.3	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB058		14-16		SM

Tolunay-Wong Engineers, Inc.
Houston, Texas

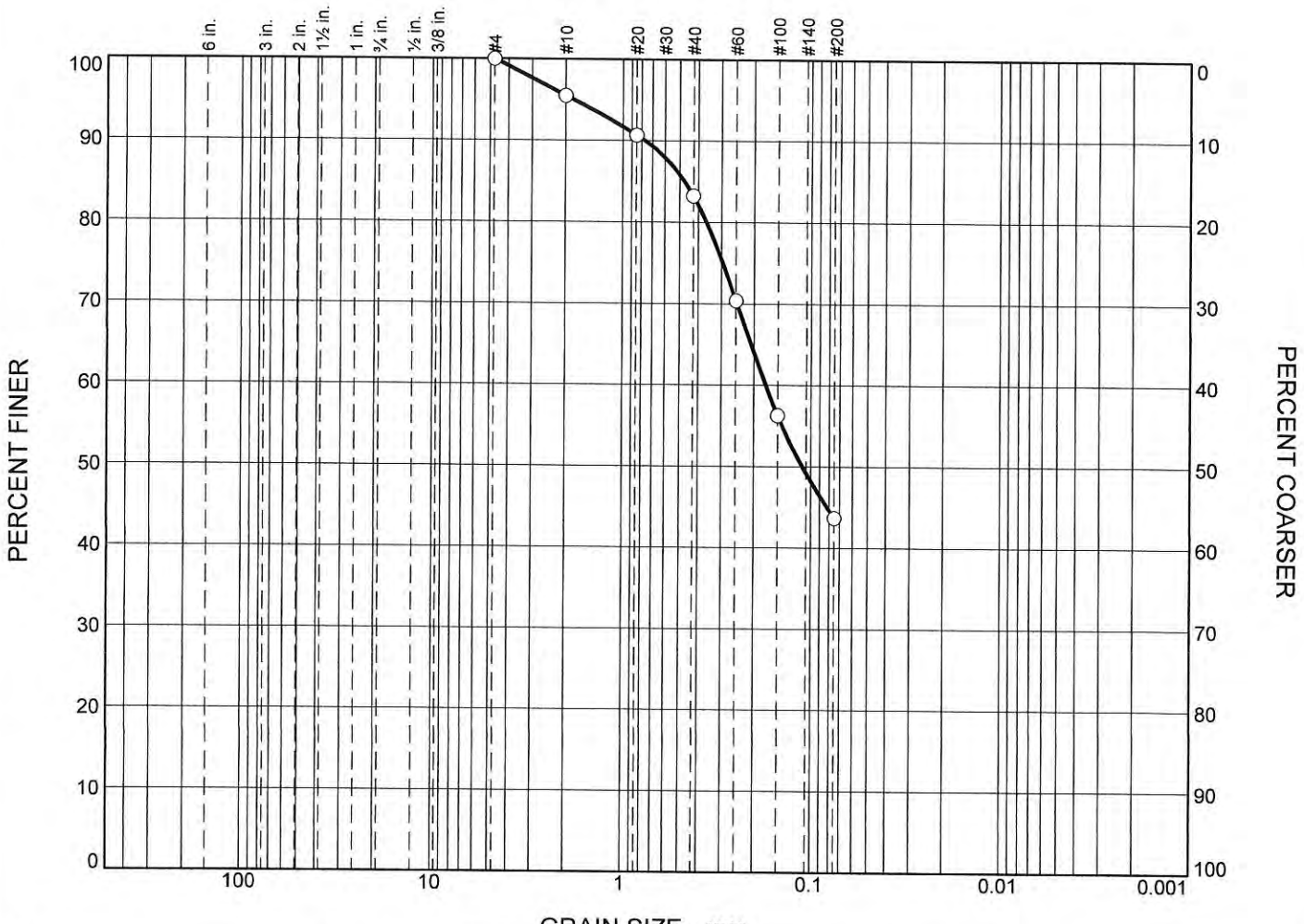
Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	4.5	12.2	39.6	43.7	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB058		18-20		SM

Tolunay-Wong Engineers, Inc.
Houston, Texas

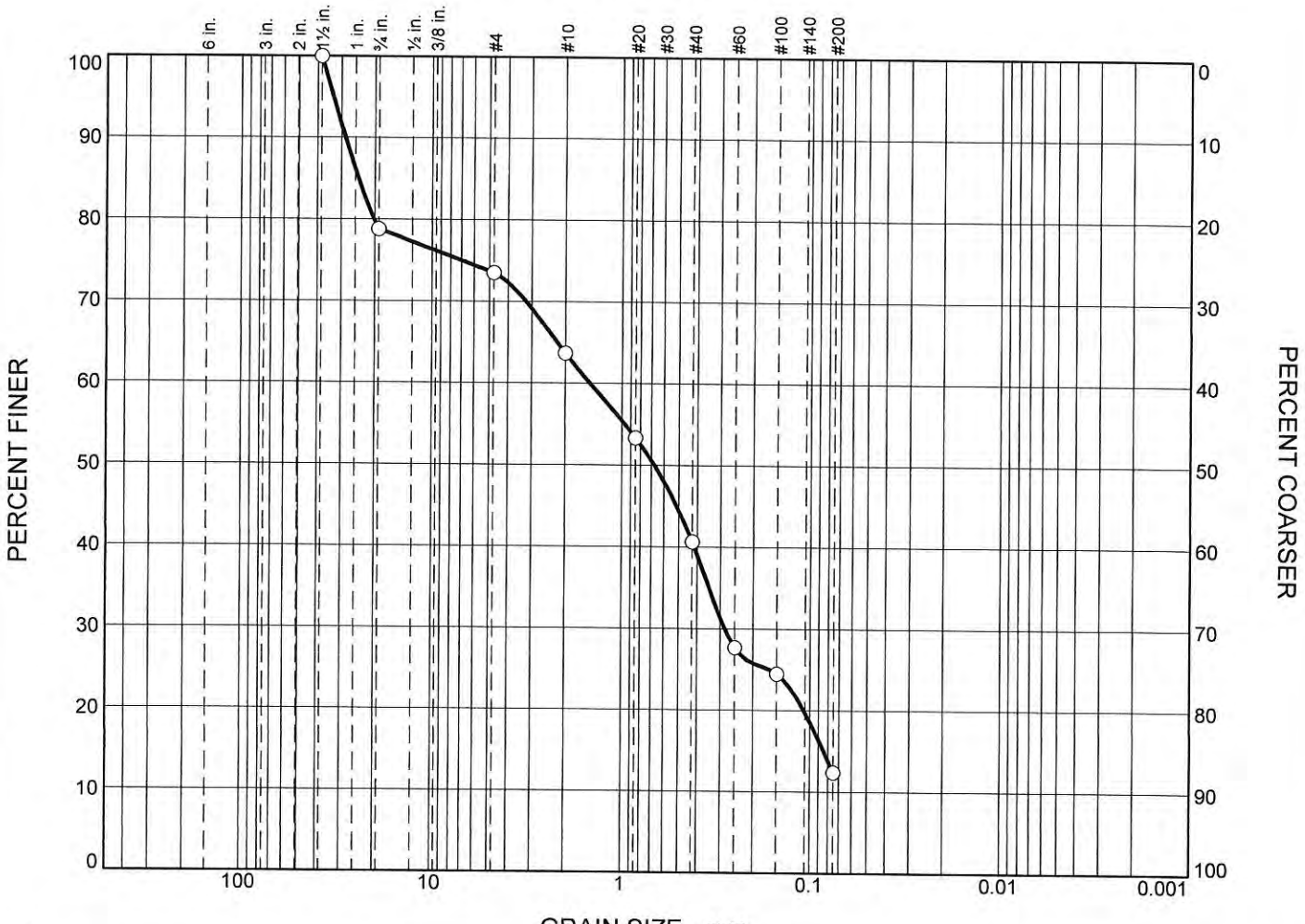
Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	21.2	5.3	9.8	23.1	28.2	12.4	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJRF-04		0-2		SM

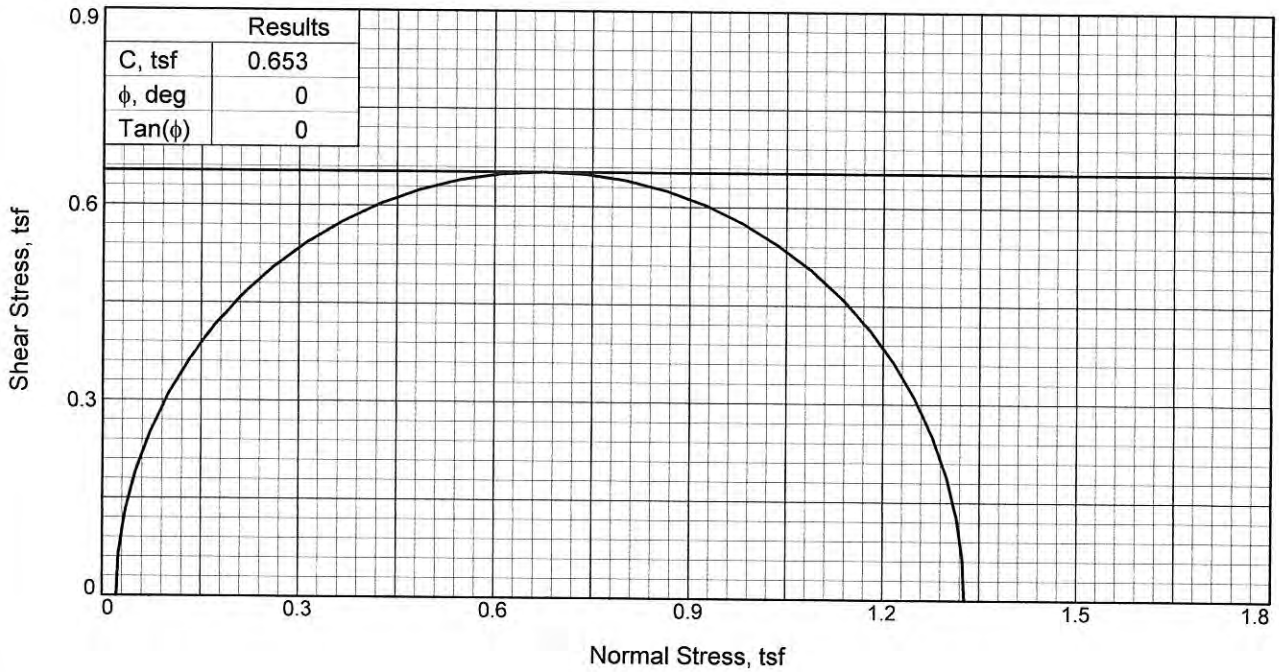
Tolunay-Wong Engineers, Inc.
Houston, Texas

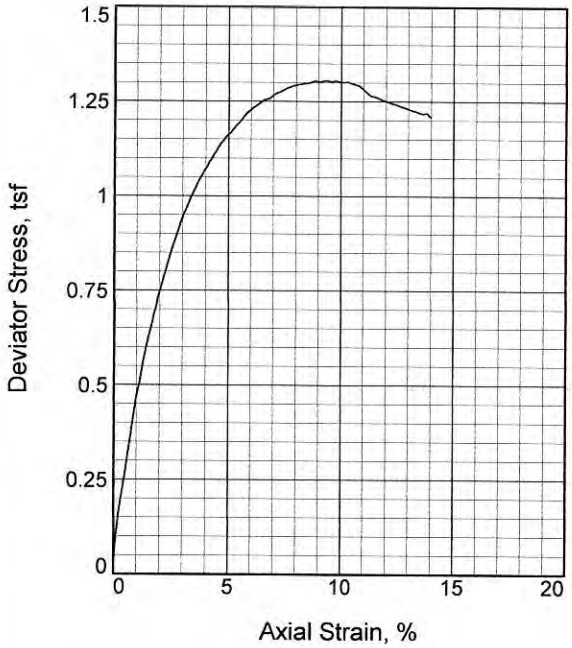
Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure





Sample No.		1
Initial	Water Content, %	18.6
	Dry Density, pcf	103.7
	Saturation, %	80.2
	Void Ratio	0.6256
	Diameter, in.	2.83
	Height, in.	5.79
At Test	Water Content, %	19.9
	Dry Density, pcf	103.7
	Saturation, %	85.8
	Void Ratio	0.6256
	Diameter, in.	2.83
	Height, in.	5.79
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		0.30
Fail. Stress, tsf		1.31
Strain, %		9.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.33
σ_3 Failure, tsf		0.02

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown LEAN CLAY with SAND

Assumed Specific Gravity= 2.70

Remarks:

Figure _____

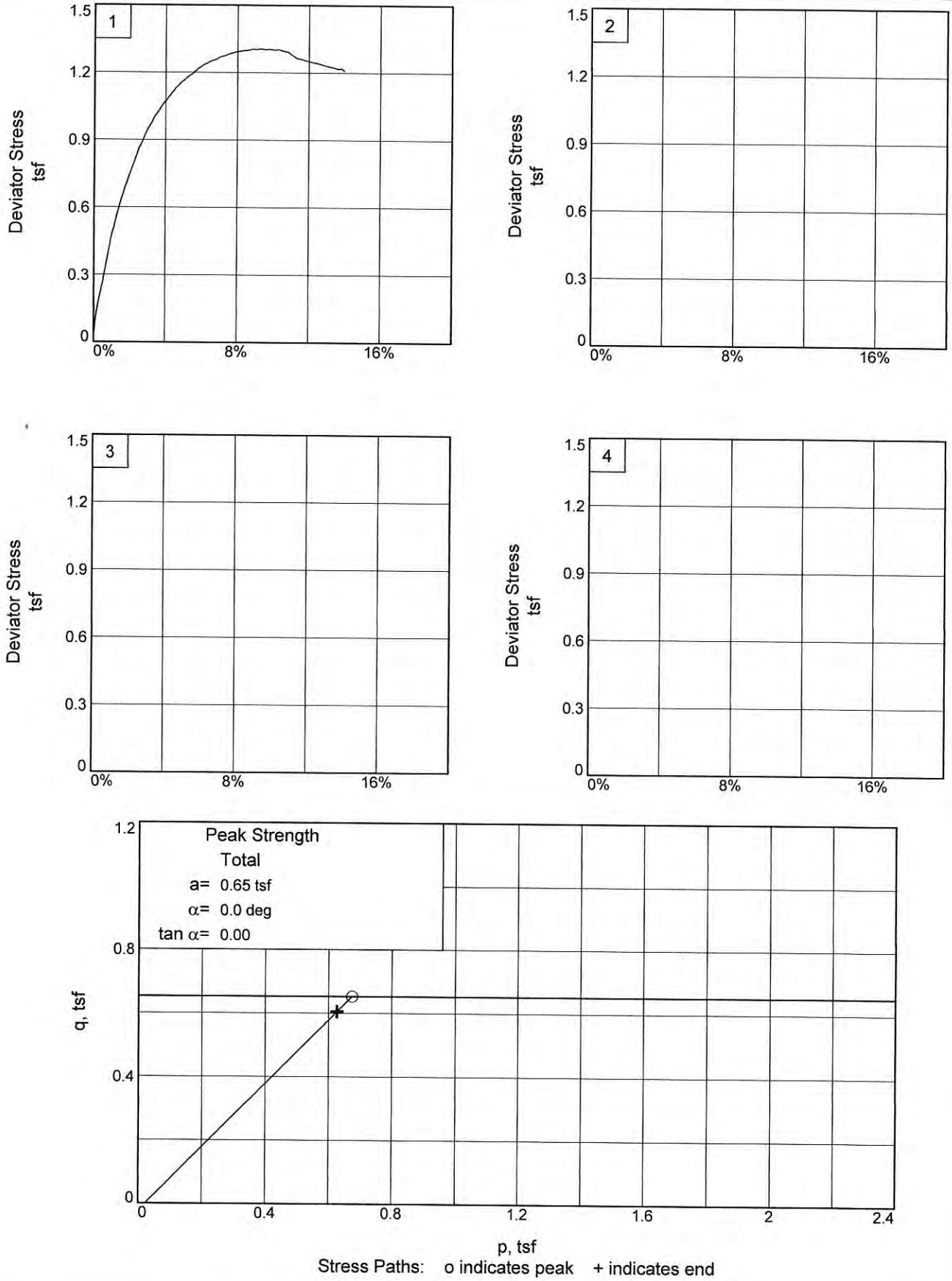
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 0-2

Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



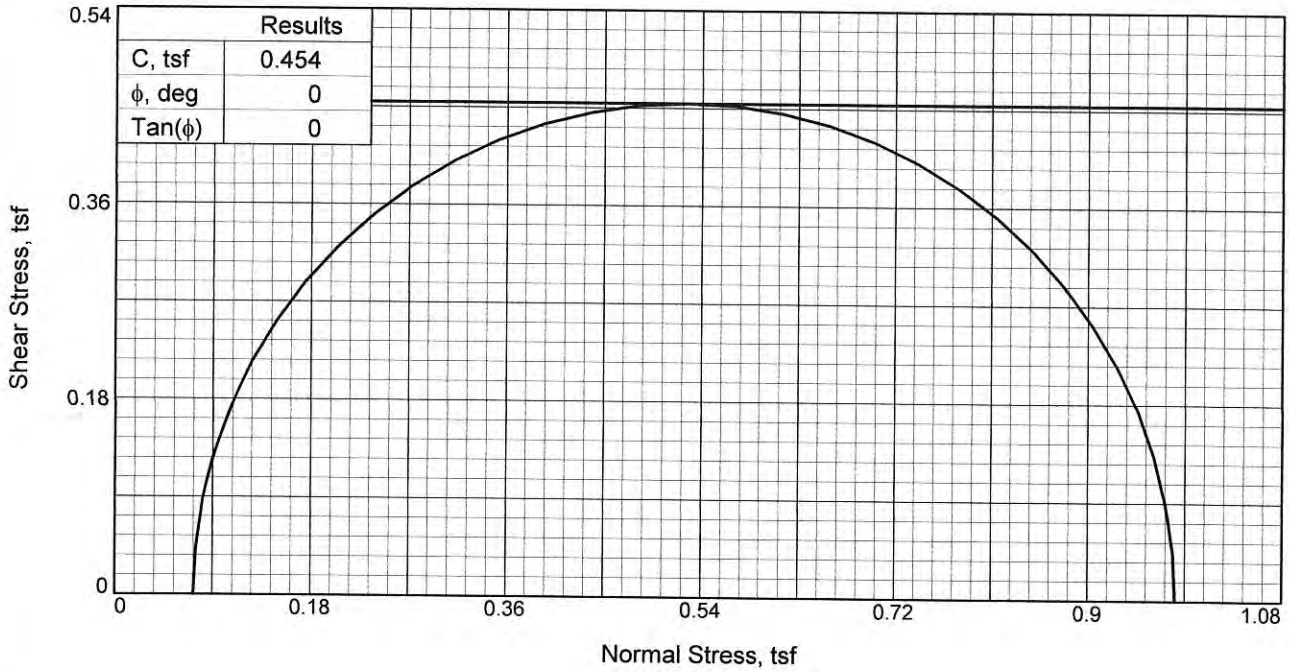
Client:

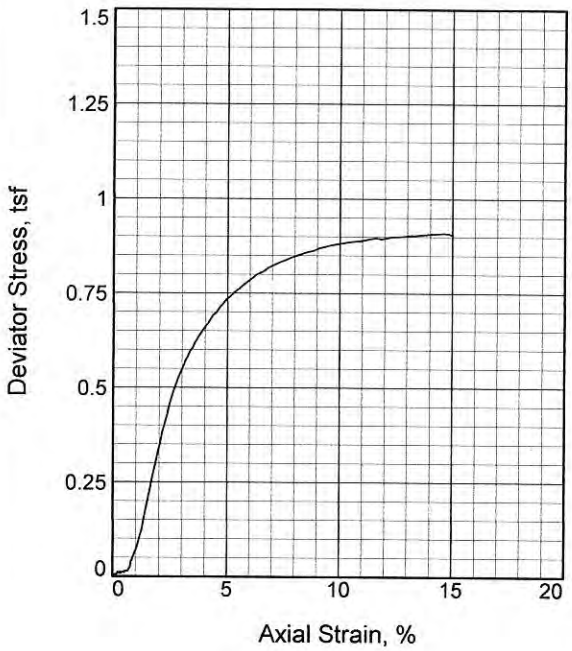
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 0-2

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	27.8
	Dry Density, pcf	89.0
	Saturation, %	84.0
	Void Ratio	0.8934
	Diameter, in.	2.81
	Height, in.	5.82
At Test	Water Content, %	28.0
	Dry Density, pcf	89.0
	Saturation, %	84.6
	Void Ratio	0.8934
	Diameter, in.	2.81
	Height, in.	5.82
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		1.00
Fail. Stress, tsf		0.91
Strain, %		14.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.98
σ_3 Failure, tsf		0.07

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown and black FAT CLAY

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

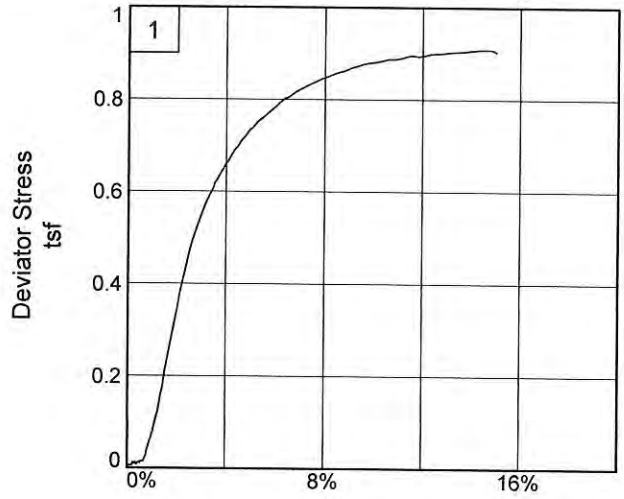
Client:

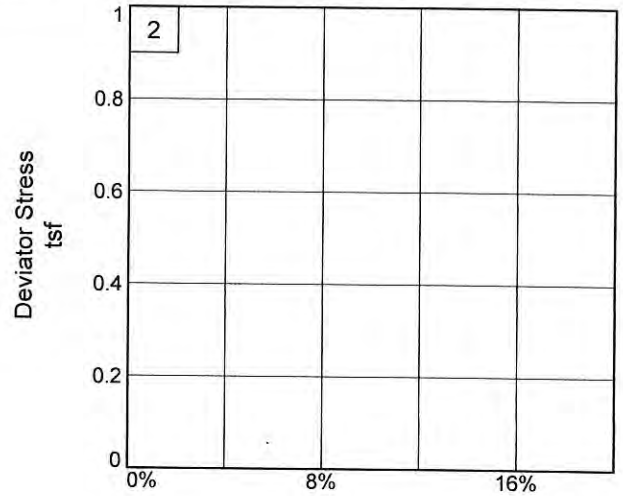
Project: San Jacinto River Waste Pit Superfund Site

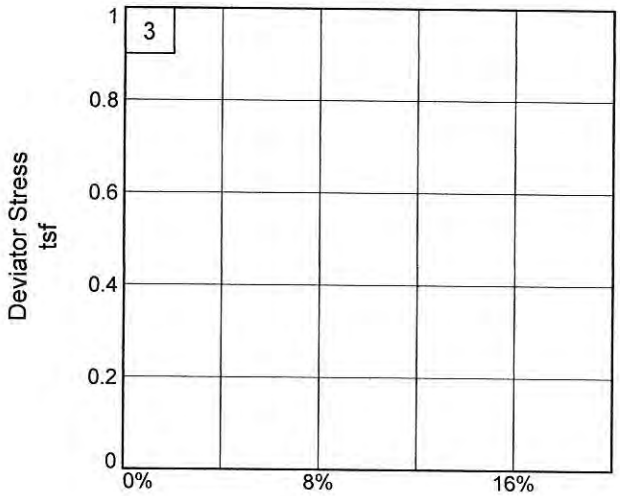
Source of Sample: SJGB024 **Depth:** 2-4

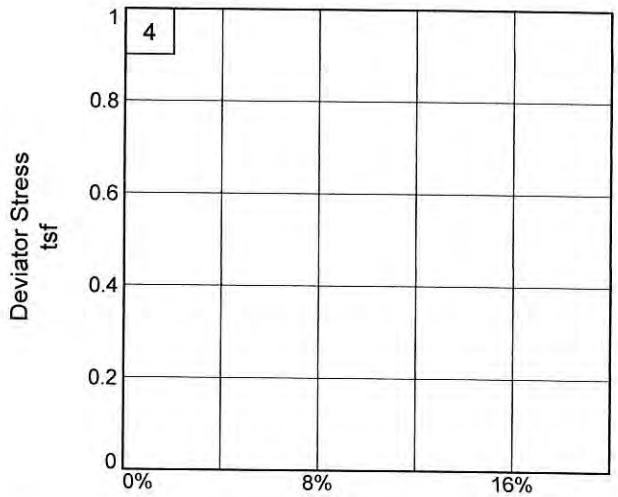
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

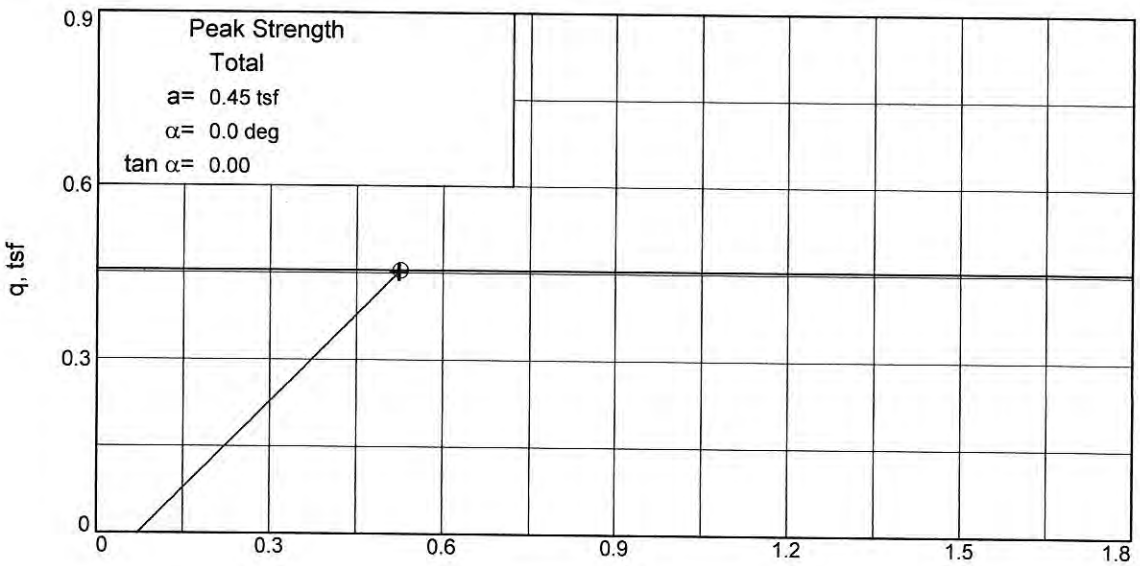
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

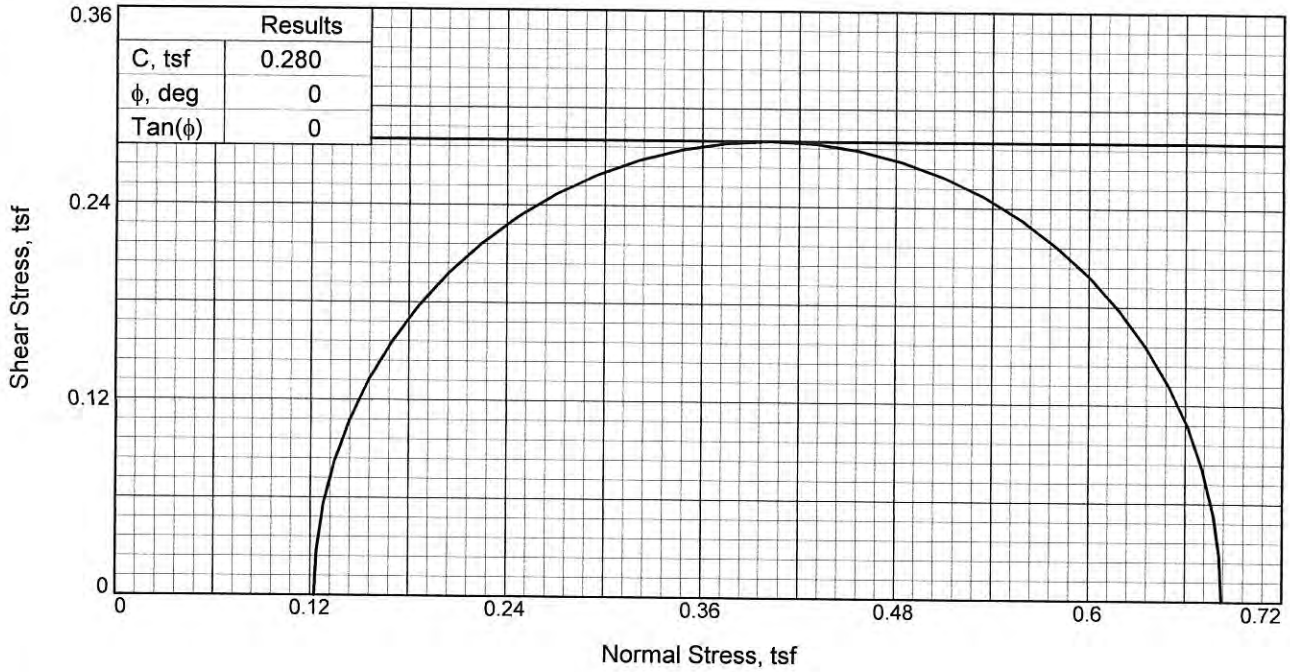
Client:

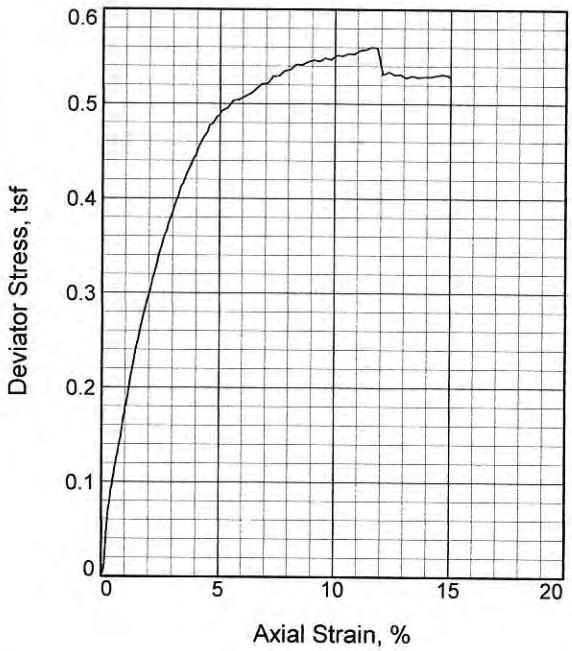
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 2-4

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	29.2
	Dry Density, pcf	90.1
	Saturation, %	90.6
	Void Ratio	0.8712
	Diameter, in.	2.85
	Height, in.	5.78
At Test	Water Content, %	31.2
	Dry Density, pcf	90.1
	Saturation, %	96.6
	Void Ratio	0.8712
	Diameter, in.	2.85
	Height, in.	5.78
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		1.70
Fail. Stress, tsf		0.56
Strain, %		11.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.68
σ_3 Failure, tsf		0.12

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown and black FAT CLAY

LL= 86 **PL=** 31 **PI=** 55

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

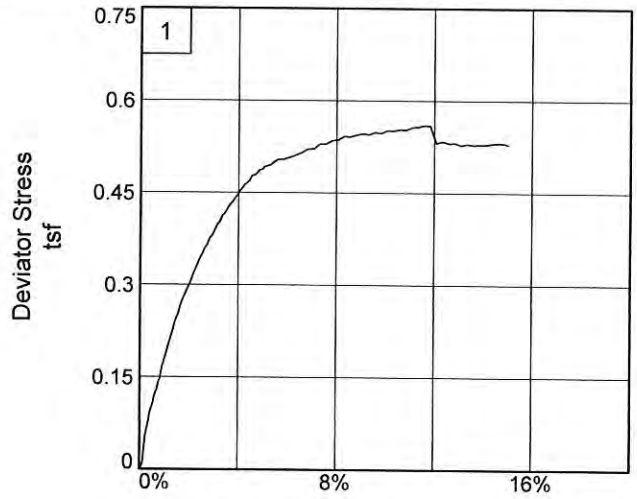
Client:

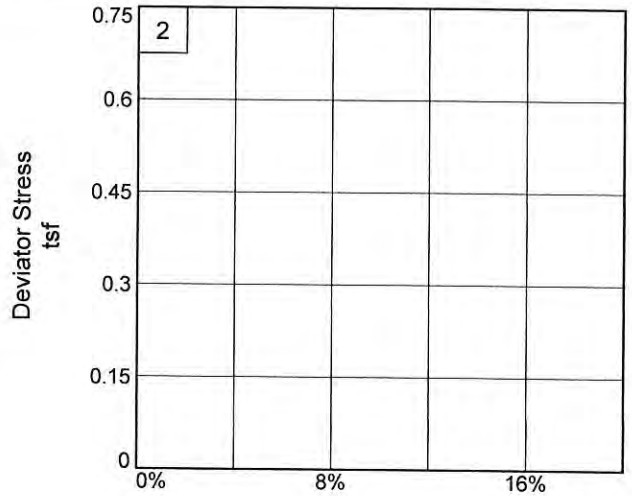
Project: San Jacinto River Waste Pit Superfund Site

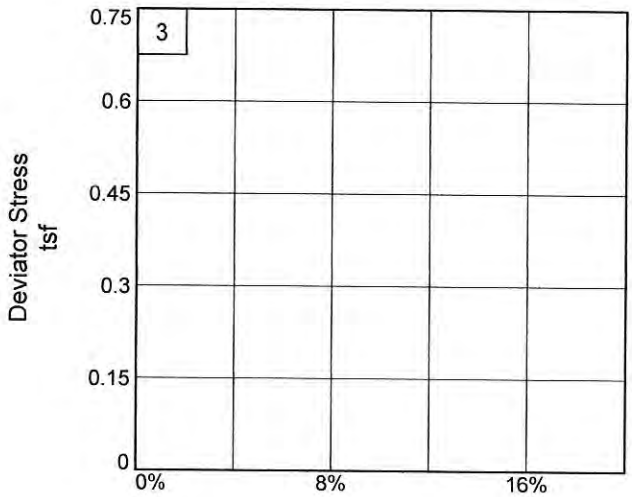
Source of Sample: SJGB024 **Depth:** 4-6

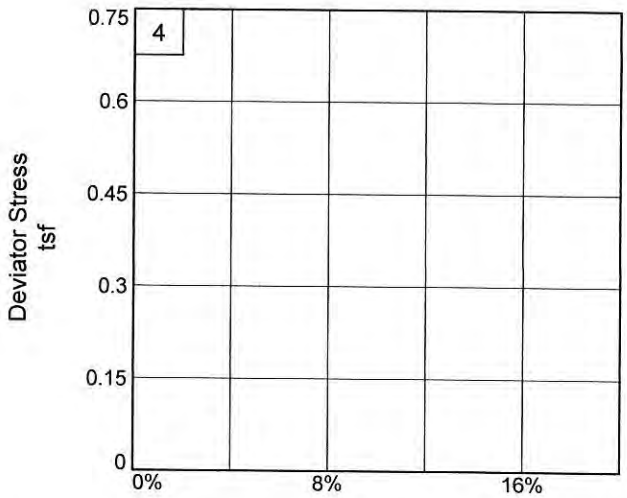
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

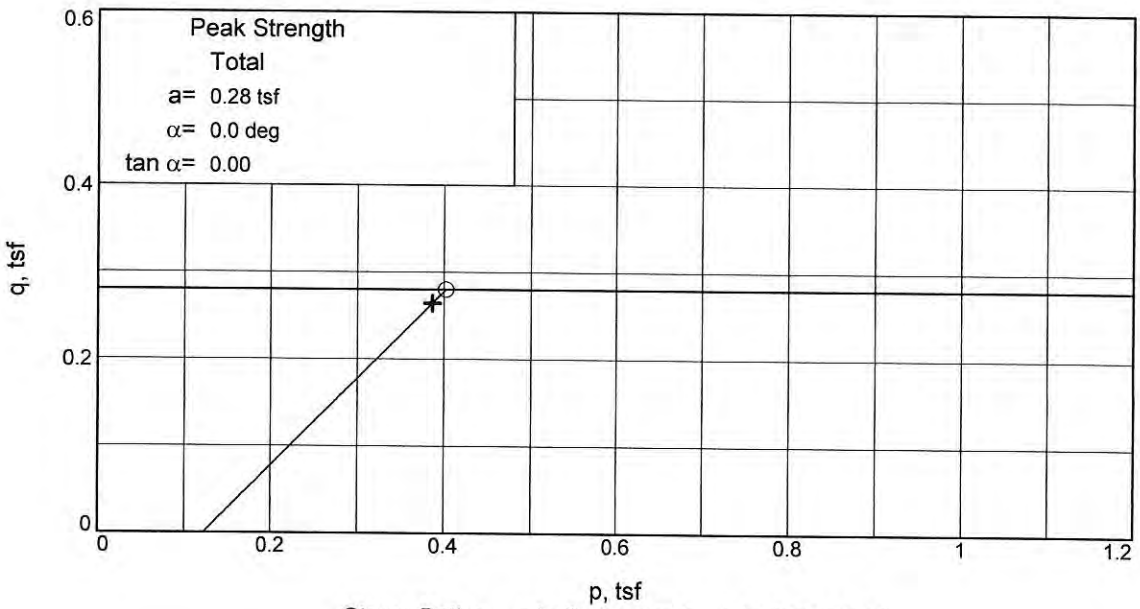
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

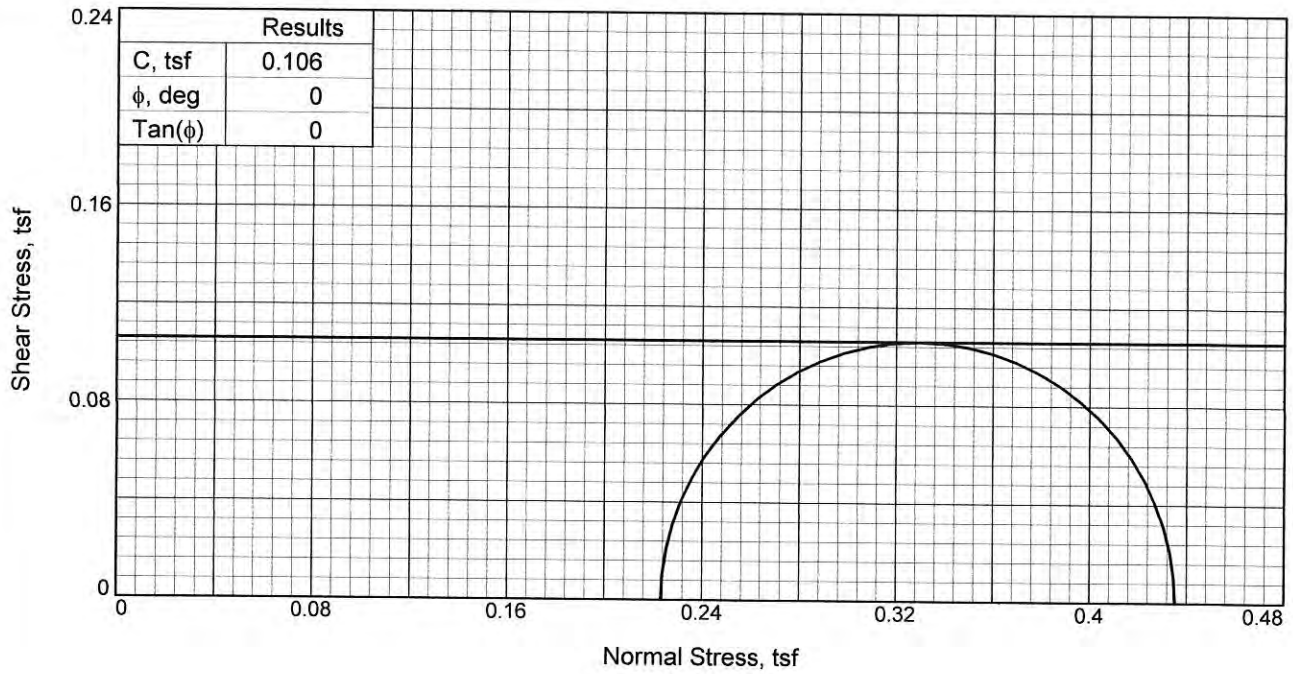
Client:

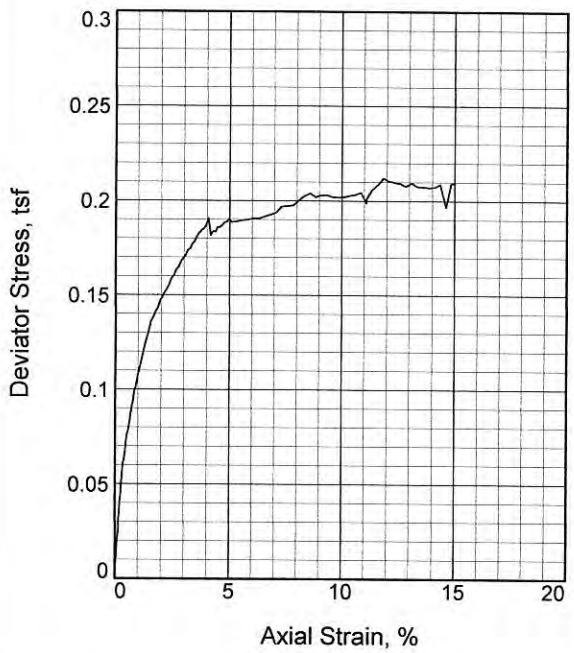
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 4-6

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	29.1
	Dry Density, pcf	89.2
	Saturation, %	88.4
	Void Ratio	0.8890
	Diameter, in.	2.83
	Height, in.	5.54
At Test	Water Content, %	28.5
	Dry Density, pcf	89.2
	Saturation, %	86.5
	Void Ratio	0.8890
	Diameter, in.	2.83
	Height, in.	5.54
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		3.10
Fail. Stress, tsf		0.21
Strain, %		11.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.44
σ_3 Failure, tsf		0.22

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown CLAYEY SAND

Assumed Specific Gravity= 2.70

Remarks:

Figure _____

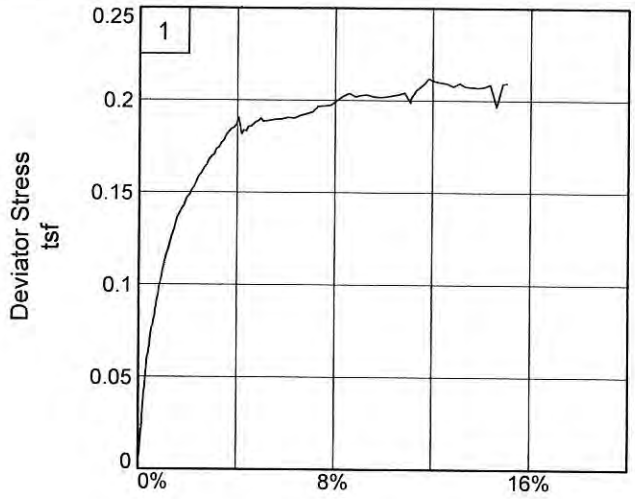
Client:

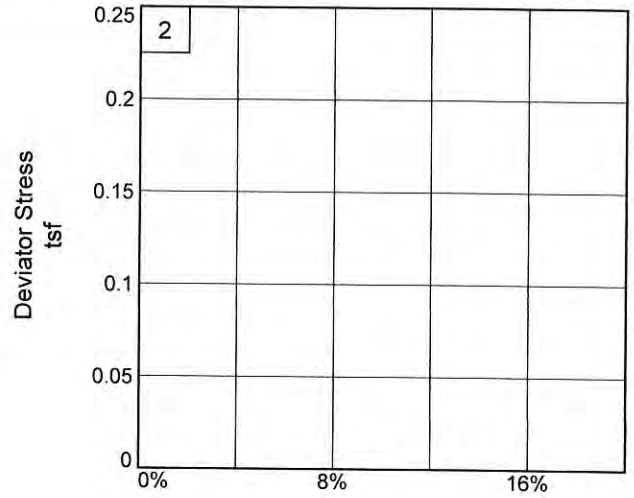
Project: San Jacinto River Waste Pit Superfund Site

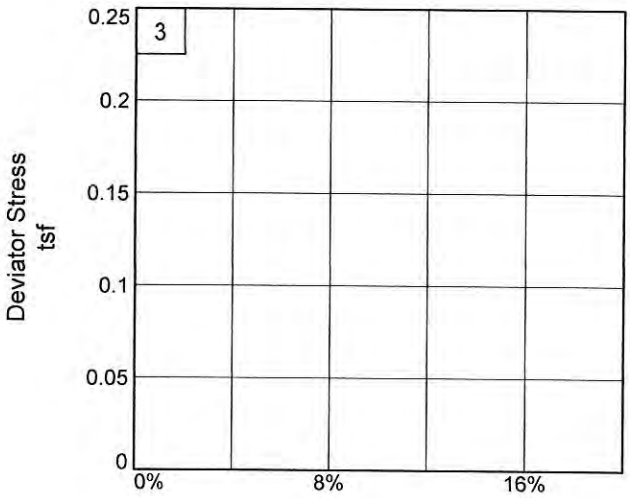
Source of Sample: SJGB024 **Depth:** 8-10

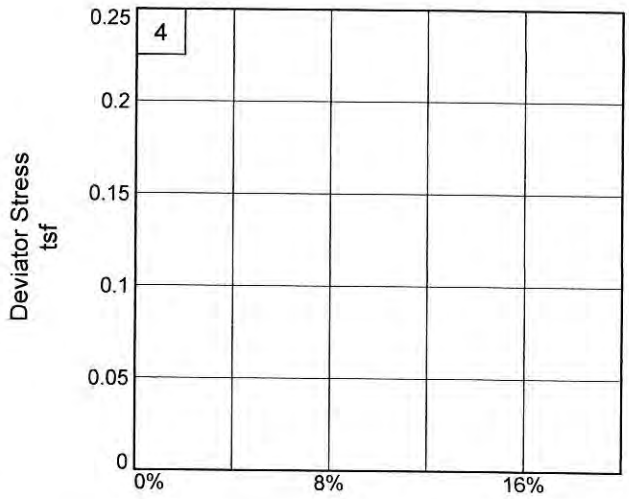
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

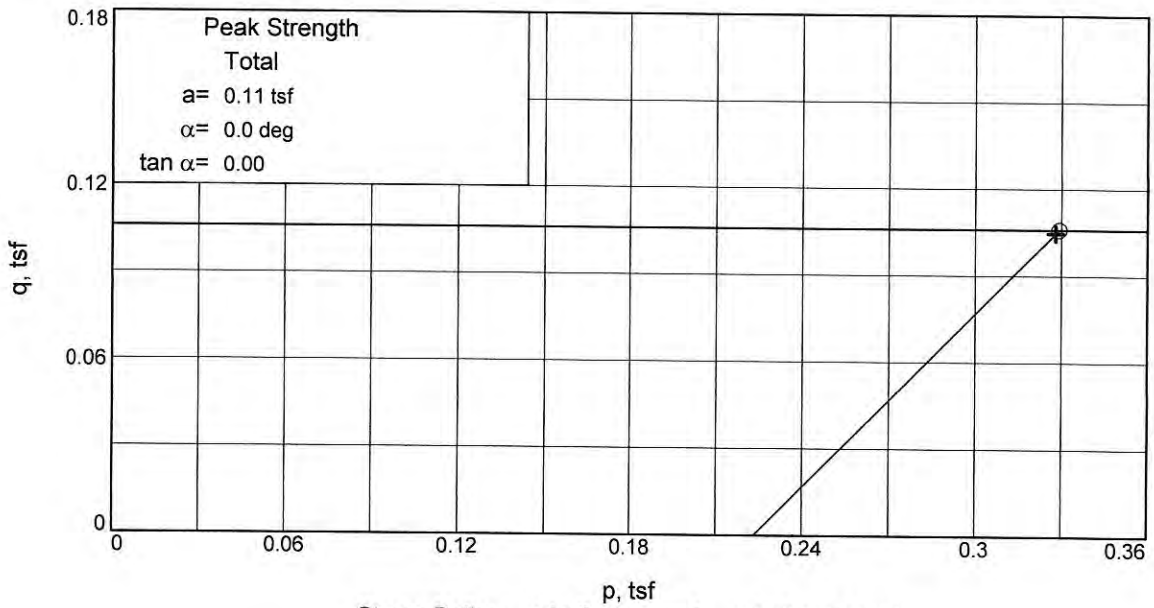
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

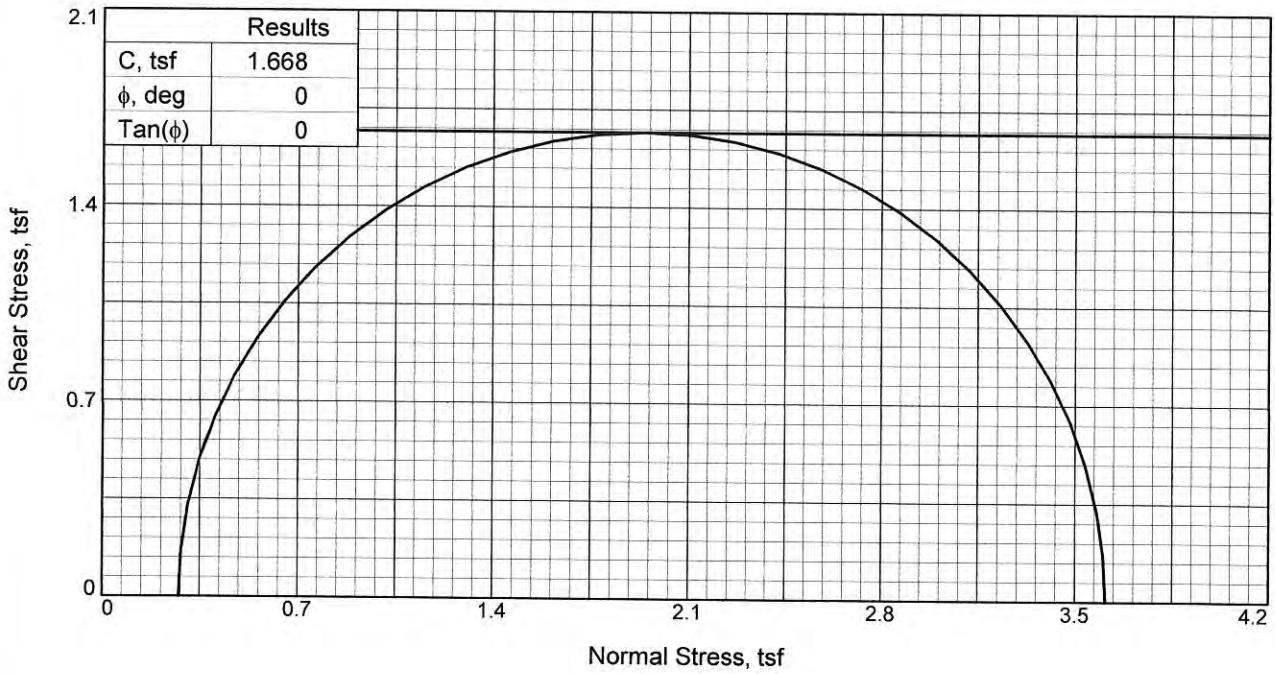
Client:

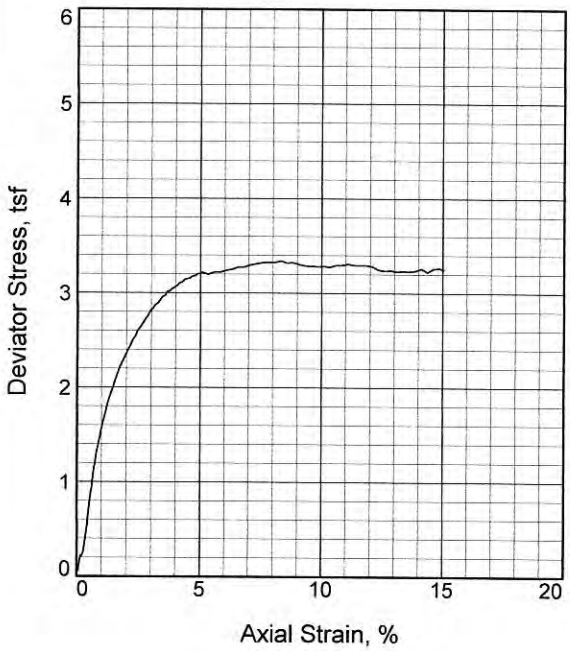
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 8-10

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	75.3
	Dry Density, pcf	53.7
	Saturation, %	95.1
	Void Ratio	2.1393
	Diameter, in.	2.82
	Height, in.	5.73
At Test	Water Content, %	76.5
	Dry Density, pcf	53.7
	Saturation, %	96.5
	Void Ratio	2.1393
	Diameter, in.	2.82
	Height, in.	5.73
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		3.80
Fail. Stress, tsf		3.34
Strain, %		8.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.61
σ_3 Failure, tsf		0.27

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown FAT CLAY

LL= 133 **PL=** 51 **PI=** 82

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

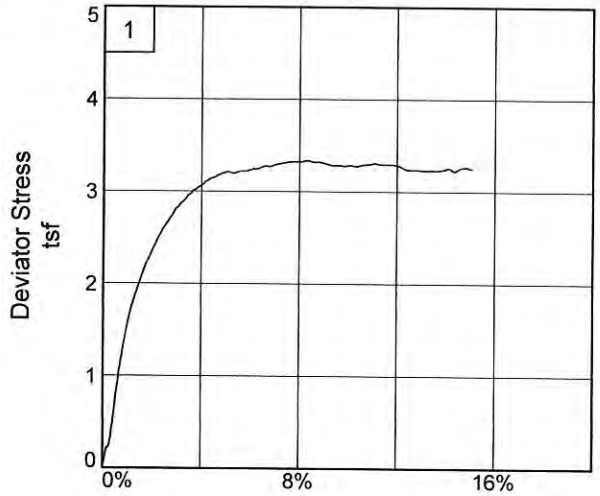
Client:

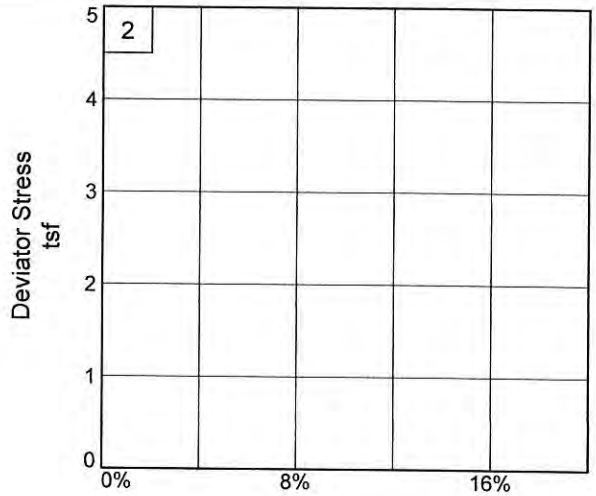
Project: San Jacinto River Waste Pit Superfund Site

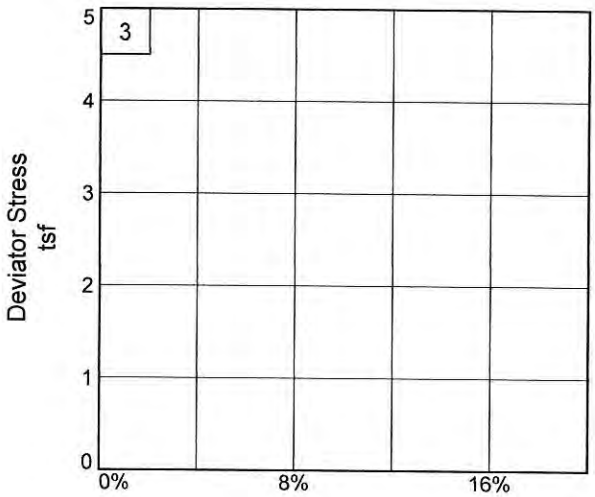
Source of Sample: SJGB024 **Depth:** 10-12

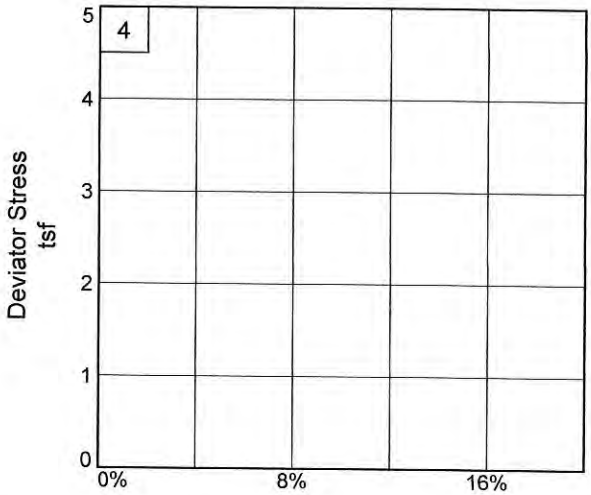
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

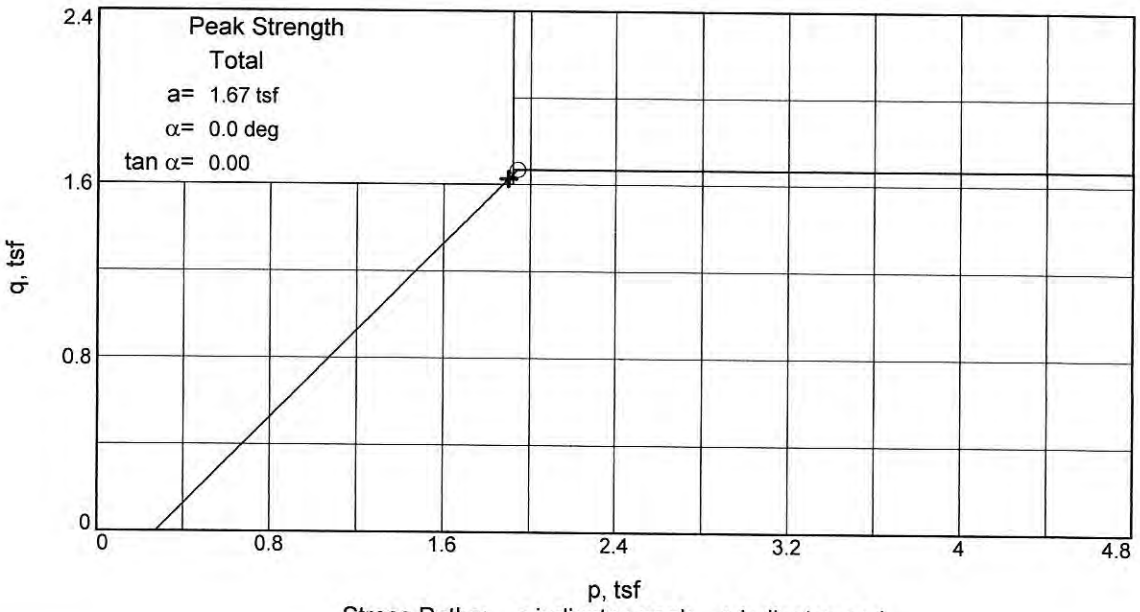
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

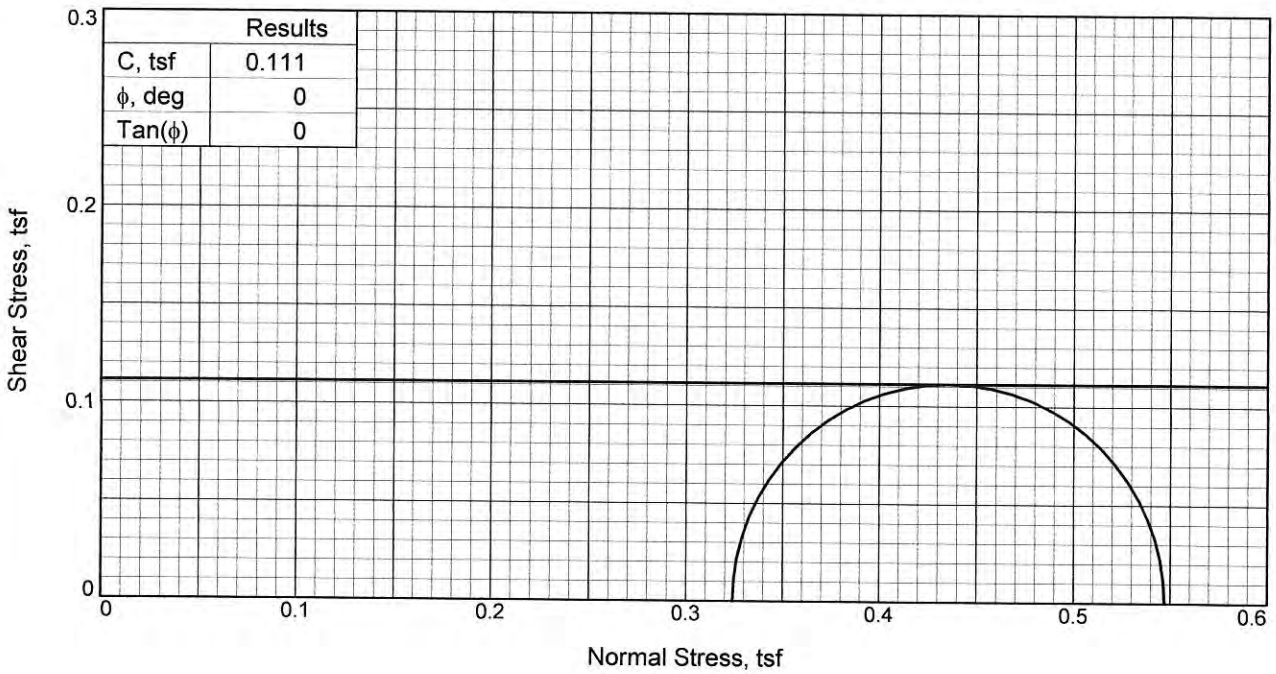
Client:

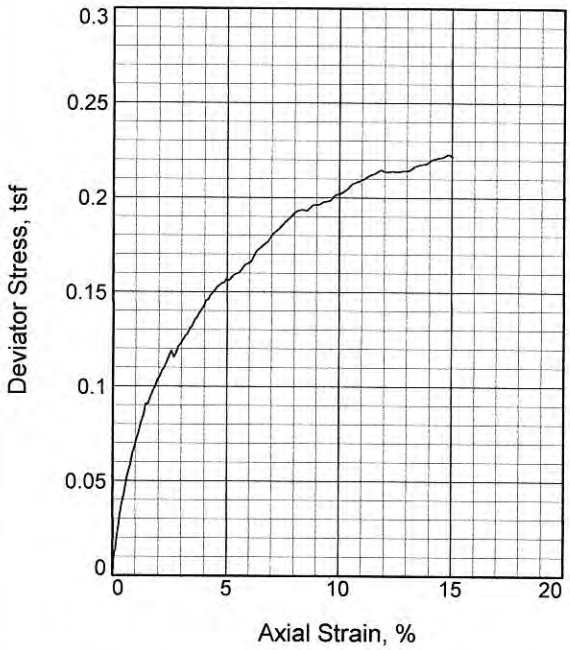
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 10-12

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	31.7
	Dry Density, pcf	82.6
	Saturation, %	82.3
	Void Ratio	1.0402
	Diameter, in.	2.87
	Height, in.	5.67
At Test	Water Content, %	37.0
	Dry Density, pcf	82.6
	Saturation, %	96.1
	Void Ratio	1.0402
	Diameter, in.	2.87
	Height, in.	5.67
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		4.50
Fail. Stress, tsf		0.22
Strain, %		14.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.55
σ_3 Failure, tsf		0.32

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown and black LEAN CLAY

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

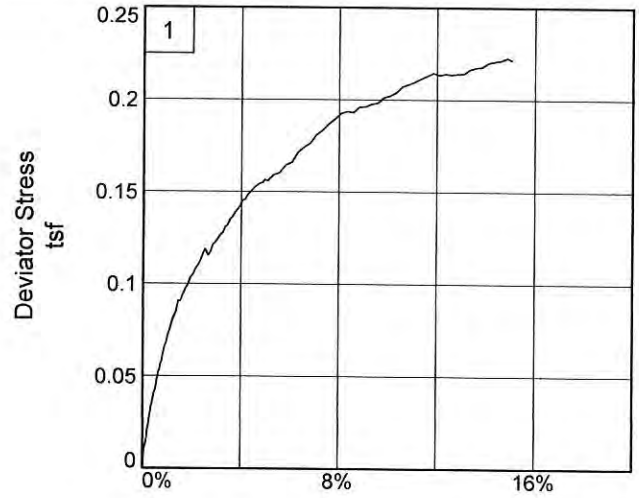
Client:

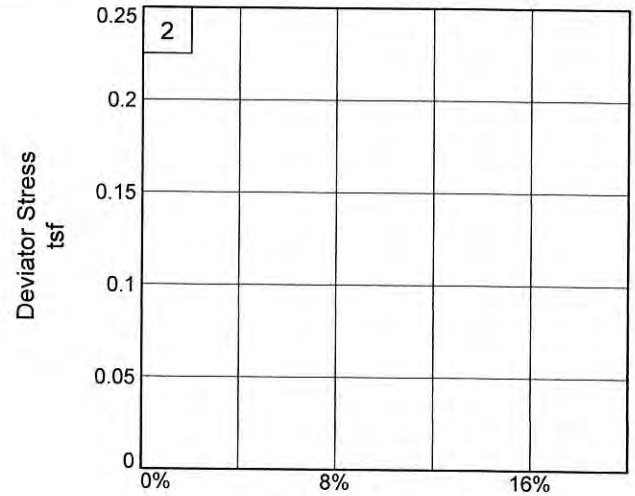
Project: San Jacinto River Waste Pit Superfund Site

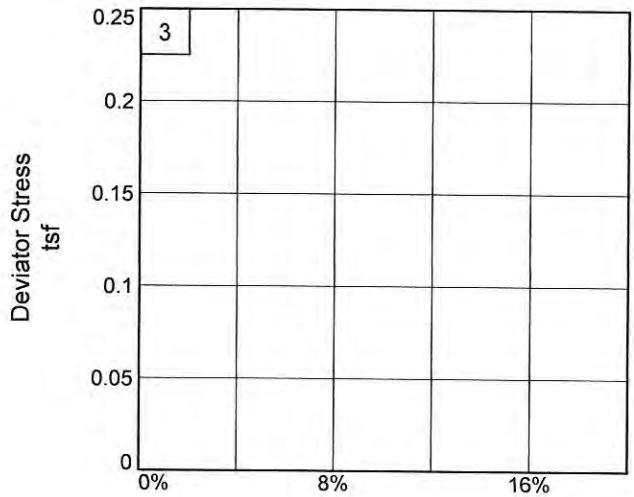
Source of Sample: SJGB024 **Depth:** 12-14

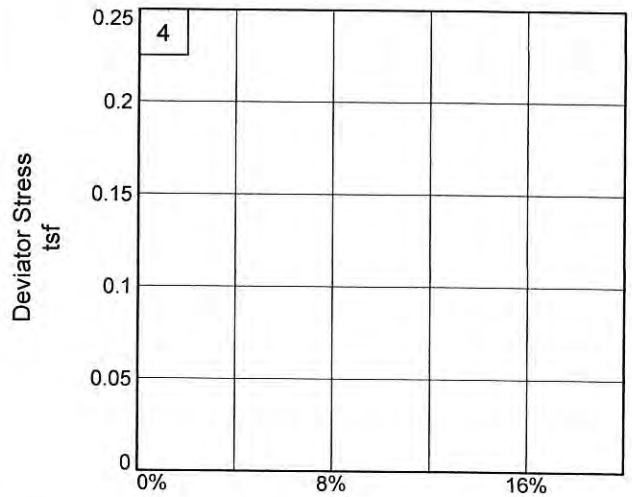
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

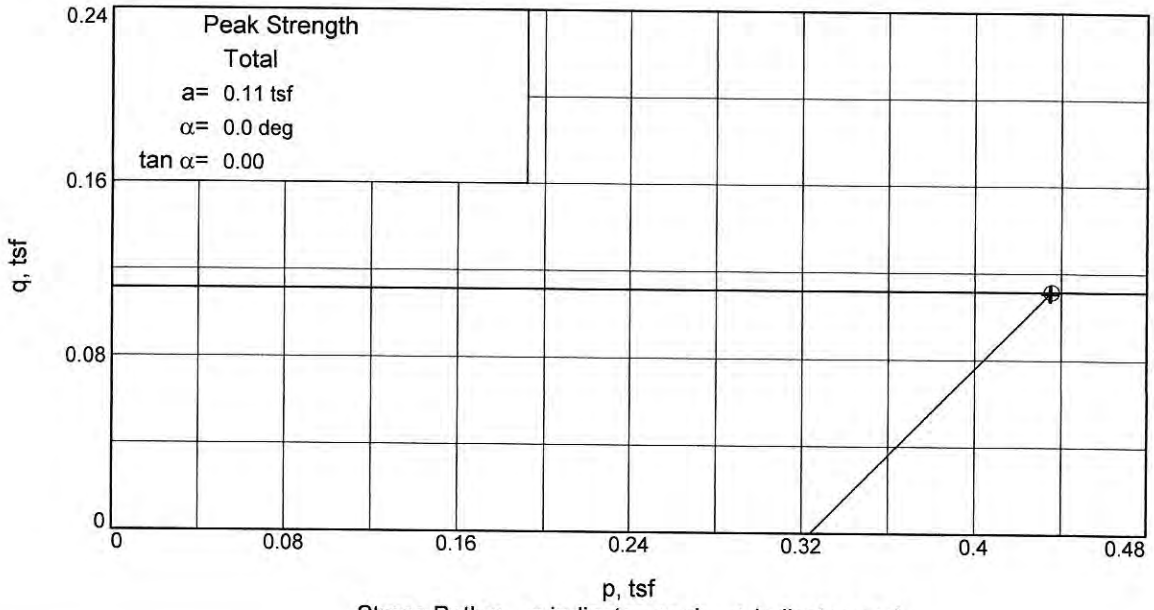
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

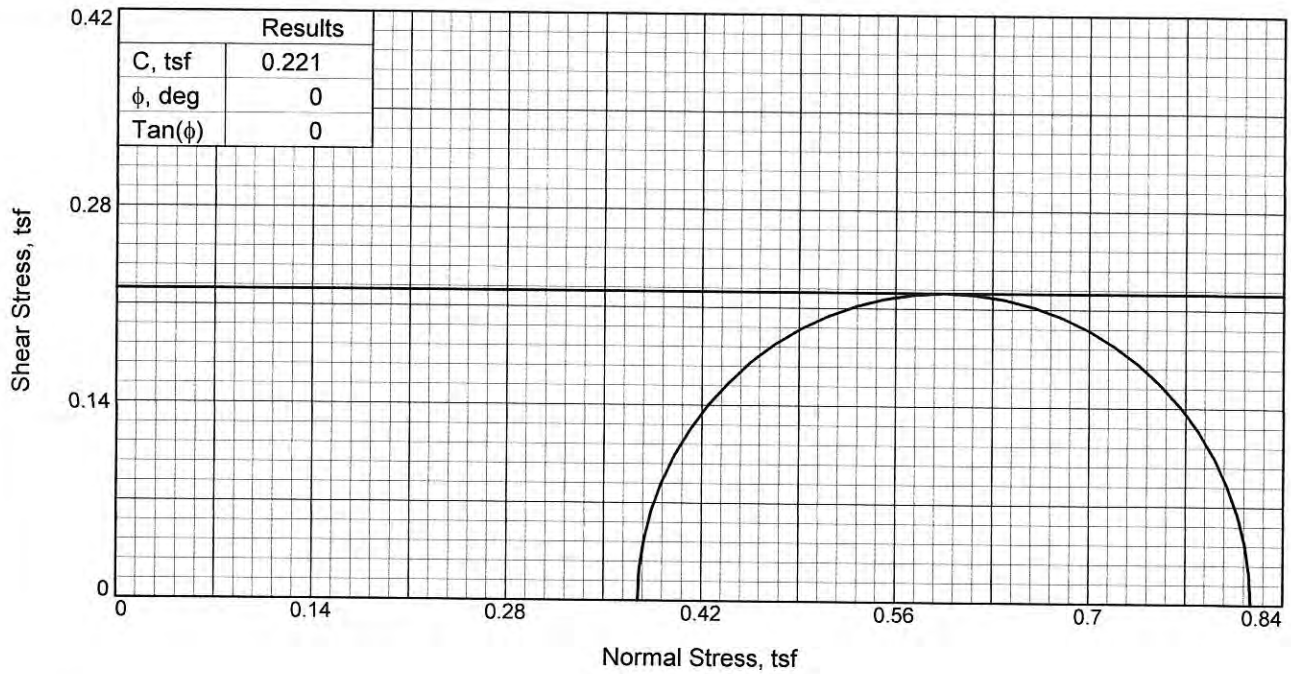
Client:

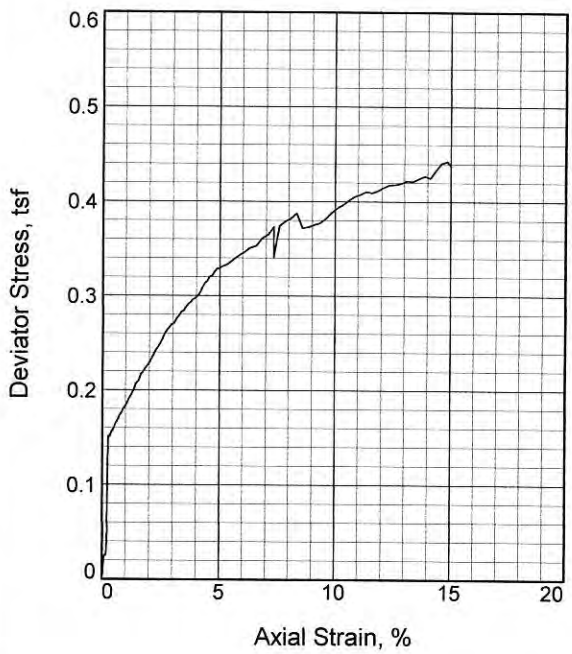
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 12-14

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	26.5
	Dry Density, pcf	91.7
	Saturation, %	85.5
	Void Ratio	0.8375
	Diameter, in.	2.87
	Height, in.	5.77
At Test	Water Content, %	29.7
	Dry Density, pcf	91.7
	Saturation, %	95.9
	Void Ratio	0.8375
	Diameter, in.	2.87
	Height, in.	5.77
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		5.20
Fail. Stress, tsf		0.44
Strain, %		14.9
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.82
σ_3 Failure, tsf		0.37

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown CLAYEY SAND

LL= 32 **PL=** 19 **PI=** 13

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

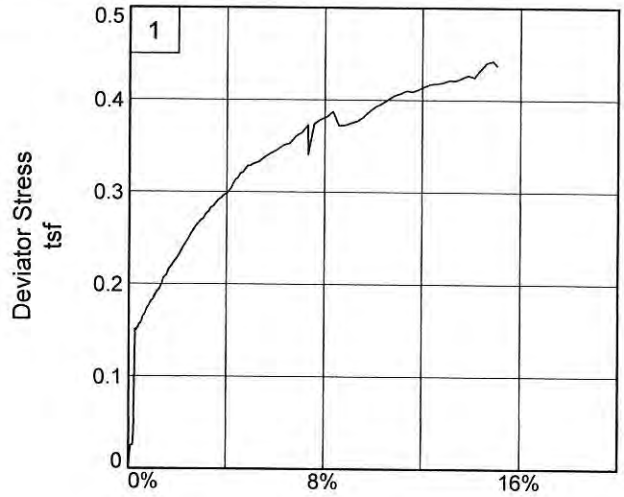
Client:

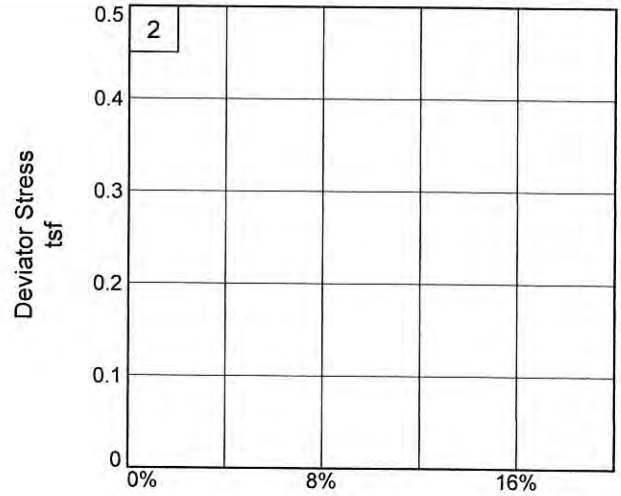
Project: San Jacinto River Waste Pit Superfund Site

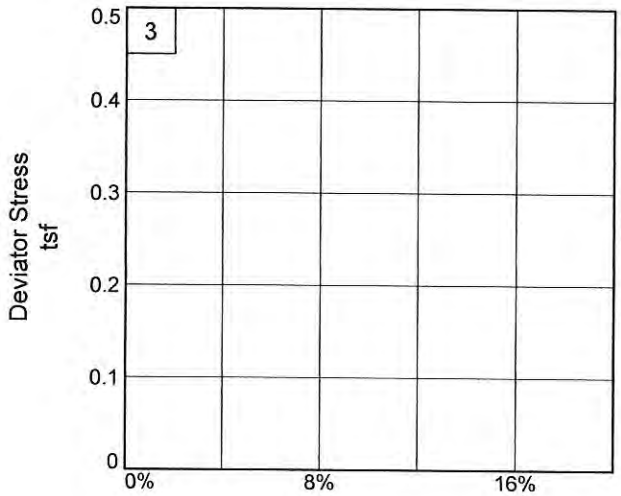
Source of Sample: SJGB024 **Depth:** 14-16

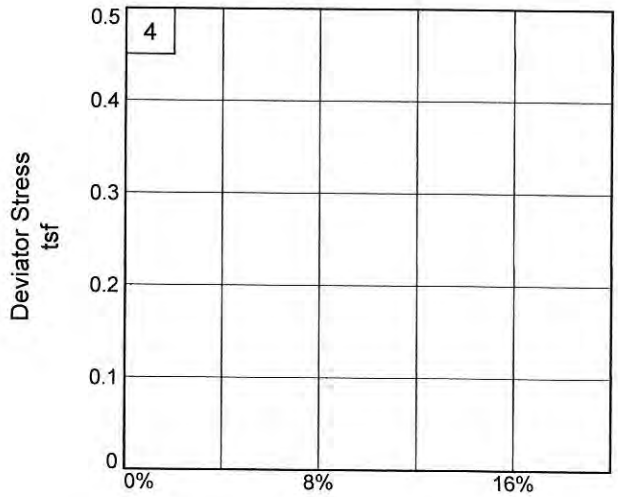
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

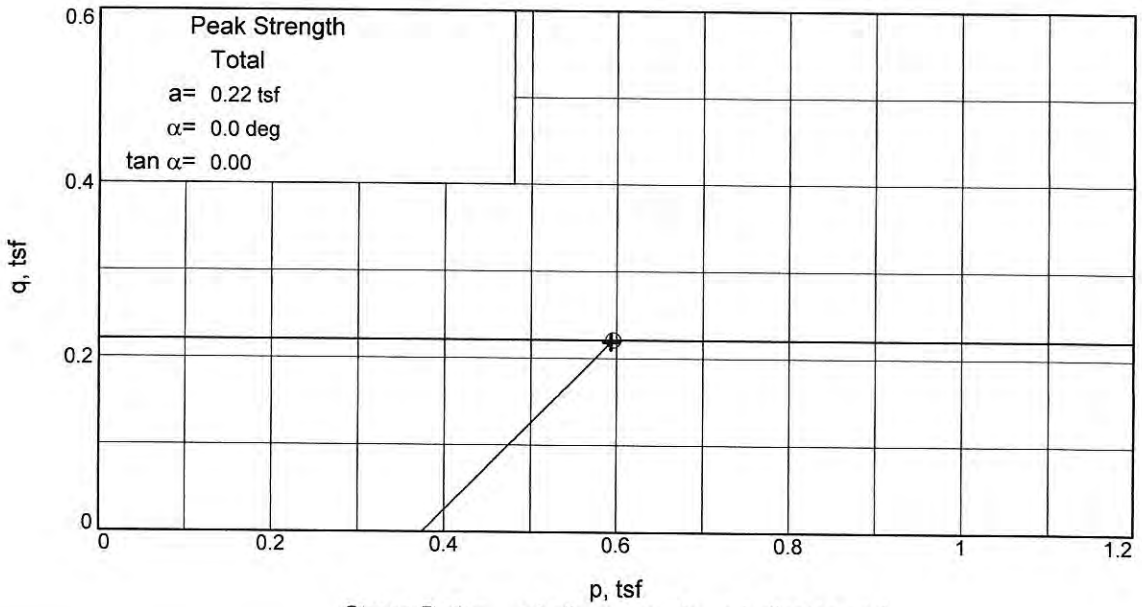
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

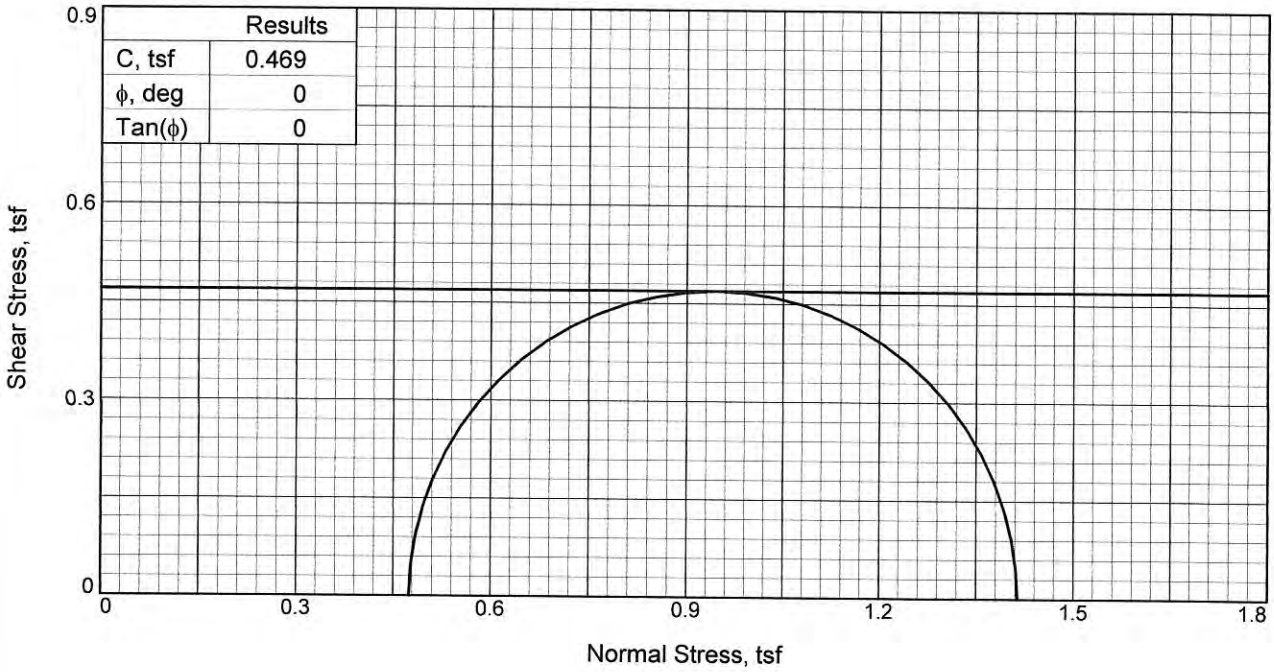
Client:

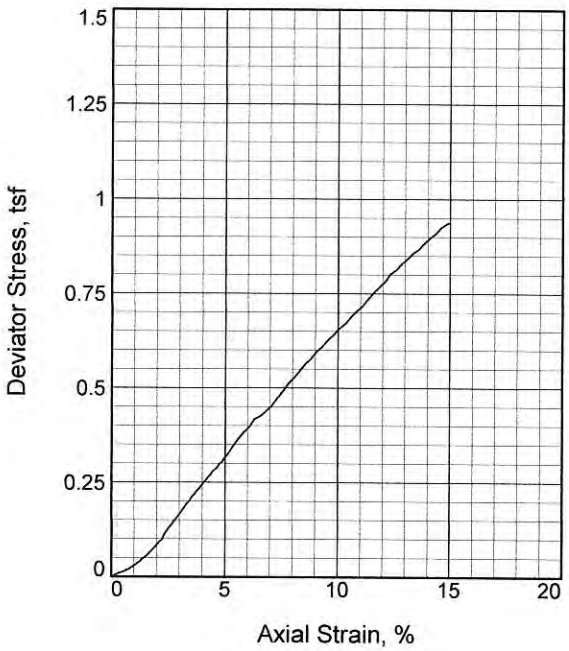
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 14-16

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	24.9
	Dry Density, pcf	98.4
	Saturation, %	94.2
	Void Ratio	0.7124
	Diameter, in.	2.81
	Height, in.	5.79
At Test	Water Content, %	24.3
	Dry Density, pcf	98.4
	Saturation, %	92.2
	Void Ratio	0.7124
	Diameter, in.	2.81
	Height, in.	5.79
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		6.60
Fail. Stress, tsf		0.94
Strain, %		15.0
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.41
σ_3 Failure, tsf		0.48

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown SILTY CLAYEY SAND

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

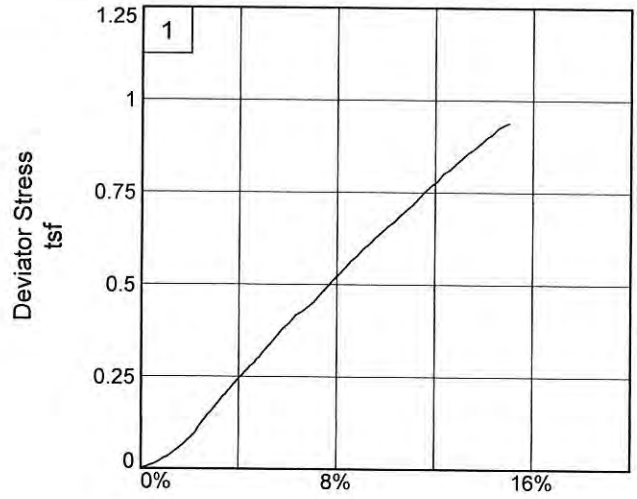
Client:

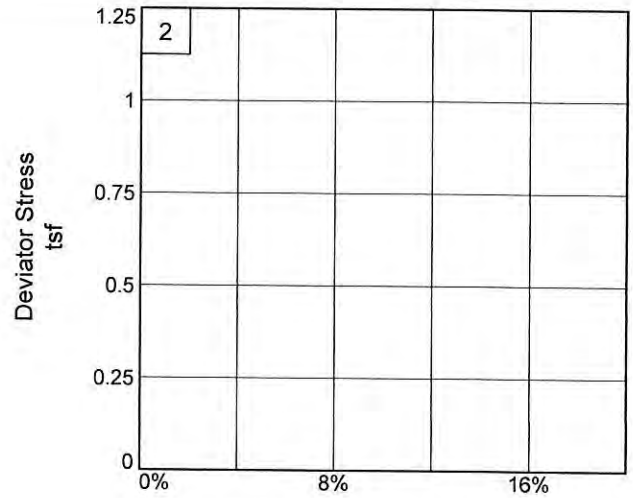
Project: San Jacinto River Waste Pit Superfund Site

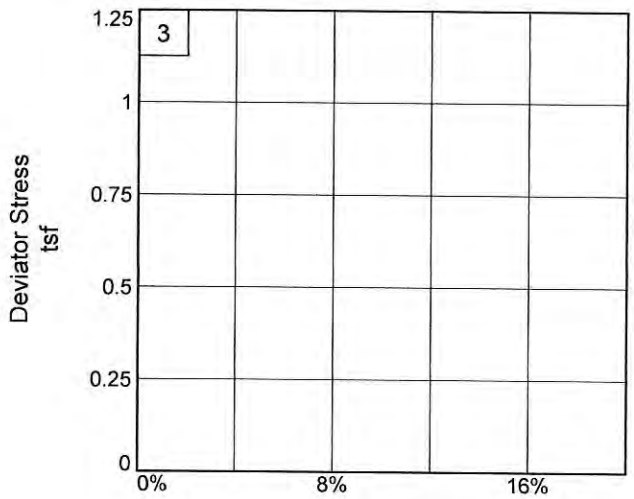
Source of Sample: SJGB024 **Depth:** 18-20

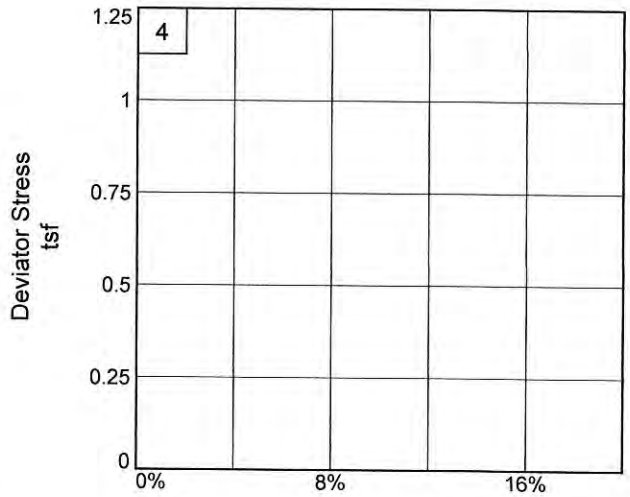
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

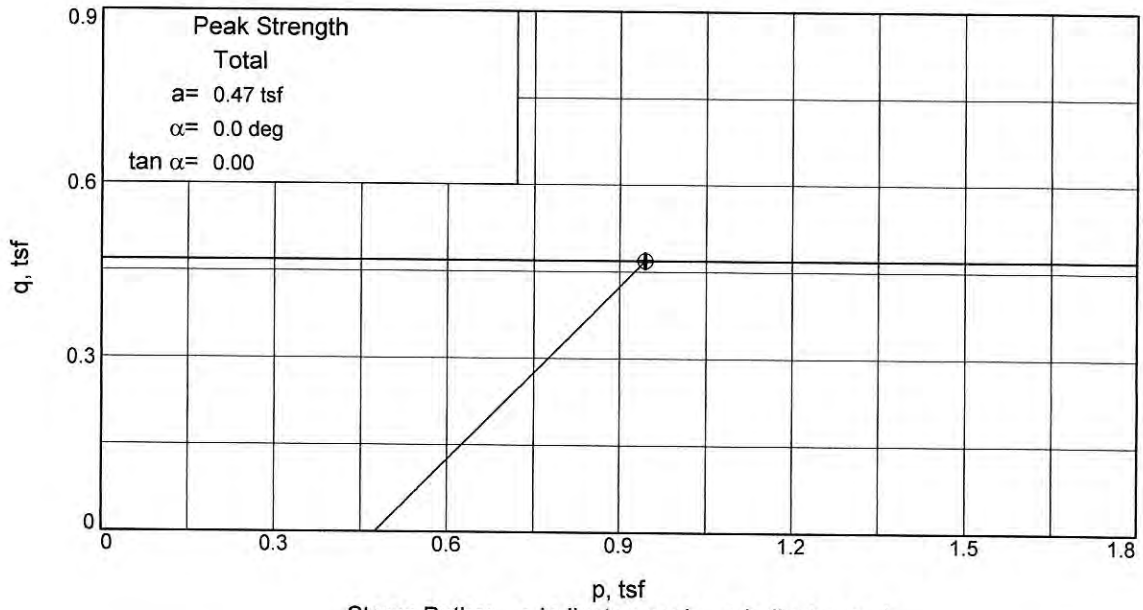
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

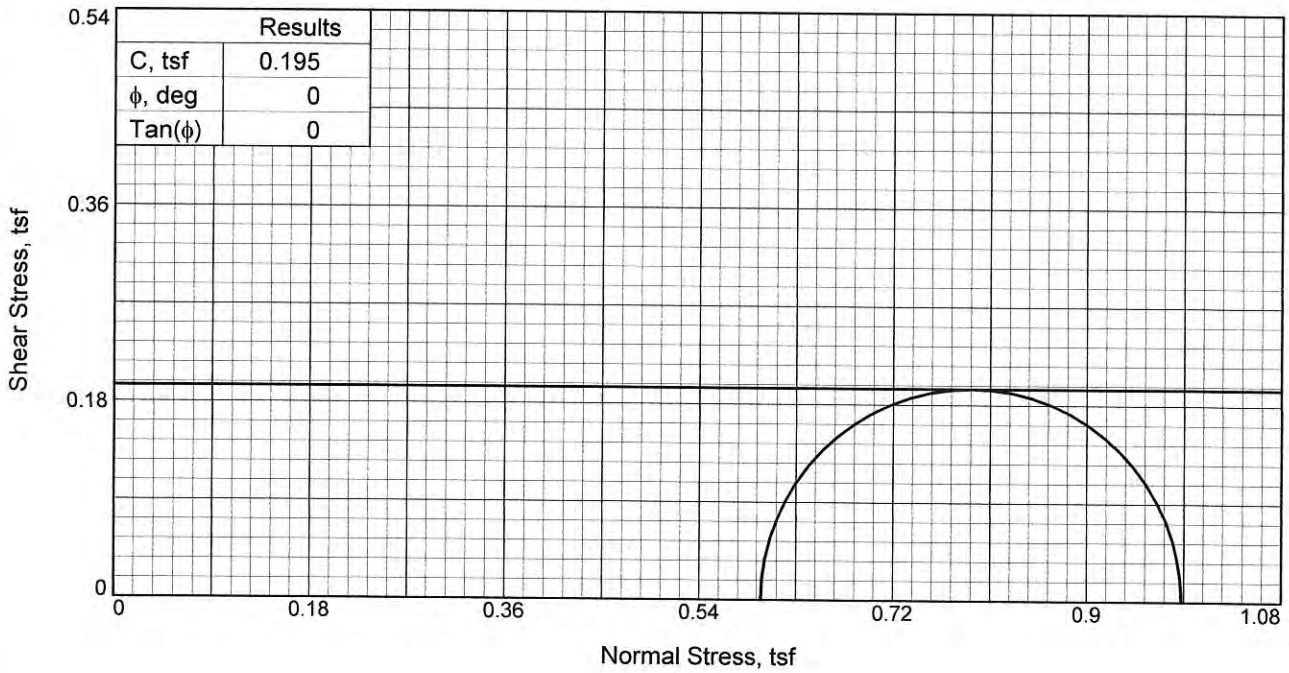
Client:

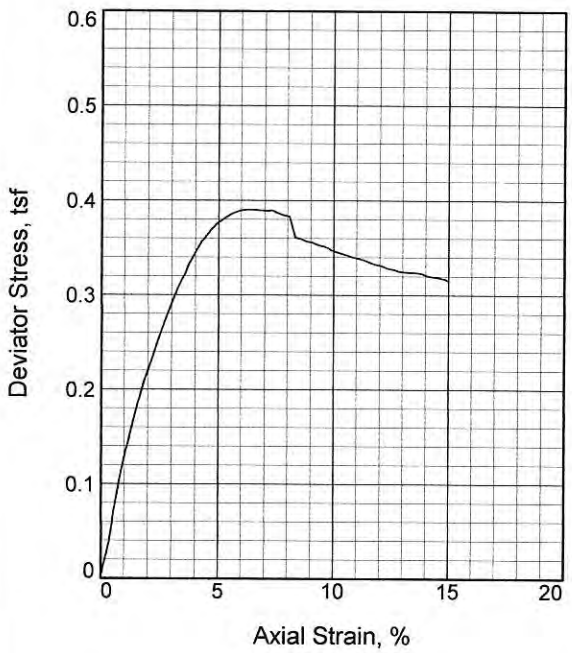
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 18-20

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	49.5
	Dry Density, pcf	66.4
	Saturation, %	86.8
	Void Ratio	1.5390
	Diameter, in.	2.85
	Height, in.	5.76
At Test	Water Content, %	52.1
	Dry Density, pcf	66.4
	Saturation, %	91.4
	Void Ratio	1.5390
	Diameter, in.	2.85
	Height, in.	5.76
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		8.30
Fail. Stress, tsf		0.39
Strain, %		6.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.99
σ_3 Failure, tsf		0.60

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown FAT CLAY

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

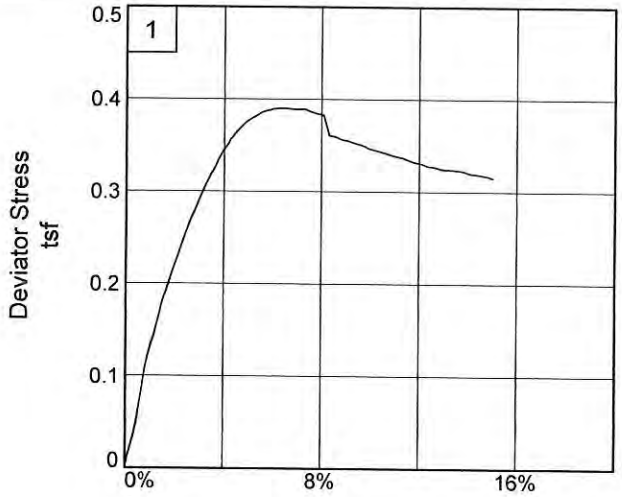
Client:

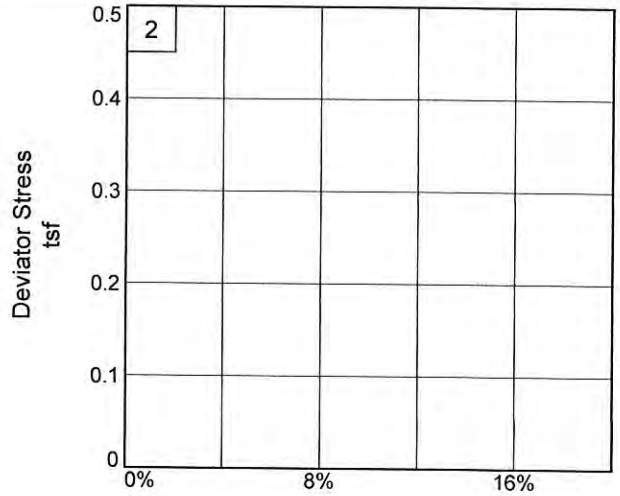
Project: San Jacinto River Waste Pit Superfund Site

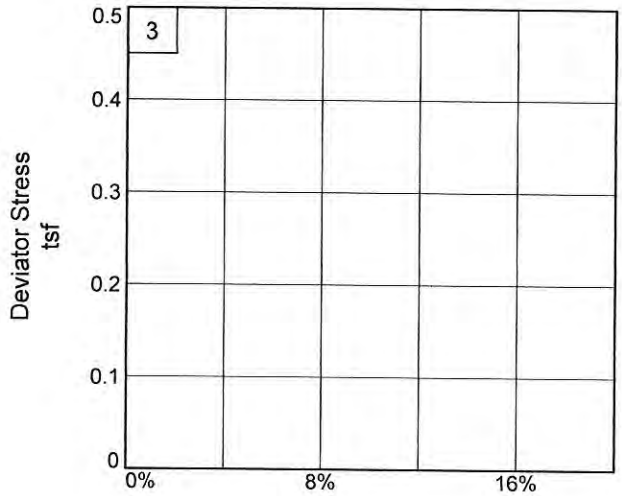
Source of Sample: SJGB024 **Depth:** 23-25

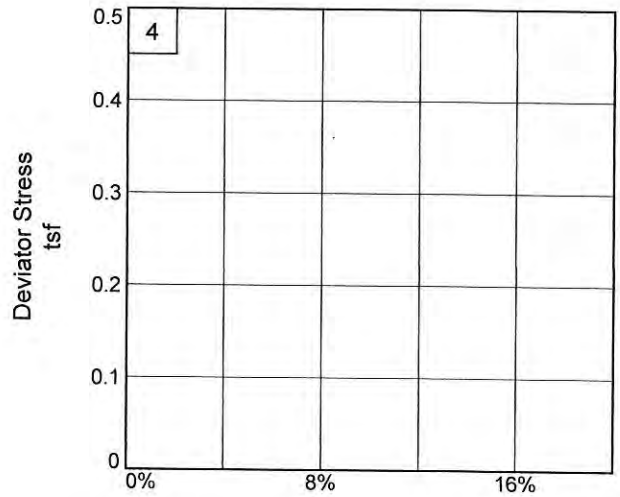
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

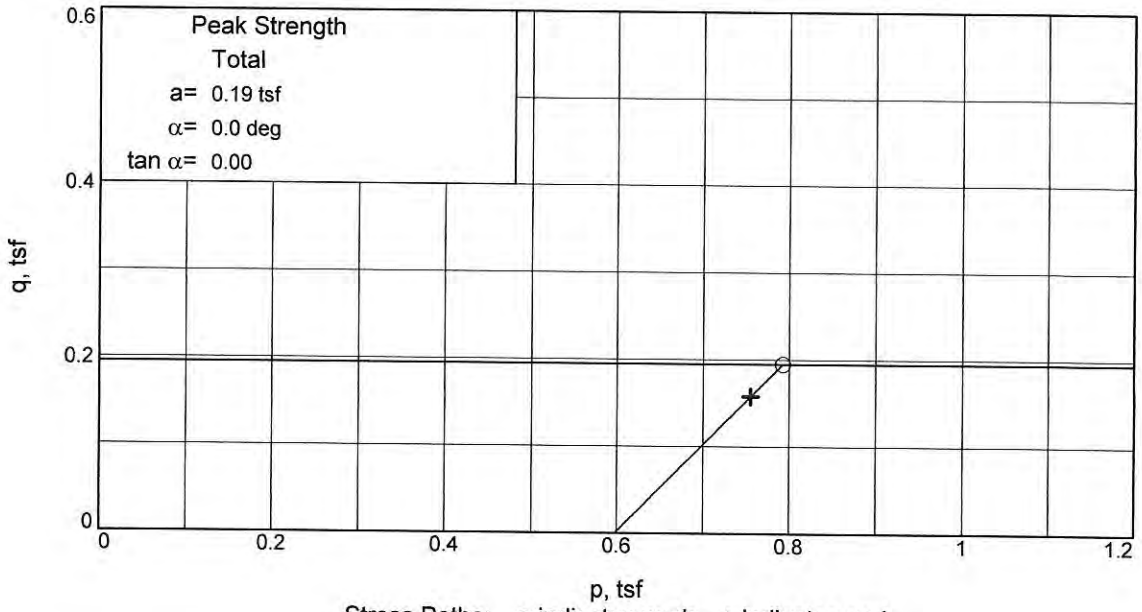
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

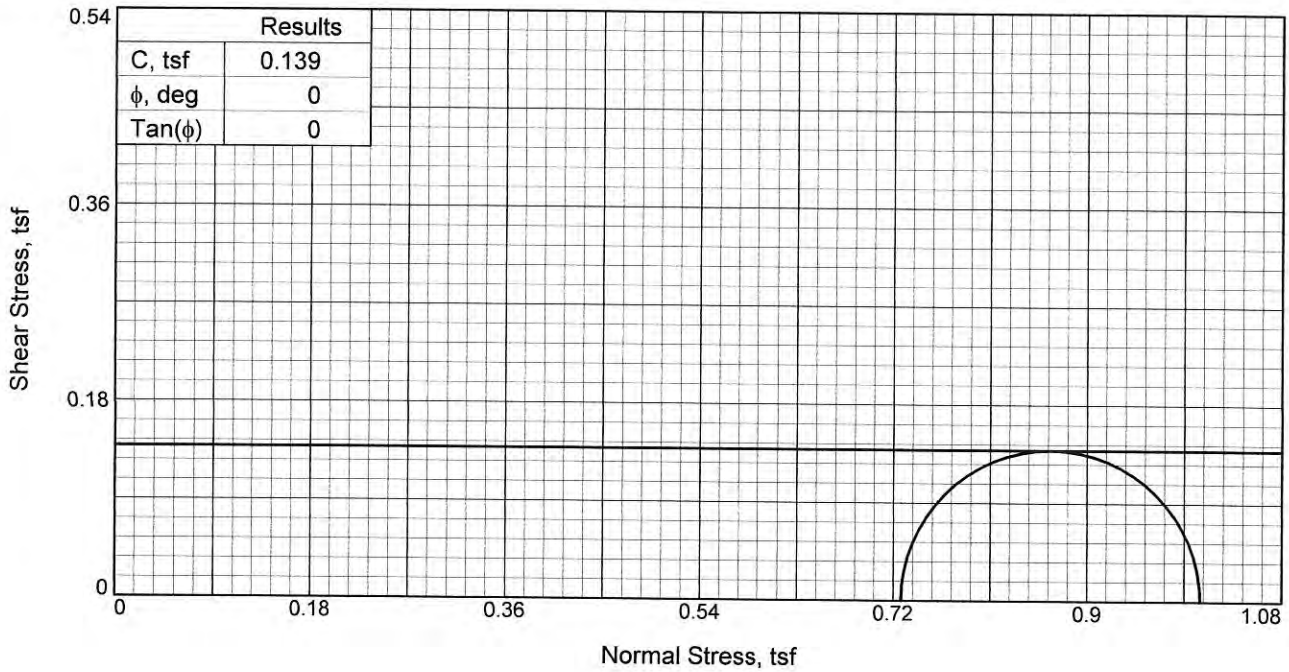
Client:

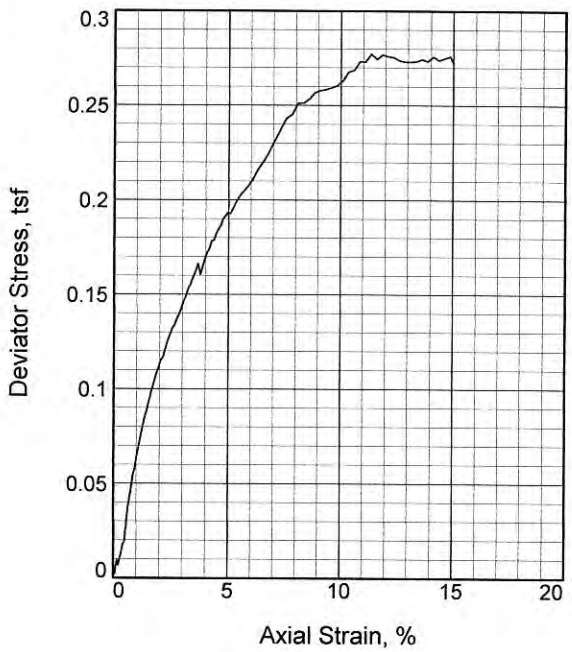
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 23-25

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	61.3
	Dry Density, pcf	59.0
	Saturation, %	89.2
	Void Ratio	1.8553
	Diameter, in.	2.93
	Height, in.	5.79
At Test	Water Content, %	47.6
	Dry Density, pcf	59.0
	Saturation, %	69.2
	Void Ratio	1.8553
	Diameter, in.	2.93
	Height, in.	5.79
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		10.10
Fail. Stress, tsf		0.28
Strain, %		11.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.00
σ_3 Failure, tsf		0.73

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown FAT CLAY

LL= 122 **PL=** 58 **PI=** 64

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

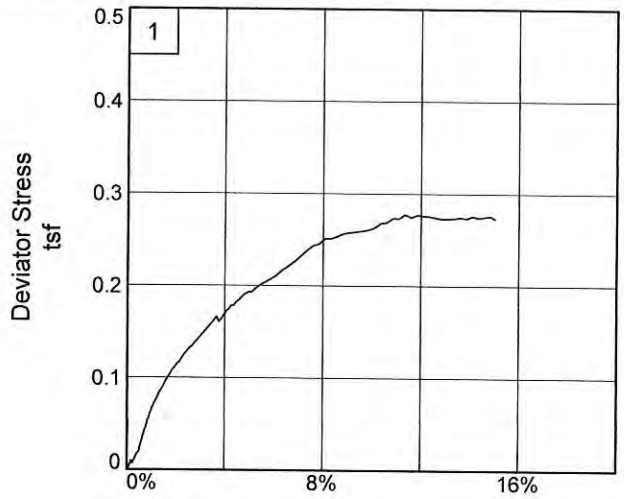
Client:

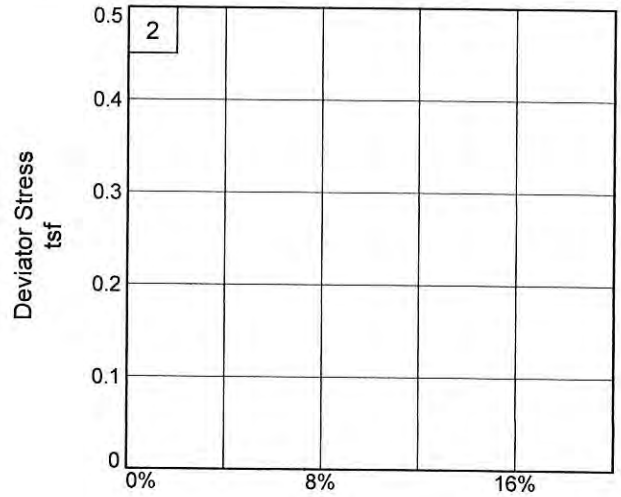
Project: San Jacinto River Waste Pit Superfund Site

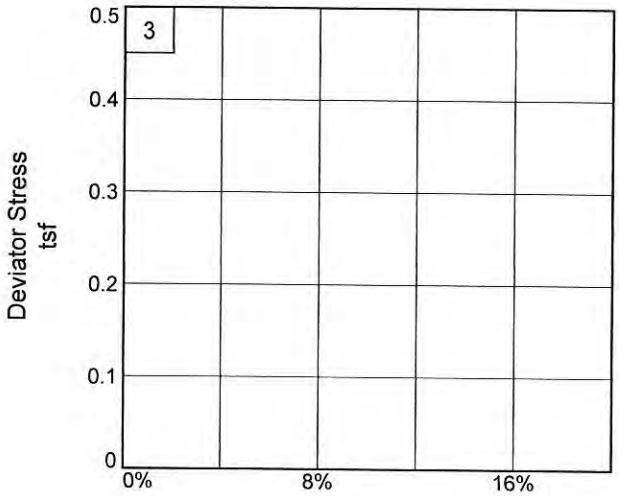
Source of Sample: SJGB024 **Depth:** 28-30

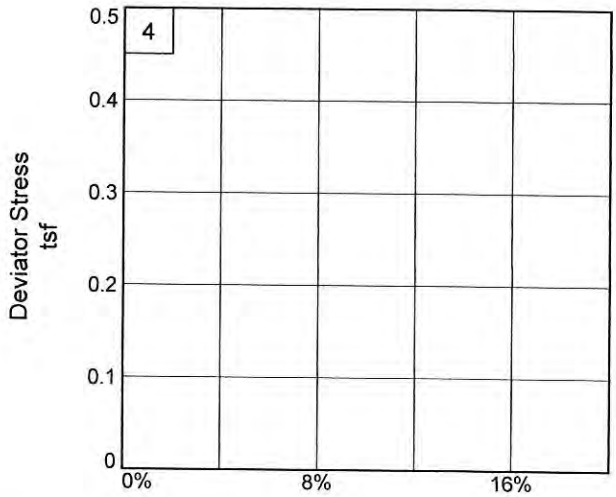
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

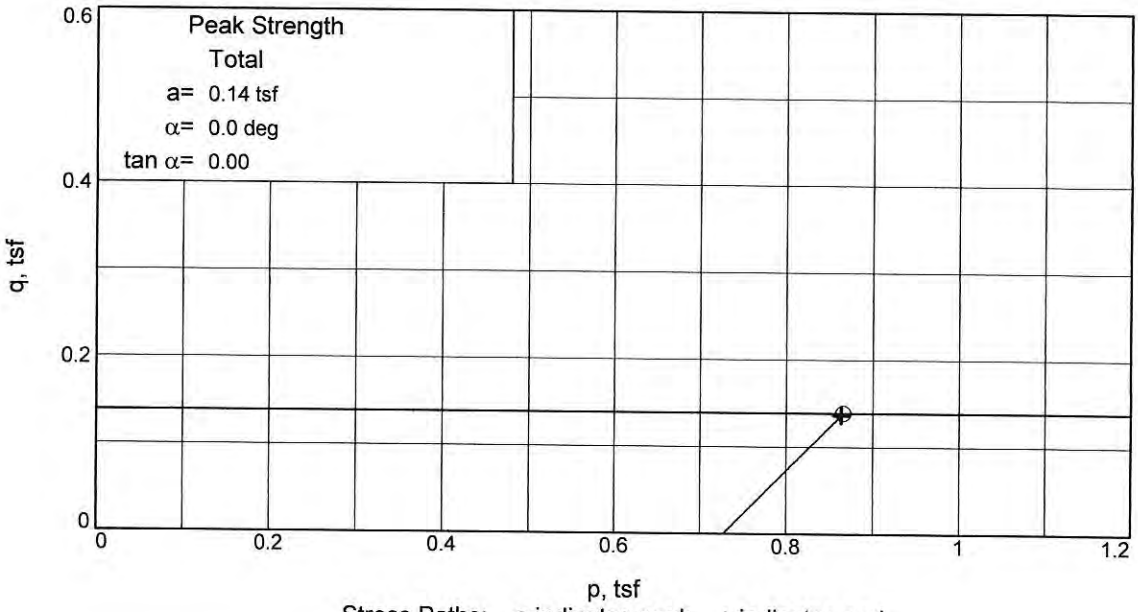
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

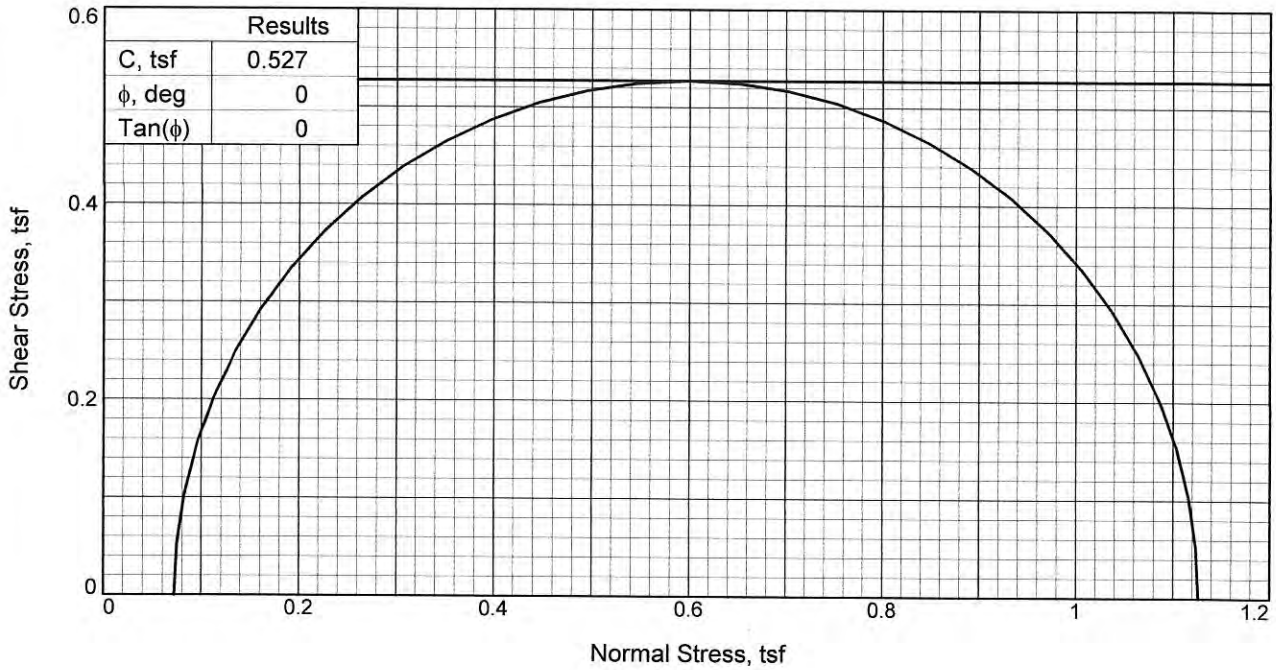
Client:

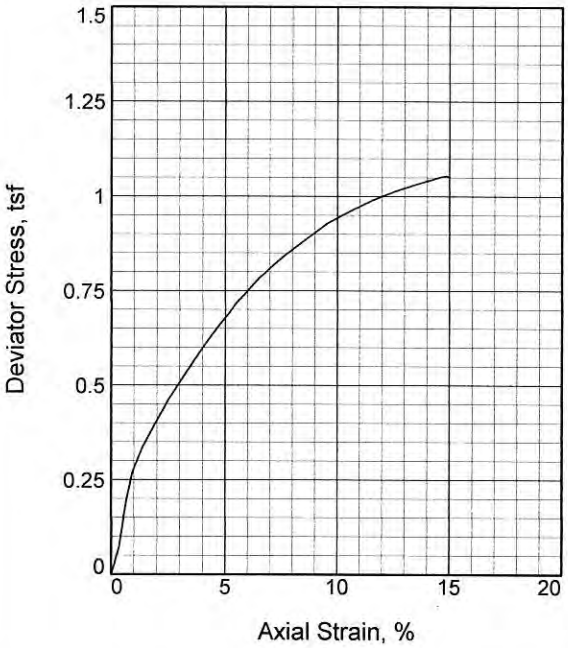
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB024 **Depth:** 28-30

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	15.5
	Dry Density, pcf	115.8
	Saturation, %	91.8
	Void Ratio	0.4558
	Diameter, in.	2.80
	Height, in.	5.70
At Test	Water Content, %	15.5
	Dry Density, pcf	115.8
	Saturation, %	91.7
	Void Ratio	0.4558
	Diameter, in.	2.80
	Height, in.	5.70
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		1.00
Fail. Stress, tsf		1.05
Ult. Stress, tsf		
σ_1 Failure, tsf		1.13
σ_3 Failure, tsf		0.07

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown LEAN CLAY with SAND

LL= 36 **PL=** 18 **PI=** 18

Specific Gravity= 2.7

Remarks:
Test Method: ASTM D2850
Failure Type: Bulge

Figure _____

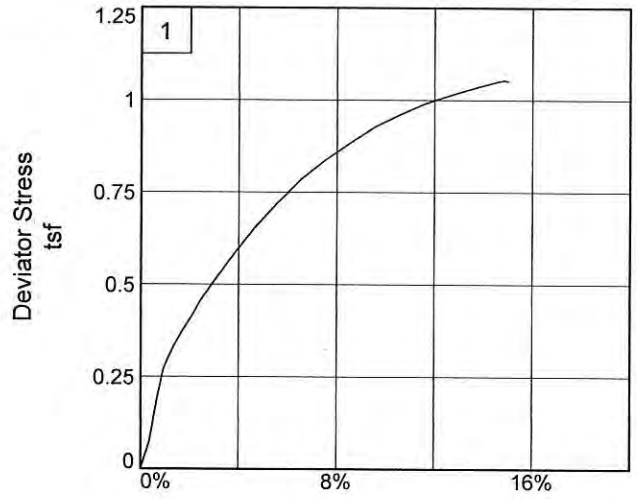
Client:

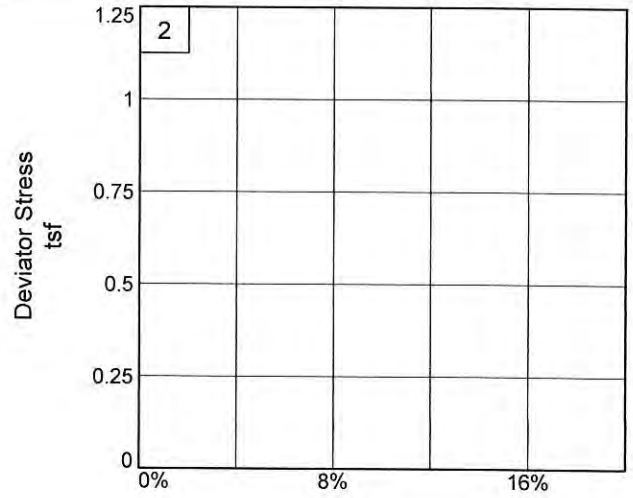
Project: San Jacinto River Waste Pit Superfund Site

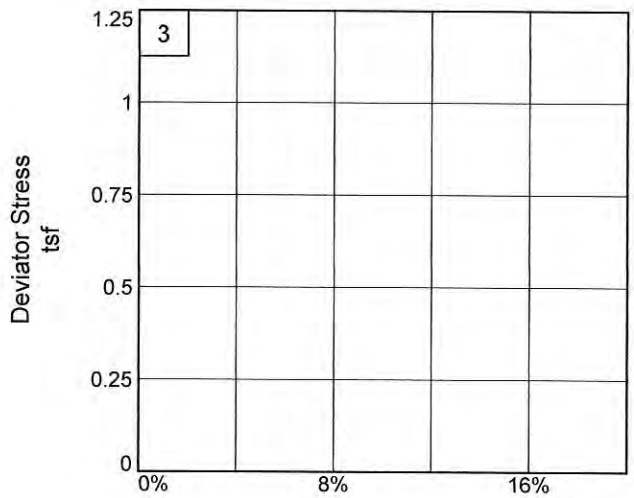
Source of Sample: SJGB025 **Depth:** 2-4

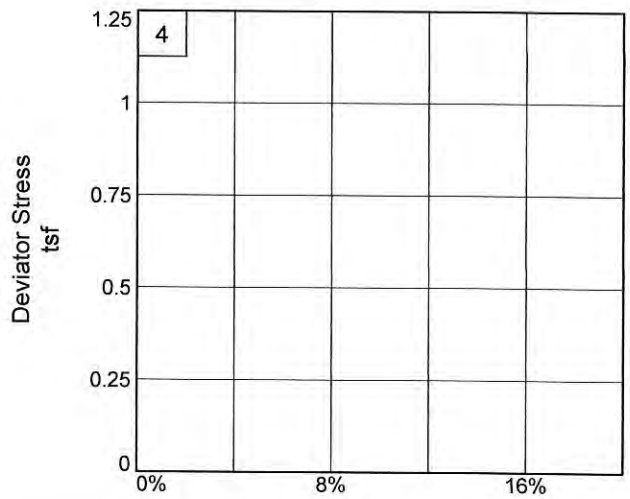
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

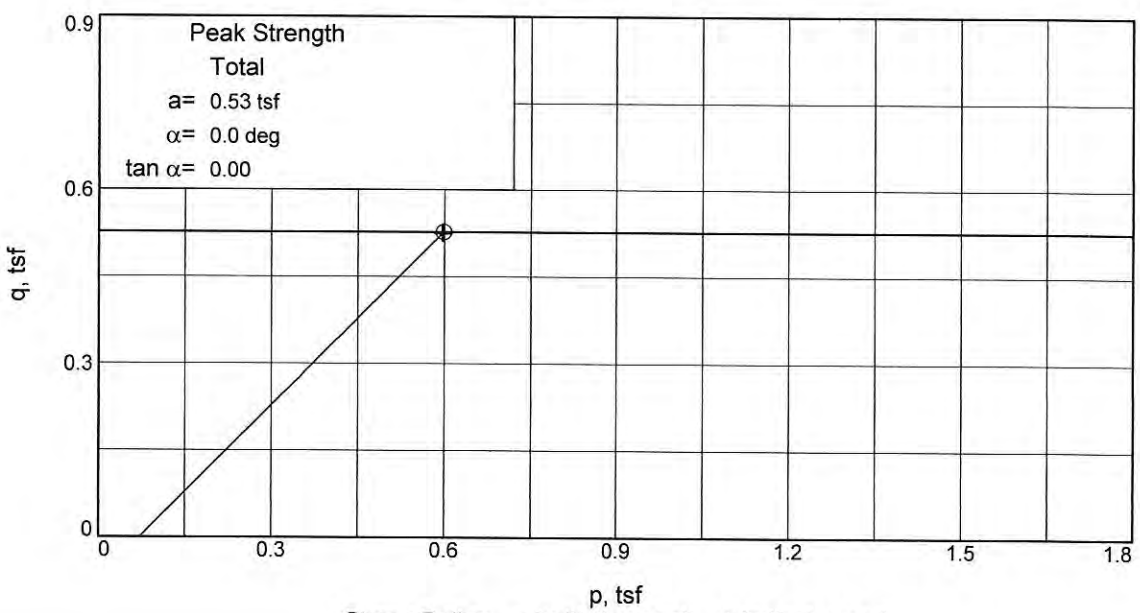
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

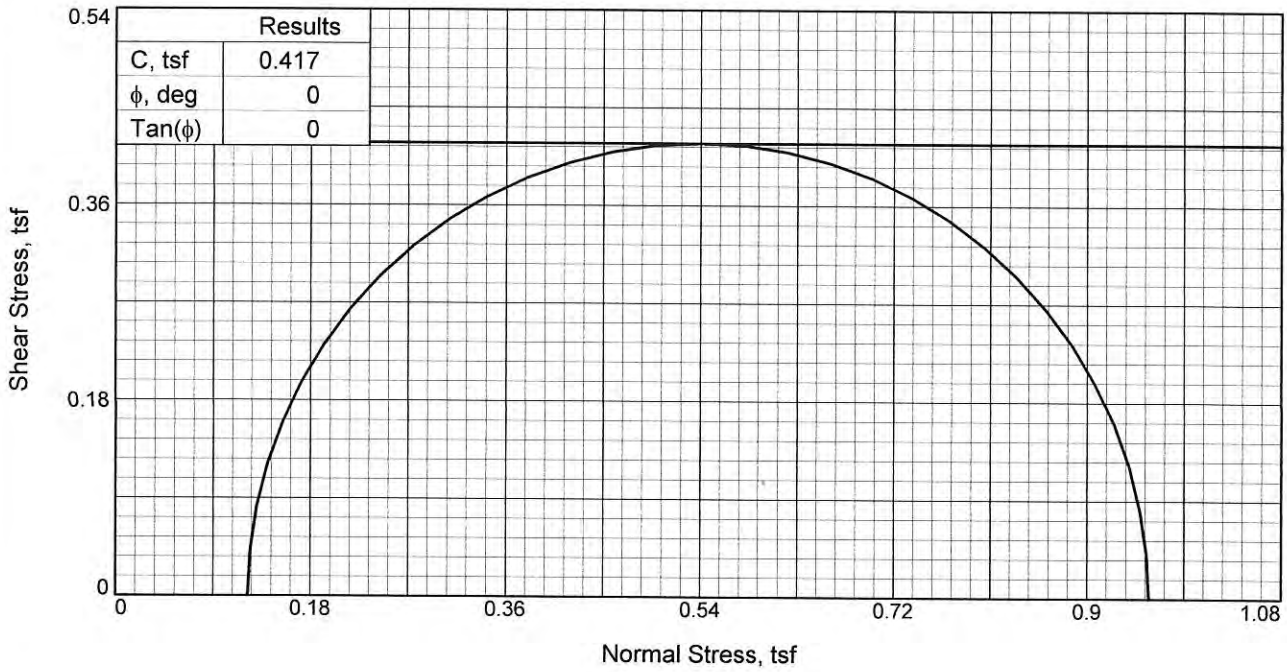
Client:

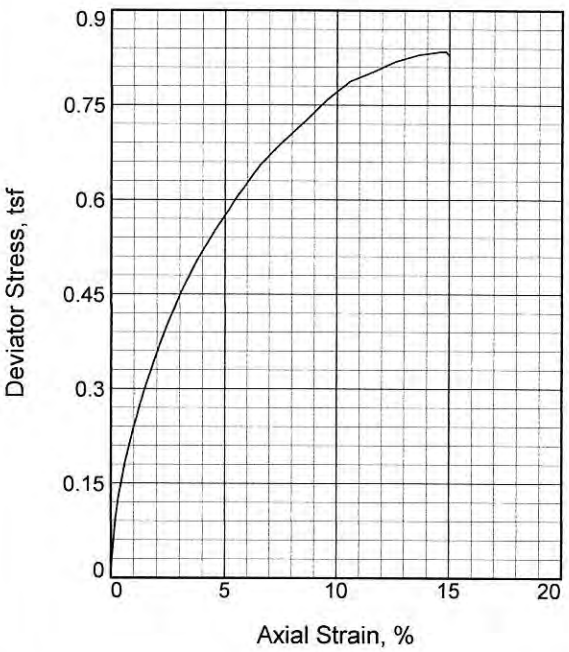
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB025 **Depth:** 2-4

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	18.8
	Dry Density, pcf	112.5
	Saturation, %	98.1
	Void Ratio	0.5258
	Diameter, in.	2.79
	Height, in.	5.72
At Test	Water Content, %	18.4
	Dry Density, pcf	112.5
	Saturation, %	96.4
	Void Ratio	0.5258
	Diameter, in.	2.79
	Height, in.	5.72
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		1.70
Fail. Stress, tsf		0.83
Ult. Stress, tsf		
σ_1 Failure, tsf		0.96
σ_3 Failure, tsf		0.12

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray SANDY LEAN CLAY

LL= 34 **PL=** 17 **PI=** 17

Specific Gravity= 2.75

Remarks:
Test Method: ASTM D2850
Failure Type:Multiple Shear

Figure _____

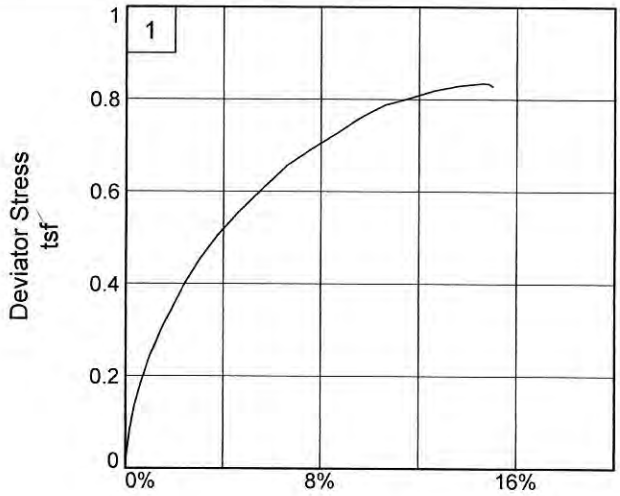
Client:

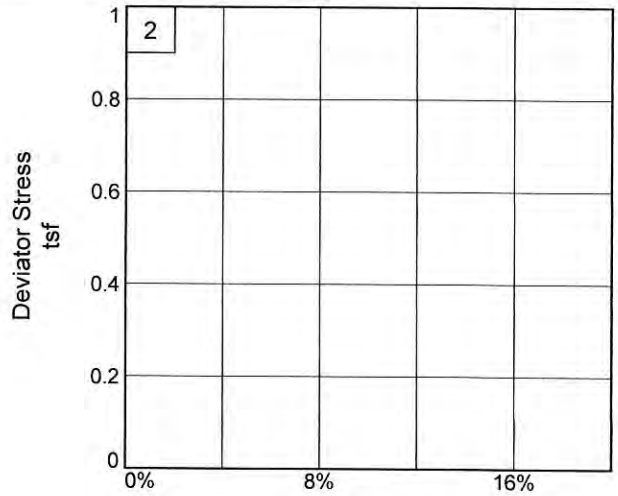
Project: San Jacinto River Waste Pit Superfund Site

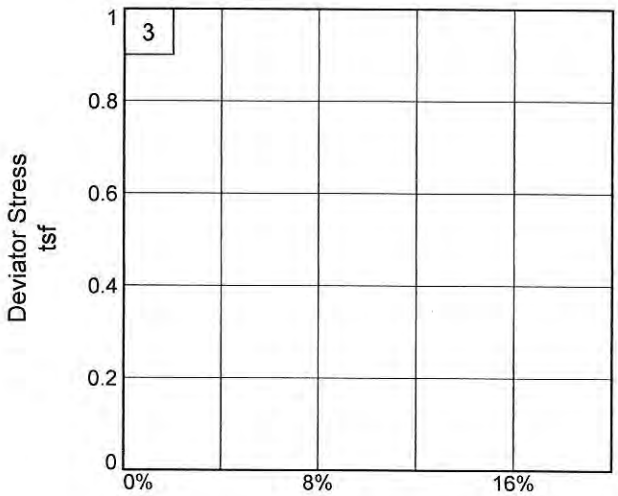
Source of Sample: SJGB025 **Depth:** 4-6

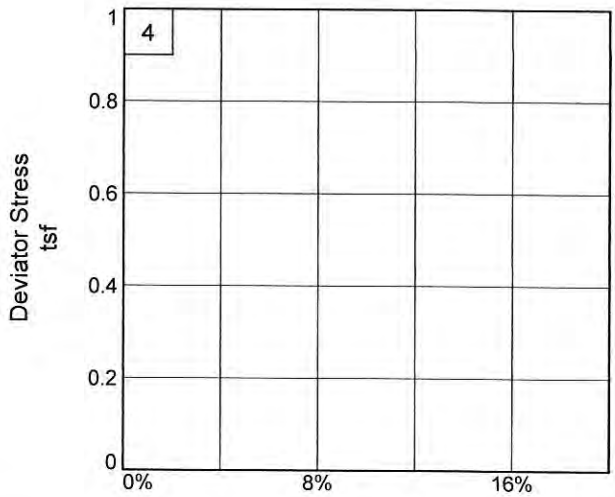
Proj. No.: 19.15.131 **Date Sampled:** 9/19/19

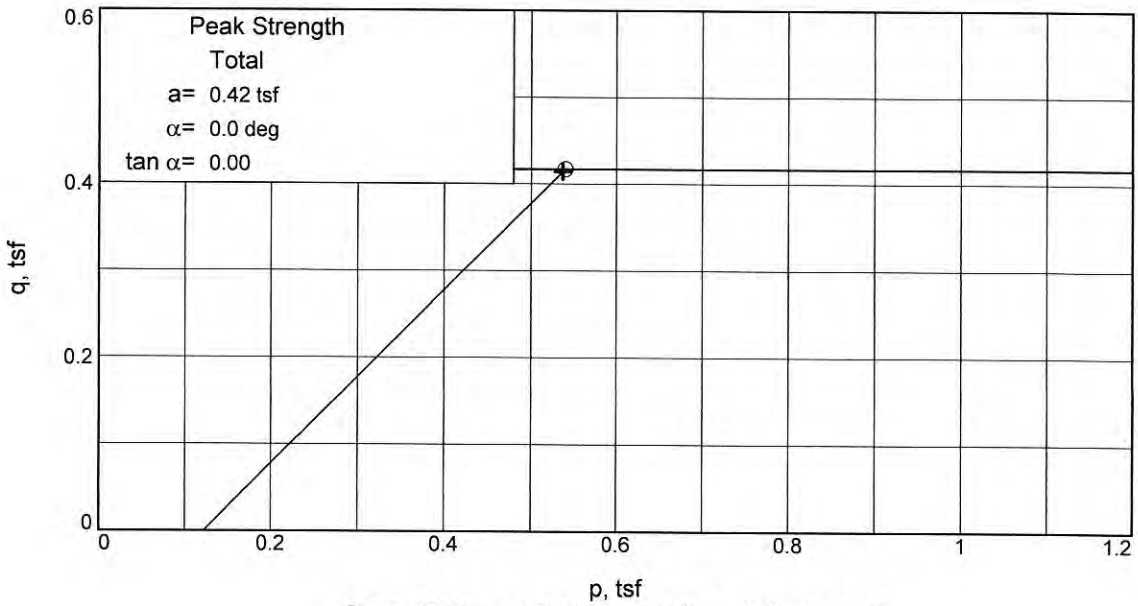
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

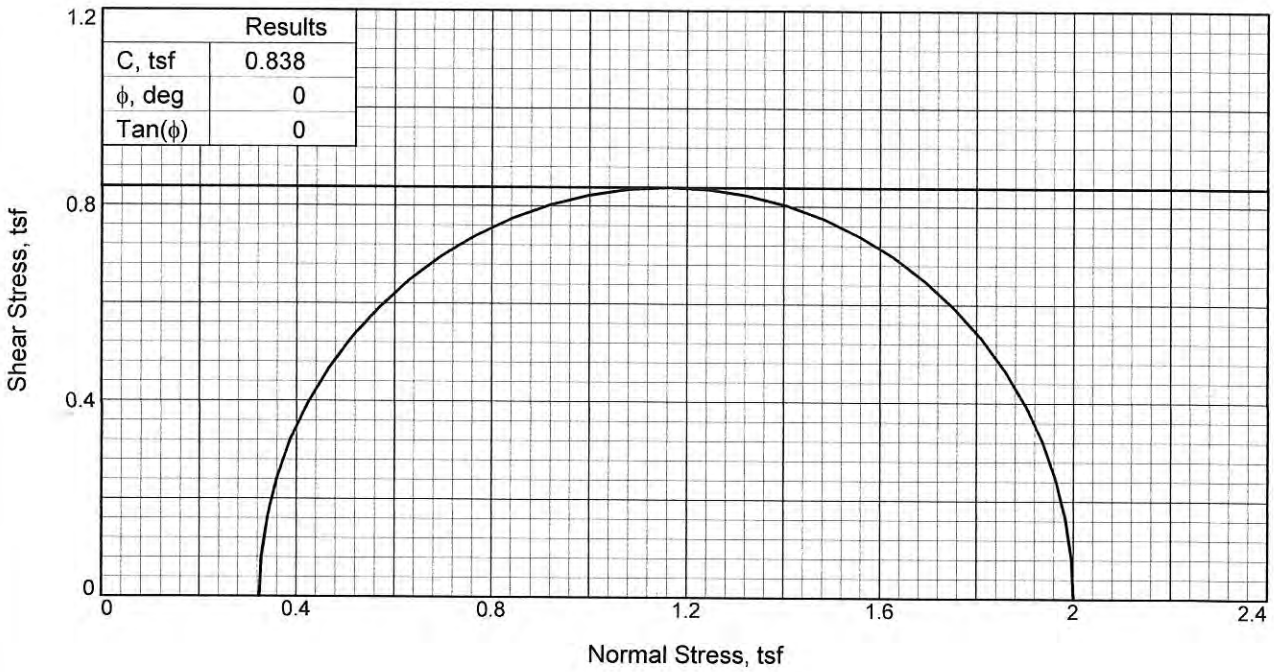
Client:

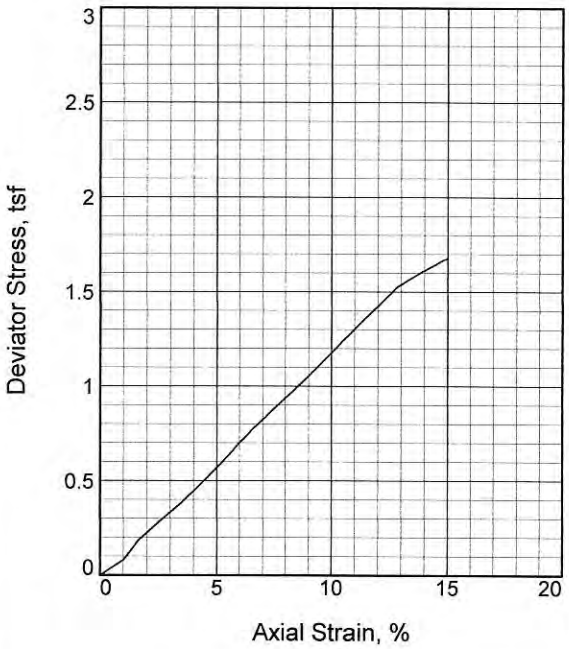
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB025 **Depth:** 4-6

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	18.6
	Dry Density, pcf	114.9
	Saturation, %	99.9
	Void Ratio	0.5208
	Diameter, in.	2.77
	Height, in.	5.19
At Test	Water Content, %	20.4
	Dry Density, pcf	114.9
	Saturation, %	109.8
	Void Ratio	0.5208
	Diameter, in.	2.77
	Height, in.	5.19
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		4.50
Fail. Stress, tsf		1.68
Ult. Stress, tsf		
σ_1 Failure, tsf		2.00
σ_3 Failure, tsf		0.32

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown SANDY LEAN CLAY

LL= 33 **PL=** 17 **PI=** 16

Specific Gravity= 2.8

Remarks:
Test Method: ASTM D2850
Failure Type: Bulge

Figure _____

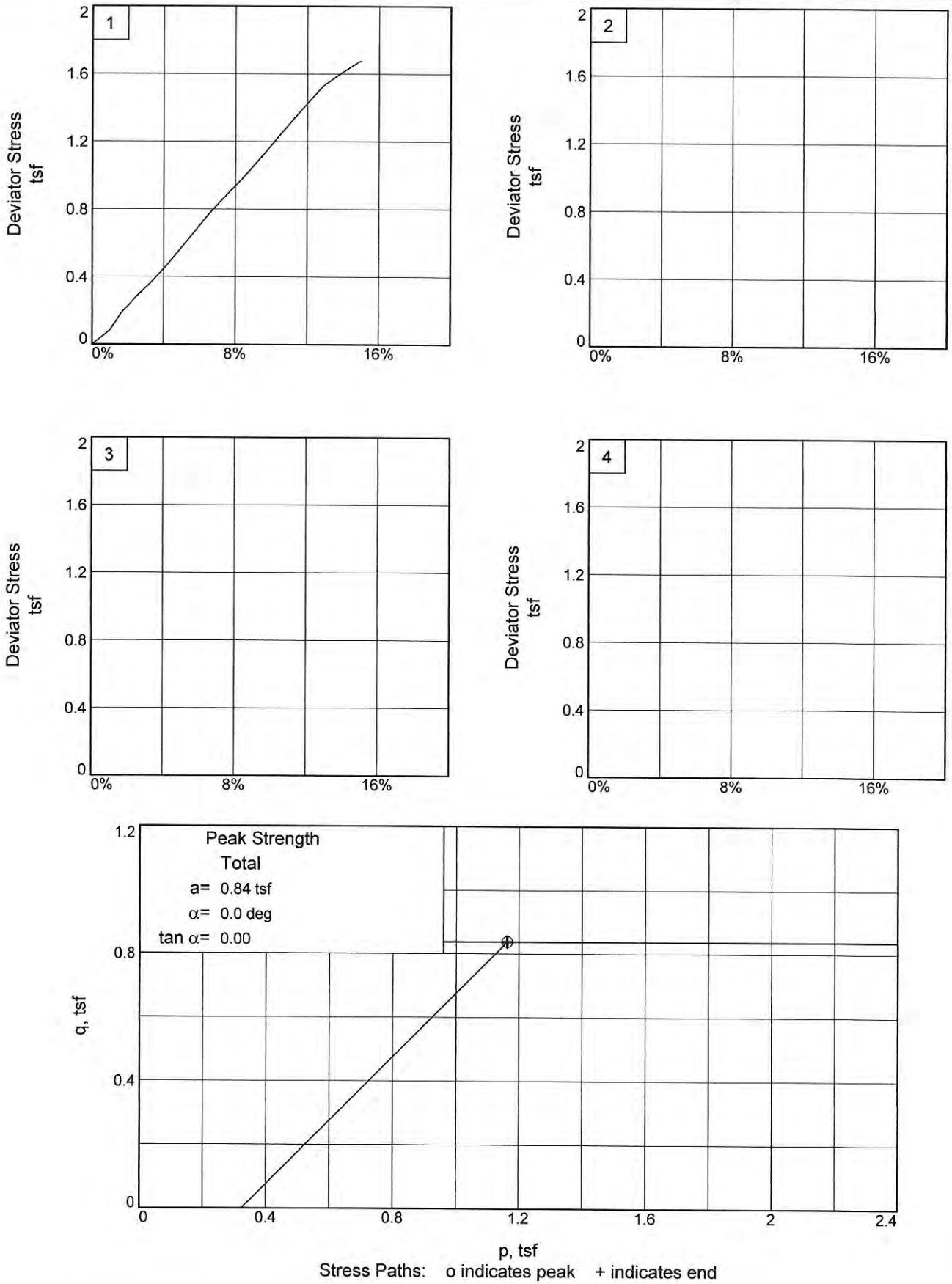
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB025 **Depth:** 12-14

Proj. No.: 19.15.131 **Date Sampled:** 9/19/19

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



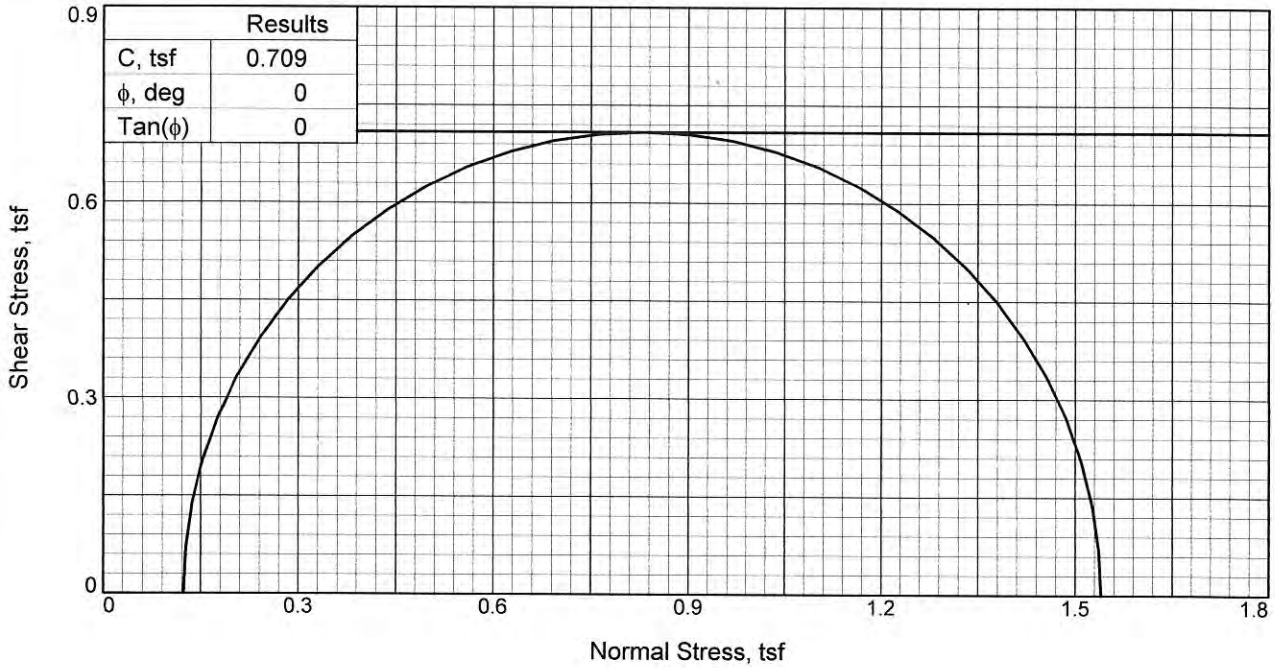
Client:

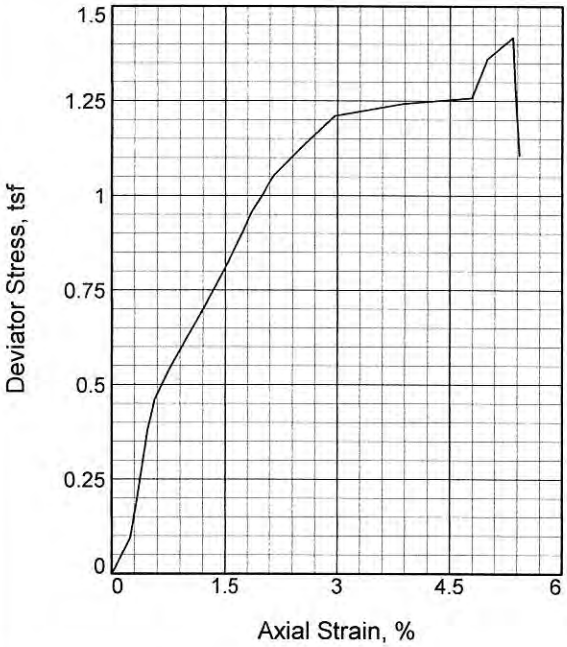
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB025 **Depth:** 12-14

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	19.1
	Dry Density, pcf	104.9
	Saturation, %	84.8
	Void Ratio	0.6074
	Diameter, in.	2.80
	Height, in.	5.66
At Test	Water Content, %	20.9
	Dry Density, pcf	104.9
	Saturation, %	93.0
	Void Ratio	0.6074
	Diameter, in.	2.80
	Height, in.	5.66
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		1.70
Fail. Stress, tsf		1.42
Ult. Stress, tsf		
σ_1 Failure, tsf		1.54
σ_3 Failure, tsf		0.12

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan and Gray LEAN CLAY with SAND

LL= 41 **PL=** 18 **PI=** 23

Specific Gravity= 2.7

Remarks:
Test Method: ASTM D2850
Failure Type: Vertical

Figure _____

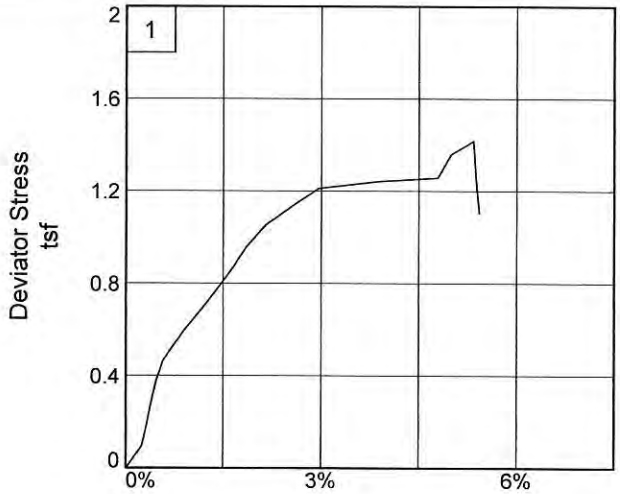
Client:

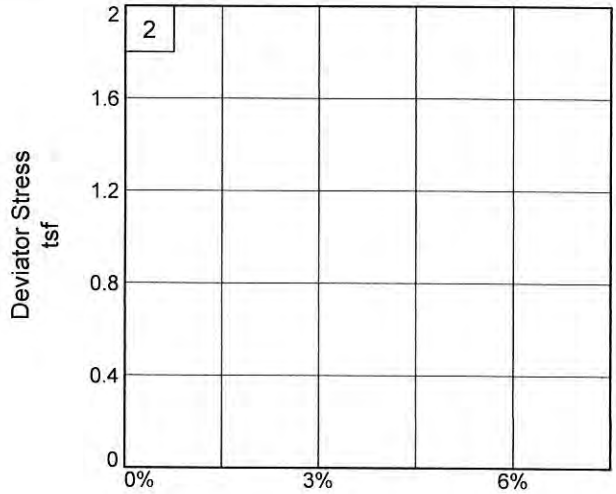
Project: San Jacinto River Waste Pit Superfund Site

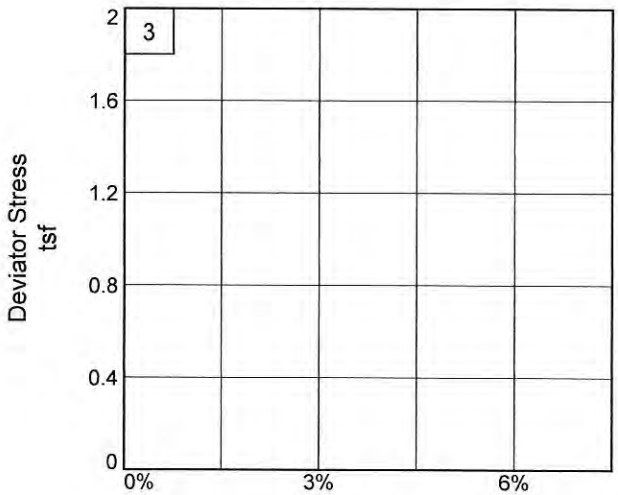
Source of Sample: SJGB026 **Depth:** 4-6

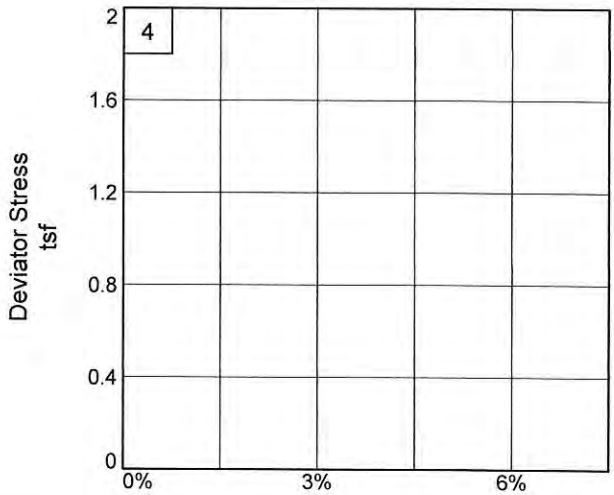
Proj. No.: 19.15.131 **Date Sampled:**

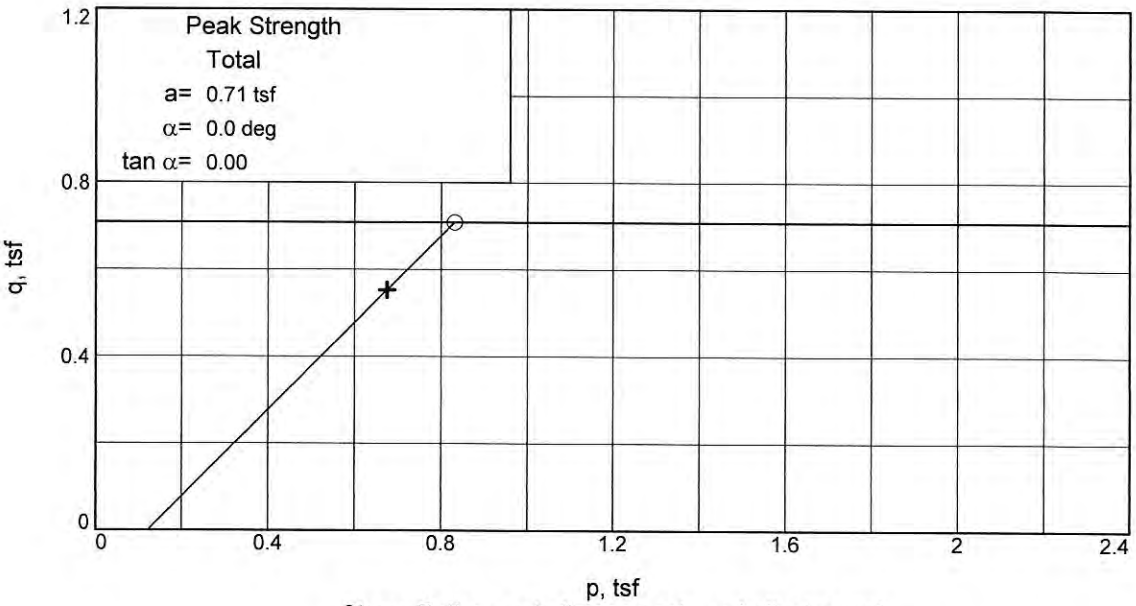
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

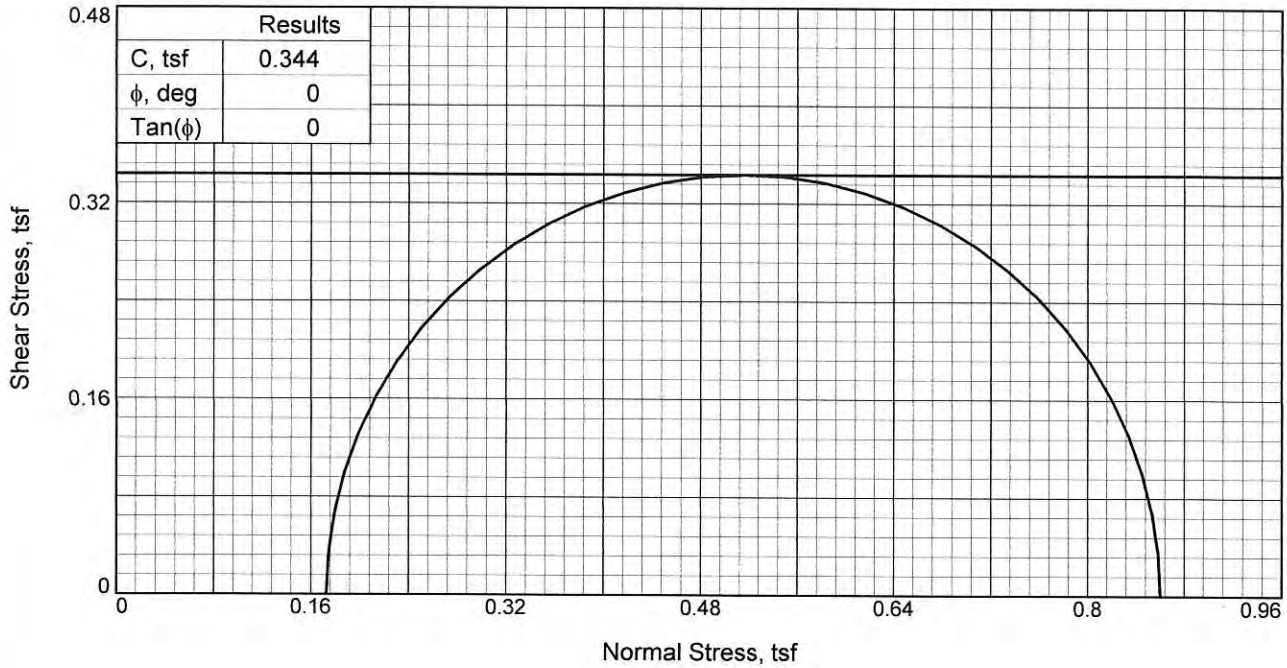
Client:

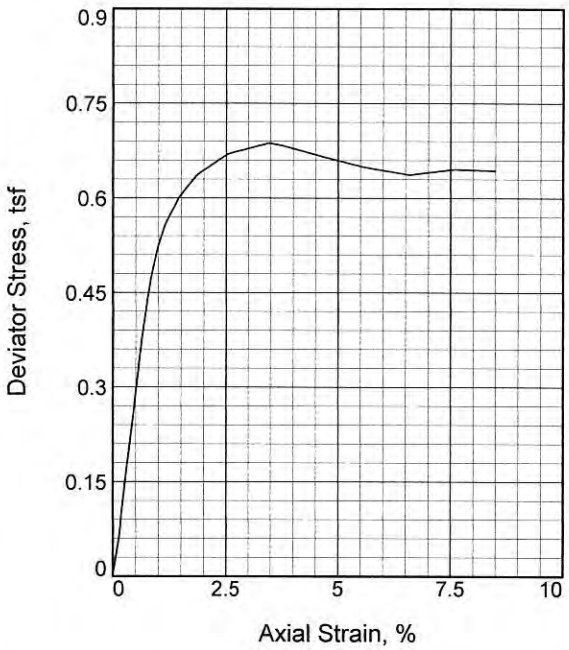
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB026 **Depth:** 4-6

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	19.1
	Dry Density, pcf	104.8
	Saturation, %	84.7
	Void Ratio	0.6086
	Diameter, in.	2.79
	Height, in.	5.64
At Test	Water Content, %	20.4
	Dry Density, pcf	104.8
	Saturation, %	90.7
	Void Ratio	0.6086
	Diameter, in.	2.79
	Height, in.	5.64
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		2.40
Fail. Stress, tsf		0.69
Ult. Stress, tsf		
σ_1 Failure, tsf		0.86
σ_3 Failure, tsf		0.17

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY

Specific Gravity= 2.7

Remarks:
Test Method: ASTM D2850
Failure Type: Multiple Shear

Figure _____

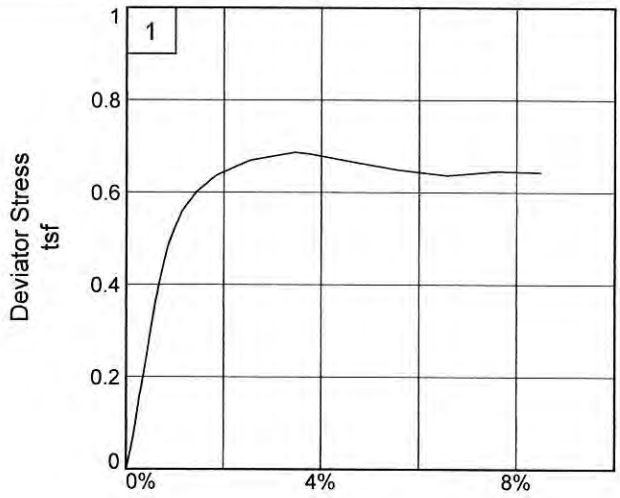
Client:

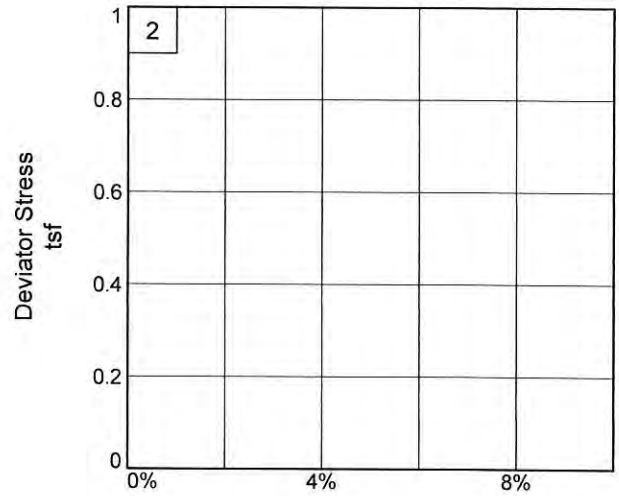
Project: San Jacinto River Waste Pit Superfund Site

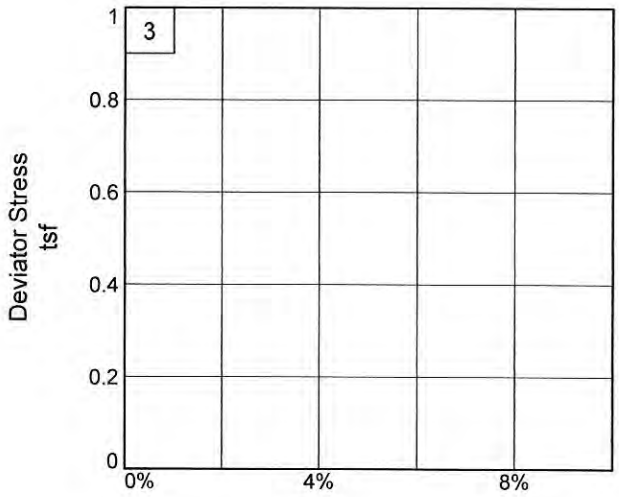
Source of Sample: SJGB026 **Depth:** 6-8

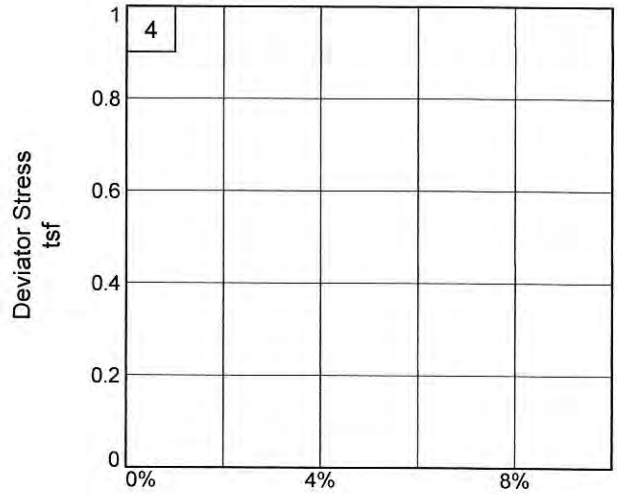
Proj. No.: 19.15.131 **Date Sampled:**

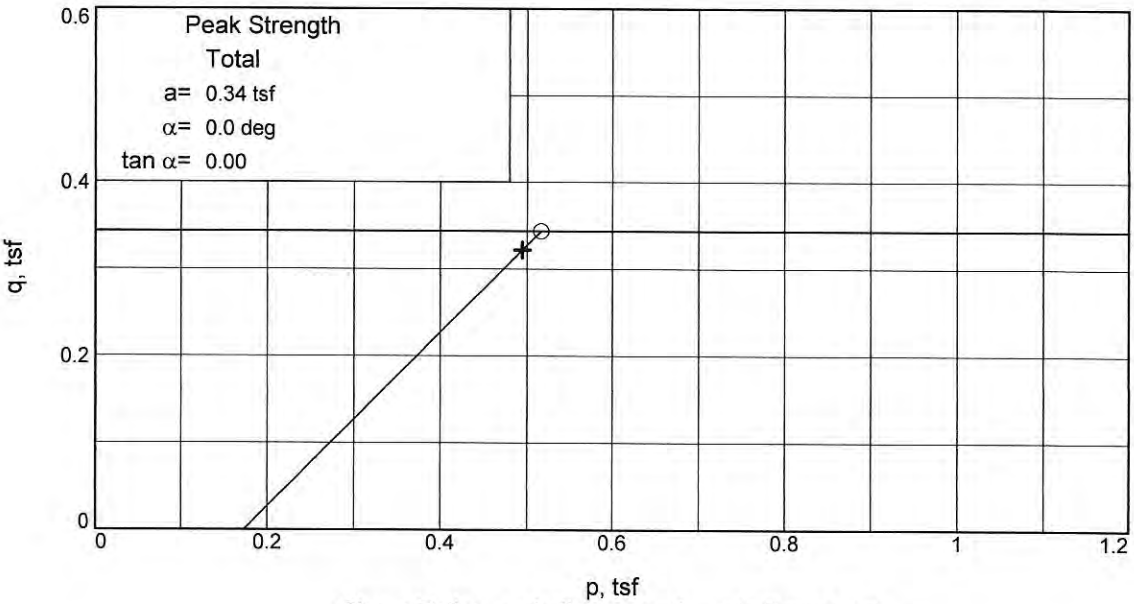
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

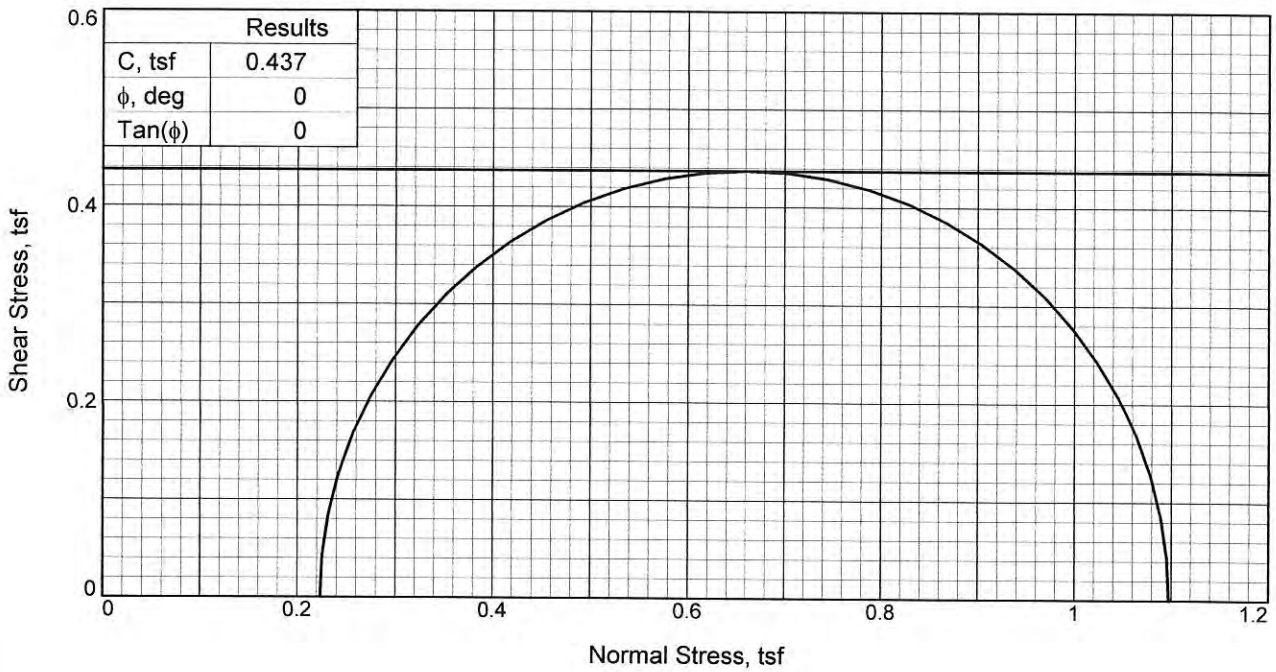
Client:

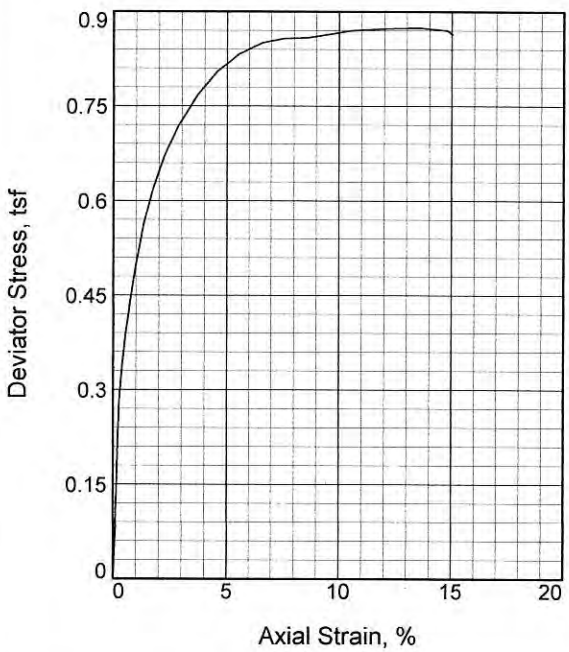
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB026 **Depth:** 6-8

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	21.4
	Dry Density, pcf	103.8
	Saturation, %	92.7
	Void Ratio	0.6242
	Diameter, in.	2.82
	Height, in.	5.70
At Test	Water Content, %	21.3
	Dry Density, pcf	103.8
	Saturation, %	92.1
	Void Ratio	0.6242
	Diameter, in.	2.82
	Height, in.	5.70
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		3.10
Fail. Stress, tsf		0.87
Ult. Stress, tsf		
σ_1 Failure, tsf		1.10
σ_3 Failure, tsf		0.22

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray and brown LEAN CLAY with SAND

LL= 35 **PL=** 17 **PI=** 18

Specific Gravity= 2.7

Remarks:
Test Method: ASTM D2850
Failure Type: Multiple Shear

Figure _____

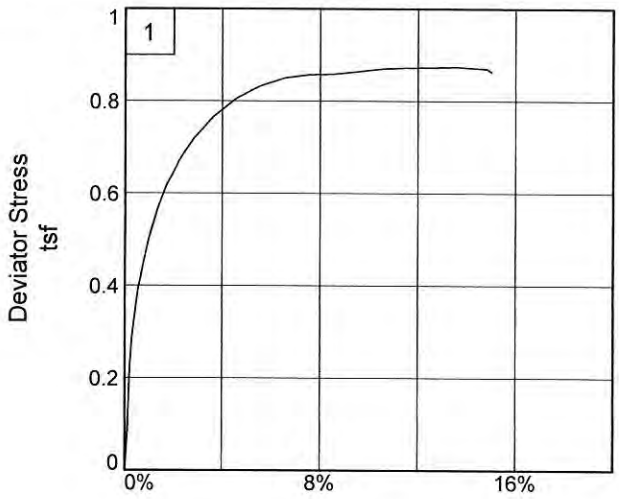
Client:

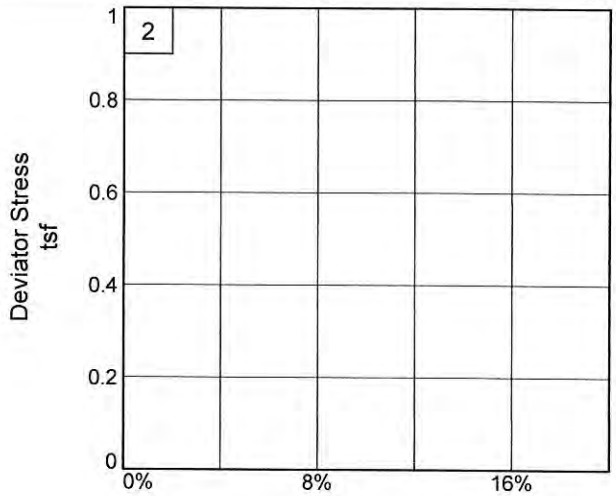
Project: San Jacinto River Waste Pit Superfund Site

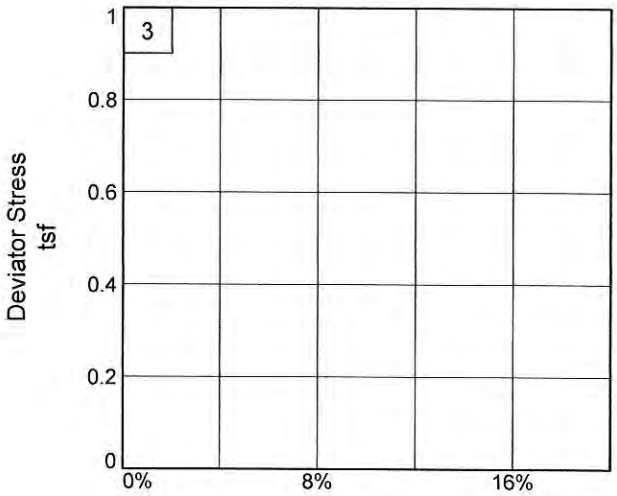
Source of Sample: SJGB026 **Depth:** 8-10

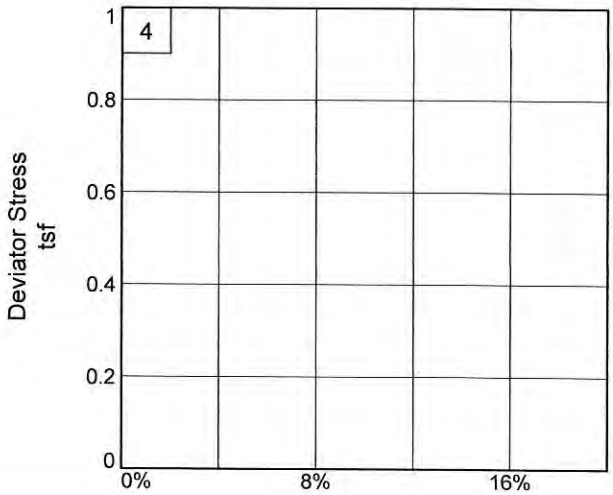
Proj. No.: 19.15.131 **Date Sampled:**

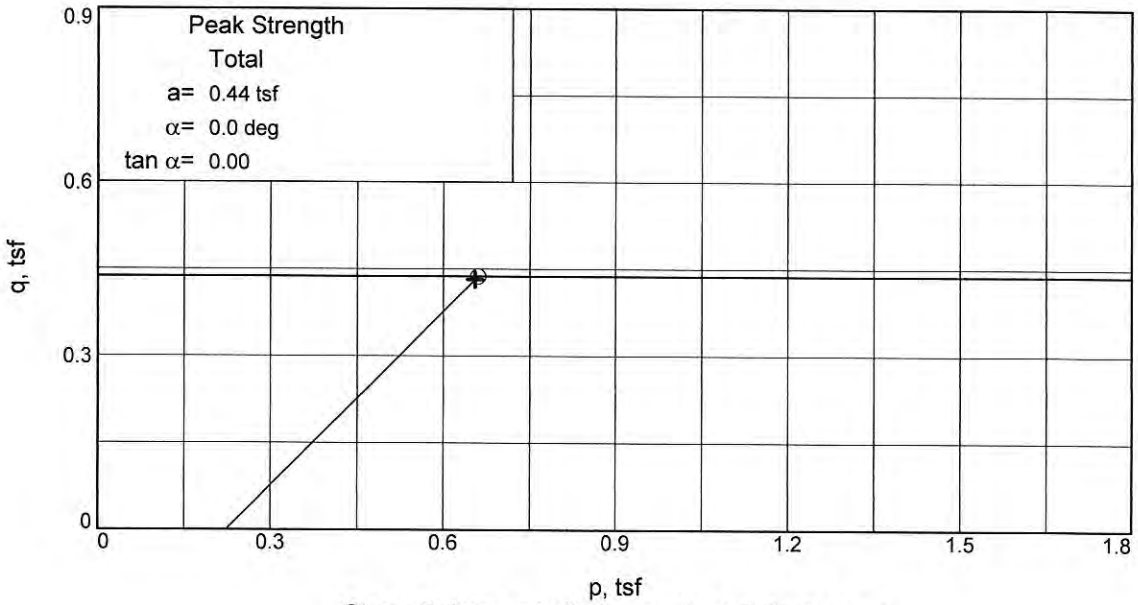
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

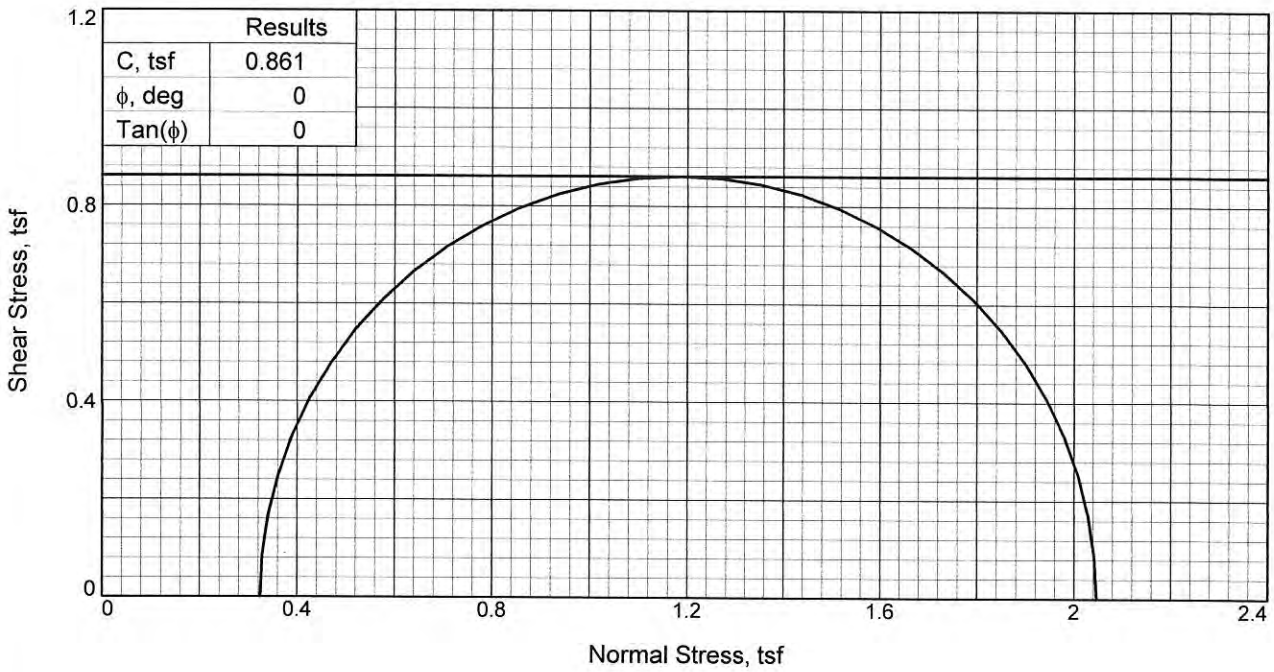
Client:

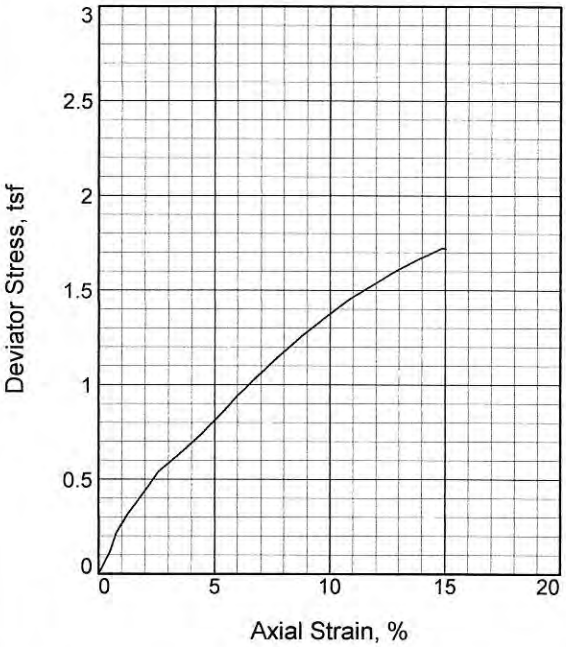
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB026 **Depth:** 8-10

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	20.6
	Dry Density, pcf	109.5
	Saturation, %	99.6
	Void Ratio	0.5685
	Diameter, in.	2.77
	Height, in.	5.74
At Test	Water Content, %	21.3
	Dry Density, pcf	109.5
	Saturation, %	103.1
	Void Ratio	0.5685
	Diameter, in.	2.77
	Height, in.	5.74
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		4.50
Fail. Stress, tsf		1.72
Ult. Stress, tsf		
σ_1 Failure, tsf		2.05
σ_3 Failure, tsf		0.32

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan and Gray SAND

LL= NV **PI=** NP

Specific Gravity= 2.75

Remarks:
Test Method: ASTM D2850
Failure Type: Bulge

Figure _____

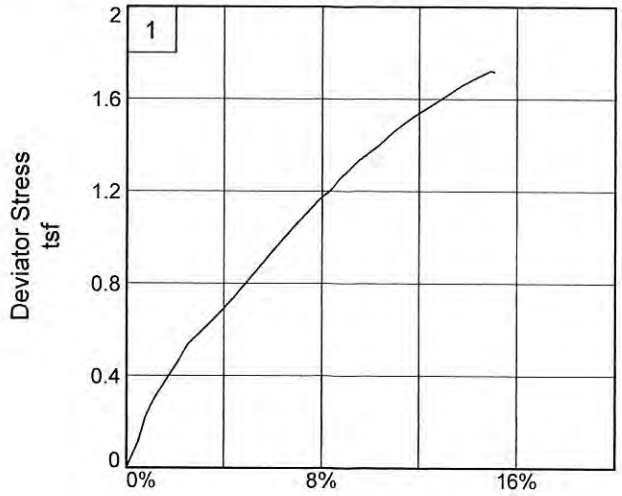
Client:

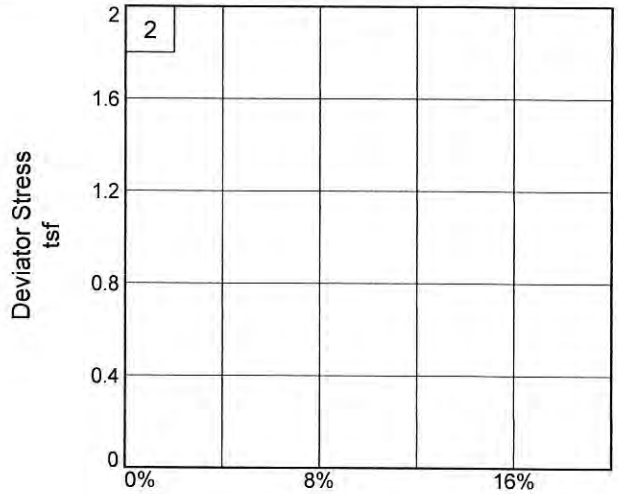
Project: San Jacinto River Waste Pit Superfund Site

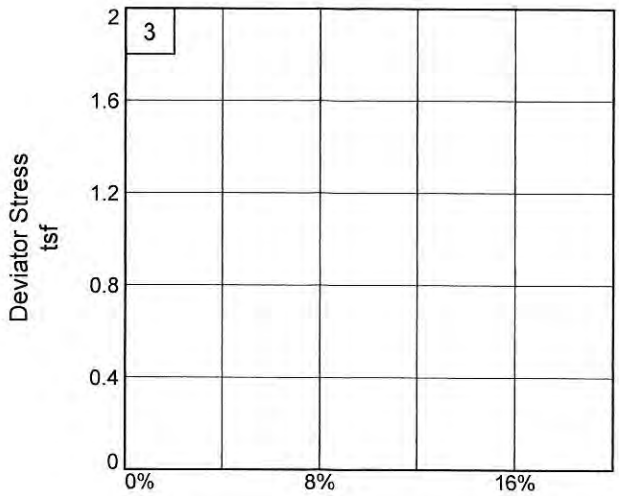
Source of Sample: SJGB026 **Depth:** 12-14

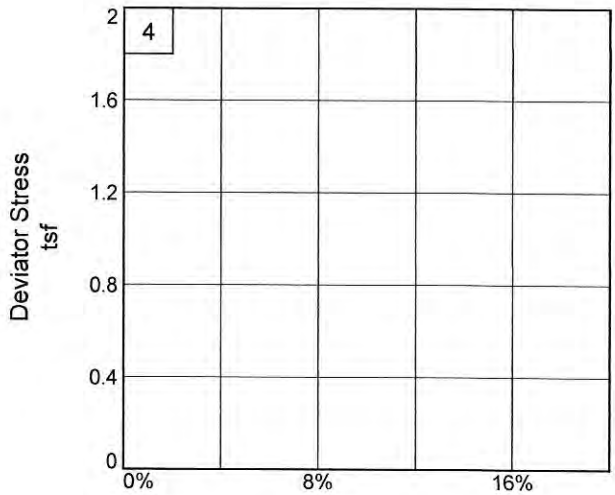
Proj. No.: 19.15.131 **Date Sampled:**

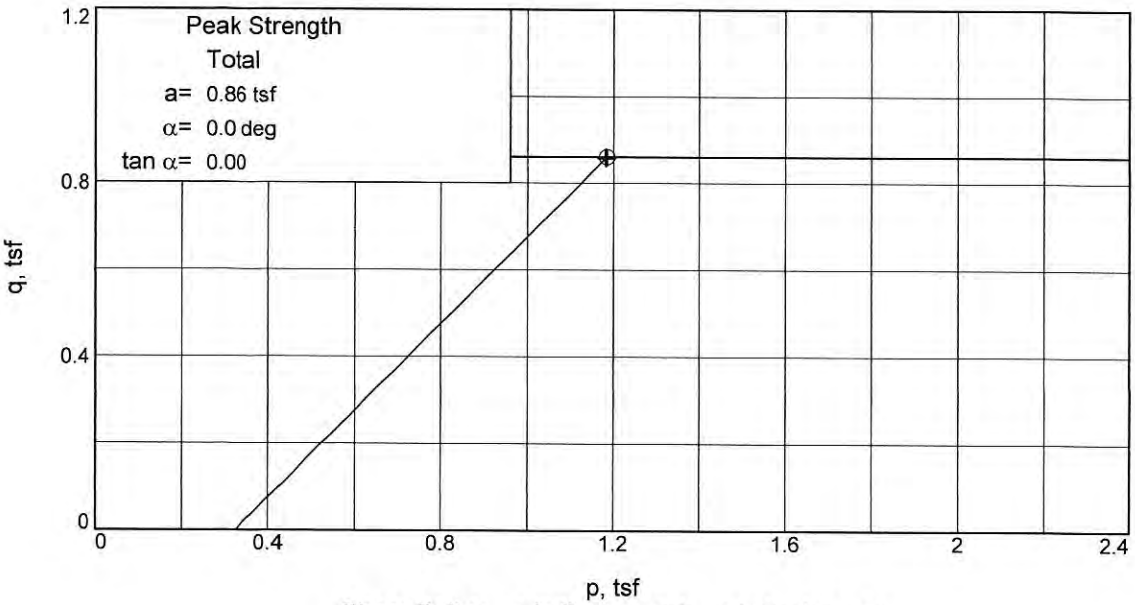
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

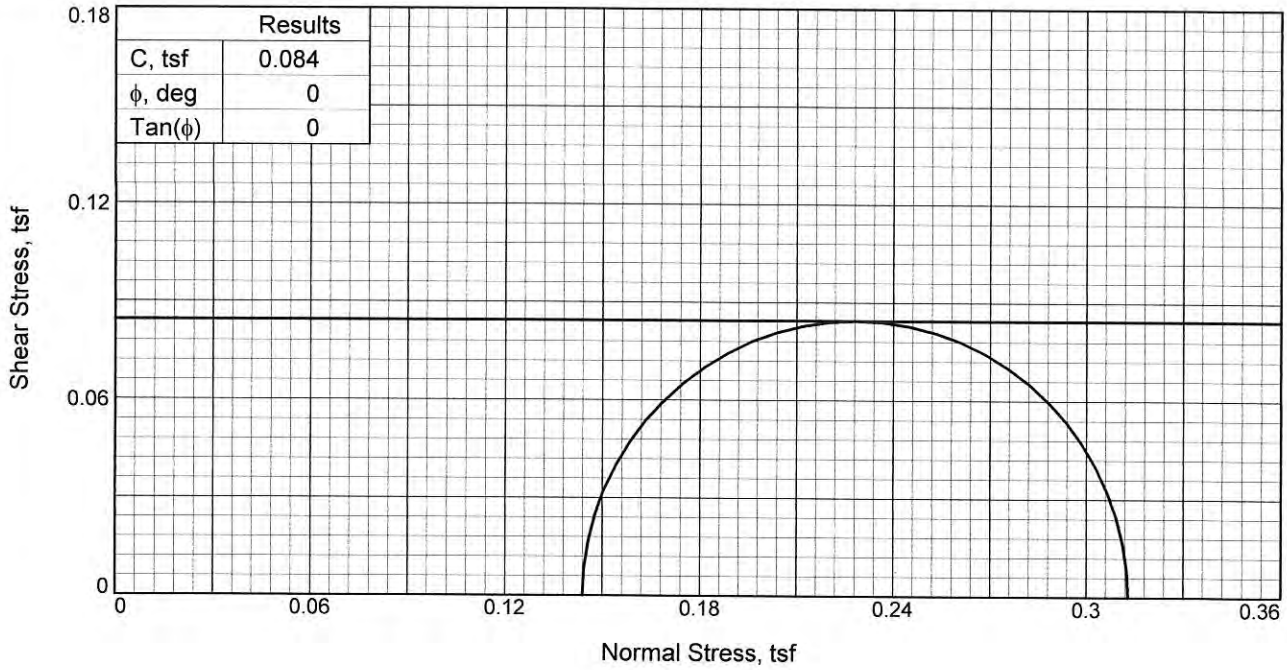
Client:

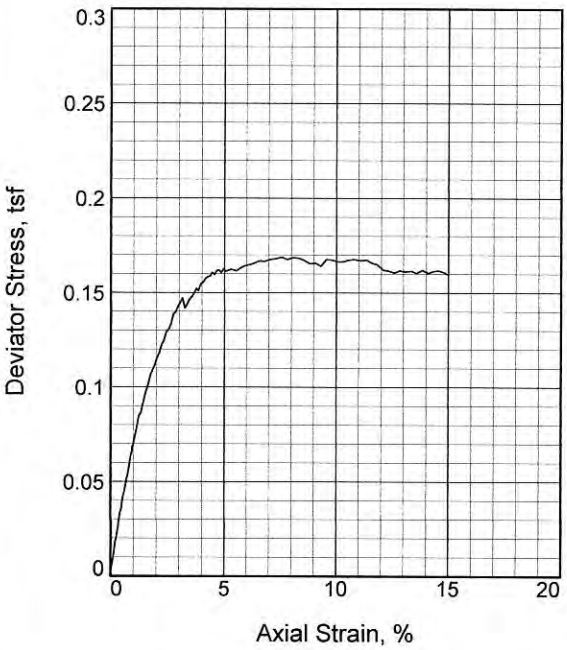
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB026 **Depth:** 12-14

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	139.7
	Dry Density, pcf	32.6
	Saturation, %	90.4
	Void Ratio	4.1710
	Diameter, in.	2.84
	Height, in.	5.84
At Test	Water Content, %	141.8
	Dry Density, pcf	32.6
	Saturation, %	91.8
	Void Ratio	4.1710
	Diameter, in.	2.84
	Height, in.	5.84
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		2.00
Fail. Stress, tsf		0.17
Strain, %		7.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.31
σ_3 Failure, tsf		0.14

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Black FAT CLAY; Organics

LL= 151 **PL=** 44 **PI=** 107

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

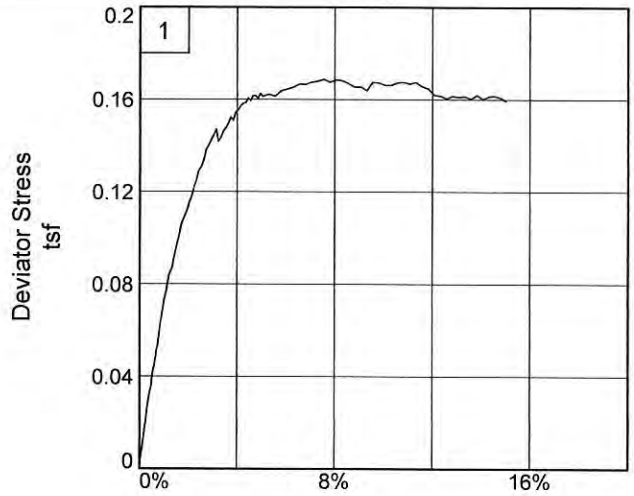
Client:

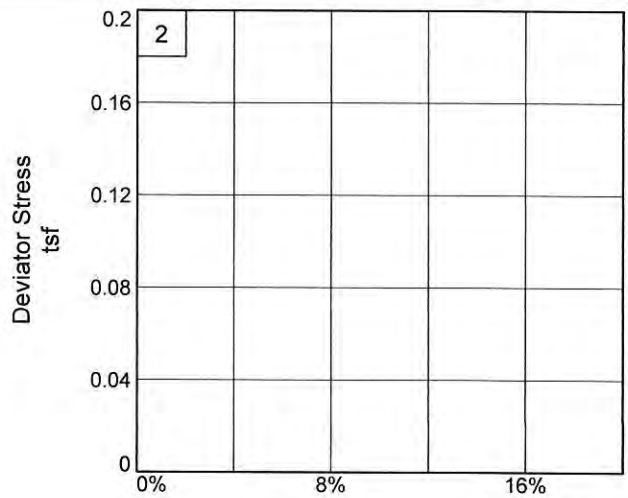
Project: San Jacinto River Waste Pit Superfund Site

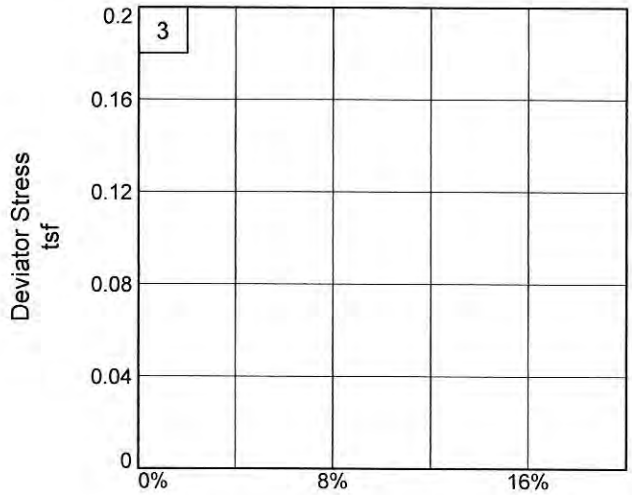
Source of Sample: SJGB027 **Depth:** 2

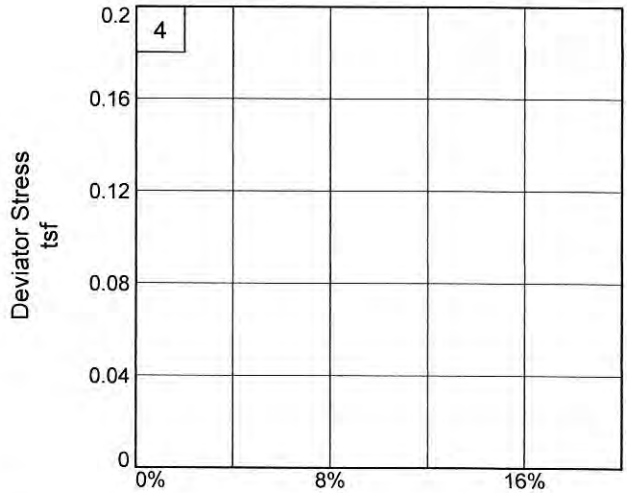
Proj. No.: 19.15.131 **Date Sampled:** 1/29/20

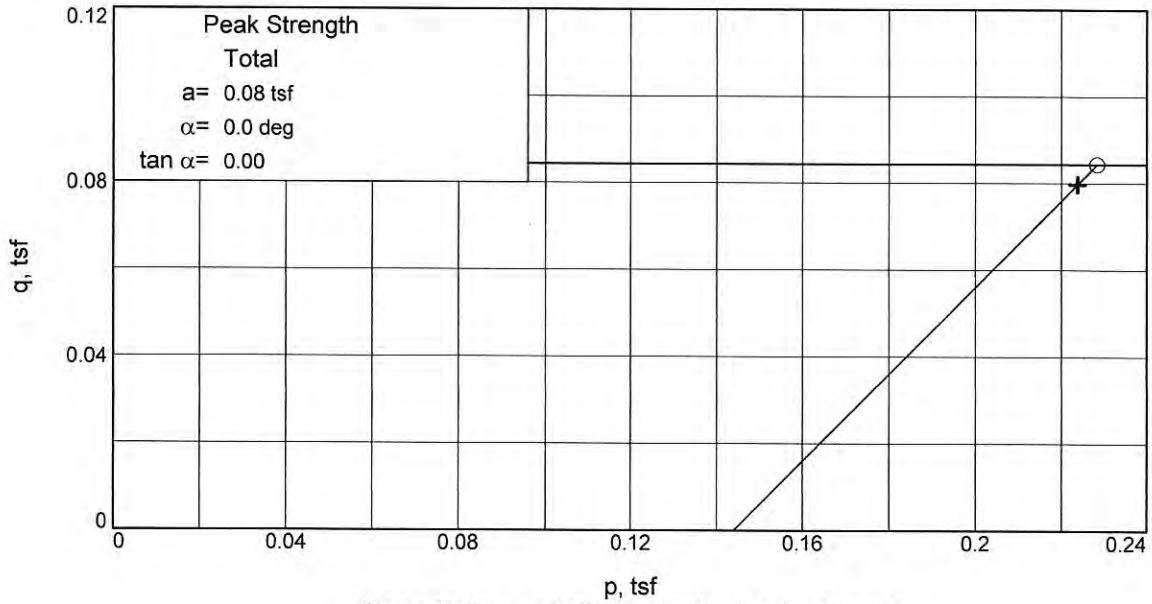
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

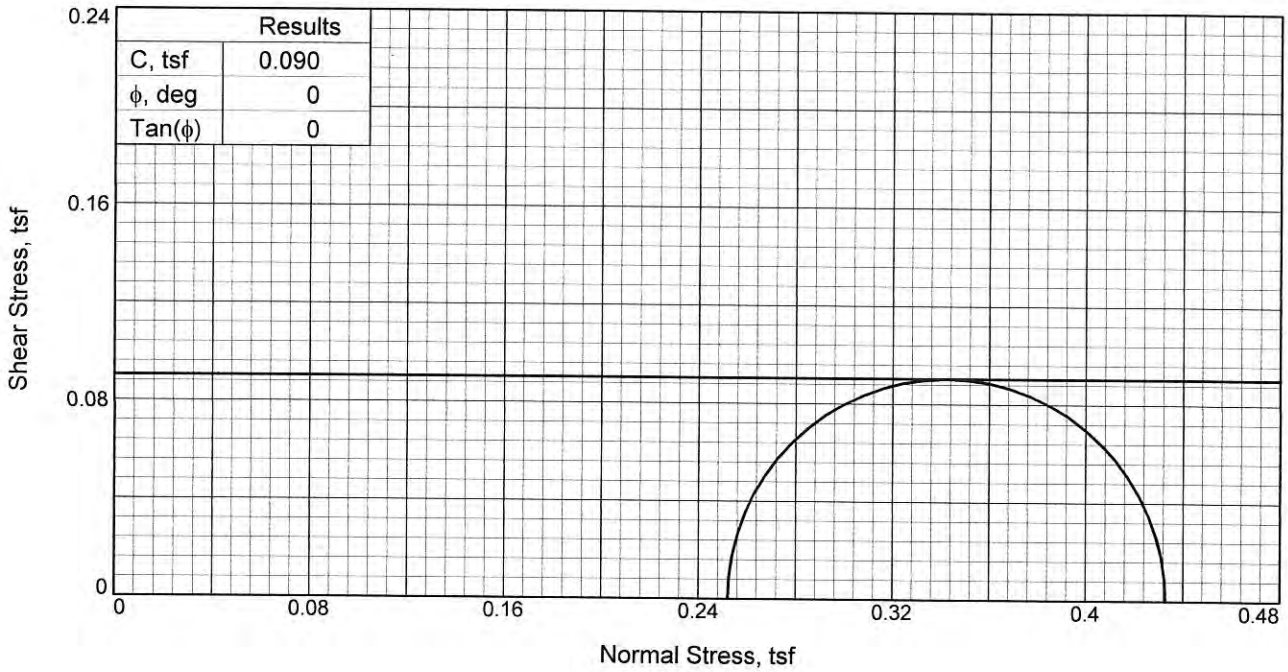
Client:

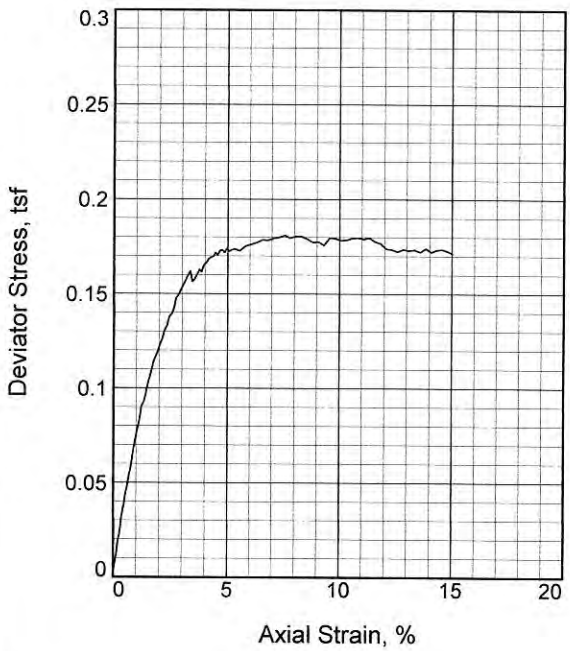
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 **Depth:** 2

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	22.4
	Dry Density, pcf	104.5
	Saturation, %	98.6
	Void Ratio	0.6123
	Diameter, in.	2.75
	Height, in.	5.84
At Test	Water Content, %	25.2
	Dry Density, pcf	104.5
	Saturation, %	111.0
	Void Ratio	0.6123
	Diameter, in.	2.75
	Height, in.	5.84
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		3.50
Fail. Stress, tsf		0.18
Strain, %		7.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.43
σ_3 Failure, tsf		0.25

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray CLAYEY SAND

LL= 41 **PL=** 21 **PI=** 20

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

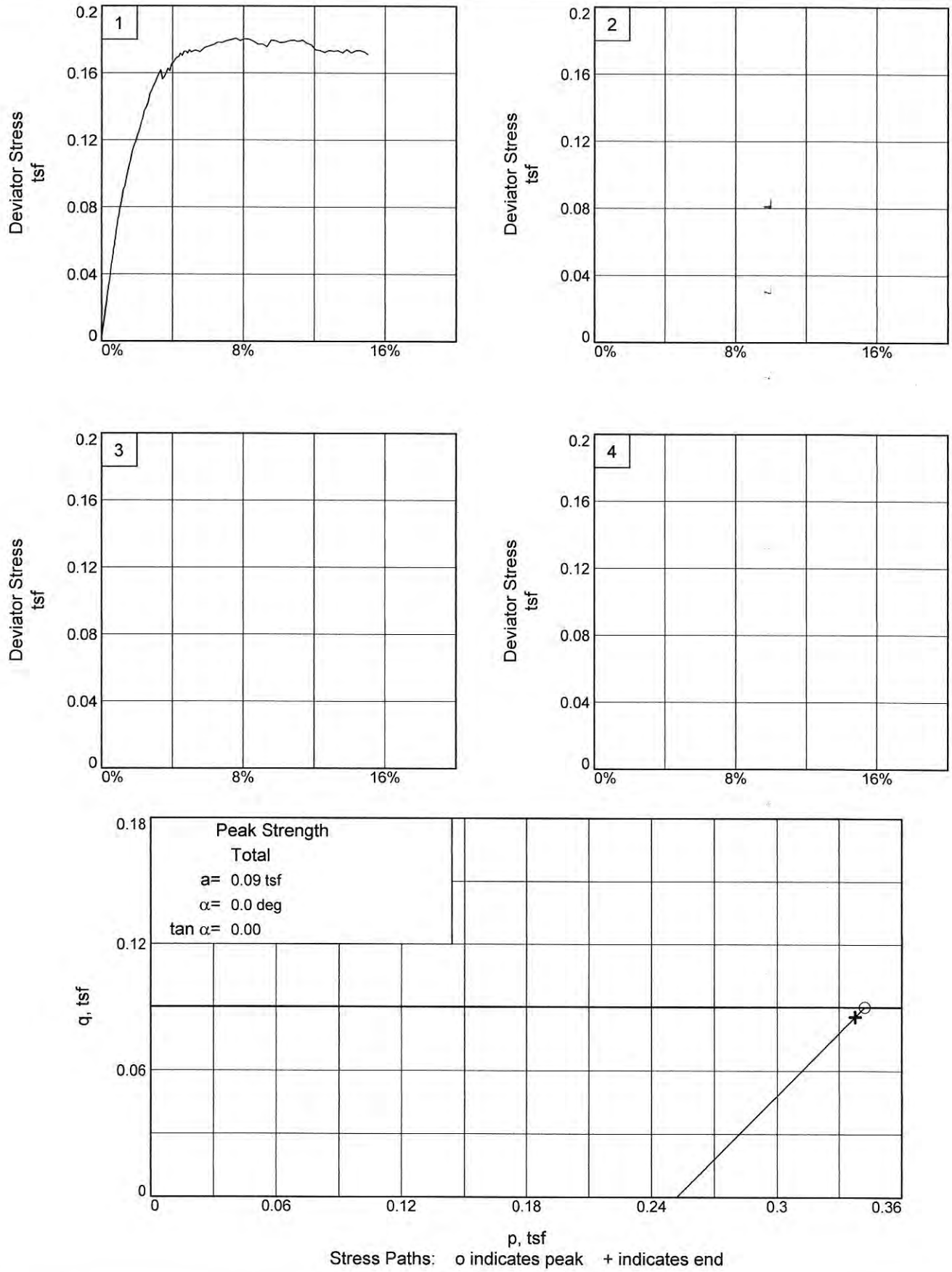
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 **Depth:** 4

Proj. No.: 19.15.131 **Date Sampled:** 1/21/20

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



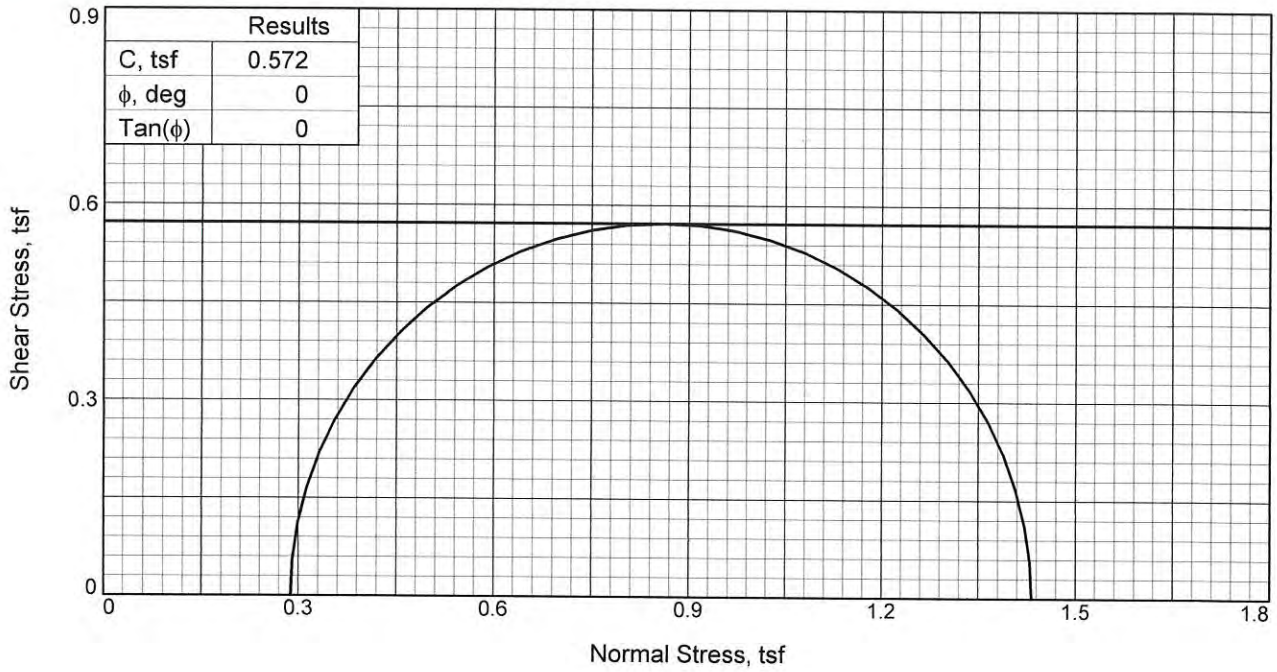
Client:

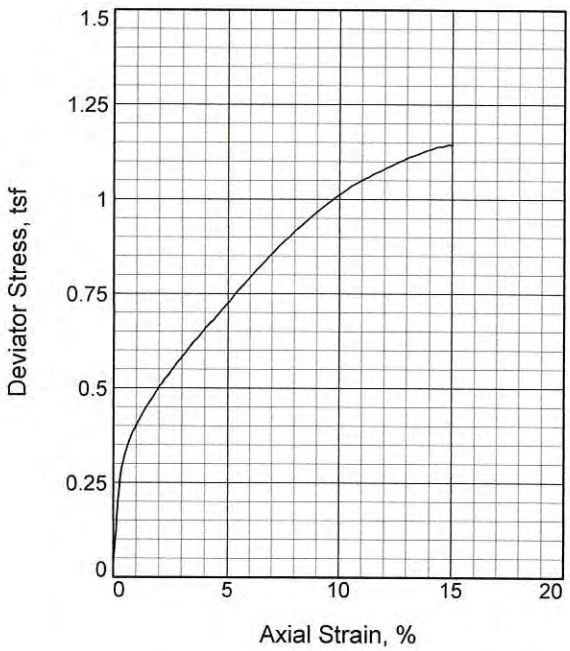
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 **Depth:** 4

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	20.3
	Dry Density, pcf	107.6
	Saturation, %	96.8
	Void Ratio	0.5662
	Diameter, in.	2.76
	Height, in.	5.85
At Test	Water Content, %	18.4
	Dry Density, pcf	107.6
	Saturation, %	87.8
	Void Ratio	0.5662
	Diameter, in.	2.76
	Height, in.	5.85
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		4.00
Fail. Stress, tsf		1.14
Strain, %		14.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.43
σ_3 Failure, tsf		0.29

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray SANDY LEAN CLAY

LL= 37 **PL=** 17 **PI=** 20

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

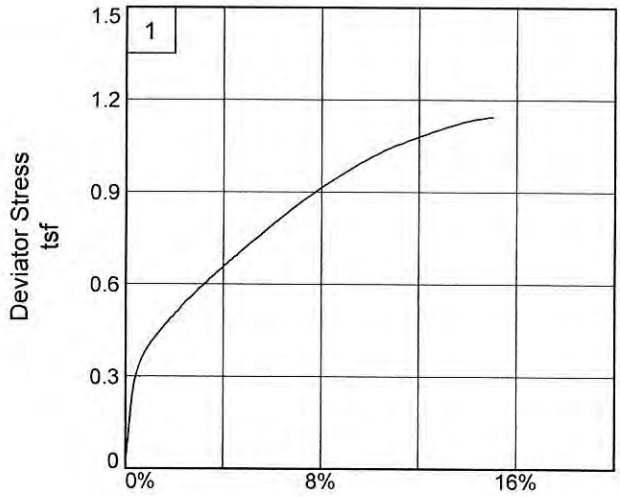
Client:

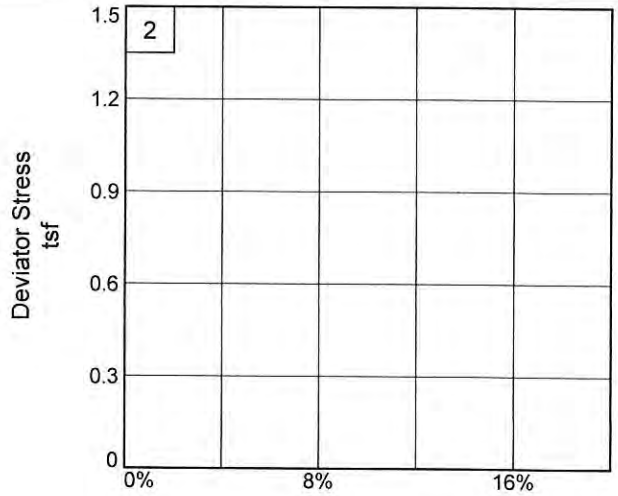
Project: San Jacinto River Waste Pit Superfund Site

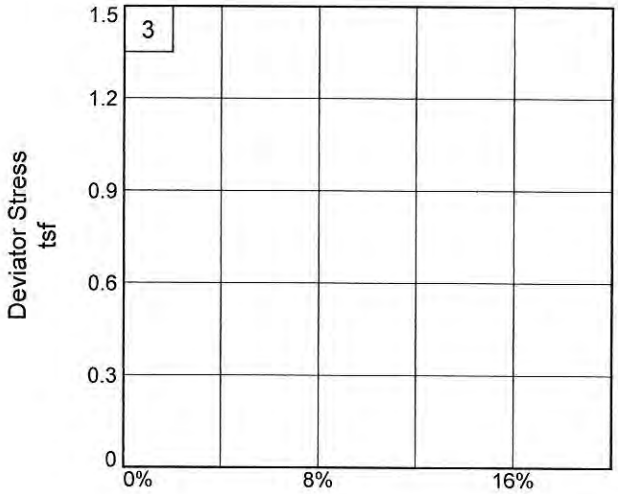
Source of Sample: SJGB027 **Depth:** 6

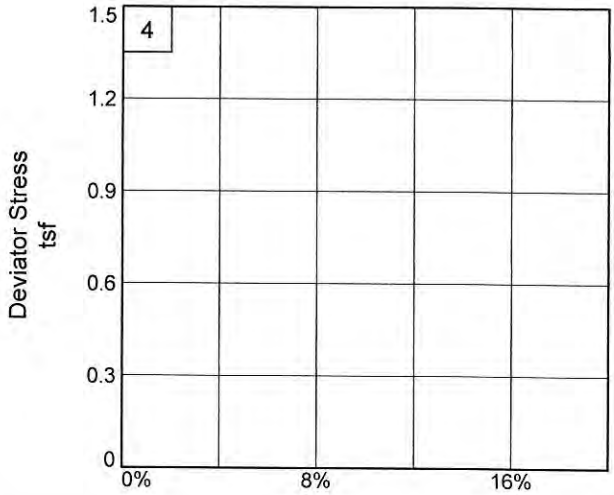
Proj. No.: 19.15.131 **Date Sampled:** 1/21/20

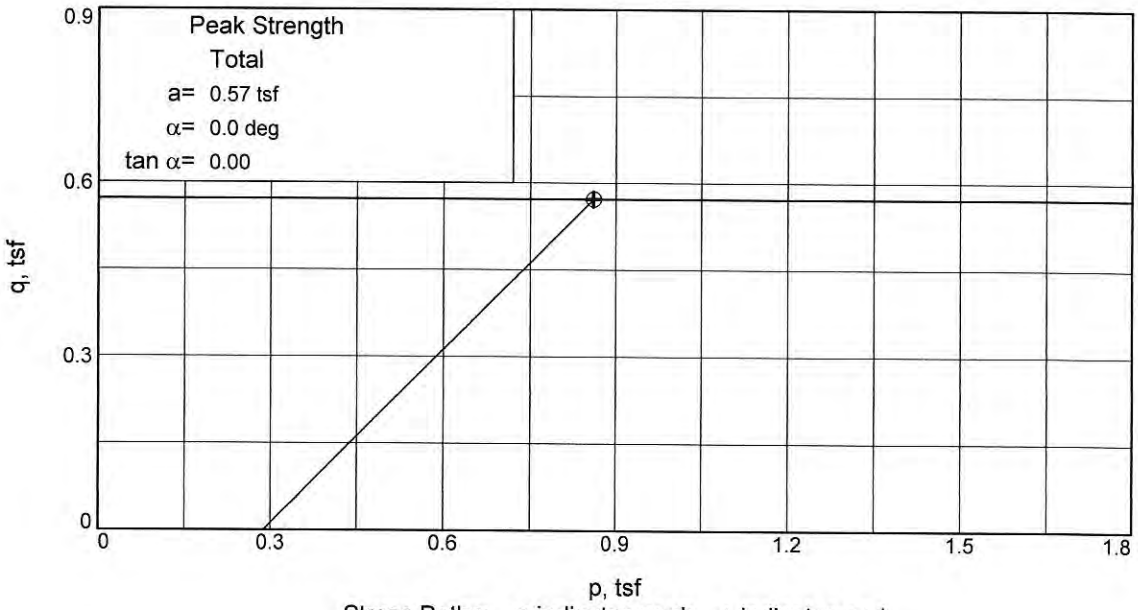
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

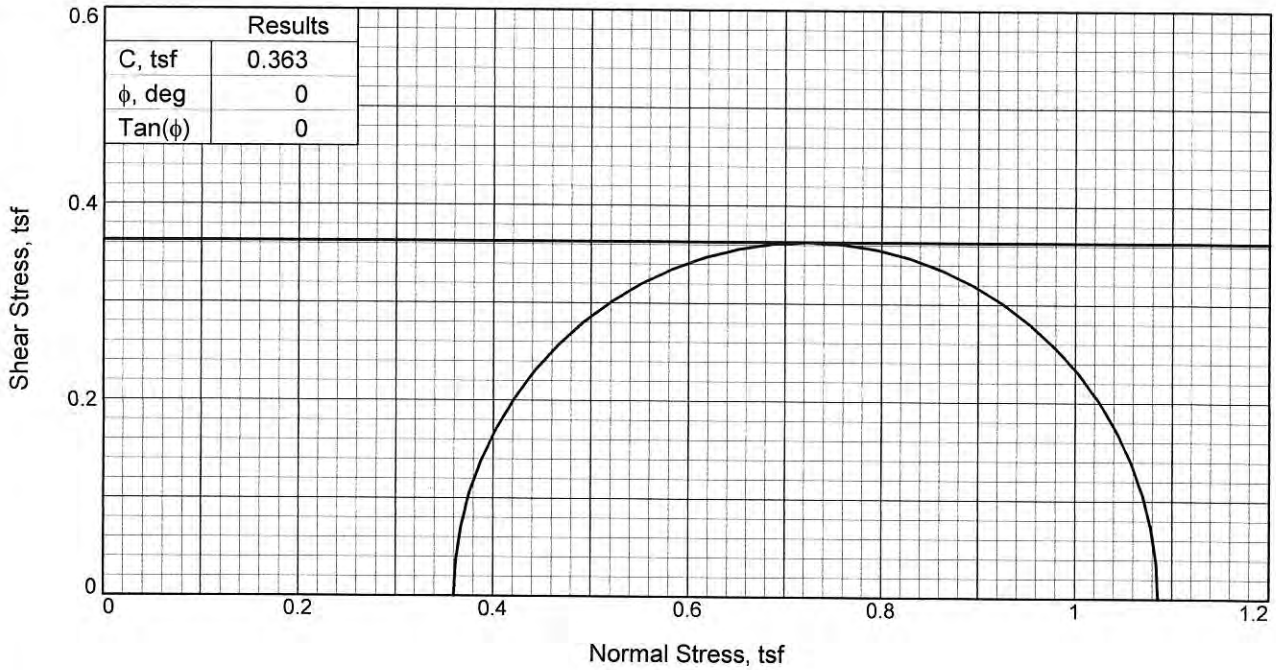
Client:

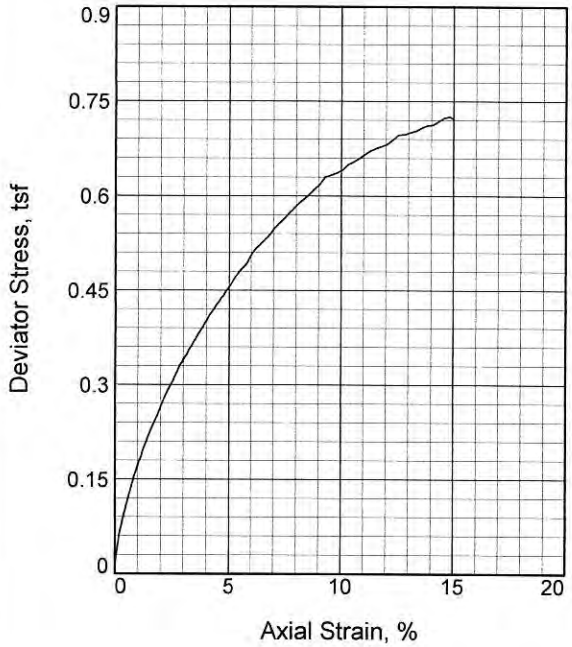
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 **Depth:** 6

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	17.9
	Dry Density, pcf	111.3
	Saturation, %	93.9
	Void Ratio	0.5138
	Diameter, in.	2.79
	Height, in.	5.83
At Test	Water Content, %	16.7
	Dry Density, pcf	111.3
	Saturation, %	87.9
	Void Ratio	0.5138
	Diameter, in.	2.79
	Height, in.	5.83
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		5.00
Fail. Stress, tsf		0.73
Strain, %		14.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.09
σ_3 Failure, tsf		0.36

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY

LL= 39 **PL=** 18 **PI=** 21

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

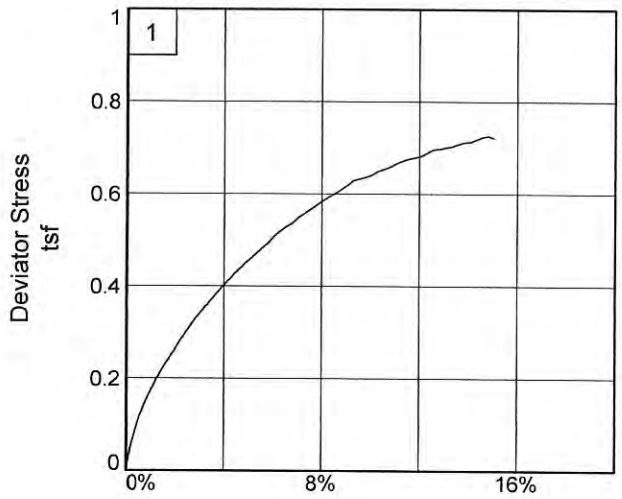
Client:

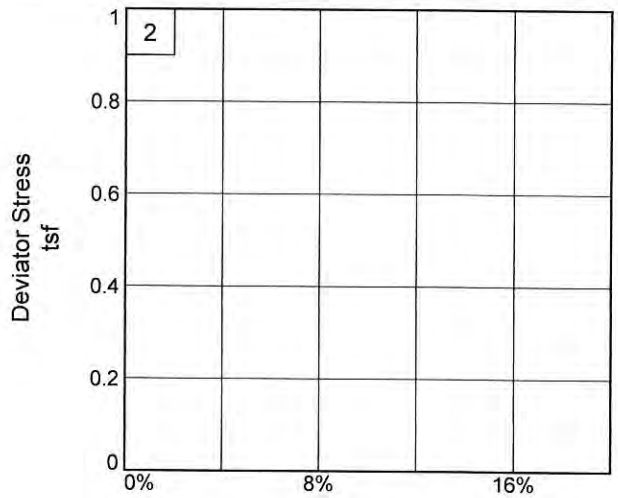
Project: San Jacinto River Waste Pit Superfund Site

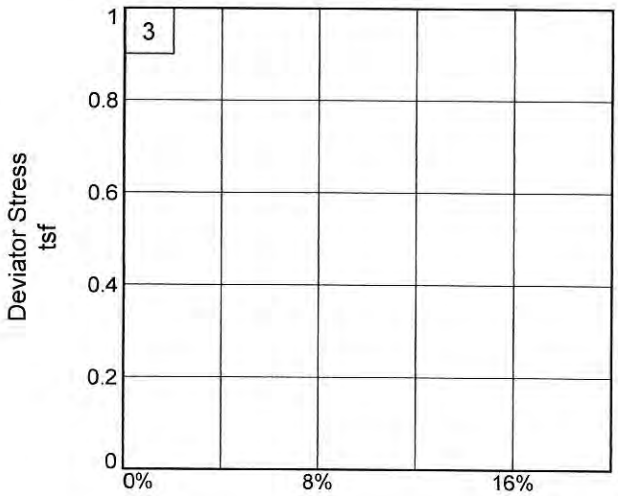
Source of Sample: SJGB027 **Depth:** 8

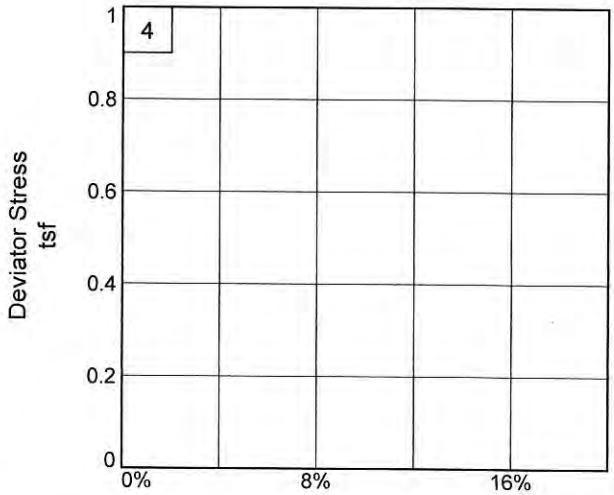
Proj. No.: 19.15.131 **Date Sampled:** 1/21/20

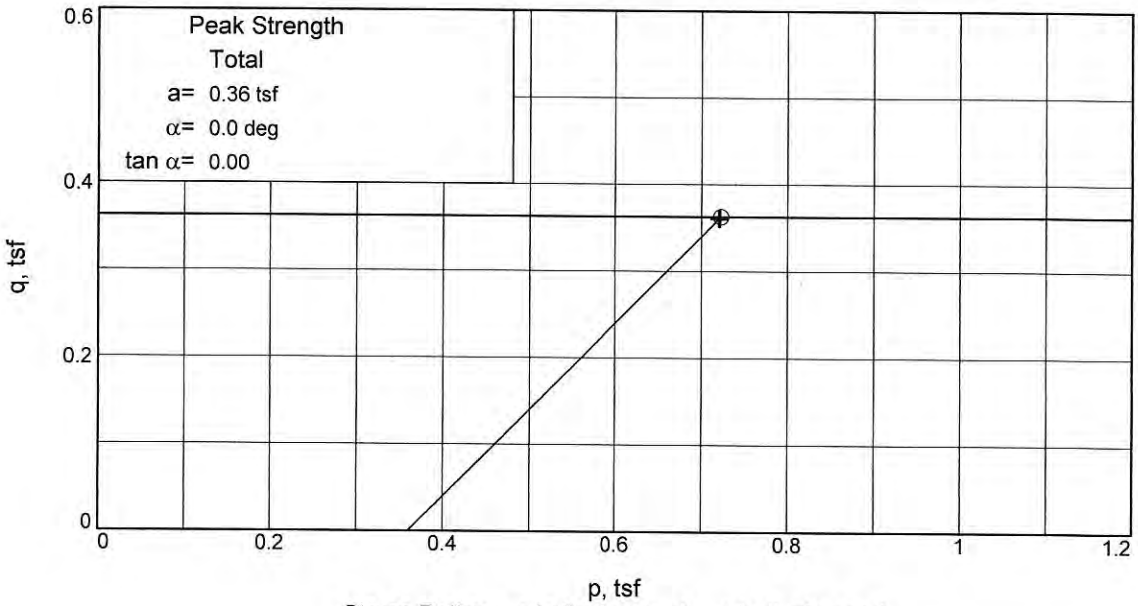
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

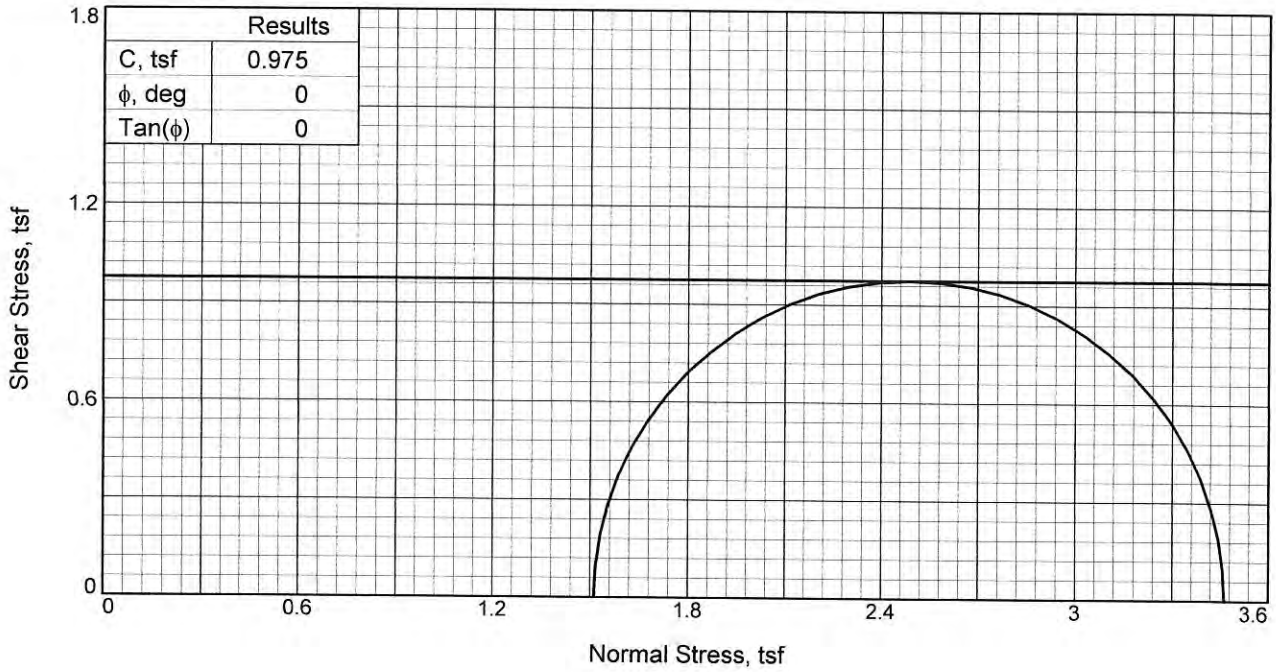
Client:

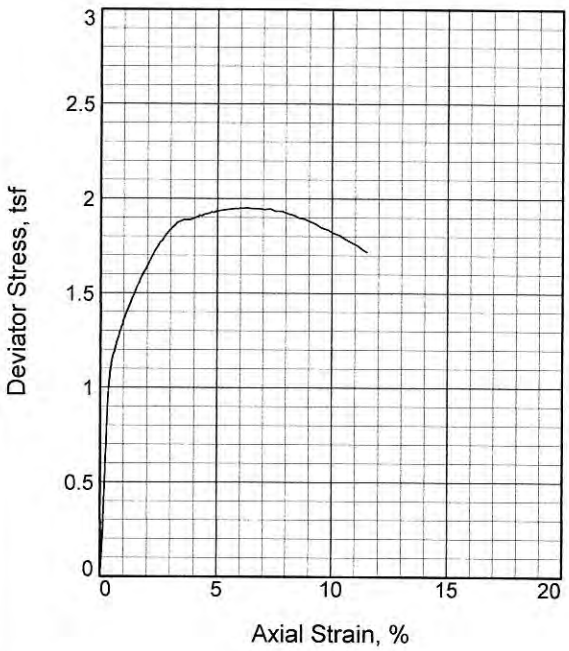
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 **Depth:** 8

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	31.2
	Dry Density, pcf	92.1
	Saturation, %	99.4
	Void Ratio	0.8638
	Diameter, in.	2.84
	Height, in.	5.88
At Test	Water Content, %	29.1
	Dry Density, pcf	92.1
	Saturation, %	92.7
	Void Ratio	0.8638
	Diameter, in.	2.84
	Height, in.	5.88
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		21.00
Fail. Stress, tsf		1.95
Strain, %		6.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.46
σ_3 Failure, tsf		1.51

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan FAT CLAY

LL= 59 **PL=** 21 **PI=** 38

Assumed Specific Gravity= 2.75

Remarks:
Test method: ASTM D2850
Failure type: Slickensided

Figure _____

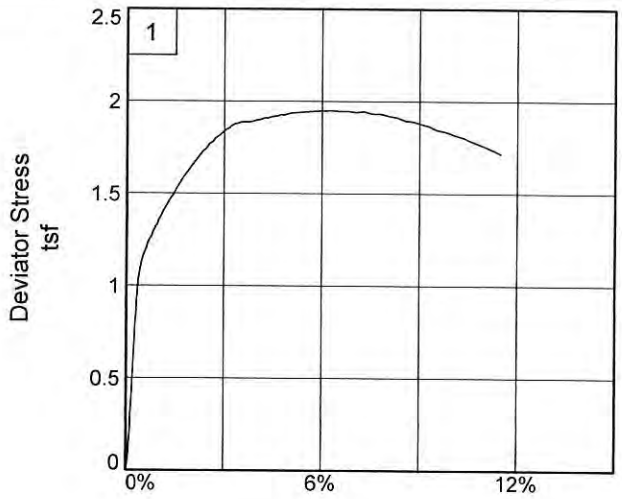
Client:

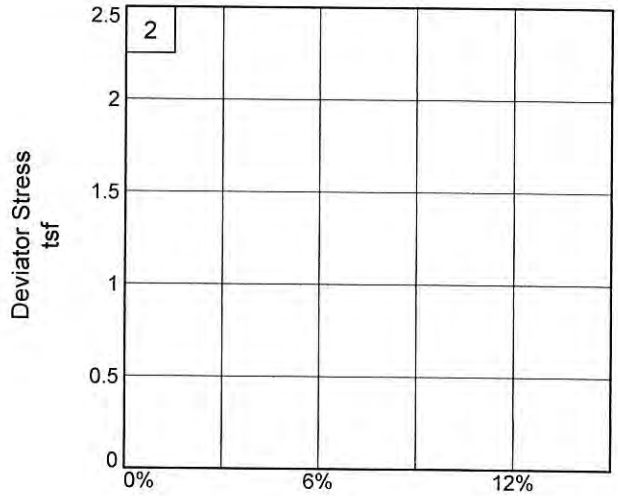
Project: San Jacinto River Waste Pit Superfund Site

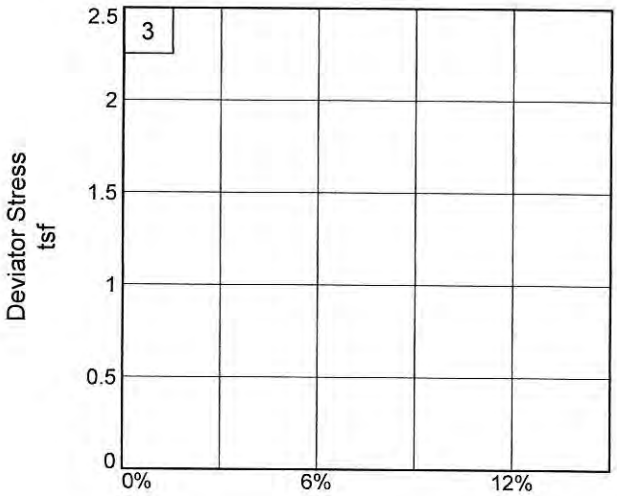
Source of Sample: SJGB027 **Depth:** 48

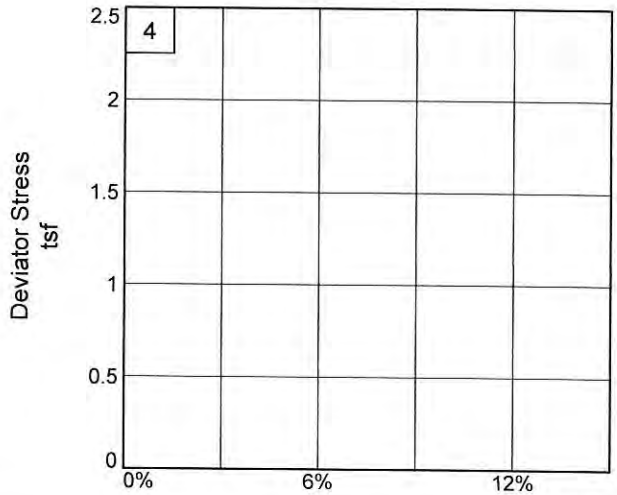
Proj. No.: 19.15.131 **Date Sampled:** 1/16/2020

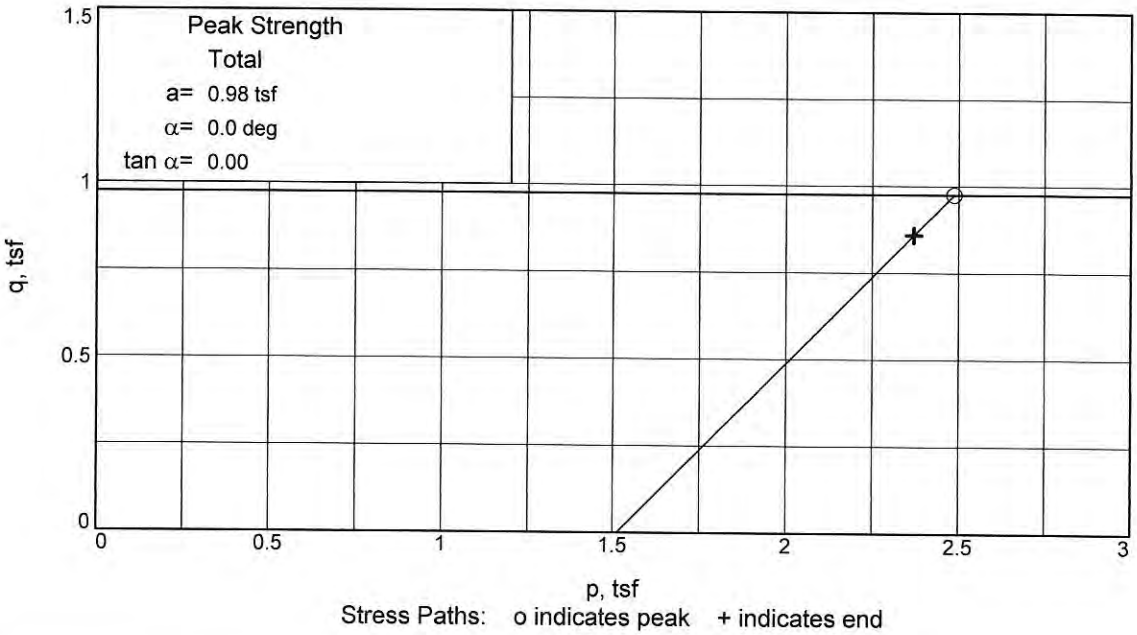
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











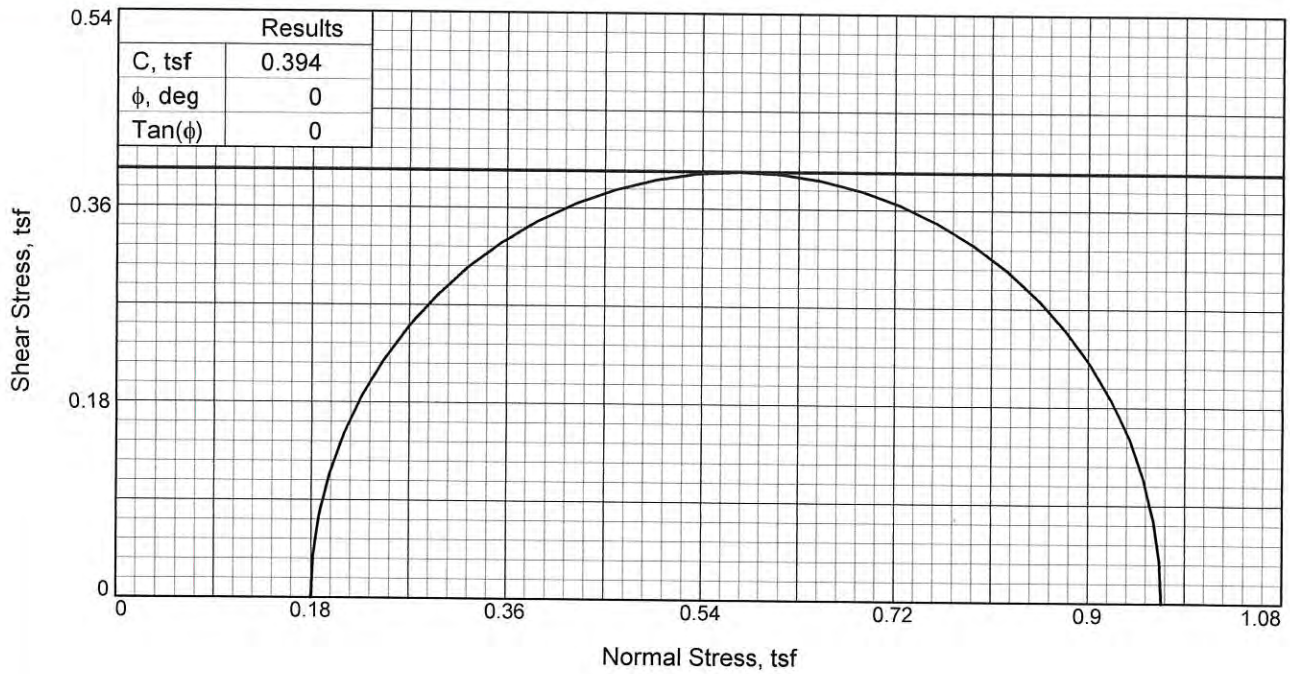
Client:

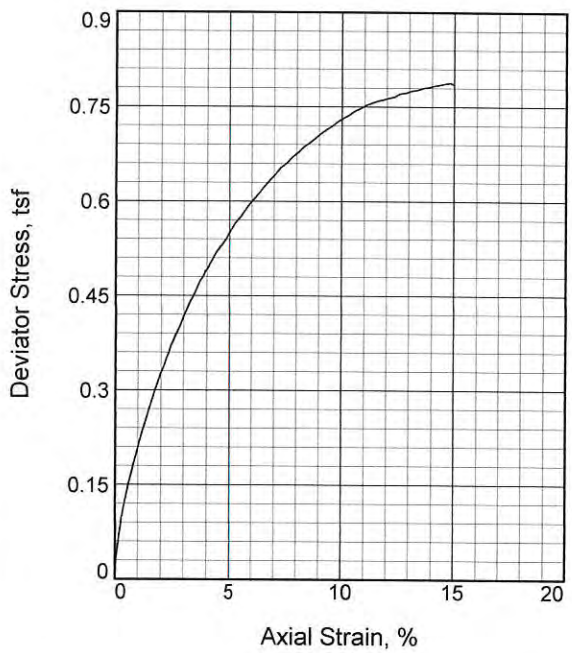
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 **Depth:** 48

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	13.3
	Dry Density, pcf	115.5
	Saturation, %	78.3
	Void Ratio	0.4588
	Diameter, in.	2.81
	Height, in.	5.89
At Test	Water Content, %	13.2
	Dry Density, pcf	115.5
	Saturation, %	77.8
	Void Ratio	0.4588
	Diameter, in.	2.81
	Height, in.	5.89
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		2.50
Fail. Stress, tsf		0.79
Strain, %		14.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.97
σ_3 Failure, tsf		0.18

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Black LEAN CLAY with SAND; sand seams and organics

LL= 32 **PL=** 15 **PI=** 17

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

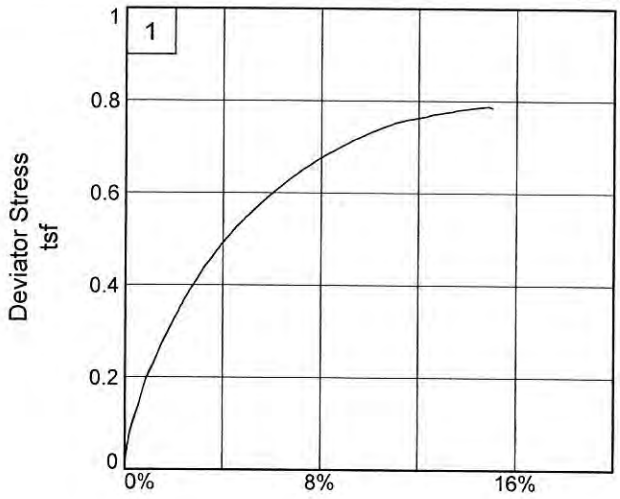
Client:

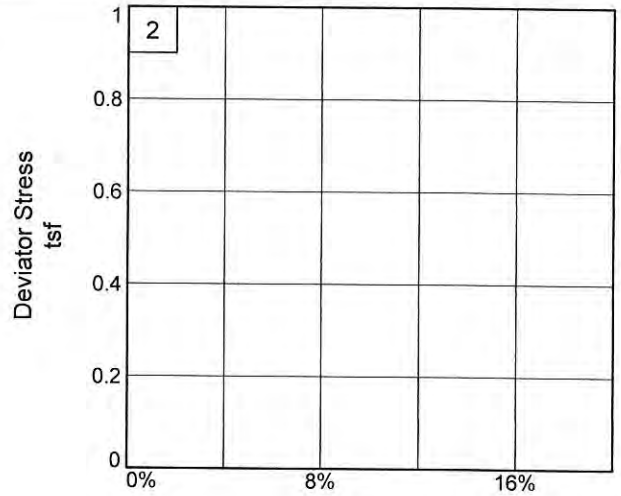
Project: San Jacinto River Waste Pit Superfund Site

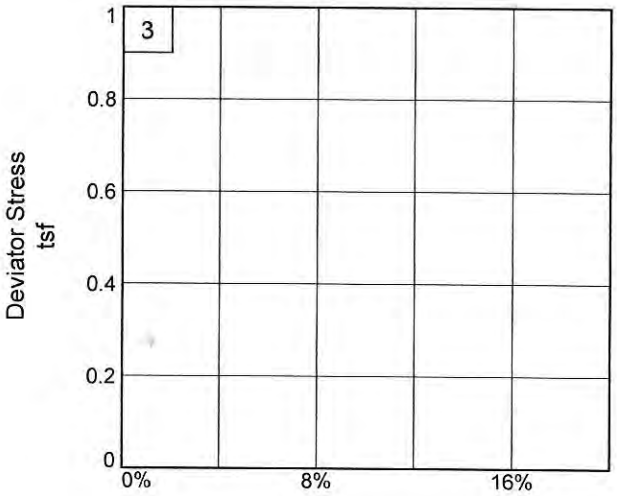
Source of Sample: SJGB028 **Depth:** 4

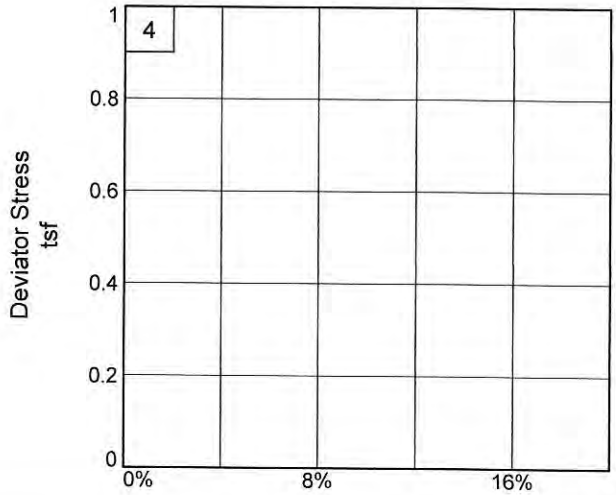
Proj. No.: 19.15.131 **Date Sampled:** 1/21/20

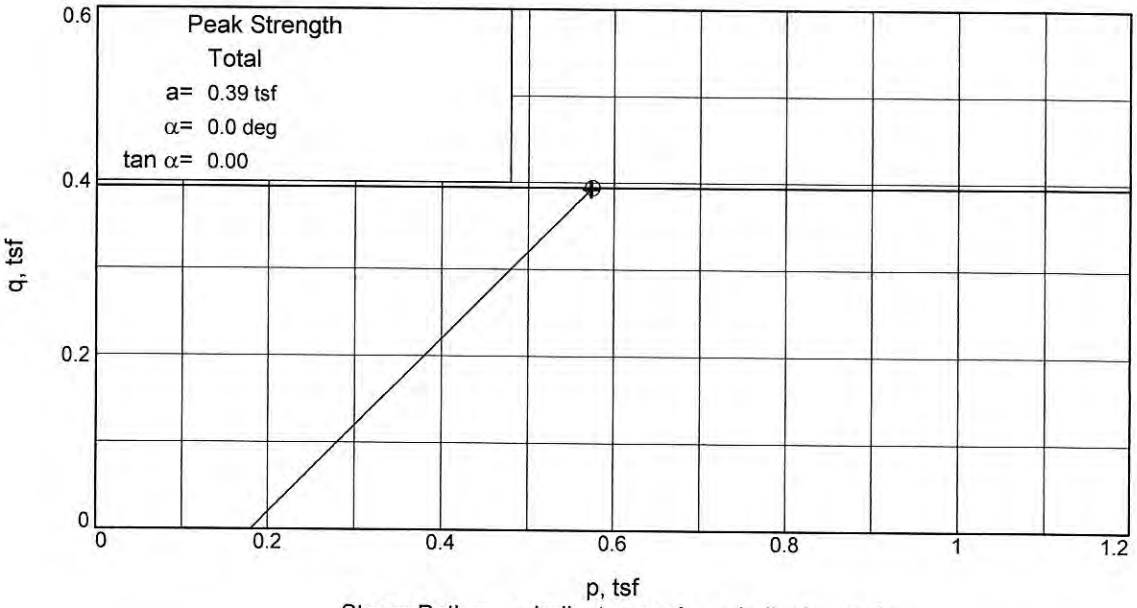
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

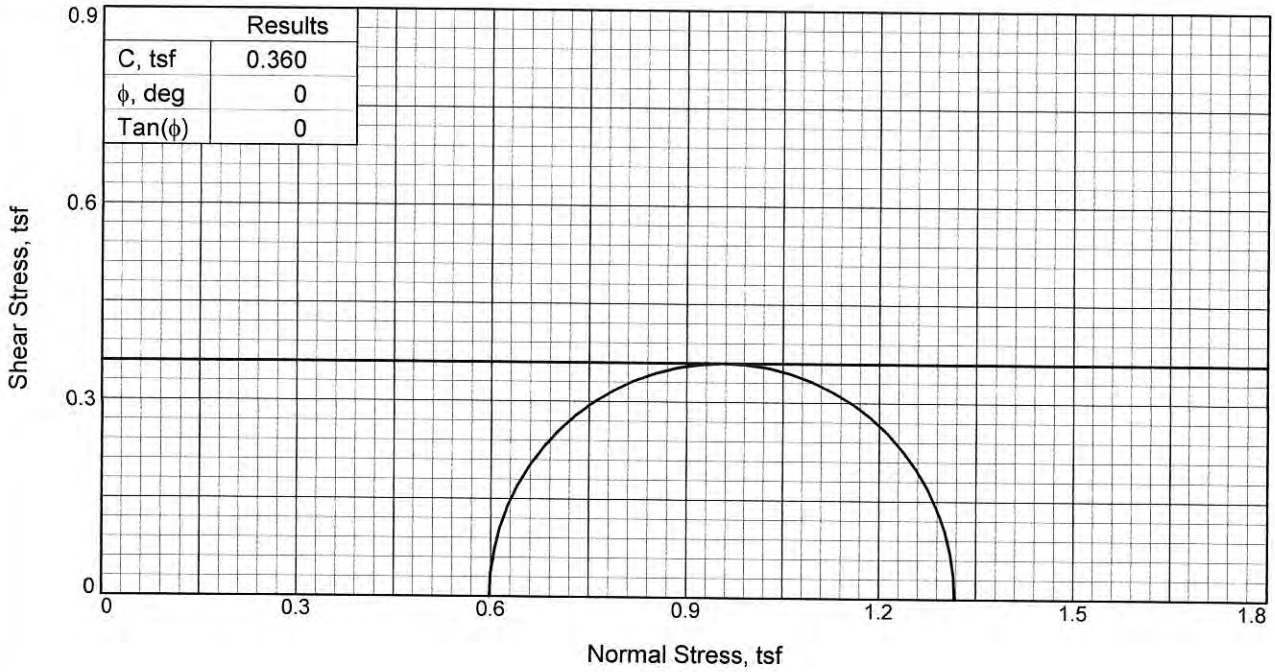
Client:

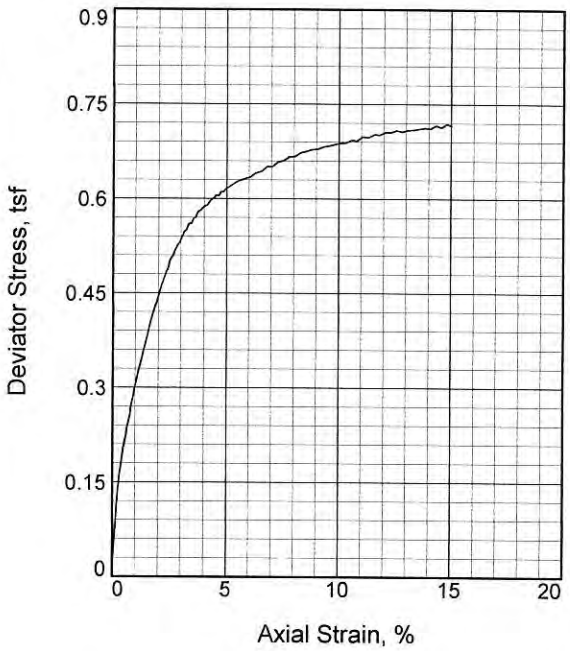
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 4

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	27.8
	Dry Density, pcf	94.3
	Saturation, %	95.4
	Void Ratio	0.7883
	Diameter, in.	2.84
	Height, in.	5.84
At Test	Water Content, %	26.0
	Dry Density, pcf	94.3
	Saturation, %	89.0
	Void Ratio	0.7883
	Diameter, in.	2.84
	Height, in.	5.84
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		8.30
Fail. Stress, tsf		0.72
Strain, %		14.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.32
σ_3 Failure, tsf		0.60

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY with SAND

LL= 41 **PL=** 18 **PI=** 23

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D2850
Failure type: Bulge

Figure _____

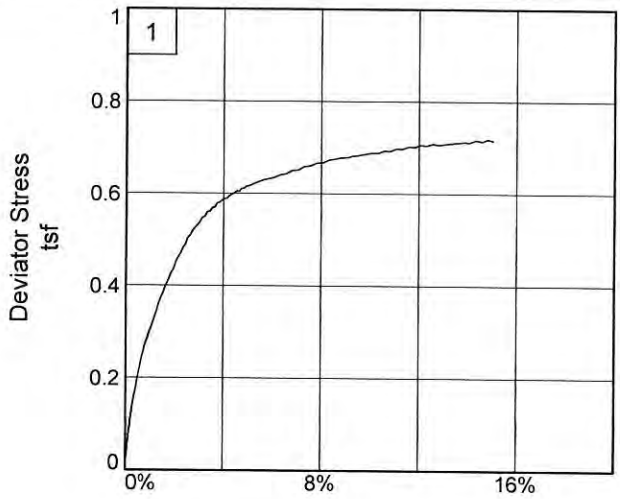
Client:

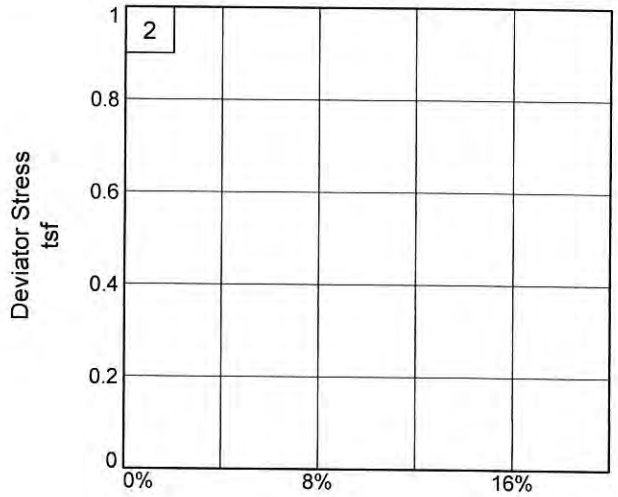
Project: San Jacinto River Waste Pit Superfund Site

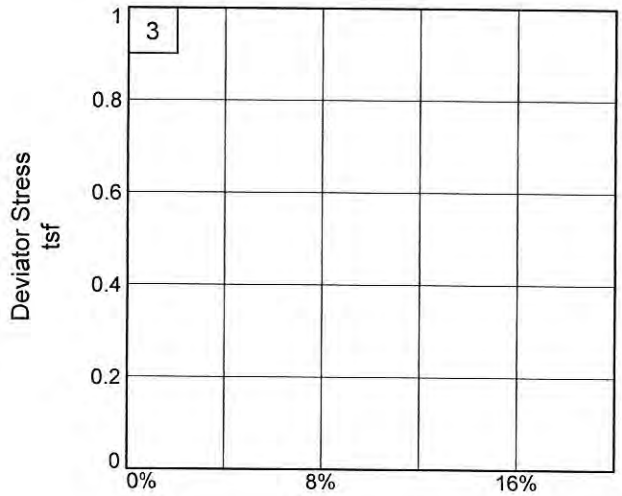
Source of Sample: SJGB028 **Depth:** 18

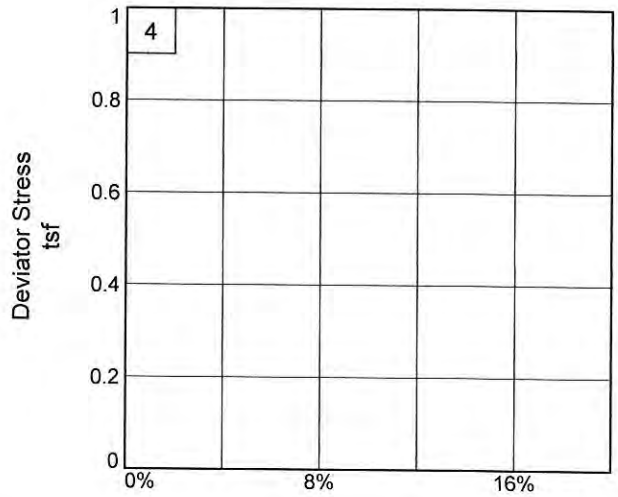
Proj. No.: 19.15.131 **Date Sampled:** 1/15/2020

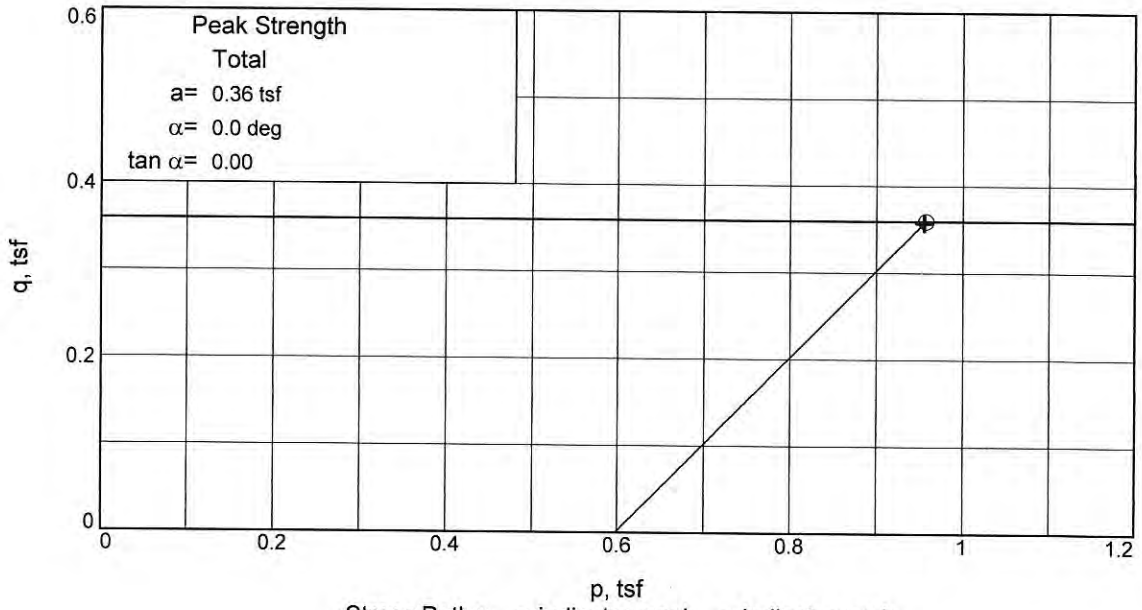
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

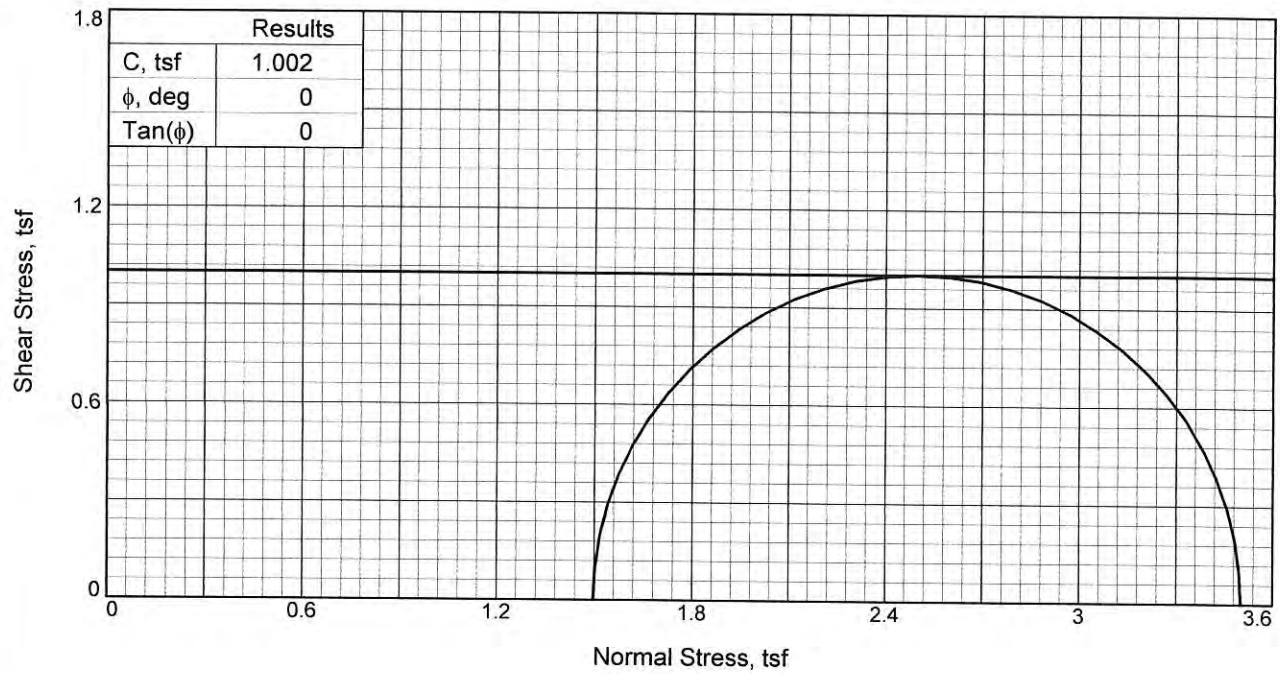
Client:

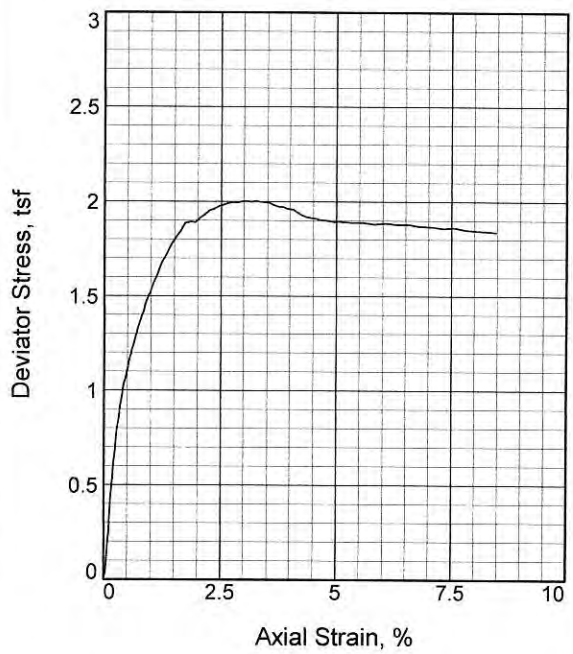
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 18

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	26.1
	Dry Density, pcf	97.8
	Saturation, %	97.4
	Void Ratio	0.7243
	Diameter, in.	2.86
	Height, in.	5.99
At Test	Water Content, %	25.5
	Dry Density, pcf	97.8
	Saturation, %	95.1
	Void Ratio	0.7243
	Diameter, in.	2.86
	Height, in.	5.99
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		20.80
Fail. Stress, tsf		2.00
Strain, %		3.2
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.50
σ_3 Failure, tsf		1.50

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Reddish-brown FAT CLAY

LL= 70 **PL=** 23 **PI=** 47

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D2850
Failure type: Slickensided

Figure _____

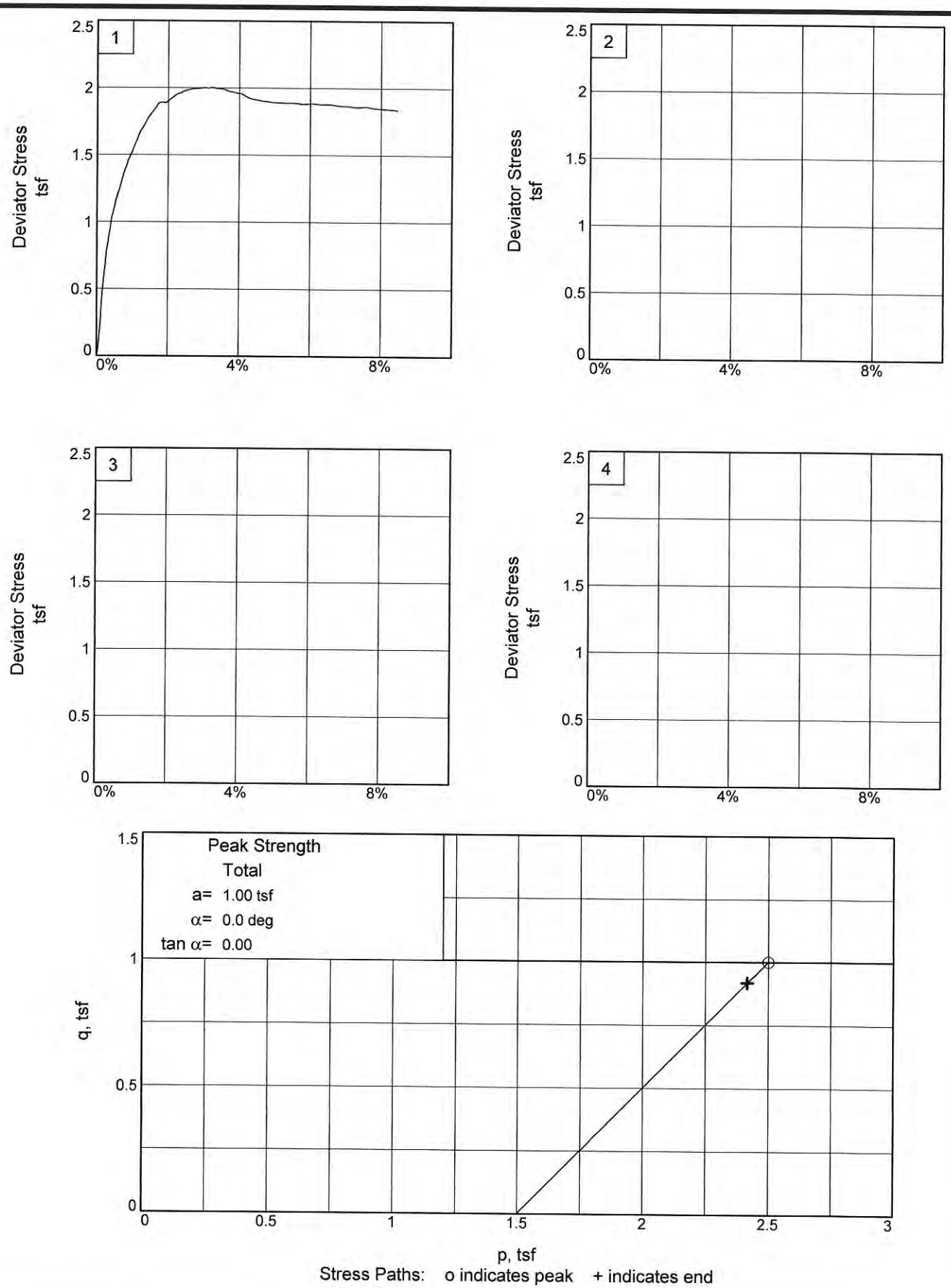
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 48

Proj. No.: 19.15.131 **Date Sampled:** 1/16/2020

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



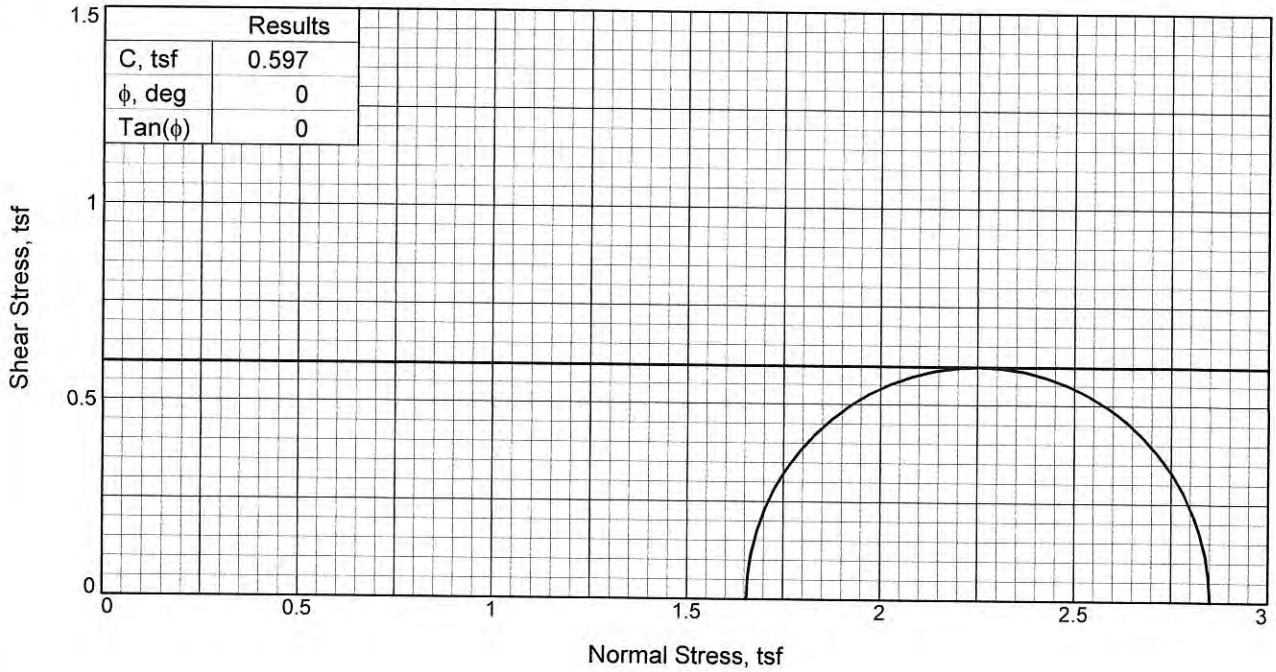
Client:

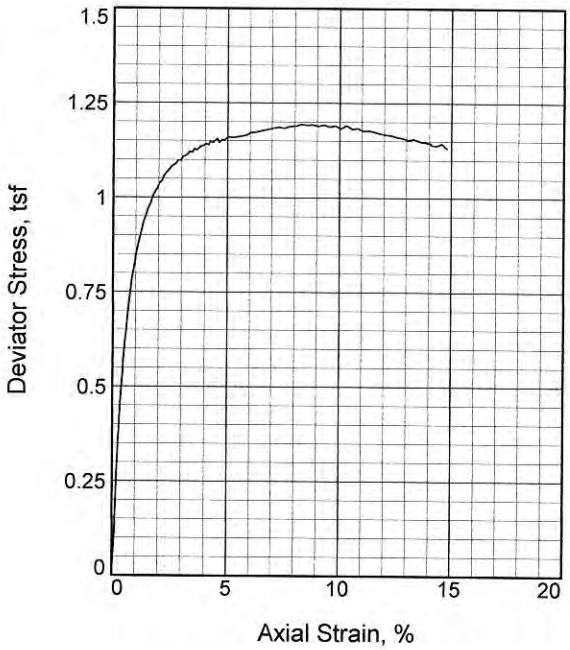
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 48

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	31.5
	Dry Density, pcf	91.0
	Saturation, %	99.7
	Void Ratio	0.8524
	Diameter, in.	2.84
	Height, in.	5.91
At Test	Water Content, %	30.5
	Dry Density, pcf	91.0
	Saturation, %	96.5
	Void Ratio	0.8524
	Diameter, in.	2.84
	Height, in.	5.91
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		23.00
Fail. Stress, tsf		1.19
Strain, %		8.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.85
σ_3 Failure, tsf		1.66

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Reddish-brown FAT CLAY

LL= 75 **PL=** 23 **PI=** 52

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D2850
Failure type: Slickensided

Figure _____

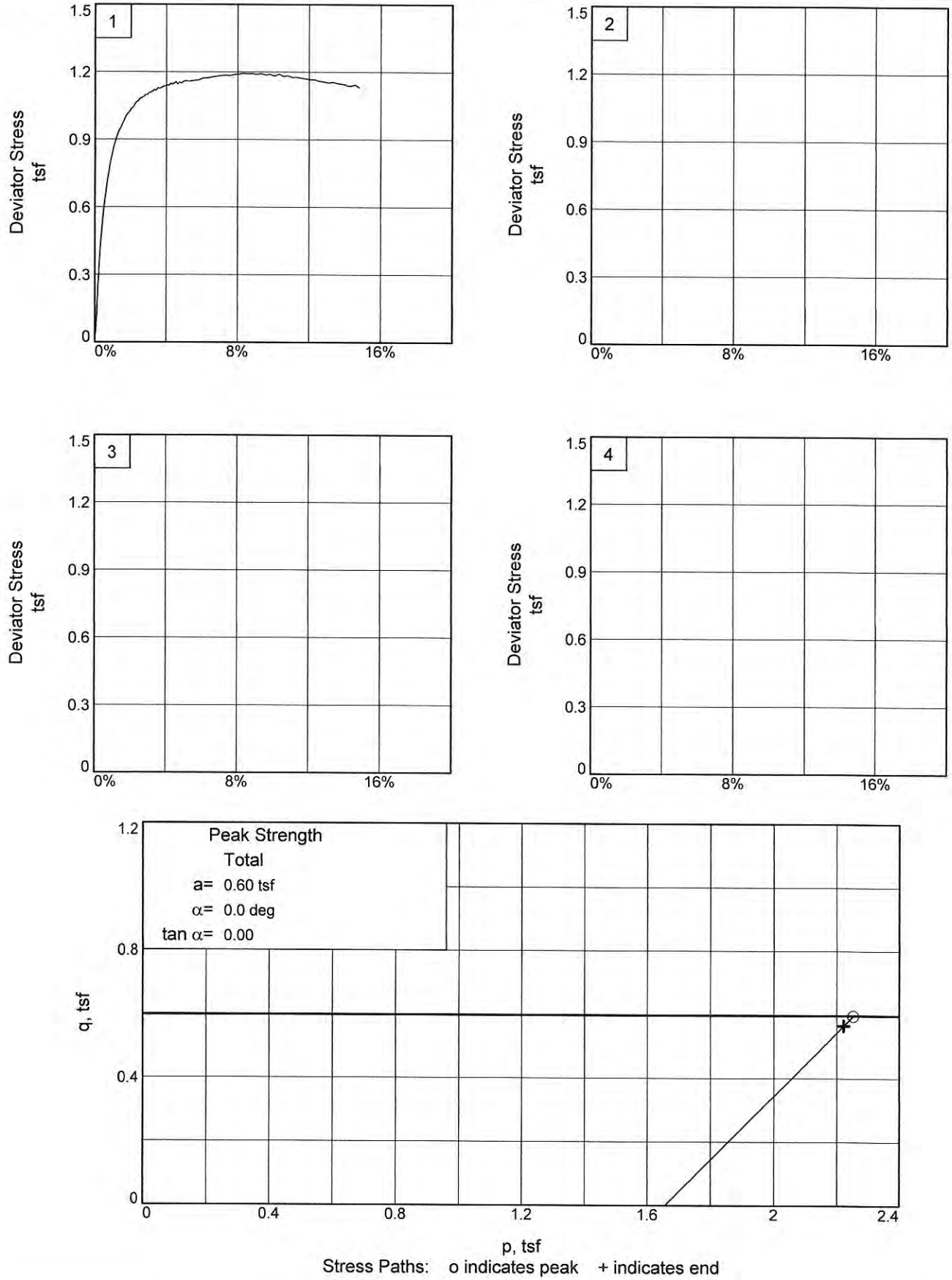
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 53

Proj. No.: 19.15.131 **Date Sampled:** 1/16/2020

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



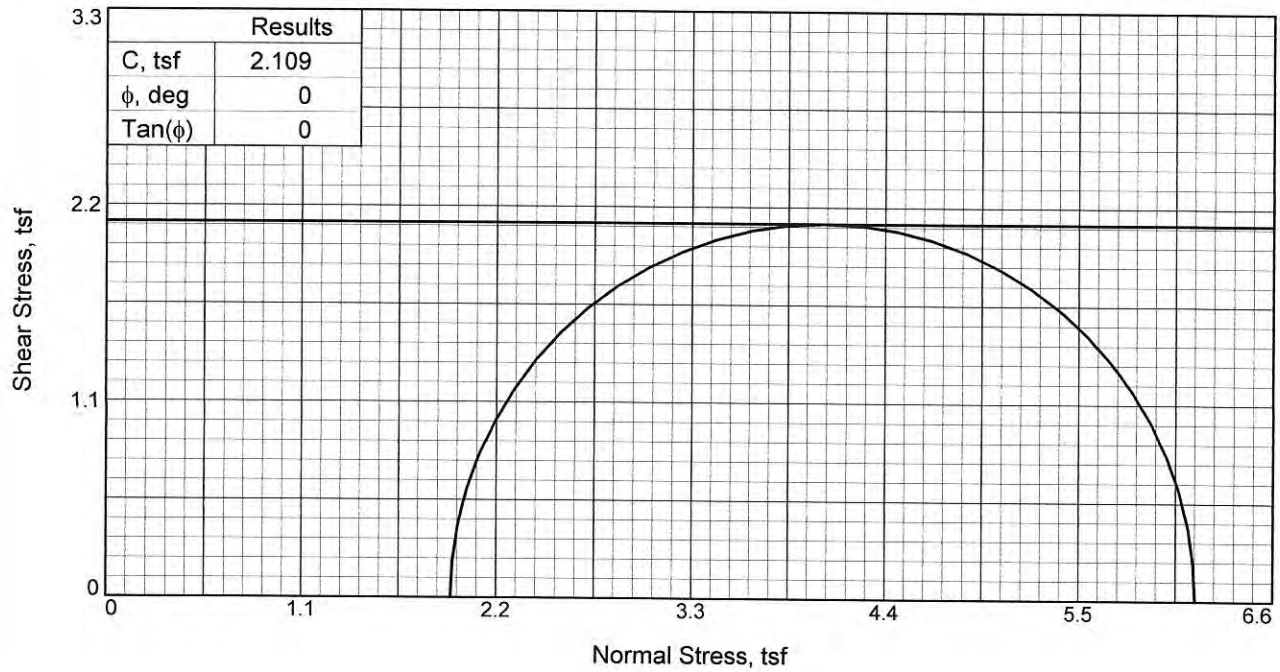
Client:

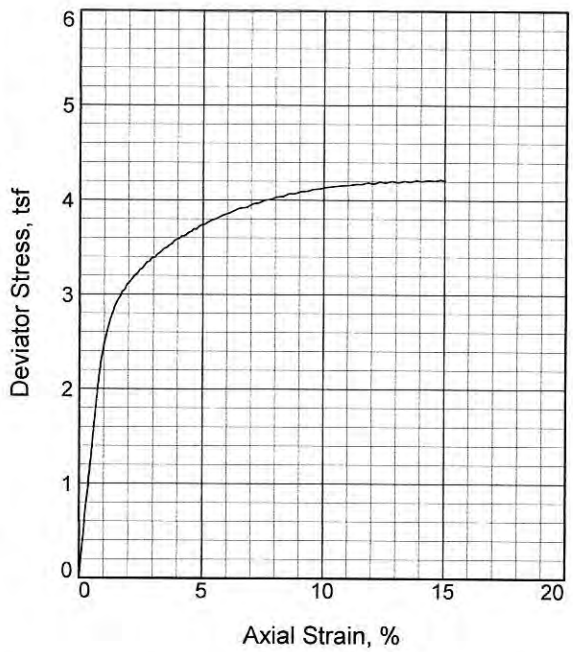
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 53

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	16.6
	Dry Density, pcf	115.4
	Saturation, %	97.2
	Void Ratio	0.4603
	Diameter, in.	2.84
	Height, in.	5.87
At Test	Water Content, %	17.0
	Dry Density, pcf	115.4
	Saturation, %	99.9
	Void Ratio	0.4603
	Diameter, in.	2.84
	Height, in.	5.87
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		27.00
Fail. Stress, tsf		4.22
Strain, %		14.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		6.16
σ_3 Failure, tsf		1.94

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan and gray LEAN CLAY with SAND

LL= 30 **PL=** 16 **PI=** 14

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D2850
Failure type: Bulge

Figure _____

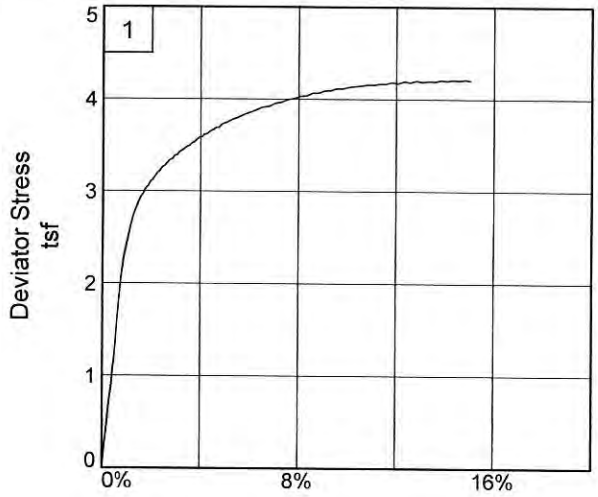
Client:

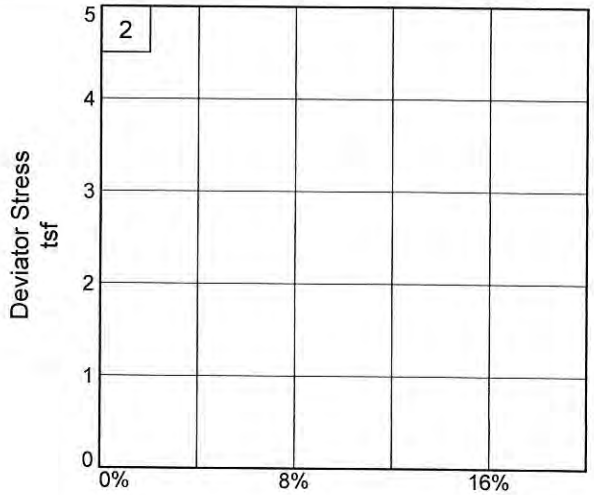
Project: San Jacinto River Waste Pit Superfund Site

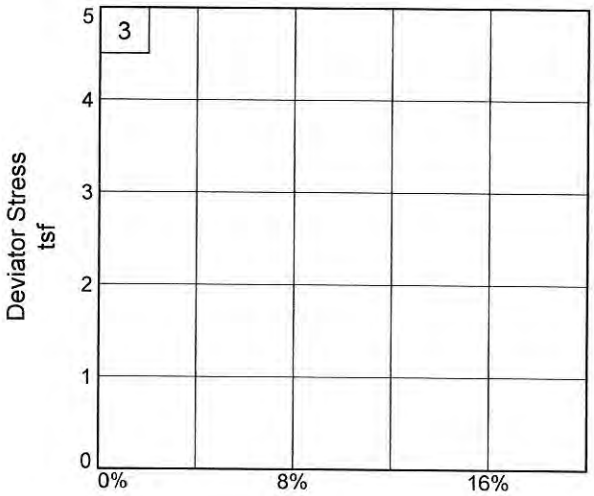
Source of Sample: SJGB028 **Depth:** 63

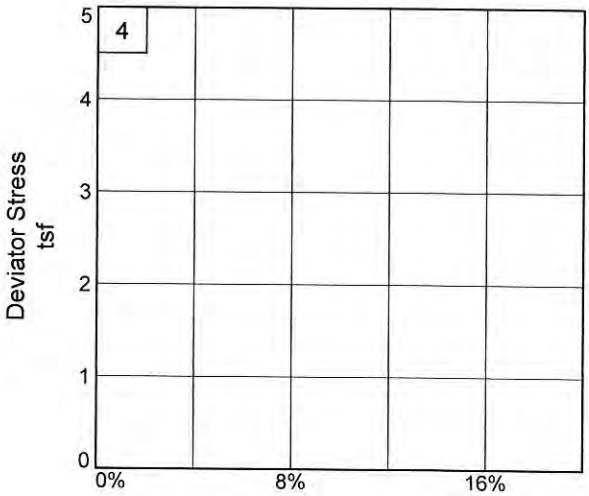
Proj. No.: 19.15.131 **Date Sampled:** 1/15/2020

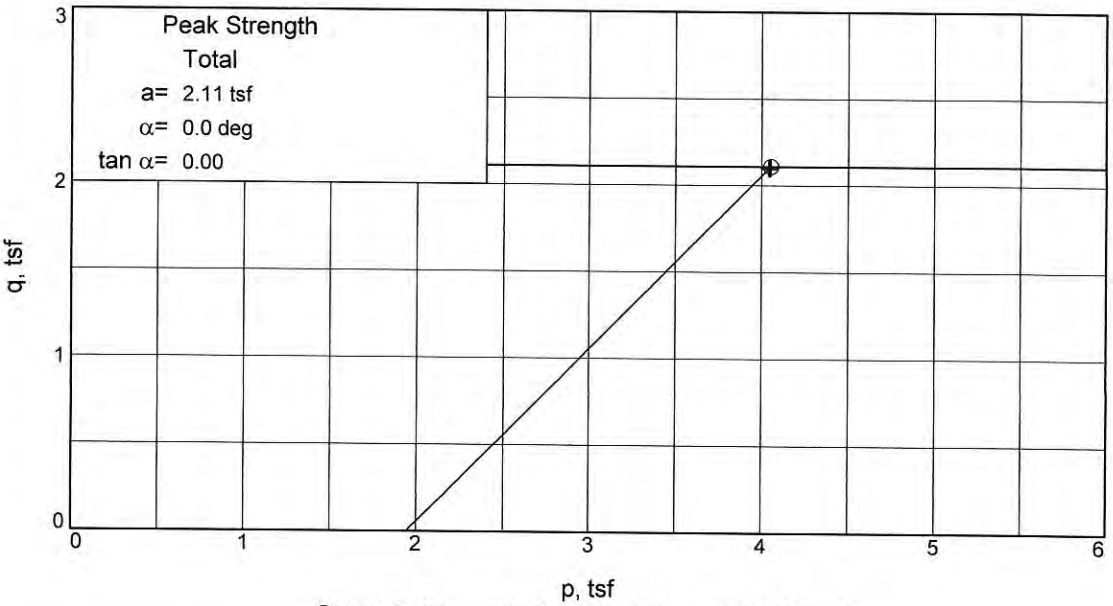
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

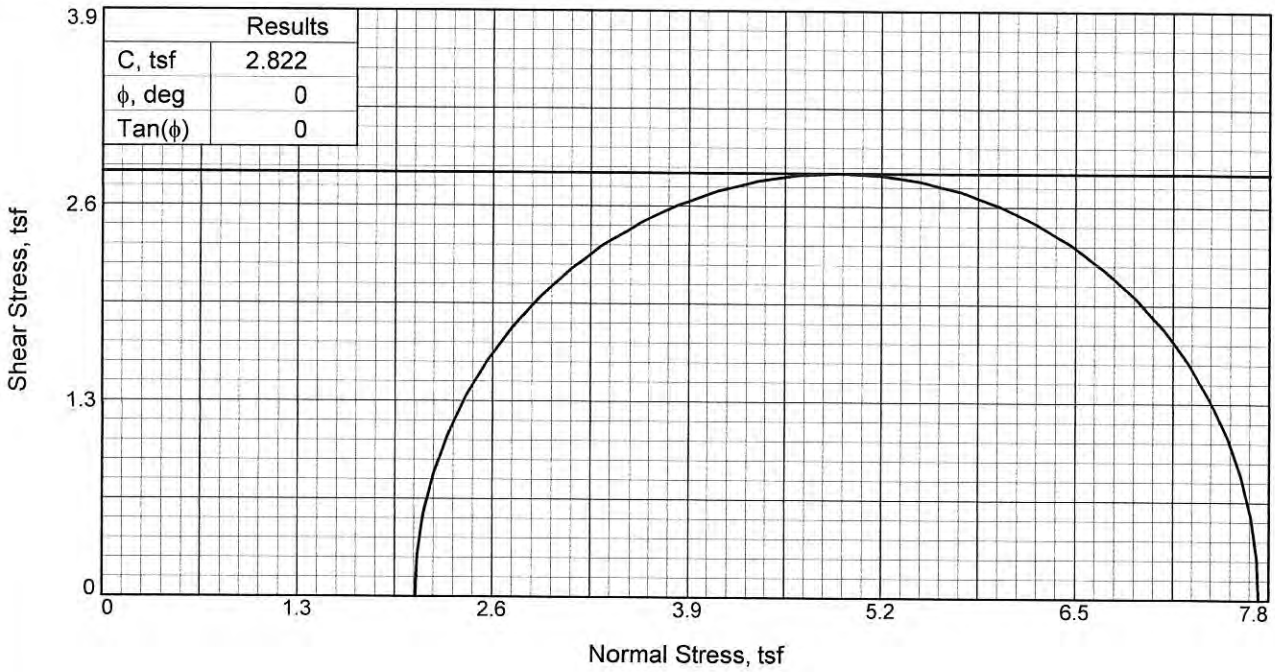
Client:

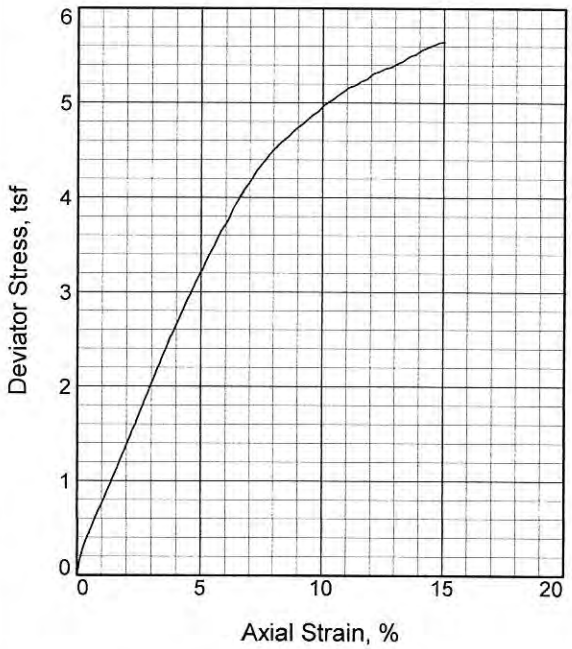
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 63

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	18.0
	Dry Density, pcf	113.5
	Saturation, %	96.7
	Void Ratio	0.5122
	Diameter, in.	2.84
	Height, in.	5.87
At Test	Water Content, %	17.4
	Dry Density, pcf	113.5
	Saturation, %	93.4
	Void Ratio	0.5122
	Diameter, in.	2.84
	Height, in.	5.87
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		29.00
Fail. Stress, tsf		5.64
Strain, %		15.0
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		7.73
σ_3 Failure, tsf		2.09

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray SANDY LEAN CLAY

LL= 28 **PL=** 16 **PI=** 12

Assumed Specific Gravity= 2.75

Remarks:
Test method: ASTM D2850
Failure type: Multiple shear

Figure _____

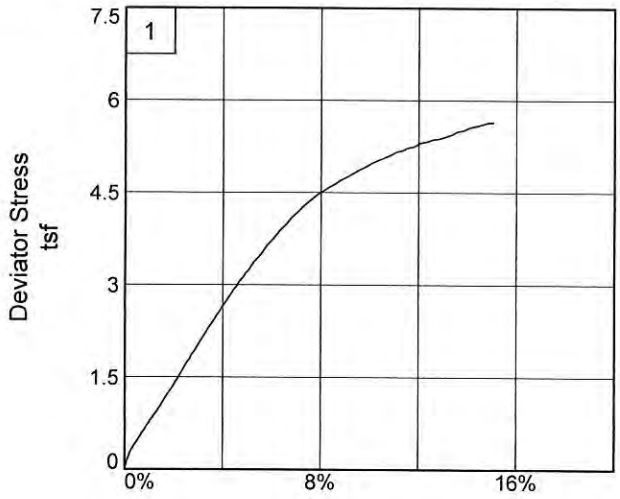
Client:

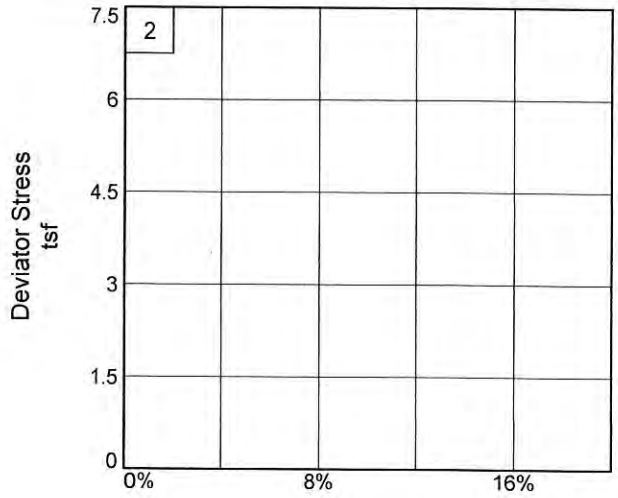
Project: San Jacinto River Waste Pit Superfund Site

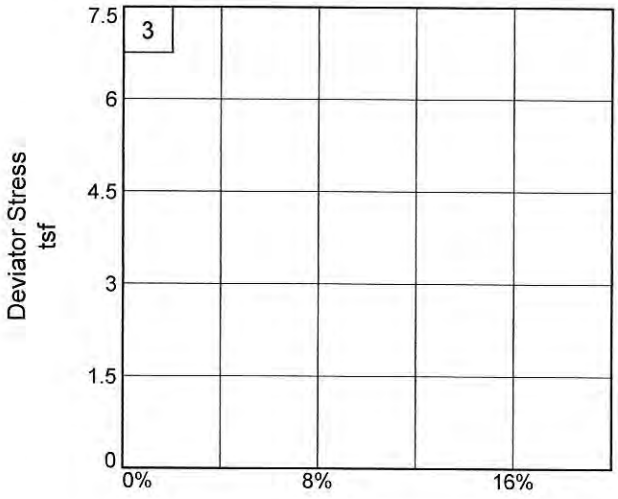
Source of Sample: SJGB028 **Depth:** 68

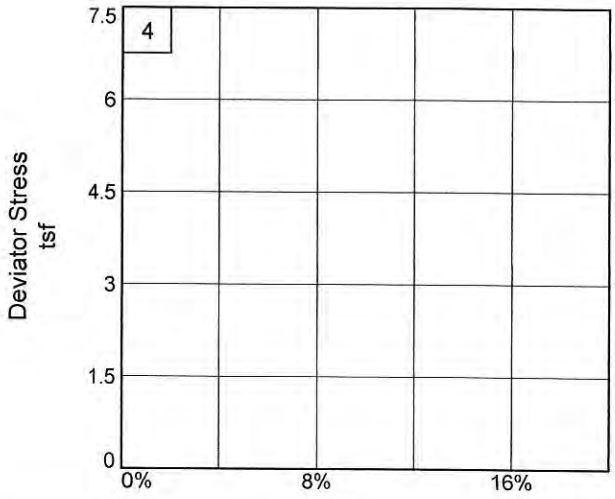
Proj. No.: 19.15.131 **Date Sampled:** 1/16/2020

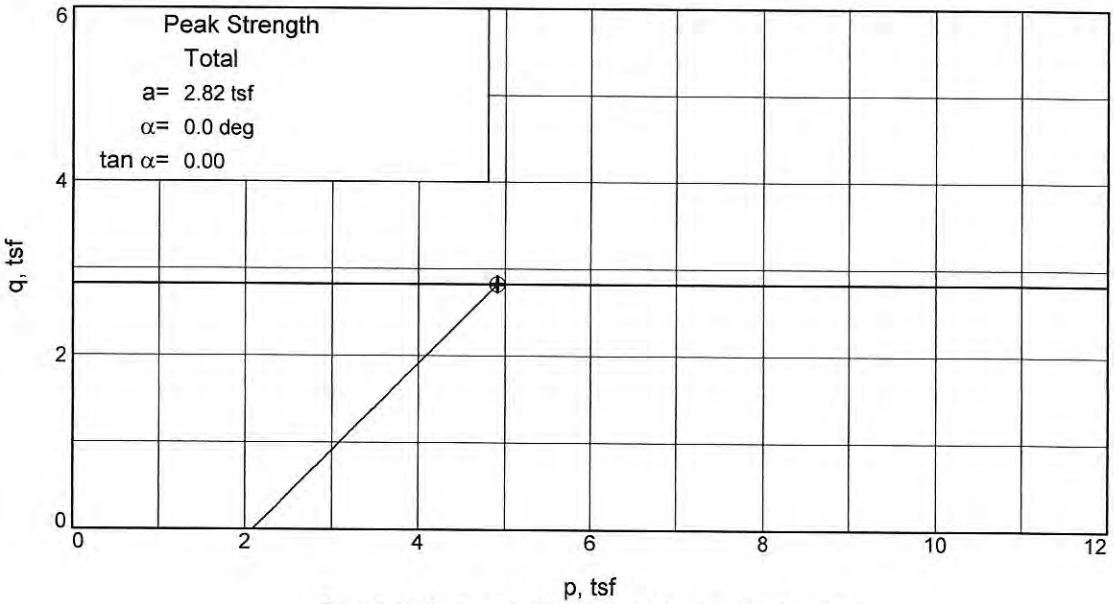
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

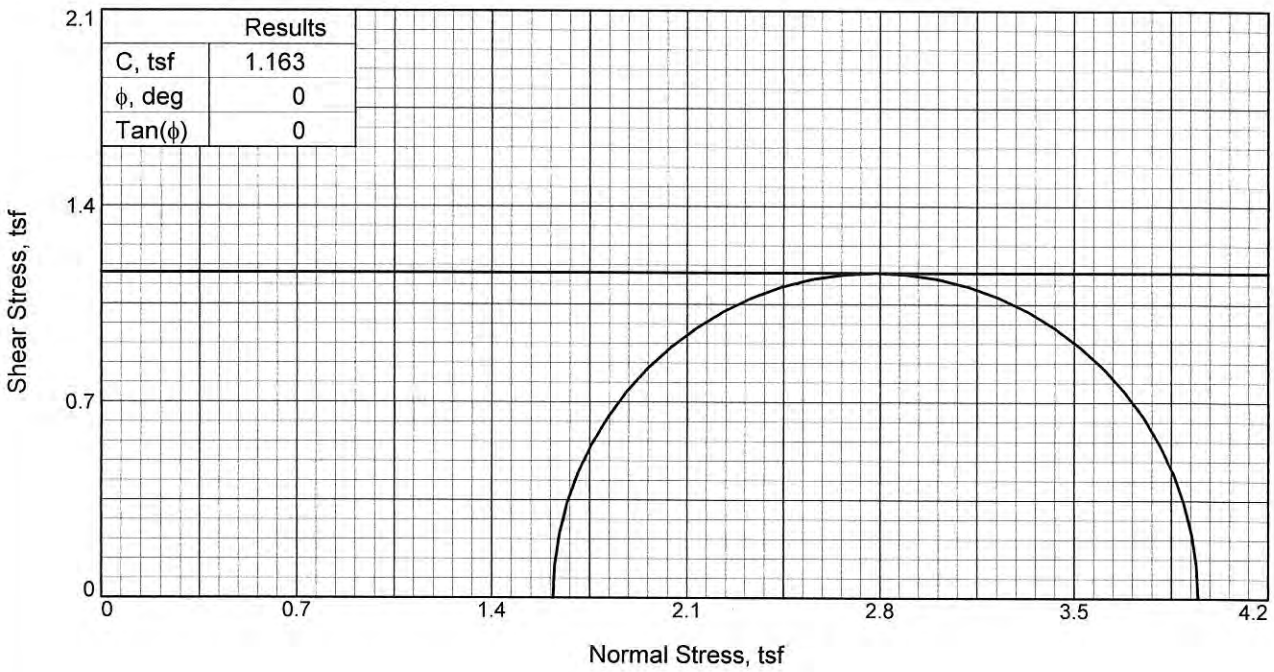
Client:

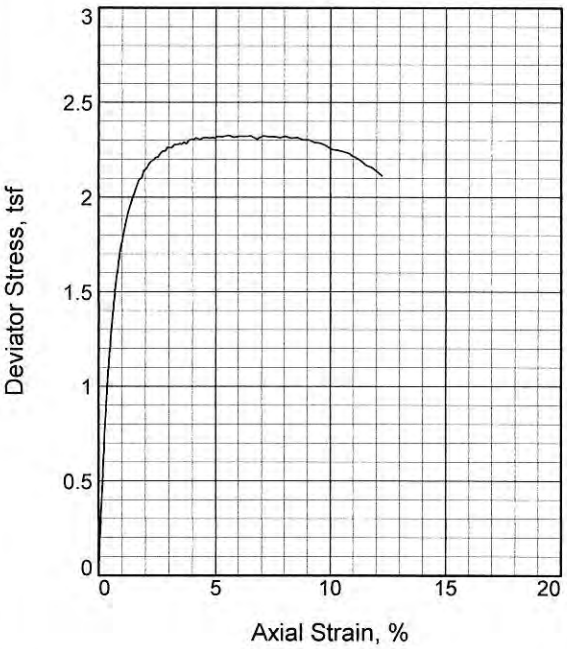
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 68

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	26.4
	Dry Density, pcf	100.0
	Saturation, %	98.7
	Void Ratio	0.7482
	Diameter, in.	2.81
	Height, in.	5.85
At Test	Water Content, %	26.6
	Dry Density, pcf	100.0
	Saturation, %	99.6
	Void Ratio	0.7482
	Diameter, in.	2.81
	Height, in.	5.85
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		22.50
Fail. Stress, tsf		2.33
Strain, %		5.5
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.95
σ_3 Failure, tsf		1.62

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY

LL= 70 **PL=** 22 **PI=** 48

Assumed Specific Gravity= 2.80

Remarks:
Test method: ASTM D2850
Failure type: Multiple shear

Figure _____

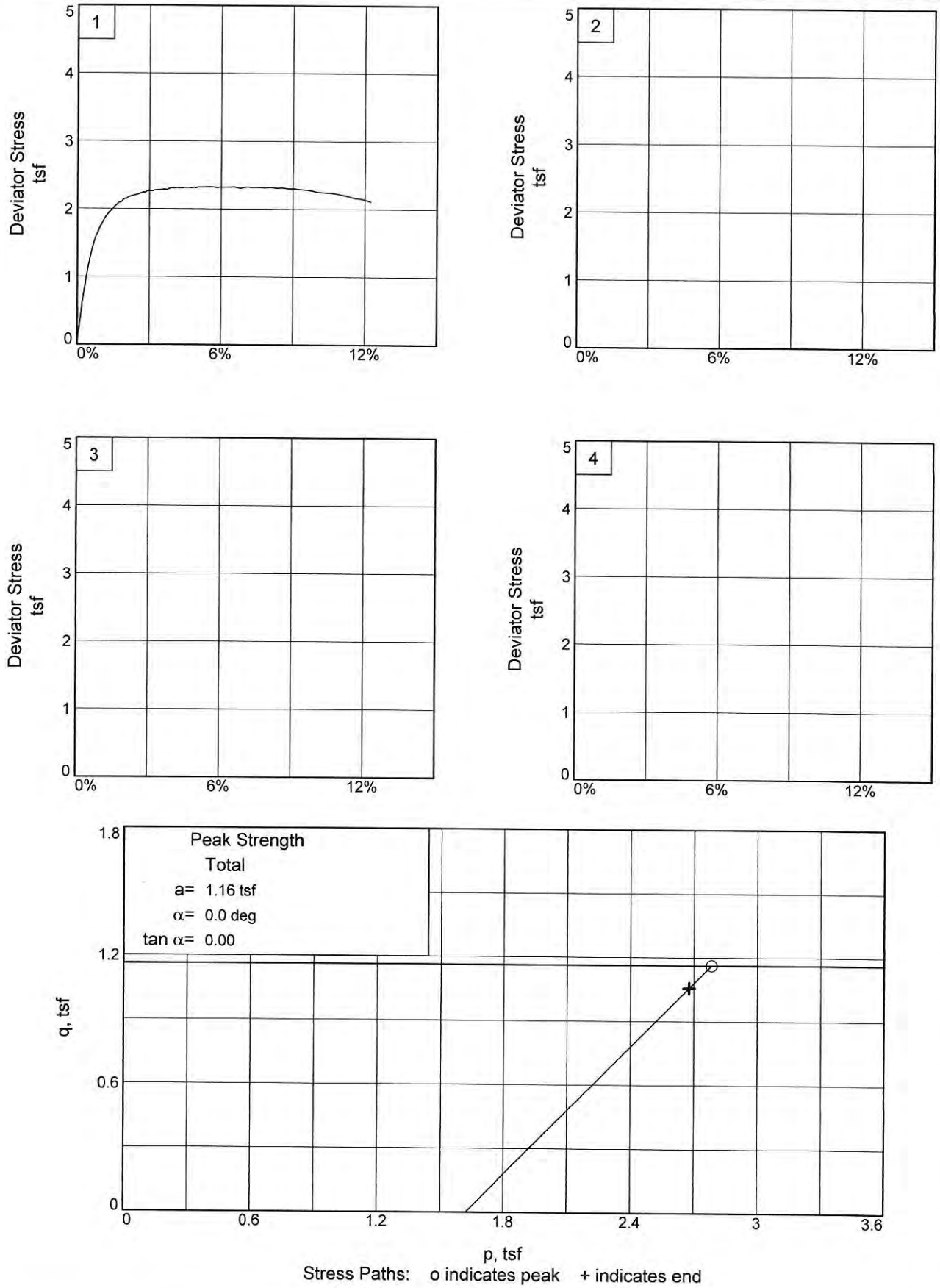
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB029 **Depth:** 53

Proj. No.: 19.15.131 **Date Sampled:** 1/15/2020

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



Client:

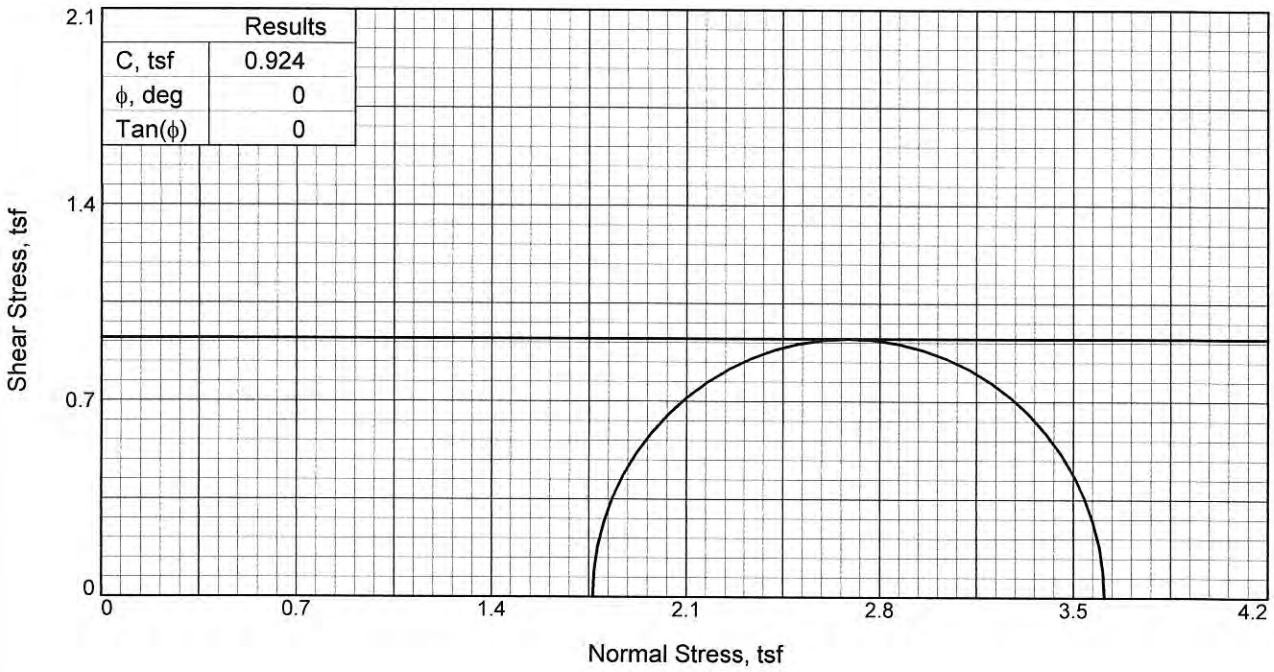
Project: San Jacinto River Waste Pit Superfund Site

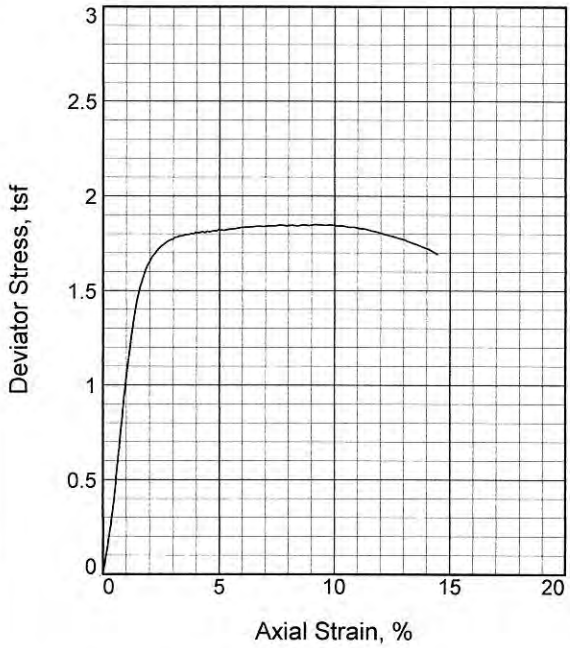
Source of Sample: SJGB029 **Depth:** 53

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-104





Sample No.		1
Initial	Water Content, %	16.8
	Dry Density, pcf	111.6
	Saturation, %	88.9
	Void Ratio	0.5109
	Diameter, in.	2.89
	Height, in.	5.92
At Test	Water Content, %	16.6
	Dry Density, pcf	111.6
	Saturation, %	87.5
	Void Ratio	0.5109
	Diameter, in.	2.89
	Height, in.	5.92
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		24.50
Fail. Stress, tsf		1.85
Strain, %		9.1
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.61
σ_3 Failure, tsf		1.76

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan and gray LEAN CLAY

LL= 33 **PL=** 17 **PI=** 16

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D2850
Failure type: Bulge

Figure _____

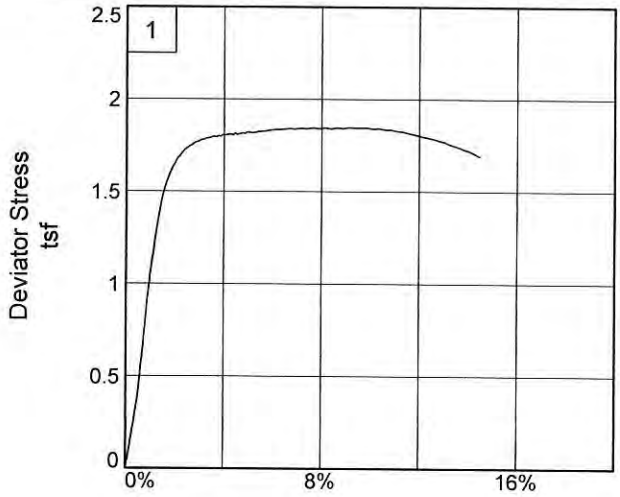
Client:

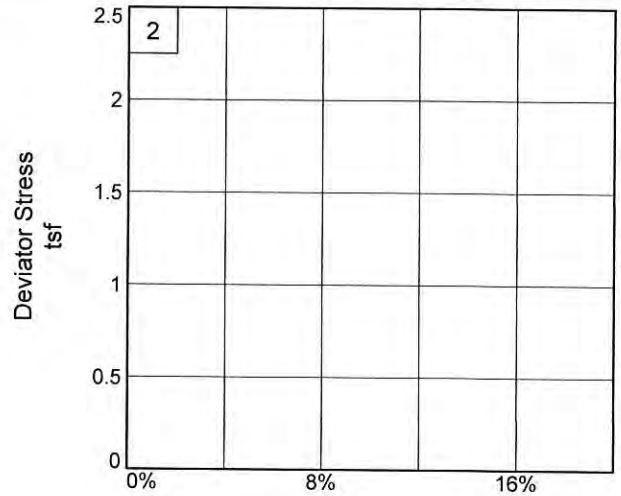
Project: San Jacinto River Waste Pit Superfund Site

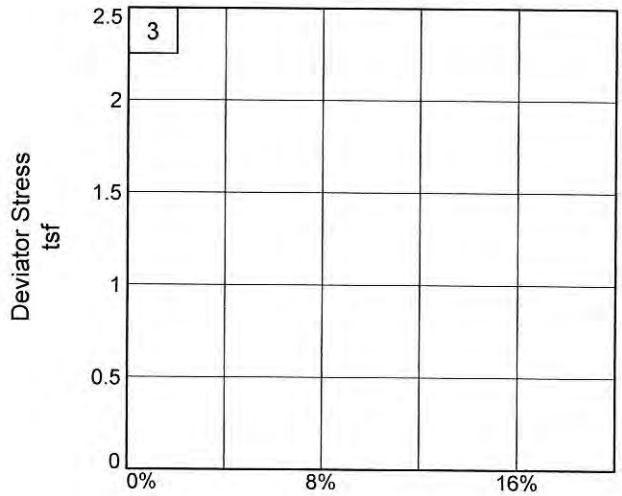
Source of Sample: SJGB029 **Depth:** 58

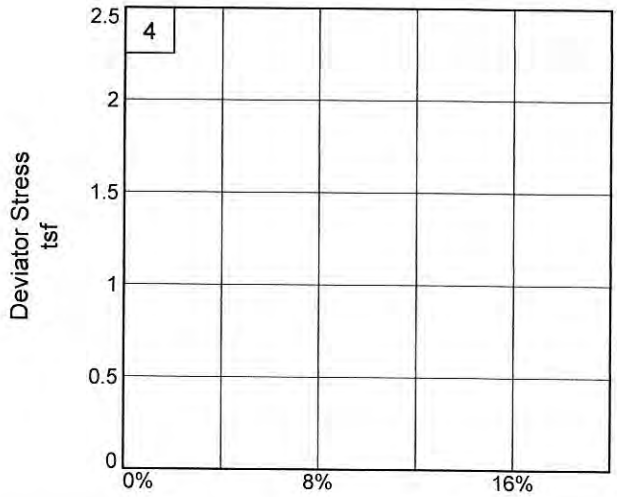
Proj. No.: 19.15.131 **Date Sampled:** 1/15/2020

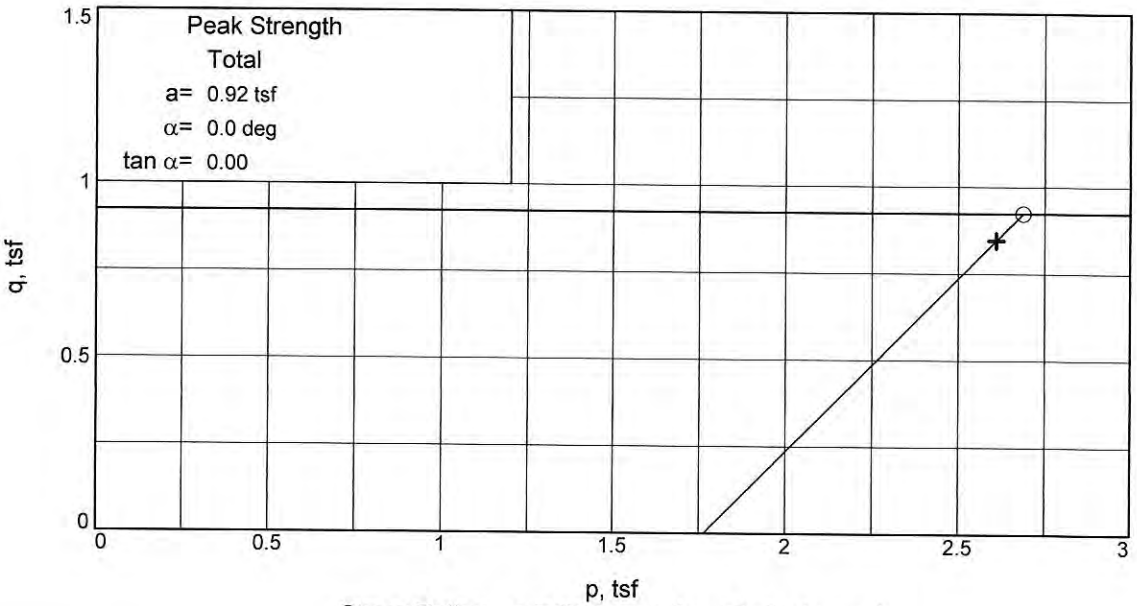
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

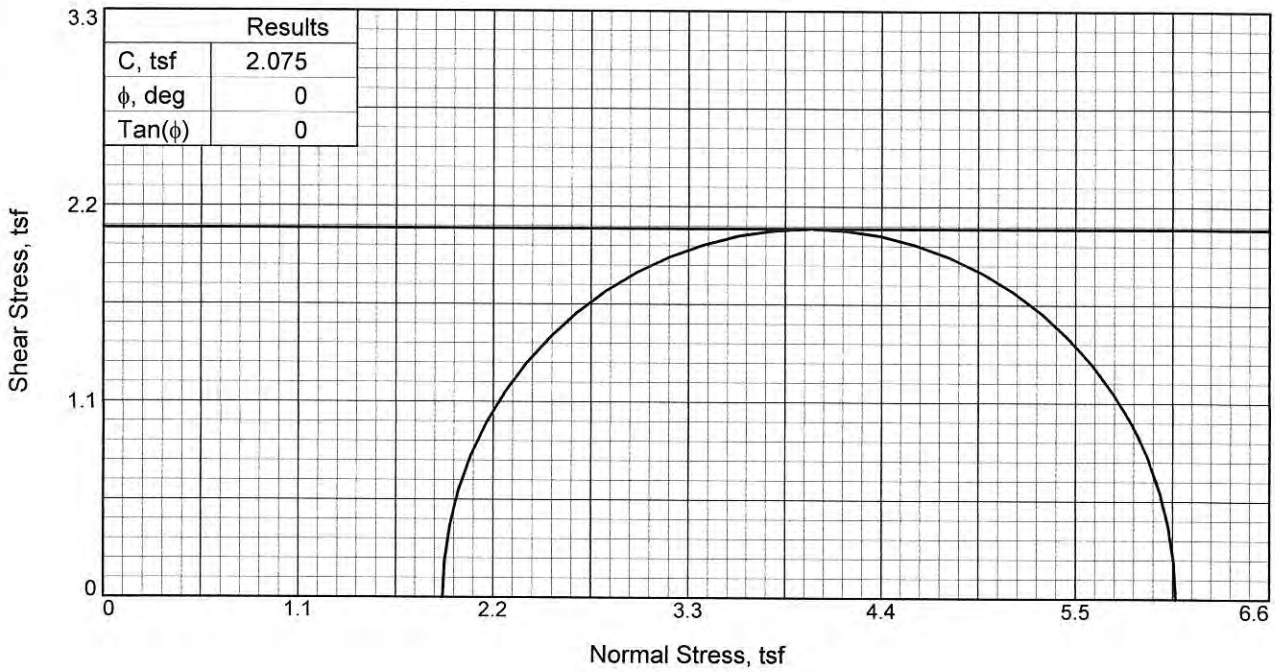
Client:

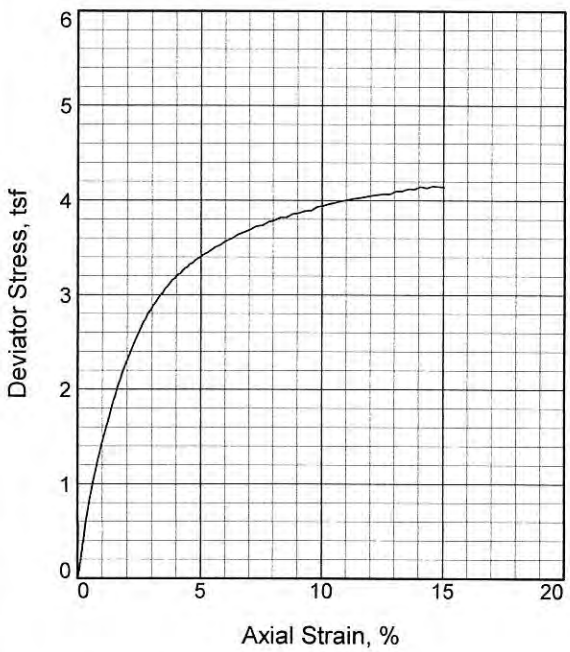
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB029 **Depth:** 58

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	17.7
	Dry Density, pcf	113.0
	Saturation, %	97.4
	Void Ratio	0.4919
	Diameter, in.	2.84
	Height, in.	5.87
At Test	Water Content, %	18.2
	Dry Density, pcf	113.0
	Saturation, %	99.8
	Void Ratio	0.4919
	Diameter, in.	2.84
	Height, in.	5.87
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		26.60
Fail. Stress, tsf		4.15
Strain, %		14.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		6.07
σ_3 Failure, tsf		1.92

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray SANDY LEAN CLAY

LL= 36 **PL=** 17 **PI=** 19

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D2850
Failure type: Vertical shear

Figure _____

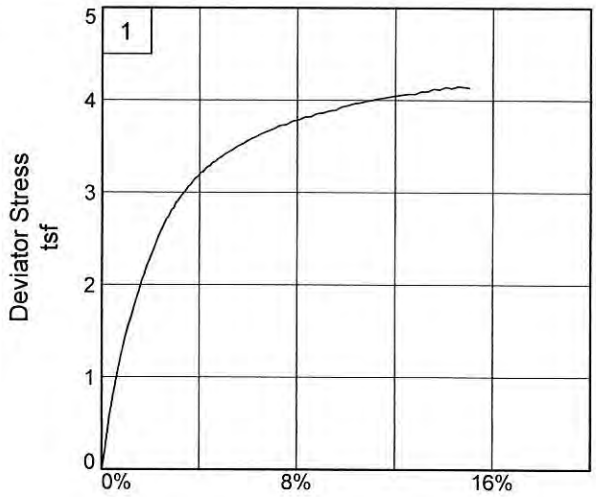
Client:

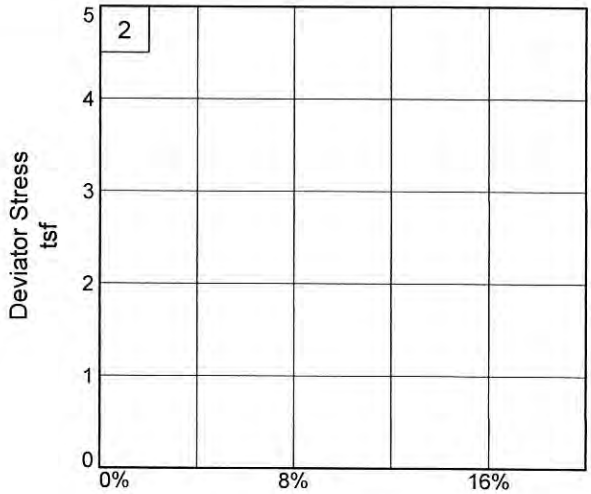
Project: San Jacinto River Waste Pit Superfund Site

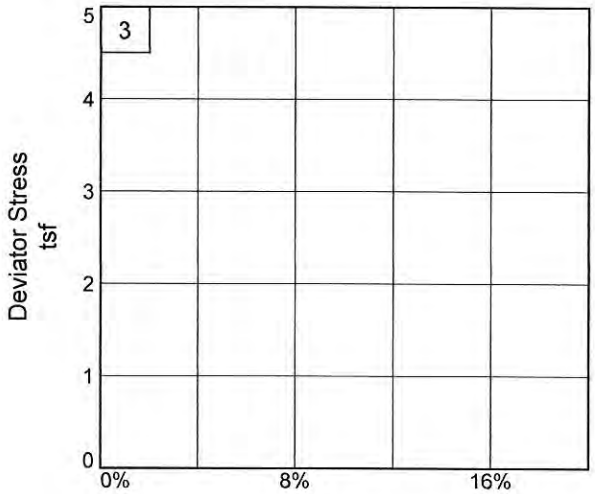
Source of Sample: SJGB029 **Depth:** 63

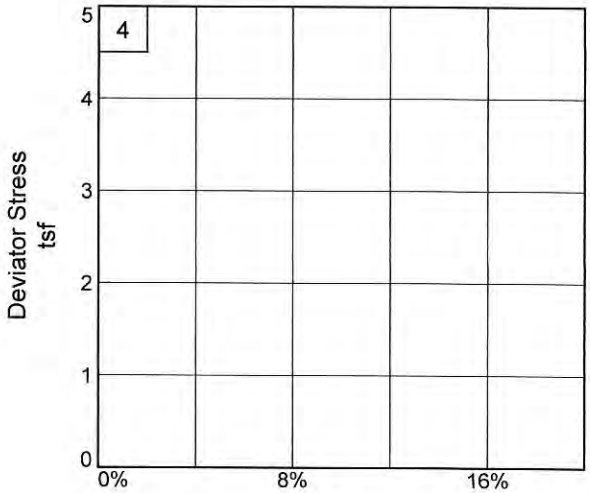
Proj. No.: 19.15.131 **Date Sampled:** 1/16/2020

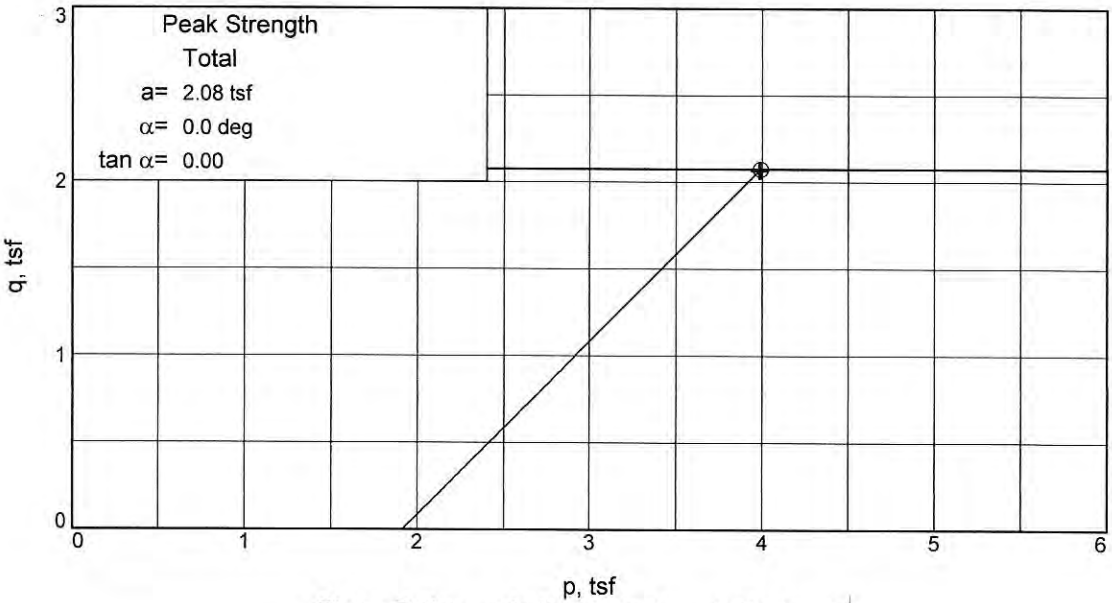
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

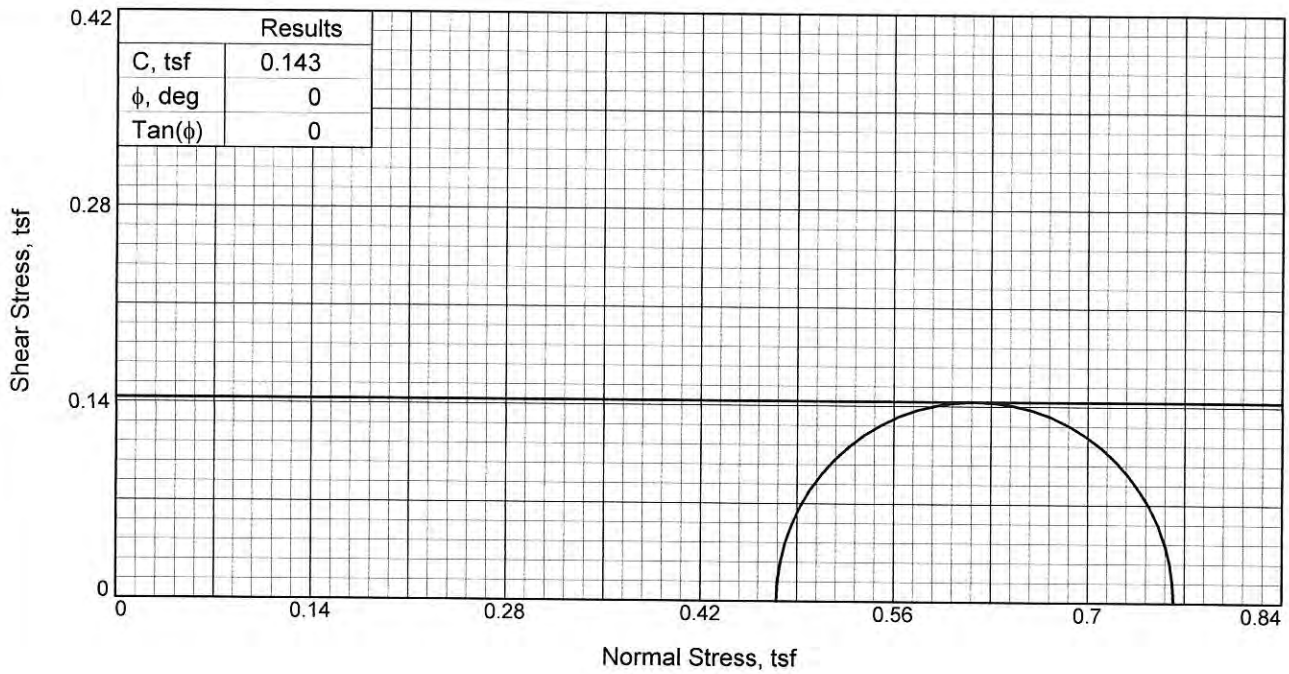
Client:

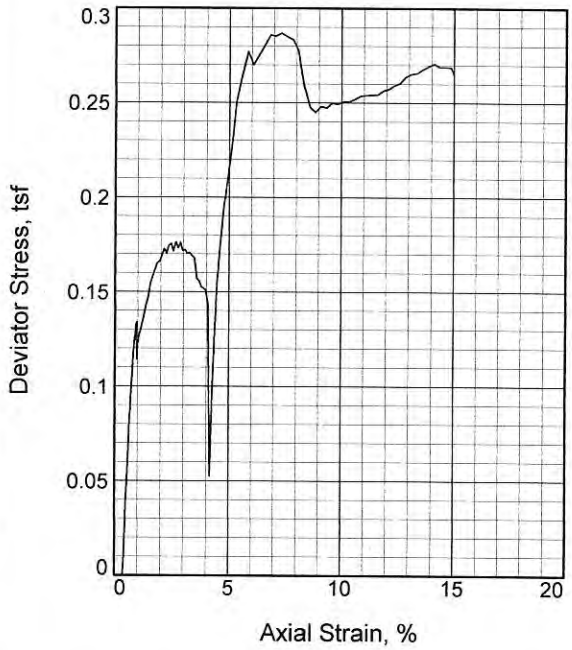
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB029 **Depth:** 63

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	37.6
	Dry Density, pcf	72.0
	Saturation, %	80.7
	Void Ratio	1.1664
	Diameter, in.	2.82
	Height, in.	5.77
At Test	Water Content, %	52.0
	Dry Density, pcf	72.0
	Saturation, %	111.6
	Void Ratio	1.1664
	Diameter, in.	2.82
	Height, in.	5.77
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		6.60
Fail. Stress, tsf		0.29
Strain, %		7.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.76
σ_3 Failure, tsf		0.48

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Dark gray SANDY FAT CLAY; sand pockets

LL= 79 **PL=** 24 **PI=** 55

Assumed Specific Gravity= 2.5

Remarks: Test Method: ASTM D2850
Failure Type: 60 Degree Shear

Figure _____

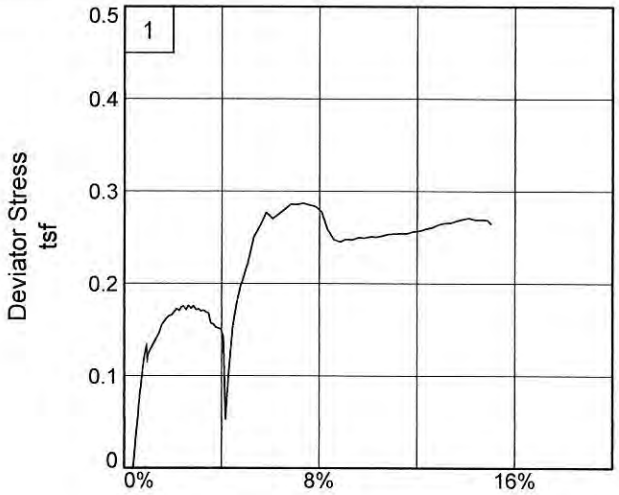
Client:

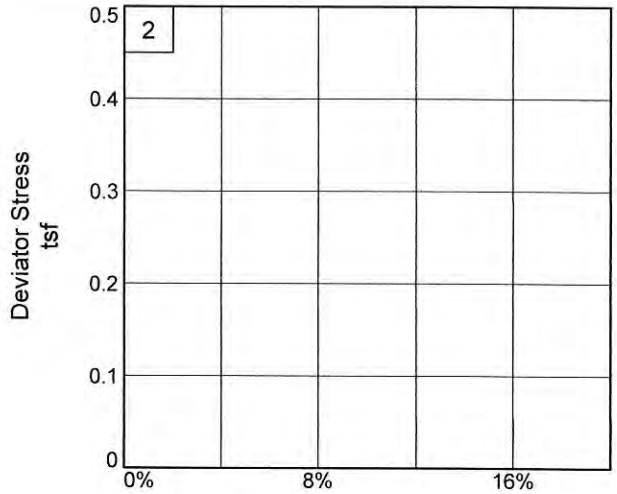
Project: San Jacinto River Waste Pit Superfund Site

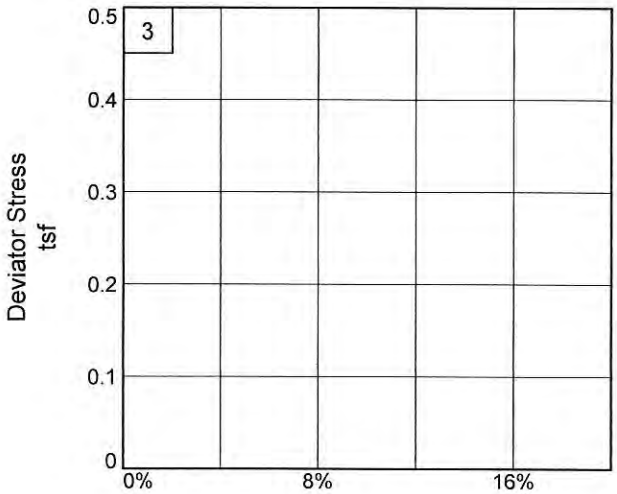
Source of Sample: SJGB047 **Depth:** 18

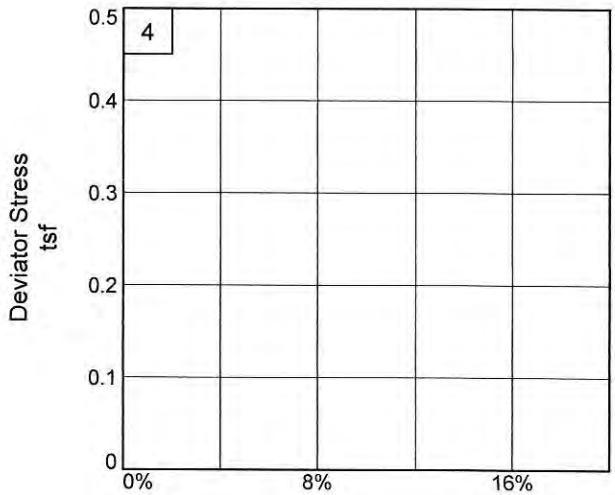
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

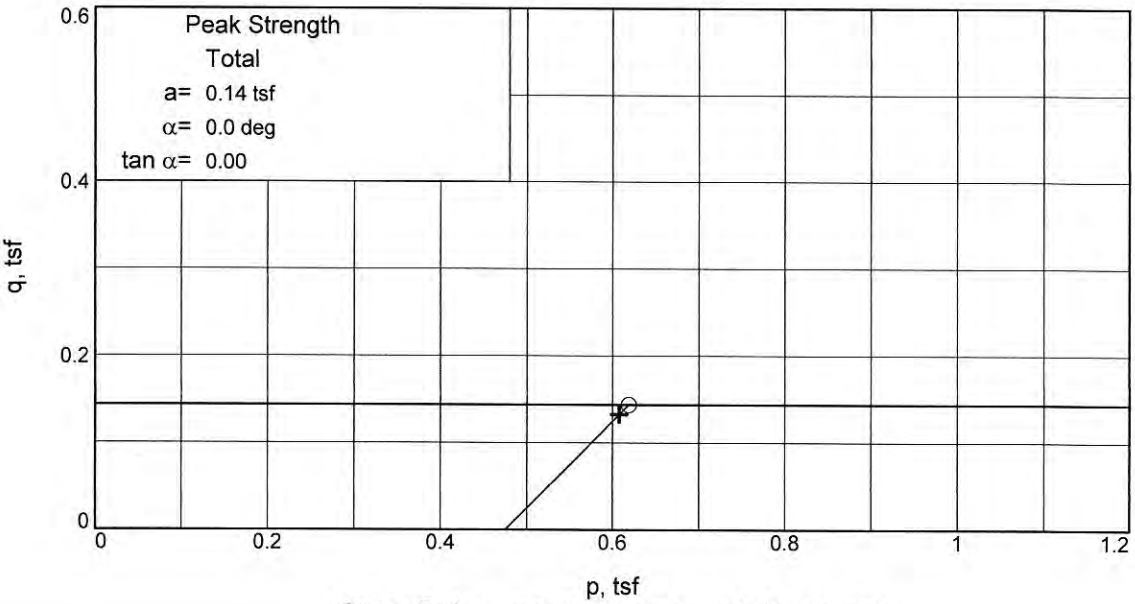
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

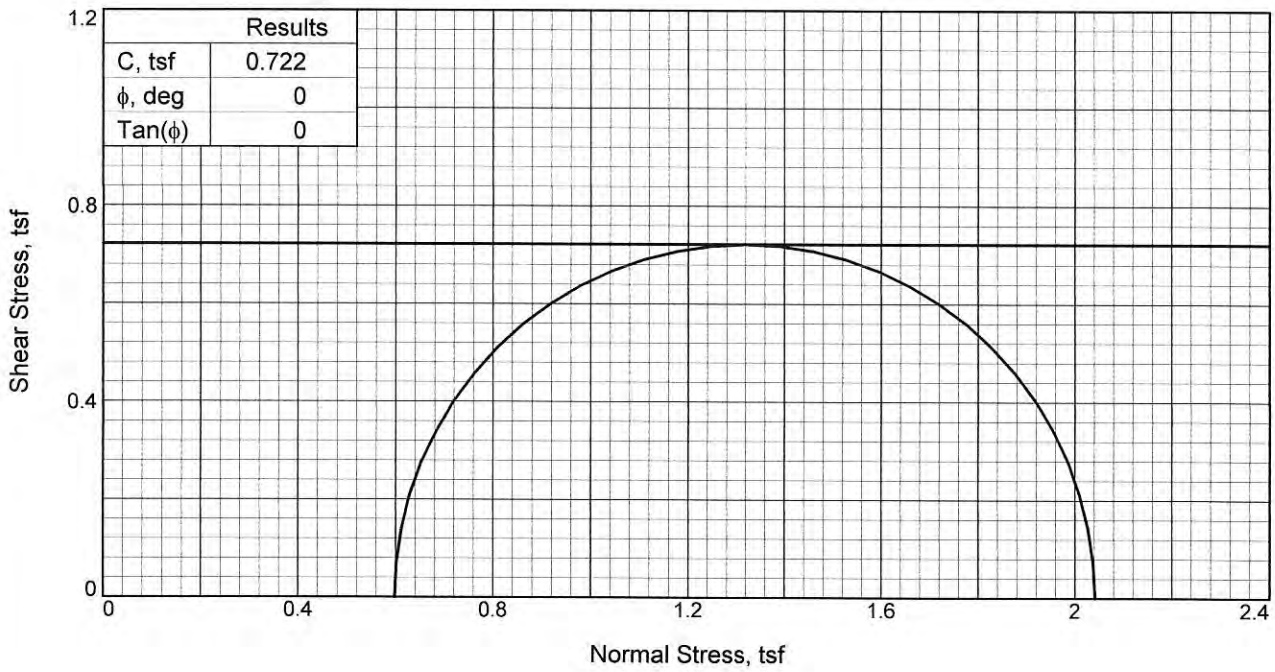
Client:

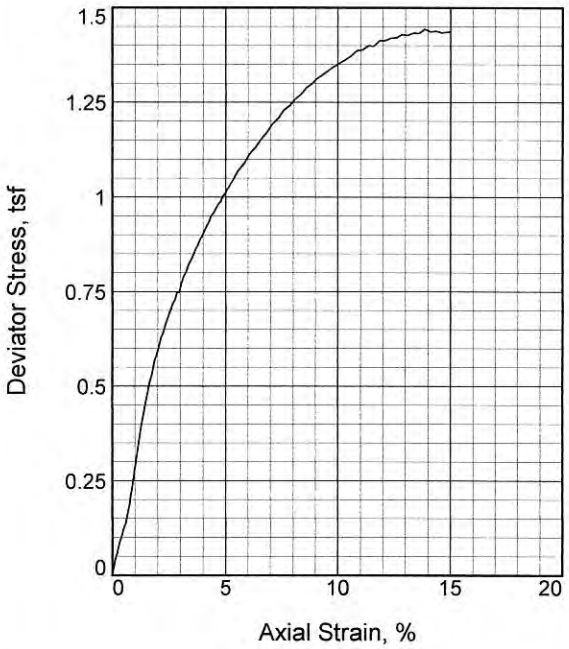
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 18

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	20.1
	Dry Density, pcf	113.6
	Saturation, %	100.0
	Void Ratio	0.5766
	Diameter, in.	2.76
	Height, in.	5.86
At Test	Water Content, %	17.4
	Dry Density, pcf	113.6
	Saturation, %	86.8
	Void Ratio	0.5766
	Diameter, in.	2.76
	Height, in.	5.86
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		8.30
Fail. Stress, tsf		1.44
Strain, %		13.9
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.04
σ_3 Failure, tsf		0.60

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY with SAND

LL= 42 **PL=** 18 **PI=** 24

Assumed Specific Gravity= 2.87

Remarks: Test Method: ASTM D2850
Failure type: Buldge

Figure _____

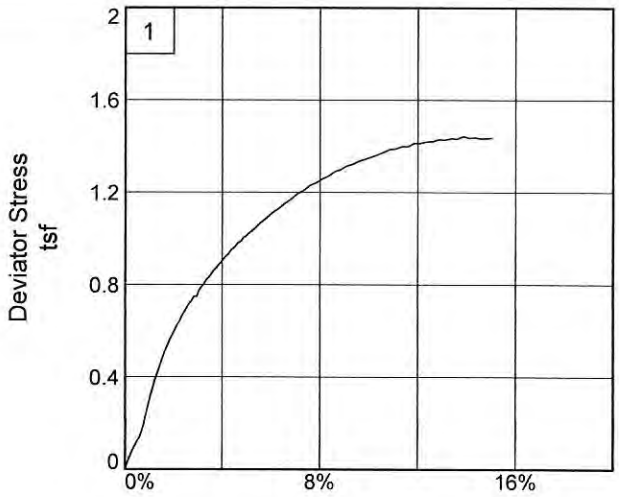
Client:

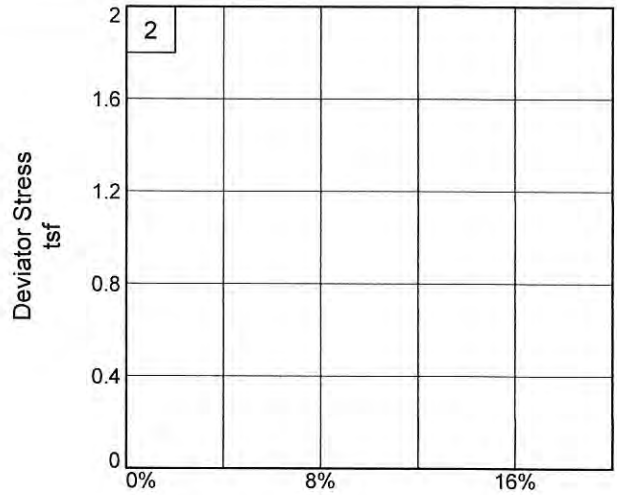
Project: San Jacinto River Waste Pit Superfund Site

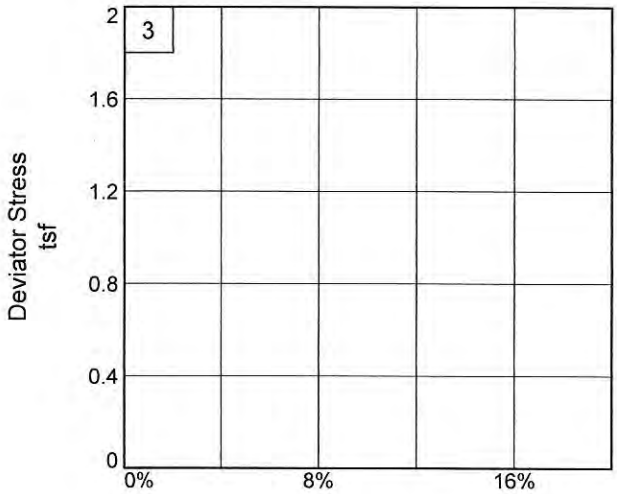
Source of Sample: SJGB047 **Depth:** 23

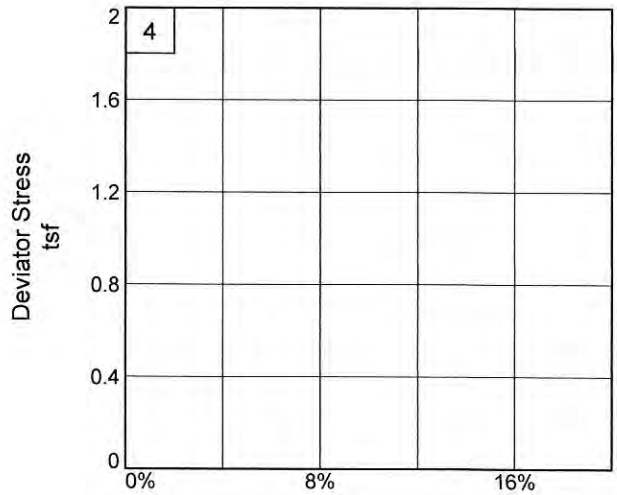
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

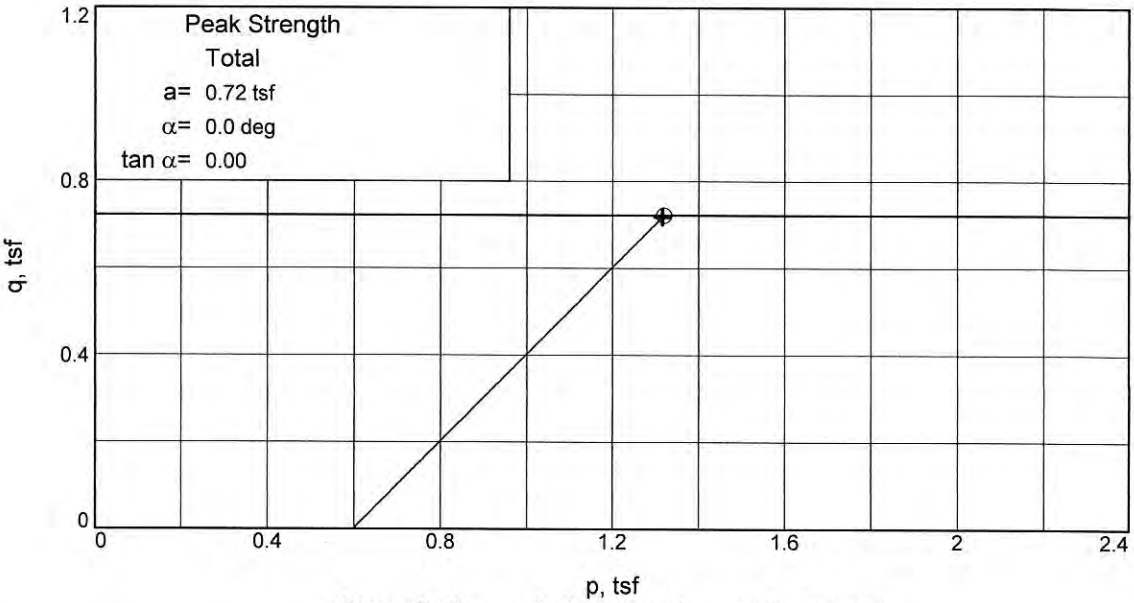
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

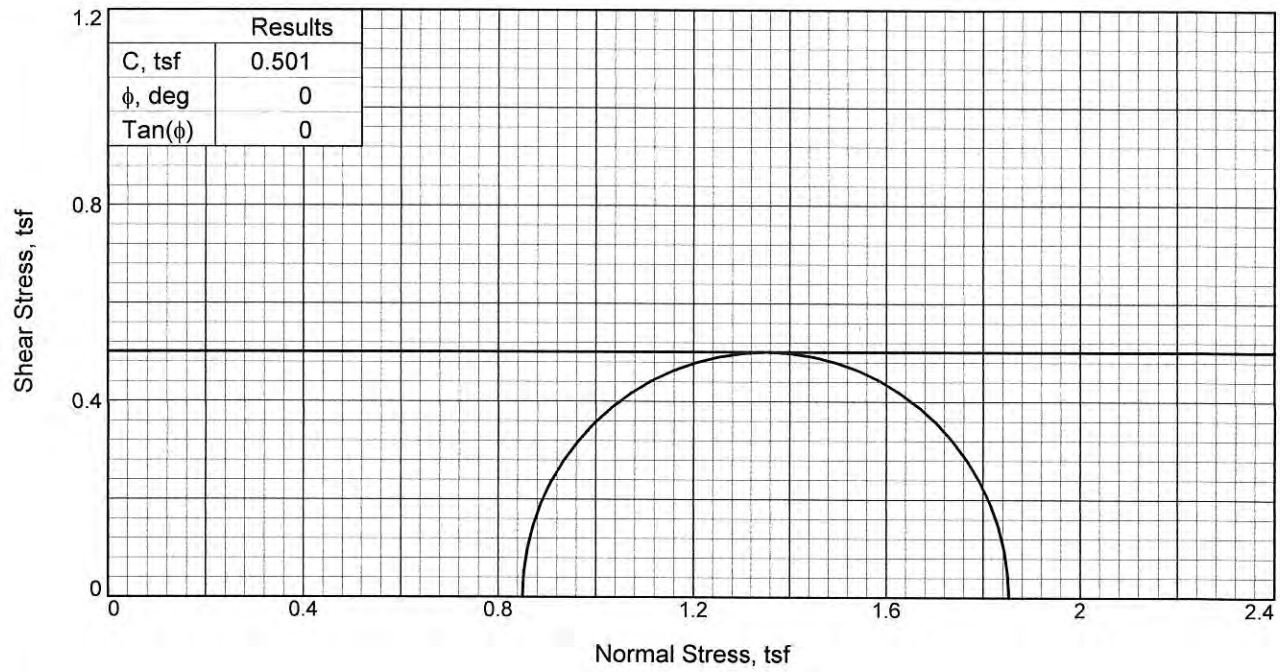
Client:

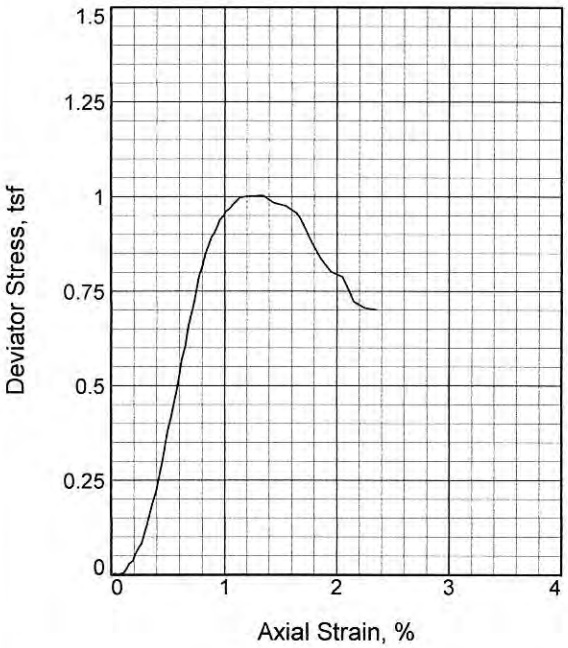
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 23

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	29.0
	Dry Density, pcf	96.5
	Saturation, %	99.6
	Void Ratio	0.8177
	Diameter, in.	2.81
	Height, in.	5.92
At Test	Water Content, %	28.8
	Dry Density, pcf	96.5
	Saturation, %	98.8
	Void Ratio	0.8177
	Diameter, in.	2.81
	Height, in.	5.92
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		11.80
Fail. Stress, tsf		1.00
Strain, %		1.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.85
σ_3 Failure, tsf		0.85

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Reddish Brown FAT CLAY

LL= 59 **PL=** 39 **PI=** 20

Assumed Specific Gravity= 2.81

Remarks: Test Method: ASTM D2850
Failure Type: 60 degree

Figure _____

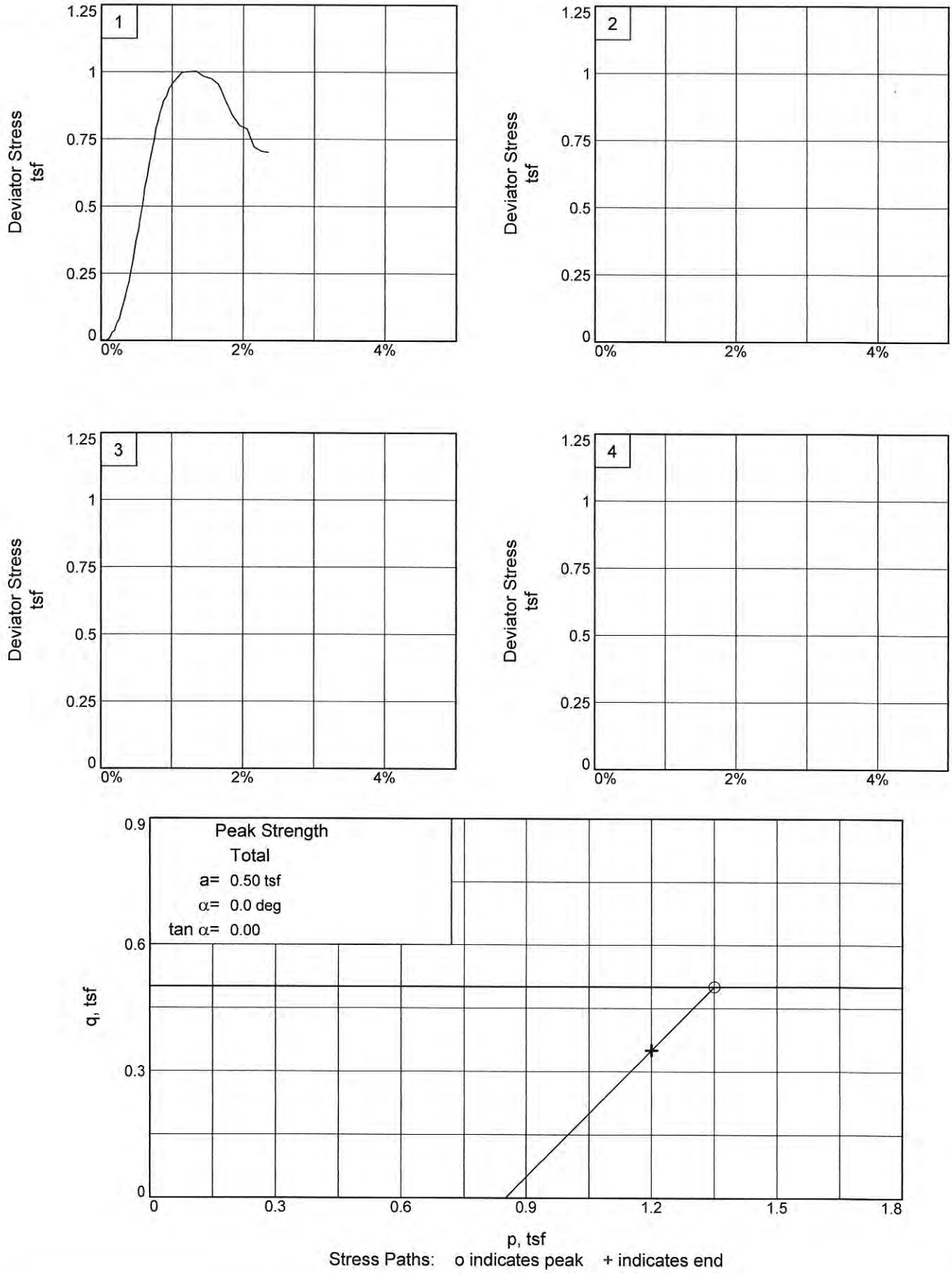
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 33

Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



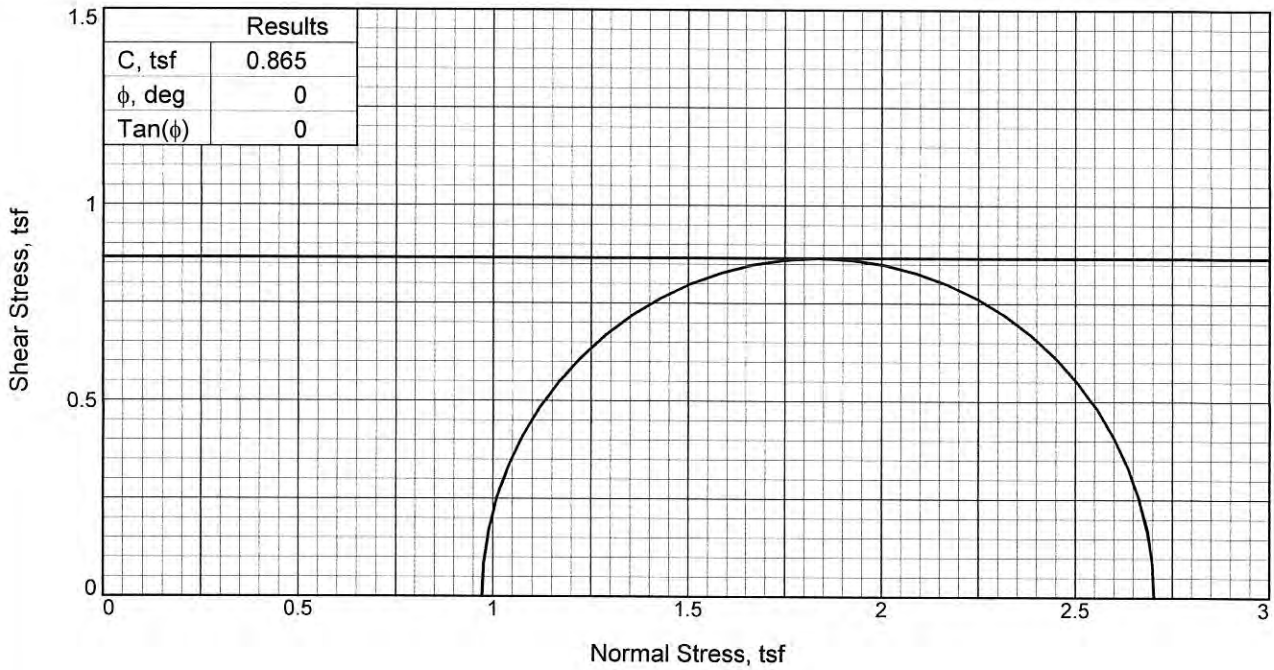
Client:

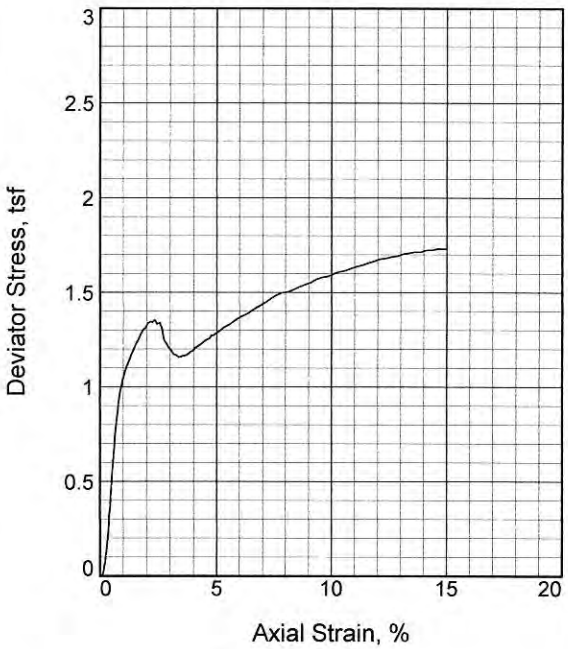
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 33

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	31.3
	Dry Density, pcf	96.0
	Saturation, %	99.9
	Void Ratio	0.9311
	Diameter, in.	2.79
	Height, in.	5.84
At Test	Water Content, %	31.4
	Dry Density, pcf	96.0
	Saturation, %	100.0
	Void Ratio	0.9311
	Diameter, in.	2.79
	Height, in.	5.84
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		13.50
Fail. Stress, tsf		1.73
Strain, %		14.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.70
σ_3 Failure, tsf		0.97

Type of Test:
Unconsolidated Undrained

Sample Type: UU

Description: Reddish Brown FAT CLAY

LL= 74 **PL=** 34 **PI=** 40

Specific Gravity= 2.97

Remarks: Test Method: ASTM D2850 Failure Type: Slickenslide

Figure _____

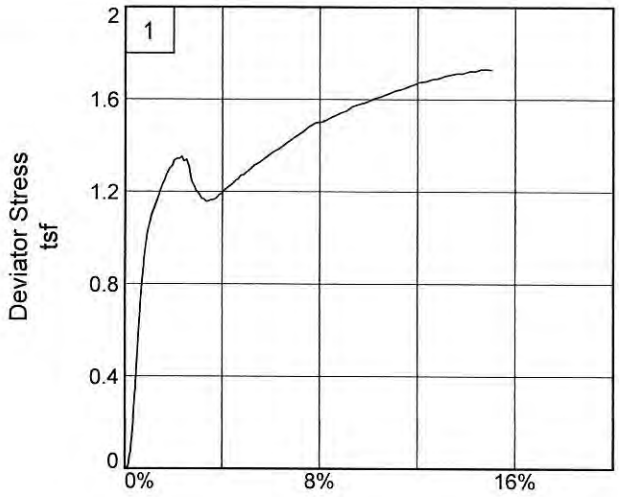
Client:

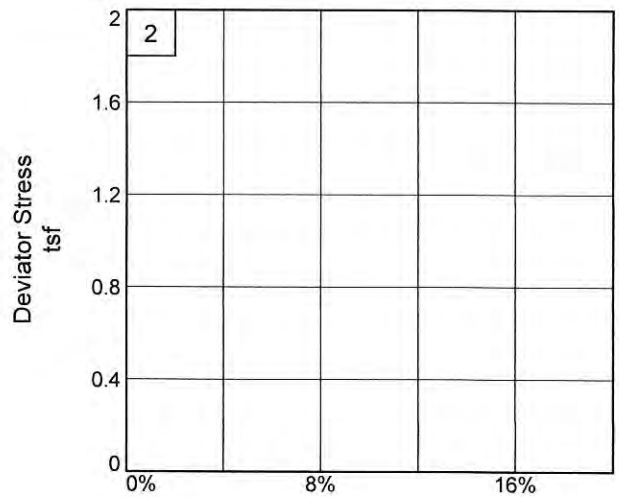
Project: San Jacinto River Waste Pit Superfund Site

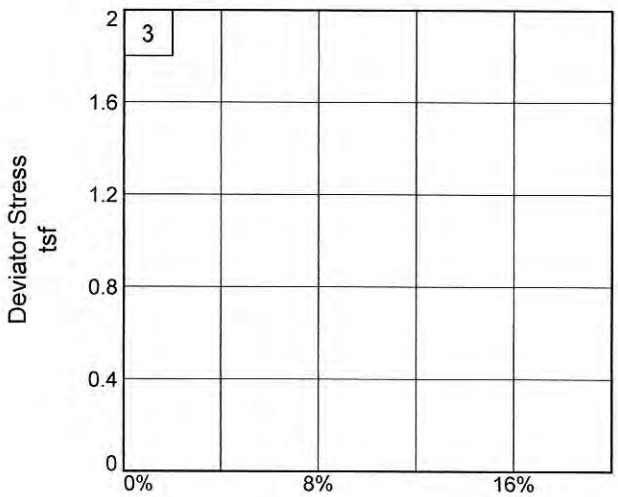
Source of Sample: SJGB047 **Depth:** 38

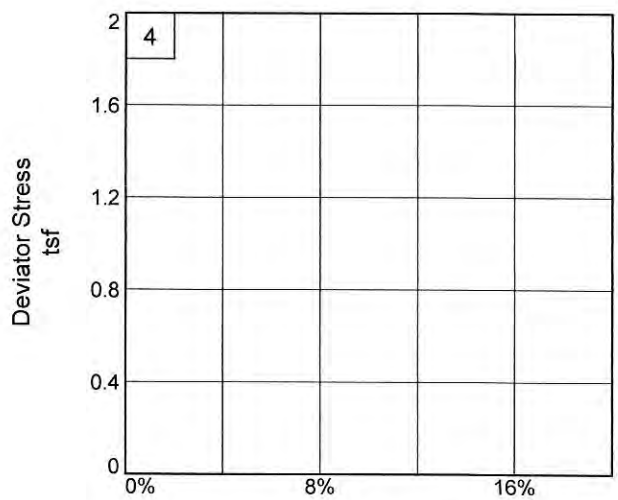
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

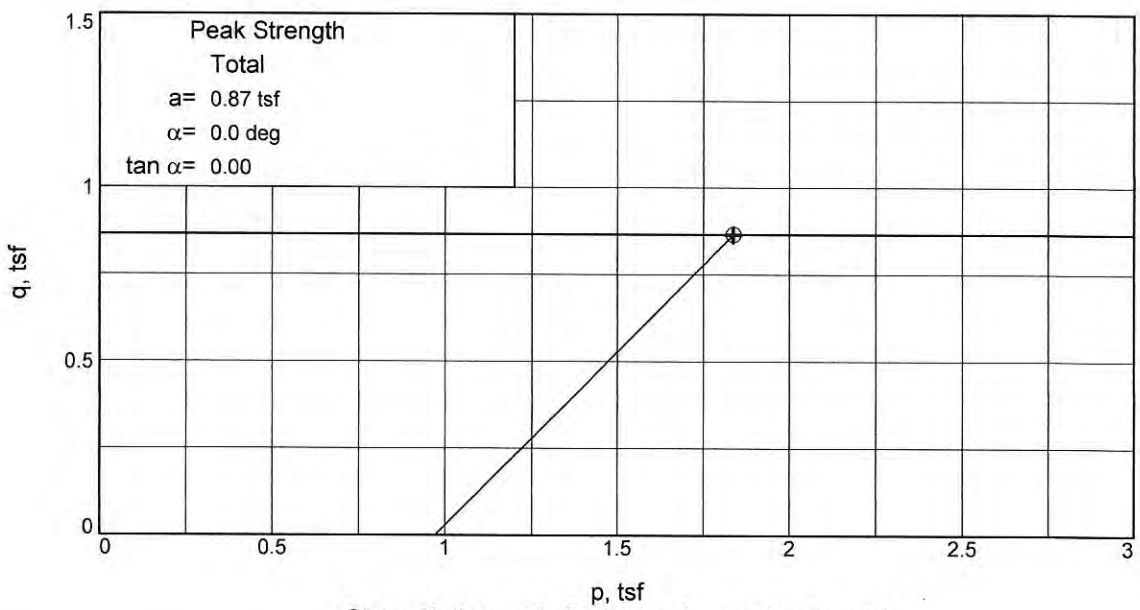
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

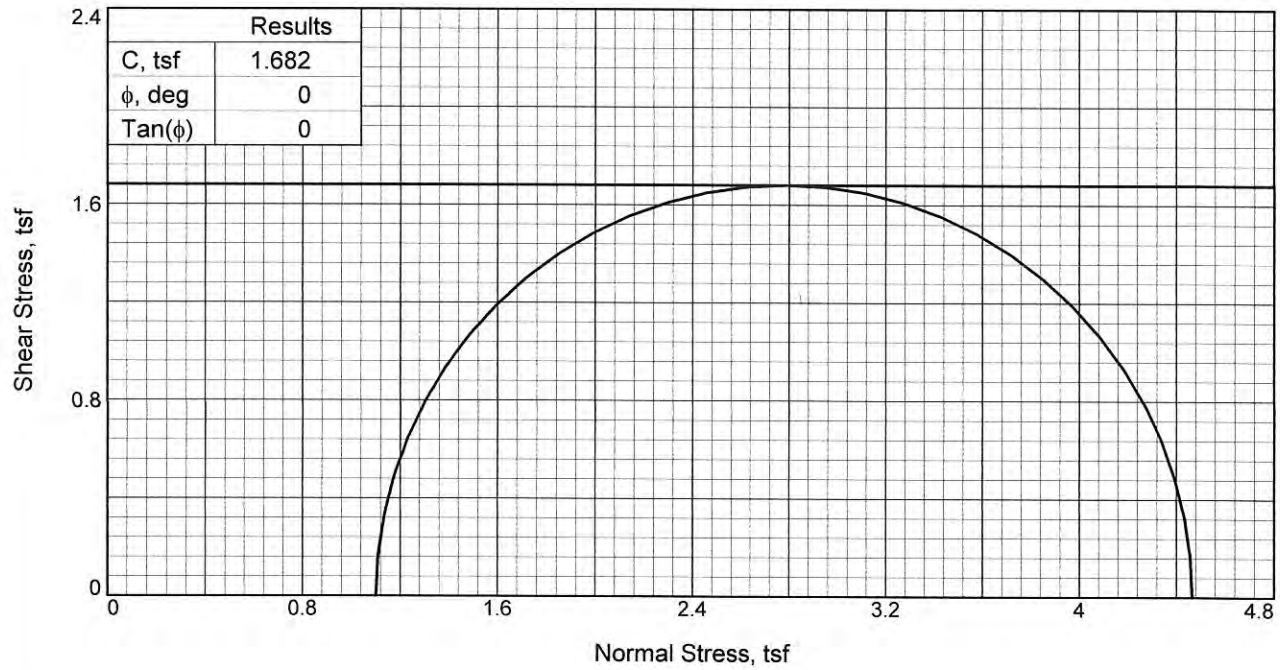
Client:

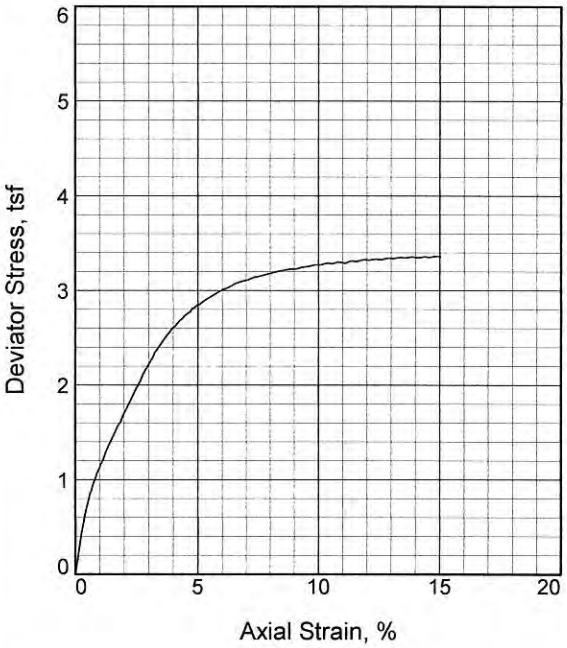
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 38

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	18.6
	Dry Density, pcf	116.0
	Saturation, %	99.5
	Void Ratio	0.5342
	Diameter, in.	2.78
	Height, in.	5.95
At Test	Water Content, %	19.0
	Dry Density, pcf	116.0
	Saturation, %	101.2
	Void Ratio	0.5342
	Diameter, in.	2.78
	Height, in.	5.95
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		15.30
Fail. Stress, tsf		3.36
Strain, %		14.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		4.46
σ_3 Failure, tsf		1.10

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY with SAND

LL= 42 **PL=** 18 **PI=** 24

Assumed Specific Gravity= 2.85

Remarks: Test Method: ASTM D2850
Failure Type: Buldge

Figure _____

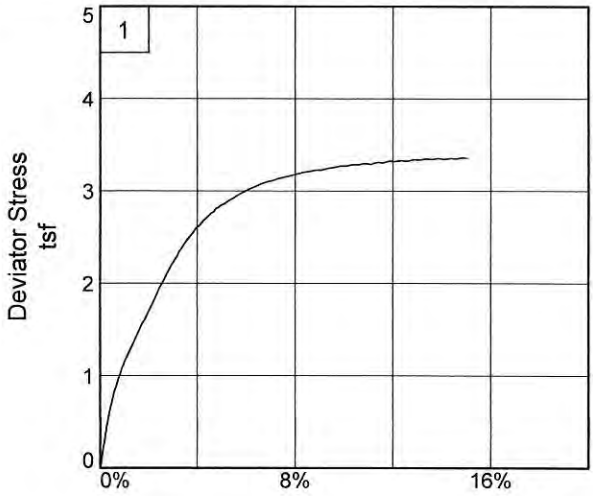
Client:

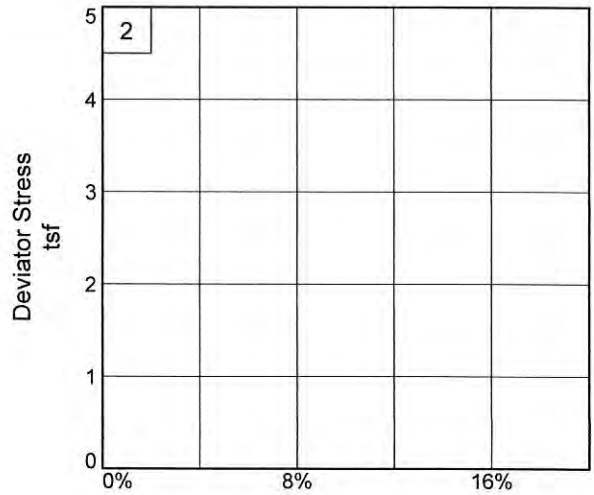
Project: San Jacinto River Waste Pit Superfund Site

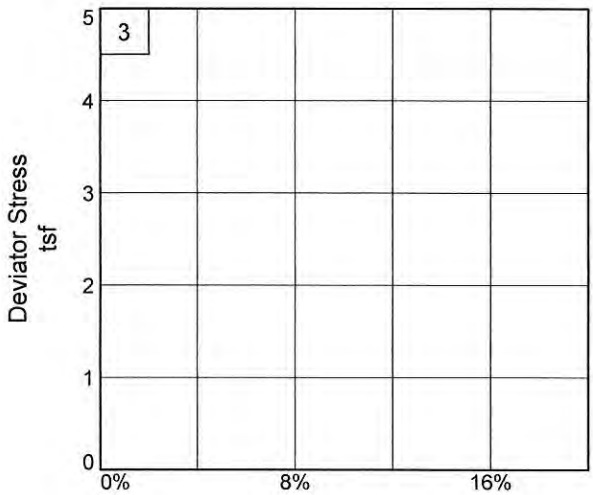
Source of Sample: SJGB047 **Depth:** 43

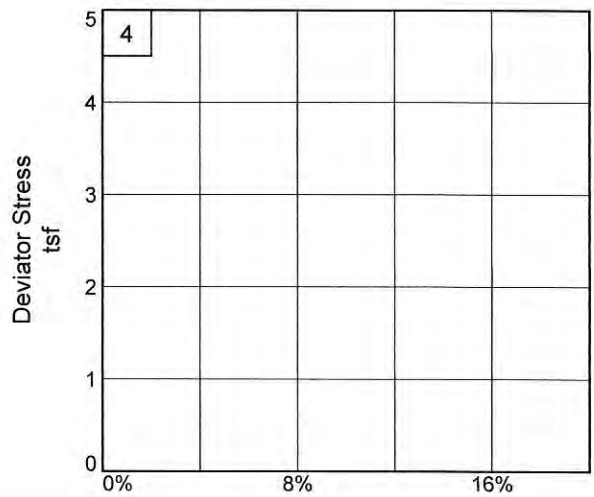
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

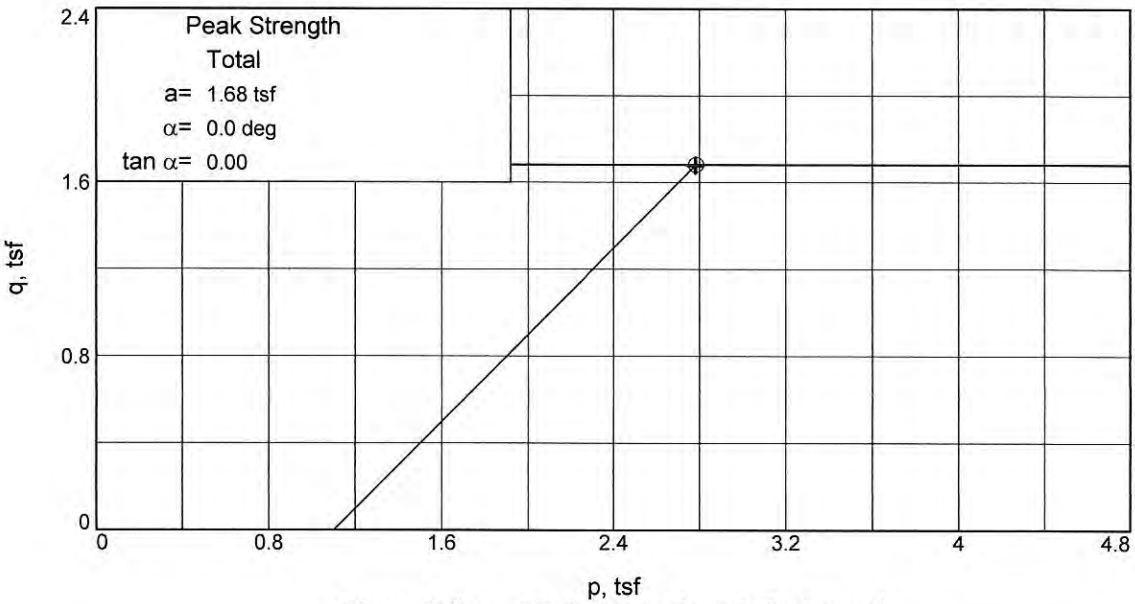
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

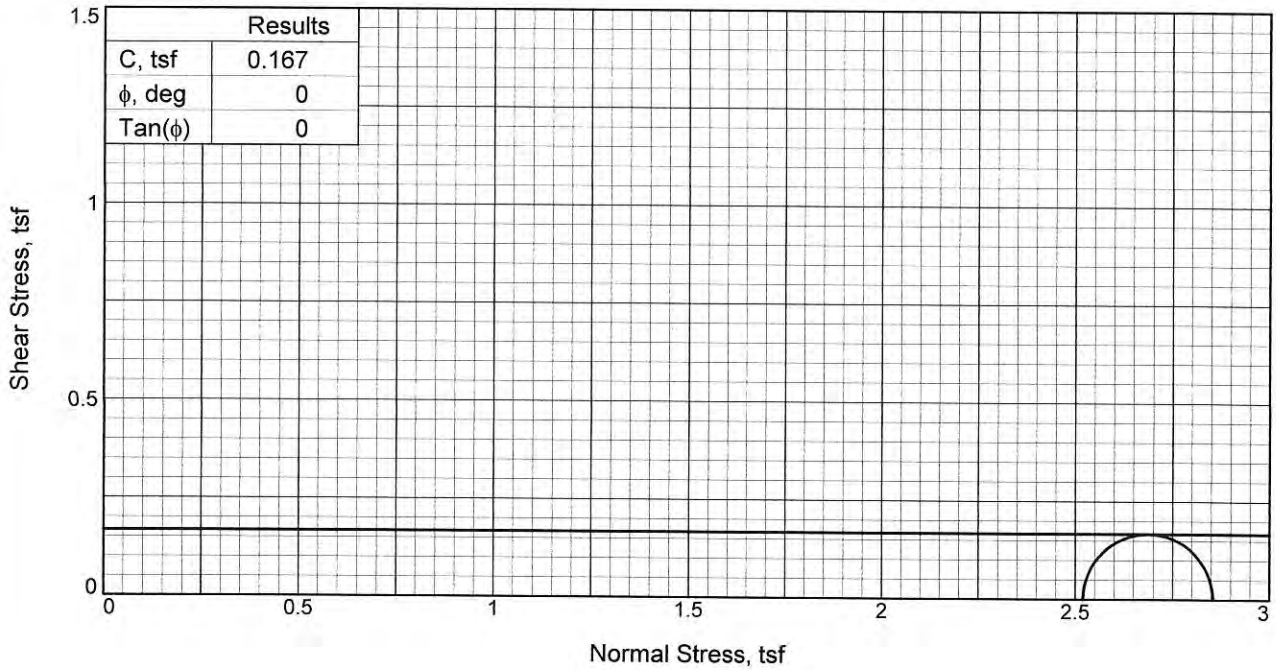
Client:

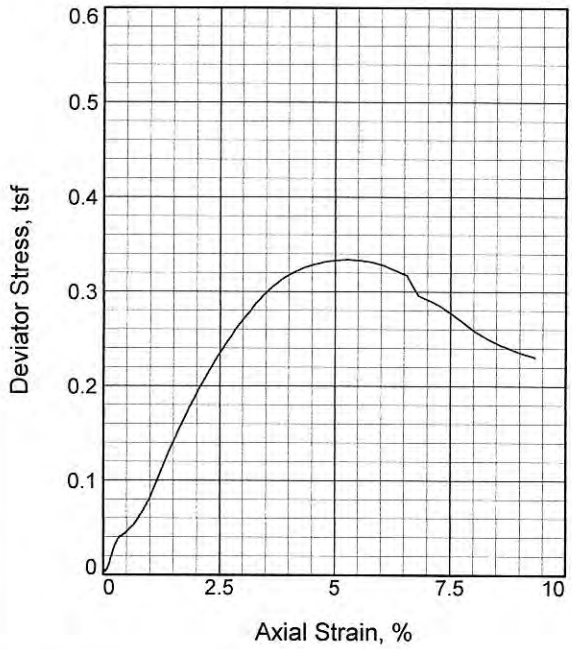
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 43

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	21.4
	Dry Density, pcf	98.0
	Saturation, %	80.4
	Void Ratio	0.7196
	Diameter, in.	2.85
	Height, in.	5.54
At Test	Water Content, %	22.5
	Dry Density, pcf	98.0
	Saturation, %	84.4
	Void Ratio	0.7196
	Diameter, in.	2.85
	Height, in.	5.54
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		35.00
Fail. Stress, tsf		0.33
Strain, %		5.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.85
σ_3 Failure, tsf		2.52

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan and gray FAT CLAY

LL= 73 **PL=** 23 **PI=** 50

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Multiple shear

Figure _____

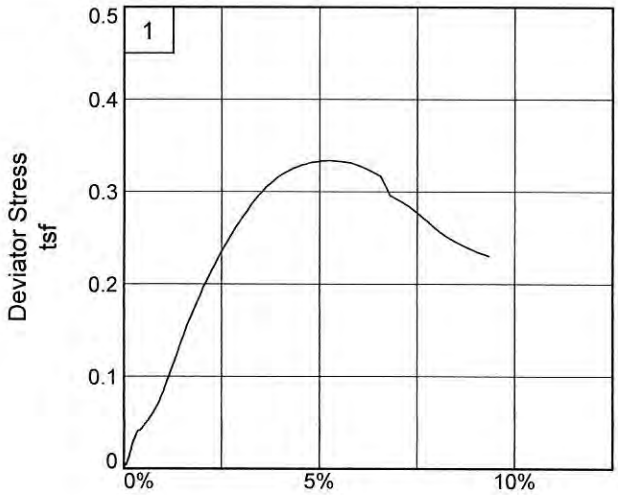
Client:

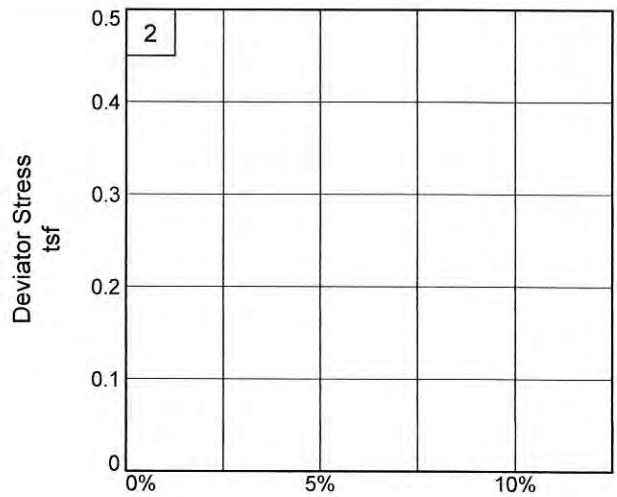
Project: San Jacinto River Waste Pit Superfund Site

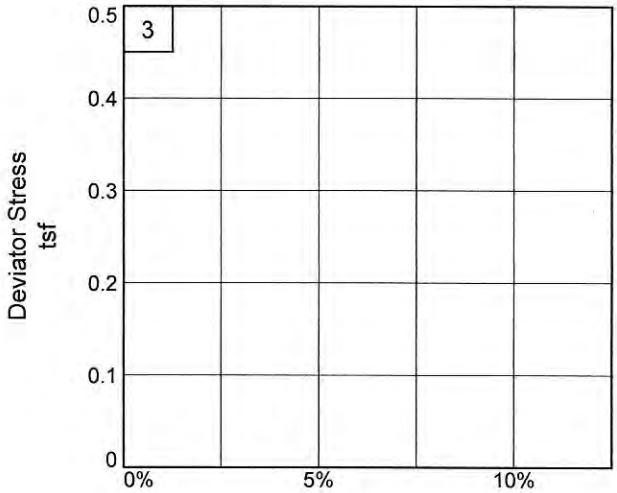
Source of Sample: SJGB047 **Depth:** 98

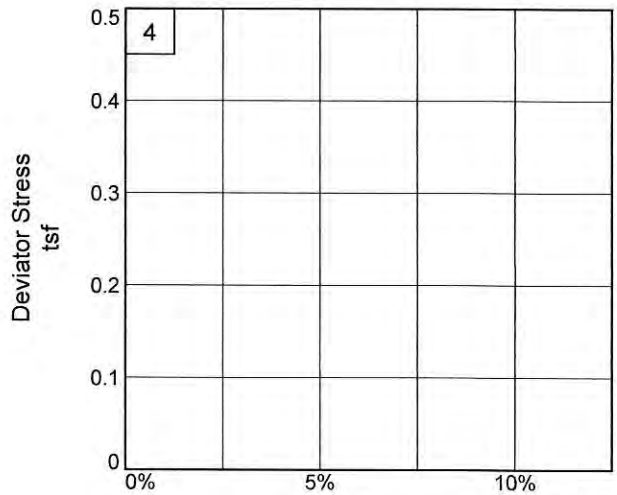
Proj. No.: 19.15.131 **Date Sampled:** 3/3/20

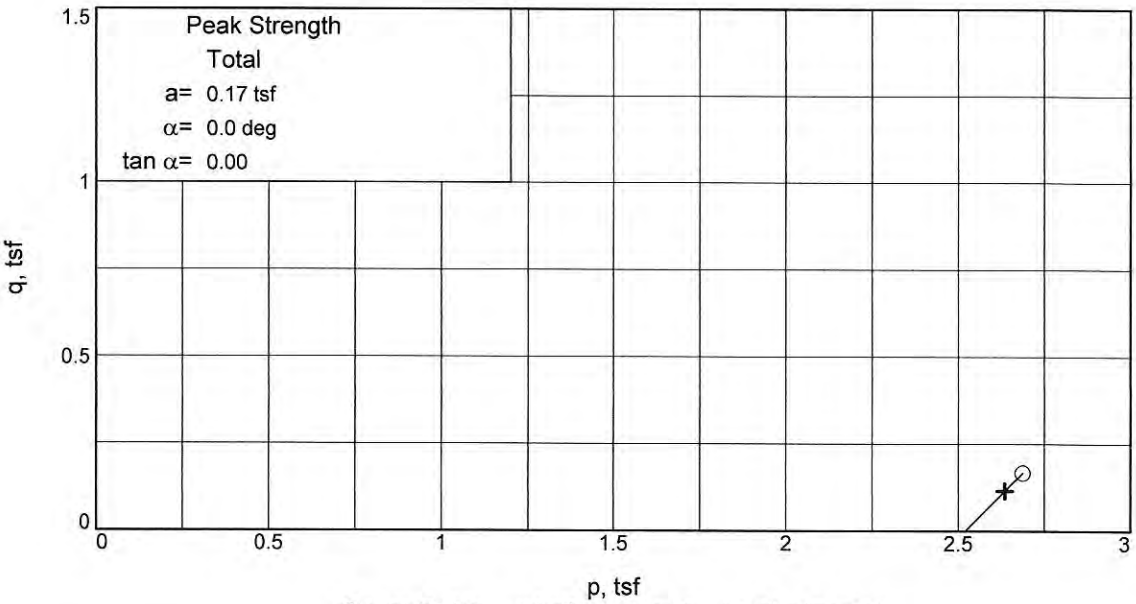
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

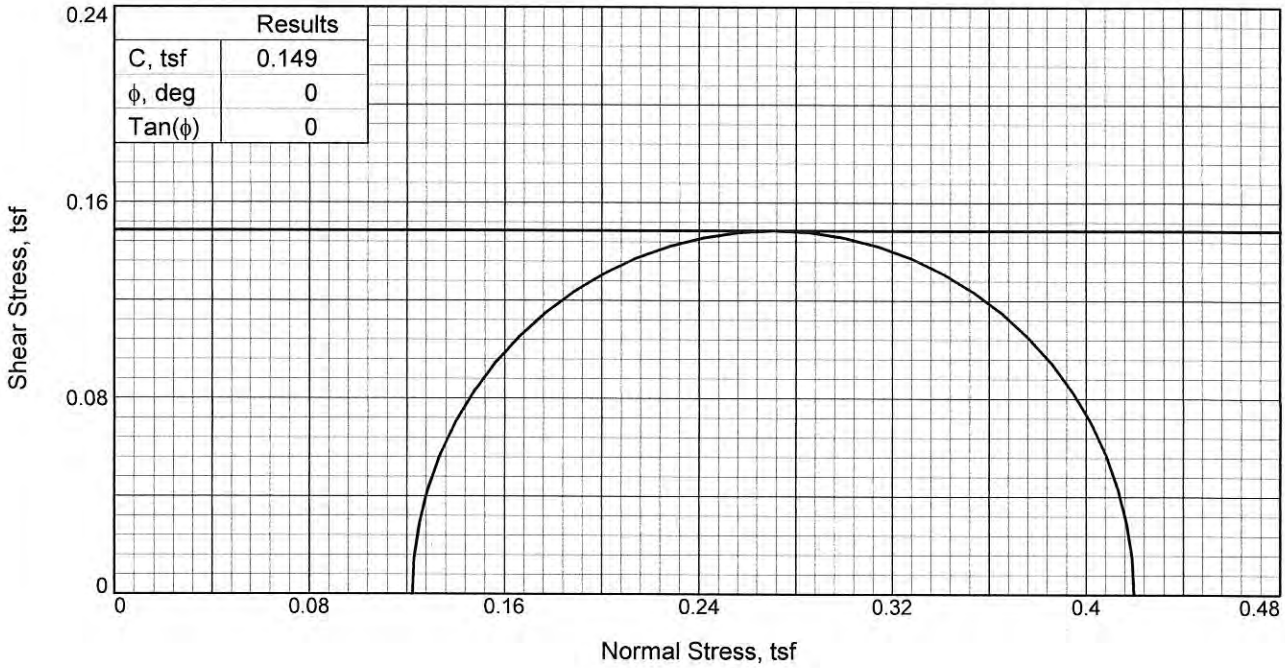
Client:

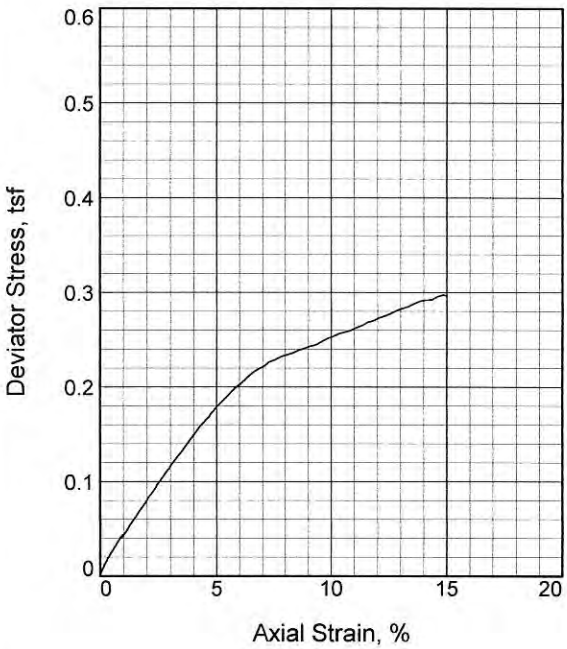
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 98

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	28.6
	Dry Density, pcf	85.0
	Saturation, %	78.6
	Void Ratio	0.9832
	Diameter, in.	2.85
	Height, in.	5.17
At Test	Water Content, %	27.8
	Dry Density, pcf	85.0
	Saturation, %	76.4
	Void Ratio	0.9832
	Diameter, in.	2.85
	Height, in.	5.17
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		1.70
Fail. Stress, tsf		0.30
Strain, %		14.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.42
σ_3 Failure, tsf		0.12

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Dark gray FAT CLAY

LL= 32 **PL=** 16 **PI=** 16

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

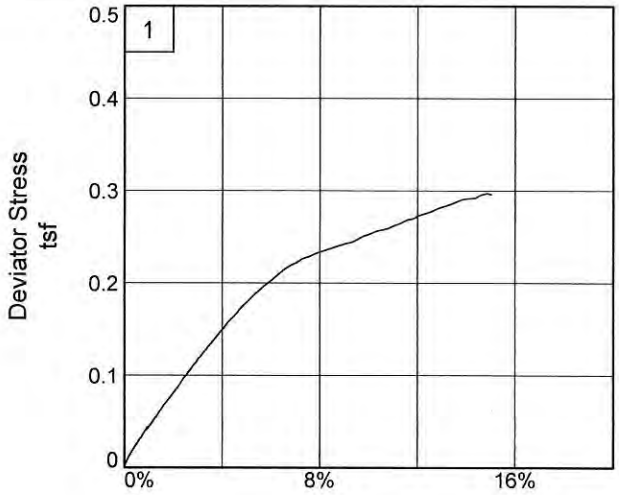
Client:

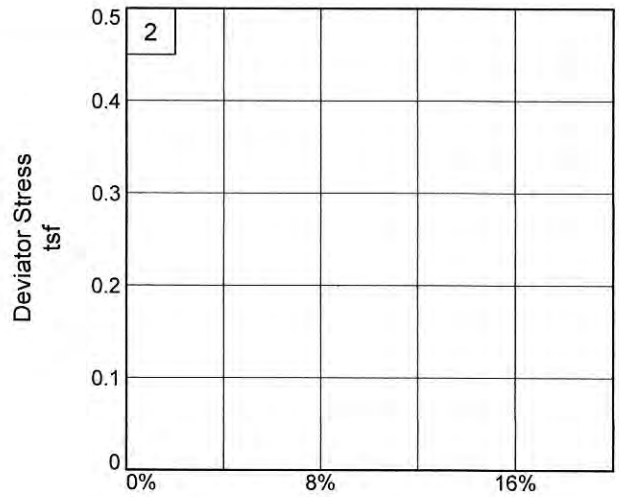
Project: San Jacinto River Waste Pit Superfund Site

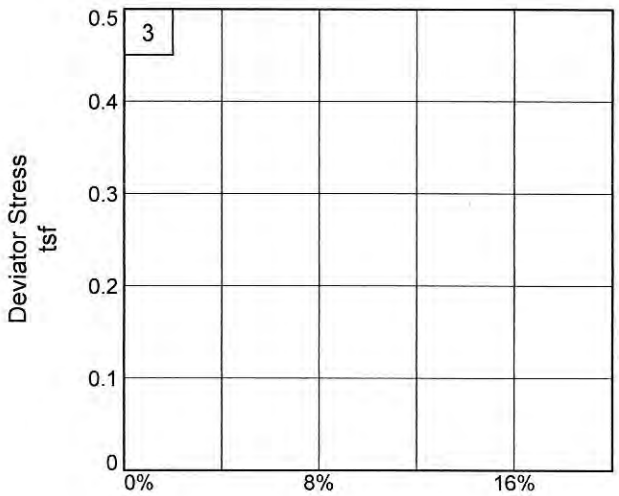
Source of Sample: SJGB050 **Depth:** 4-6

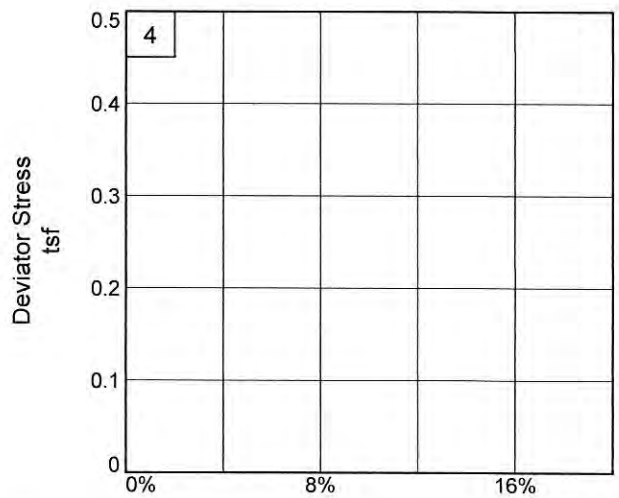
Proj. No.: 19.15.131 **Date Sampled:** 2/20/20

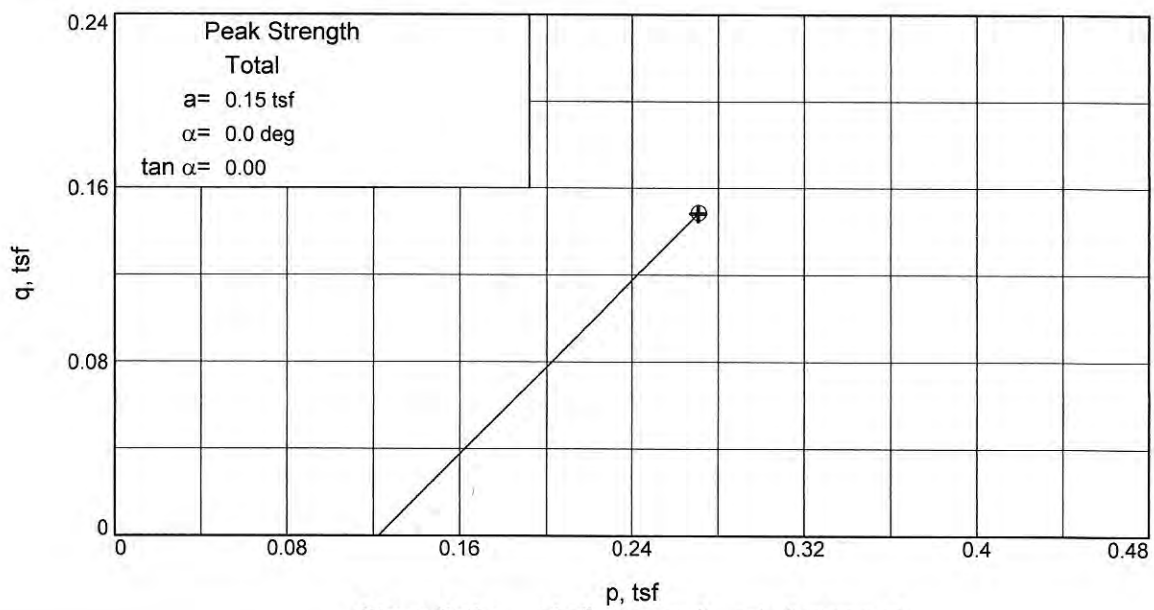
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

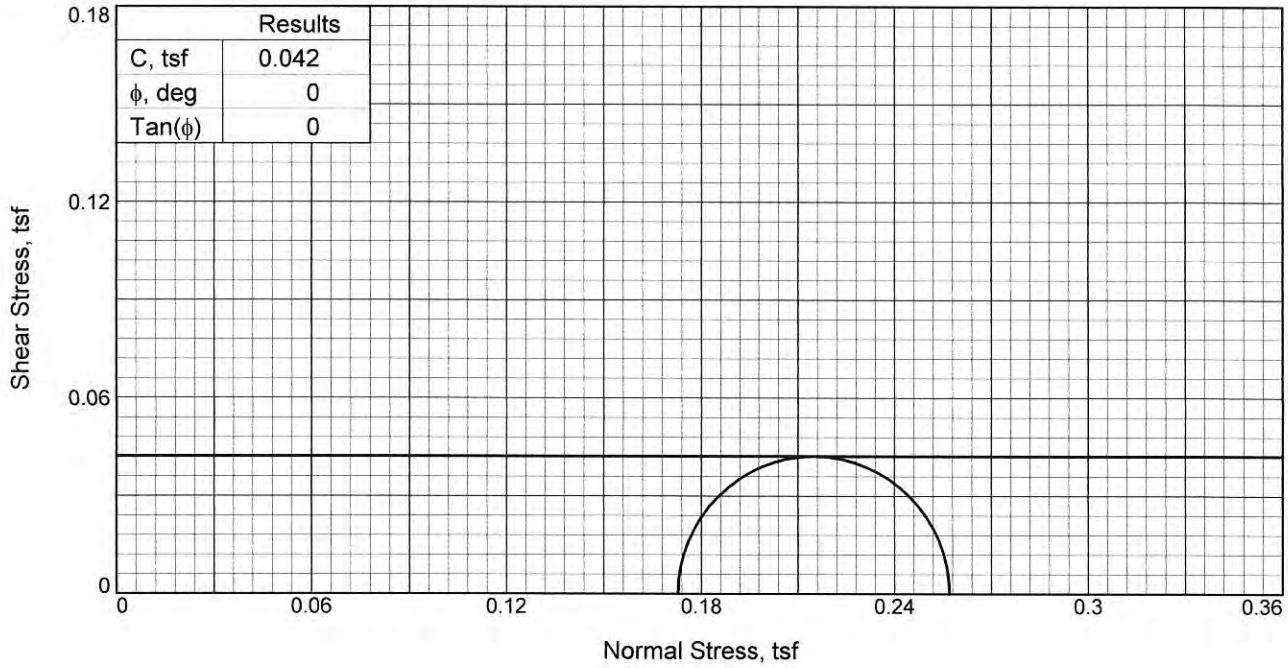
Client:

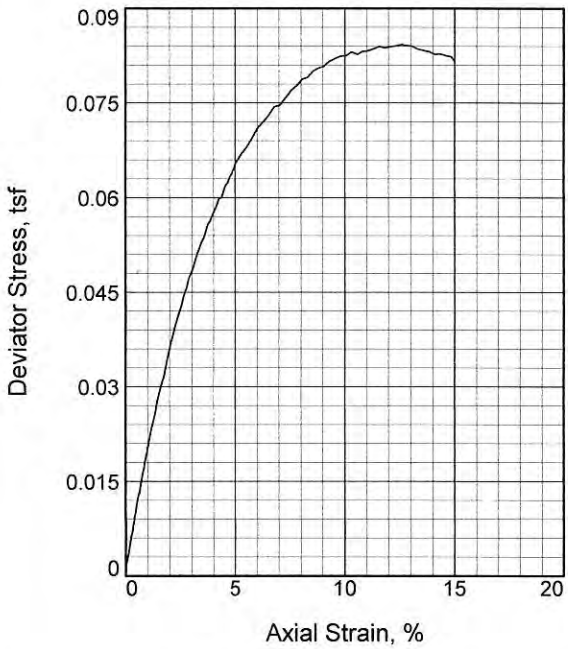
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB050 **Depth:** 4-6

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	32.8
	Dry Density, pcf	85.3
	Saturation, %	90.7
	Void Ratio	0.9761
	Diameter, in.	2.73
	Height, in.	5.70
At Test	Water Content, %	34.1
	Dry Density, pcf	85.3
	Saturation, %	94.2
	Void Ratio	0.9761
	Diameter, in.	2.73
	Height, in.	5.70
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		2.40
Fail. Stress, tsf		0.08
Strain, %		12.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		0.26
σ_3 Failure, tsf		0.17

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Dark gray CLAYEY SAND

LL= 34 **PL=** 17 **PI=** 17

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

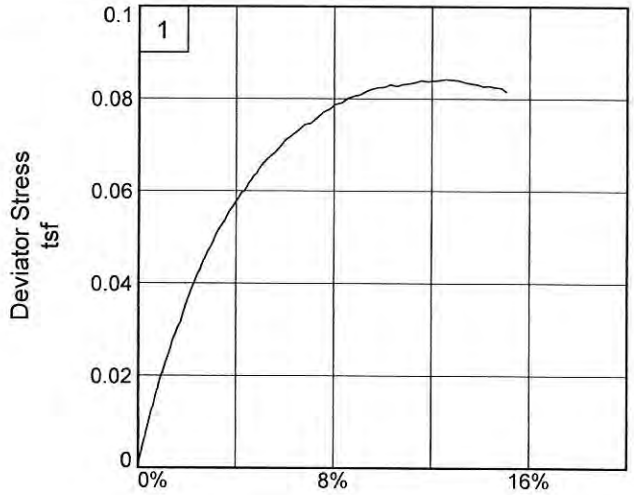
Client:

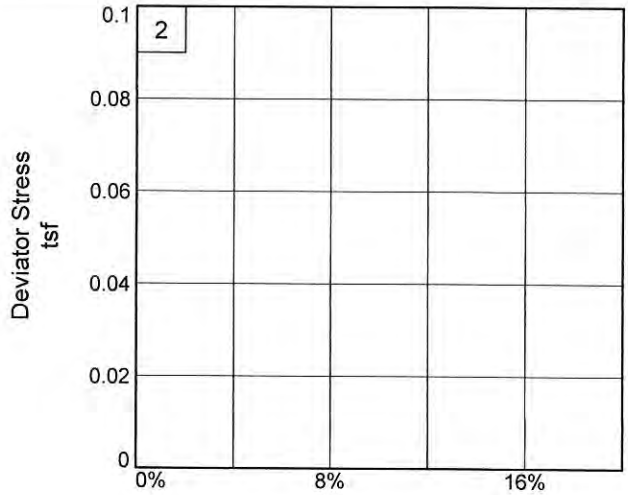
Project: San Jacinto River Waste Pit Superfund Site

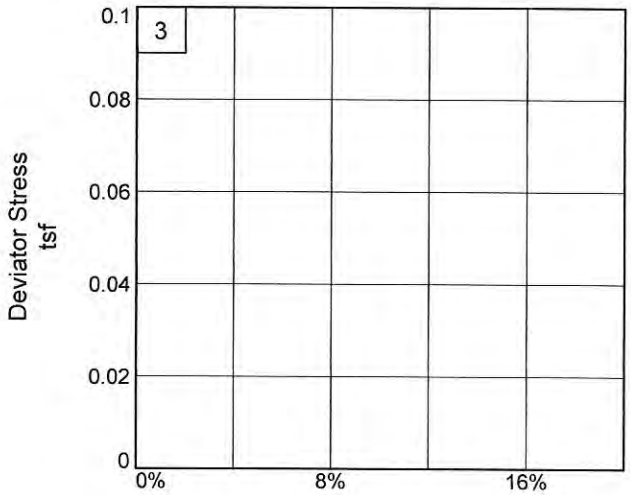
Source of Sample: SJGB050 **Depth:** 6-8

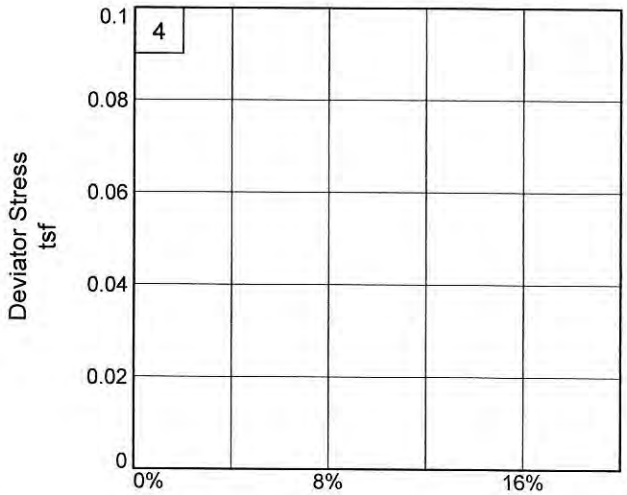
Proj. No.: 19.15.131 **Date Sampled:** 2/20/20

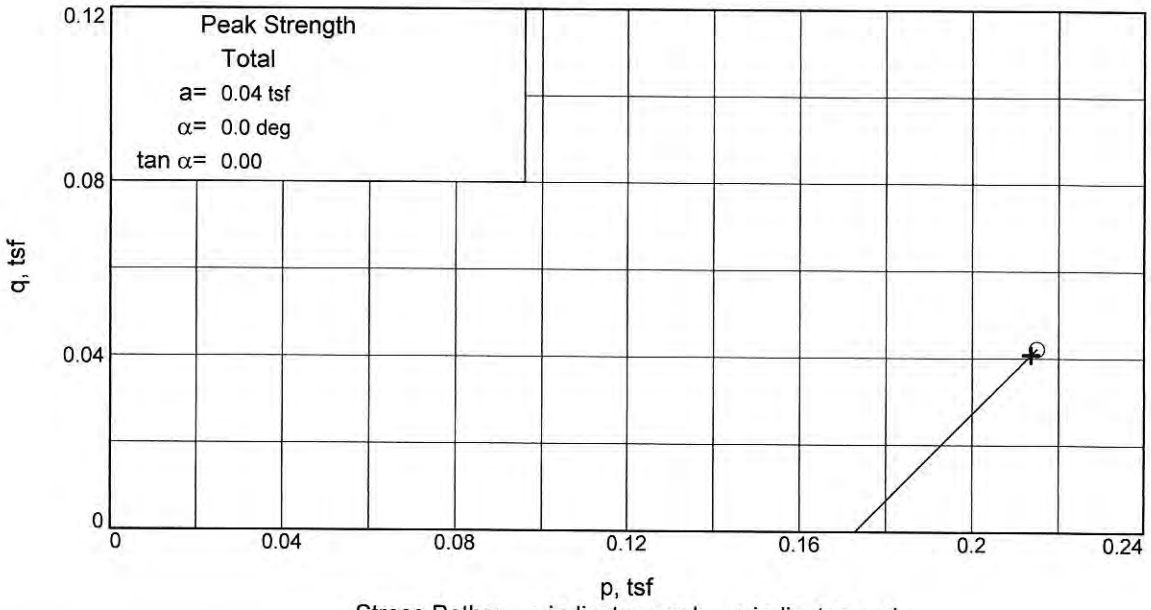
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

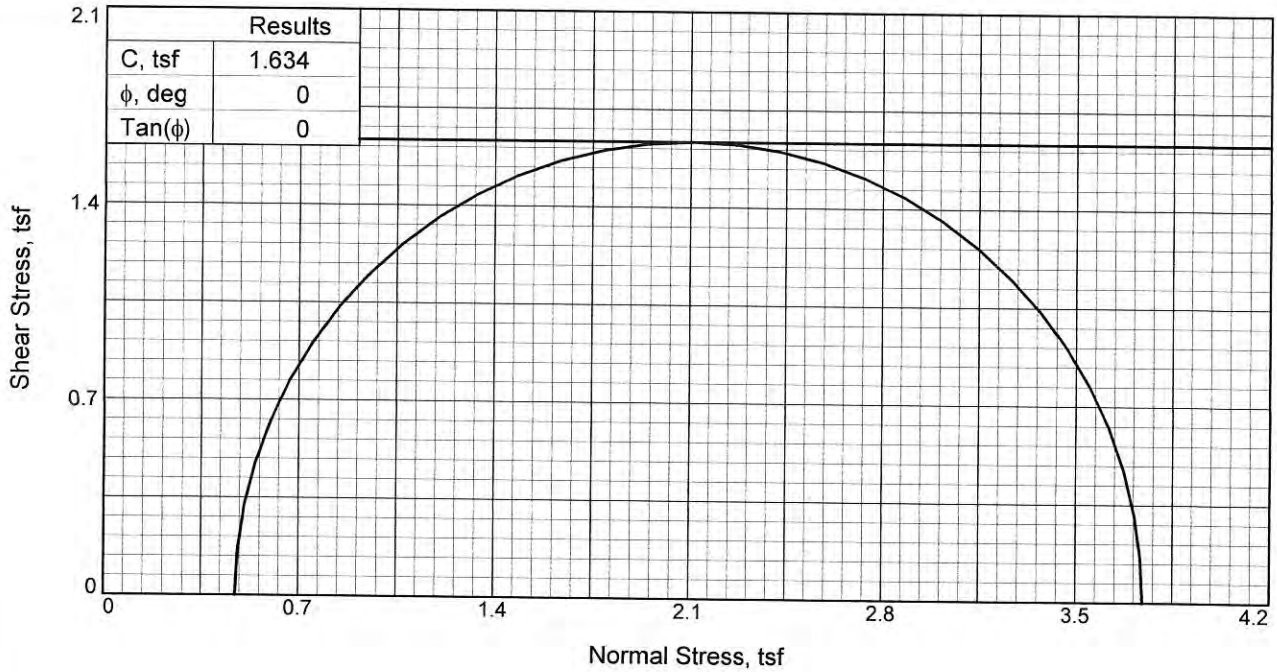
Client:

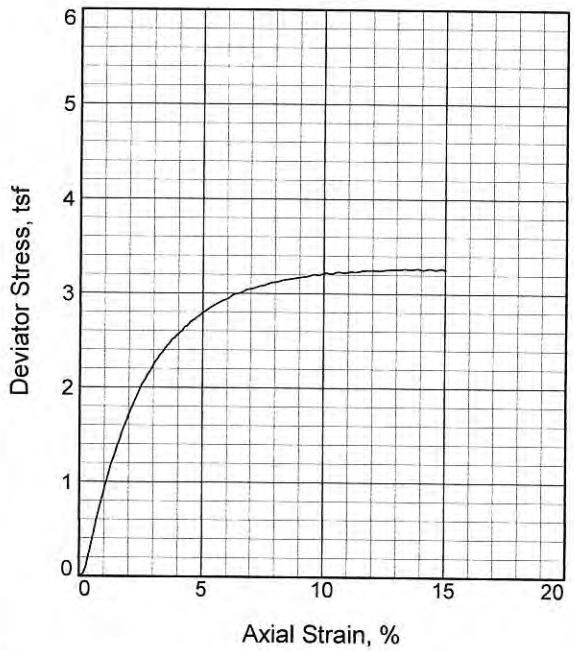
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB050 **Depth:** 6-8

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	17.3
	Dry Density, pcf	116.3
	Saturation, %	99.2
	Void Ratio	0.4816
	Diameter, in.	2.79
	Height, in.	5.84
At Test	Water Content, %	17.6
	Dry Density, pcf	116.3
	Saturation, %	101.1
	Void Ratio	0.4816
	Diameter, in.	2.79
	Height, in.	5.84
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		6.60
Fail. Stress, tsf		3.27
Strain, %		14.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.74
σ_3 Failure, tsf		0.48

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY

LL= 45 **PL=** 22 **PI=** 23

Assumed Specific Gravity= 2.76

Remarks: Test Method: ASTM D2850
Failure Type: Bulge

Figure _____

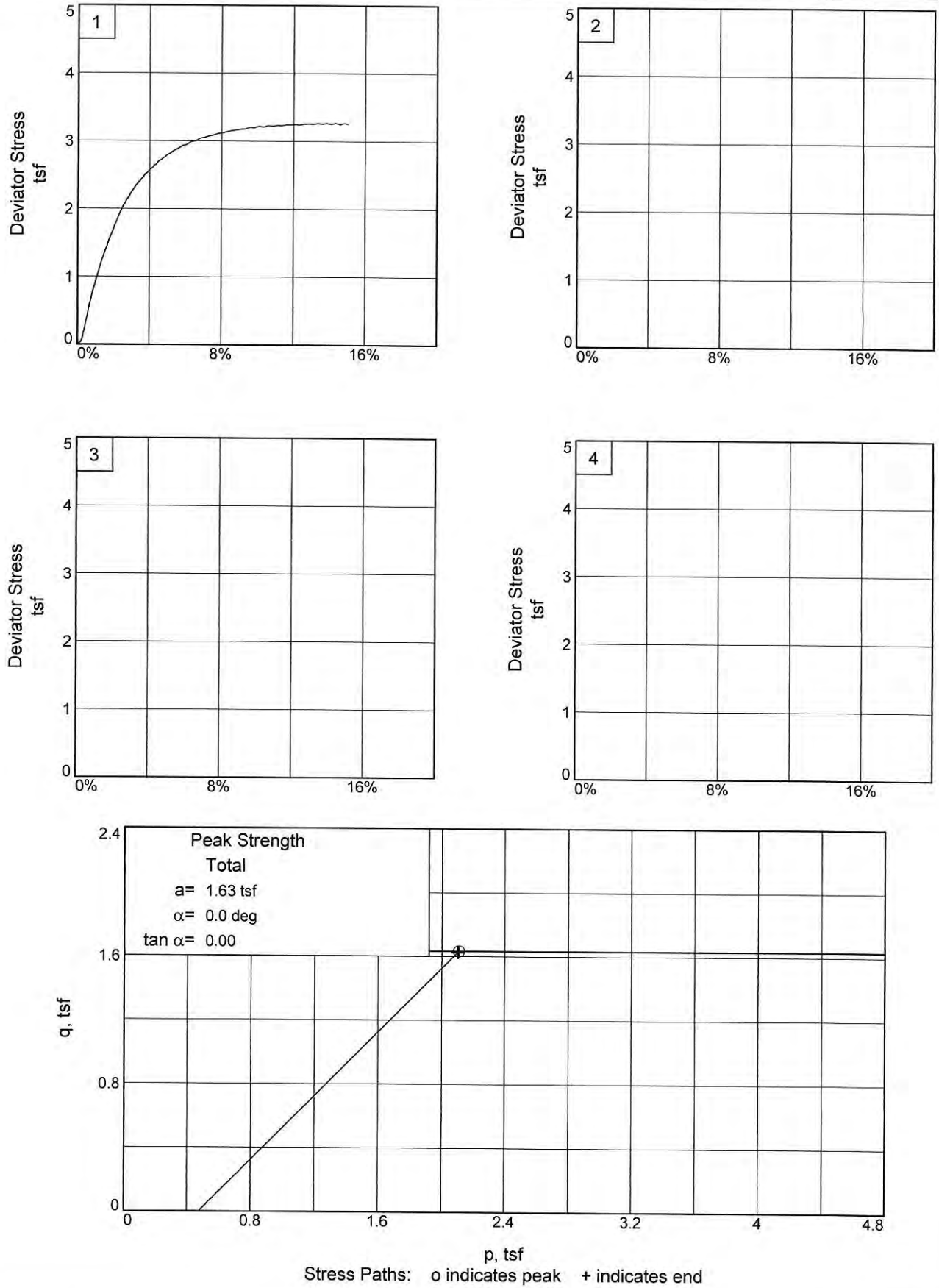
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 18

Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



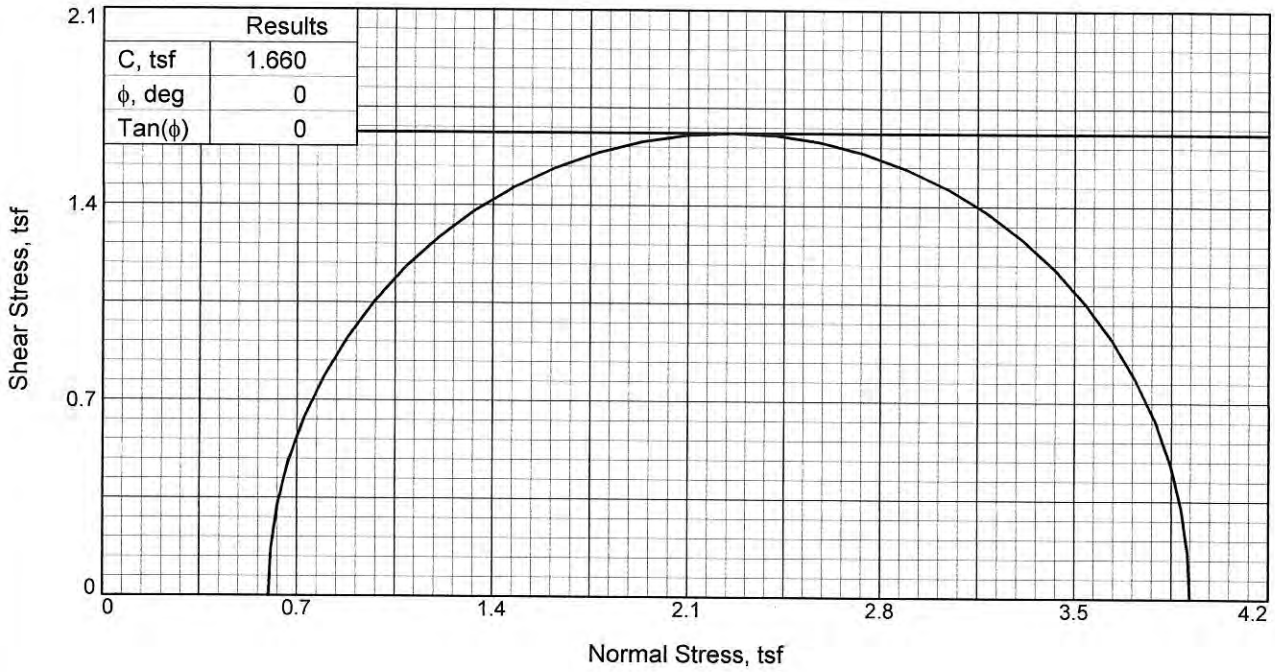
Client:

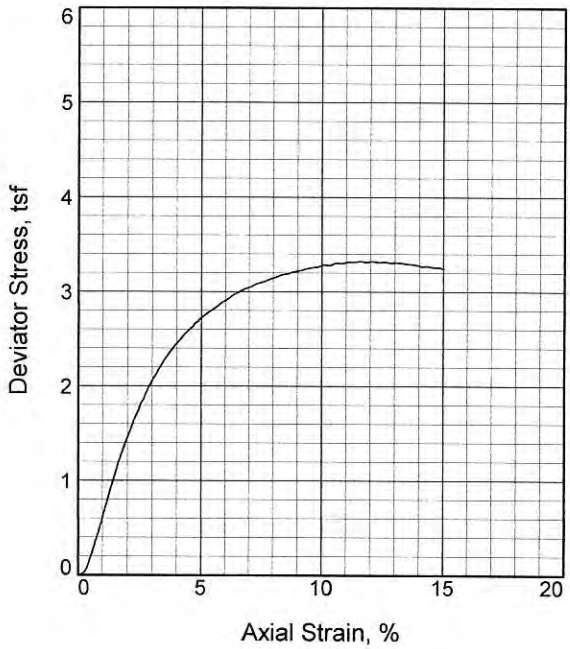
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 18

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	17.5
	Dry Density, pcf	116.0
	Saturation, %	99.5
	Void Ratio	0.4850
	Diameter, in.	2.79
	Height, in.	5.84
At Test	Water Content, %	16.9
	Dry Density, pcf	116.0
	Saturation, %	96.0
	Void Ratio	0.4850
	Diameter, in.	2.79
	Height, in.	5.84
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		8.30
Fail. Stress, tsf		3.32
Strain, %		12.1
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.92
σ_3 Failure, tsf		0.60

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan LEAN CLAY with SAND

LL= 46 **PL=** 21 **PI=** 25

Assumed Specific Gravity= 2.76

Remarks:
Test Method: ASTM D2850
Failure Type: Buldge

Figure _____

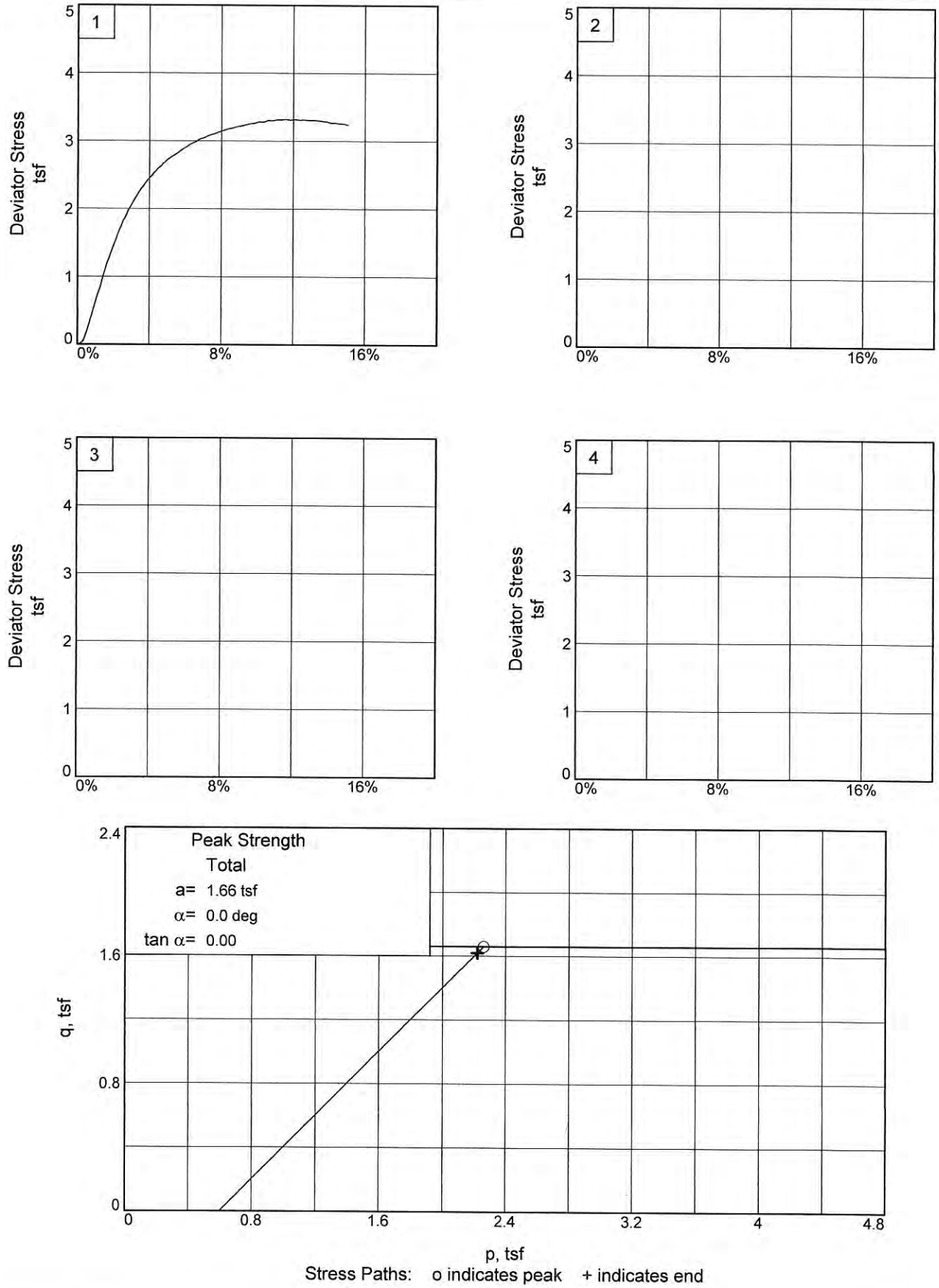
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 23

Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



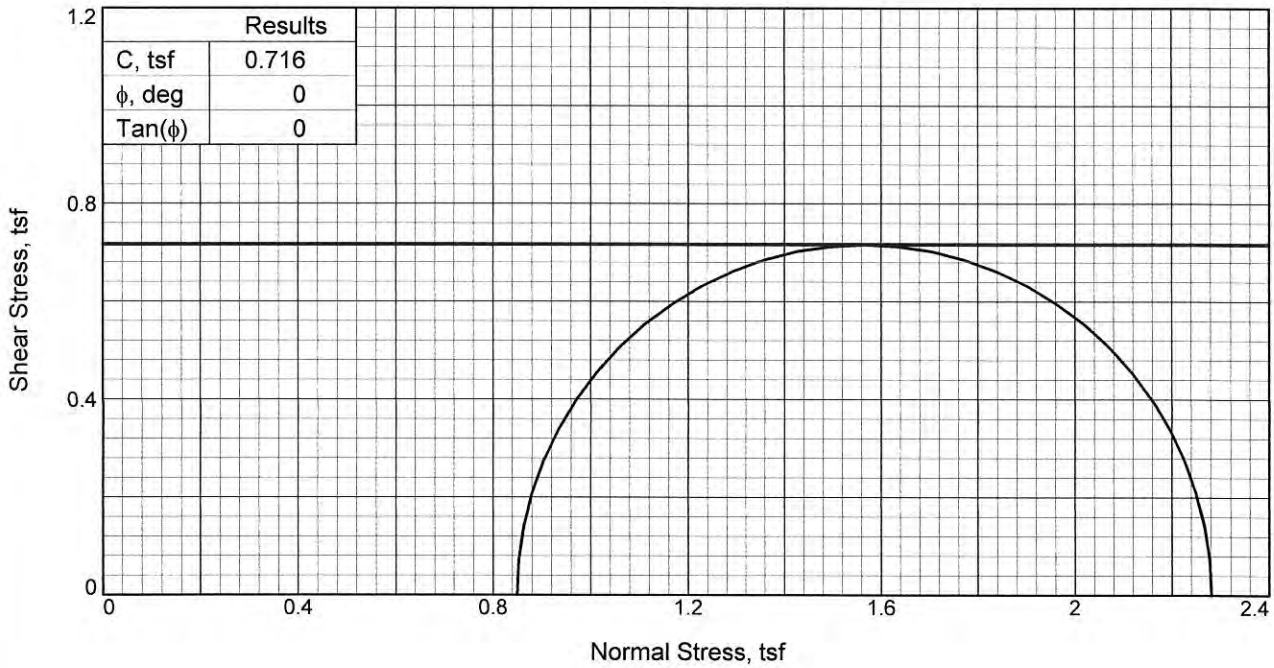
Client:

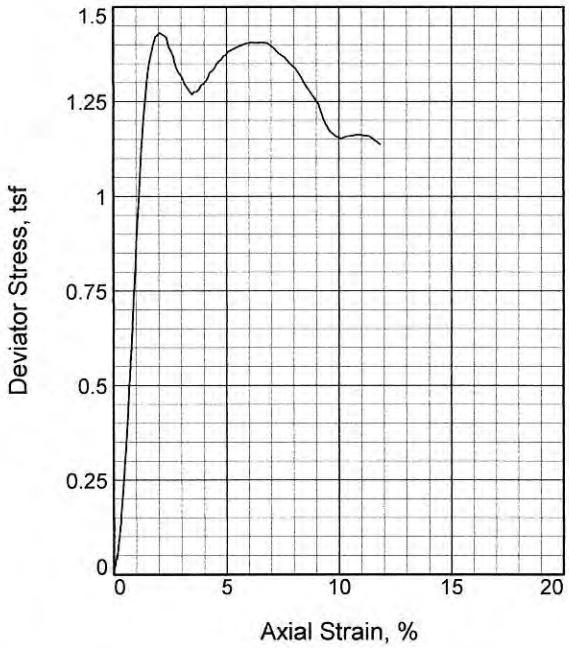
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 23

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	28.4
	Dry Density, pcf	96.0
	Saturation, %	99.9
	Void Ratio	0.7752
	Diameter, in.	2.82
	Height, in.	5.89
At Test	Water Content, %	30.8
	Dry Density, pcf	96.0
	Saturation, %	108.6
	Void Ratio	0.7752
	Diameter, in.	2.82
	Height, in.	5.89
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		11.80
Fail. Stress, tsf		1.43
Strain, %		2.0
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.28
σ_3 Failure, tsf		0.85

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Reddish Brown FAT CLAY

LL= 70 **PL=** 37 **PI=** 33

Assumed Specific Gravity= 2.73

Remarks: Test Method: ASTM D2850
Failure type: Slickenslide

Figure _____

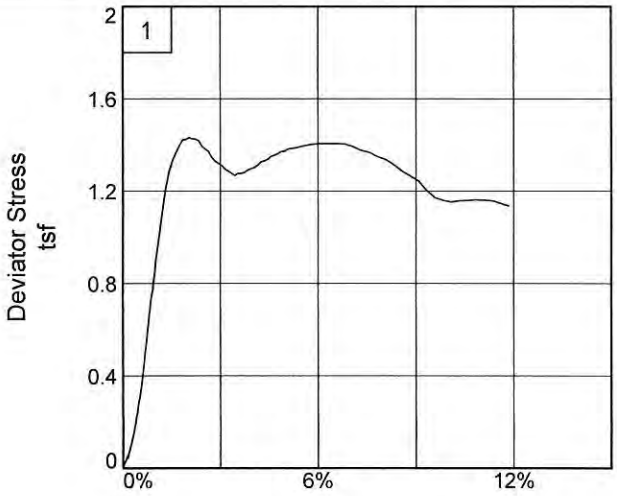
Client:

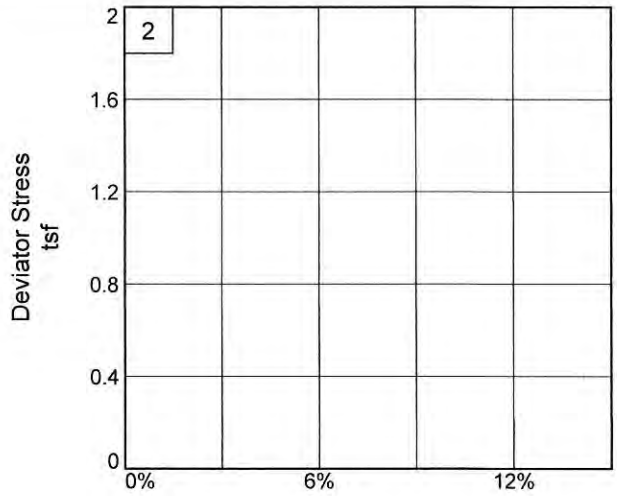
Project: San Jacinto River Waste Pit Superfund Site

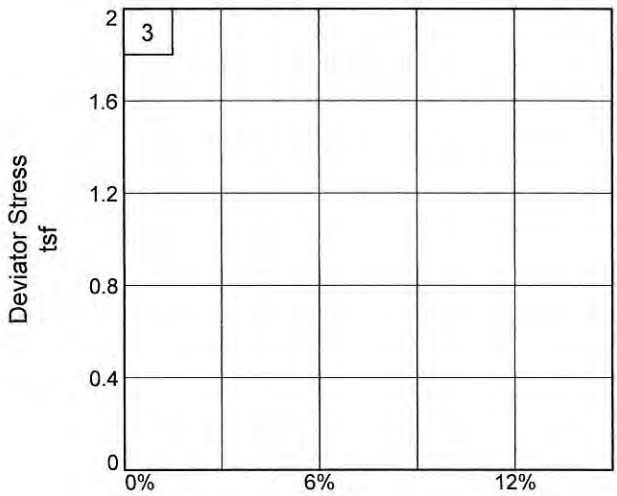
Source of Sample: SJGB053 **Depth:** 33

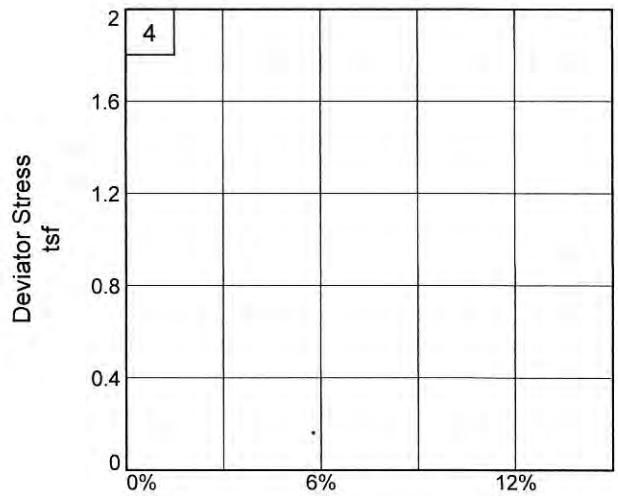
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

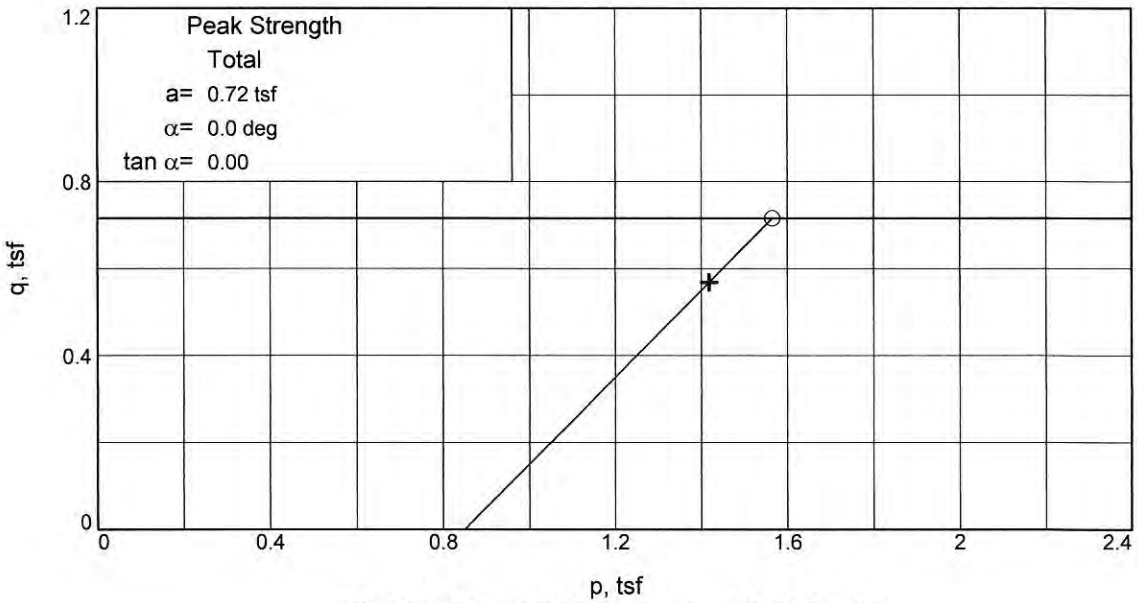
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

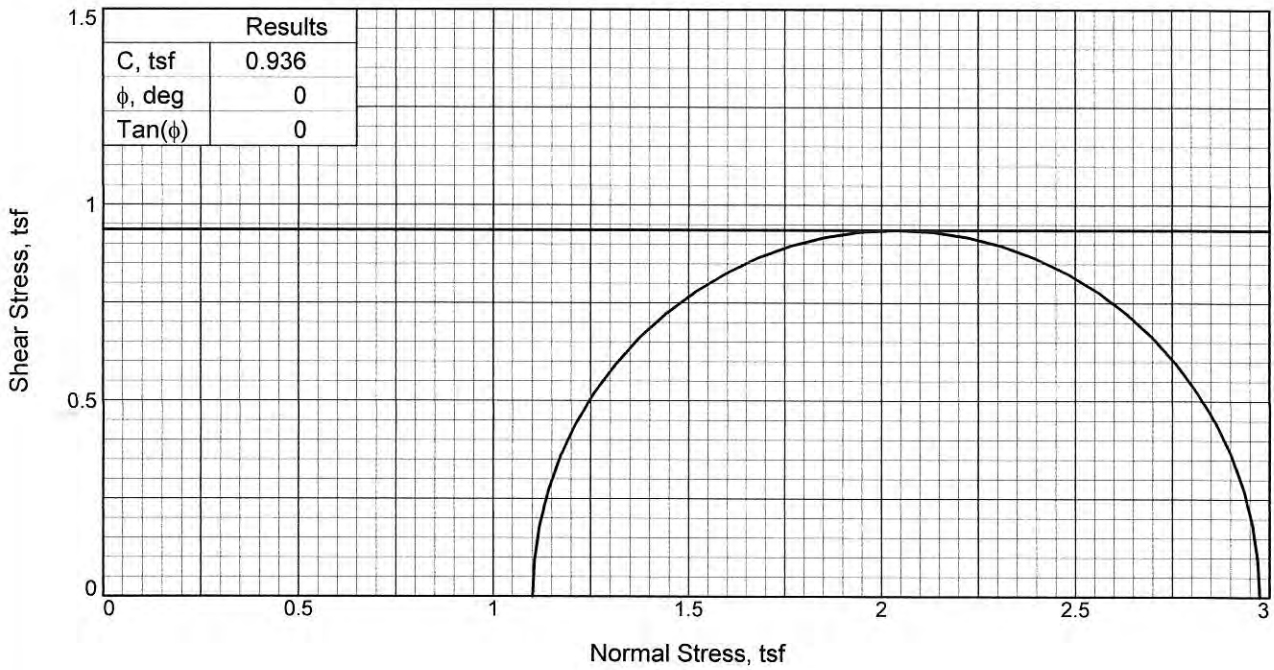
Client:

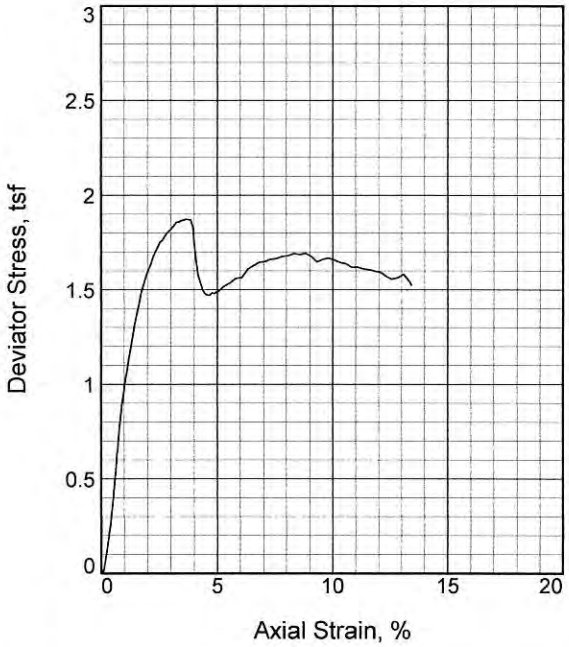
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 33

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	27.0
	Dry Density, pcf	96.9
	Saturation, %	99.6
	Void Ratio	0.7266
	Diameter, in.	2.82
	Height, in.	5.85
At Test	Water Content, %	28.3
	Dry Density, pcf	96.9
	Saturation, %	104.5
	Void Ratio	0.7266
	Diameter, in.	2.82
	Height, in.	5.85
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		15.30
Fail. Stress, tsf		1.87
Strain, %		3.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.97
σ_3 Failure, tsf		1.10

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY

LL= 71 **PL=** 35 **PI=** 36

Assumed Specific Gravity= 2.68

Remarks: Test Method: ASTM D2850
Failure type: Slickenslide

Figure _____

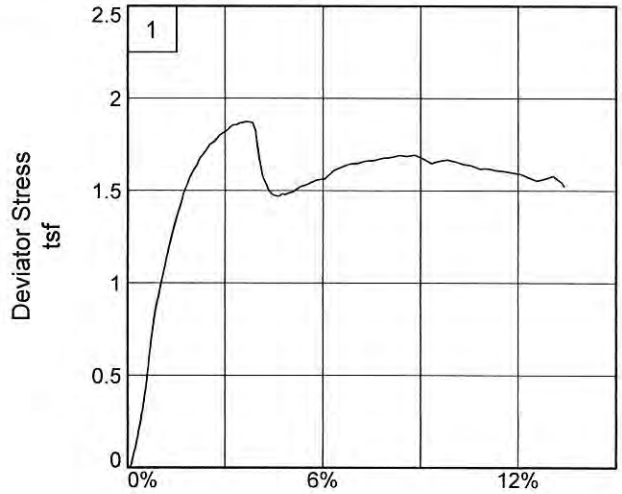
Client:

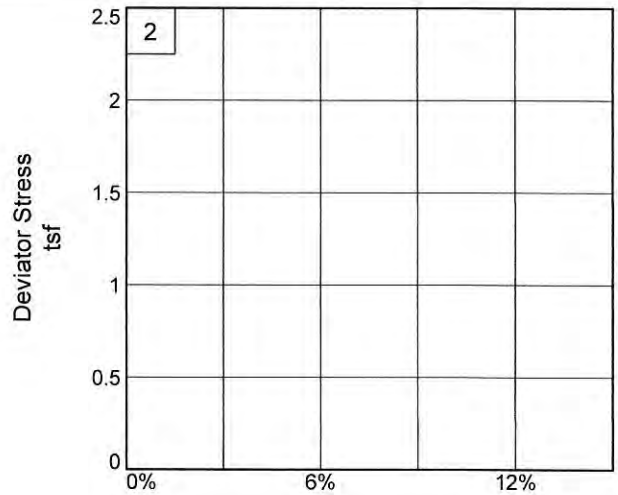
Project: San Jacinto River Waste Pit Superfund Site

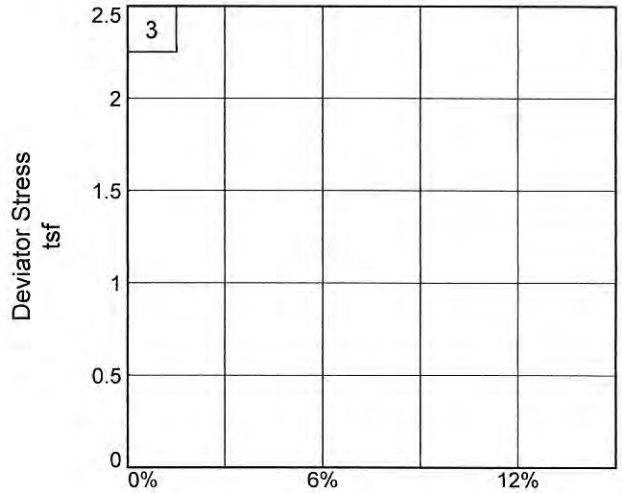
Source of Sample: SJGB053 **Depth:** 43

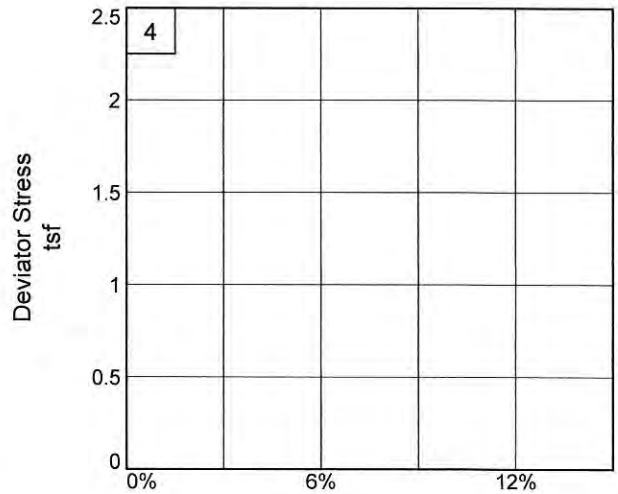
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

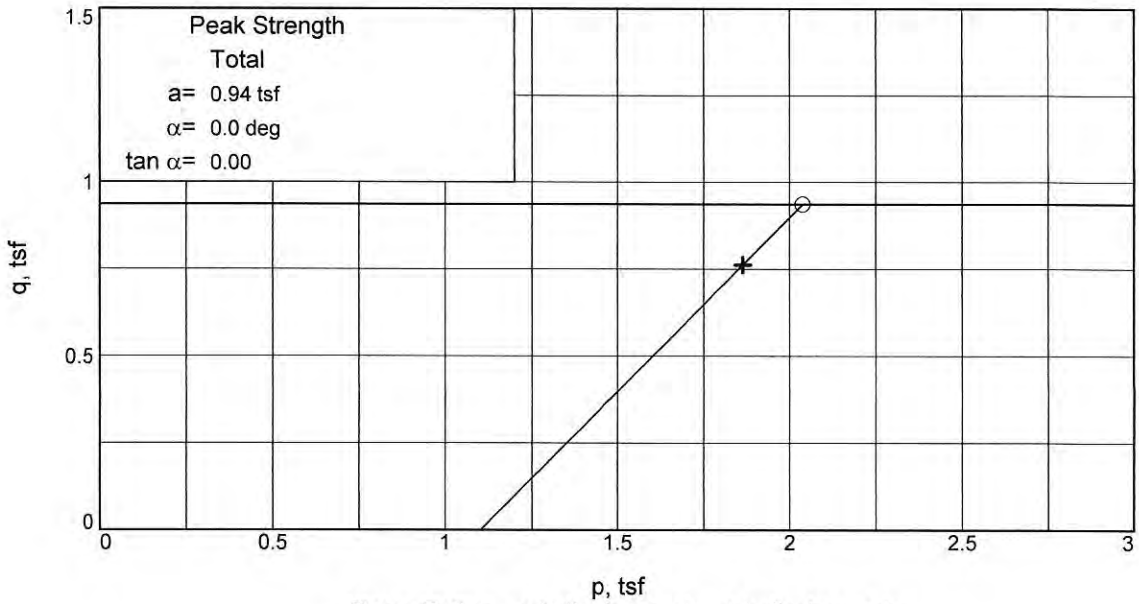
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

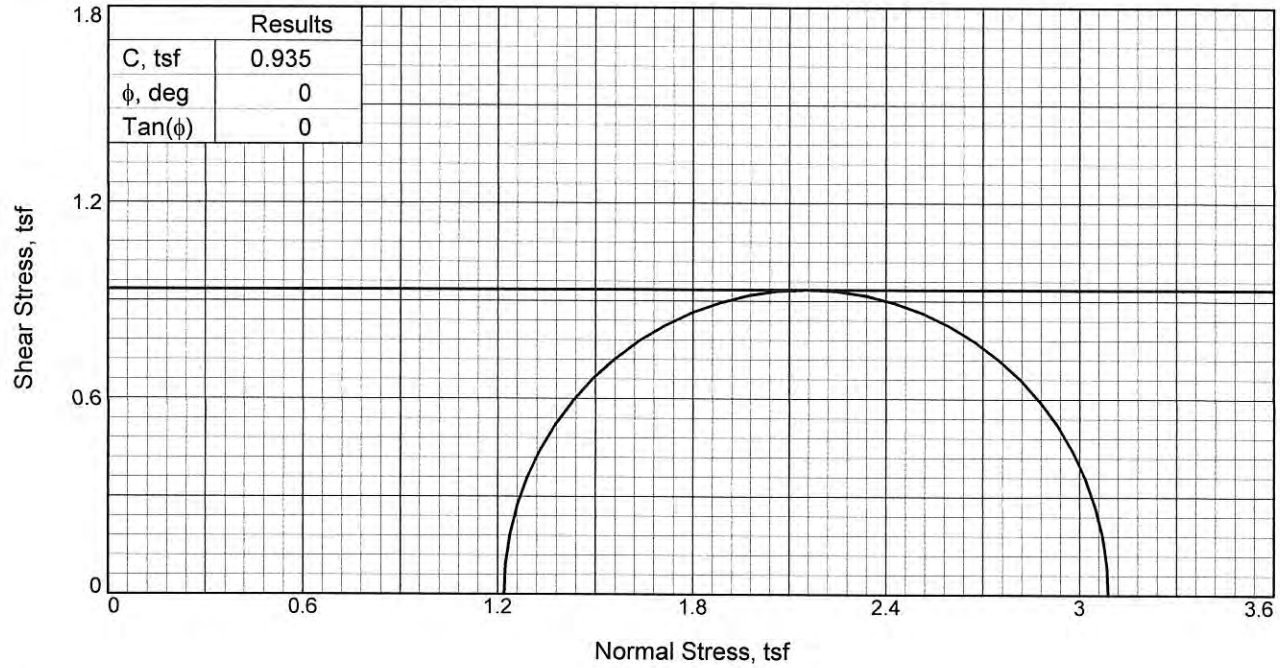
Client:

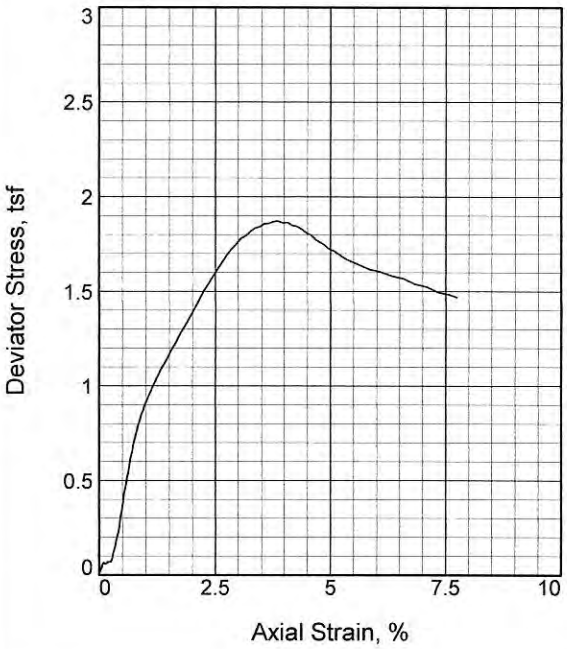
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 43

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	20.5
	Dry Density, pcf	106.7
	Saturation, %	99.7
	Void Ratio	0.5442
	Diameter, in.	2.82
	Height, in.	5.91
At Test	Water Content, %	21.3
	Dry Density, pcf	106.7
	Saturation, %	103.4
	Void Ratio	0.5442
	Diameter, in.	2.82
	Height, in.	5.91
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		16.93
Fail. Stress, tsf		1.87
Strain, %		3.9
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.09
σ_3 Failure, tsf		1.22

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY

LL= 47 **PL=** 21 **PI=** 26

Assumed Specific Gravity= 2.64

Remarks: Test Method: ASTM D2850
Failure type: 60 degree

Figure _____

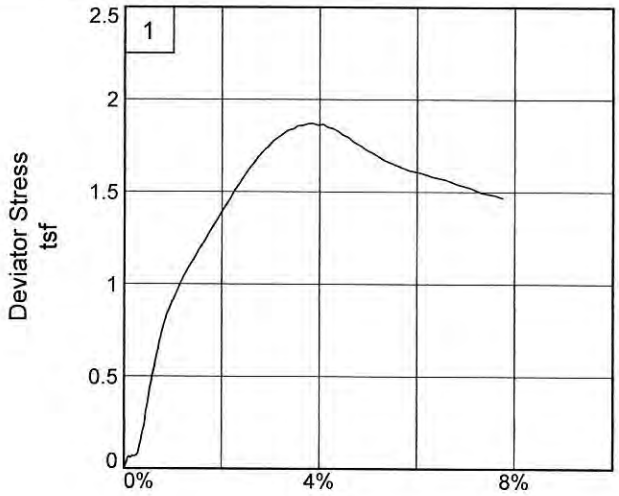
Client:

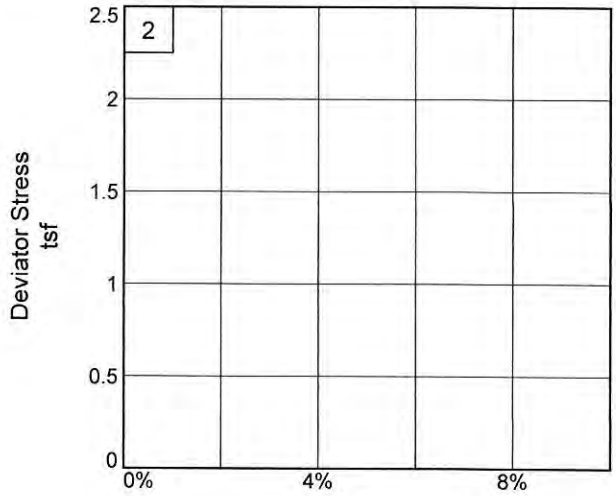
Project: San Jacinto River Waste Pit Superfund Site

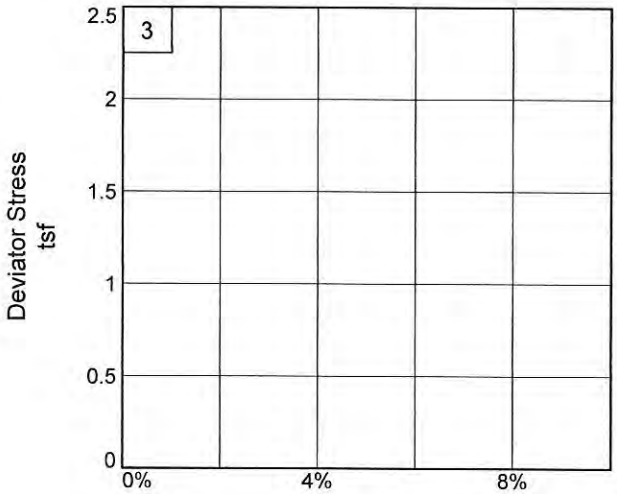
Source of Sample: SJGB053 **Depth:** 48

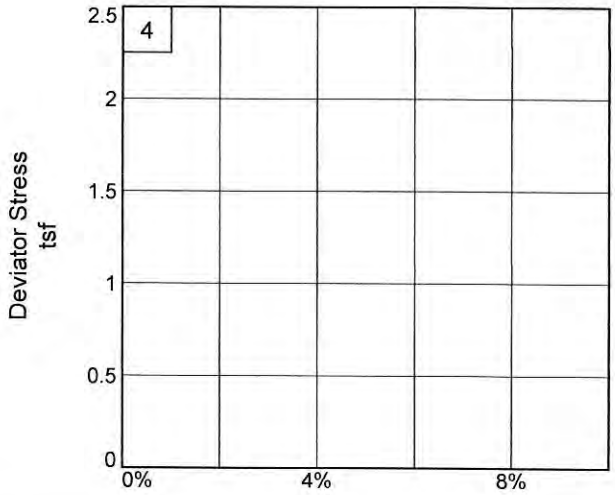
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

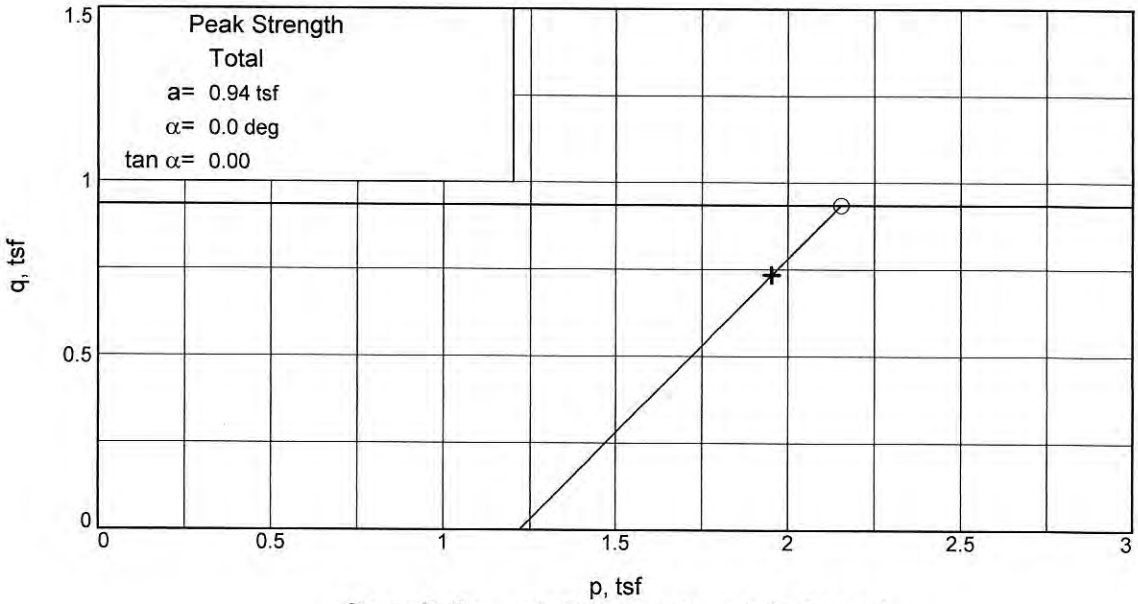
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

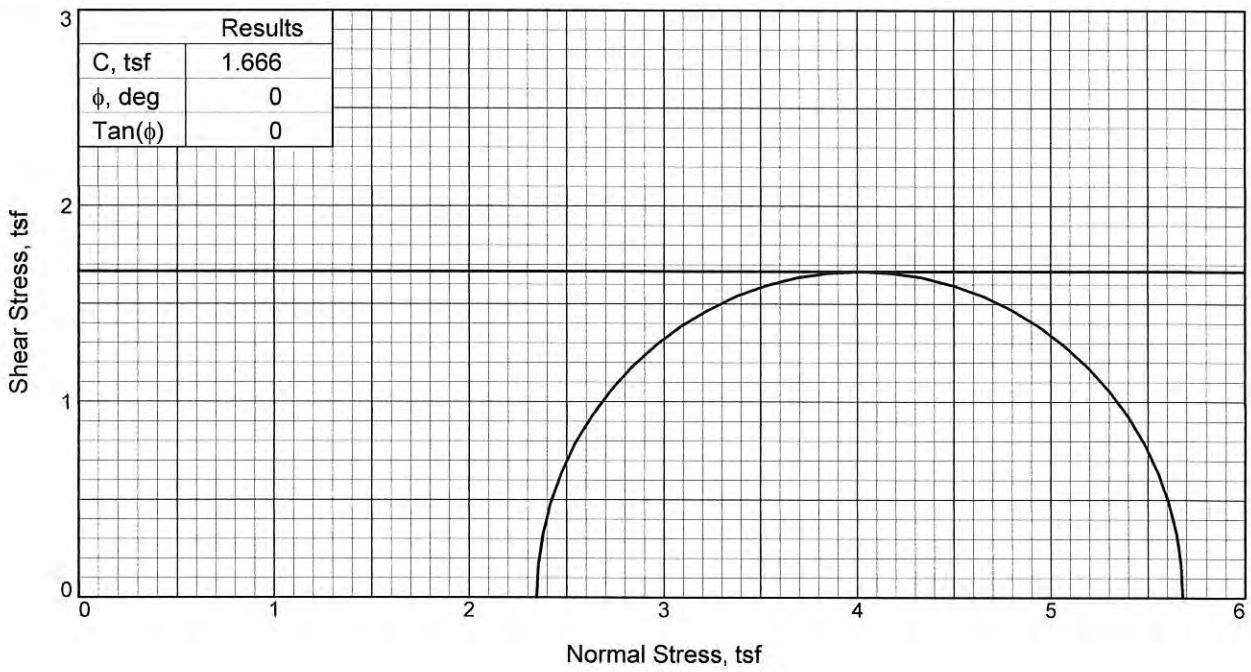
Client:

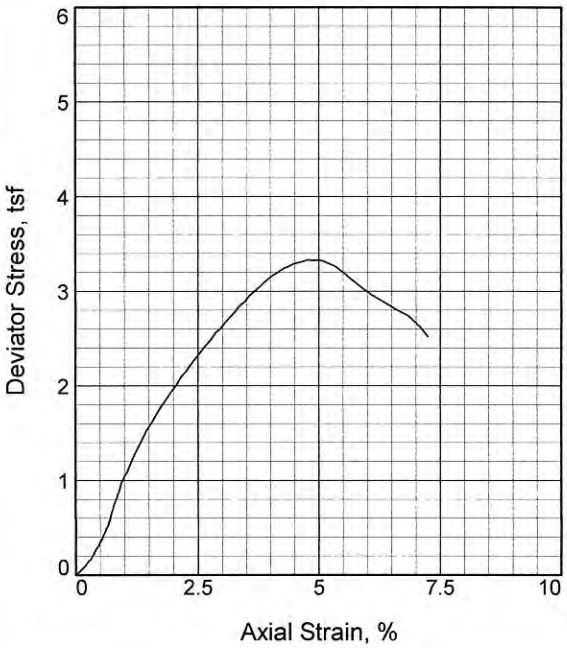
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 48

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	111.5
	Dry Density, pcf	41.7
	Saturation, %	100.0
	Void Ratio	2.9196
	Diameter, in.	2.86
	Height, in.	5.74
At Test	Water Content, %	111.2
	Dry Density, pcf	41.7
	Saturation, %	99.8
	Void Ratio	2.9196
	Diameter, in.	2.86
	Height, in.	5.74
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		32.60
Fail. Stress, tsf		3.33
Strain, %		4.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		5.68
σ_3 Failure, tsf		2.35

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Black FAT CLAY; organics

LL= 144 **PL=** 78 **PI=** 66

Assumed Specific Gravity= 2.62

Remarks: Test Method: ASTM D2850
Failure Type: Buldge

Figure _____

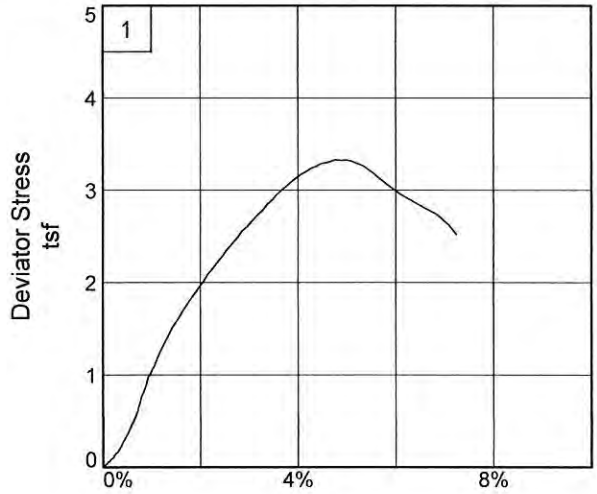
Client:

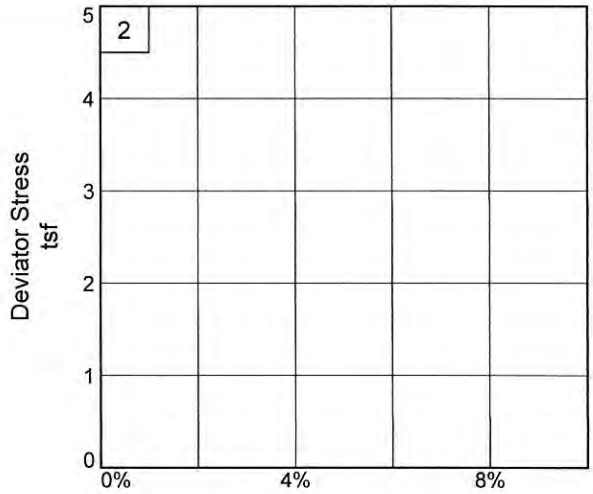
Project: San Jacinto River Waste Pit Superfund Site

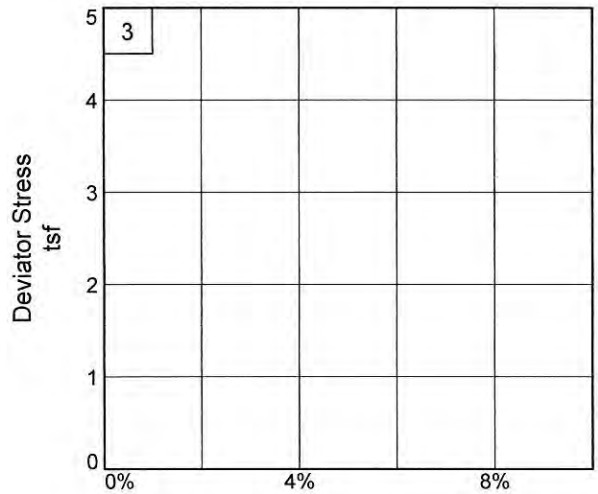
Source of Sample: SJGB053 **Depth:** 93

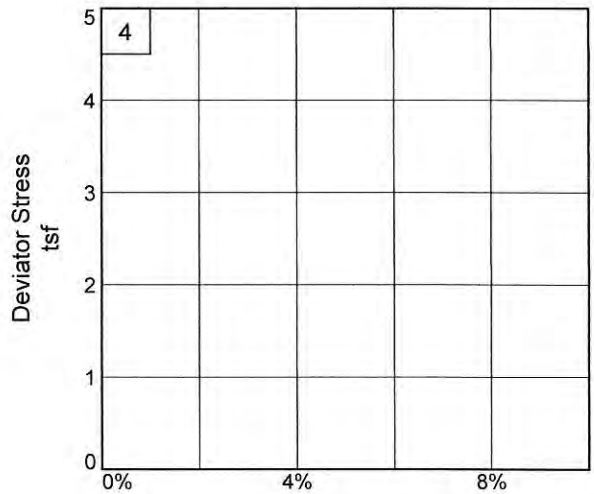
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

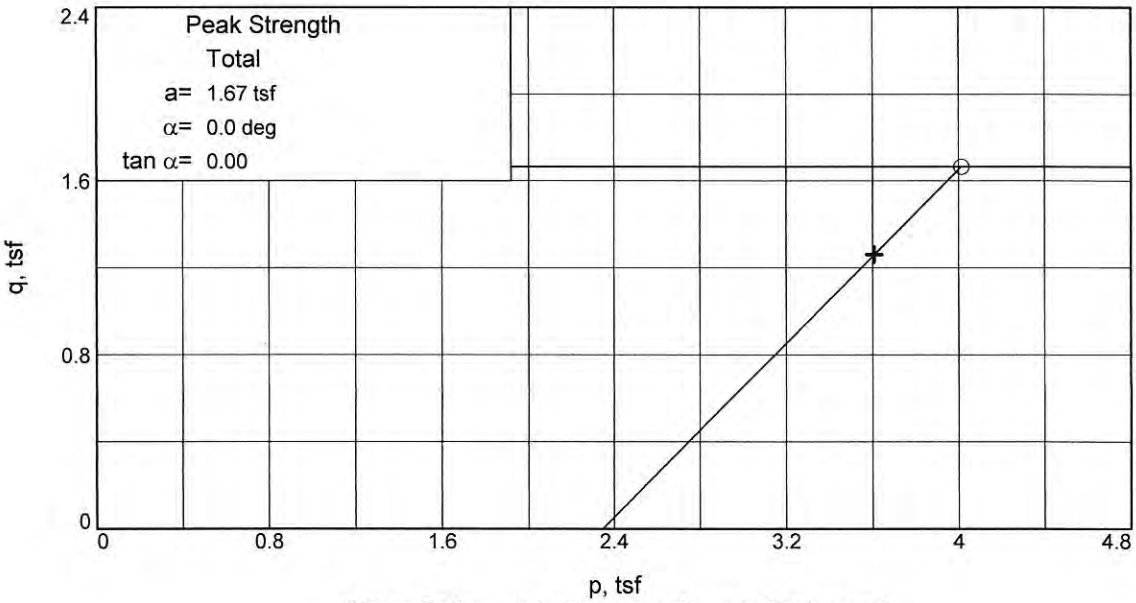
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

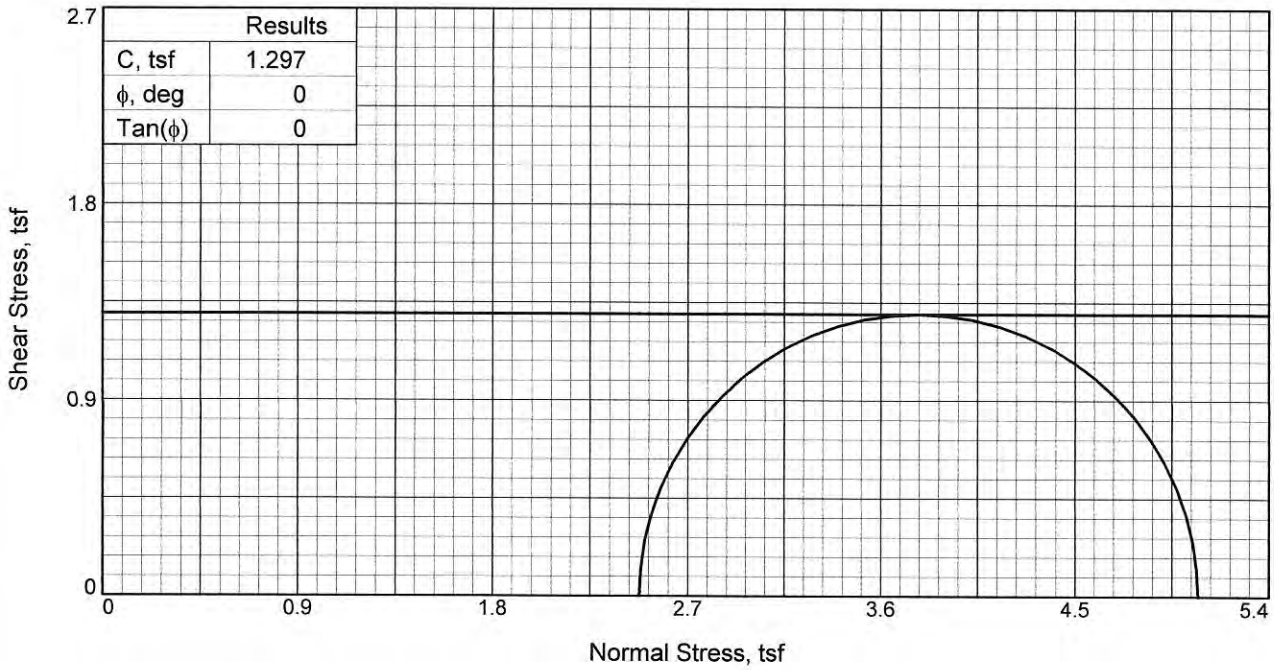
Client:

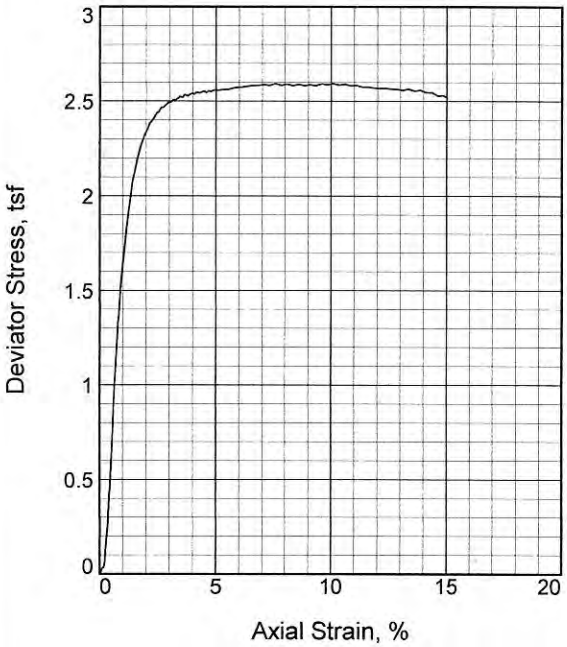
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 93

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	24.3
	Dry Density, pcf	101.6
	Saturation, %	99.7
	Void Ratio	0.6590
	Diameter, in.	2.83
	Height, in.	5.88
At Test	Water Content, %	24.7
	Dry Density, pcf	101.6
	Saturation, %	101.2
	Void Ratio	0.6590
	Diameter, in.	2.83
	Height, in.	5.88
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		34.40
Fail. Stress, tsf		2.59
Strain, %		10.1
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		5.07
σ_3 Failure, tsf		2.48

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY

LL= 71 **PL=** 23 **PI=** 48

Assumed Specific Gravity= 2.7

Remarks: Test Method: ASTM D2850
Failure type: Buldge

Figure _____

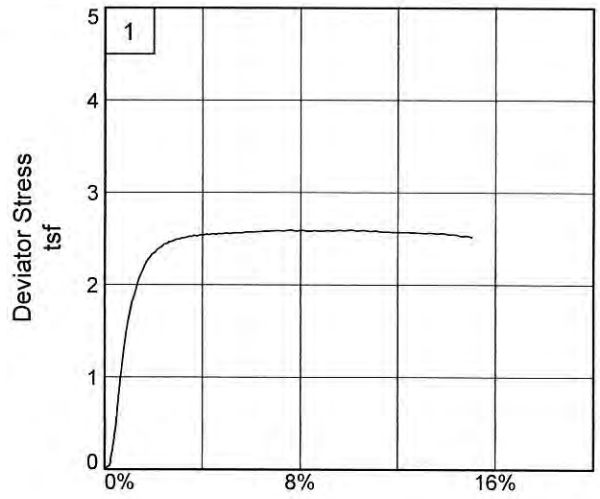
Client:

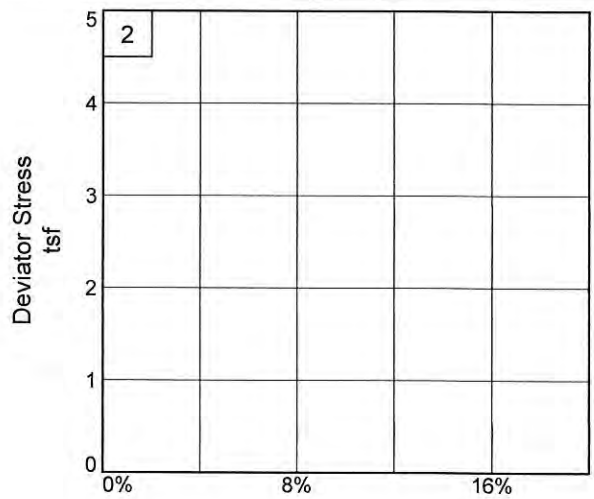
Project: San Jacinto River Waste Pit Superfund Site

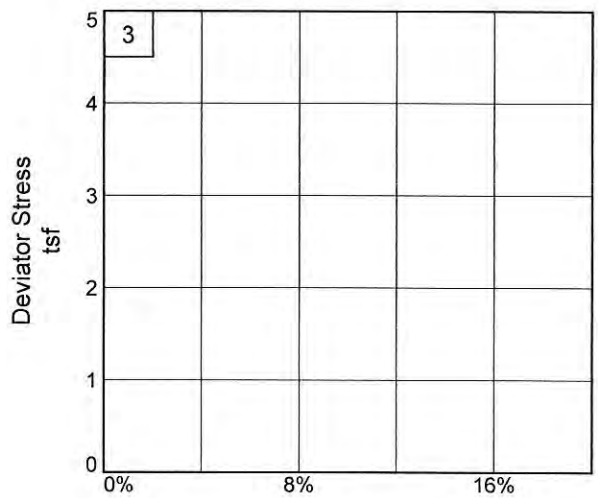
Source of Sample: SJGB053 **Depth:** 98

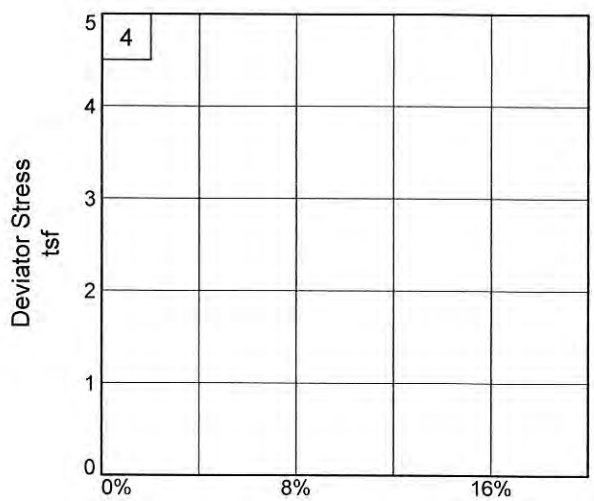
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

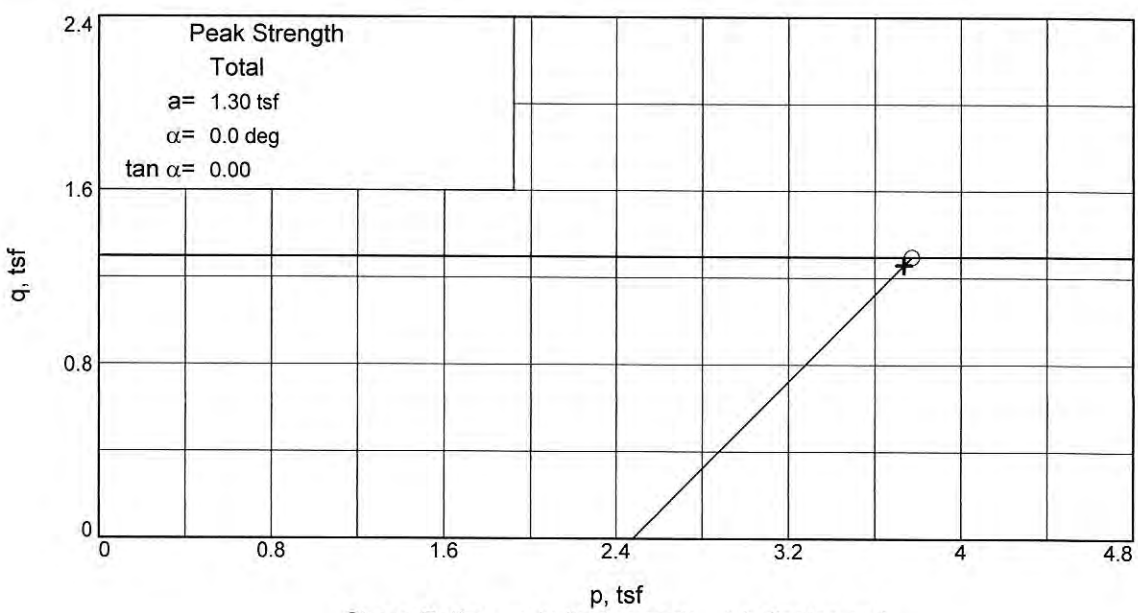
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

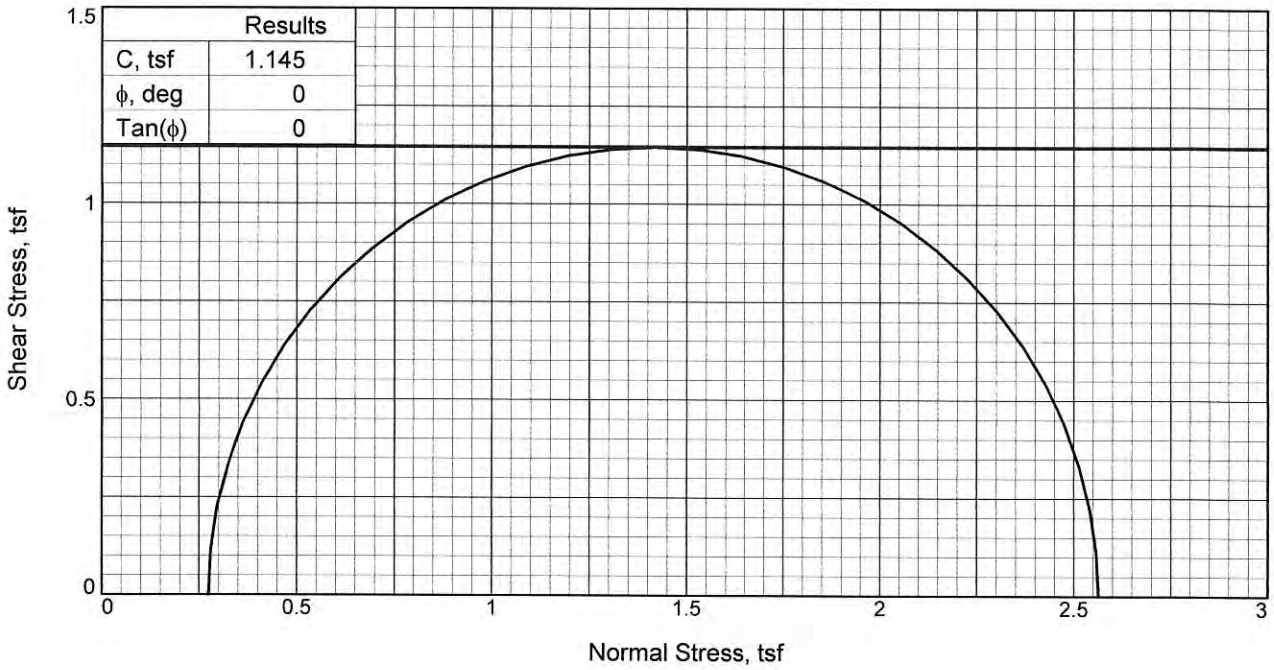
Client:

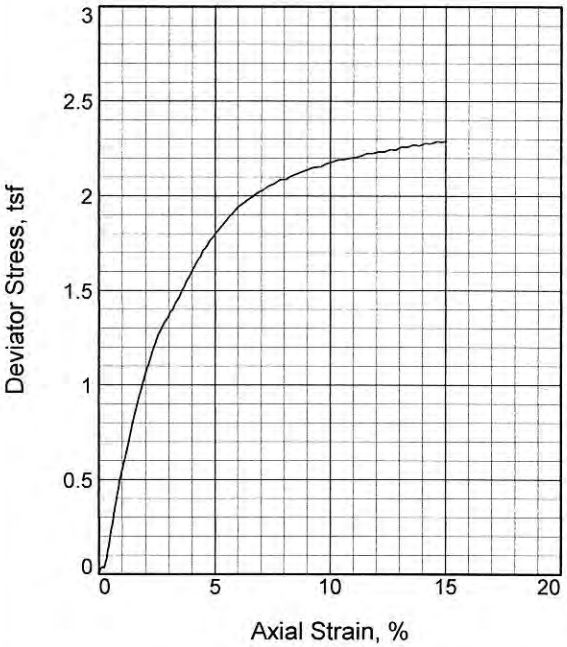
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 98

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	20.4
	Dry Density, pcf	111.0
	Saturation, %	100.0
	Void Ratio	0.5692
	Diameter, in.	2.79
	Height, in.	5.88
At Test	Water Content, %	21.6
	Dry Density, pcf	111.0
	Saturation, %	105.9
	Void Ratio	0.5692
	Diameter, in.	2.79
	Height, in.	5.88
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		3.80
Fail. Stress, tsf		2.29
Strain, %		15.0
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.56
σ_3 Failure, tsf		0.27

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray and brown FAT CLAY

LL= 66 **PL=** 23 **PI=** 43

Assumed Specific Gravity= 2.79

Remarks: Test Method: ASTM D2850
Failure Type: Buldge

Figure _____

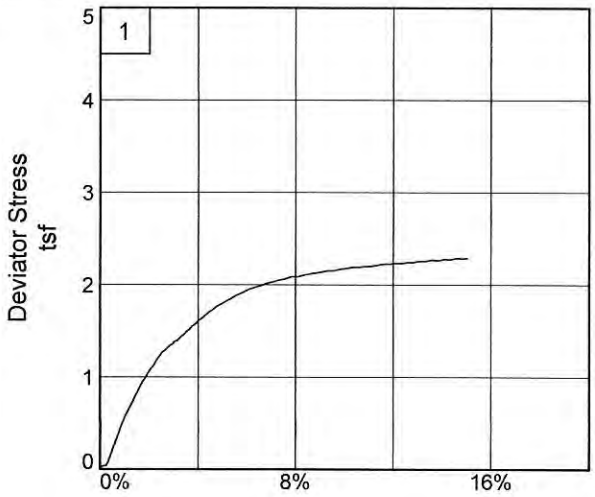
Client:

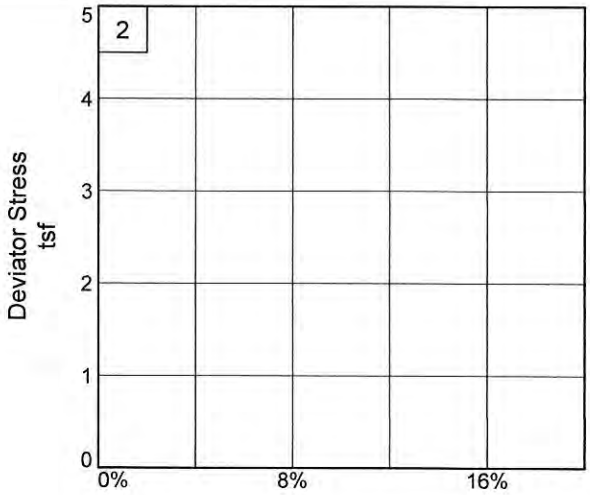
Project: San Jacinto River Waste Pit Superfund Site

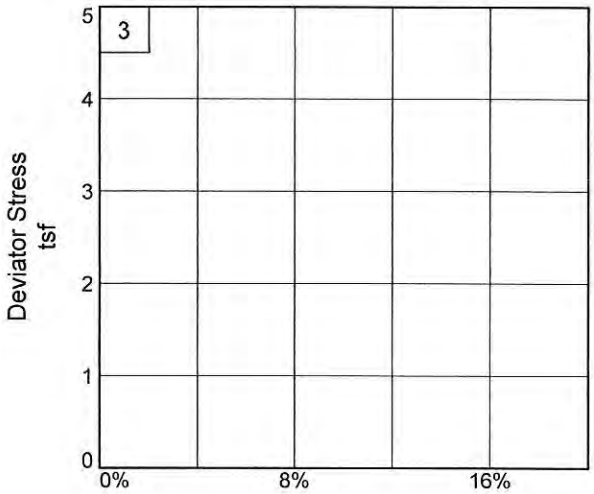
Source of Sample: SJGB057 **Depth:** 12

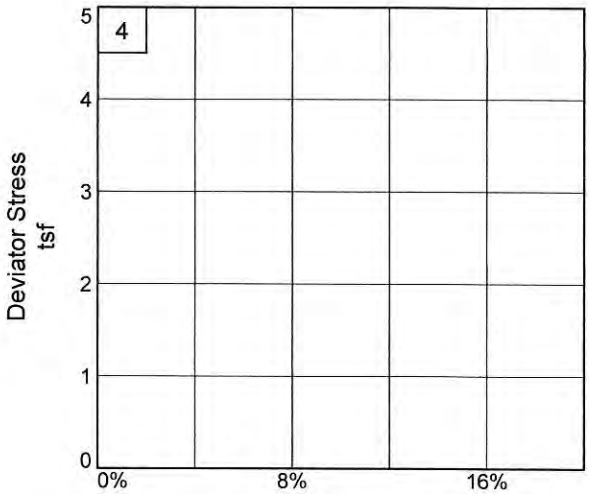
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

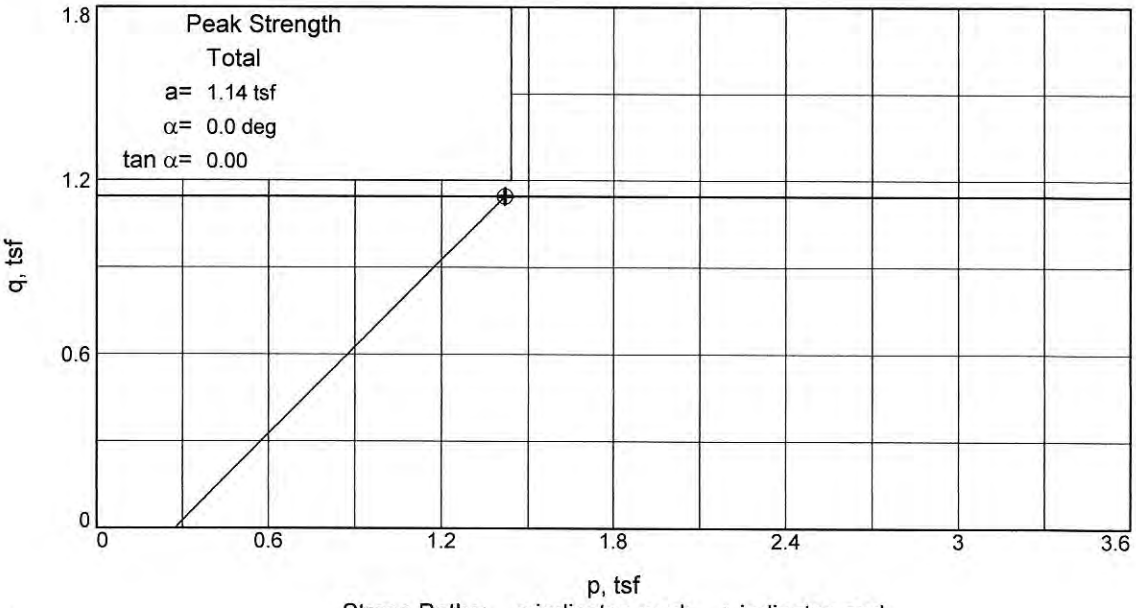
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

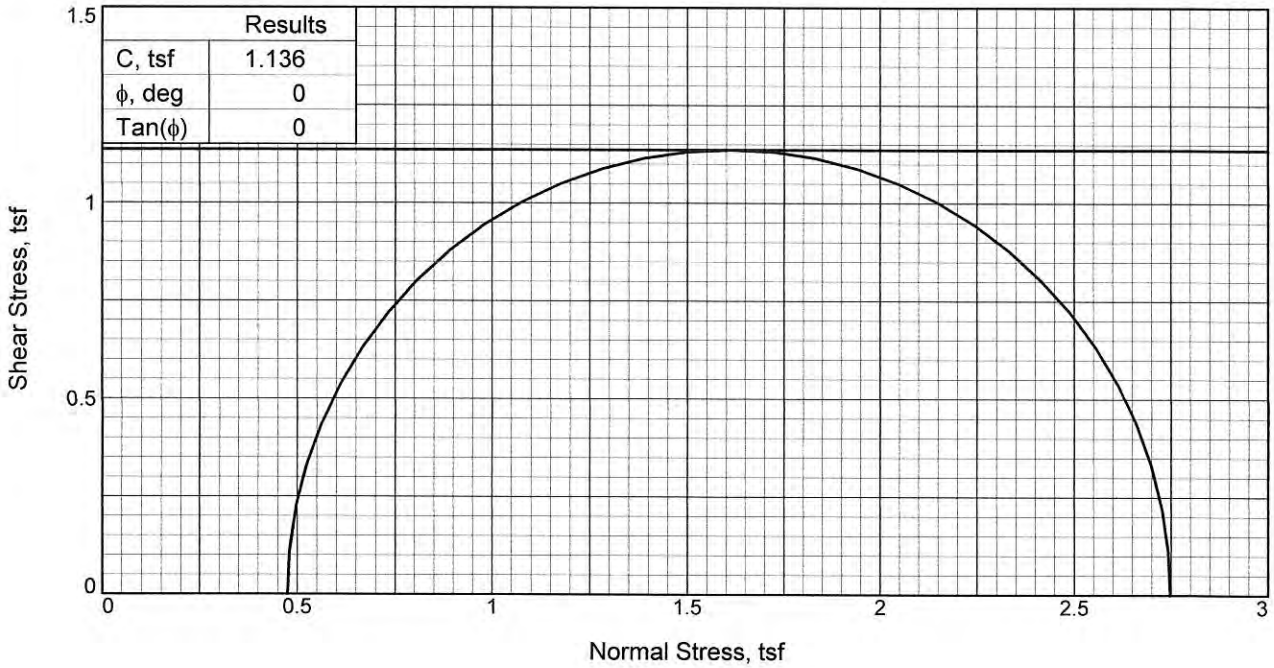
Client:

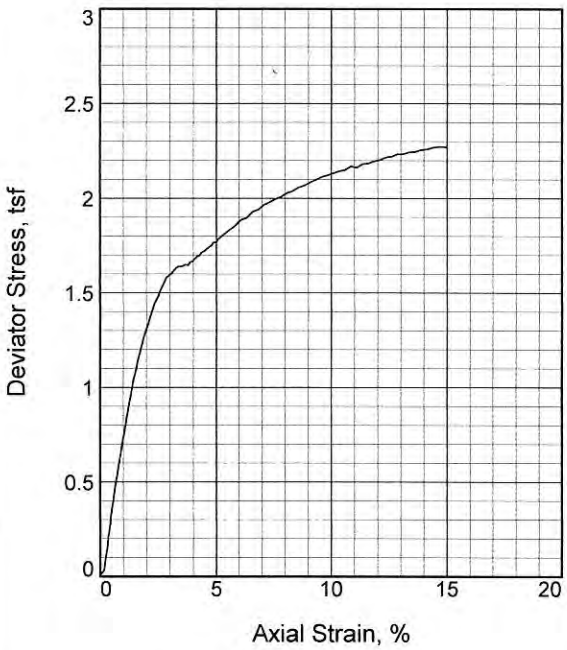
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 12

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	18.7
	Dry Density, pcf	112.7
	Saturation, %	99.1
	Void Ratio	0.5171
	Diameter, in.	2.82
	Height, in.	5.87
At Test	Water Content, %	18.8
	Dry Density, pcf	112.7
	Saturation, %	99.8
	Void Ratio	0.5171
	Diameter, in.	2.82
	Height, in.	5.87
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		6.60
Fail. Stress, tsf		2.27
Strain, %		14.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.75
σ_3 Failure, tsf		0.48

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan SANDY LEAN CLAY

LL= 45 **PL=** 16 **PI=** 29

Assumed Specific Gravity= 2.74

Remarks: Test Method: ASTM D2850
Failure Type: Slickenslide

Figure _____

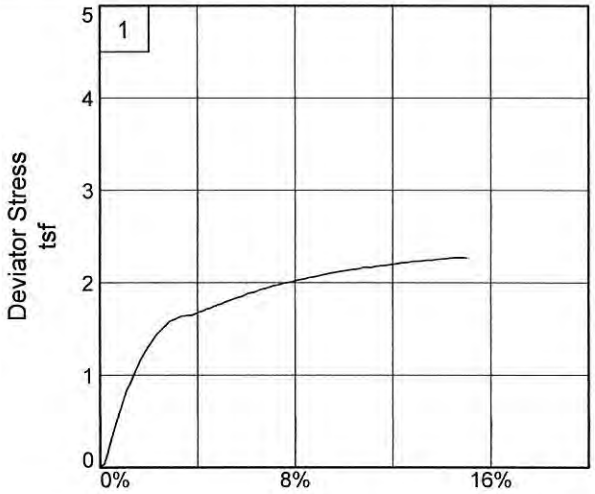
Client:

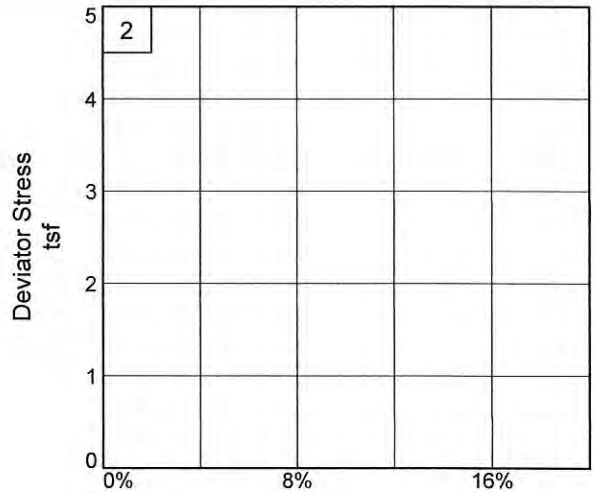
Project: San Jacinto River Waste Pit Superfund Site

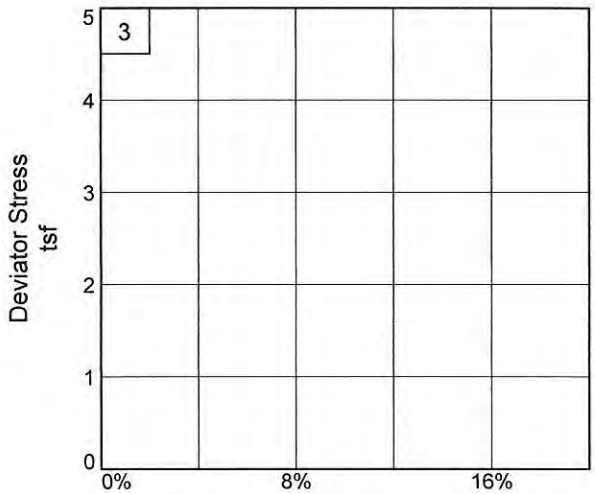
Source of Sample: SJGB057 **Depth:** 18

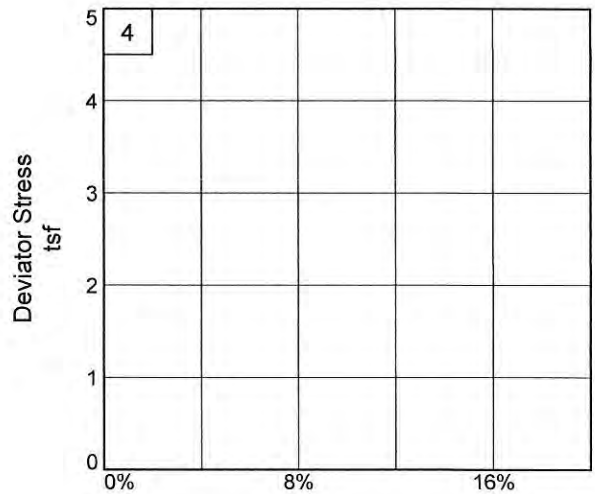
Proj. No.: 19.15.131 **Date Sampled:** 2-89-2020

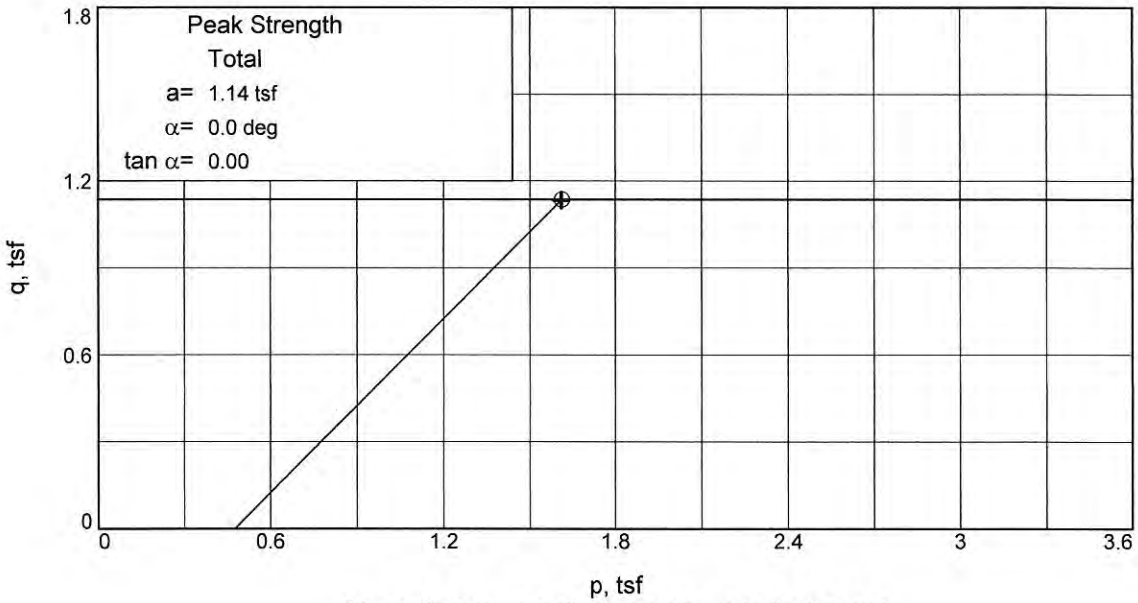
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

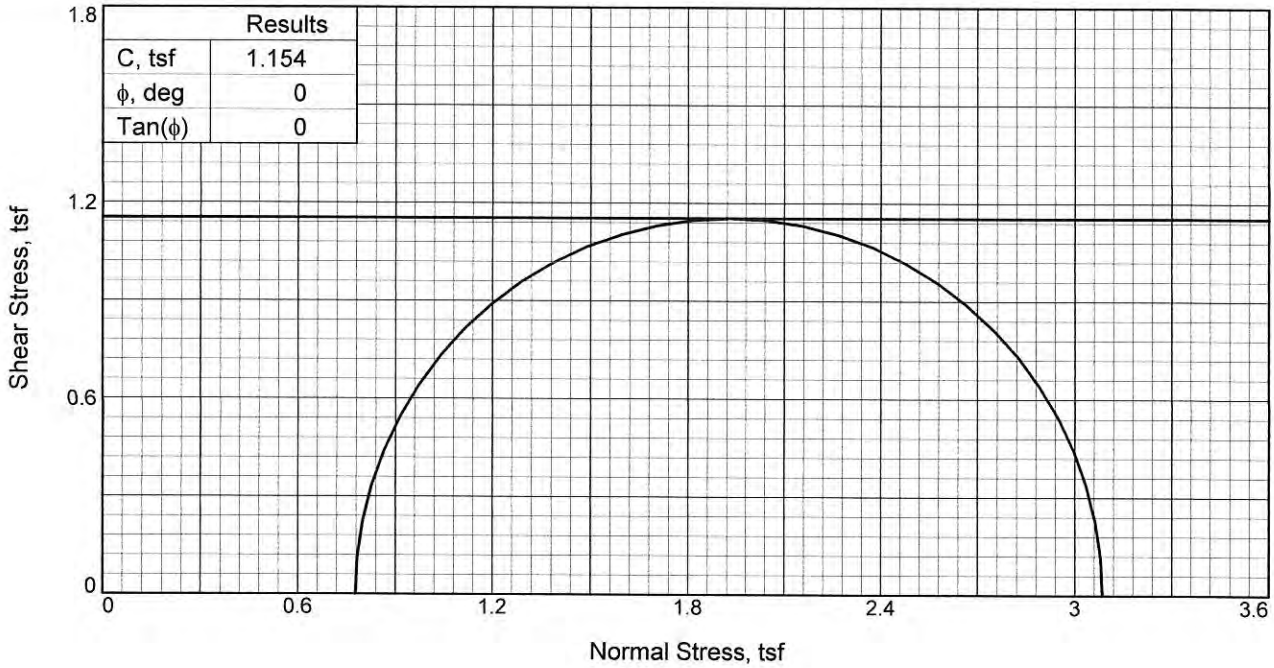
Client:

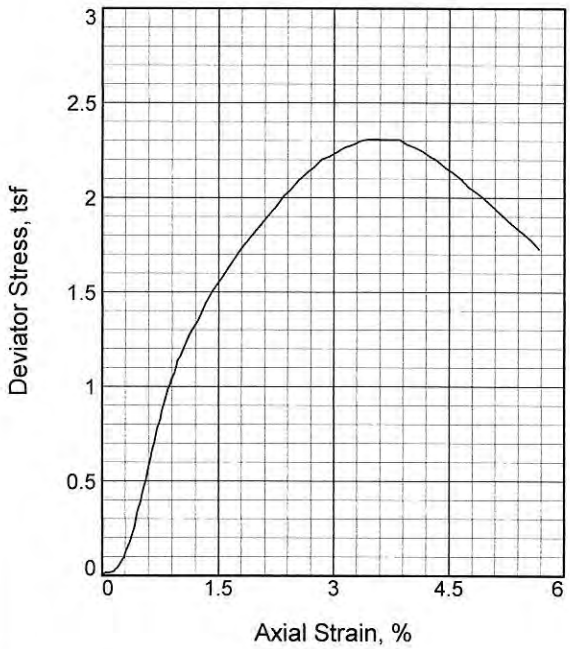
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 18

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	26.8
	Dry Density, pcf	96.2
	Saturation, %	95.4
	Void Ratio	0.7644
	Diameter, in.	2.87
	Height, in.	5.87
At Test	Water Content, %	26.7
	Dry Density, pcf	96.2
	Saturation, %	95.1
	Void Ratio	0.7644
	Diameter, in.	2.87
	Height, in.	5.87
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		10.80
Fail. Stress, tsf		2.31
Strain, %		3.5
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.09
σ_3 Failure, tsf		0.78

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Reddish-brown FAT CLAY

LL= 65 **PL=** 22 **PI=** 43

Assumed Specific Gravity= 2.72

Remarks: Test Method: ASTM D2850
Failure Type: Slickenslide

Figure _____

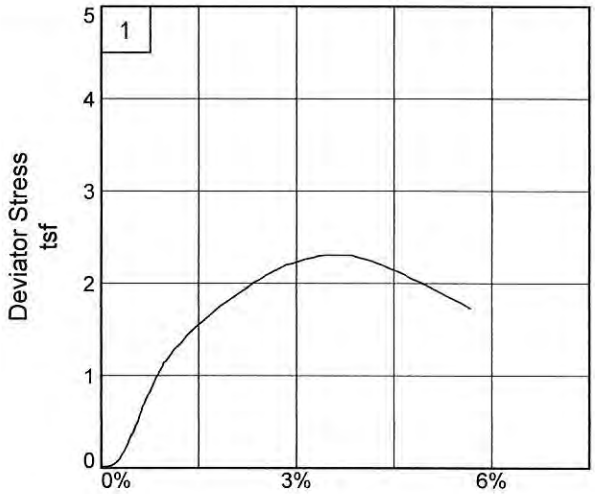
Client:

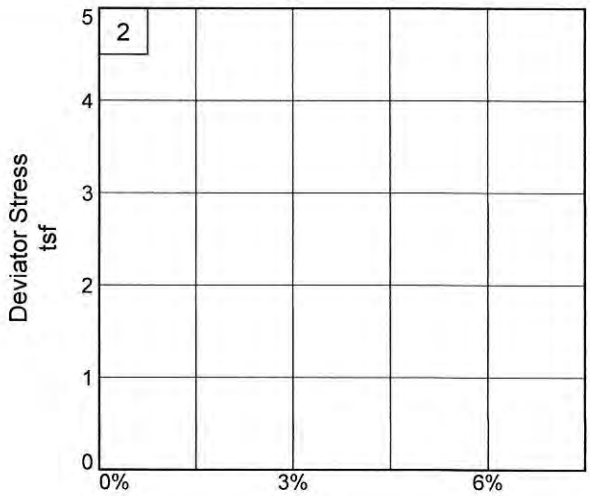
Project: San Jacinto River Waste Pit Superfund Site

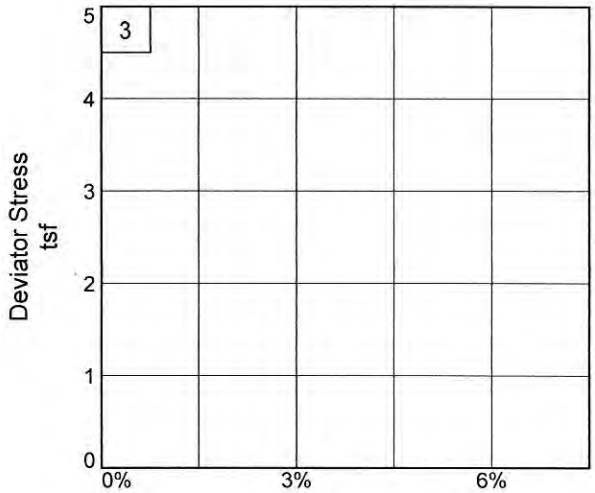
Source of Sample: SJGB057 **Depth:** 33

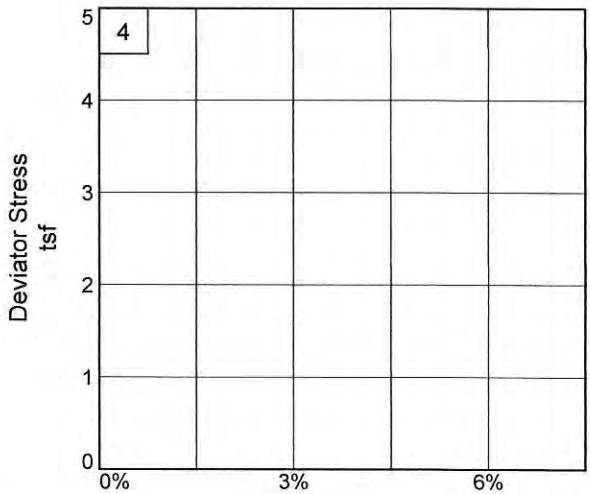
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

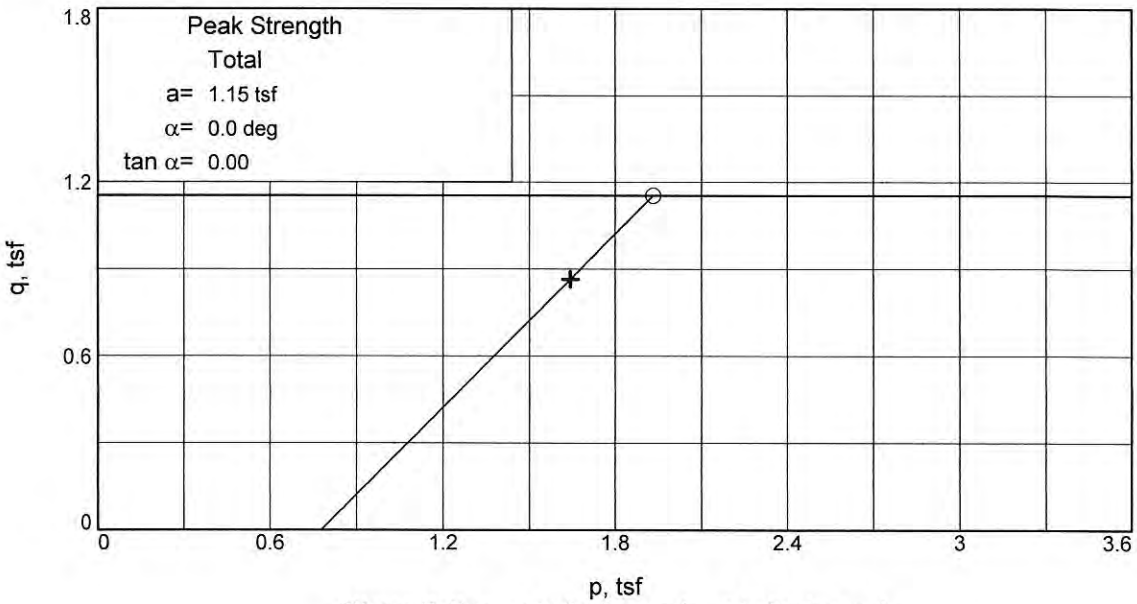
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

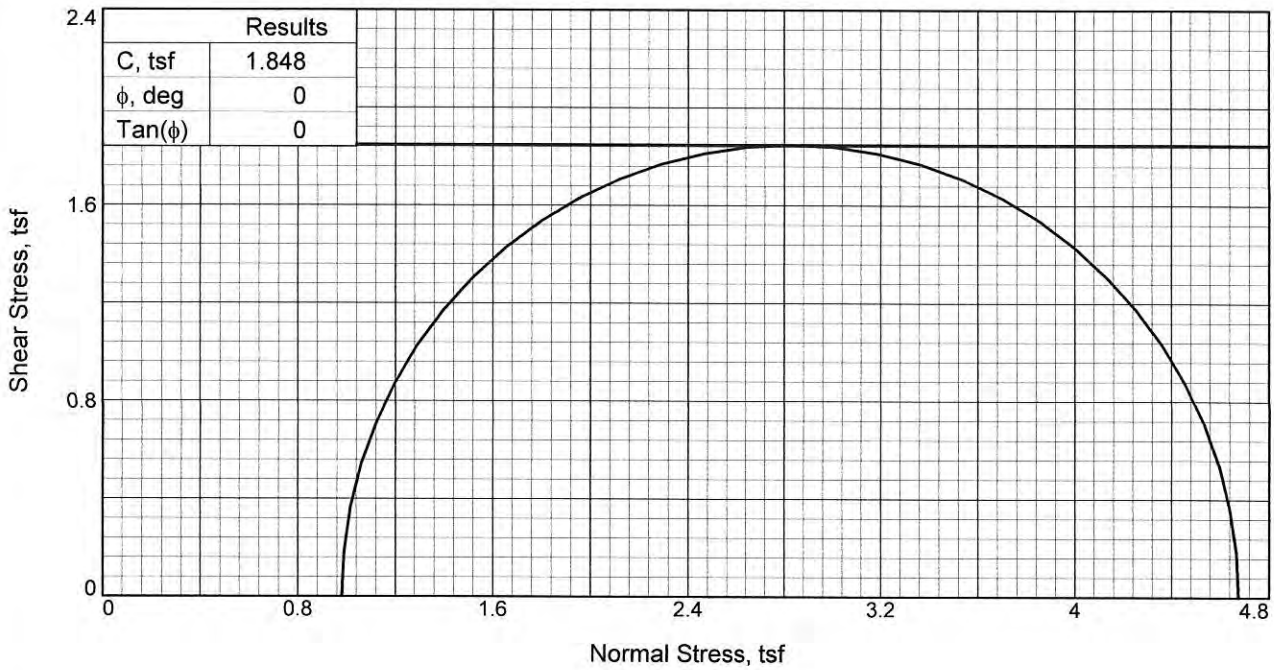
Client:

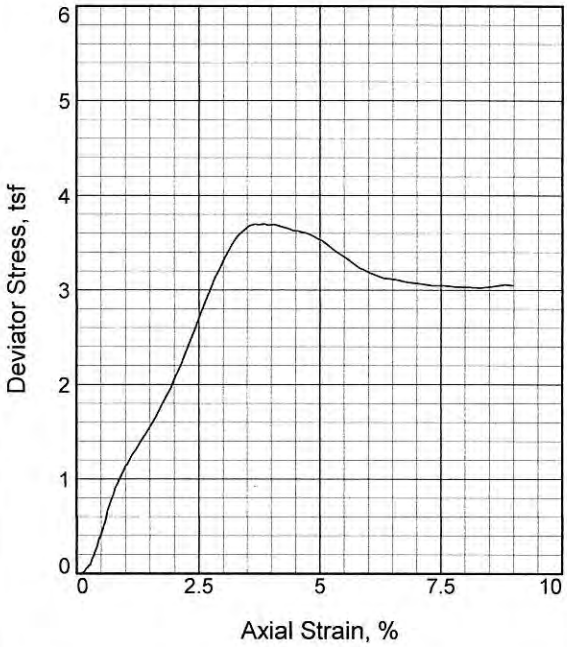
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 33

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	20.7
	Dry Density, pcf	107.8
	Saturation, %	99.0
	Void Ratio	0.5634
	Diameter, in.	2.84
	Height, in.	5.87
At Test	Water Content, %	20.5
	Dry Density, pcf	107.8
	Saturation, %	98.1
	Void Ratio	0.5634
	Diameter, in.	2.84
	Height, in.	5.87
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		13.60
Fail. Stress, tsf		3.70
Strain, %		3.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		4.68
σ_3 Failure, tsf		0.98

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY

LL= 56 **PL=** 19 **PI=** 37

Assumed Specific Gravity= 2.7

Remarks: Test Method: ASTM D2850
Failure type: Slickenslide

Figure _____

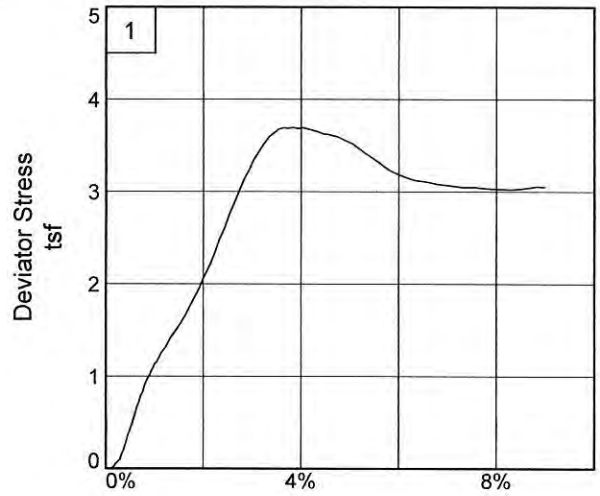
Client:

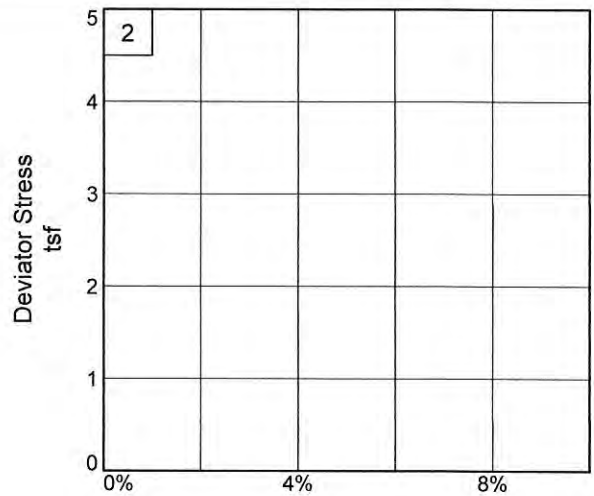
Project: San Jacinto River Waste Pit Superfund Site

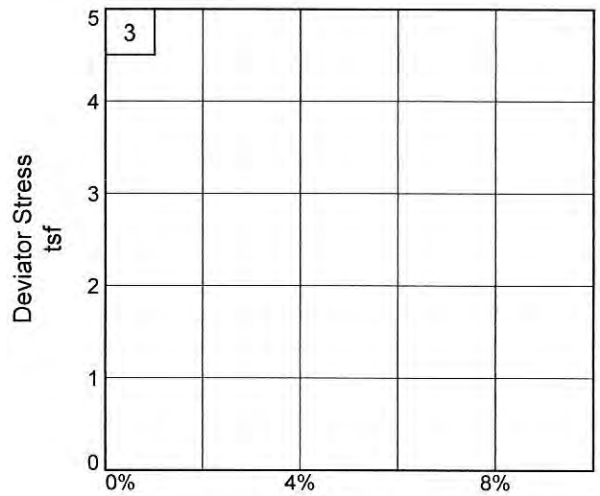
Source of Sample: SJGB057 **Depth:** 43

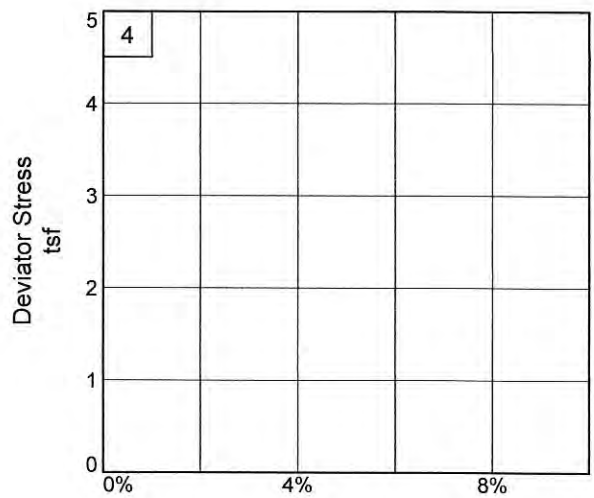
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

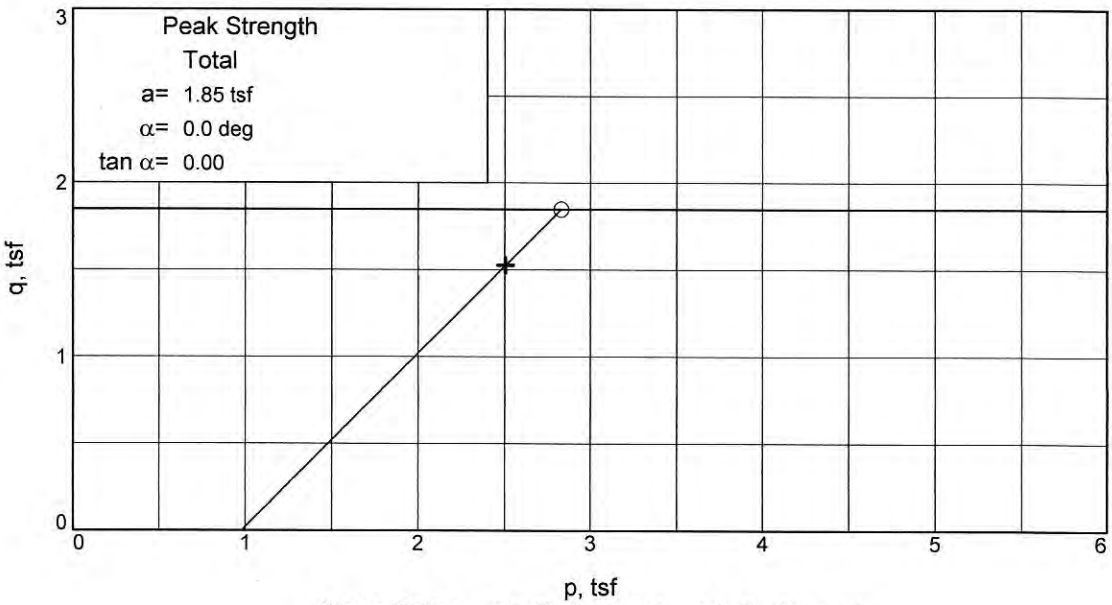
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

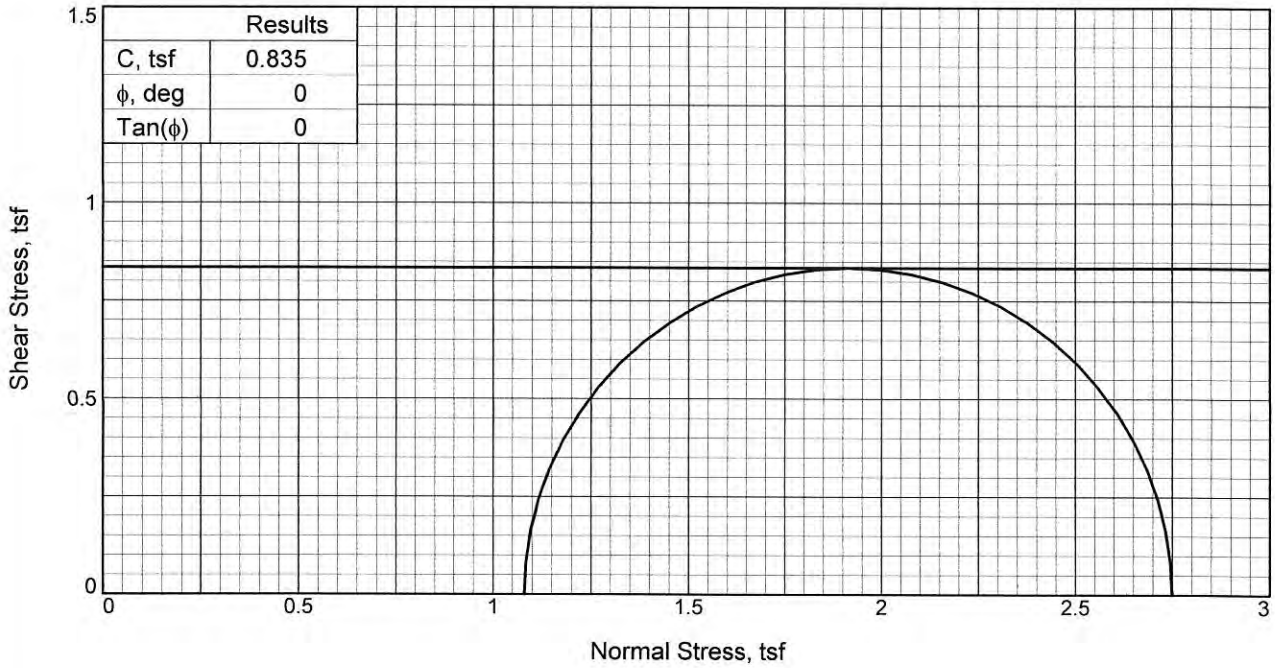
Client:

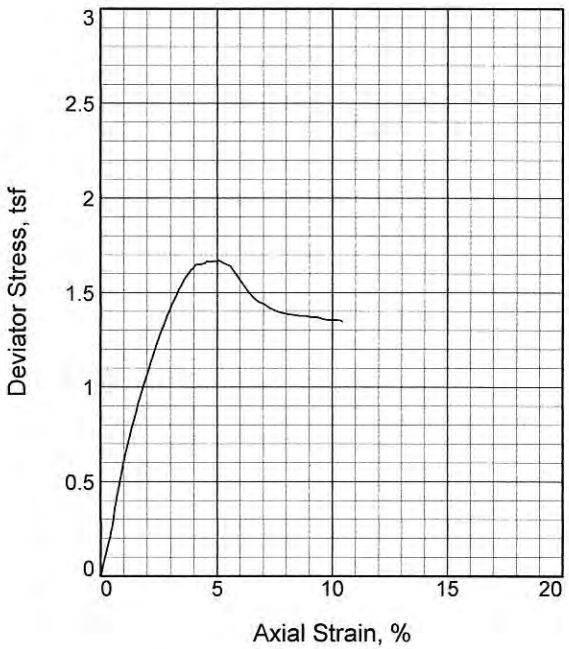
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 43

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	35.6
	Dry Density, pcf	92.5
	Saturation, %	99.9
	Void Ratio	1.1188
	Diameter, in.	2.78
	Height, in.	5.84
At Test	Water Content, %	28.9
	Dry Density, pcf	92.5
	Saturation, %	81.2
	Void Ratio	1.1188
	Diameter, in.	2.78
	Height, in.	5.84
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		15.00
Fail. Stress, tsf		1.67
Strain, %		5.1
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.75
σ_3 Failure, tsf		1.08

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY

LL= 52 **PL=** 19 **PI=** 33

Assumed Specific Gravity= 3.14

Remarks: Test Method: ASTM D2850
Failure type: Slickenslide

Figure _____

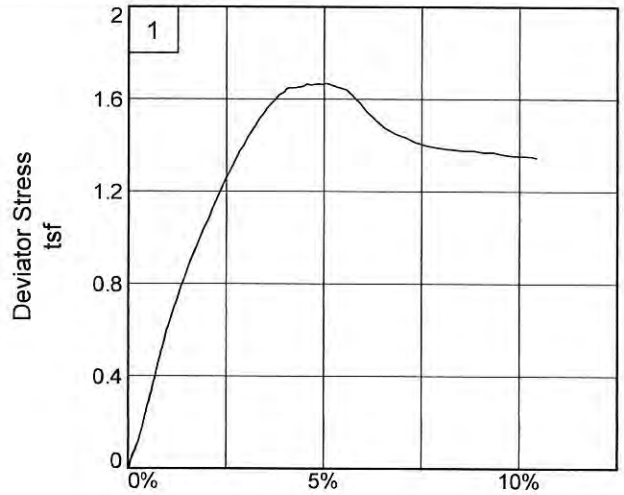
Client:

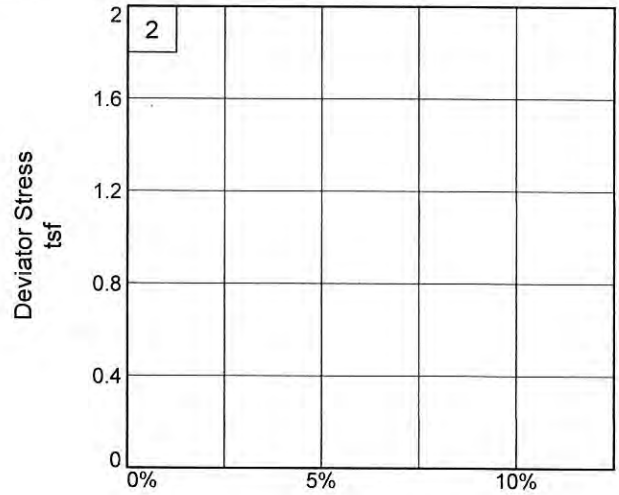
Project: San Jacinto River Waste Pit Superfund Site

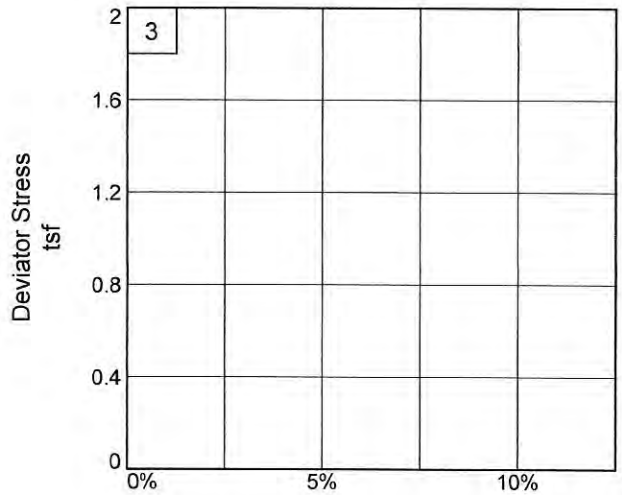
Source of Sample: SJGB057 **Depth:** 48

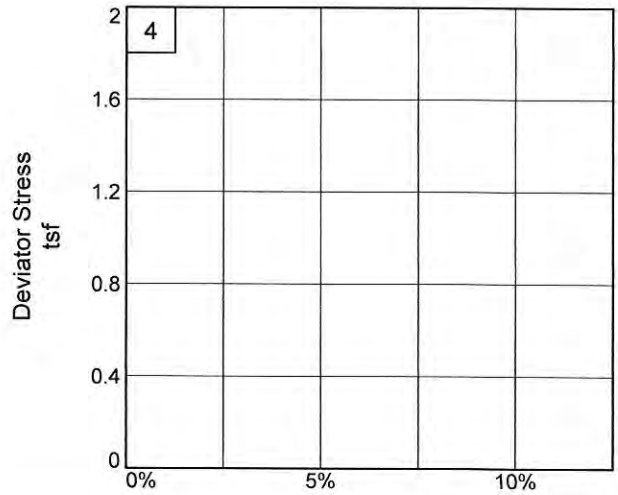
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

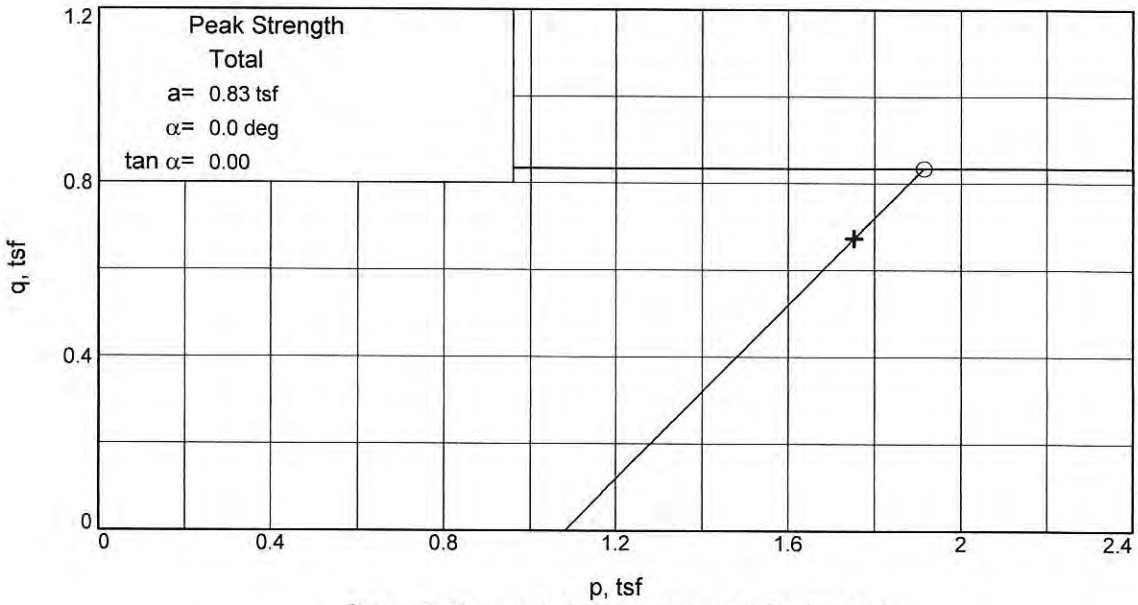
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

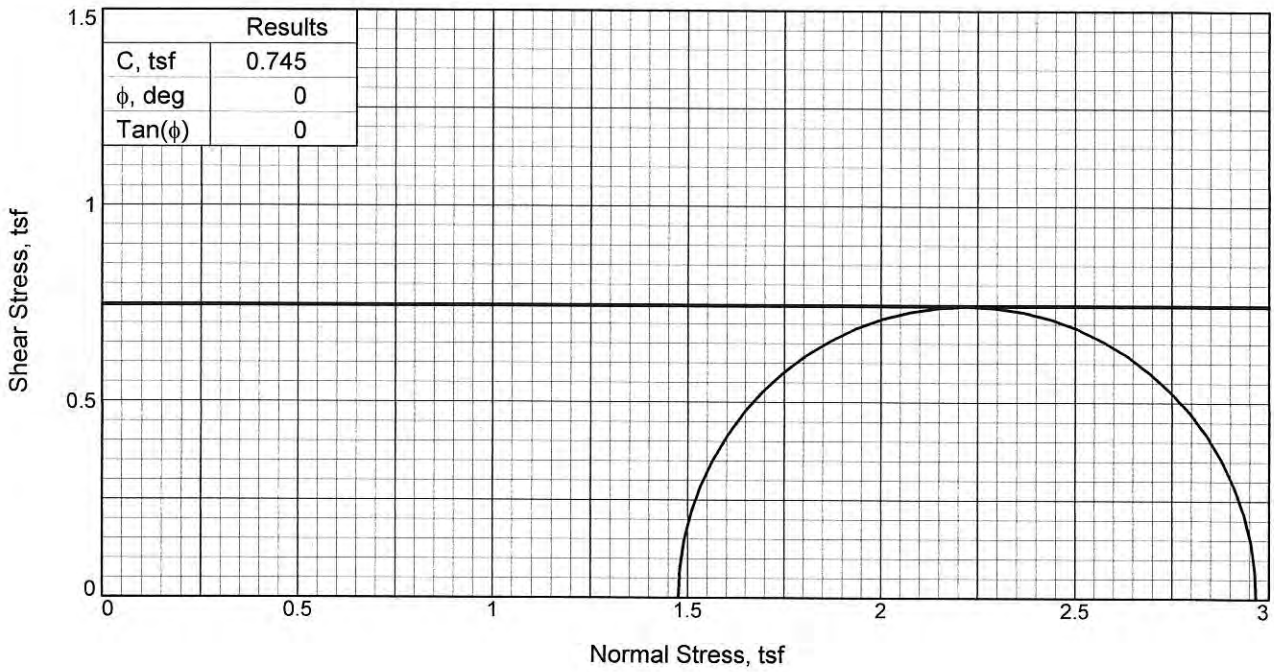
Client:

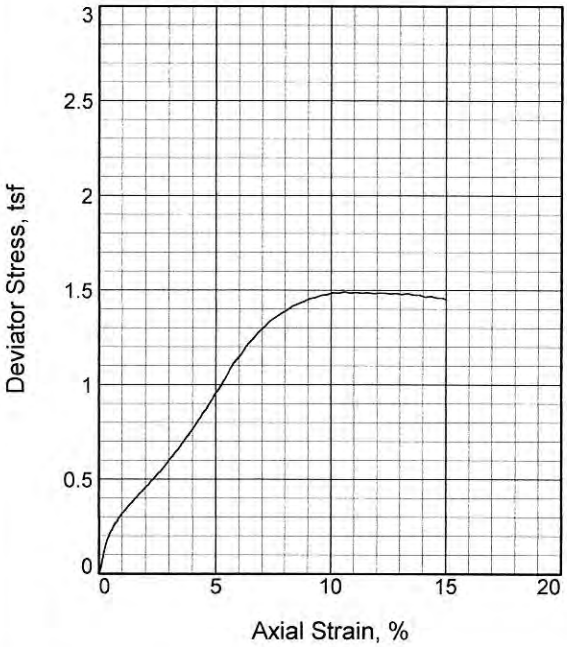
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 48

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	24.4
	Dry Density, pcf	106.0
	Saturation, %	99.6
	Void Ratio	0.7141
	Diameter, in.	2.80
	Height, in.	5.83
At Test	Water Content, %	23.5
	Dry Density, pcf	106.0
	Saturation, %	96.0
	Void Ratio	0.7141
	Diameter, in.	2.80
	Height, in.	5.83
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		20.50
Fail. Stress, tsf		1.49
Strain, %		10.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.97
σ_3 Failure, tsf		1.48

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY with SAND

LL= 52 **PL=** 20 **PI=** 32

Assumed Specific Gravity= 2.91

Remarks: Test Method: ASTM D2850
Failure type: Buldge

Figure _____

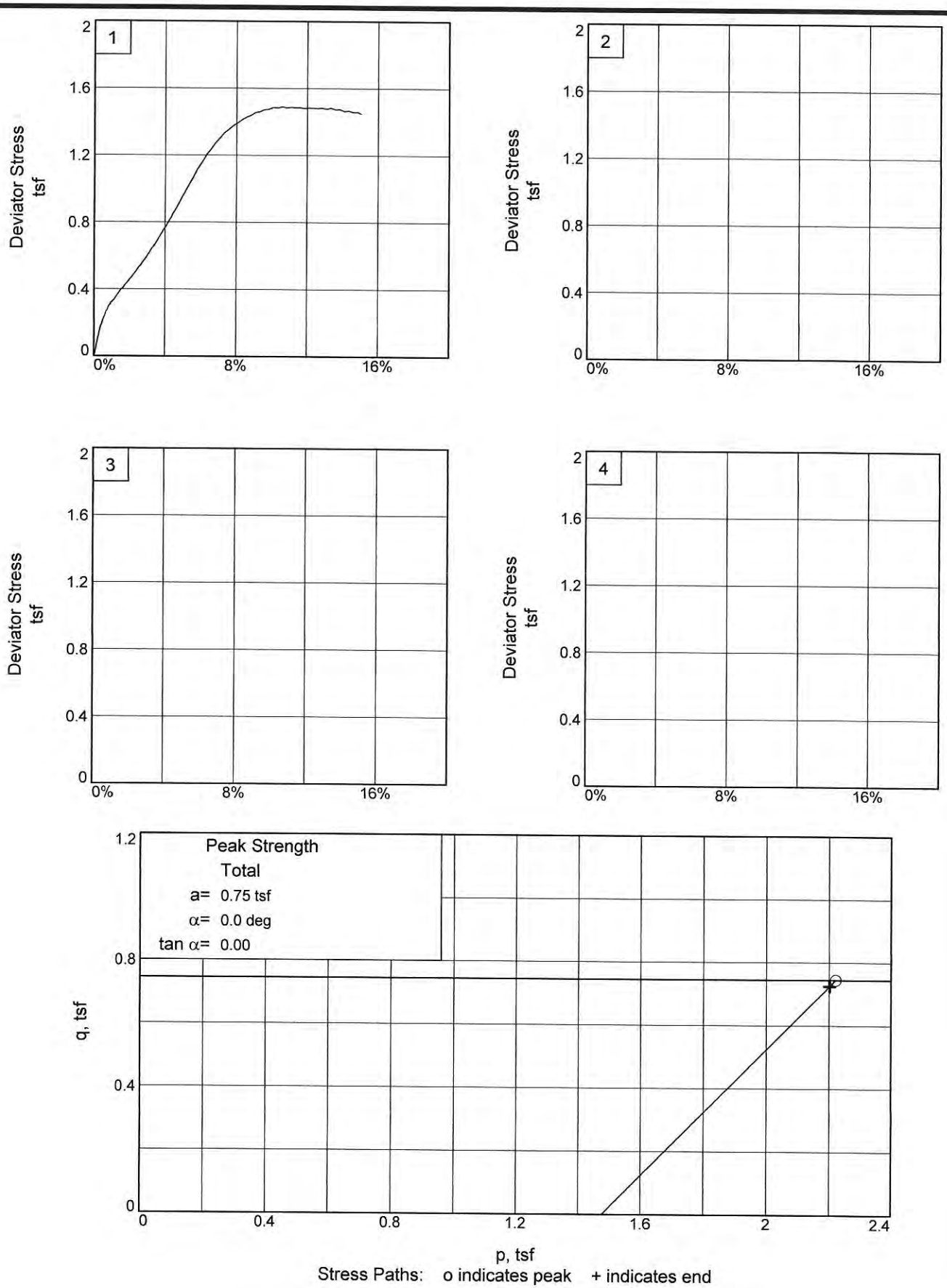
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 58

Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas



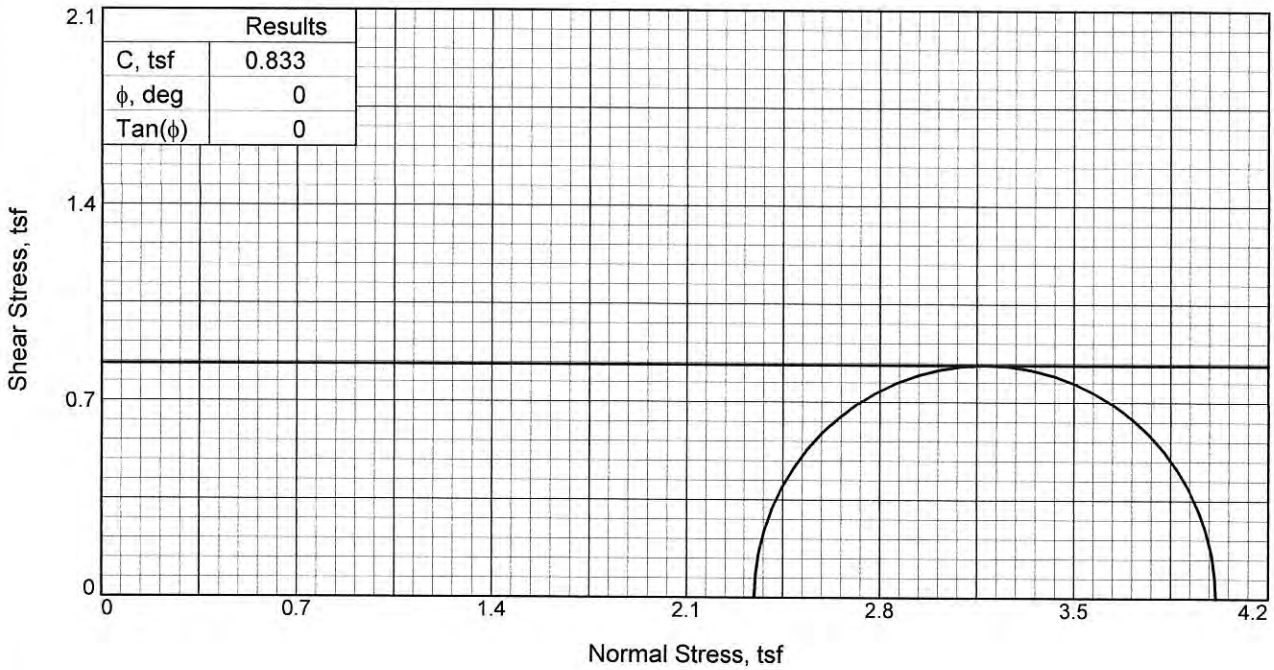
Client:

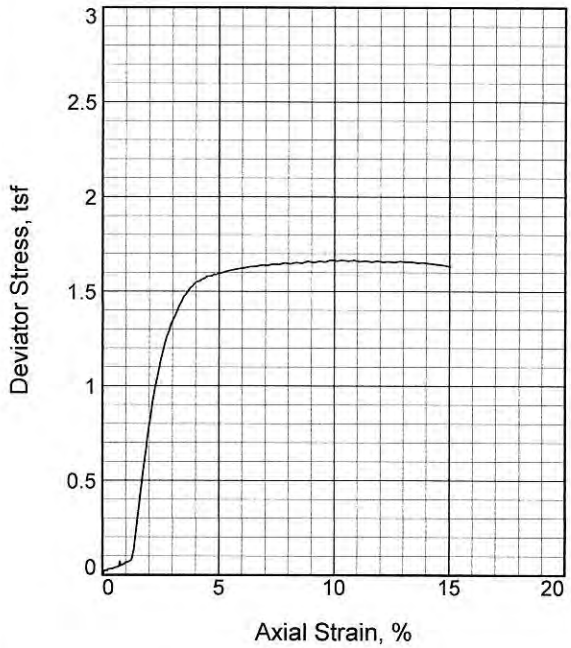
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 58

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	25.2
	Dry Density, pcf	101.1
	Saturation, %	99.1
	Void Ratio	0.6987
	Diameter, in.	2.82
	Height, in.	5.91
At Test	Water Content, %	23.4
	Dry Density, pcf	101.1
	Saturation, %	91.9
	Void Ratio	0.6987
	Diameter, in.	2.82
	Height, in.	5.91
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		32.60
Fail. Stress, tsf		1.67
Strain, %		9.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		4.01
σ_3 Failure, tsf		2.35

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY

LL= 41 **PL=** 18 **PI=** 23

Assumed Specific Gravity= 2.75

Remarks: Test Method: ASTM D2850
Failure type: Buldge

Figure _____

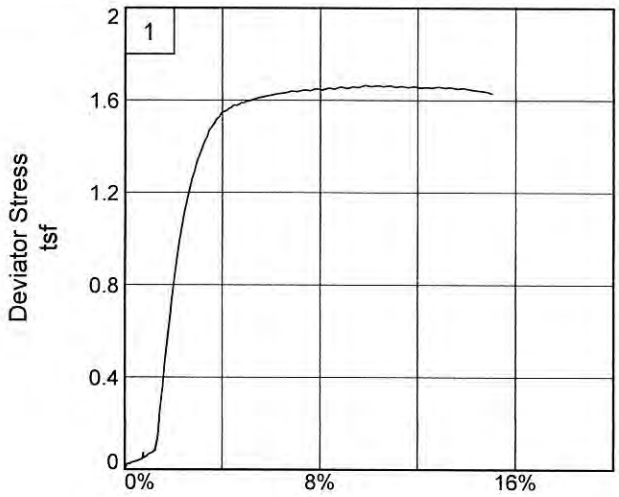
Client:

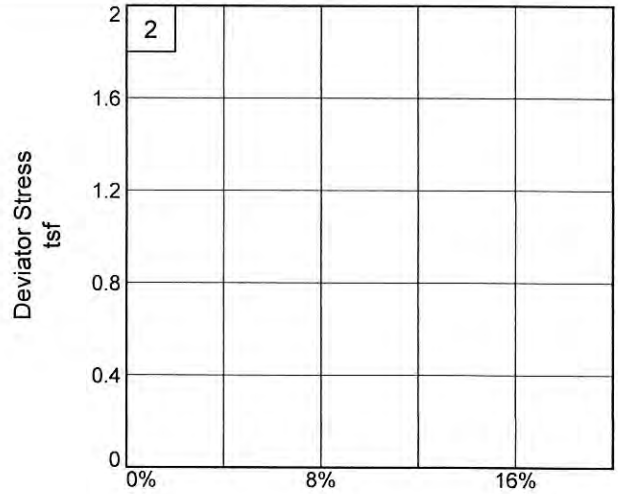
Project: San Jacinto River Waste Pit Superfund Site

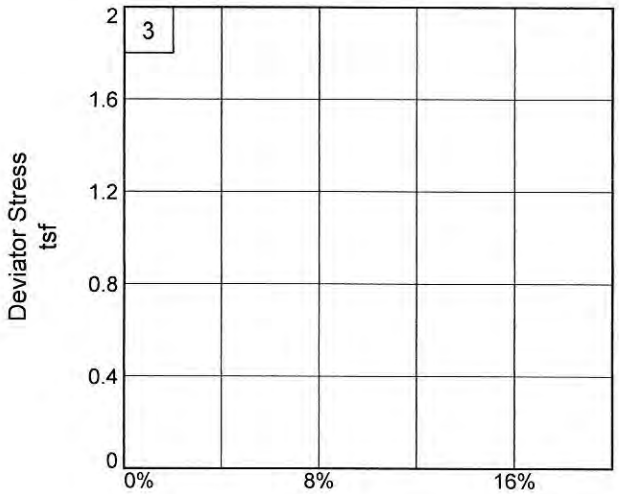
Source of Sample: SJGB057 **Depth:** 93

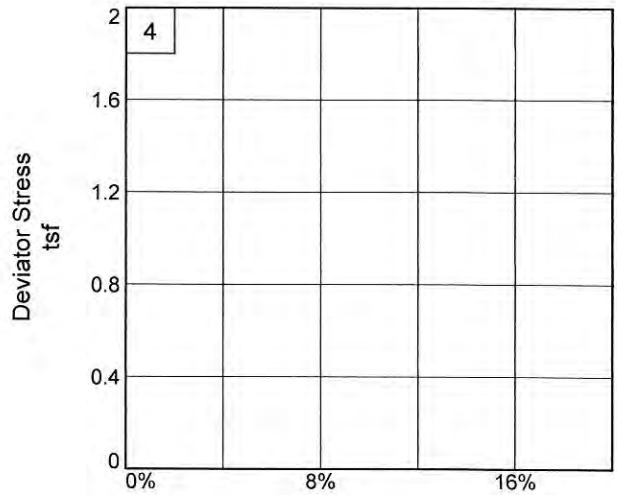
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

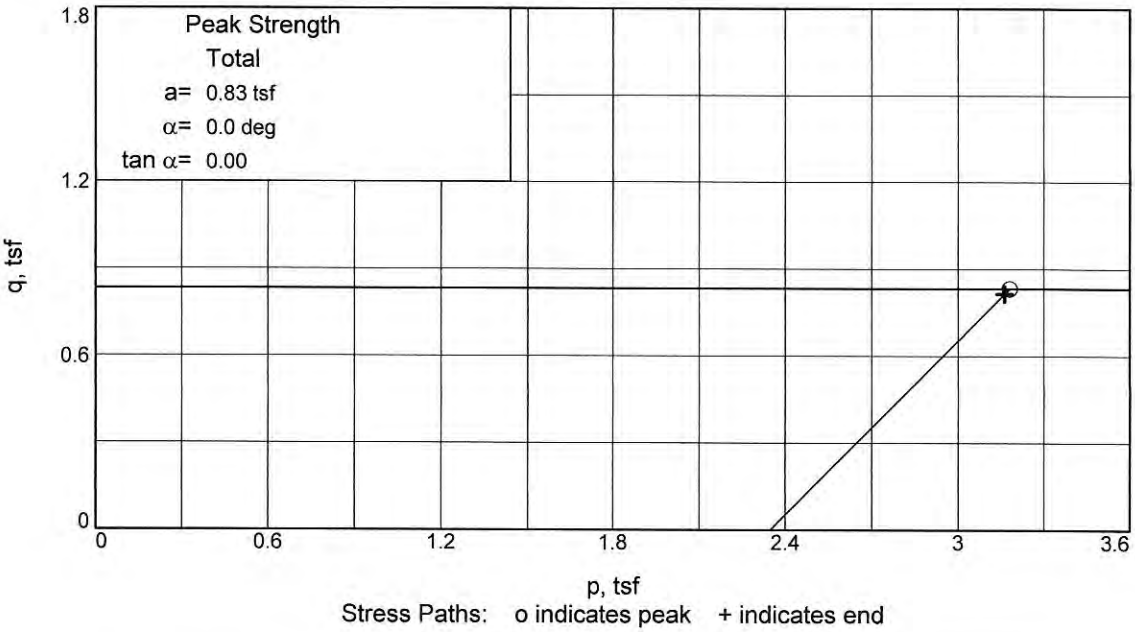
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











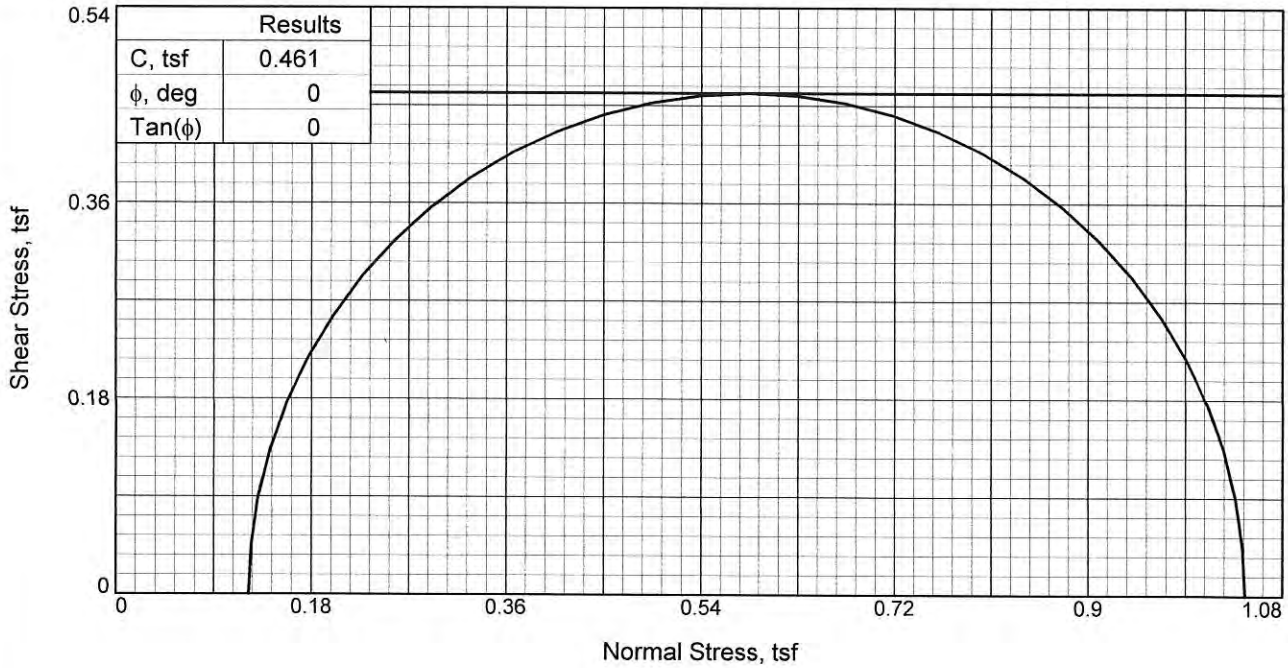
Client:

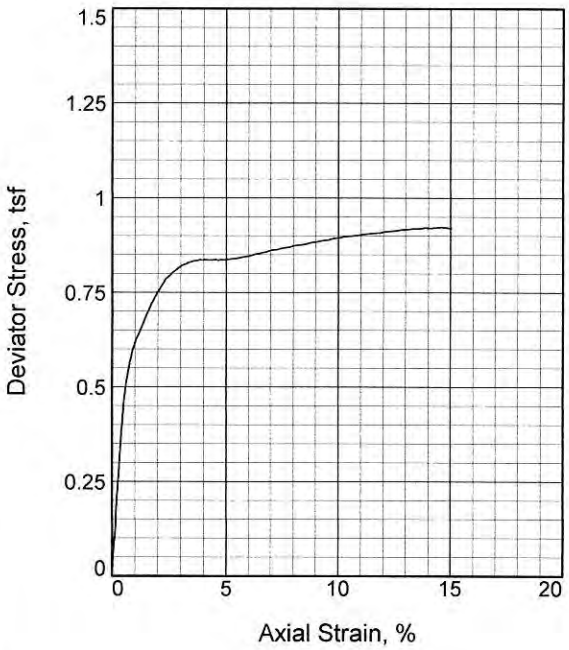
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 93

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	25.5
	Dry Density, pcf	89.3
	Saturation, %	77.7
	Void Ratio	0.8871
	Diameter, in.	2.89
	Height, in.	5.70
At Test	Water Content, %	25.1
	Dry Density, pcf	89.3
	Saturation, %	76.3
	Void Ratio	0.8871
	Diameter, in.	2.89
	Height, in.	5.70
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		1.70
Fail. Stress, tsf		0.92
Strain, %		14.6
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.05
σ_3 Failure, tsf		0.12

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Dark brown LEAN CLAY

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

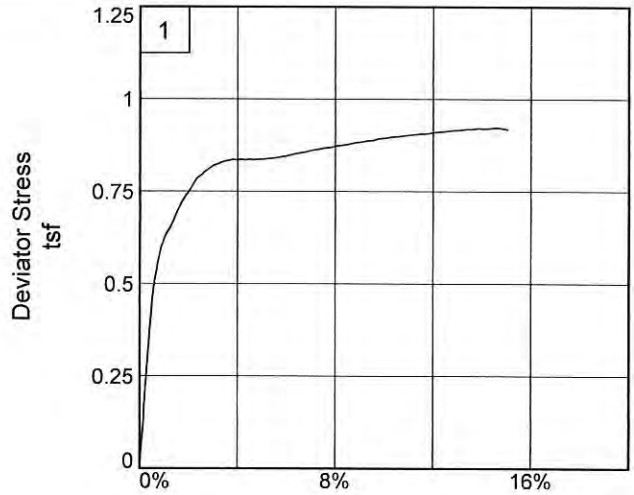
Client:

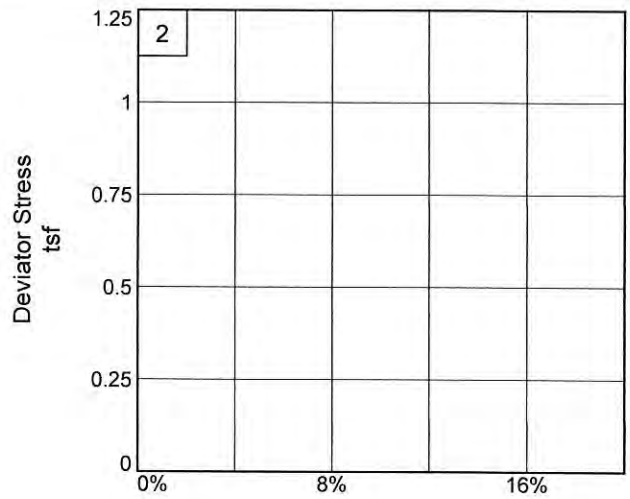
Project: San Jacinto River Waste Pit Superfund Site

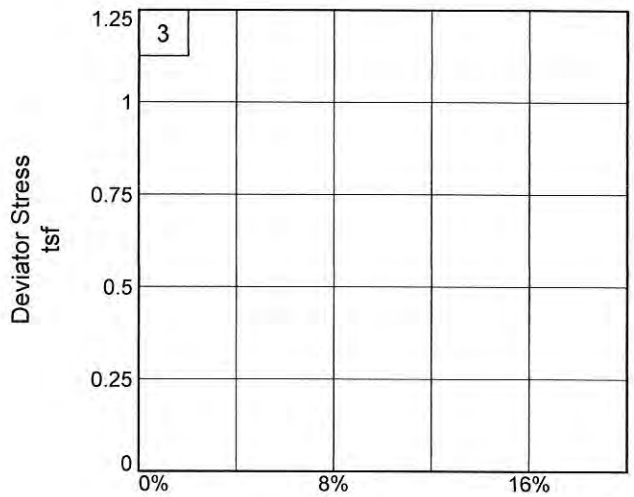
Source of Sample: SJGB058 **Depth:** 4-6

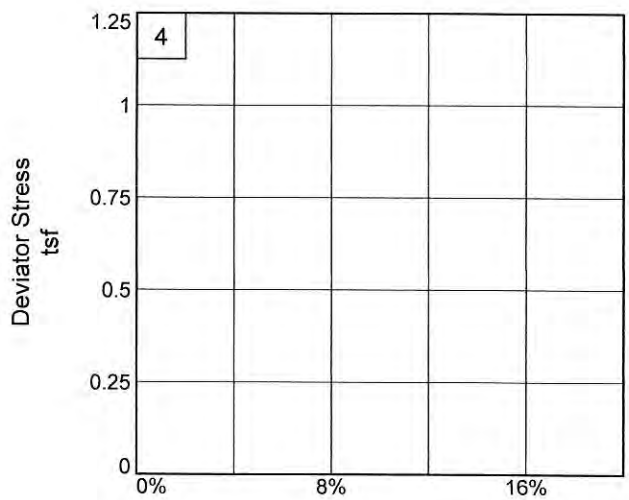
Proj. No.: 19.15.131 **Date Sampled:** 2/20/20

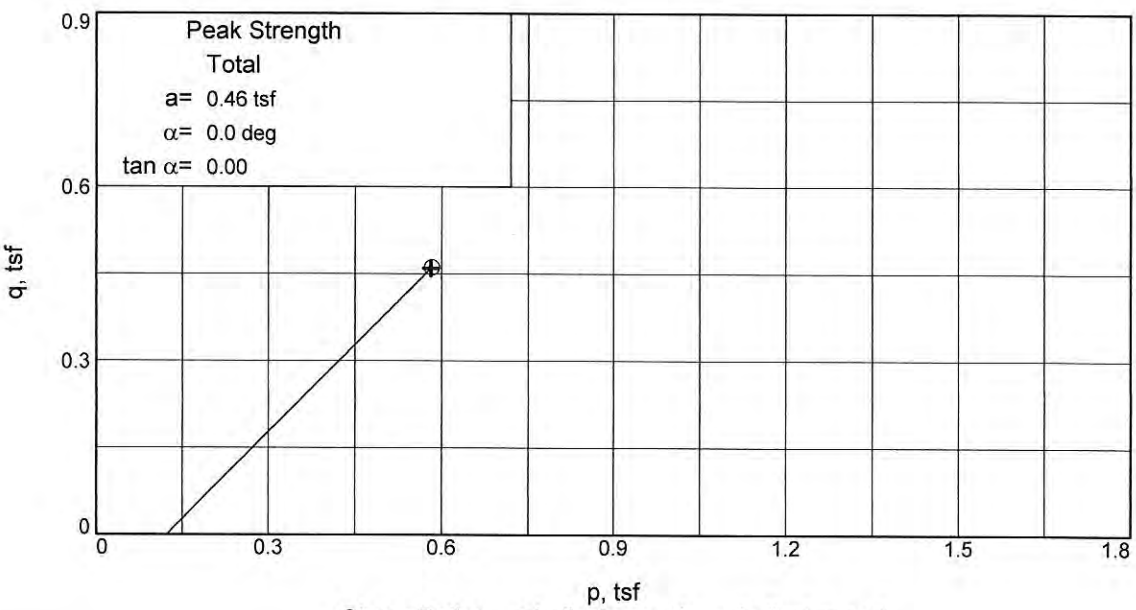
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

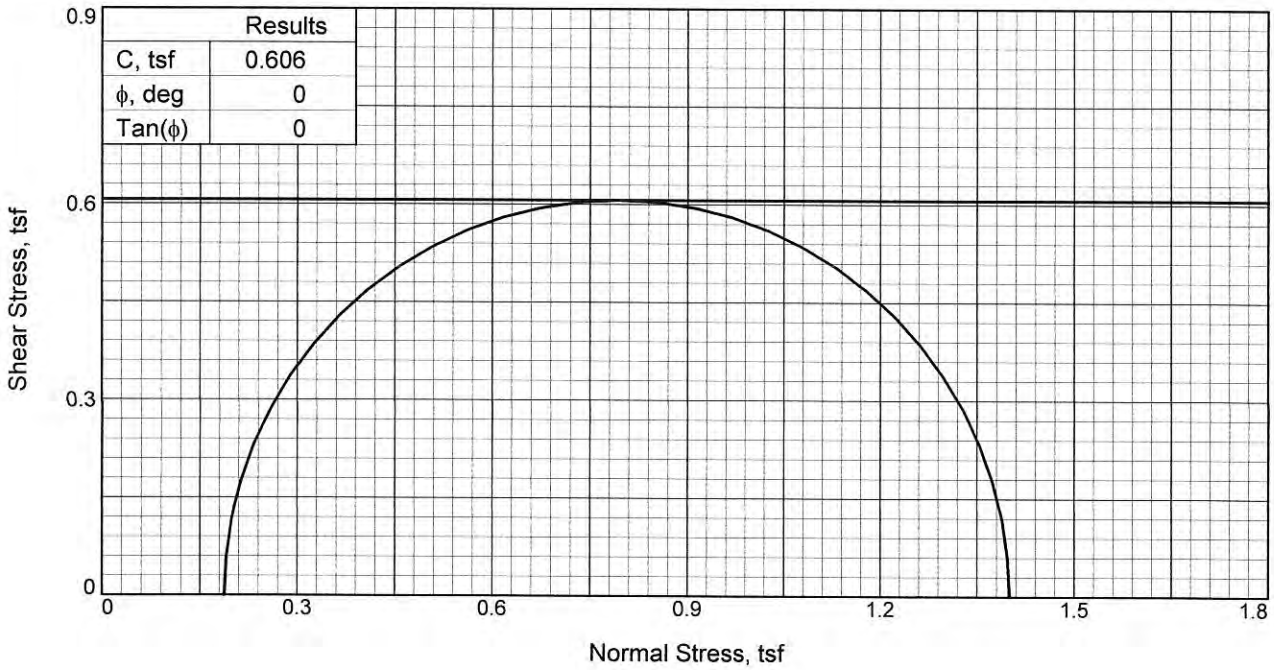
Client:

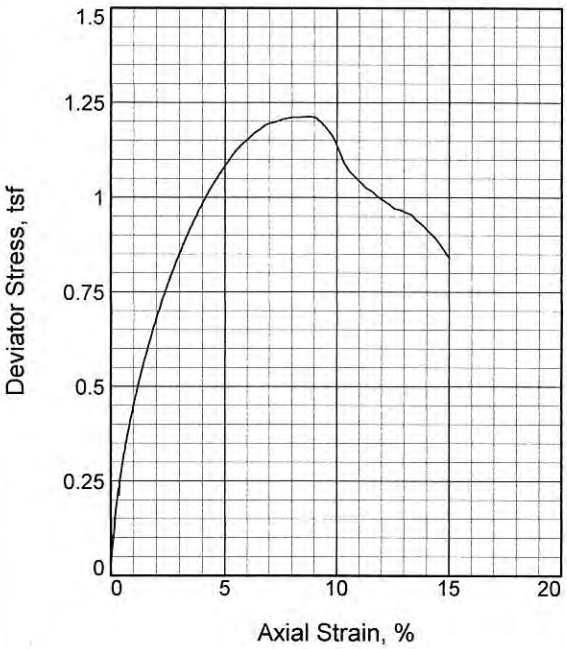
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB058 **Depth:** 4-6

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	34.9
	Dry Density, pcf	86.6
	Saturation, %	99.6
	Void Ratio	0.9459
	Diameter, in.	2.84
	Height, in.	5.68
At Test	Water Content, %	31.3
	Dry Density, pcf	86.6
	Saturation, %	89.4
	Void Ratio	0.9459
	Diameter, in.	2.84
	Height, in.	5.68
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		2.60
Fail. Stress, tsf		1.21
Strain, %		8.8
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.40
σ_3 Failure, tsf		0.19

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Dark brown LEAN CLAY

LL= 42 **PL=** 18 **PI=** 24

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Multiple shear

Figure _____

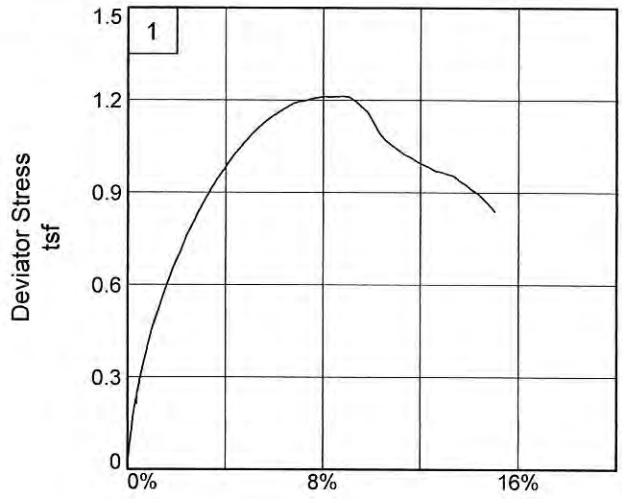
Client:

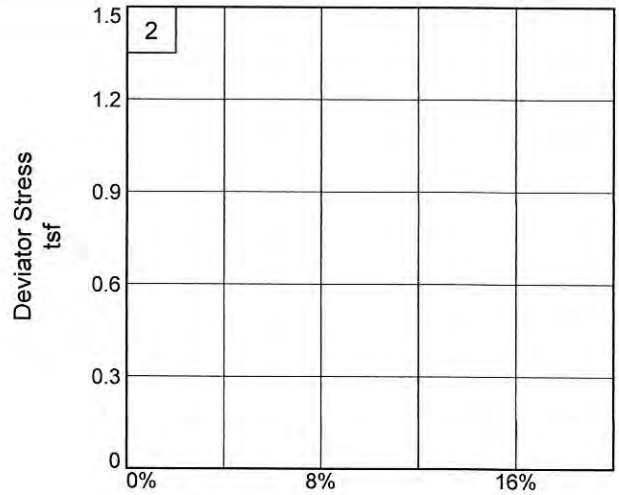
Project: San Jacinto River Waste Pit Superfund Site

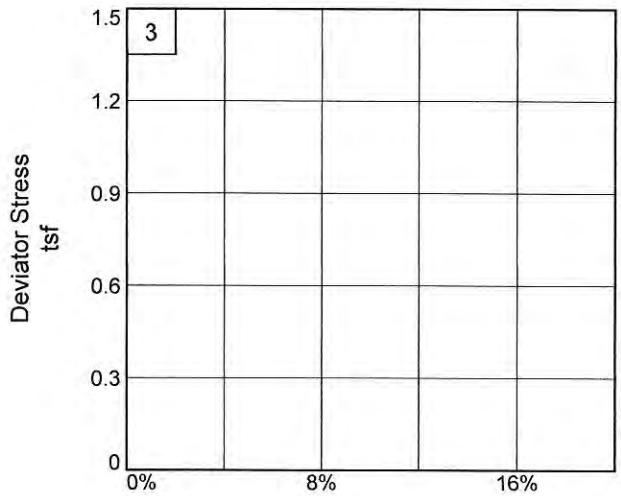
Source of Sample: SJGB058 **Depth:** 6-8

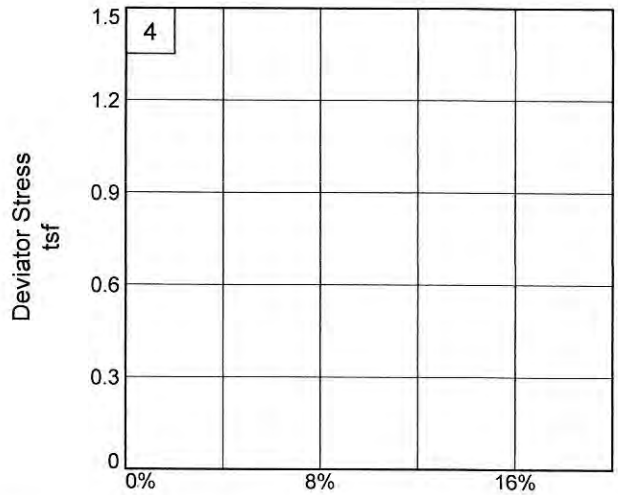
Proj. No.: 19.15.131 **Date Sampled:** 2/20/20

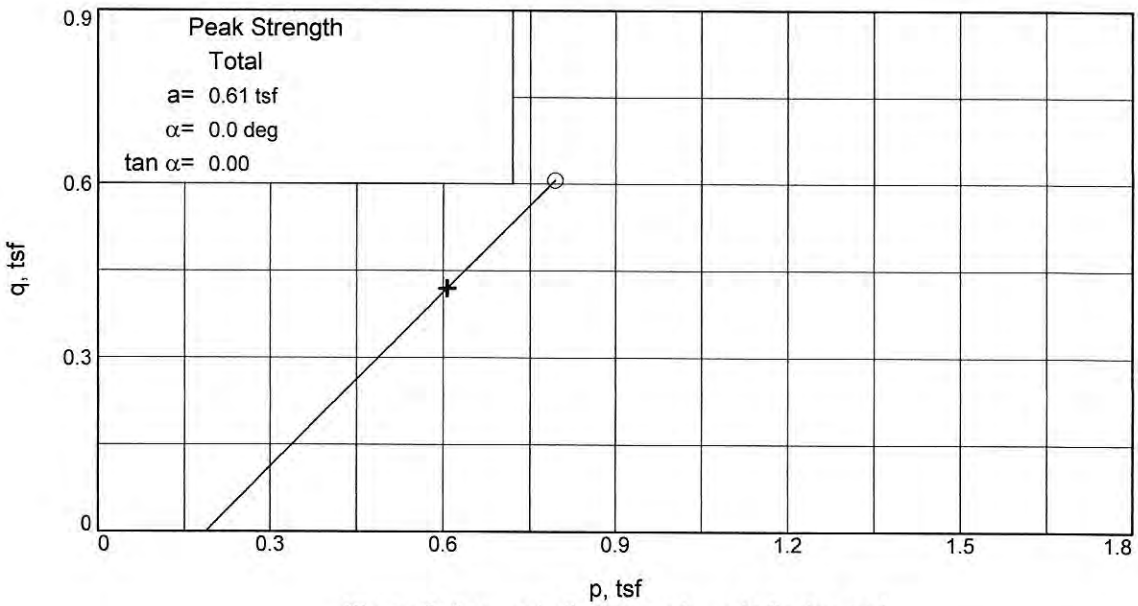
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

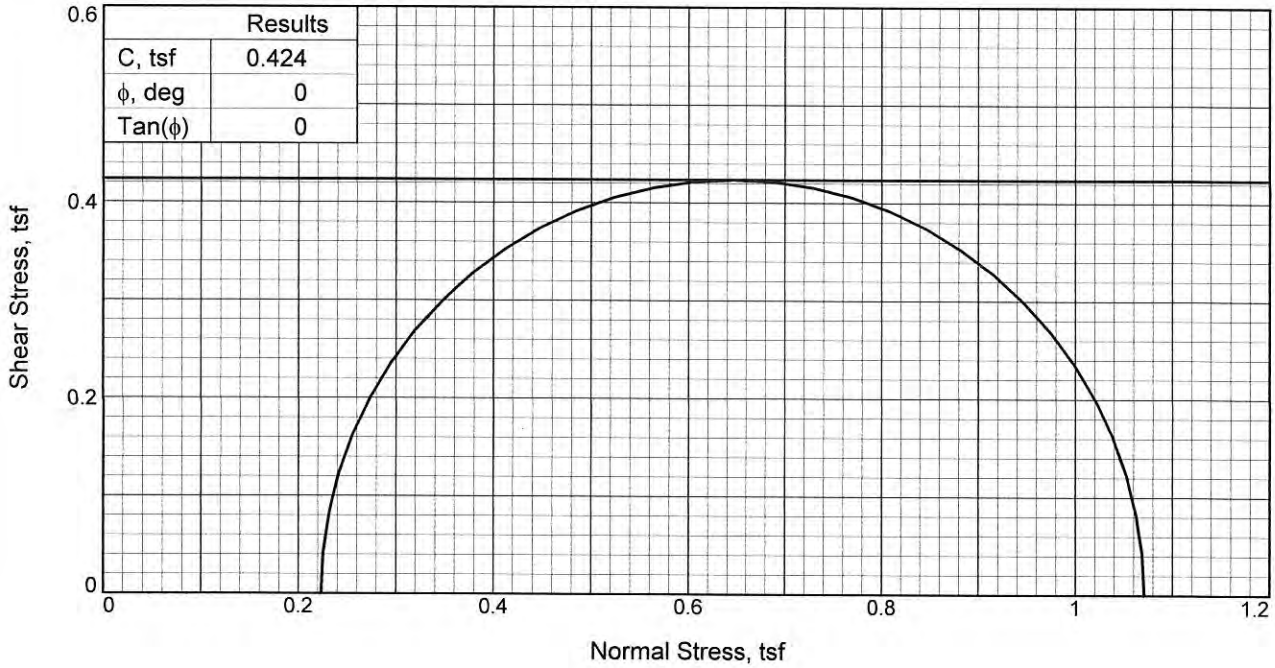
Client:

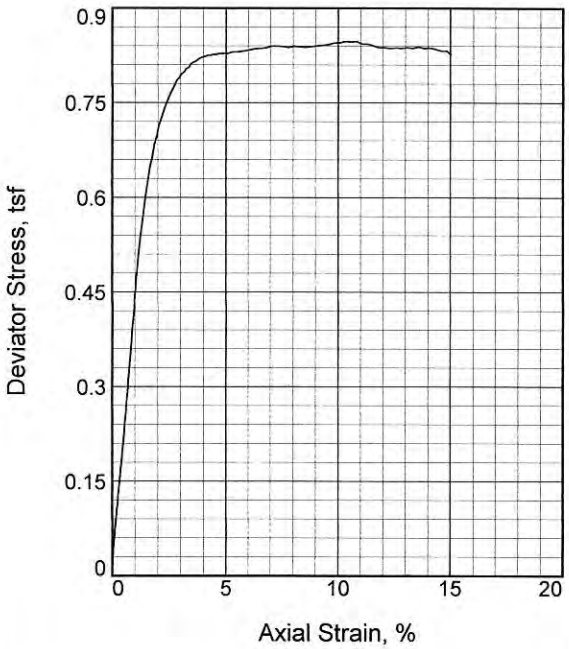
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB058 **Depth:** 6-8

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.





Sample No.		1
Initial	Water Content, %	30.5
	Dry Density, pcf	87.8
	Saturation, %	89.5
	Void Ratio	0.9190
	Diameter, in.	2.89
	Height, in.	5.77
At Test	Water Content, %	27.9
	Dry Density, pcf	87.8
	Saturation, %	81.9
	Void Ratio	0.9190
	Diameter, in.	2.89
	Height, in.	5.77
Strain rate, %/min.		1.00
Back Pressure, psi		0.00
Cell Pressure, psi		3.10
Fail. Stress, tsf		0.85
Strain, %		10.3
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		1.07
σ_3 Failure, tsf		0.22

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Dark brown FAT CLAY

Assumed Specific Gravity= 2.70

Remarks: Test method: ASTM D2850
Failure type: Bulge

Figure _____

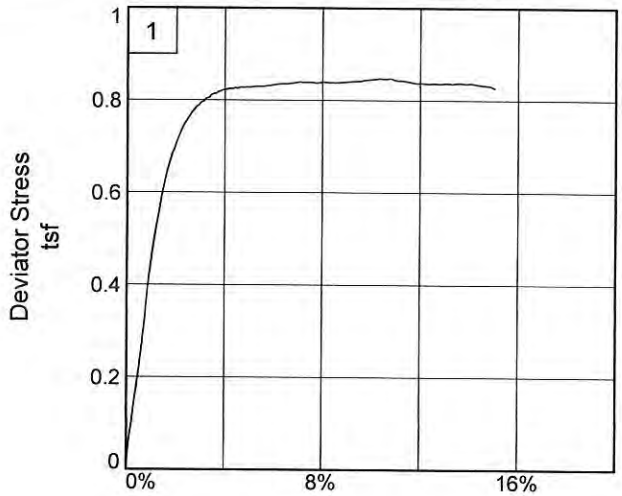
Client:

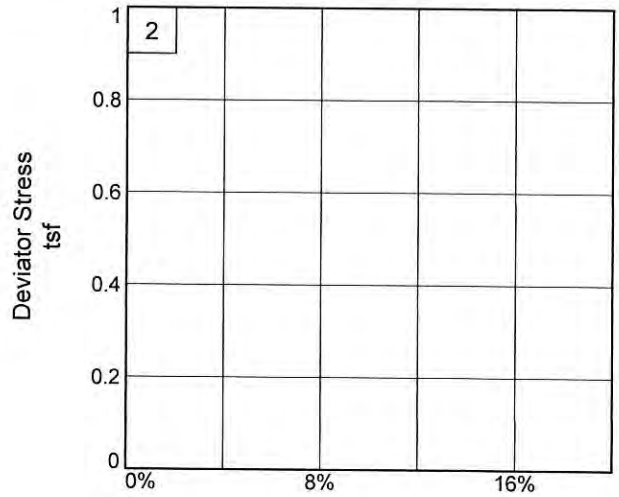
Project: San Jacinto River Waste Pit Superfund Site

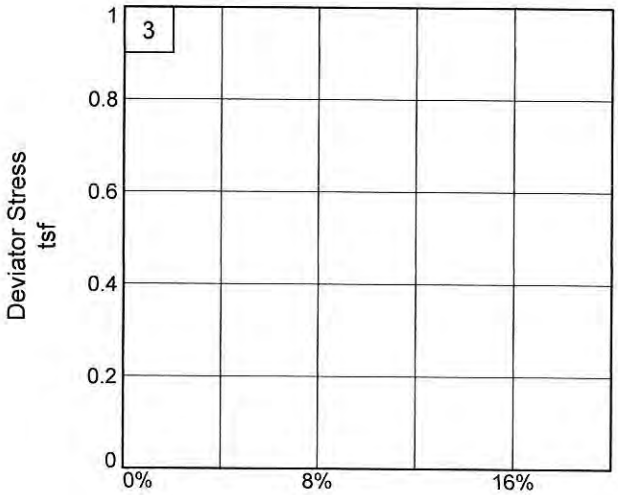
Source of Sample: SJGB058 **Depth:** 8-10

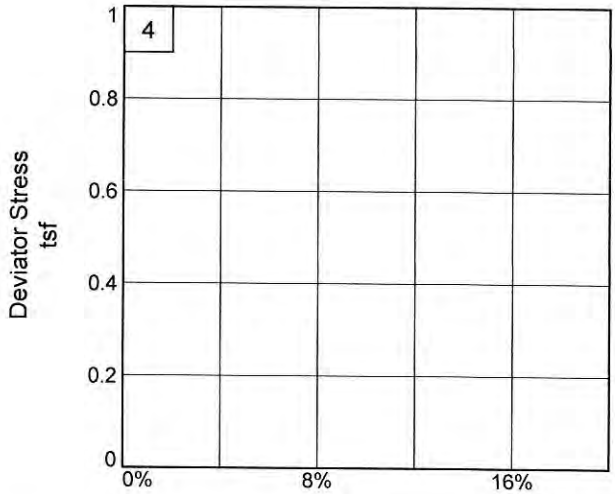
Proj. No.: 19.15.131 **Date Sampled:** 2/20/20

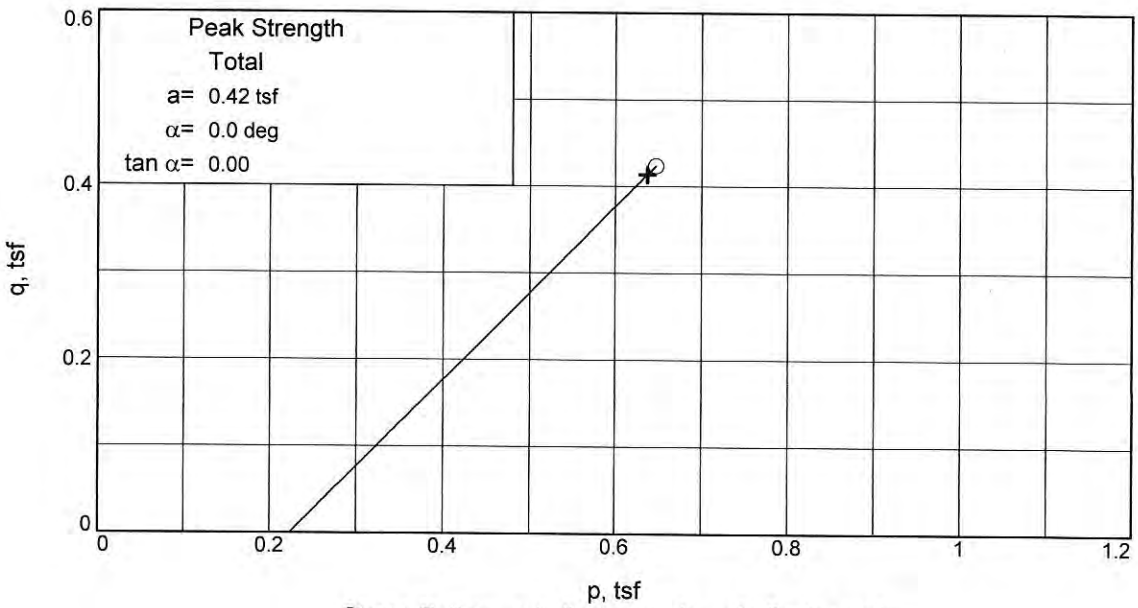
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

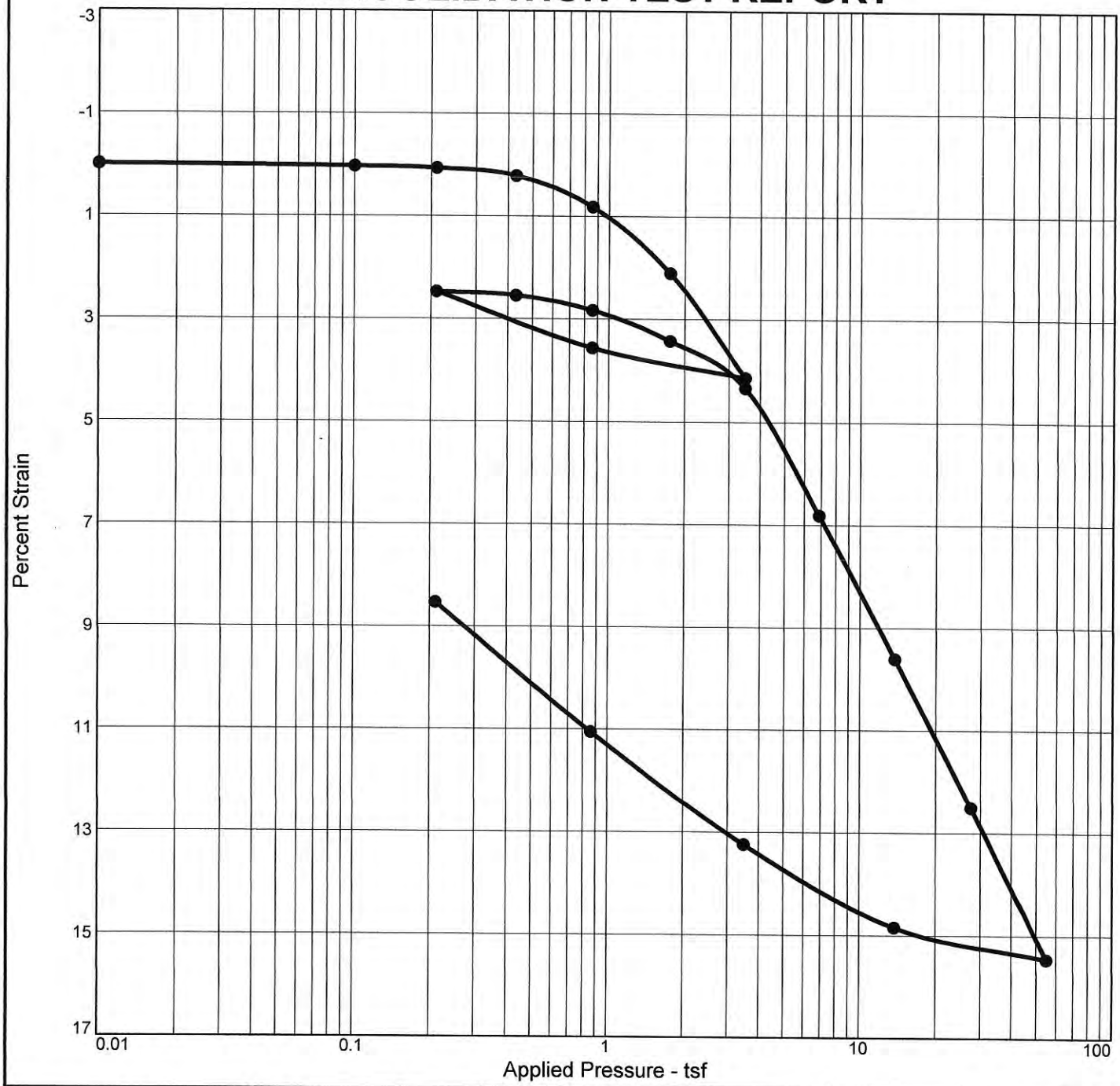
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB058 **Depth:** 8-10

Project No.: 19.15.131 **Figure** _____

TOLUNAY-WONG ENGINEERS, INC.

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
98.0 %	20.6 %	107.5	37	20	2.70	CL		0.567

MATERIAL DESCRIPTION

Gray SANDY LEAN CLAY

Project No. 19.15.131 **Client:**

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 **Depth:** 6

Remarks:

Test method: ASTM D2435
Specific gravity: Assumed

Tolunay-Wong Engineers, Inc.

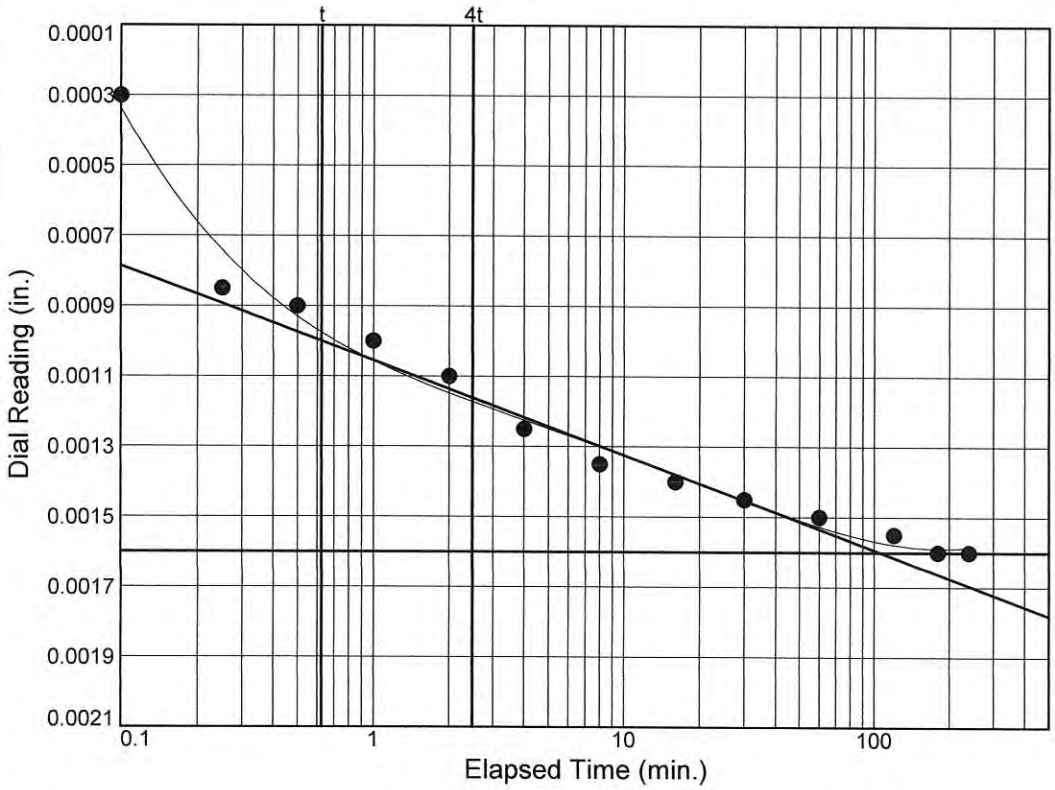
Houston, Texas

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

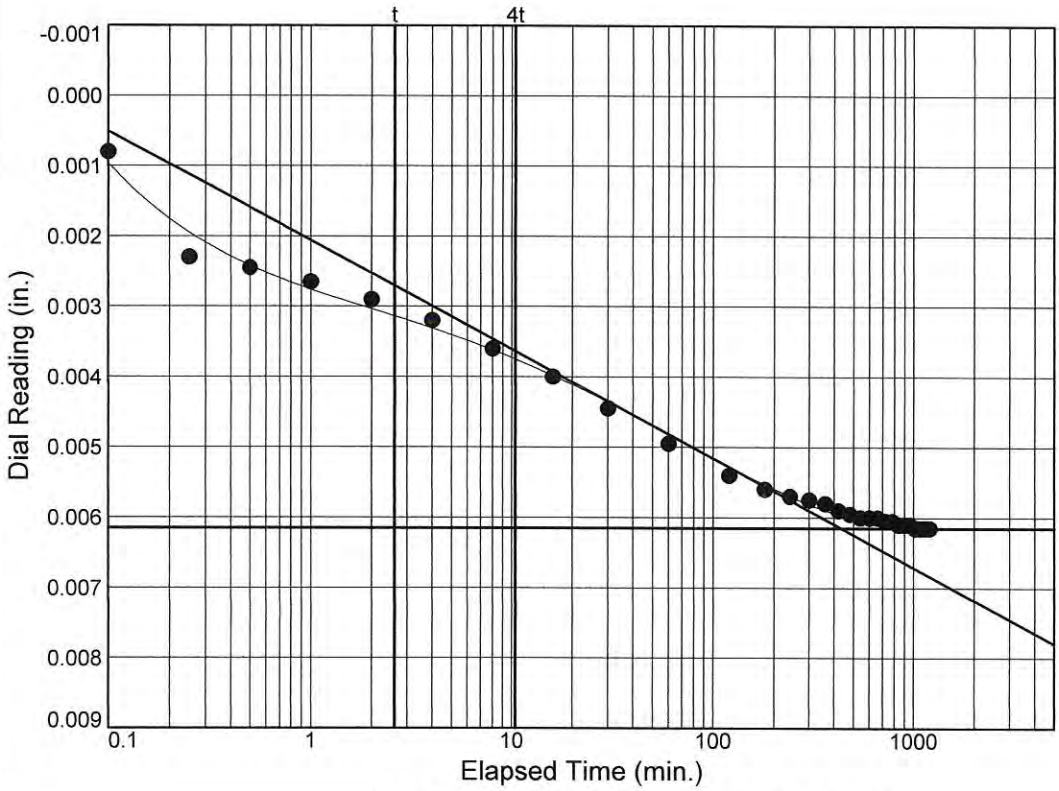
Source of Sample: SJGB027 Depth: 6



Load No.= 4
Load= 0.43 tsf
D_0 = 0.0008
D_{50} = 0.0012
D_{100} = 0.0016
T_{50} = 2.86 min.

C_v @ T_{50}
35.3 ft.^{2}/yr.

C_α = 0.000



Load No.= 5
Load= 0.86 tsf
D_0 = 0.0025
D_{50} = 0.0043
D_{100} = 0.0062
T_{50} = 28.88 min.

C_v @ T_{50}
3.5 ft.^{2}/yr.

C_α = 0.000

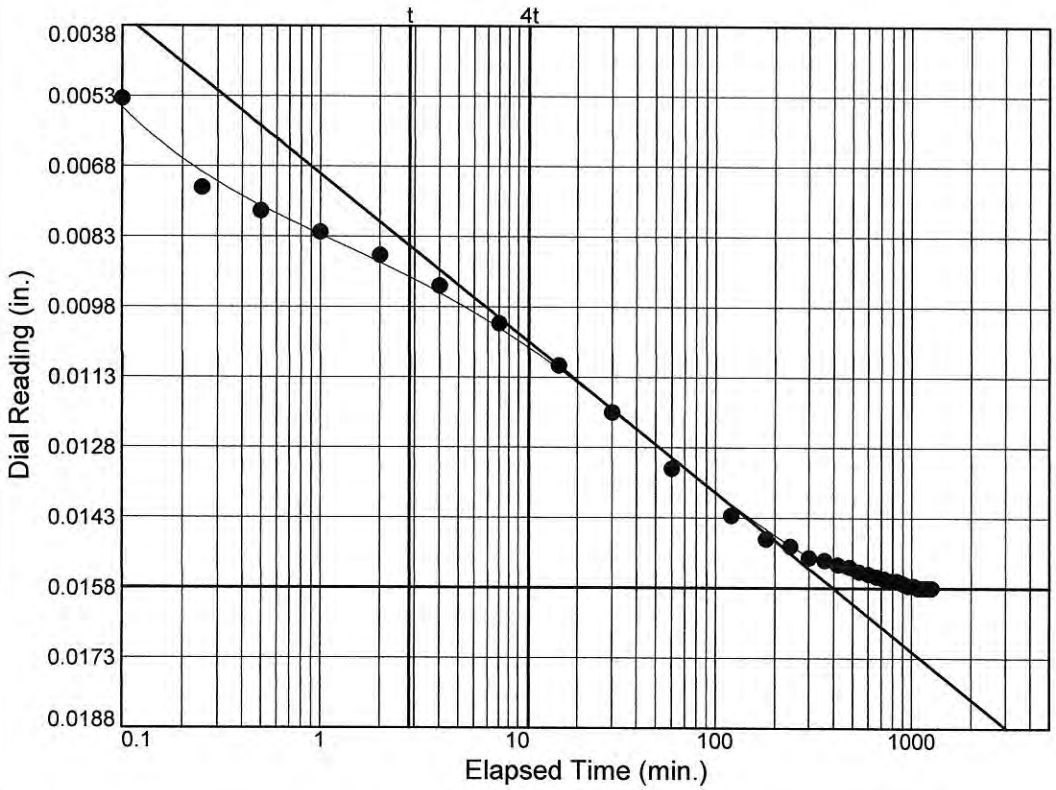
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

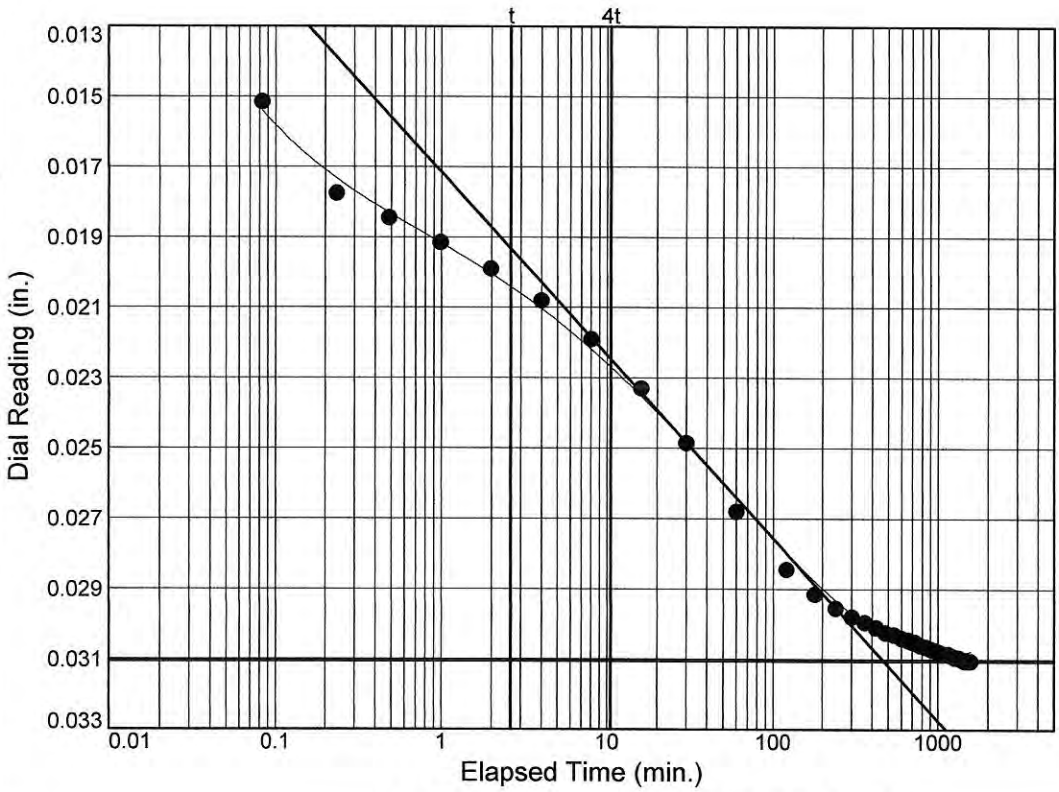
Source of Sample: SJGB027 Depth: 6



Load No.= 6
Load= 1.75 tsf
D_0 = 0.0077
D_{50} = 0.0117
D_{100} = 0.0158
T_{50} = 24.96 min.

C_v @ T_{50}
3.9 ft.^{2}/yr.

C_α = 0.000



Load No.= 7
Load= 3.49 tsf
D_0 = 0.0181
D_{50} = 0.0246
D_{100} = 0.0311
T_{50} = 26.63 min.

C_v @ T_{50}
3.6 ft.^{2}/yr.

C_α = 0.000

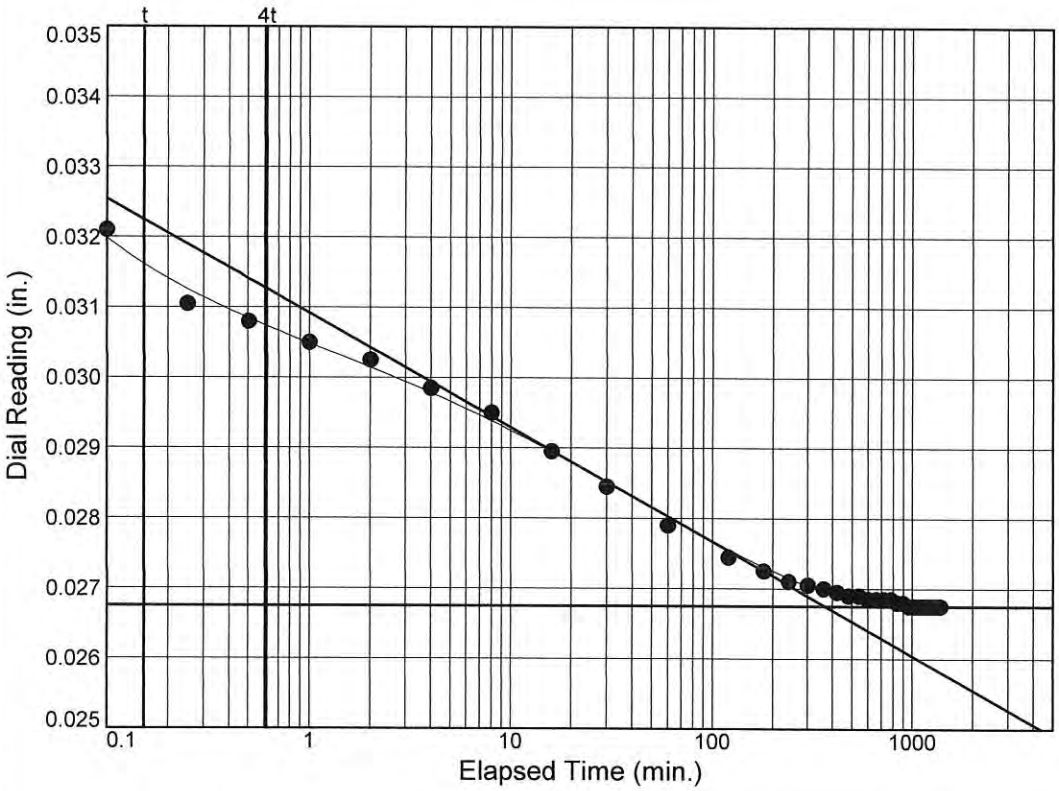
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

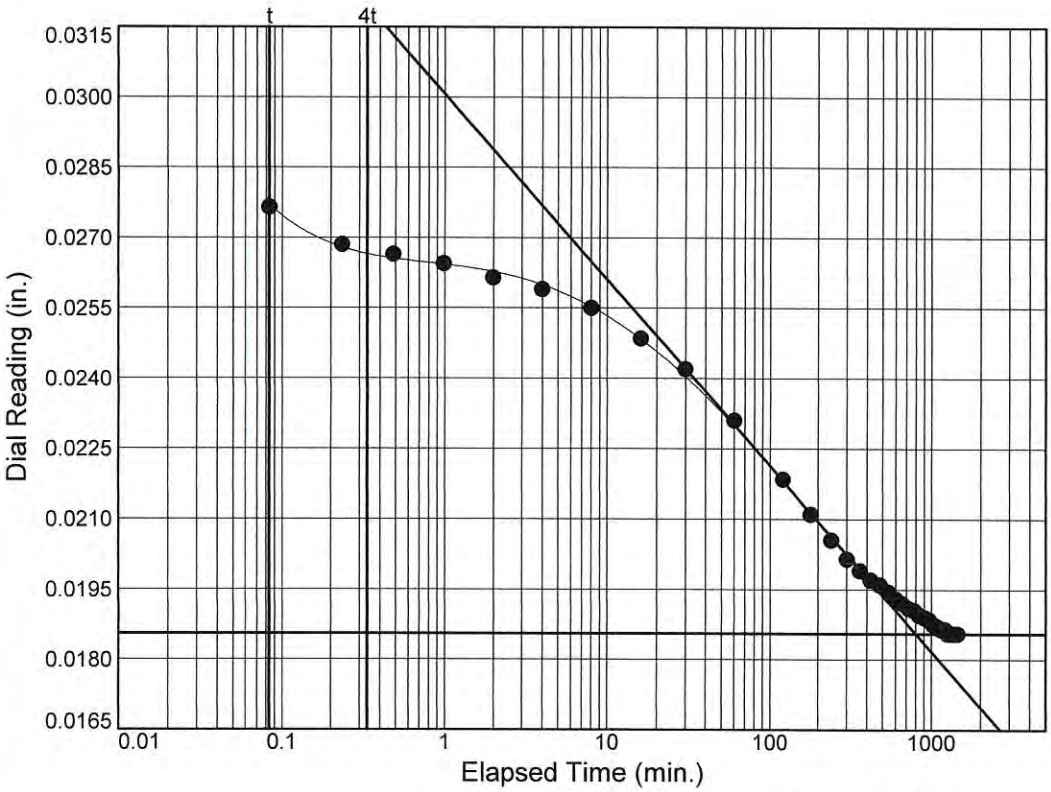
Source of Sample: SJGB027 Depth: 6



Load No.= 8
Load= 0.86 tsf
D_0 = 0.0325
D_{50} = 0.0296
D_{100} = 0.0267
T_{50} = 5.38 min.

C_v @ T_{50}
17.3 ft.^{2}/yr.

C_α = 0.000



Load No.= 9
Load= 0.21 tsf
D_0 = 0.0287
D_{50} = 0.0236
D_{100} = 0.0186
T_{50} = 39.47 min.

C_v @ T_{50}
2.4 ft.^{2}/yr.

C_α = 0.000

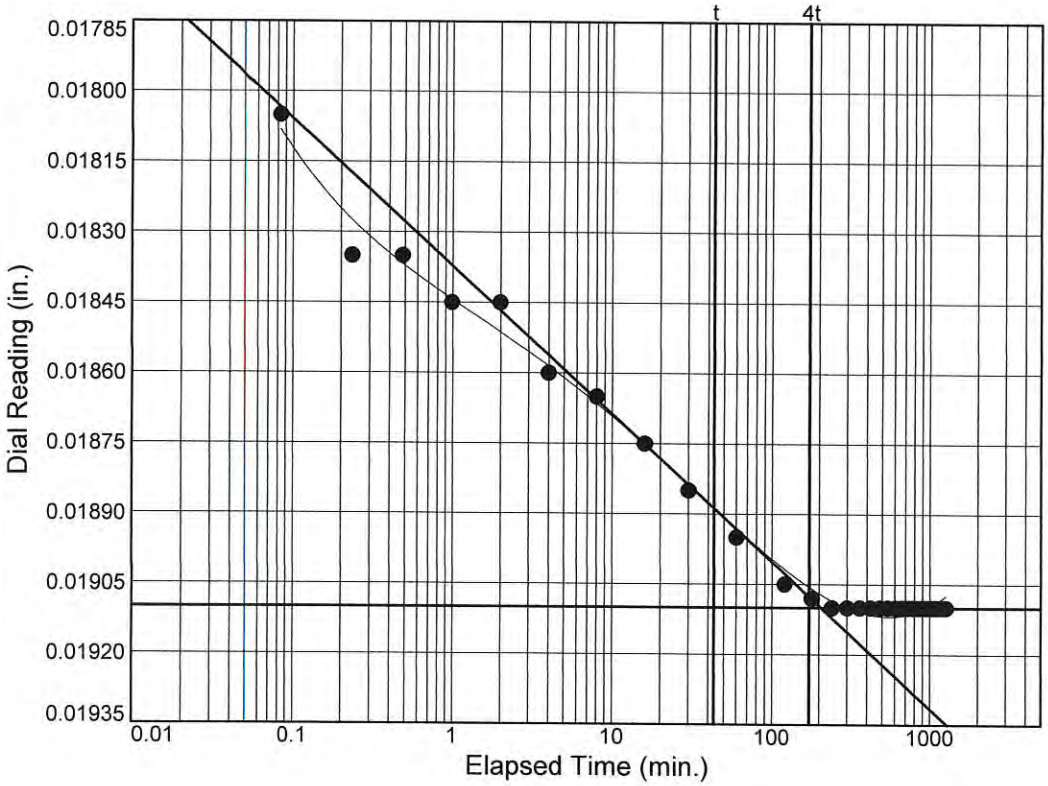
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

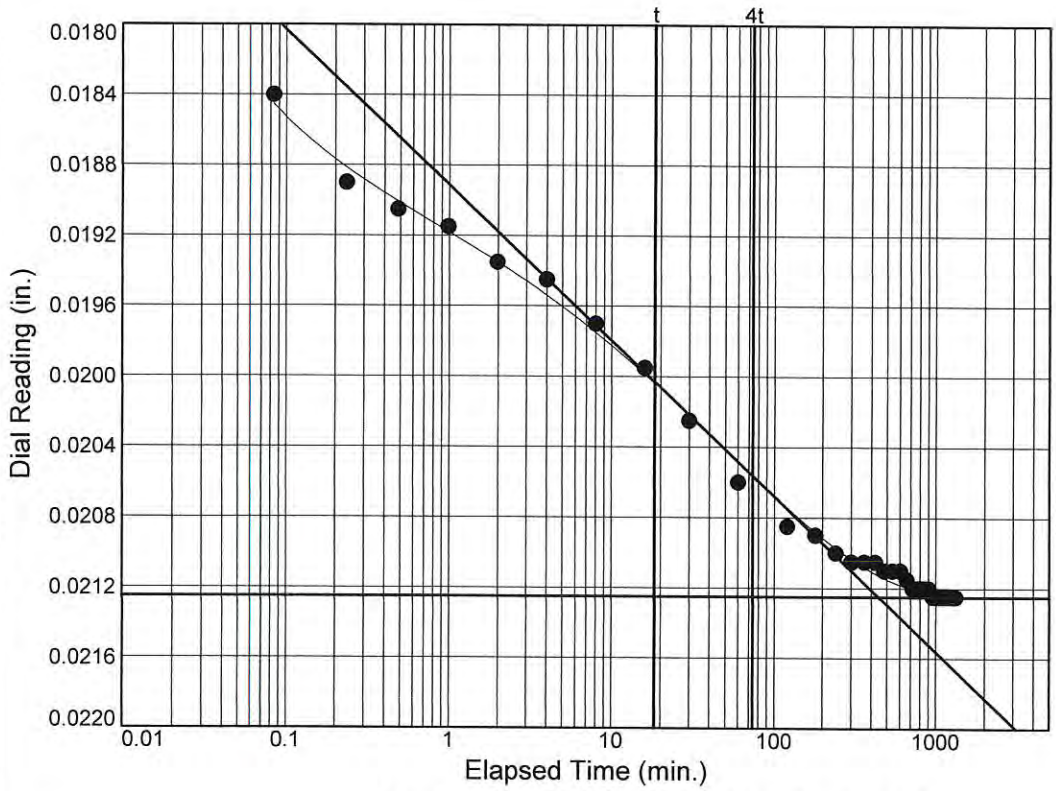
Source of Sample: SJGB027 Depth: 6



Load No.= 10
Load= 0.43 tsf
D_0 = 0.0187
D_{50} = 0.0189
D_{100} = 0.0191
T_{50} = 50.94 min.

C_v @ T_{50}
1.9 ft.^{2}/yr.

C_α = 0.000



Load No.= 11
Load= 0.86 tsf
D_0 = 0.0195
D_{50} = 0.0204
D_{100} = 0.0212
T_{50} = 45.95 min.

C_v @ T_{50}
2.1 ft.^{2}/yr.

C_α = 0.000

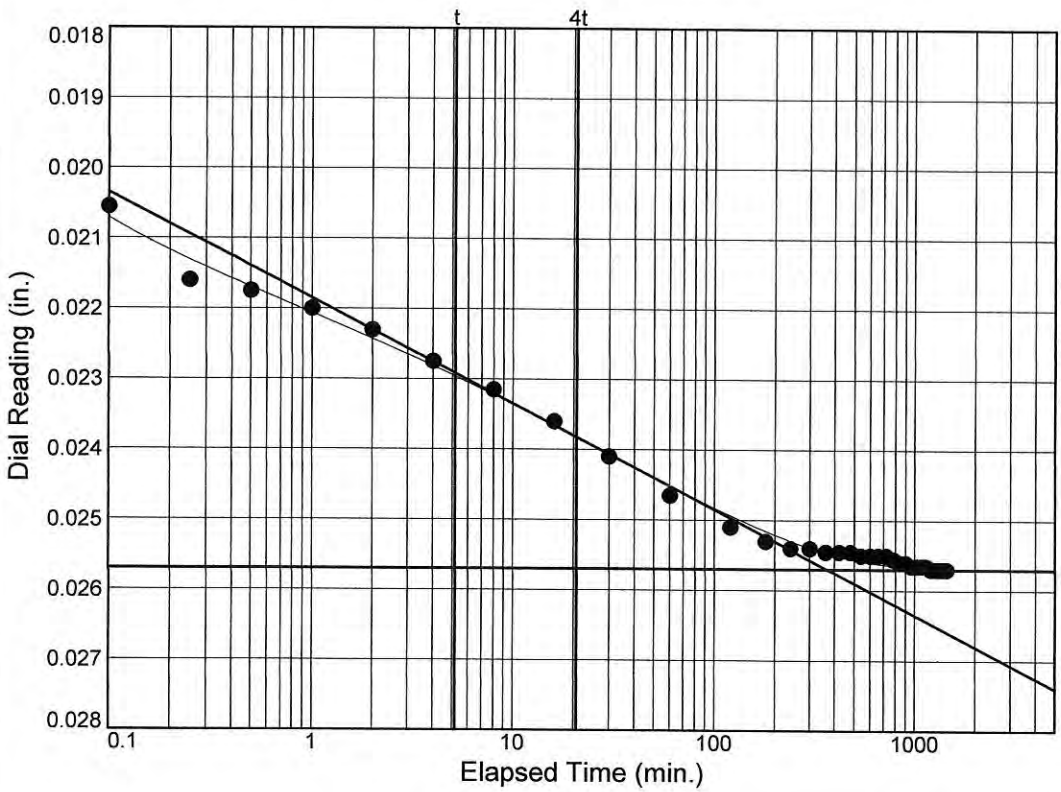
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

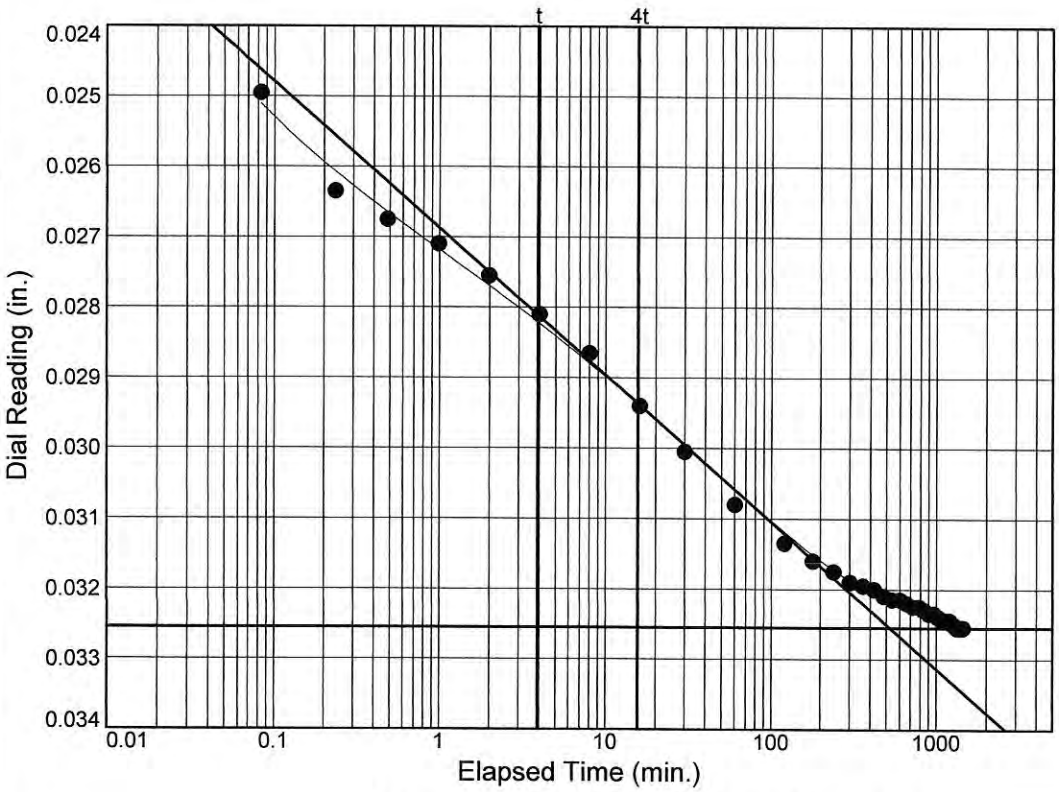
Source of Sample: SJGB027 Depth: 6



Load No.= 12
Load= 1.75 tsf
D_0 = 0.0221
D_{50} = 0.0239
D_{100} = 0.0257
T_{50} = 23.24 min.

C_v @ T_{50}
4.1 ft.^{2}/yr.

C_α = 0.000



Load No.= 13
Load= 3.49 tsf
D_0 = 0.0270
D_{50} = 0.0298
D_{100} = 0.0325
T_{50} = 25.16 min.

C_v @ T_{50}
3.7 ft.^{2}/yr.

C_α = 0.000

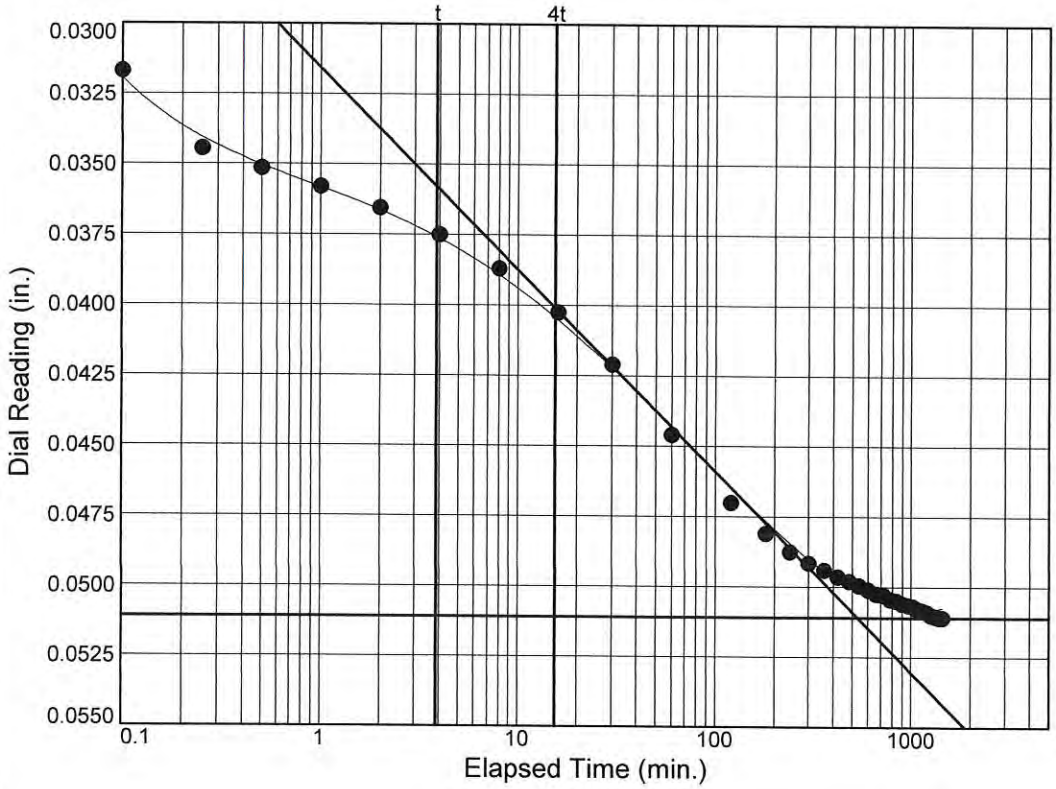
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

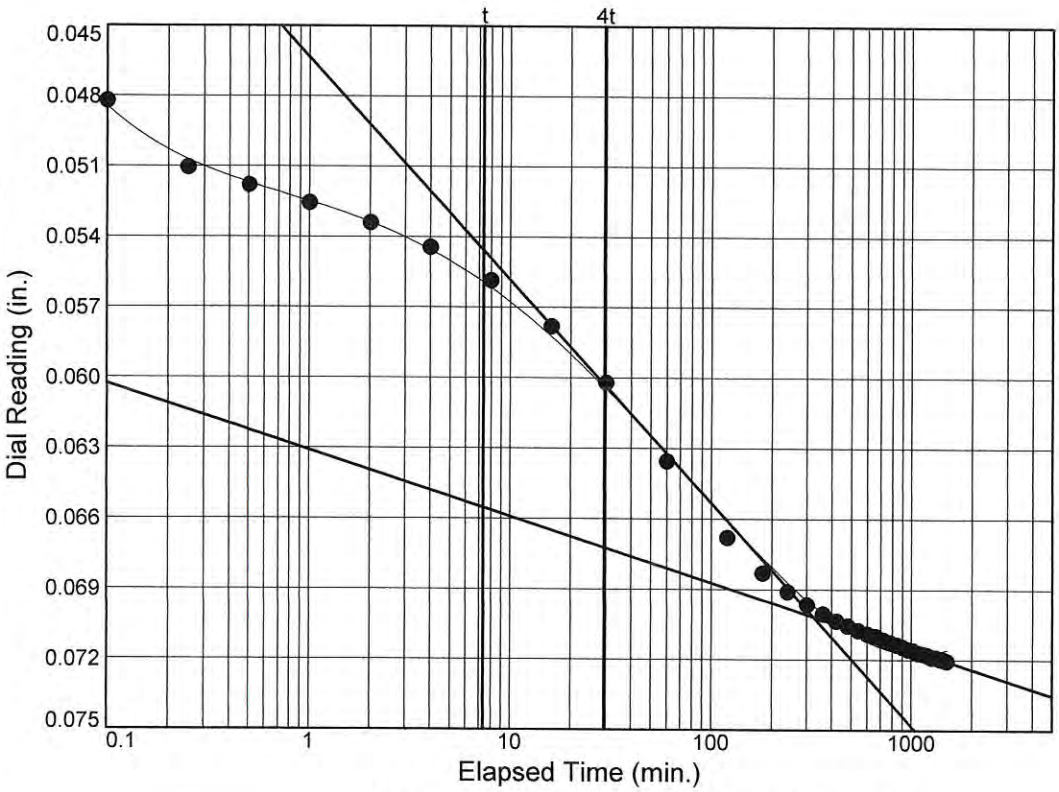
Source of Sample: SJGB027 Depth: 6



Load No.= 14
Load= 6.87 tsf
D_0 = 0.0347
D_{50} = 0.0429
D_{100} = 0.0511
T_{50} = 37.82 min.

C_v @ T_{50}
2.4 ft.^{2}/yr.

C_α = 0.000



Load No.= 15
Load= 13.75 tsf
D_0 = 0.0515
D_{50} = 0.0608
D_{100} = 0.0702
T_{50} = 32.86 min.

C_v @ T_{50}
2.6 ft.^{2}/yr.

C_α = 0.006

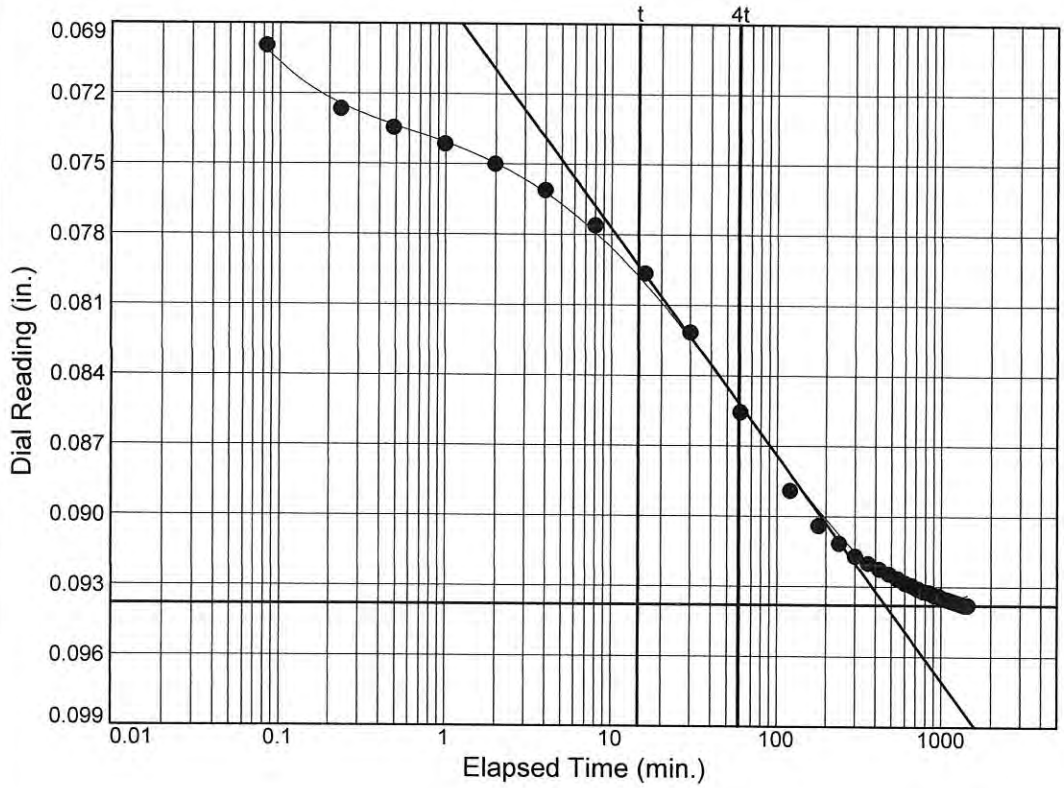
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

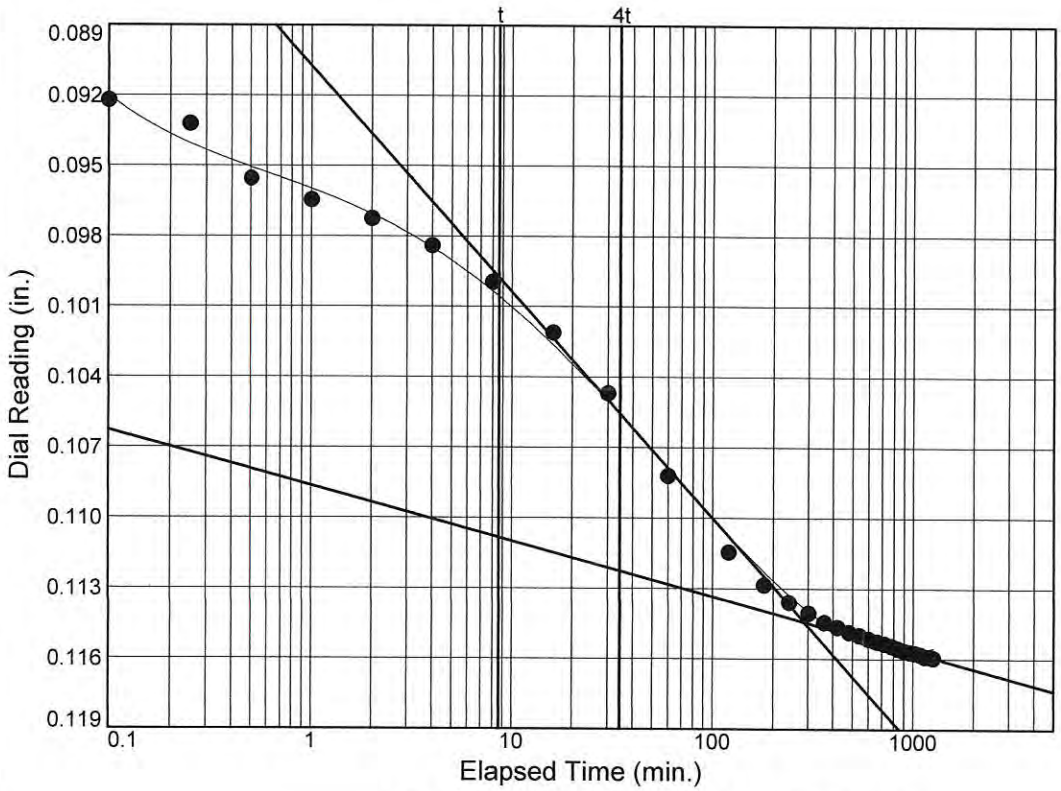
Source of Sample: SJGB027 Depth: 6



Load No.= 16
Load= 27.50 tsf
D_0 = 0.0744
D_{50} = 0.0841
D_{100} = 0.0938
T_{50} = 45.65 min.

C_v @ T_{50}
1.8 ft.^{2}/yr.

C_α = 0.000



Load No.= 17
Load= 54.99 tsf
D_0 = 0.0955
D_{50} = 0.1050
D_{100} = 0.1144
T_{50} = 29.67 min.

C_v @ T_{50}
2.5 ft.^{2}/yr.

C_α = 0.005

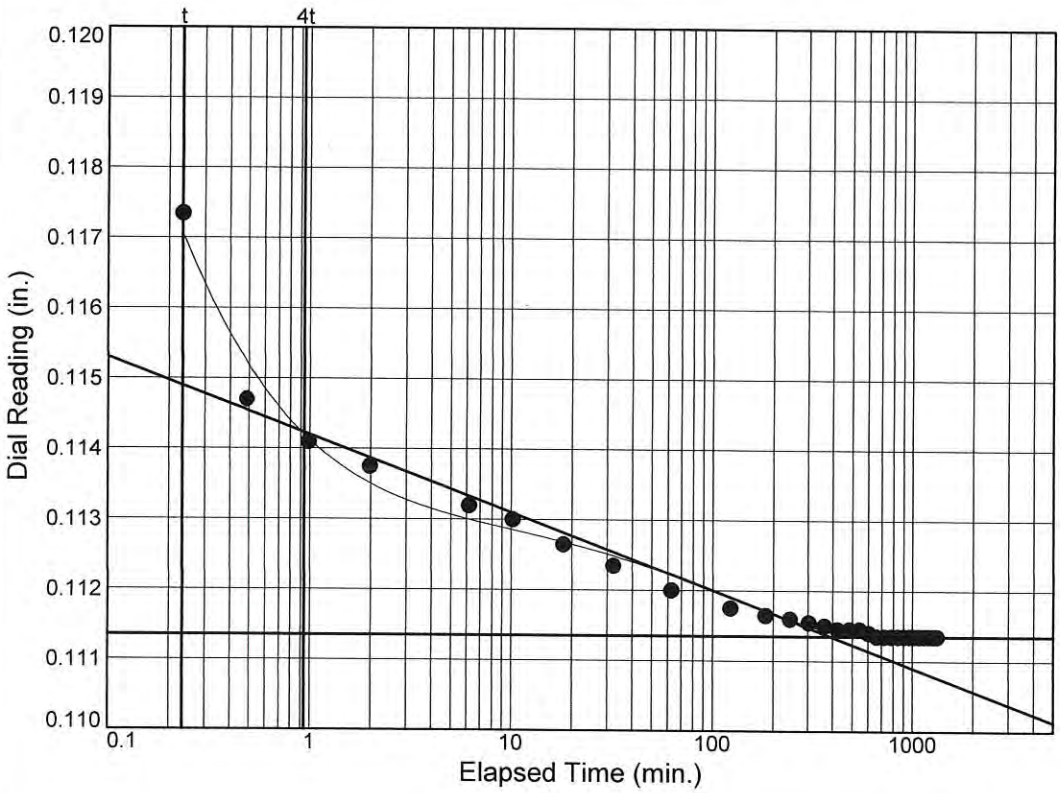
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

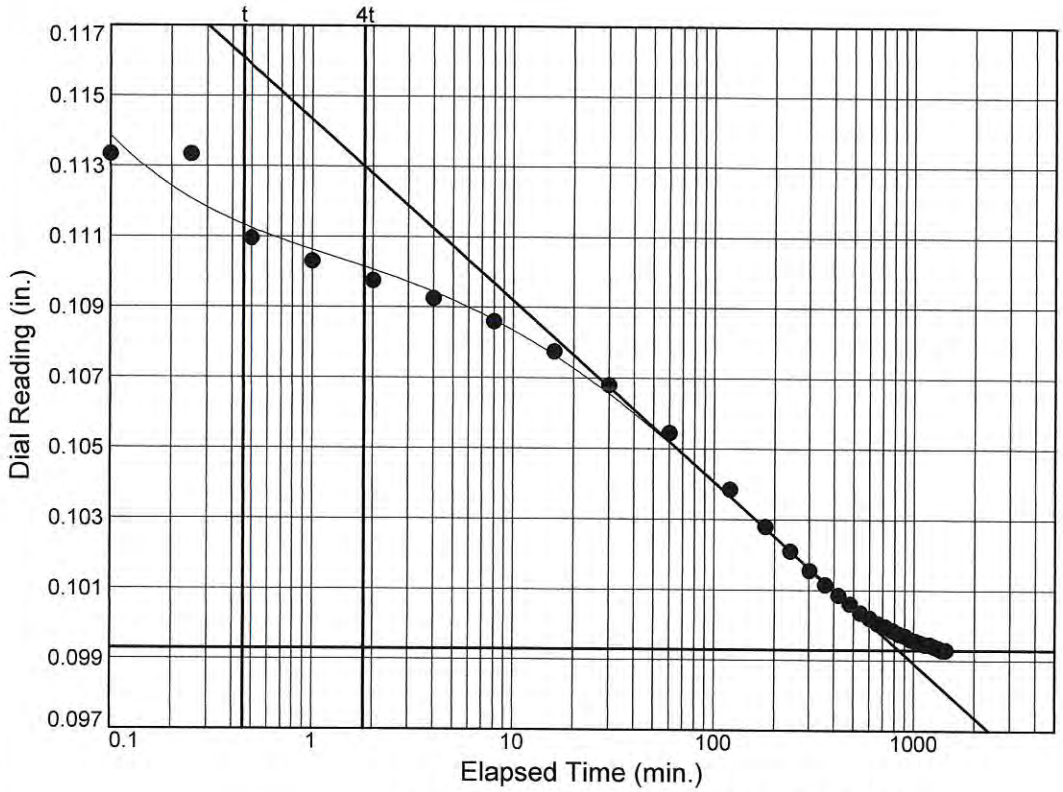
Source of Sample: SJGB027 Depth: 6



Load No.= 18
Load= 13.75 tsf
D_0 = 0.1199
D_{50} = 0.1156
D_{100} = 0.1114
T_{50} = 0.40 min.

C_v @ T_{50}
181.8 ft.^{2}/yr.

C_α = 0.000



Load No.= 19
Load= 3.49 tsf
D_0 = 0.1125
D_{50} = 0.1059
D_{100} = 0.0993
T_{50} = 41.67 min.

C_v @ T_{50}
1.8 ft.^{2}/yr.

C_α = 0.000

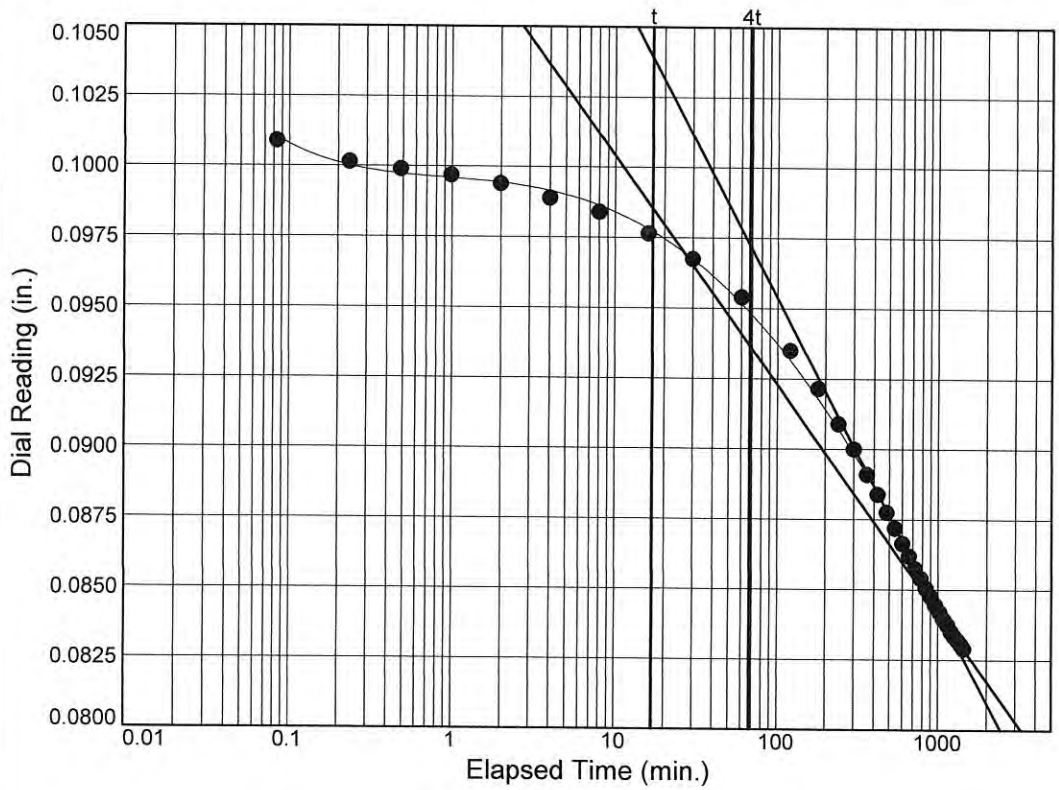
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

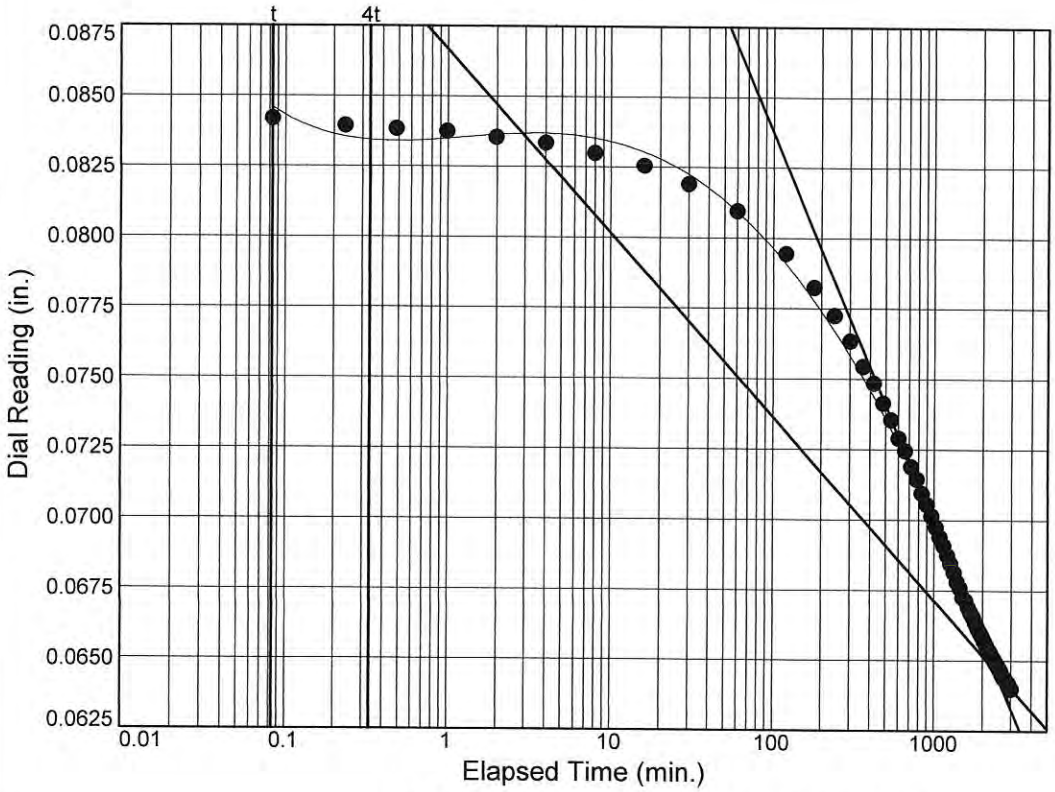
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 Depth: 6



Load No.= 20
Load= 0.86 tsf
D_0 = 0.1006
D_{50} = 0.0922
D_{100} = 0.0839
T_{50} = 158.06 min.

C_v @ T_{50}
0.5 ft.^{2}/yr.



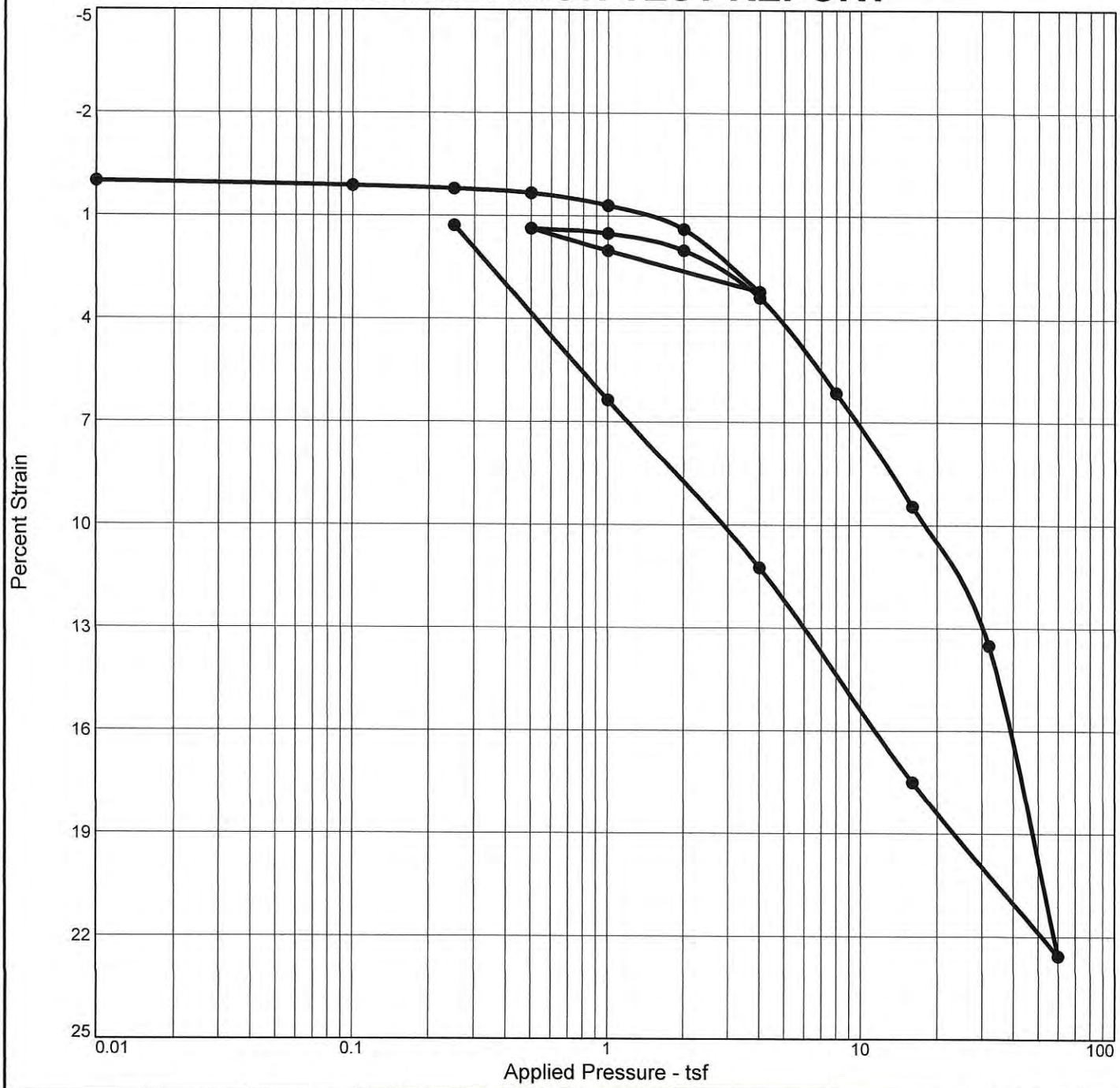
Load No.= 21
Load= 0.21 tsf
D_0 = 0.0858
D_{50} = 0.0752
D_{100} = 0.0647
T_{50} = 346.90 min.

C_v @ T_{50}
0.2 ft.^{2}/yr.

TOLUNAY-WONG ENGINEERS, INC.

Figure

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
98.6 %	32.3 %	89.5	49	30	2.70	CL		0.884

MATERIAL DESCRIPTION

Reddish-brown LEAN CLAY; calcareous

Project No. 19.15.131 **Client:**

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 **Depth:** 43

Remarks:

Test method: ASTM D2435
Specific gravity: Assumed

Tolunay-Wong Engineers, Inc.

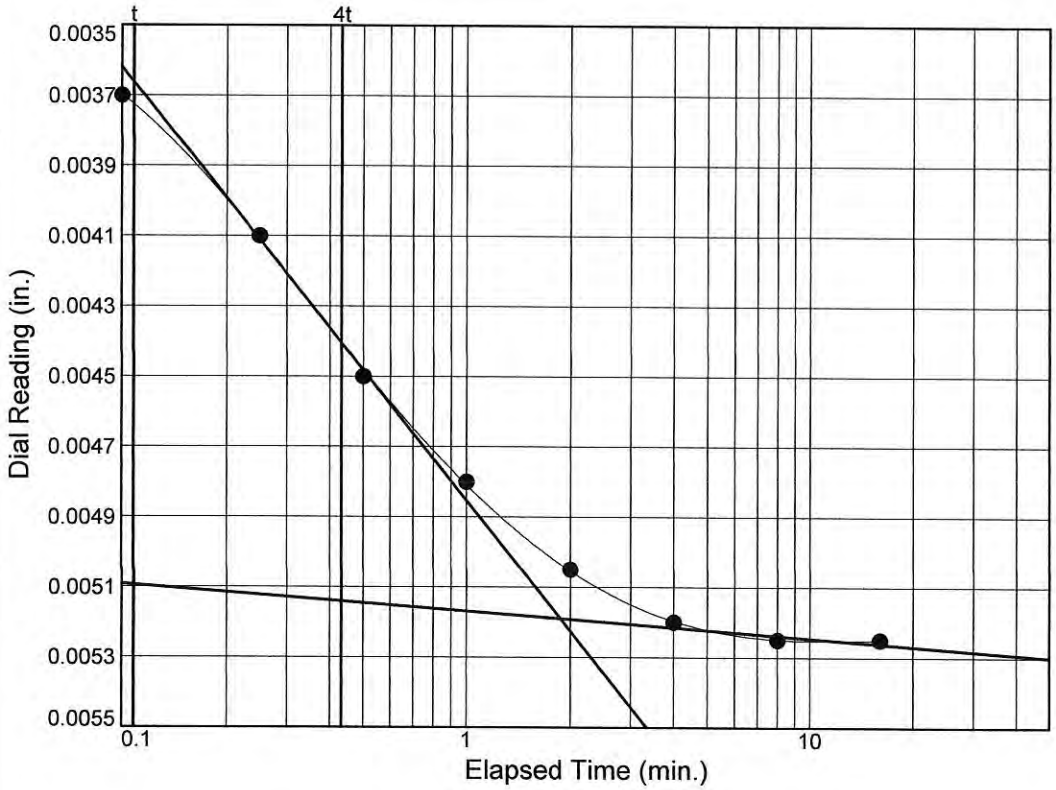
Houston, Texas

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

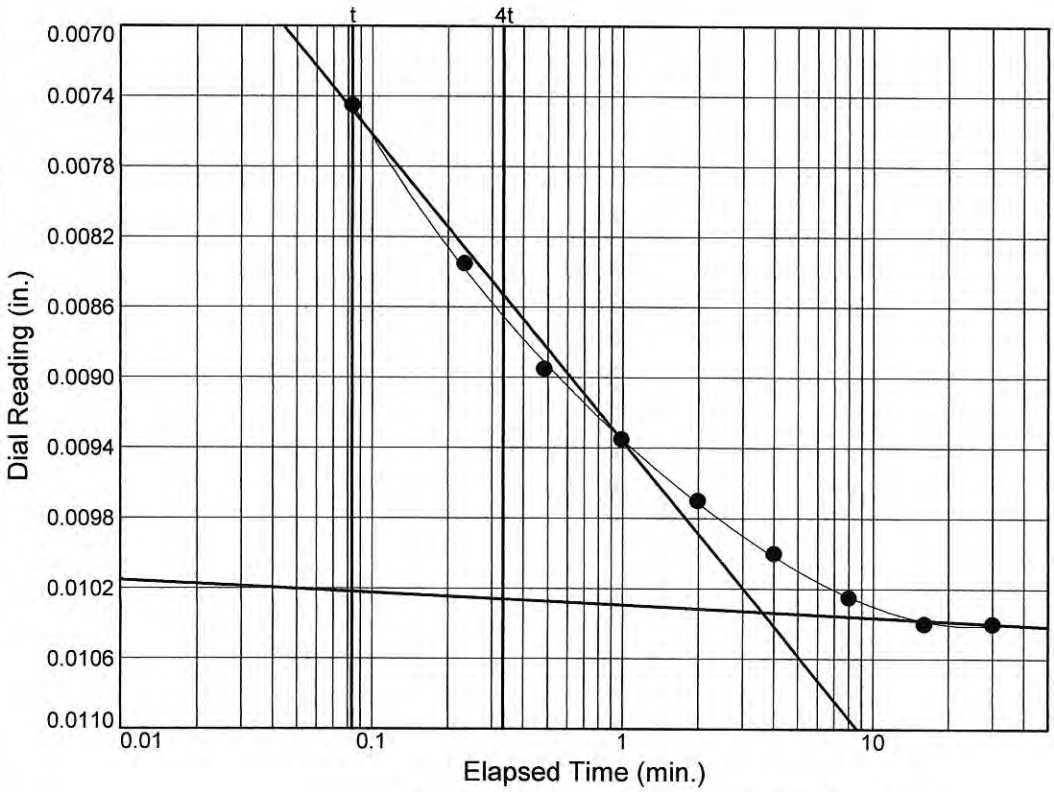
Source of Sample: SJGB027 Depth: 43



Load No.= 5
Load= 1.00 tsf
D_0 = 0.0030
D_{50} = 0.0041
D_{100} = 0.0052
T_{50} = 0.25 min.

C_v @ T_{50}
395.9 ft.^{2}/yr.

C_α = 0.000



Load No.= 6
Load= 2.00 tsf
D_0 = 0.0062
D_{50} = 0.0083
D_{100} = 0.0103
T_{50} = 0.21 min.

C_v @ T_{50}
480.8 ft.^{2}/yr.

C_α = 0.000

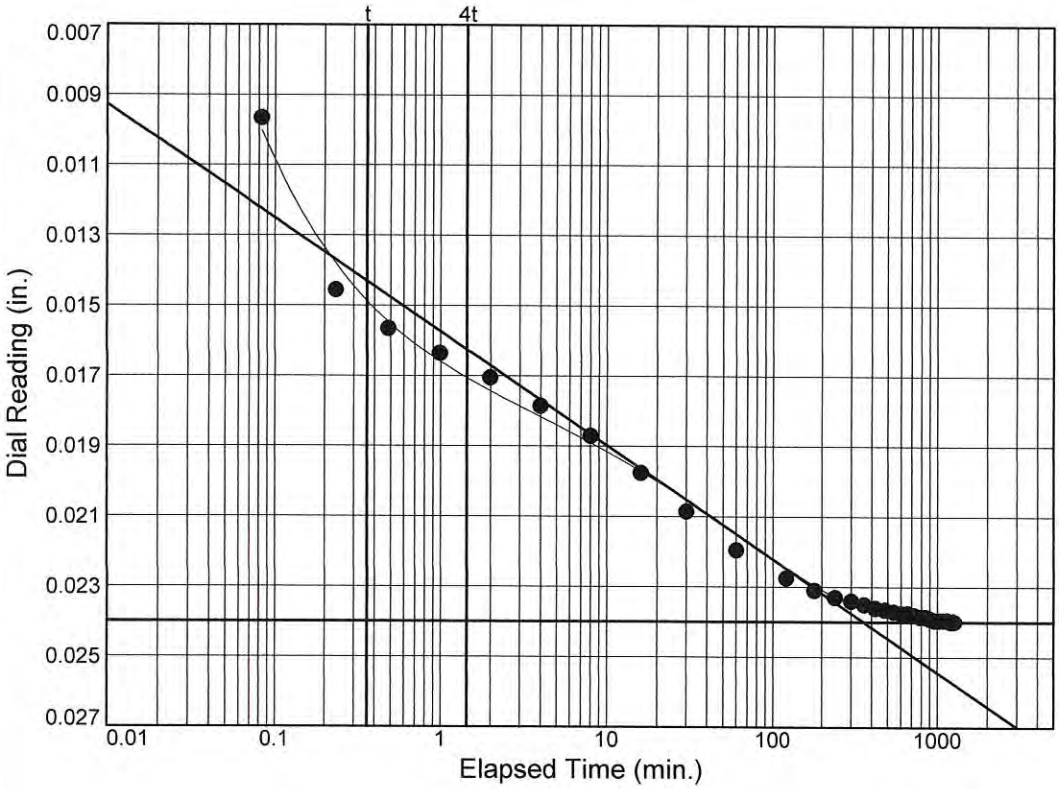
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

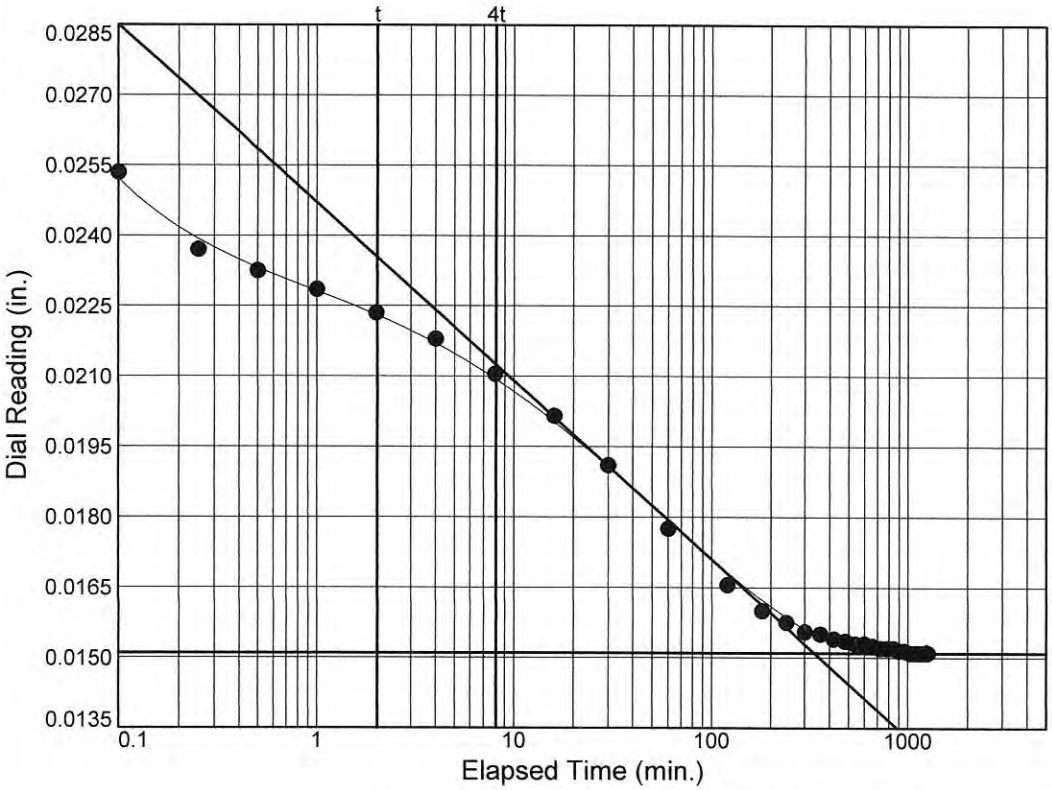
Source of Sample: SJGB027 Depth: 43



Load No.= 7
Load= 4.00 tsf
D_0 = 0.0127
D_{50} = 0.0183
D_{100} = 0.0240
T_{50} = 4.76 min.

C_v @ T_{50}
20.3 ft.^{2}/yr.

C_α = 0.000



Load No.= 8
Load= 1.00 tsf
D_0 = 0.0237
D_{50} = 0.0194
D_{100} = 0.0151
T_{50} = 24.57 min.

C_v @ T_{50}
3.9 ft.^{2}/yr.

C_α = 0.000

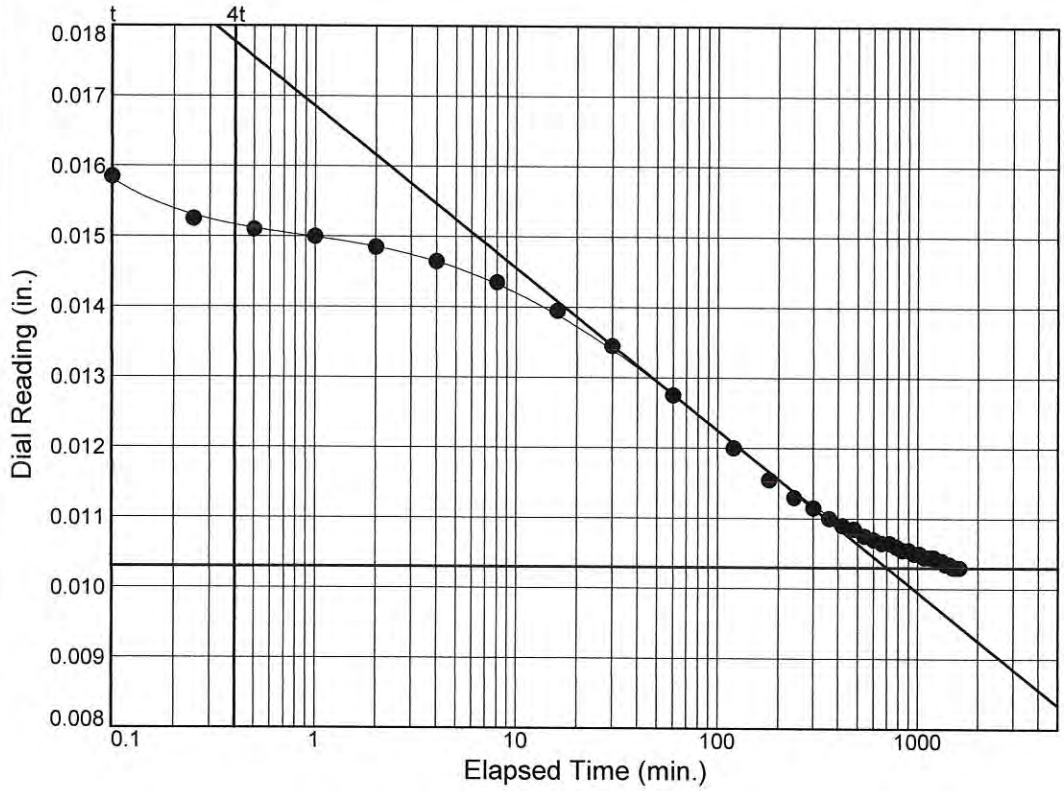
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

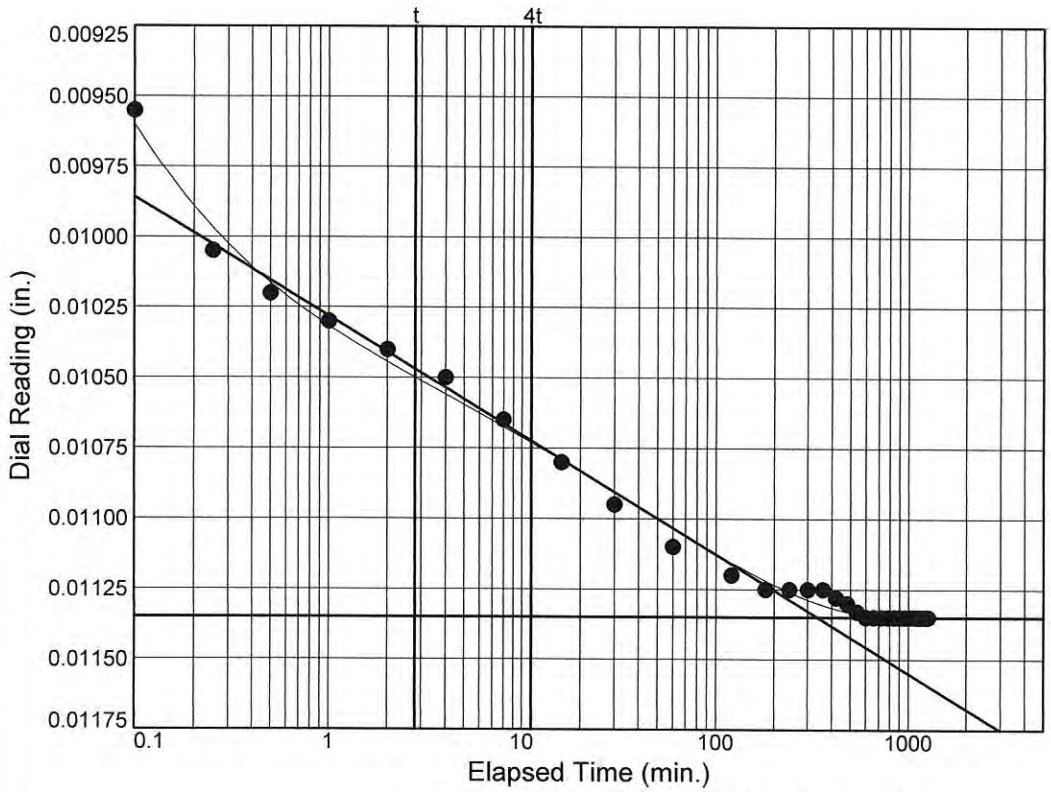
Source of Sample: SJGB027 Depth: 43



Load No.= 9
Load= 0.50 tsf
D_0 = 0.0165
D_{50} = 0.0134
D_{100} = 0.0103
T_{50} = 30.43 min.

C_v @ T_{50}
3.2 ft.^{2}/yr.

C_α = 0.000



Load No.= 10
Load= 1.00 tsf
D_0 = 0.0103
D_{50} = 0.0108
D_{100} = 0.0114
T_{50} = 17.52 min.

C_v @ T_{50}
5.6 ft.^{2}/yr.

C_α = 0.000

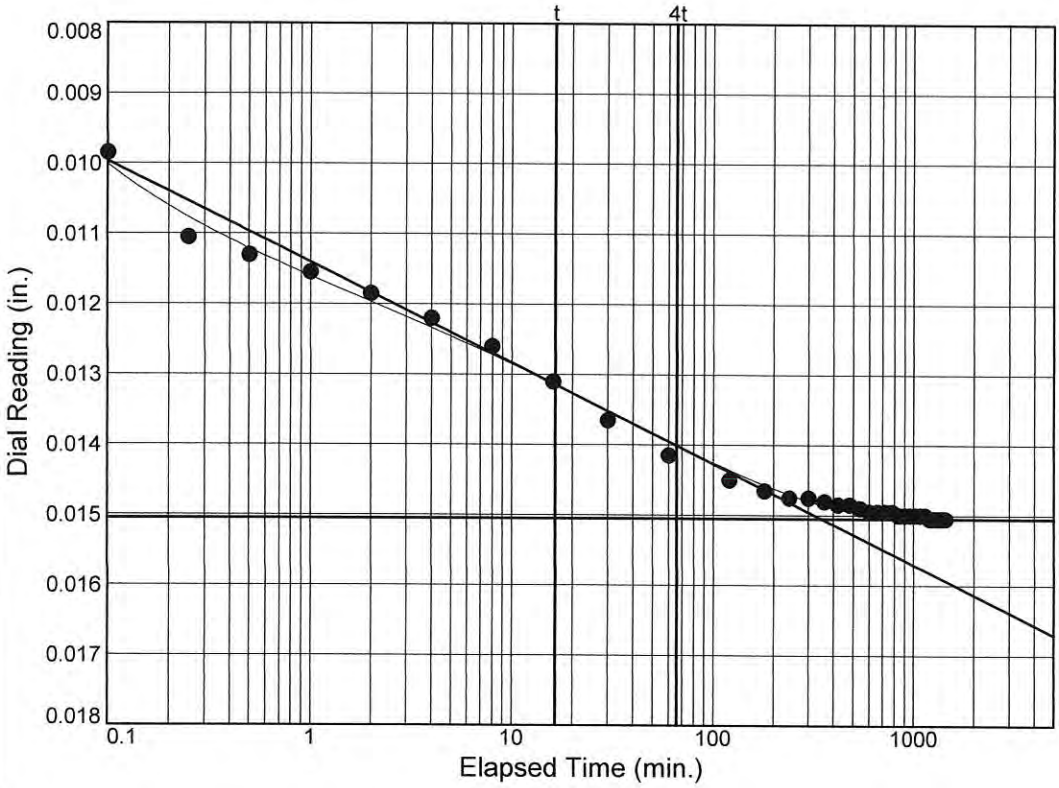
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

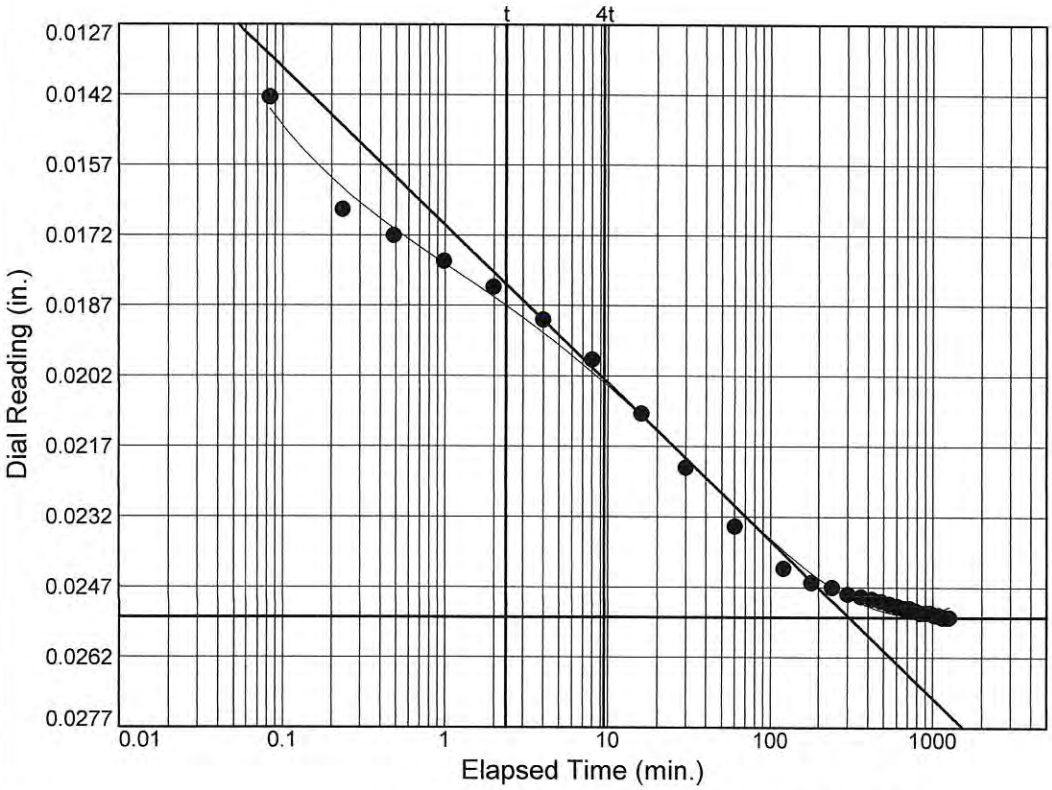
Source of Sample: SJGB027 Depth: 43



Load No.= 11
Load= 2.00 tsf
D_0 = 0.0123
D_{50} = 0.0137
D_{100} = 0.0151
T_{50} = 38.22 min.

C_v @ T_{50}
2.6 ft.^{2}/yr.

C_α = 0.000



Load No.= 12
Load= 4.00 tsf
D_0 = 0.0171
D_{50} = 0.0212
D_{100} = 0.0253
T_{50} = 17.82 min.

C_v @ T_{50}
5.4 ft.^{2}/yr.

C_α = 0.000

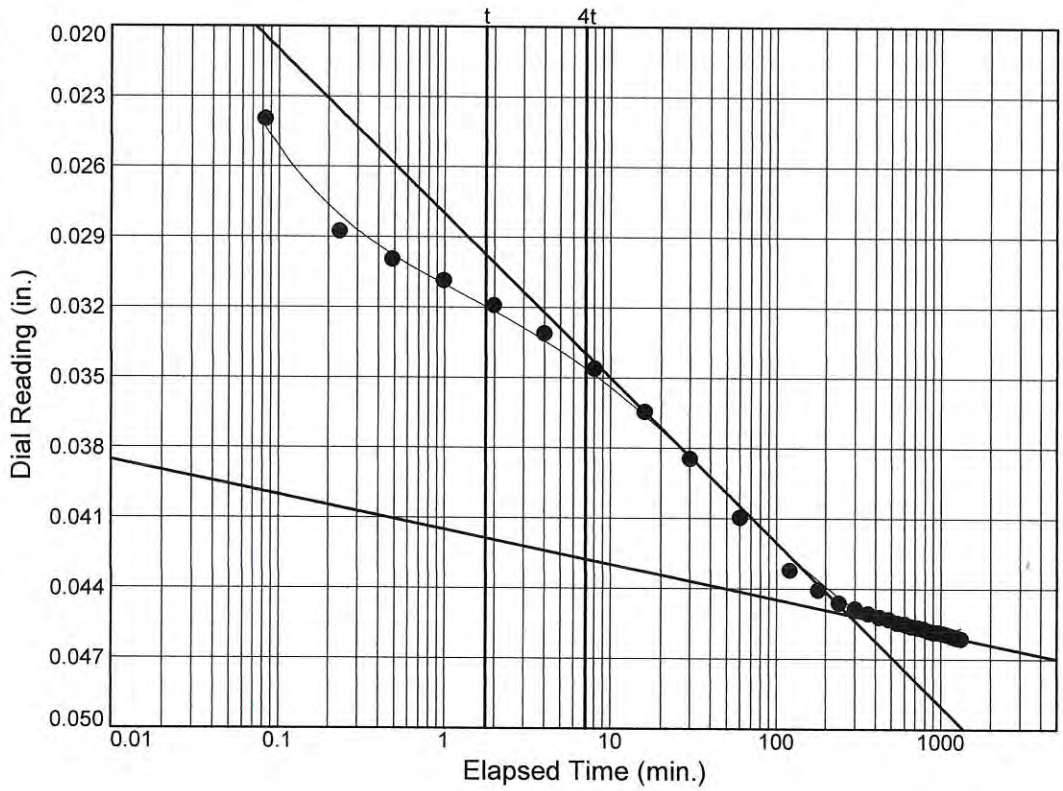
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

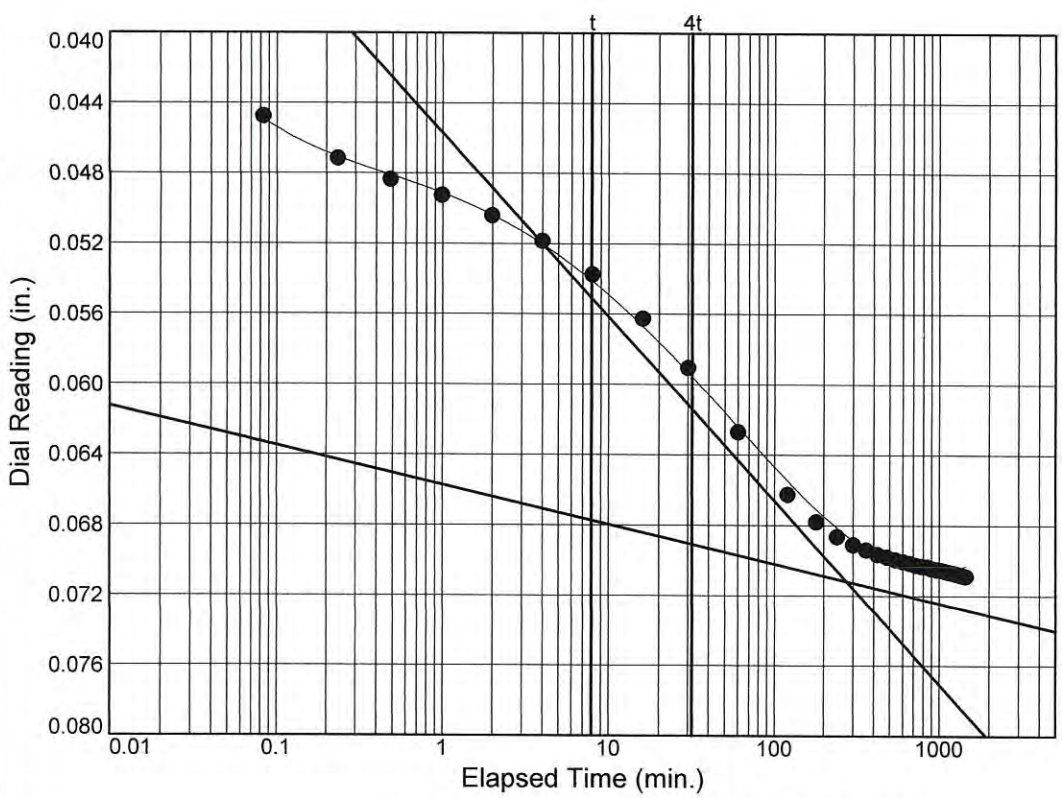
Source of Sample: SJGB027 Depth: 43



Load No.= 13
Load= 8.00 tsf
D_0 = 0.0293
D_{50} = 0.0372
D_{100} = 0.0451
T_{50} = 20.04 min.

C_v @ T_{50}
4.6 ft.^{2}/yr.

C_α = 0.004



Load No.= 14
Load= 16.00 tsf
D_0 = 0.0486
D_{50} = 0.0599
D_{100} = 0.0712
T_{50} = 34.35 min.

C_v @ T_{50}
2.5 ft.^{2}/yr.

C_α = 0.006

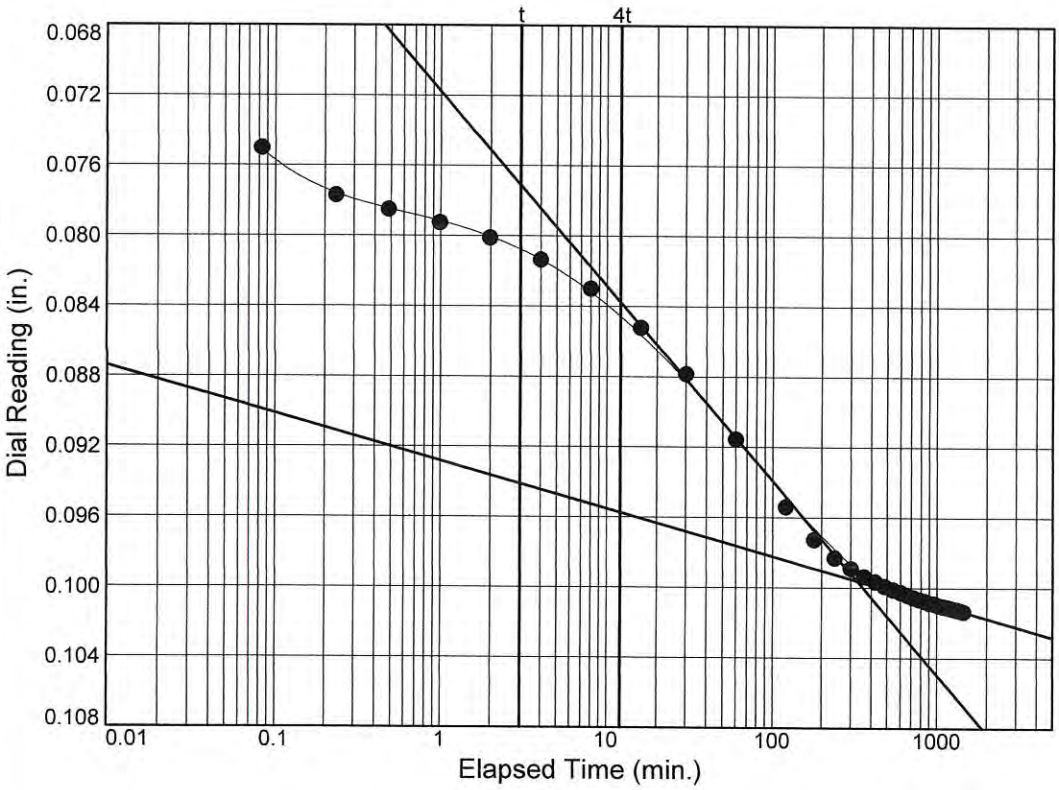
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

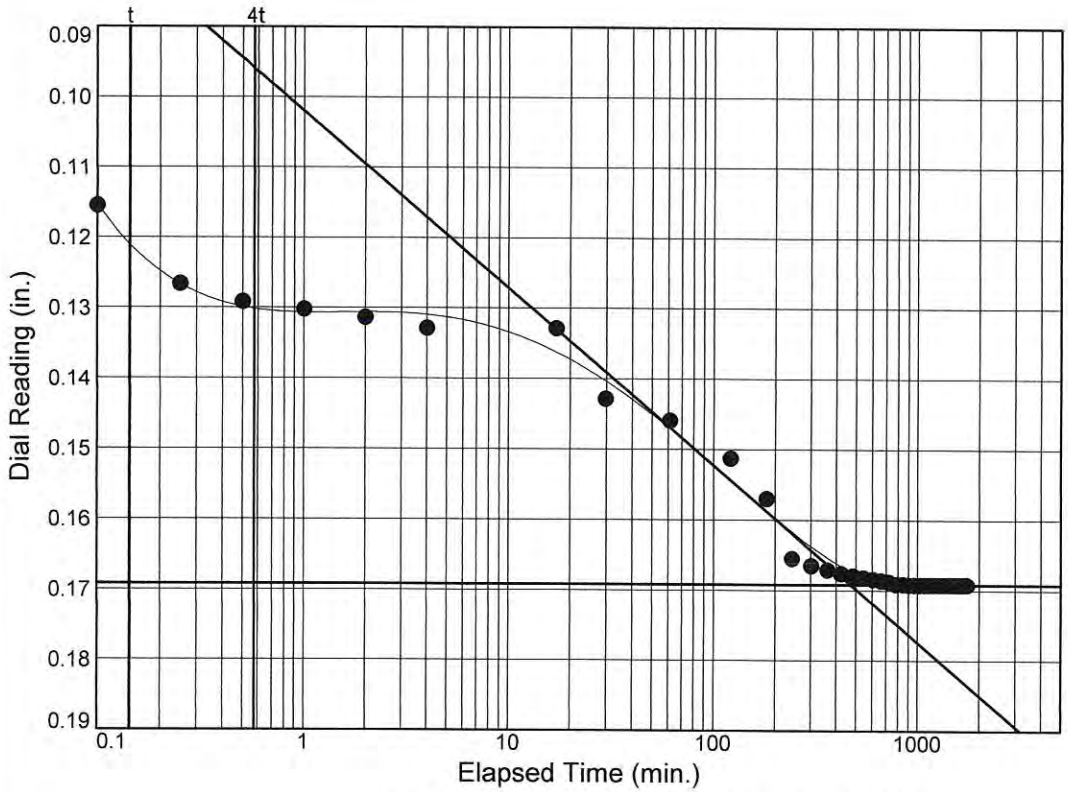
Source of Sample: SJGB027 Depth: 43



Load No.= 15
Load= 32.00 tsf
D_0 = 0.0770
D_{50} = 0.0883
D_{100} = 0.0996
T_{50} = 30.32 min.

C_v @ T_{50}
2.6 ft.^{2}/yr.

C_α = 0.007



Load No.= 16
Load= 60.00 tsf
D_0 = 0.1119
D_{50} = 0.1406
D_{100} = 0.1692
T_{50} = 30.67 min.

C_v @ T_{50}
2.2 ft.^{2}/yr.

C_α = 0.000

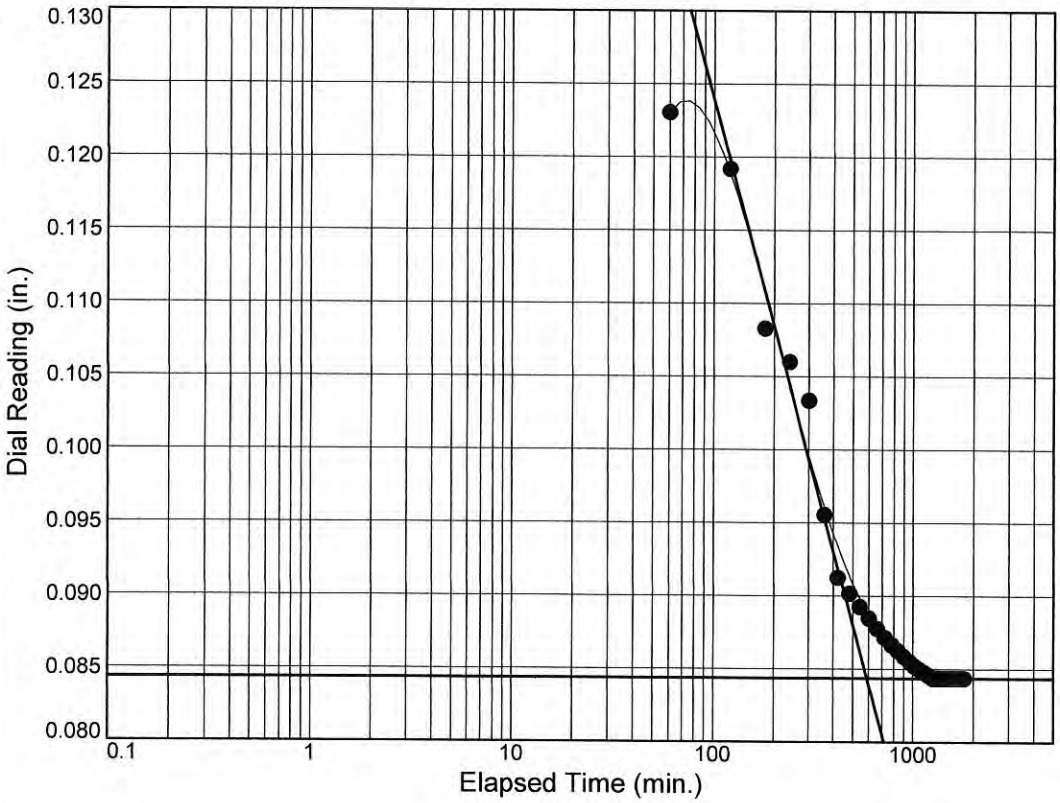
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 Depth: 43



Load No.= 18

Load= 4.00 tsf

D_0 = 0.1313

D_{50} = 0.1078

D_{100} = 0.0844

T_{50} = 205.70 min.

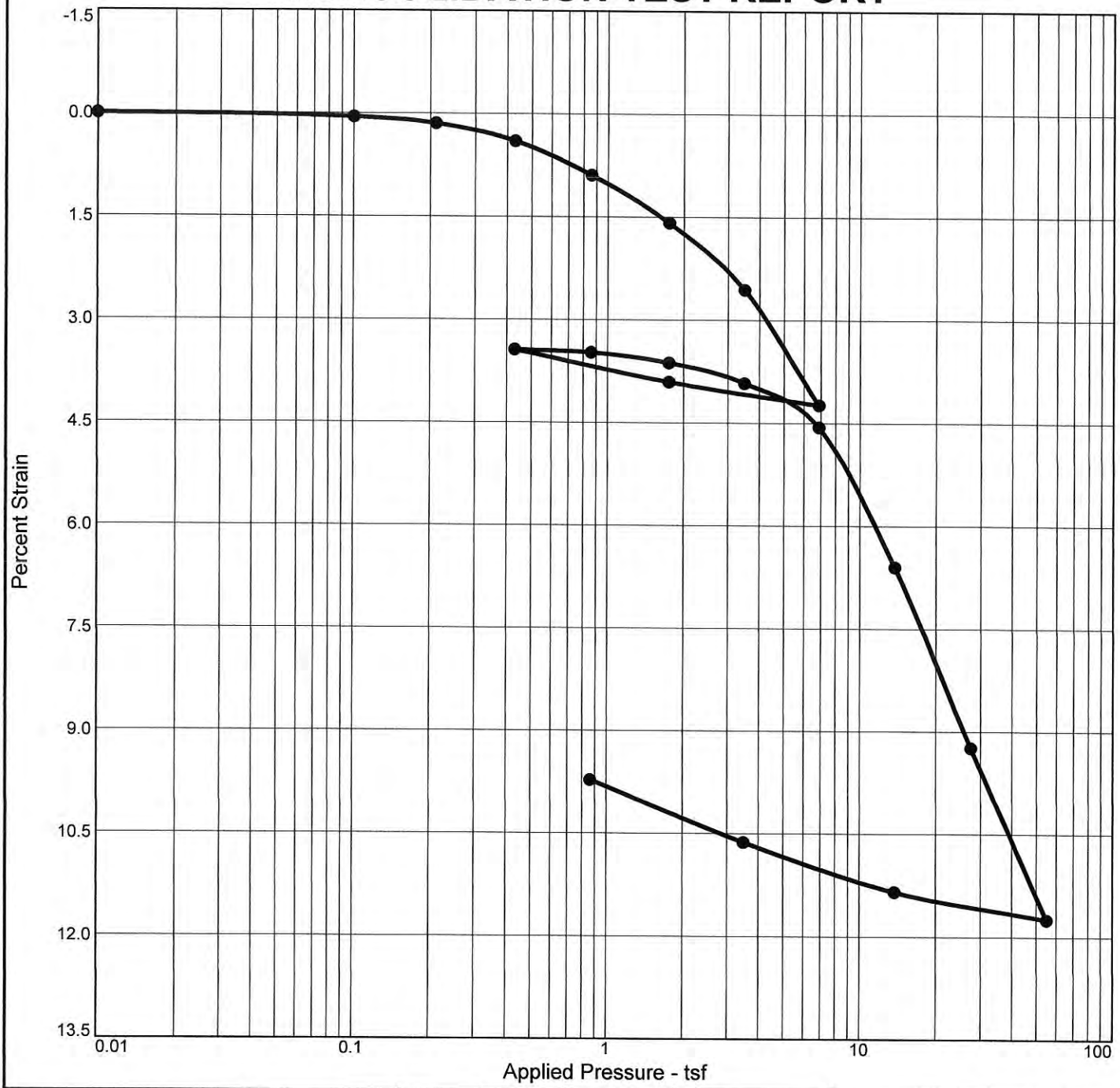
C_v @ T_{50}
0.4 ft.^{2}/yr.

C_α = 0.000

TOLUNAY-WONG ENGINEERS, INC.

Figure

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
89.3 %	19.4 %	106.4	26	10	2.70	CL		0.585

MATERIAL DESCRIPTION

Light gray and tan LEAN CLAY

Project No. 19.15.131 **Client:**

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 58

Remarks:

Test method: ASTM D2435
Specific gravity: Assumed

Tolunay-Wong Engineers, Inc.

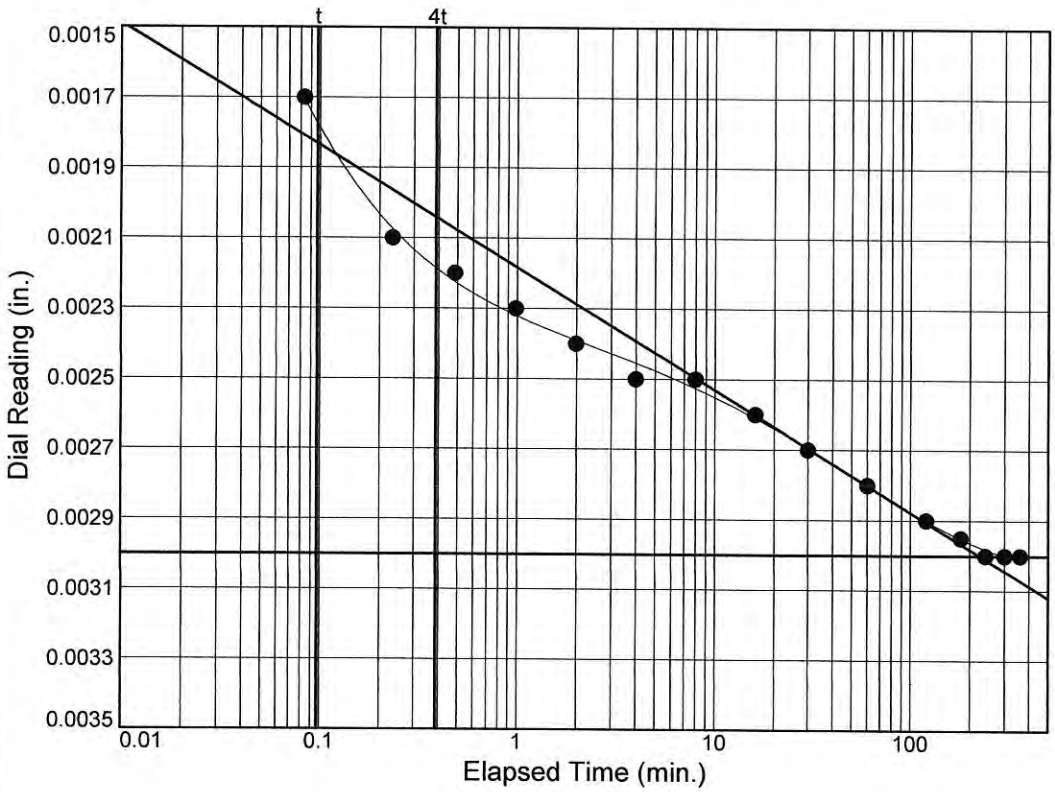
Houston, Texas

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

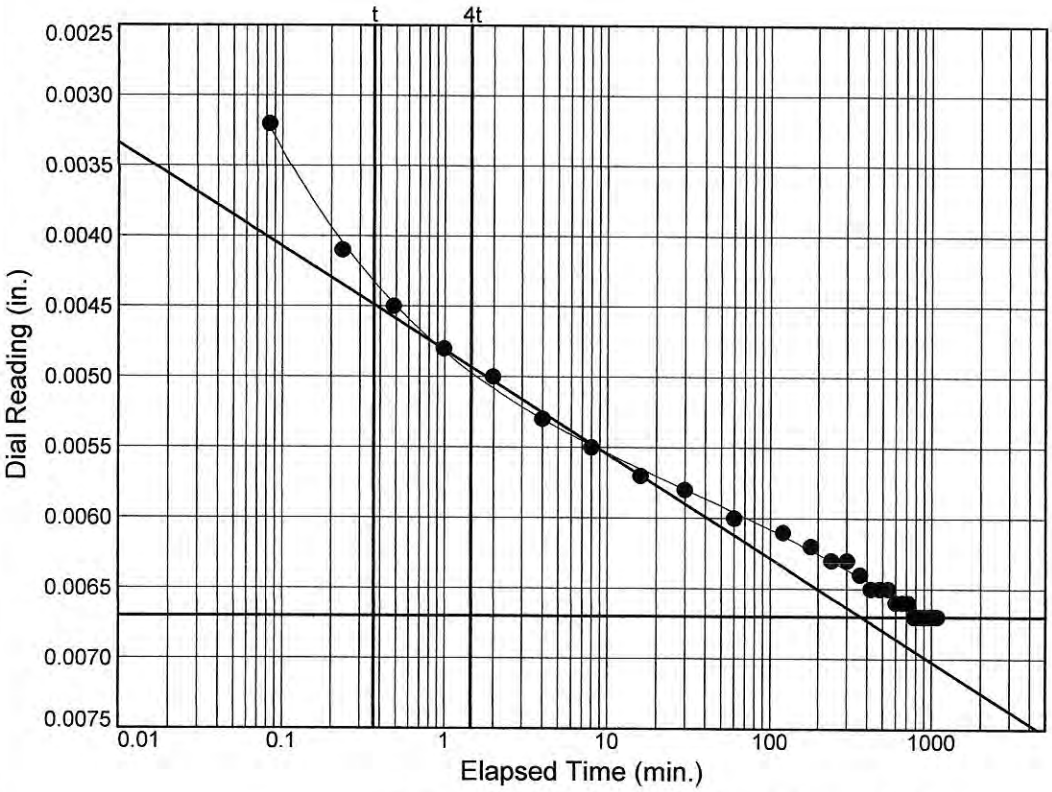
Source of Sample: SJGB028 Depth: 58



Load No.= 4
Load= 0.43 tsf
D_0 = 0.0014
D_{50} = 0.0022
D_{100} = 0.0030
T_{50} = 0.38 min.

C_v @ T_{50}
265.2 ft.^{2}/yr.

C_α = 0.000



Load No.= 5
Load= 0.86 tsf
D_0 = 0.0037
D_{50} = 0.0052
D_{100} = 0.0067
T_{50} = 2.75 min.

C_v @ T_{50}
36.3 ft.^{2}/yr.

C_α = 0.000

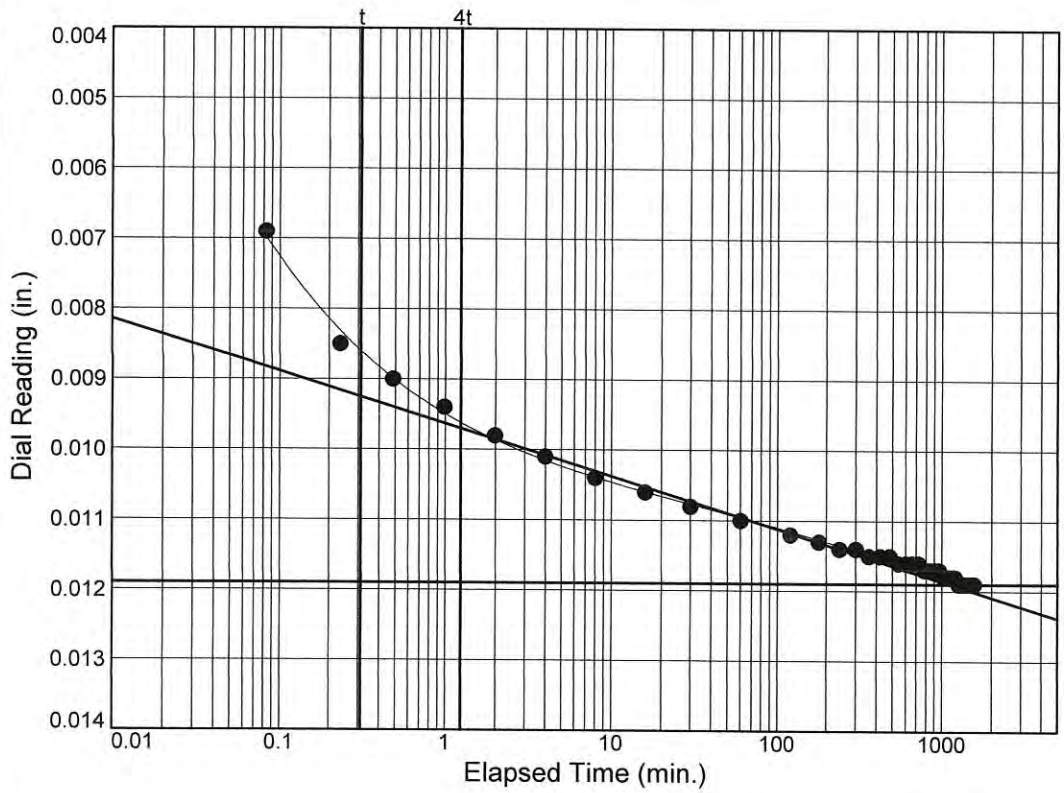
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

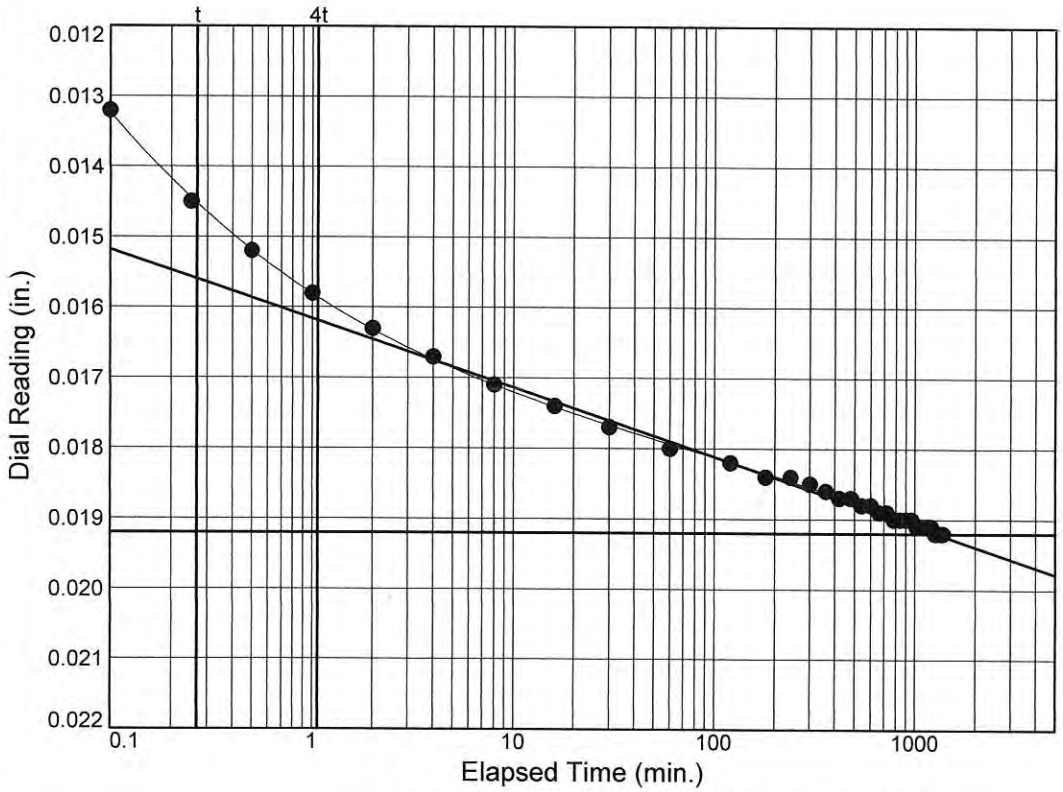
Source of Sample: SJGB028 Depth: 58



Load No.= 6
Load= 1.75 tsf
D_0 = 0.0076
D_{50} = 0.0097
D_{100} = 0.0119
T_{50} = 1.55 min.

C_v @ T_{50}
63.5 ft.^{2}/yr.

C_α = 0.000



Load No.= 7
Load= 3.49 tsf
D_0 = 0.0132
D_{50} = 0.0162
D_{100} = 0.0192
T_{50} = 1.68 min.

C_v @ T_{50}
57.8 ft.^{2}/yr.

C_α = 0.000

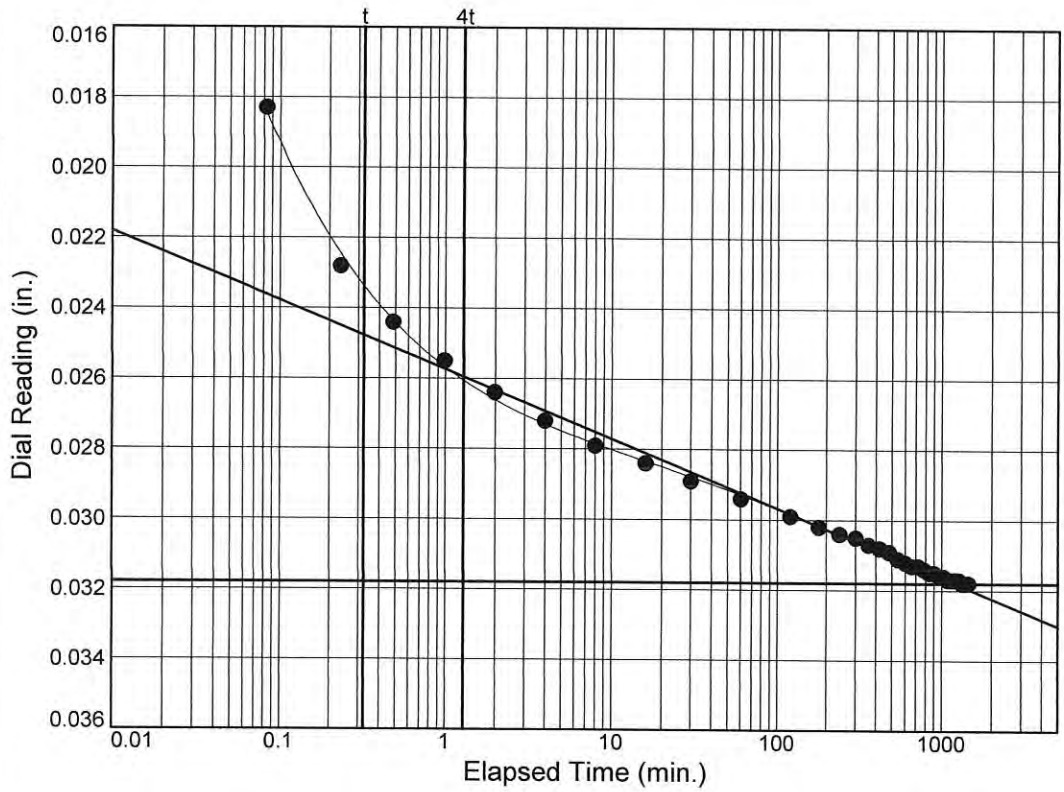
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

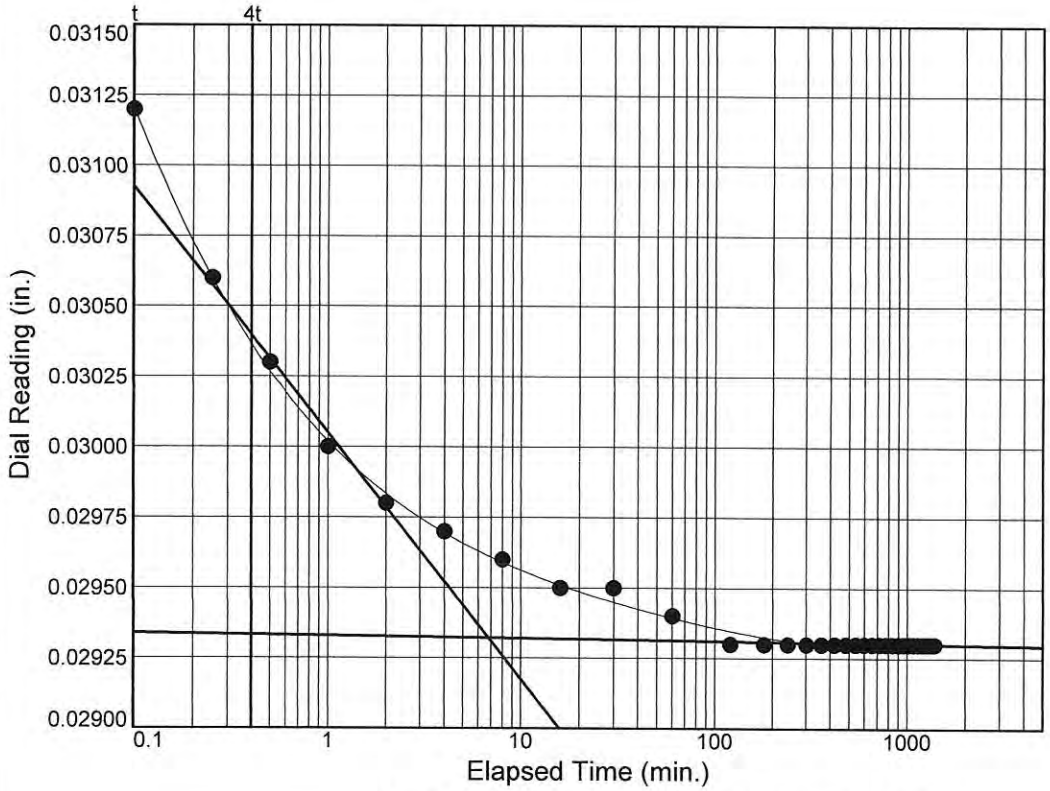
Source of Sample: SJGB028 Depth: 58



Load No.= 8
Load= 6.87 tsf
D_0 = 0.0207
D_{50} = 0.0262
D_{100} = 0.0318
T_{50} = 1.47 min.

C_v @ T_{50}
64.0 ft.^{2}/yr.

C_α = 0.000



Load No.= 9
Load= 1.75 tsf
D_0 = 0.0320
D_{50} = 0.0307
D_{100} = 0.0293
T_{50} = 0.21 min.

C_v @ T_{50}
433.0 ft.^{2}/yr.

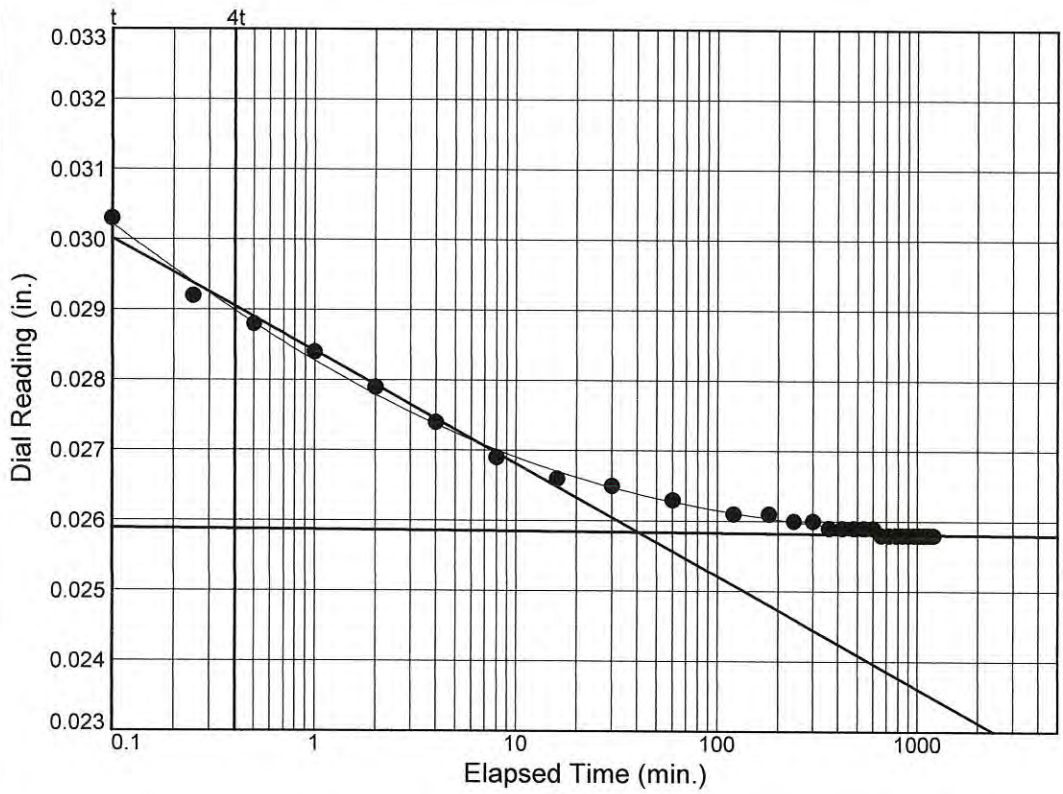
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

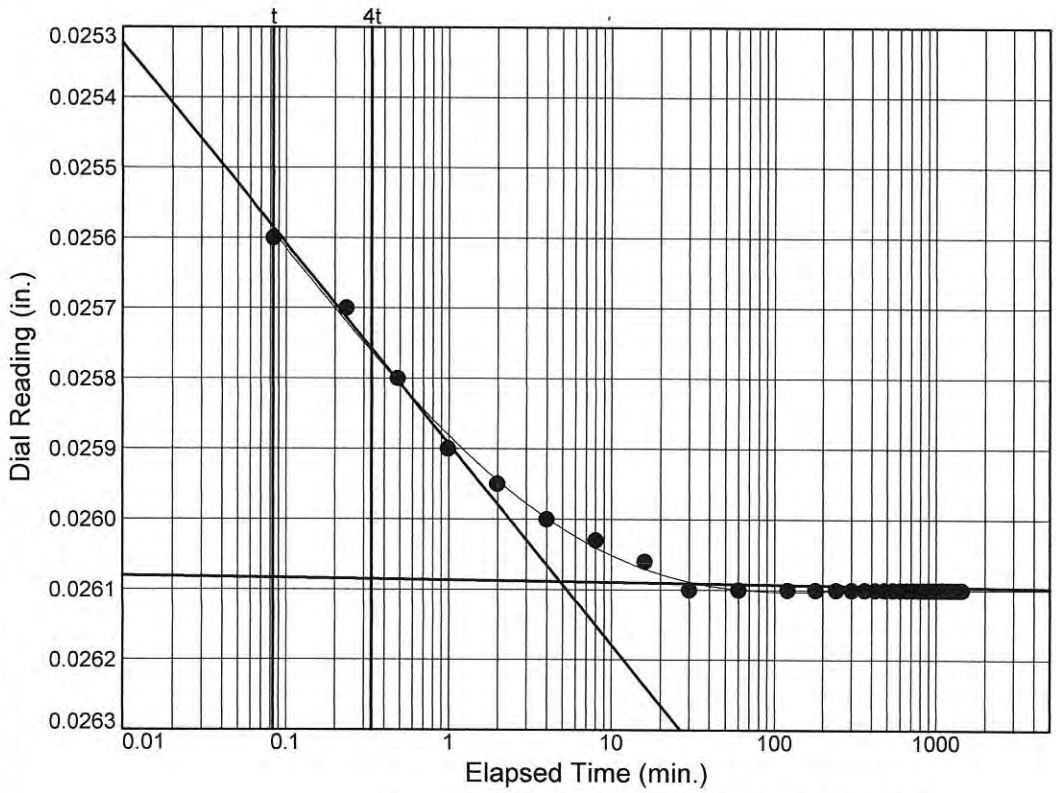
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 Depth: 58



Load No.= 10
Load= 0.43 tsf
D_0 = 0.0314
D_{50} = 0.0286
D_{100} = 0.0258
T_{50} = 0.62 min.

C_v @ T_{50}
152.2 ft.^{2}/yr.



Load No.= 11
Load= 0.86 tsf
D_0 = 0.0254
D_{50} = 0.0258
D_{100} = 0.0261
T_{50} = 0.32 min.

C_v @ T_{50}
297.0 ft.^{2}/yr.

C_α = 0.000

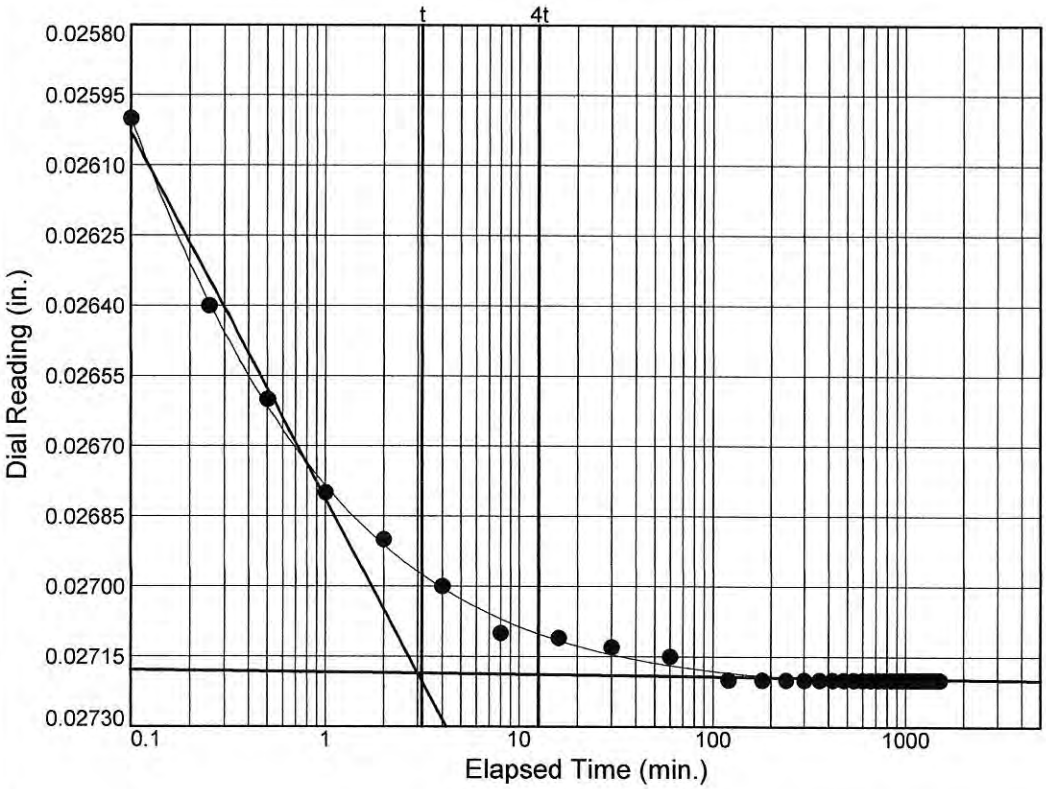
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

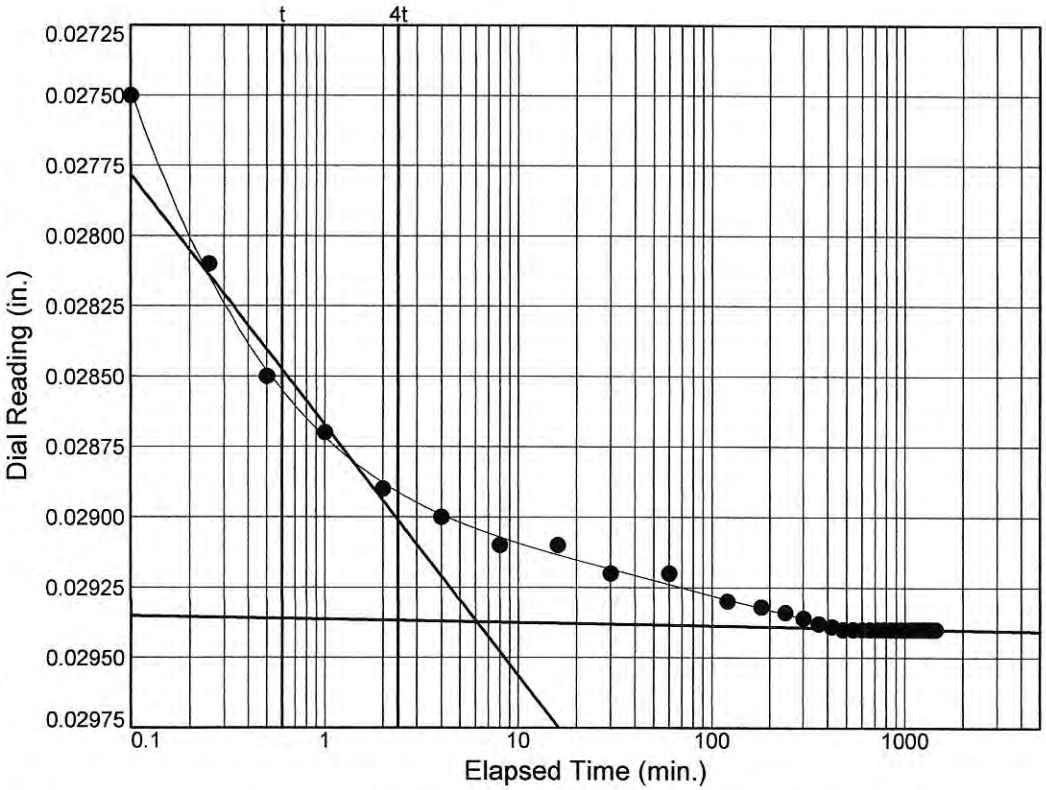
Source of Sample: SJGB028 Depth: 58



Load No.= 12
Load= 1.75 tsf
D_0 = 0.0268
D_{50} = 0.0270
D_{100} = 0.0272
T_{50} = 4.52 min.

C_v @ T_{50}
20.8 ft.^{2}/yr.

C_α = 0.000



Load No.= 13
Load= 3.49 tsf
D_0 = 0.0282
D_{50} = 0.0288
D_{100} = 0.0294
T_{50} = 1.27 min.

C_v @ T_{50}
73.6 ft.^{2}/yr.

C_α = 0.000

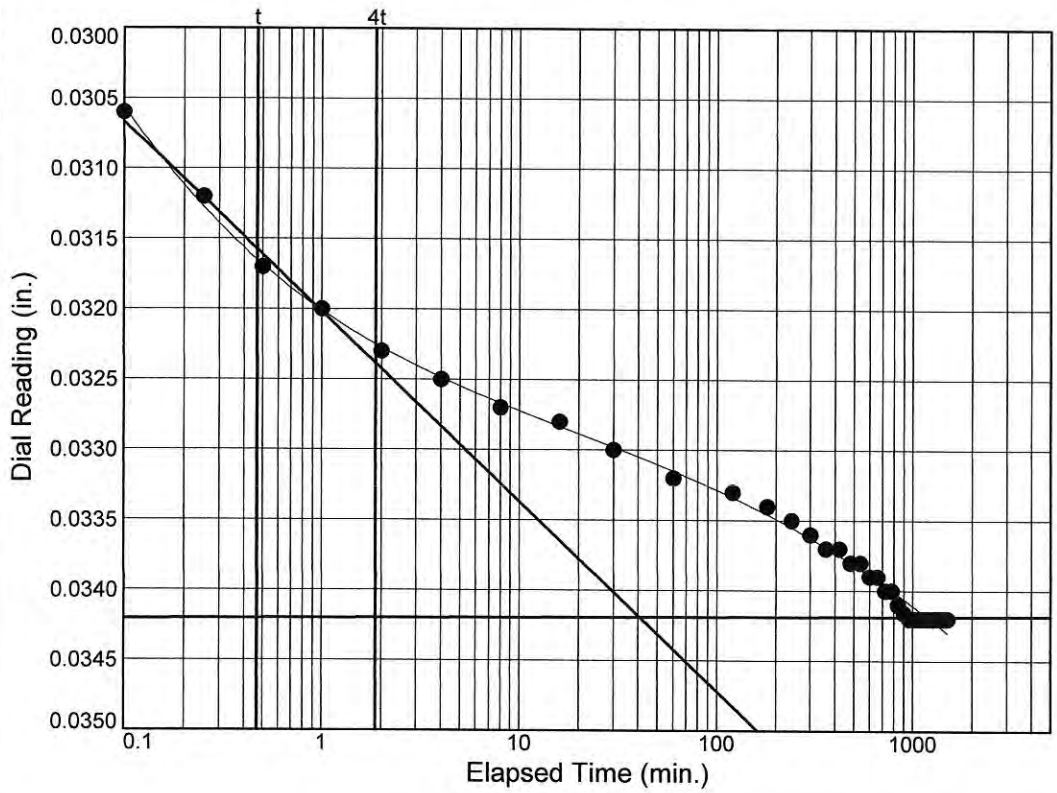
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

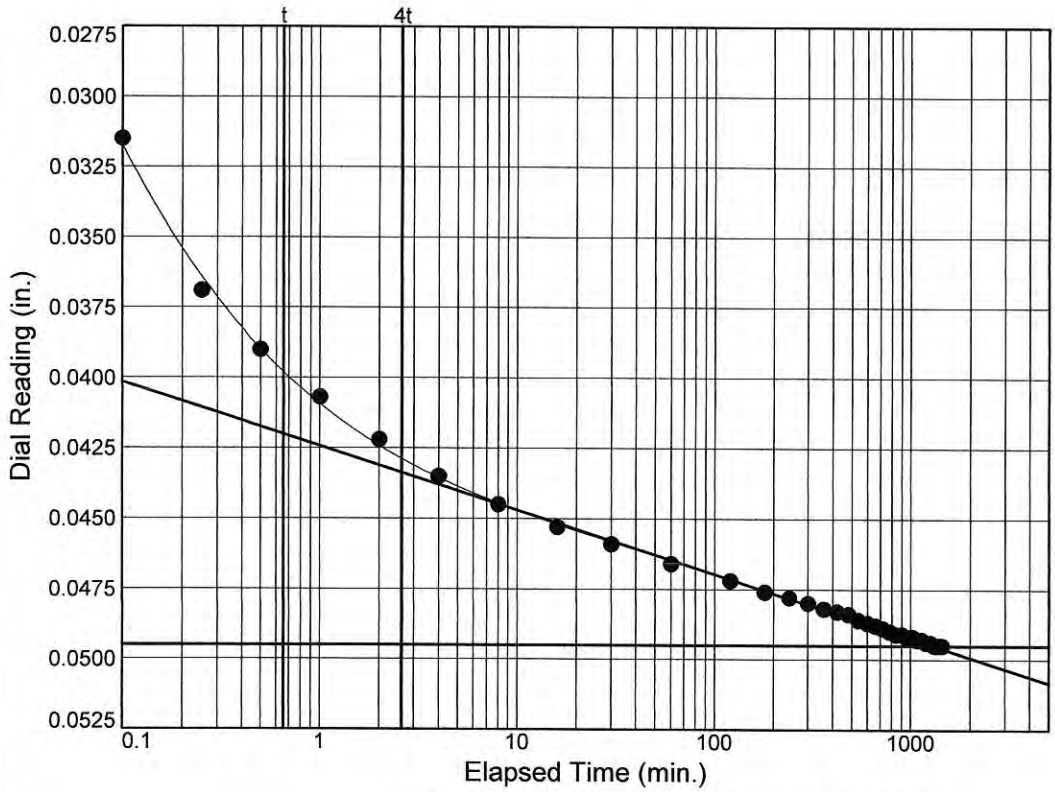
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 Depth: 58



Load No.= 14
Load= 6.87 tsf
D_0 = 0.0310
D_{50} = 0.0326
D_{100} = 0.0342
T_{50} = 6.60 min.

C_v @ T_{50}
14.0 ft.^{2}/yr.



Load No.= 15
Load= 13.75 tsf
D_0 = 0.0367
D_{50} = 0.0431
D_{100} = 0.0495
T_{50} = 2.99 min.

C_v @ T_{50}
30.2 ft.^{2}/yr.

C_α = 0.000

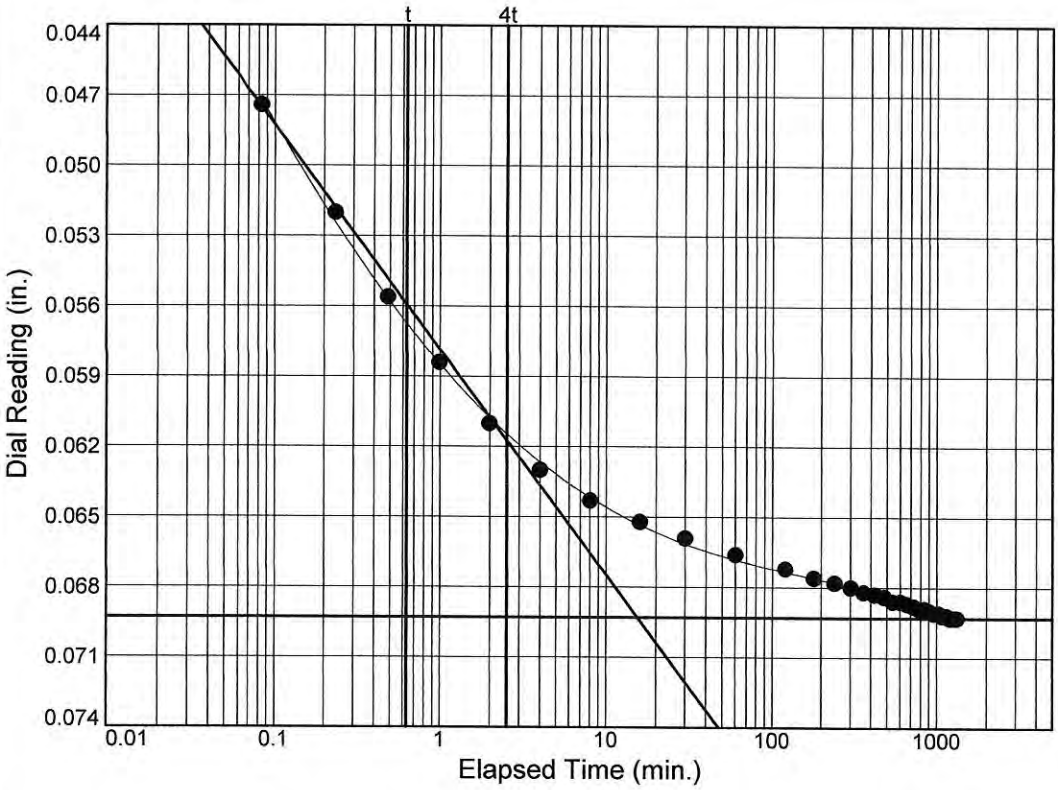
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

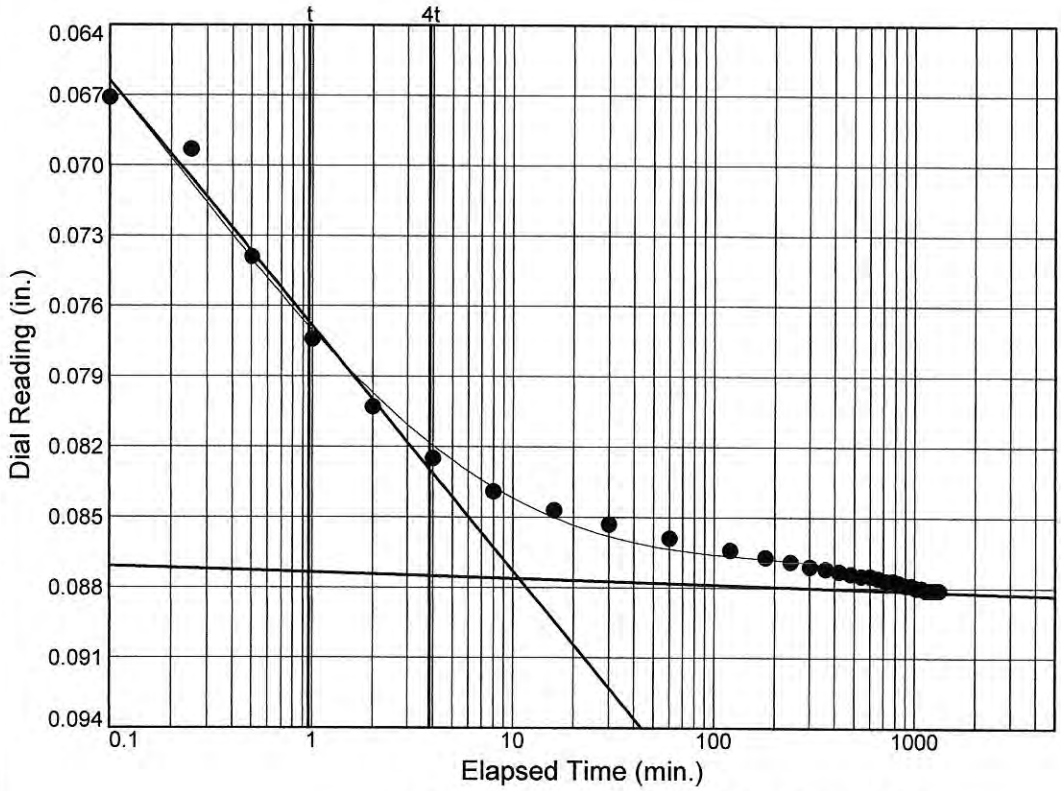
Source of Sample: SJGB028 Depth: 58



Load No.= 16
Load= 27.50 tsf
D_0 = 0.0521
D_{50} = 0.0607
D_{100} = 0.0693
T_{50} = 1.94 min.

C_v @ T_{50}
44.2 ft.^{2}/yr.

C_α = 0.000



Load No.= 17
Load= 54.99 tsf
D_0 = 0.0719
D_{50} = 0.0798
D_{100} = 0.0876
T_{50} = 2.04 min.

C_v @ T_{50}
39.8 ft.^{2}/yr.

C_α = 0.001

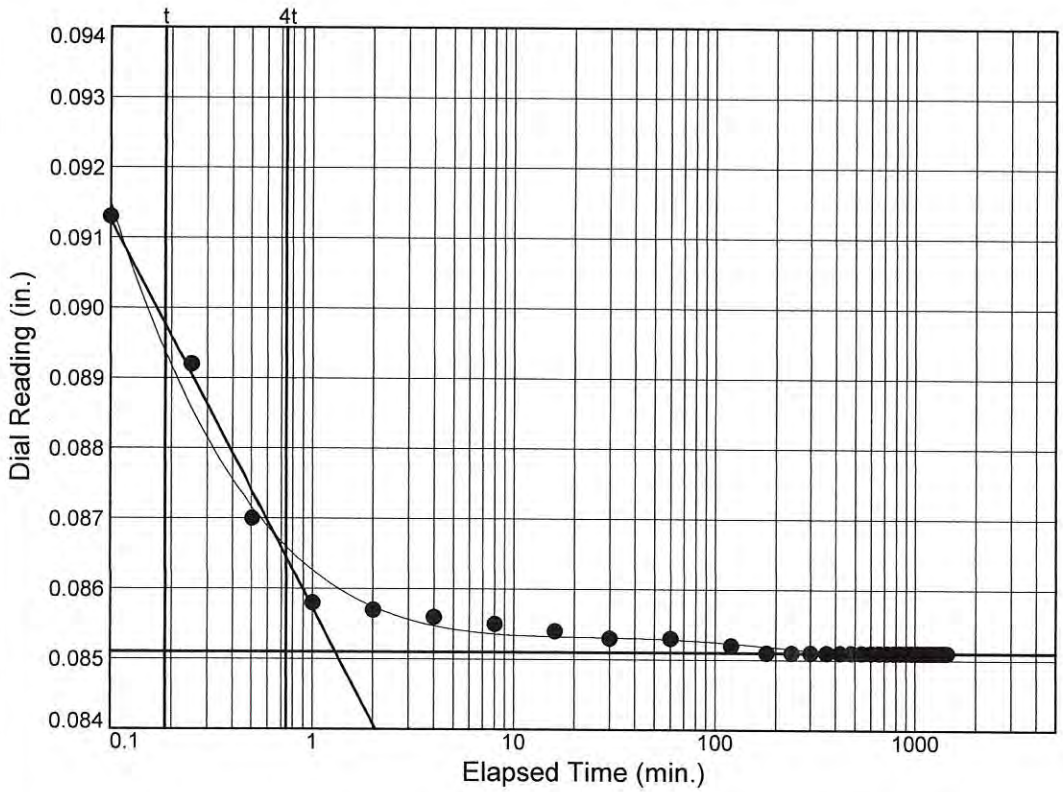
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

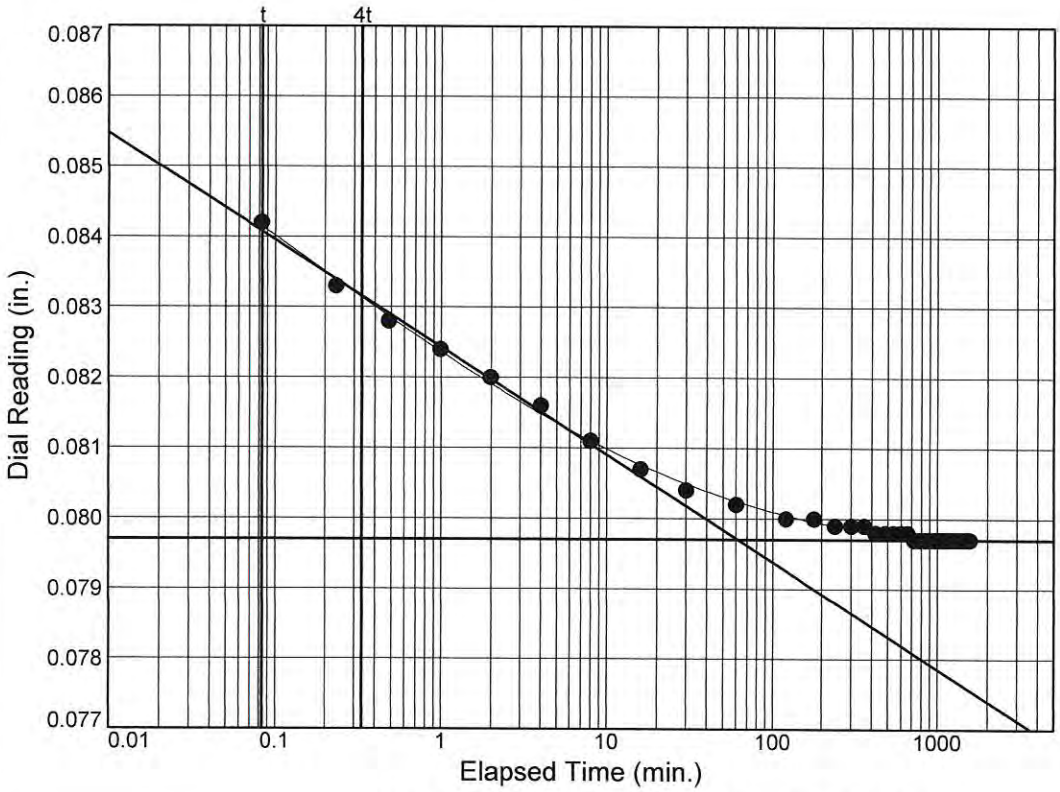
Source of Sample: SJGB028 Depth: 58



Load No.= 18
Load= 13.75 tsf
D_0 = 0.0922
D_{50} = 0.0886
D_{100} = 0.0851
T_{50} = 0.24 min.

C_v @ T_{50}
323.4 ft.^{2}/yr.

C_α = 0.000



Load No.= 19
Load= 3.49 tsf
D_0 = 0.0852
D_{50} = 0.0824
D_{100} = 0.0797
T_{50} = 0.91 min.

C_v @ T_{50}
88.0 ft.^{2}/yr.

C_α = 0.000

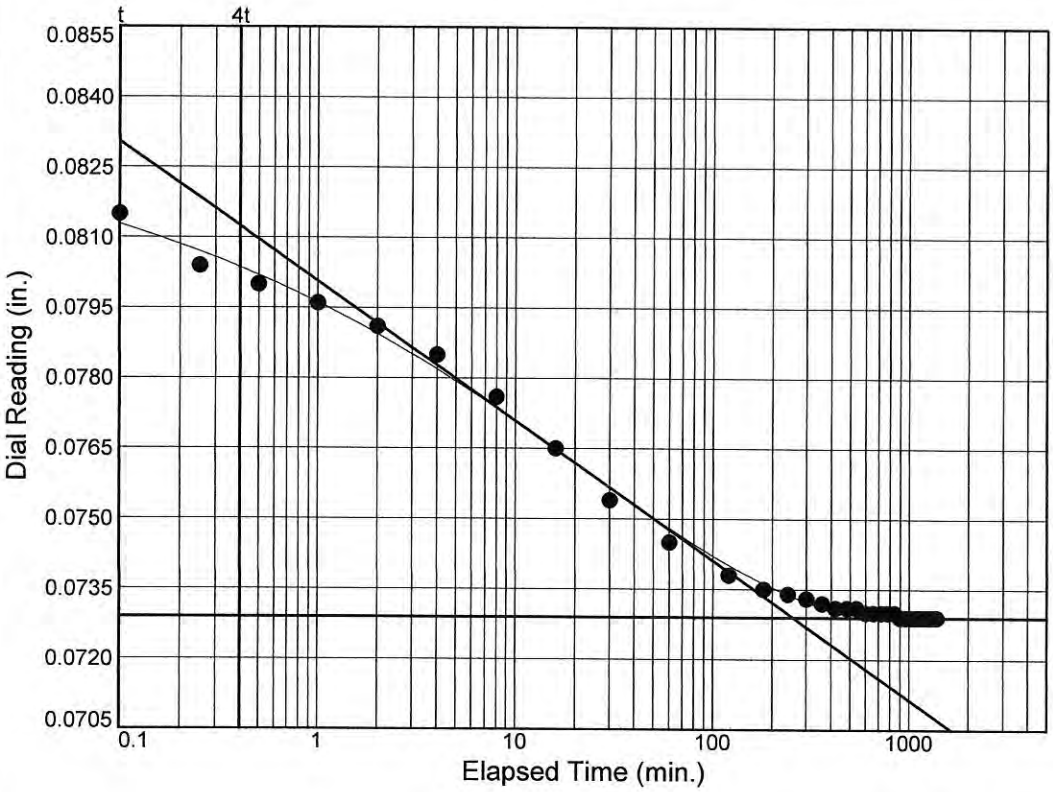
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 Depth: 58



Load No.= 20

Load= 0.86 tsf

D_0 = 0.0822

D_{50} = 0.0776

D_{100} = 0.0729

T_{50} = 6.81 min.

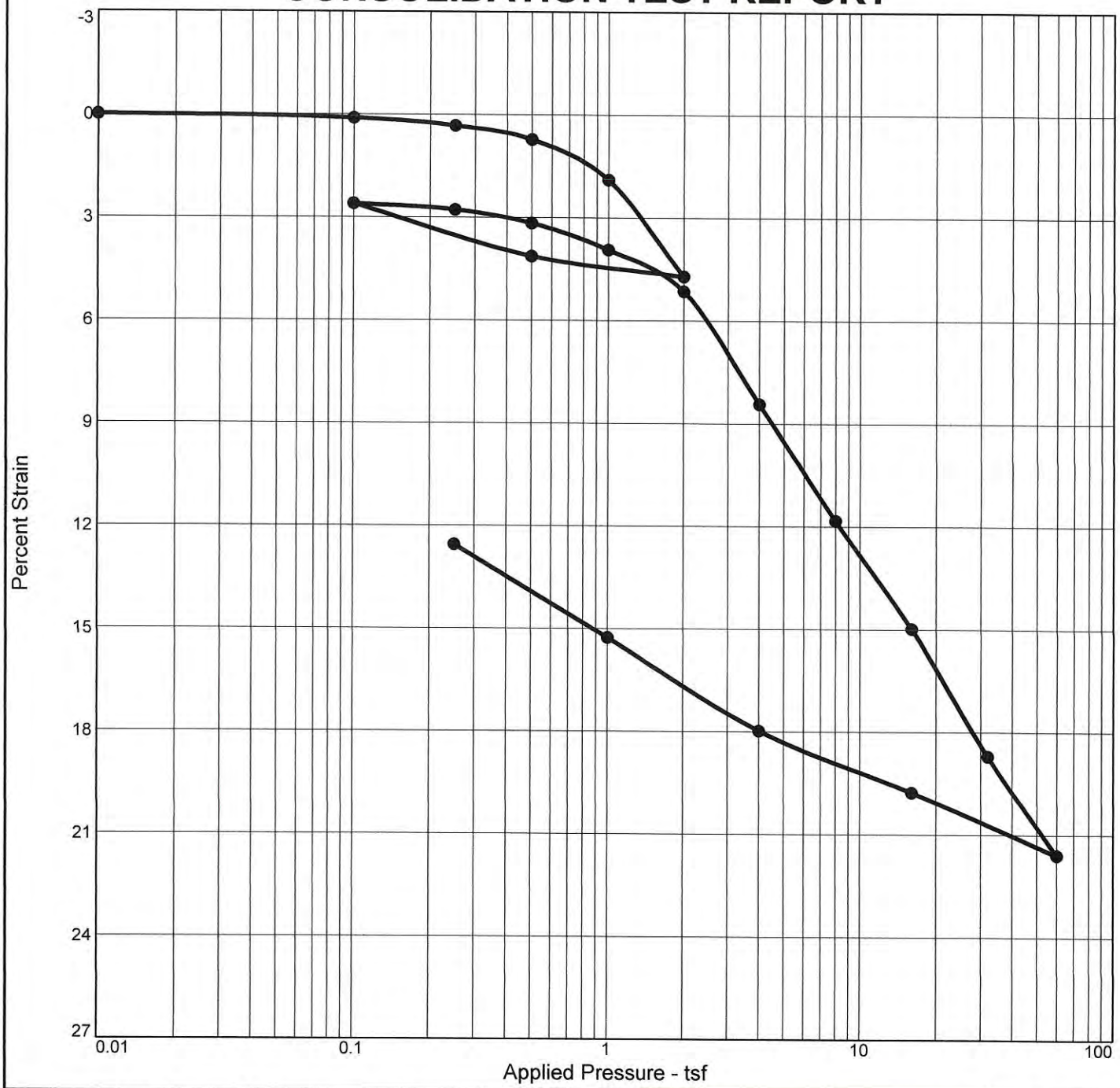
C_v @ T_{50}
12.0 ft.^{2}/yr.

C_α = 0.000

TOLUNAY-WONG ENGINEERS, INC.

Figure

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
96.0 %	24.1 %	100.4	62	41	2.70	CH		0.679

MATERIAL DESCRIPTION

Gray and tan FAT CLAY; organics

Project No. 19.15.131 **Client:**

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB029 **Depth:** 14

Remarks:

Test method: ASTM D2435
Specific gravity: Assumed

Tolunay-Wong Engineers, Inc.

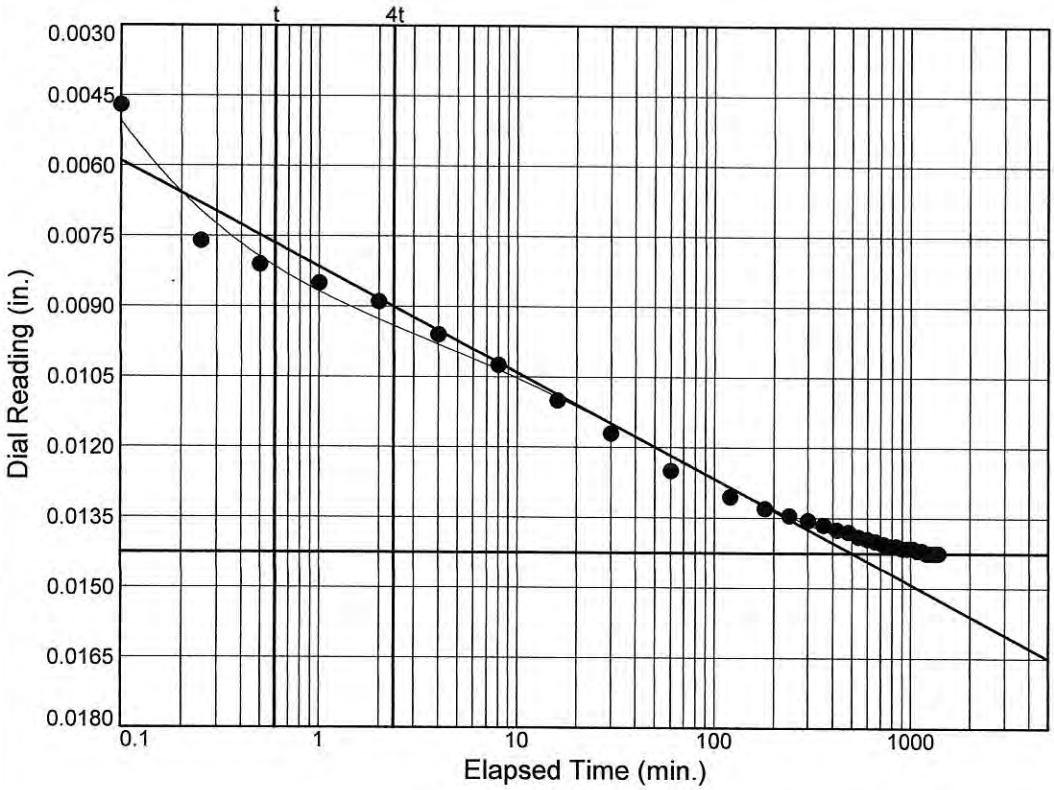
Houston, Texas

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

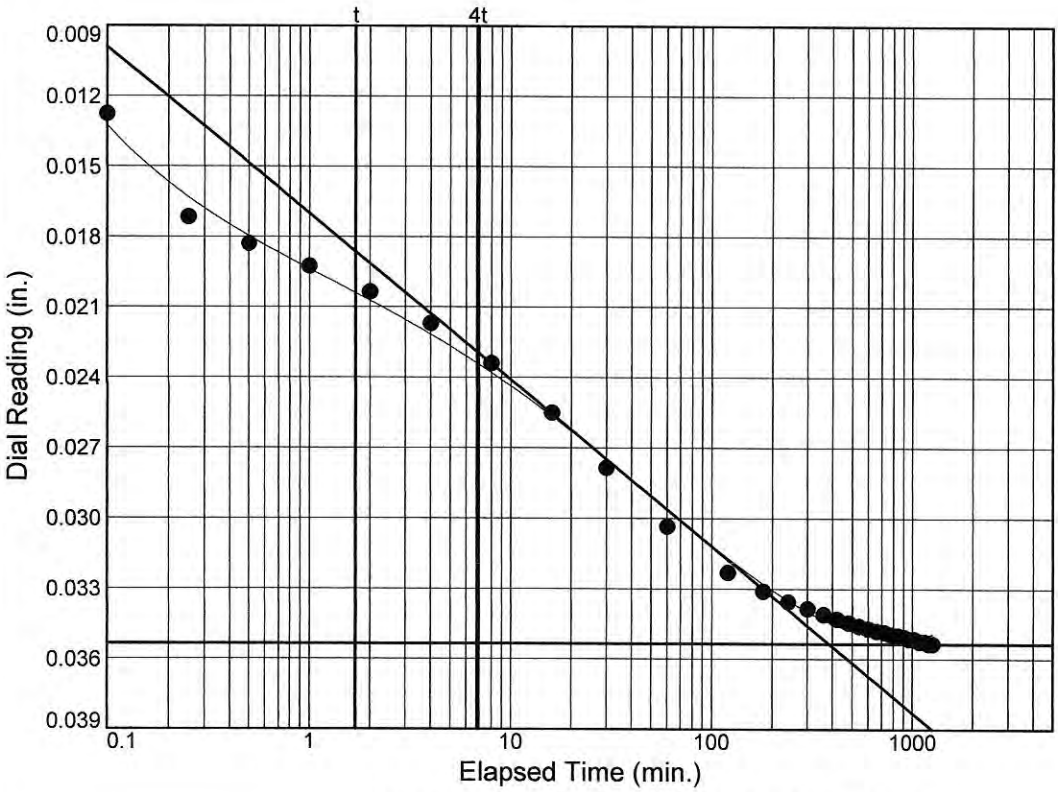
Source of Sample: SJGB029 Depth: 14



Load No.= 5
Load= 1.00 tsf
D_0 = 0.0069
D_{50} = 0.0106
D_{100} = 0.0143
T_{50} = 10.49 min.

C_v @ T_{50}
9.4 ft.^{2}/yr.

C_α = 0.000



Load No.= 6
Load= 2.00 tsf
D_0 = 0.0174
D_{50} = 0.0264
D_{100} = 0.0353
T_{50} = 20.59 min.

C_v @ T_{50}
4.6 ft.^{2}/yr.

C_α = 0.000

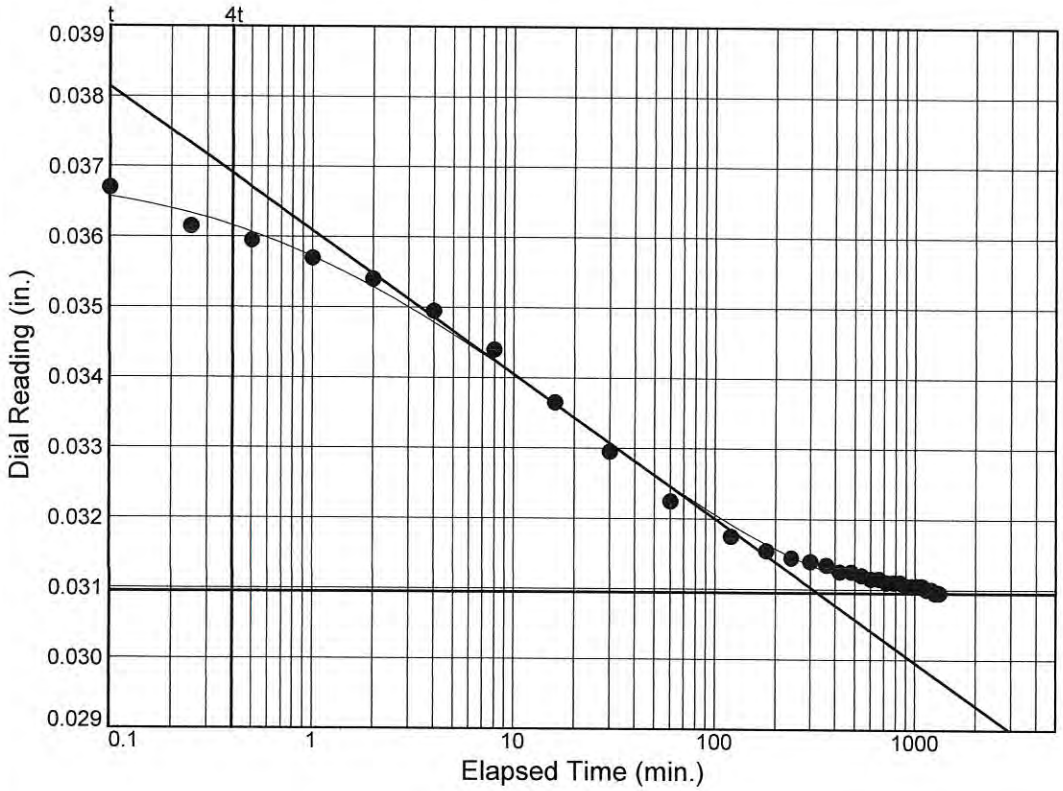
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

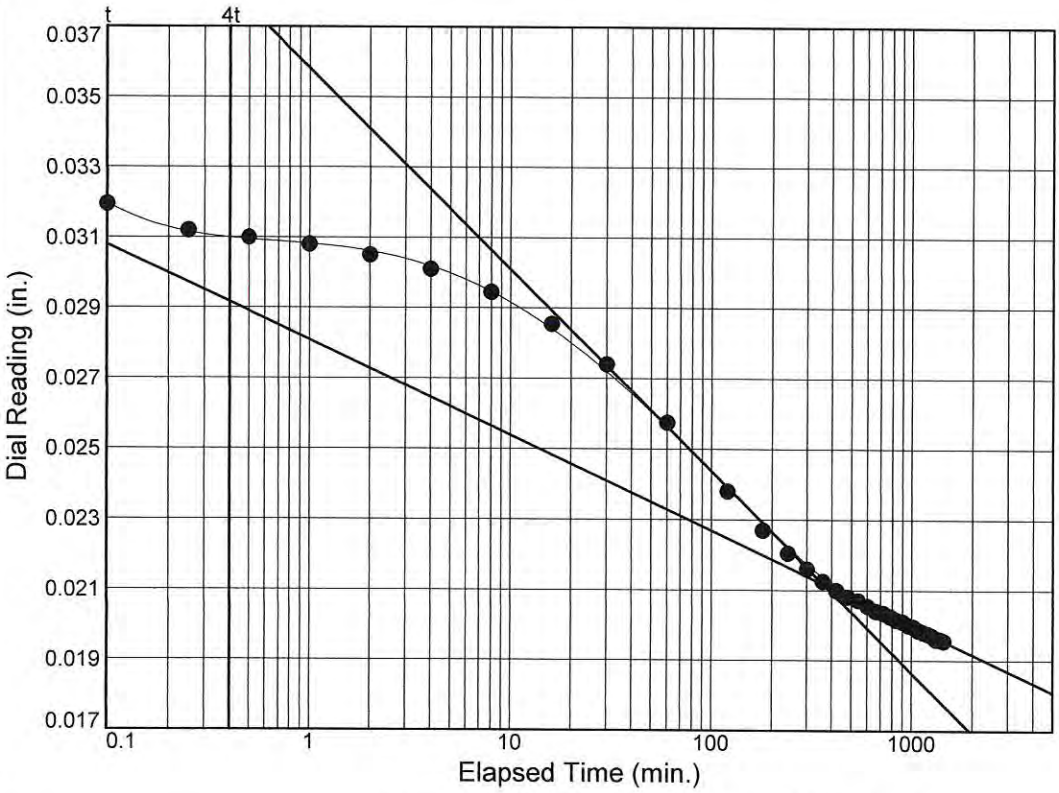
Source of Sample: SJGB029 Depth: 14



Load No.= 7
Load= 0.50 tsf
D_0 = 0.0370
D_{50} = 0.0340
D_{100} = 0.0310
T_{50} = 10.92 min.

C_v @ T_{50}
8.5 ft.^{2}/yr.

C_α = 0.000



Load No.= 8
Load= 0.10 tsf
D_0 = 0.0330
D_{50} = 0.0271
D_{100} = 0.0212
T_{50} = 31.91 min.

C_v @ T_{50}
3.0 ft.^{2}/yr.

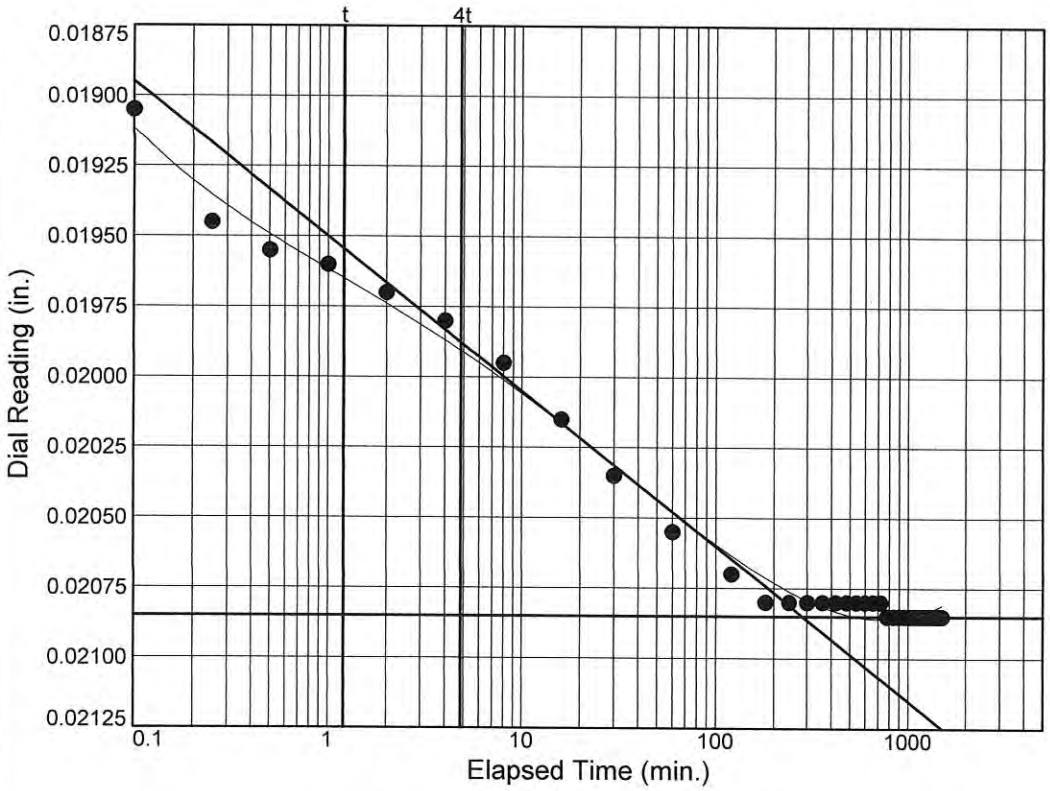
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

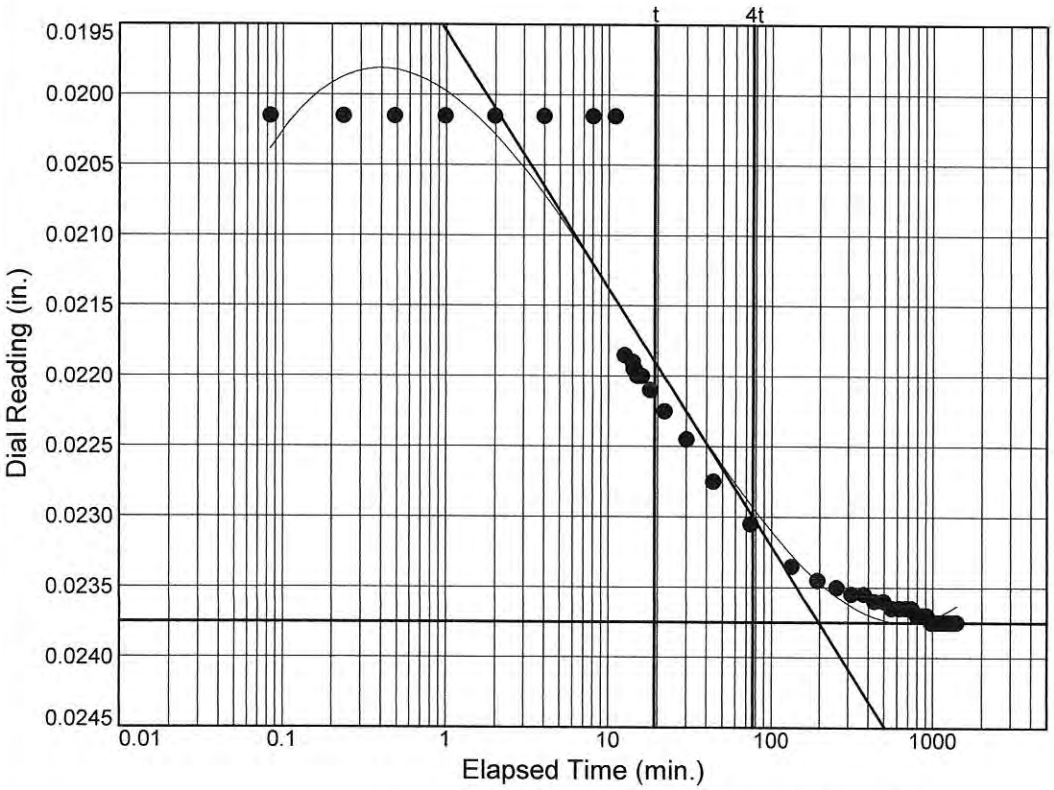
Source of Sample: SJGB029 Depth: 14



Load No.= 9
Load= 0.25 tsf
D_0 = 0.0194
D_{50} = 0.0201
D_{100} = 0.0209
T_{50} = 13.24 min.

C_v @ T_{50}
7.2 ft.^{2}/yr.

C_α = 0.000



Load No.= 10
Load= 0.50 tsf
D_0 = 0.0209
D_{50} = 0.0223
D_{100} = 0.0238
T_{50} = 32.32 min.

C_v @ T_{50}
2.9 ft.^{2}/yr.

C_α = 0.000

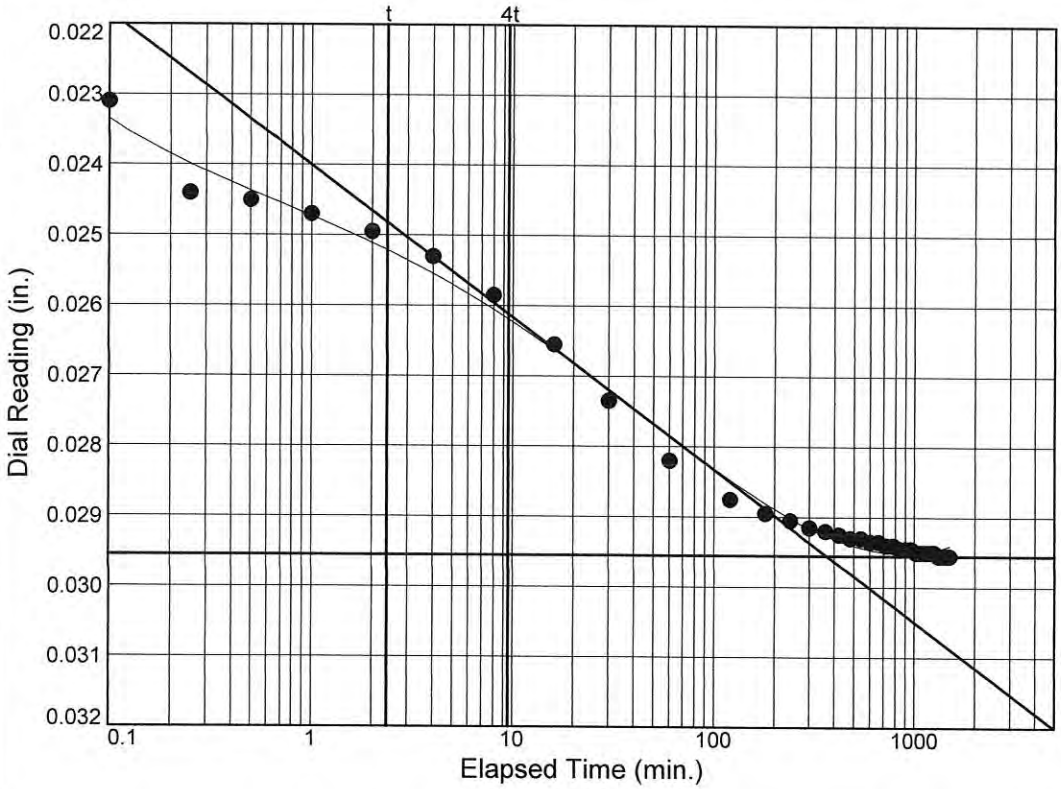
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

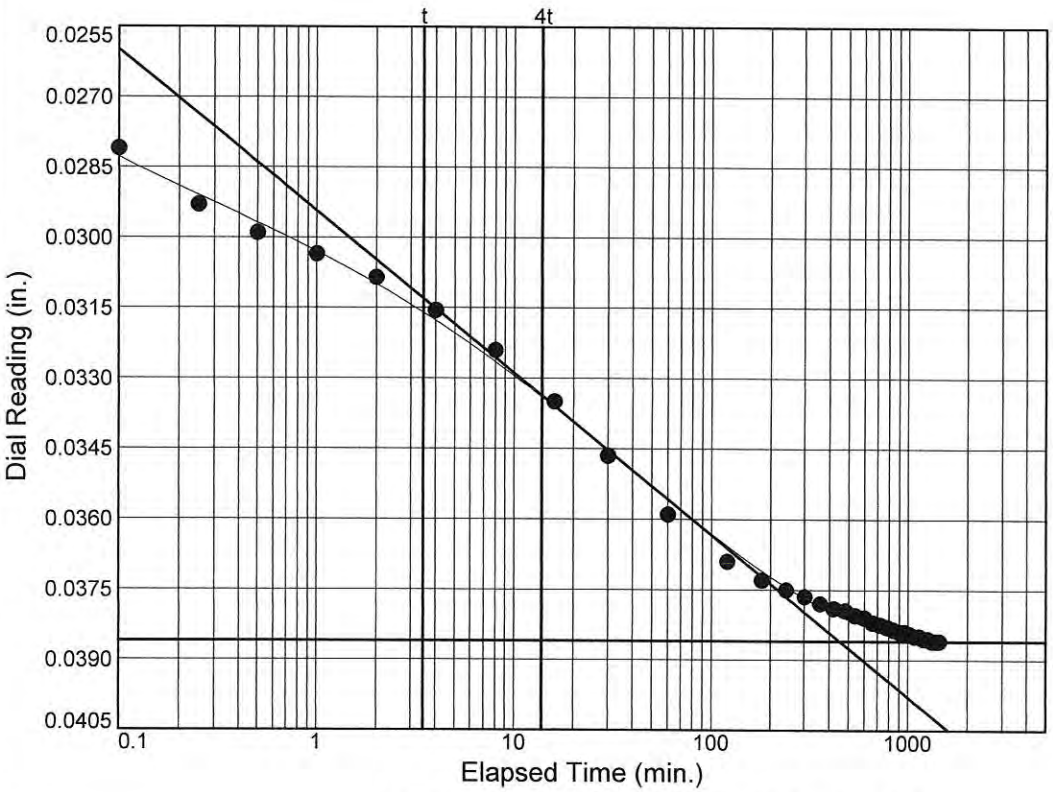
Source of Sample: SJGB029 Depth: 14



Load No.= 11
Load= 1.00 tsf
D_0 = 0.0242
D_{50} = 0.0269
D_{100} = 0.0295
T_{50} = 21.47 min.

C_v @ T_{50}
4.4 ft.^{2}/yr.

C_α = 0.000



Load No.= 12
Load= 2.00 tsf
D_0 = 0.0298
D_{50} = 0.0342
D_{100} = 0.0386
T_{50} = 23.92 min.

C_v @ T_{50}
3.9 ft.^{2}/yr.

C_α = 0.000

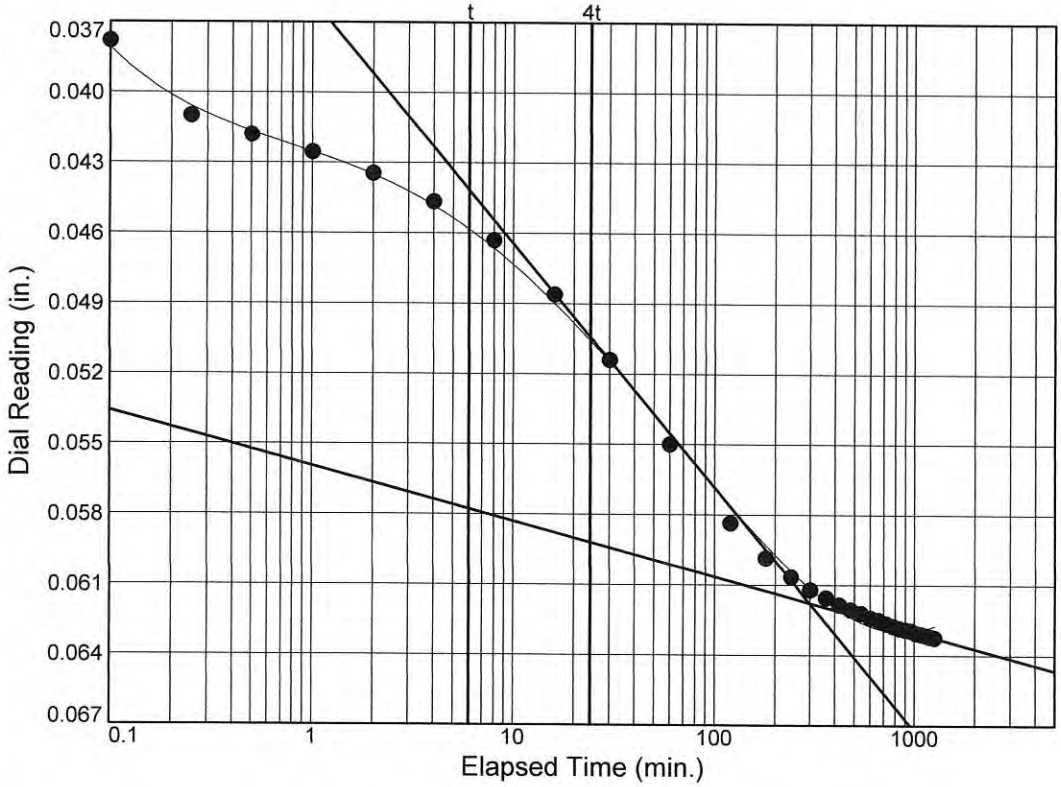
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

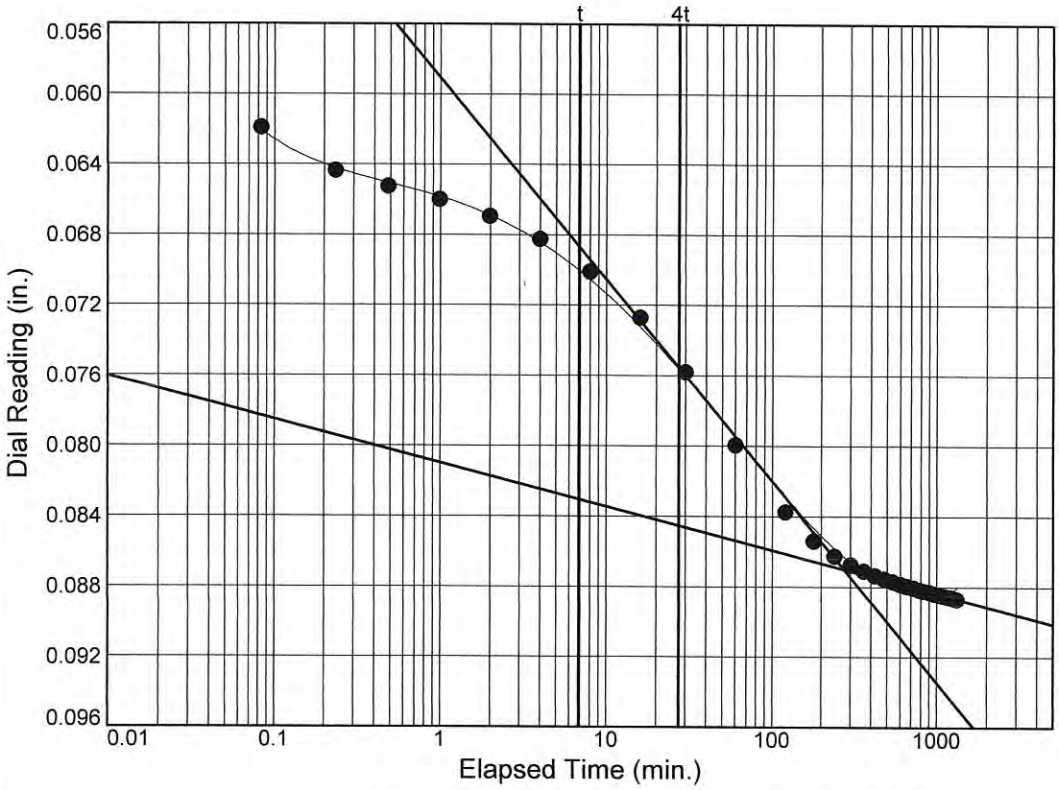
Source of Sample: SJGB029 Depth: 14



Load No.= 13
Load= 4.00 tsf
D_0 = 0.0411
D_{50} = 0.0514
D_{100} = 0.0618
T_{50} = 29.70 min.

C_v @ T_{50}
3.0 ft.^{2}/yr.

C_α = 0.005



Load No.= 14
Load= 8.00 tsf
D_0 = 0.0644
D_{50} = 0.0757
D_{100} = 0.0870
T_{50} = 27.88 min.

C_v @ T_{50}
2.9 ft.^{2}/yr.

C_α = 0.006

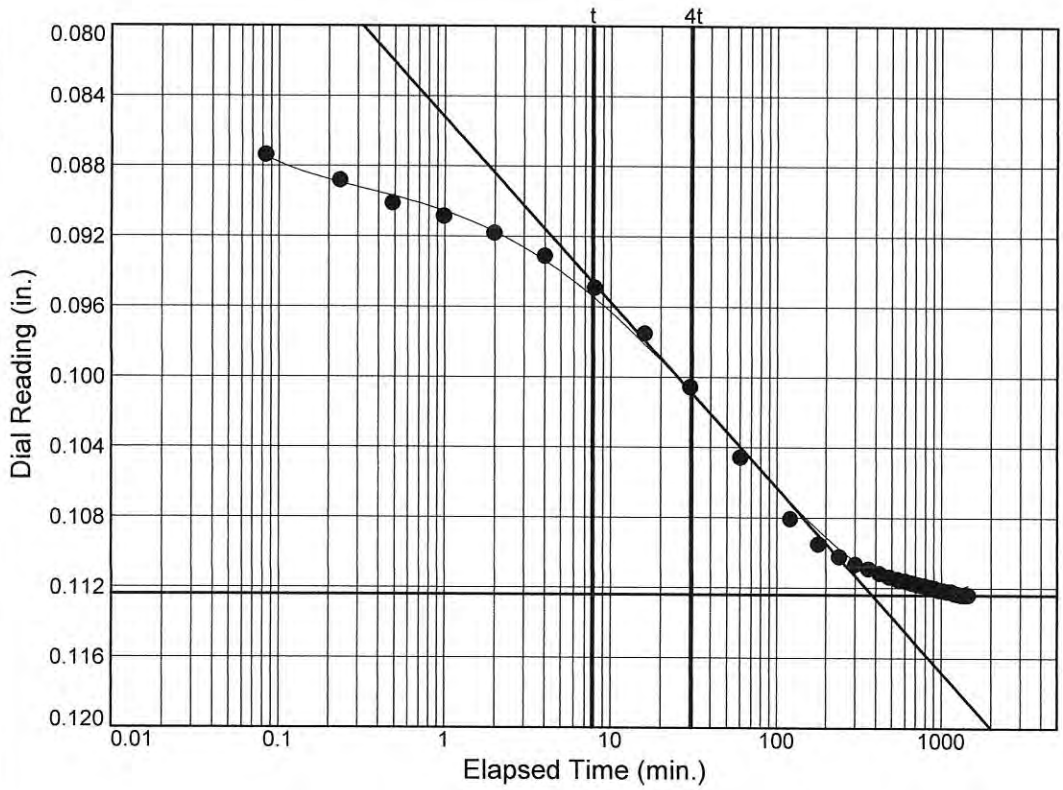
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

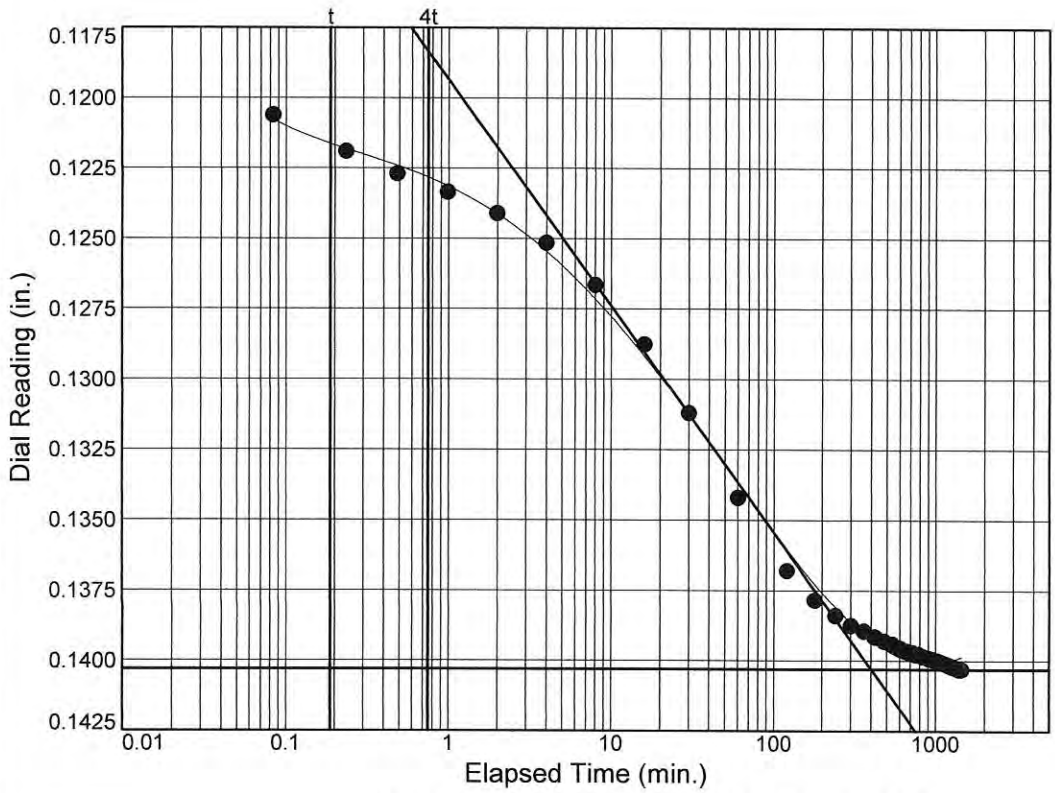
Source of Sample: SJGB029 Depth: 14



Load No.= 15
Load= 16.00 tsf
D_0 = 0.0898
D_{50} = 0.1011
D_{100} = 0.1124
T_{50} = 32.22 min.

C_v @ T_{50}
2.4 ft.^{2}/yr.

C_α = 0.000



Load No.= 16
Load= 32.00 tsf
D_0 = 0.1204
D_{50} = 0.1304
D_{100} = 0.1403
T_{50} = 23.02 min.

C_v @ T_{50}
3.0 ft.^{2}/yr.

C_α = 0.000

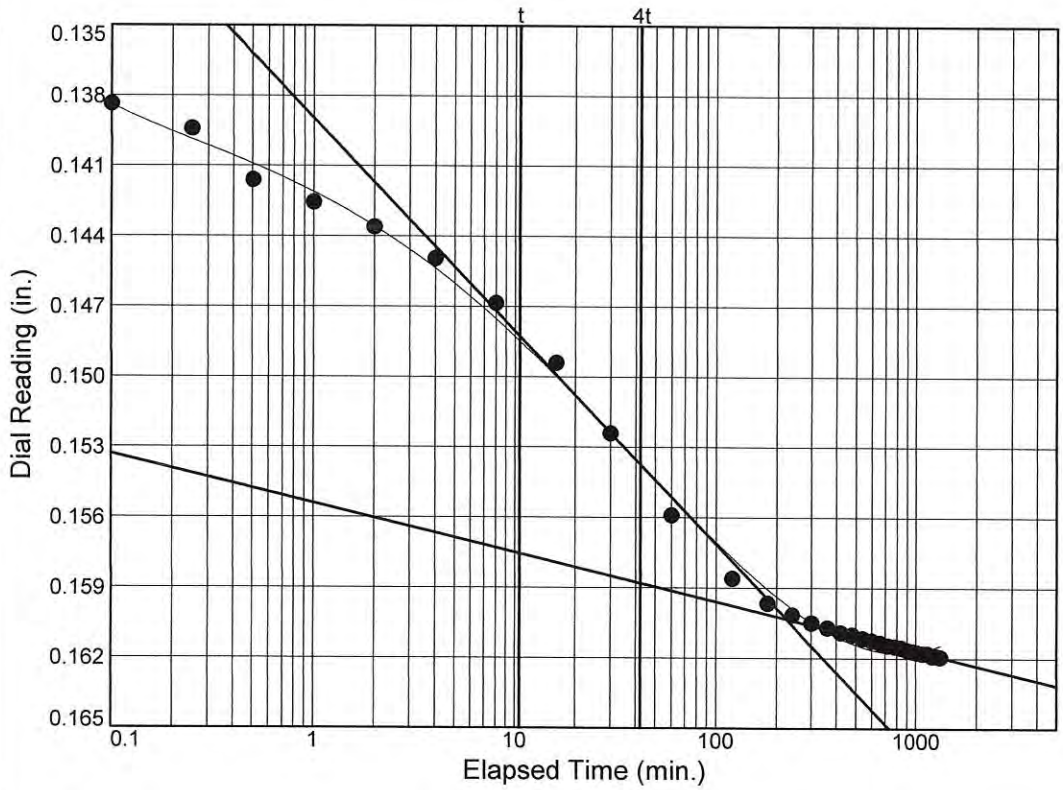
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

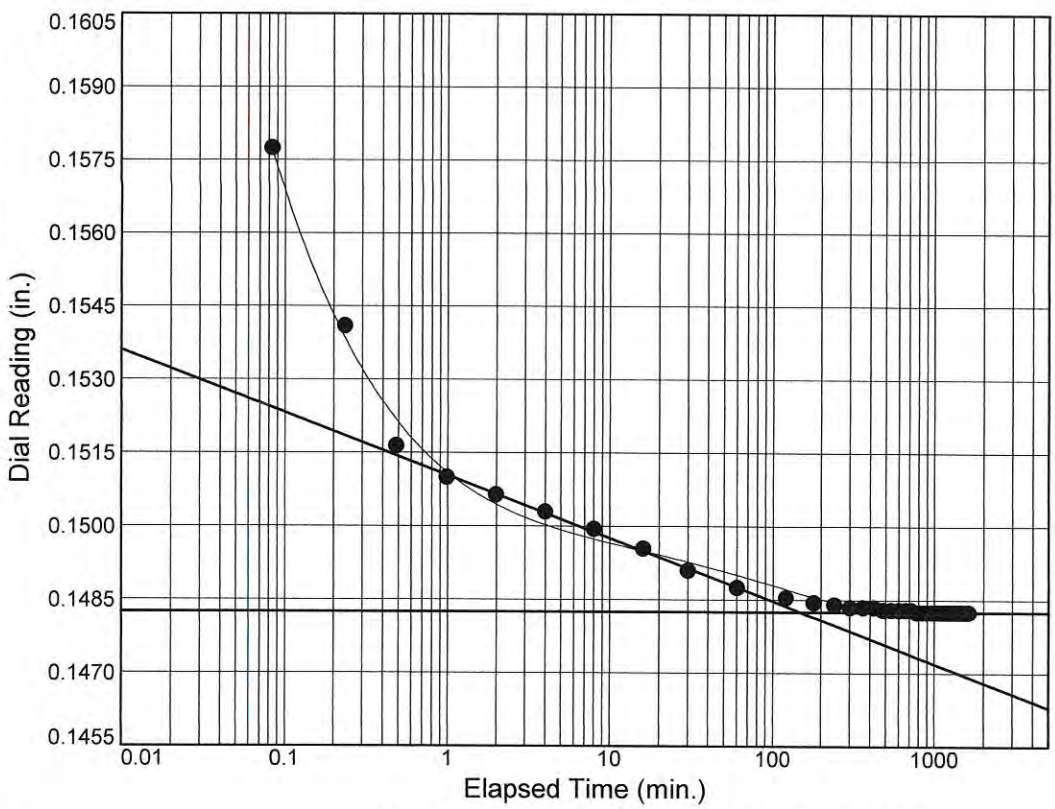
Source of Sample: SJGB029 Depth: 14



Load No.= 17
Load= 60.00 tsf
D_0 = 0.1432
D_{50} = 0.1518
D_{100} = 0.1603
T_{50} = 25.54 min.

C_v @ T_{50}
2.5 ft.^{2}/yr.

C_α = 0.005



Load No.= 18
Load= 16.00 tsf
D_0 = 0.1619
D_{50} = 0.1551
D_{100} = 0.1482
T_{50} = 0.16 min.

C_v @ T_{50}
404.0 ft.^{2}/yr.

C_α = 0.000

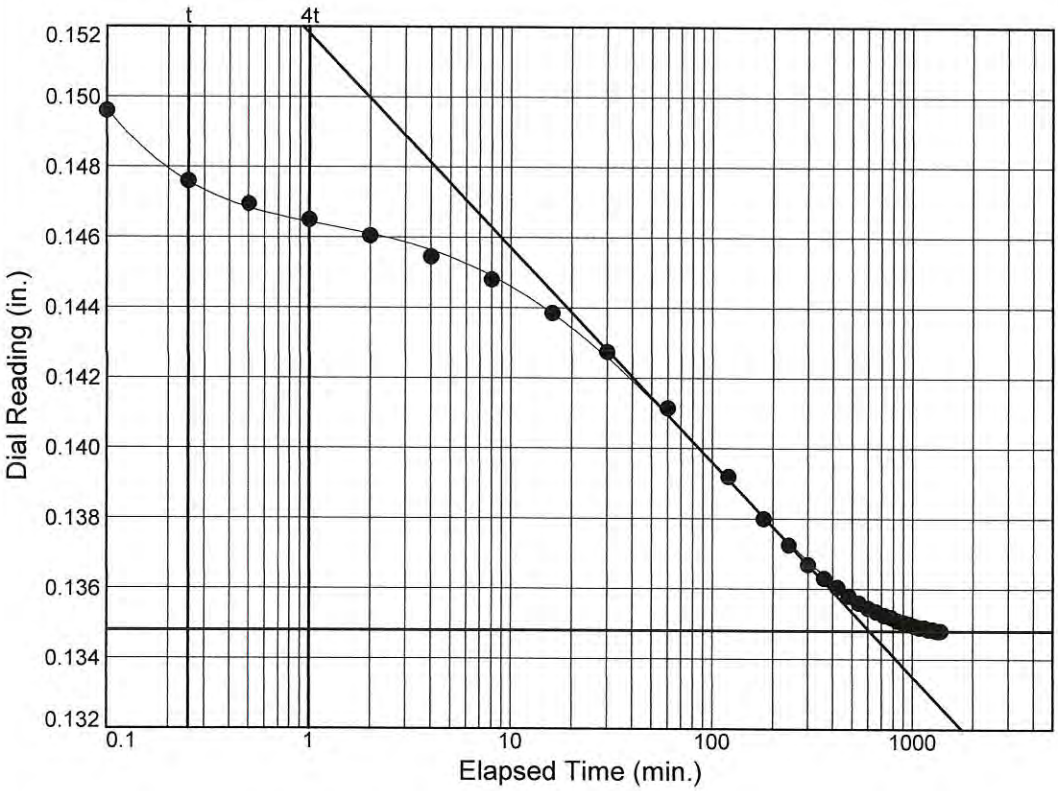
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

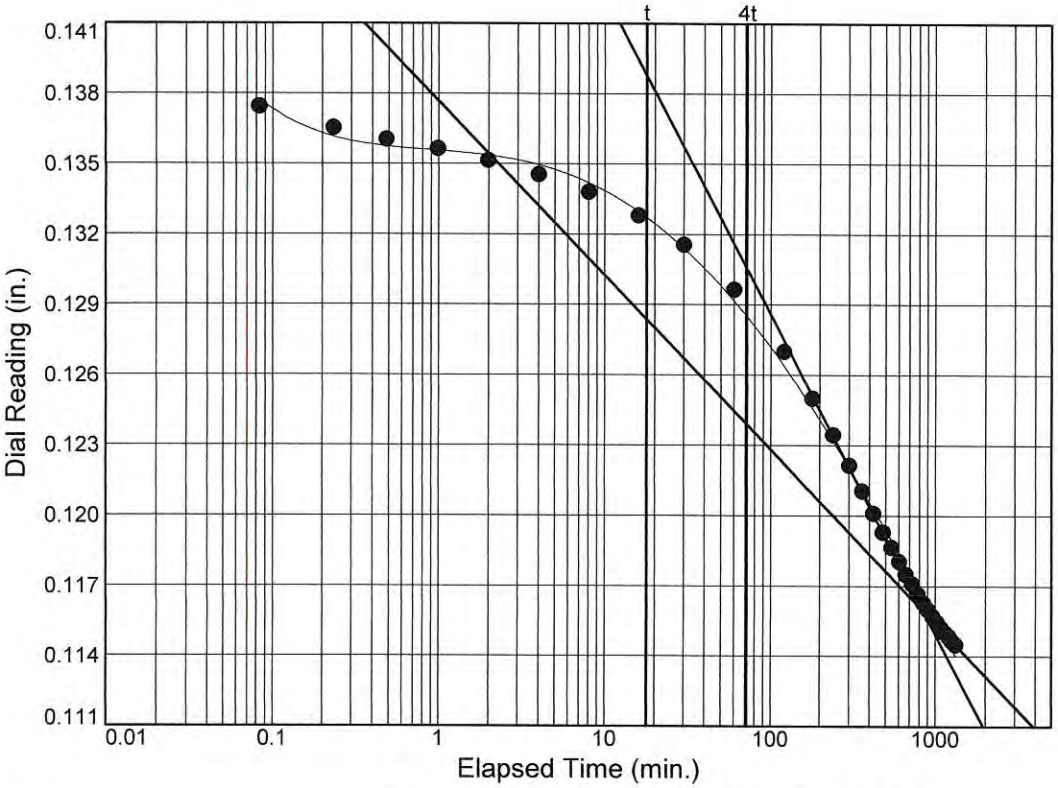
Source of Sample: SJGB029 Depth: 14



Load No.= 19
Load= 4.00 tsf
D_0 = 0.1487
D_{50} = 0.1418
D_{100} = 0.1348
T_{50} = 43.00 min.

C_v @ T_{50}
1.5 ft.^{2}/yr.

C_α = 0.000



Load No.= 20
Load= 1.00 tsf
D_0 = 0.1369
D_{50} = 0.1264
D_{100} = 0.1160
T_{50} = 119.20 min.

C_v @ T_{50}
0.6 ft.^{2}/yr.

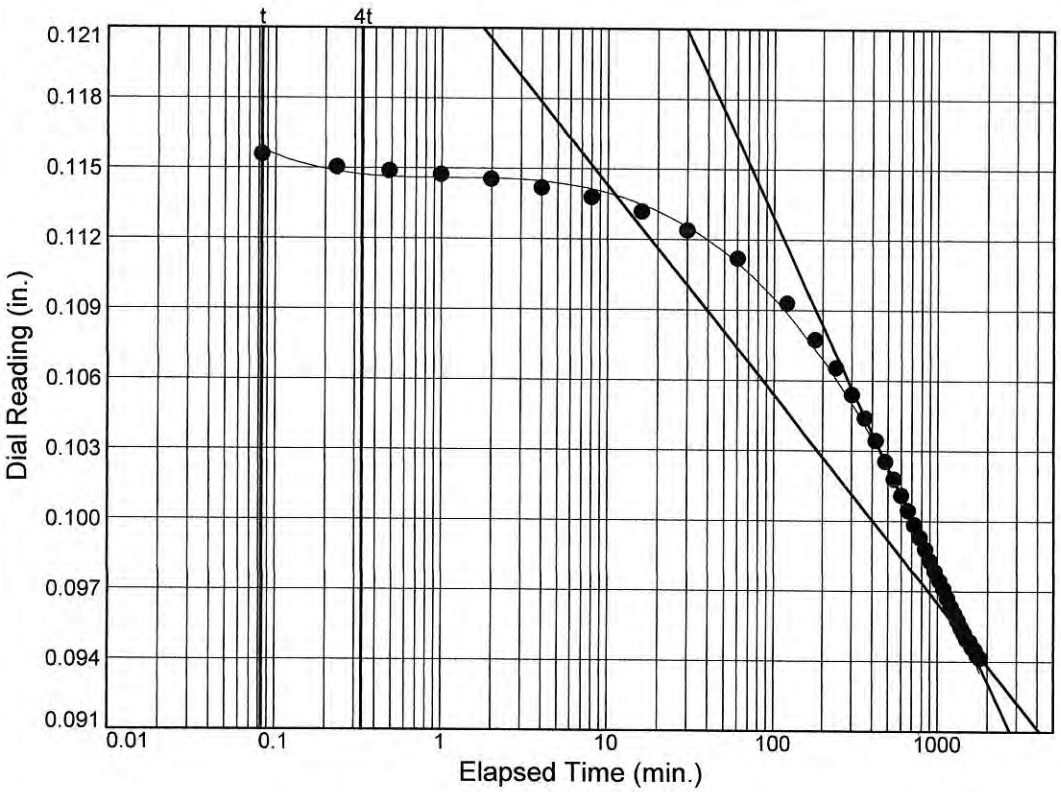
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB029 Depth: 14



Load No.= 21

Load= 0.25 tsf

D_0 = 0.1169

D_{50} = 0.1059

D_{100} = 0.0948

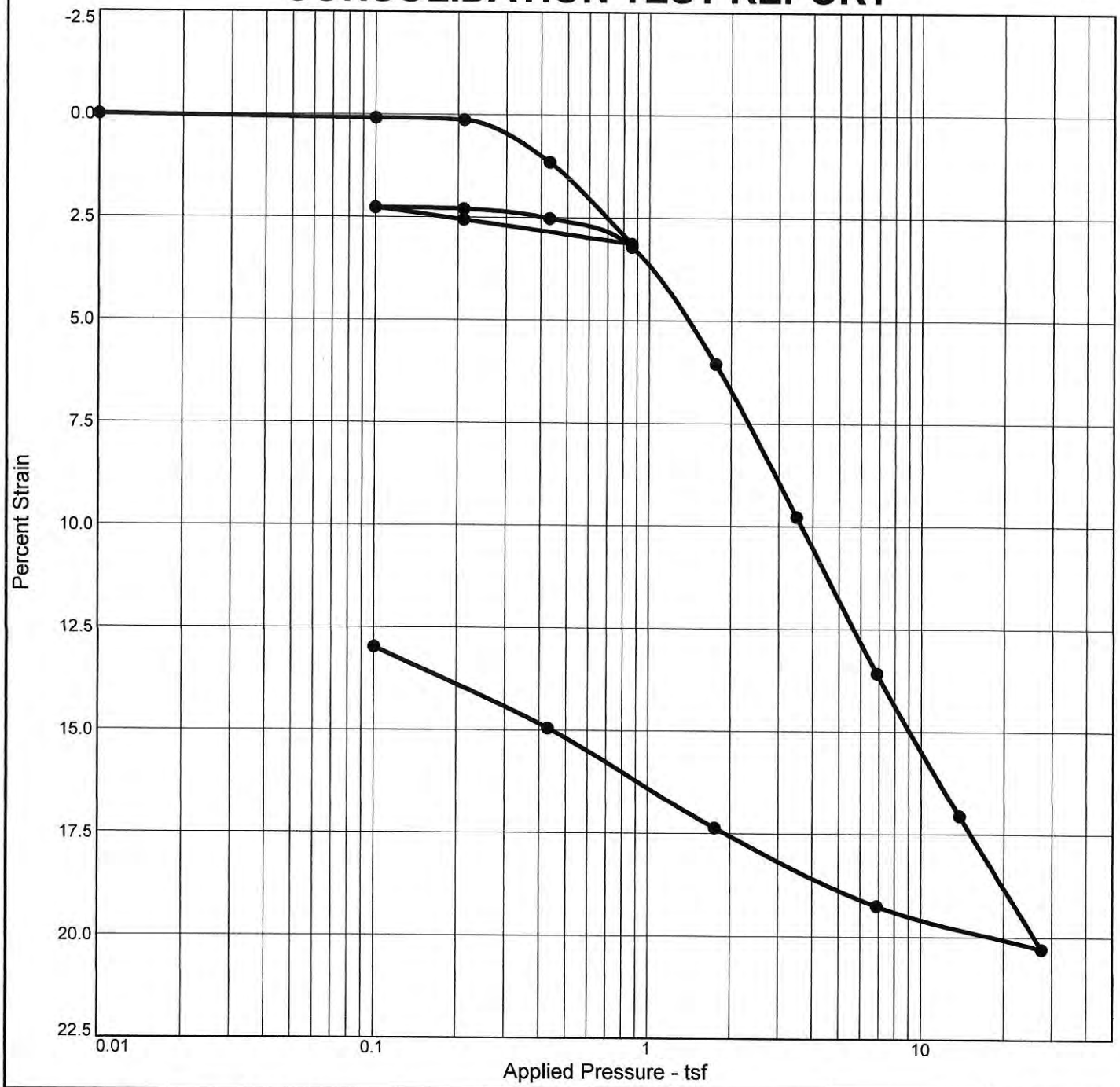
T_{50} = 252.37 min.

C_v @ T_{50}
0.3 ft.^{2}/yr.

TOLUNAY-WONG ENGINEERS, INC.

Figure

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
98.8 %	28.9 %	96.1	27	6	2.80	CL-ML		0.819

MATERIAL DESCRIPTION

Reddish Brown SANDY SILTY CLAY

Project No. 19.15.131 **Client:**

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 28

Remarks:

Test method: ASTM D2435
Specific gravity: Assumed

Tolunay-Wong Engineers, Inc.

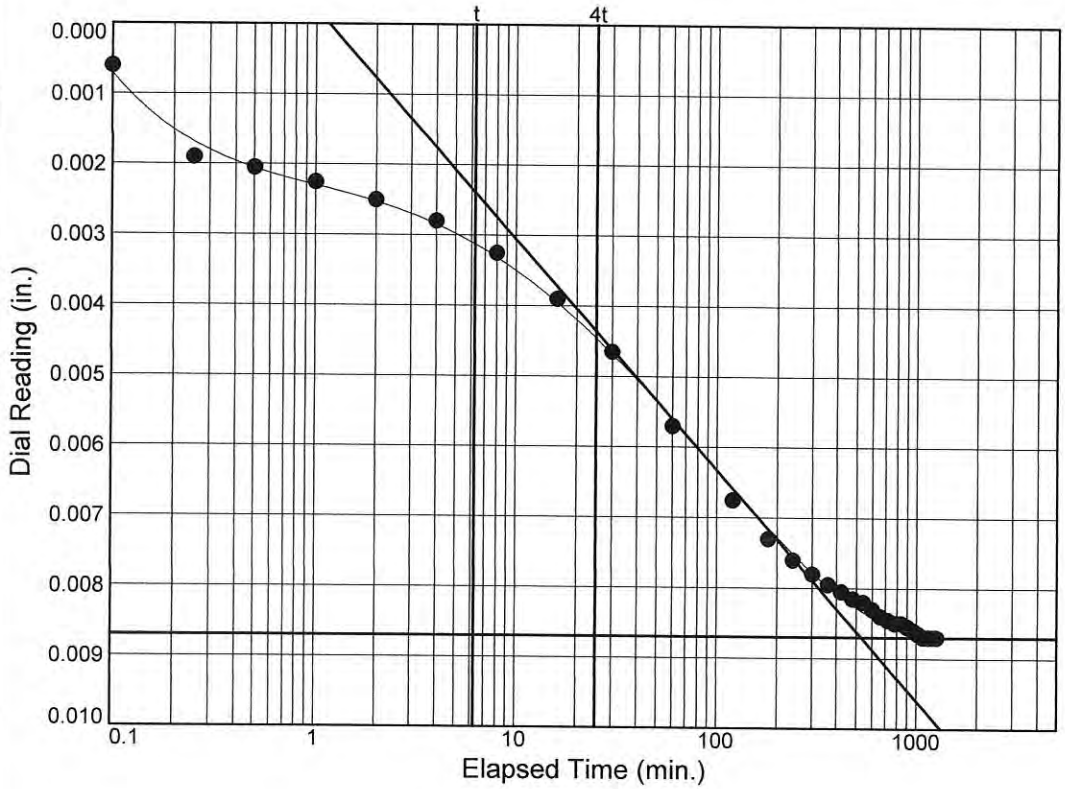
Houston, Texas

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

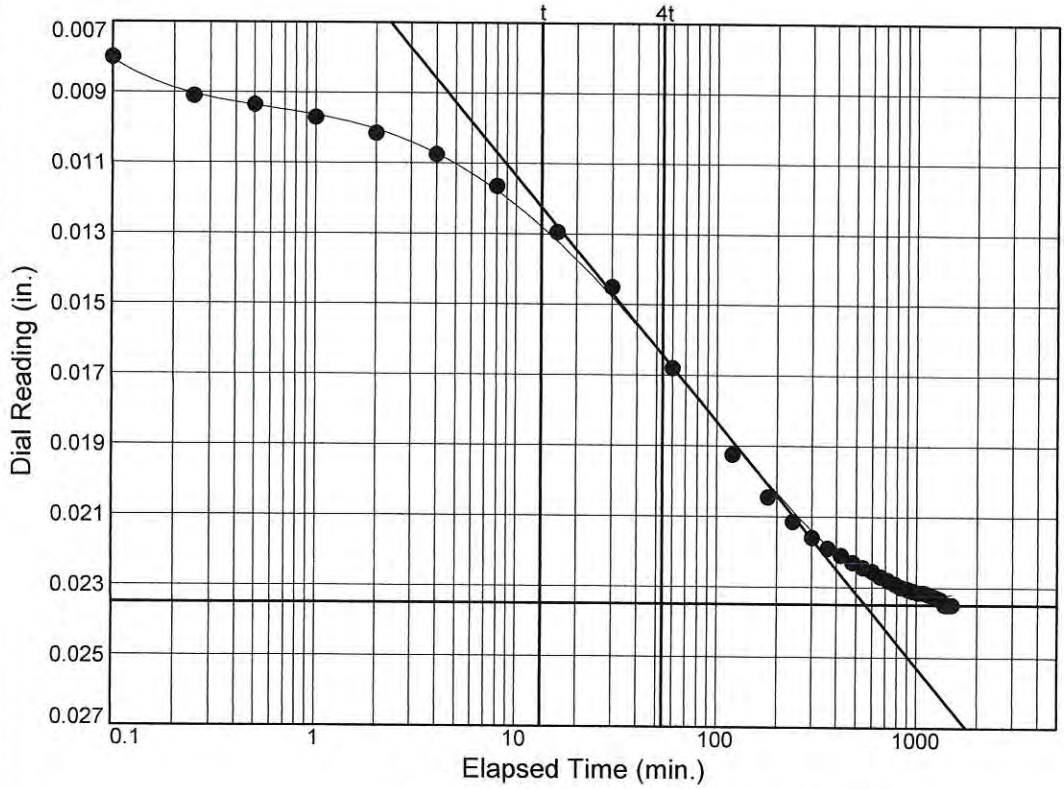
Source of Sample: SJGB047 Depth: 28



Load No.= 4
Load= 0.43 tsf
D_0 = 0.0018
D_{50} = 0.0052
D_{100} = 0.0087
T_{50} = 46.27 min.

C_v @ T_{50}
2.2 ft.^{2}/yr.

C_α = 0.000



Load No.= 5
Load= 0.86 tsf
D_0 = 0.0092
D_{50} = 0.0163
D_{100} = 0.0235
T_{50} = 51.48 min.

C_v @ T_{50}
1.9 ft.^{2}/yr.

C_α = 0.000

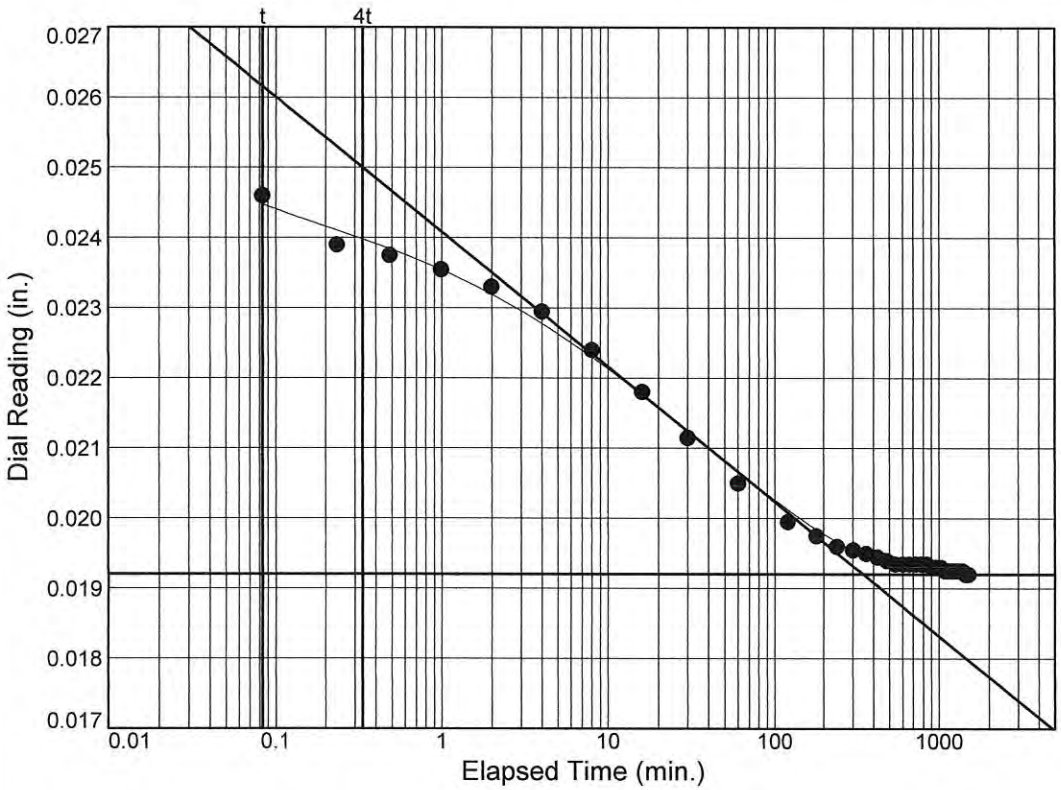
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

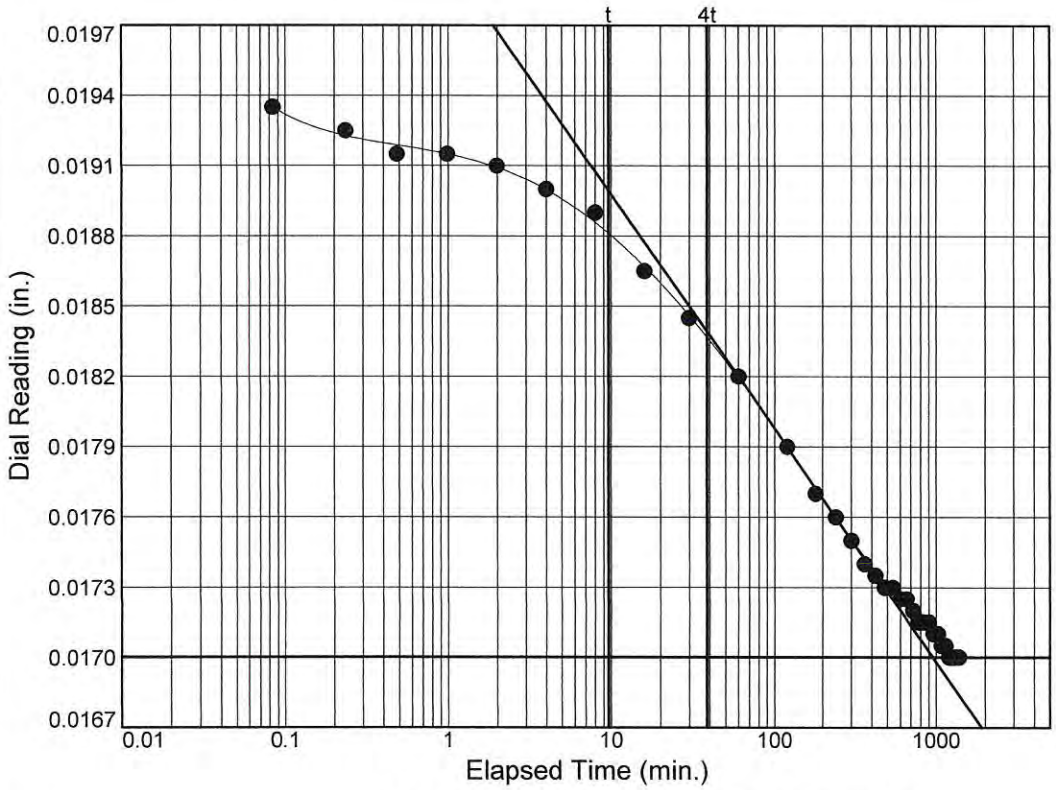
Source of Sample: SJGB047 Depth: 28



Load No.= 6
Load= 0.21 tsf
D_0 = 0.0250
D_{50} = 0.0221
D_{100} = 0.0192
T_{50} = 10.56 min.

C_v @ T_{50}
9.0 ft.^{2}/yr.

C_α = 0.000



Load No.= 7
Load= 0.10 tsf
D_0 = 0.0193
D_{50} = 0.0181
D_{100} = 0.0170
T_{50} = 69.80 min.

C_v @ T_{50}
1.4 ft.^{2}/yr.

C_α = 0.000

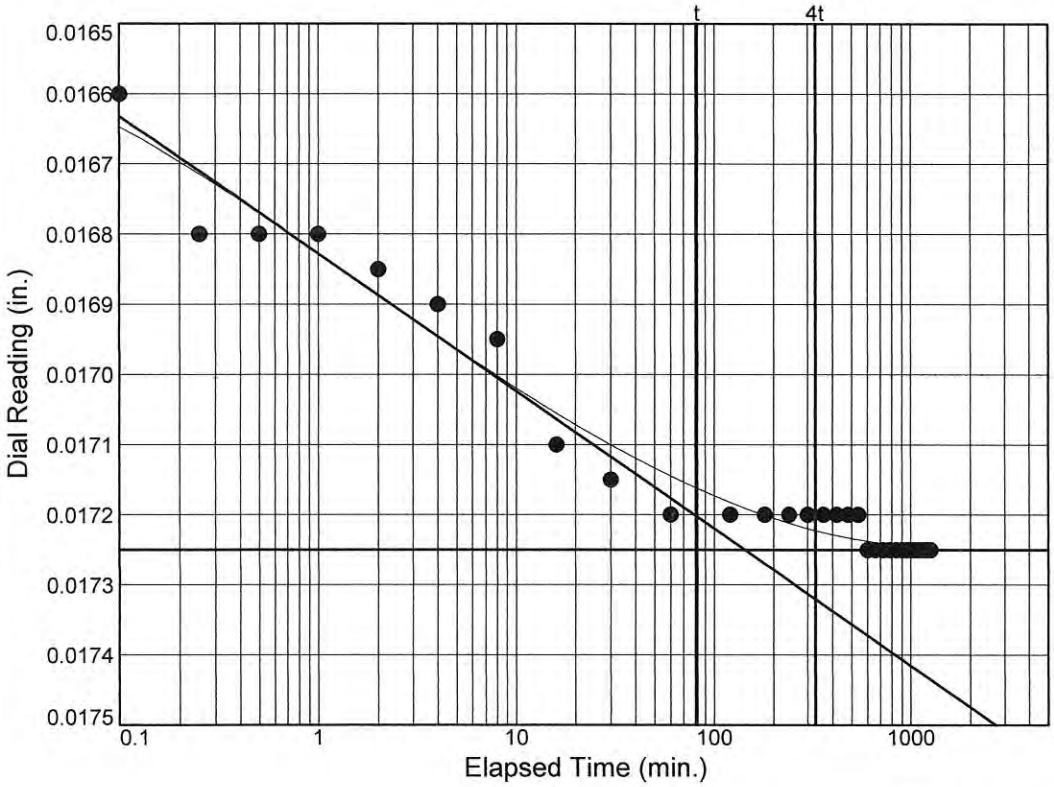
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

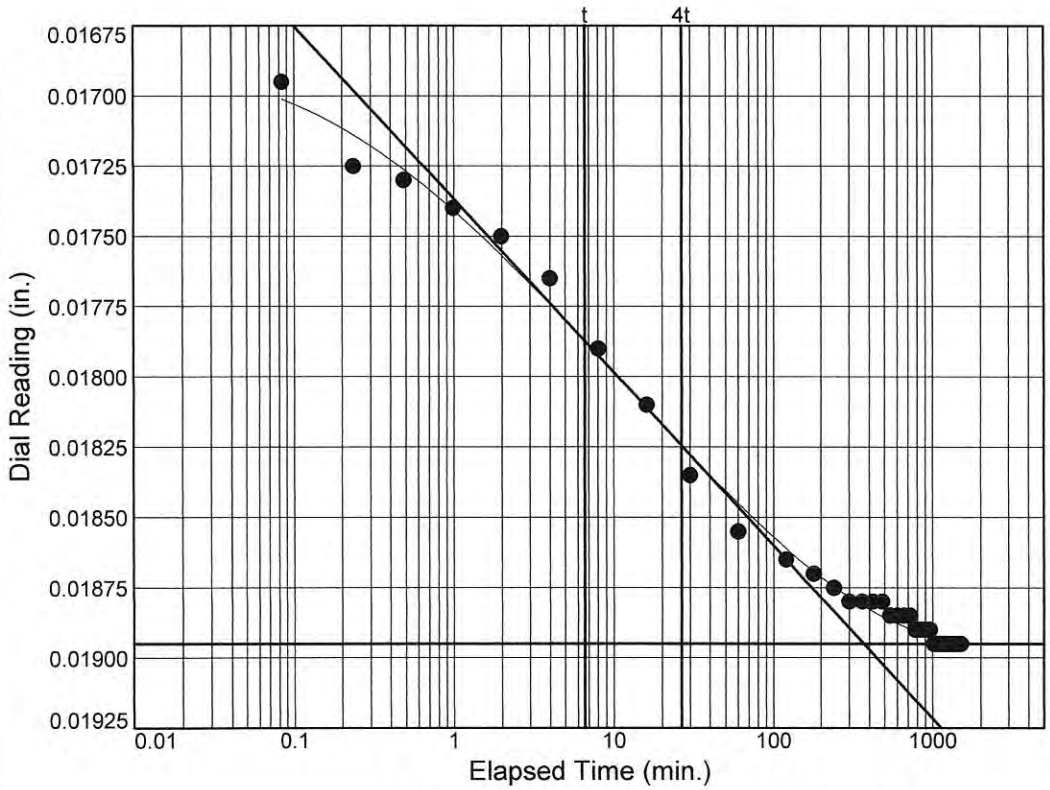
Source of Sample: SJGB047 Depth: 28



Load No.= 8
Load= 0.21 tsf
D_0 = 0.0171
D_{50} = 0.0172
D_{100} = 0.0172
T_{50} = 105.96 min.

C_v @ T_{50}
0.9 ft.^{2}/yr.

C_α = 0.000



Load No.= 9
Load= 0.43 tsf
D_0 = 0.0175
D_{50} = 0.0182
D_{100} = 0.0190
T_{50} = 24.96 min.

C_v @ T_{50}
3.9 ft.^{2}/yr.

C_α = 0.000

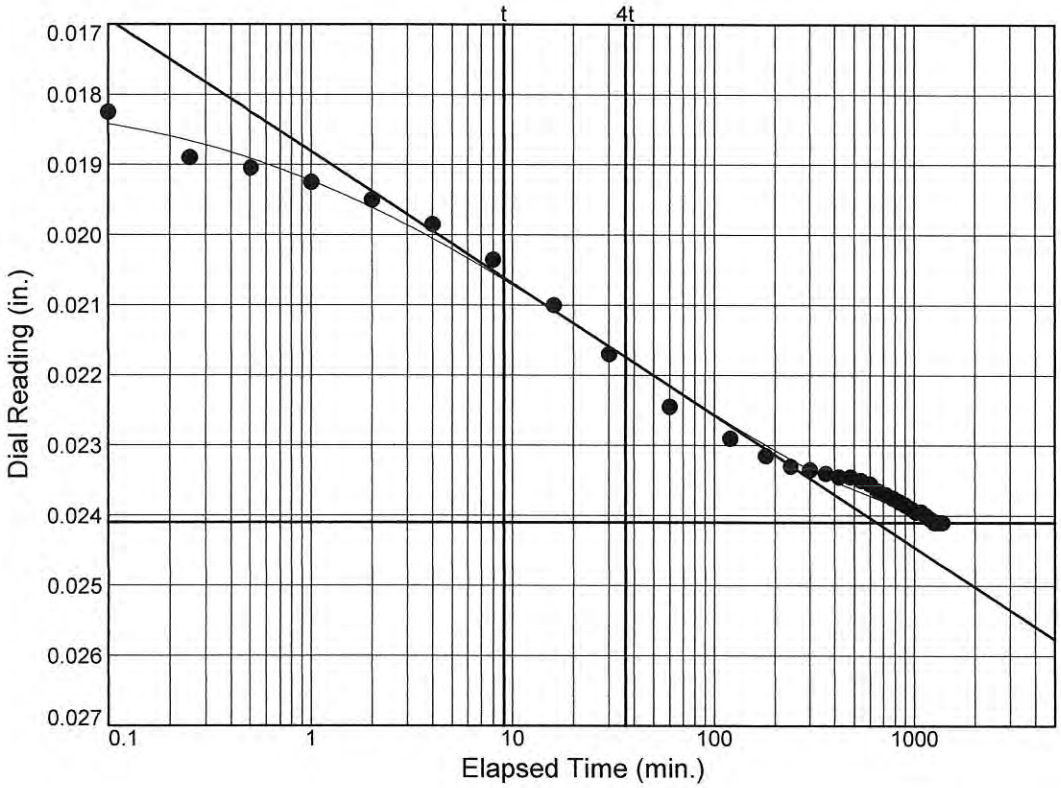
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

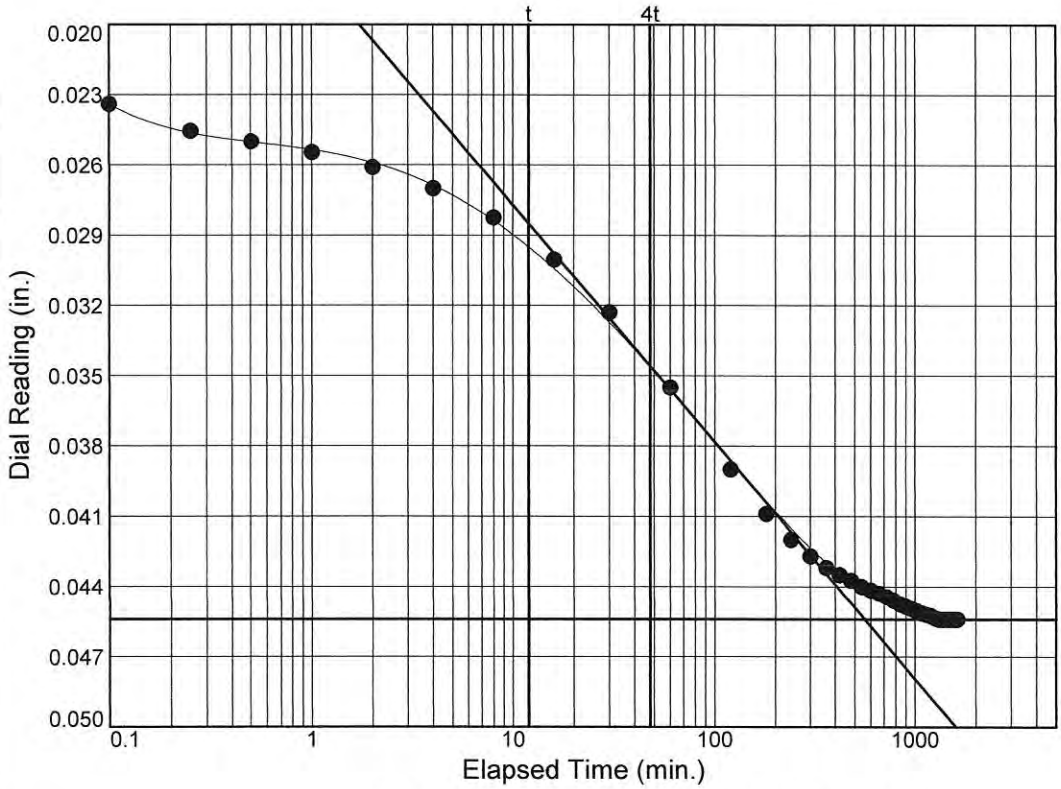
Source of Sample: SJGB047 Depth: 28



Load No.= 10
Load= 0.86 tsf
D_0 = 0.0195
D_{50} = 0.0218
D_{100} = 0.0241
T_{50} = 39.71 min.

C_v @ T_{50}
2.4 ft.^{2}/yr.

C_α = 0.000



Load No.= 11
Load= 1.75 tsf
D_0 = 0.0244
D_{50} = 0.0349
D_{100} = 0.0454
T_{50} = 50.73 min.

C_v @ T_{50}
1.8 ft.^{2}/yr.

C_α = 0.000

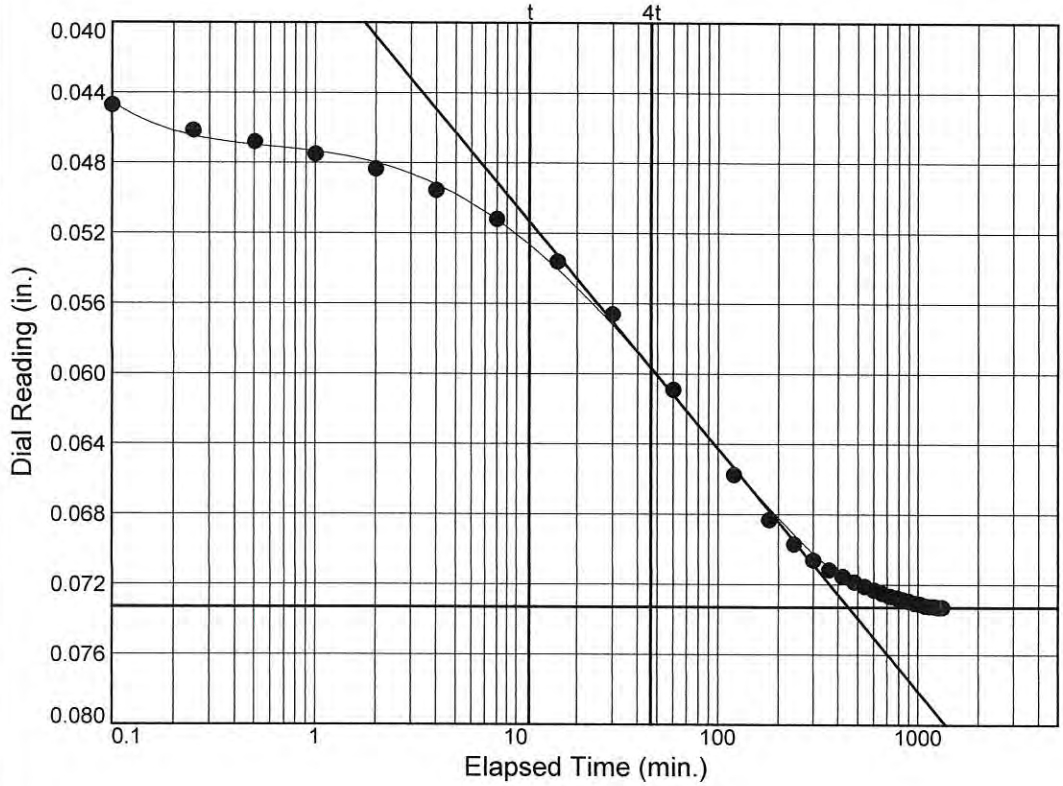
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

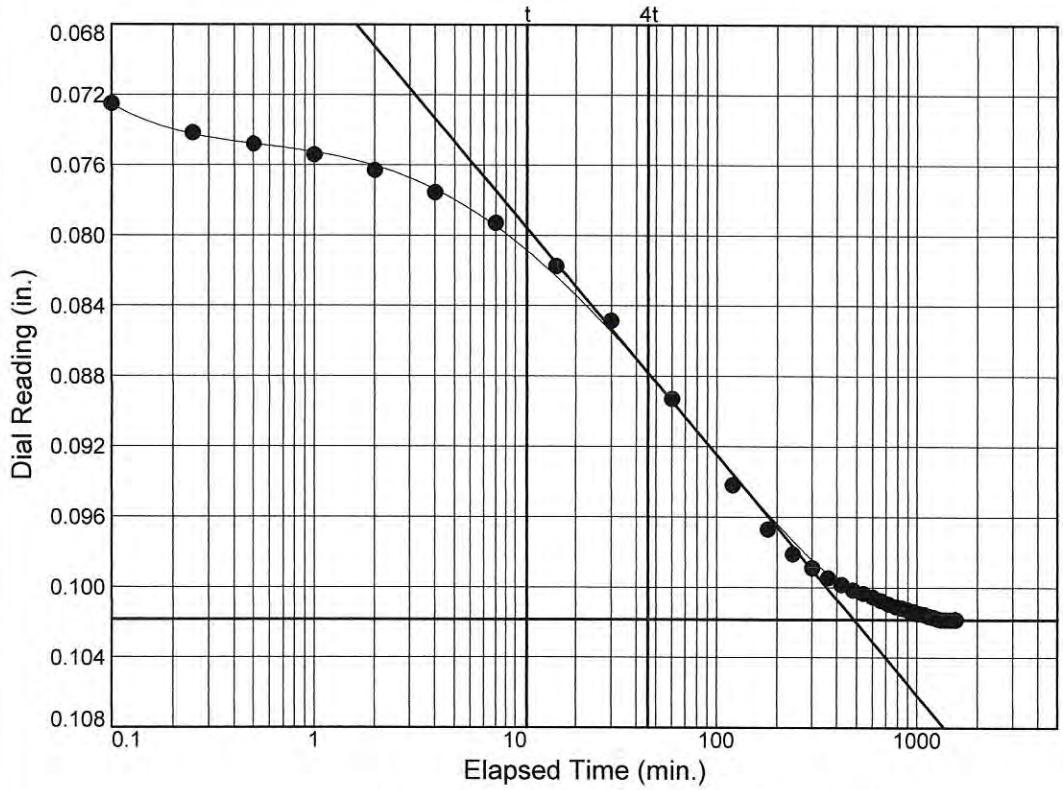
Source of Sample: SJGB047 Depth: 28



Load No.= 12
Load= 3.49 tsf
D_0 = 0.0456
D_{50} = 0.0595
D_{100} = 0.0733
T_{50} = 44.60 min.

C_v @ T_{50}
1.9 ft.^{2}/yr.

C_α = 0.000



Load No.= 13
Load= 6.87 tsf
D_0 = 0.0739
D_{50} = 0.0879
D_{100} = 0.1018
T_{50} = 45.75 min.

C_v @ T_{50}
1.7 ft.^{2}/yr.

C_α = 0.000

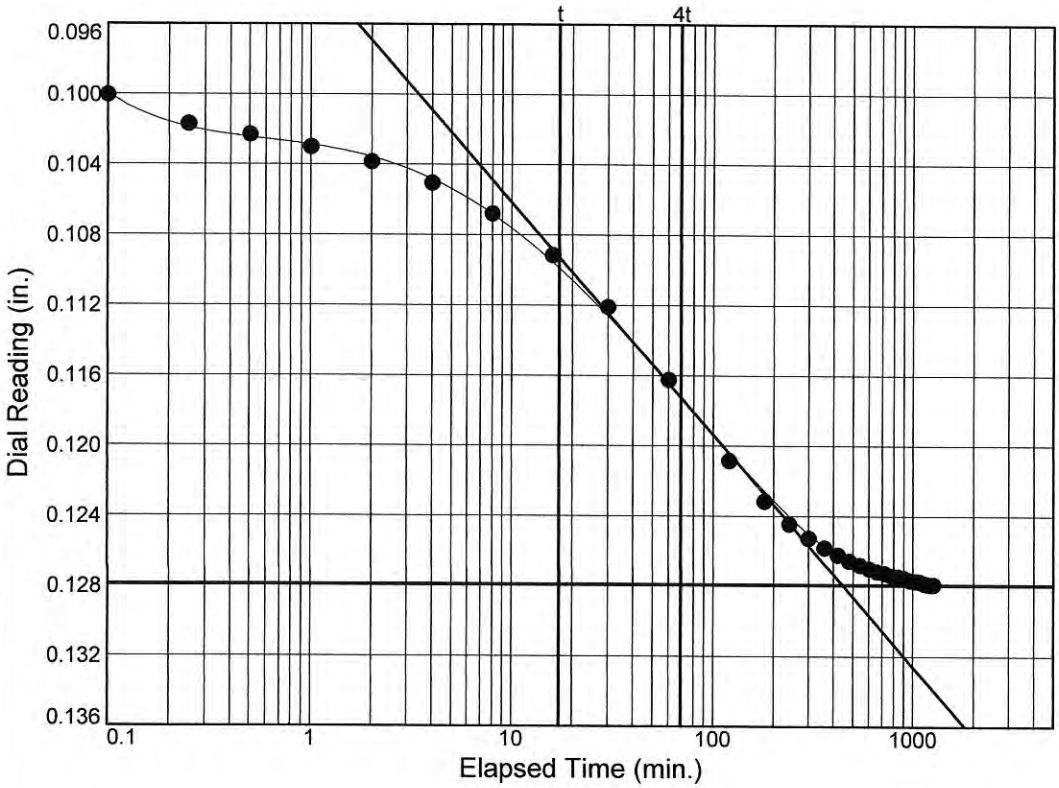
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

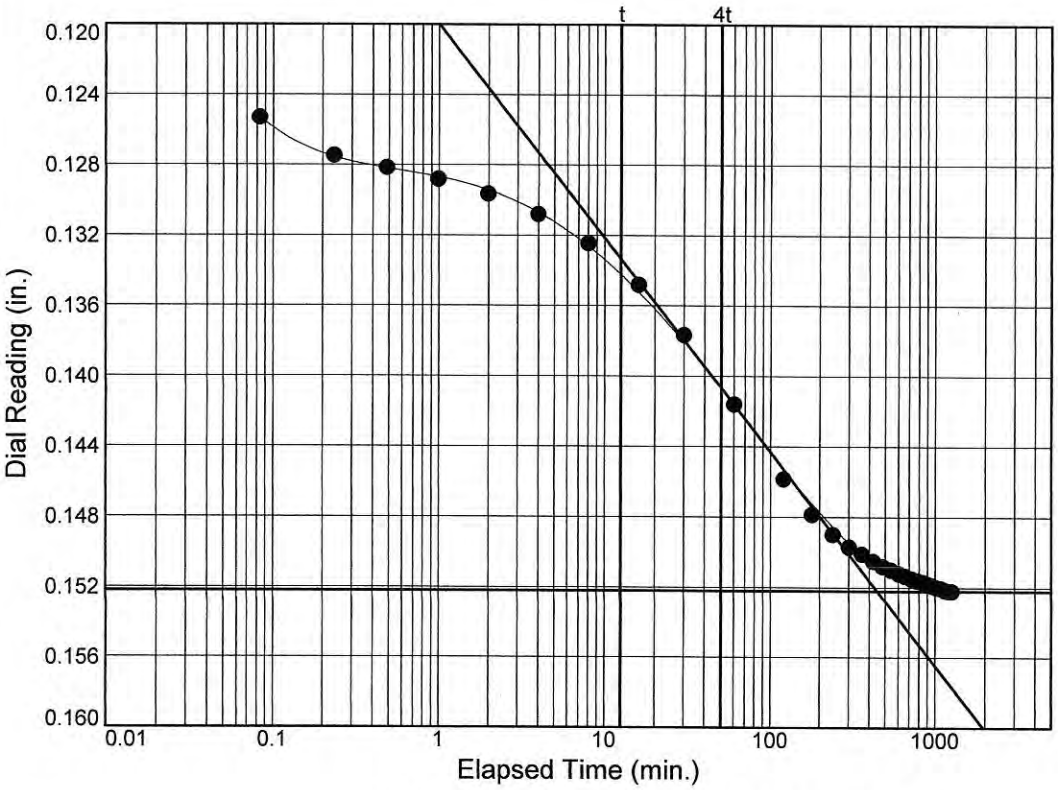
Source of Sample: SJGB047 Depth: 28



Load No.= 14
Load= 13.75 tsf
D_0 = 0.1025
D_{50} = 0.1152
D_{100} = 0.1279
T_{50} = 48.41 min.

C_v @ T_{50}
1.5 ft.^{2}/yr.

C_α = 0.000



Load No.= 15
Load= 27.50 tsf
D_0 = 0.1278
D_{50} = 0.1400
D_{100} = 0.1522
T_{50} = 43.98 min.

C_v @ T_{50}
1.5 ft.^{2}/yr.

C_α = 0.000

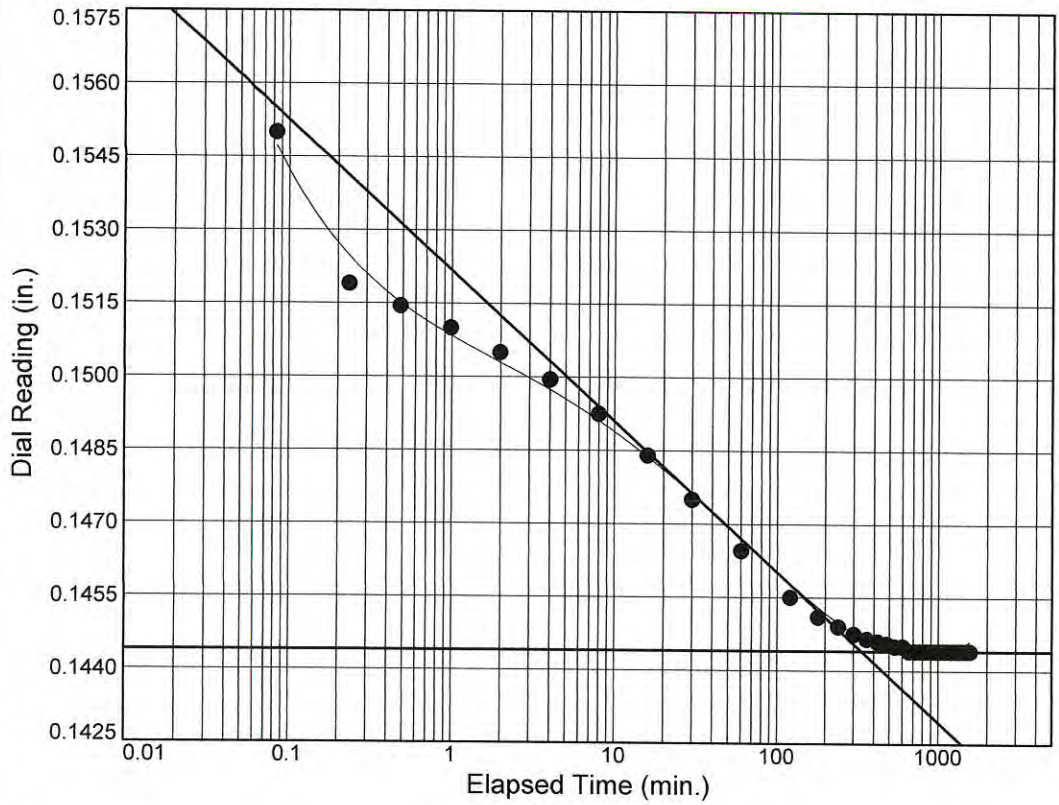
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

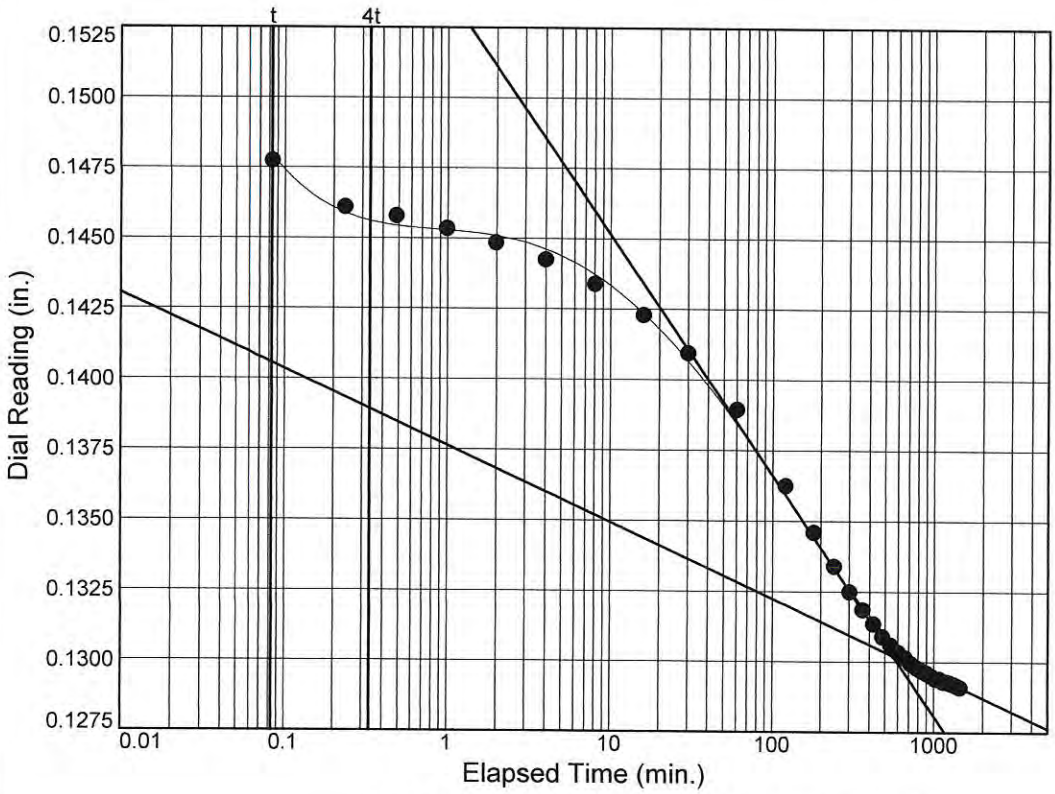
Source of Sample: SJGB047 Depth: 28



Load No.= 16
Load= 6.87 tsf
D_0 = 0.1550
D_{50} = 0.1497
D_{100} = 0.1444
T_{50} = 4.20 min.

C_v @ T_{50}
15.4 ft.^{2}/yr.

C_α = 0.000



Load No.= 17
Load= 1.75 tsf
D_0 = 0.1503
D_{50} = 0.1402
D_{100} = 0.1302
T_{50} = 34.60 min.

C_v @ T_{50}
1.9 ft.^{2}/yr.

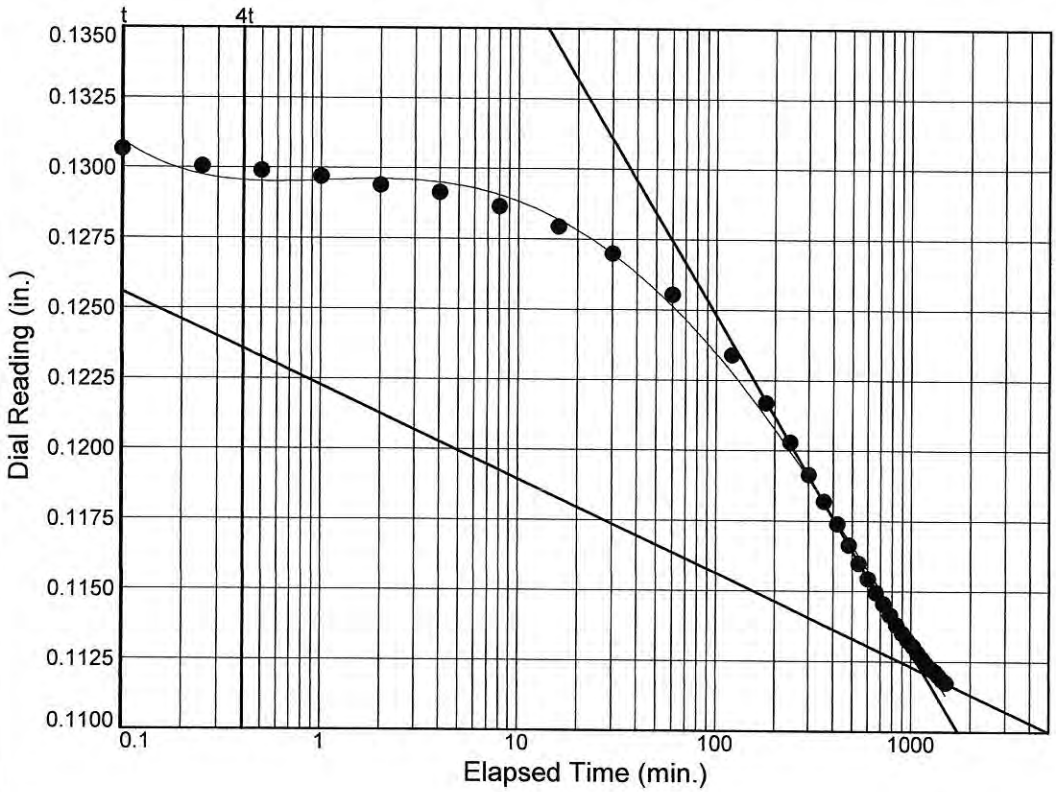
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

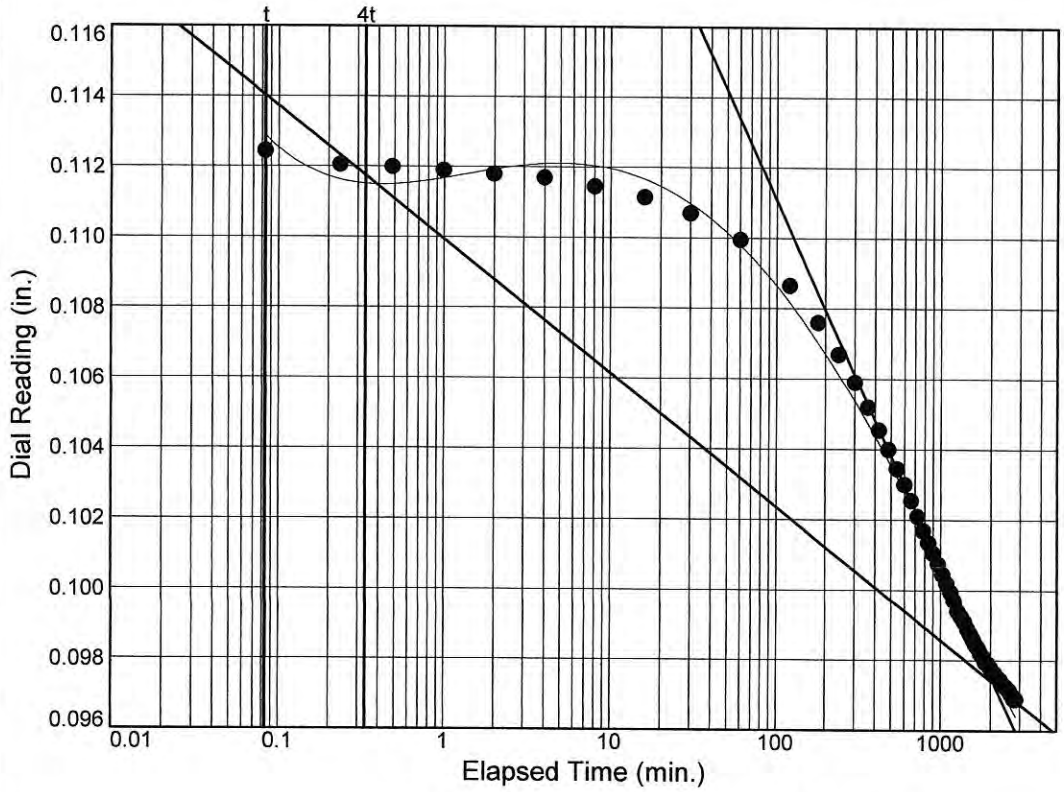
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 Depth: 28



Load No.= 18
Load= 0.43 tsf
D_0 = 0.1323
D_{50} = 0.1222
D_{100} = 0.1121
T_{50} = 139.92 min.

C_v @ T_{50}
0.5 ft.^{2}/yr.



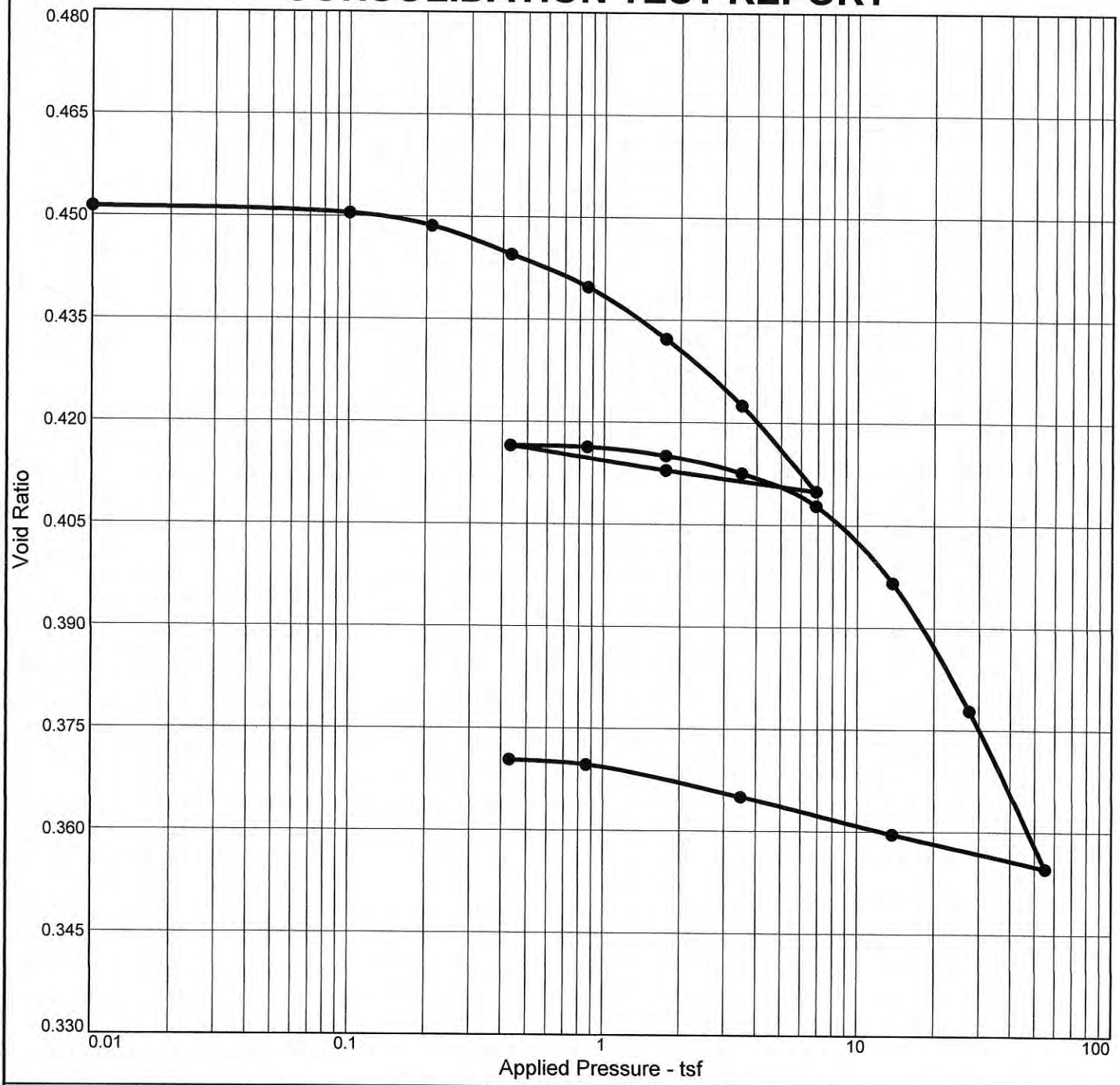
Load No.= 19
Load= 0.10 tsf
D_0 = 0.1142
D_{50} = 0.1058
D_{100} = 0.0973
T_{50} = 265.37 min.

C_v @ T_{50}
0.3 ft.^{2}/yr.

Figure

TOLUNAY-WONG ENGINEERS, INC.

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
90.9 %	15.2 %	116.1	30	11	2.70	CL		0.451

MATERIAL DESCRIPTION

Grey LEAN CLAY with SAND

Project No. 19.15.131 **Client:**

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 48

Remarks:

Test method: ASTM D2435
Specific gravity: Assumed

Tolunay-Wong Engineers, Inc.

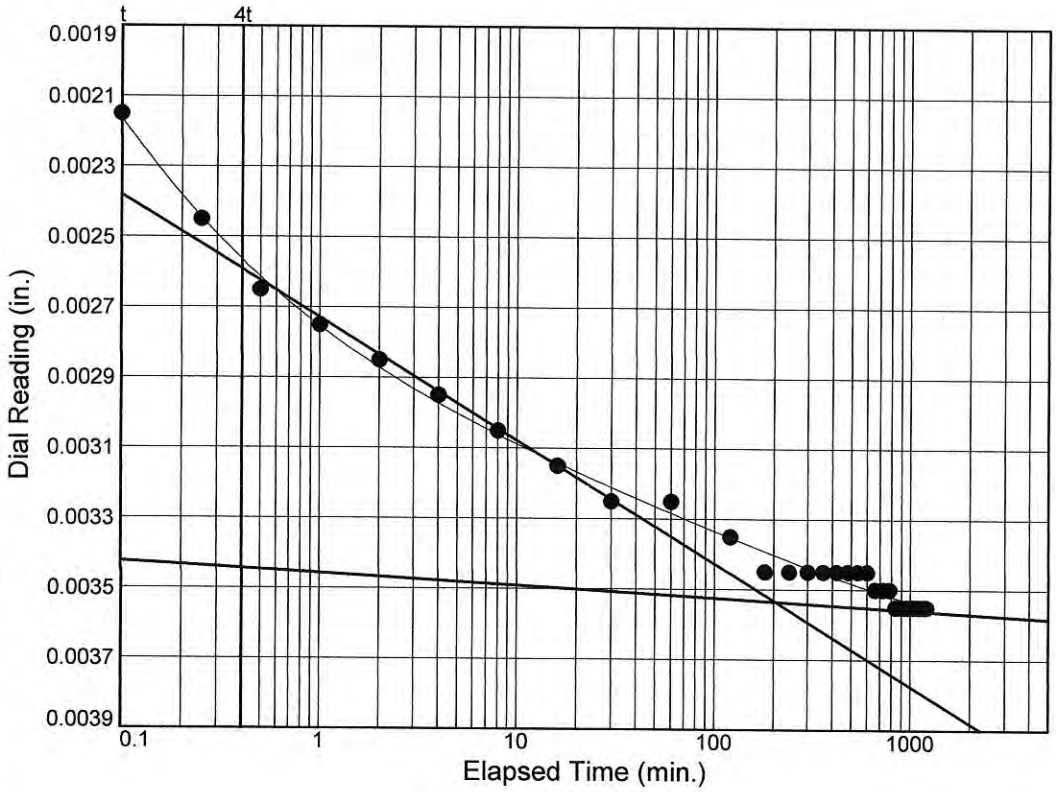
Houston, Texas

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

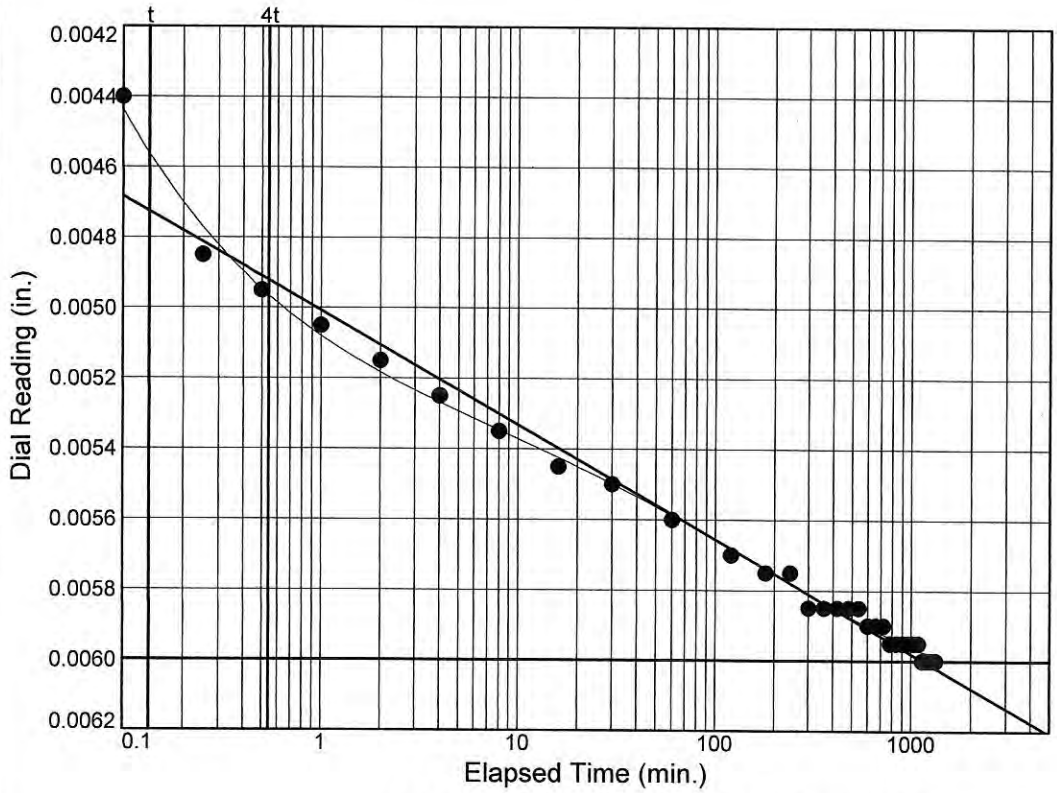
Source of Sample: SJGB047 Depth: 48



Load No.= 4
Load= 0.43 tsf
D_0 = 0.0018
D_{50} = 0.0026
D_{100} = 0.0035
T_{50} = 0.59 min.

C_v @ T_{50}
170.7 ft.^{2}/yr.

C_α = 0.000



Load No.= 5
Load= 0.86 tsf
D_0 = 0.0042
D_{50} = 0.0051
D_{100} = 0.0060
T_{50} = 1.00 min.

C_v @ T_{50}
99.9 ft.^{2}/yr.

C_α = 0.000

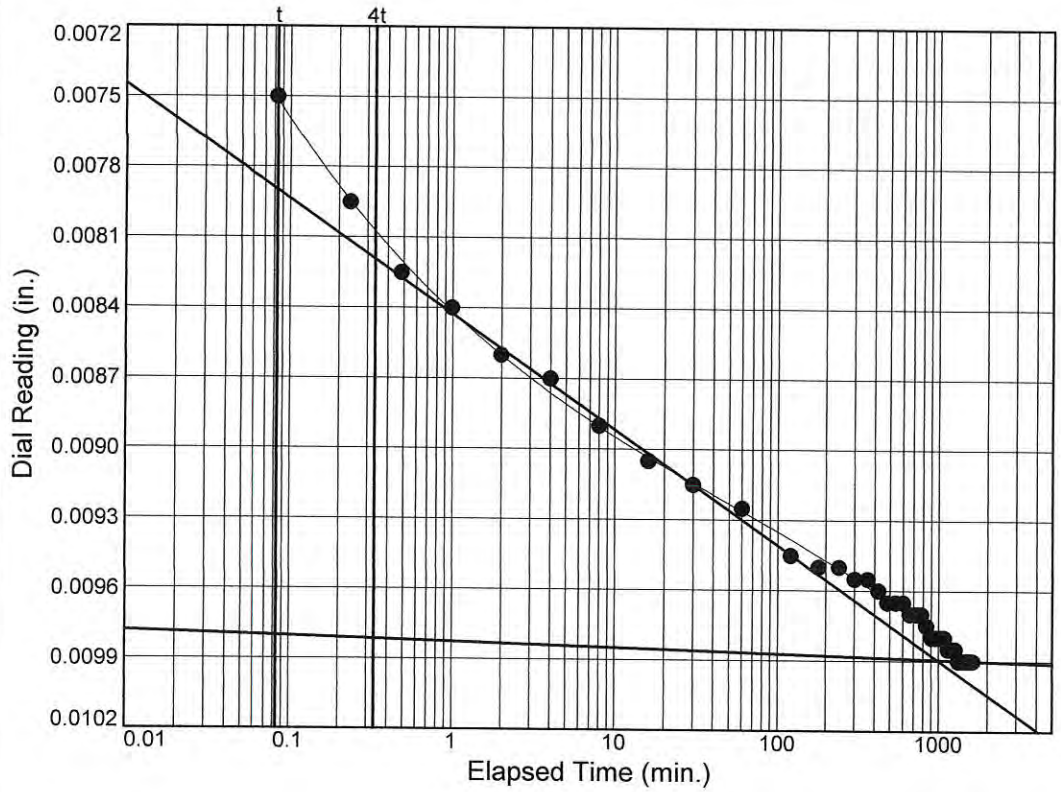
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

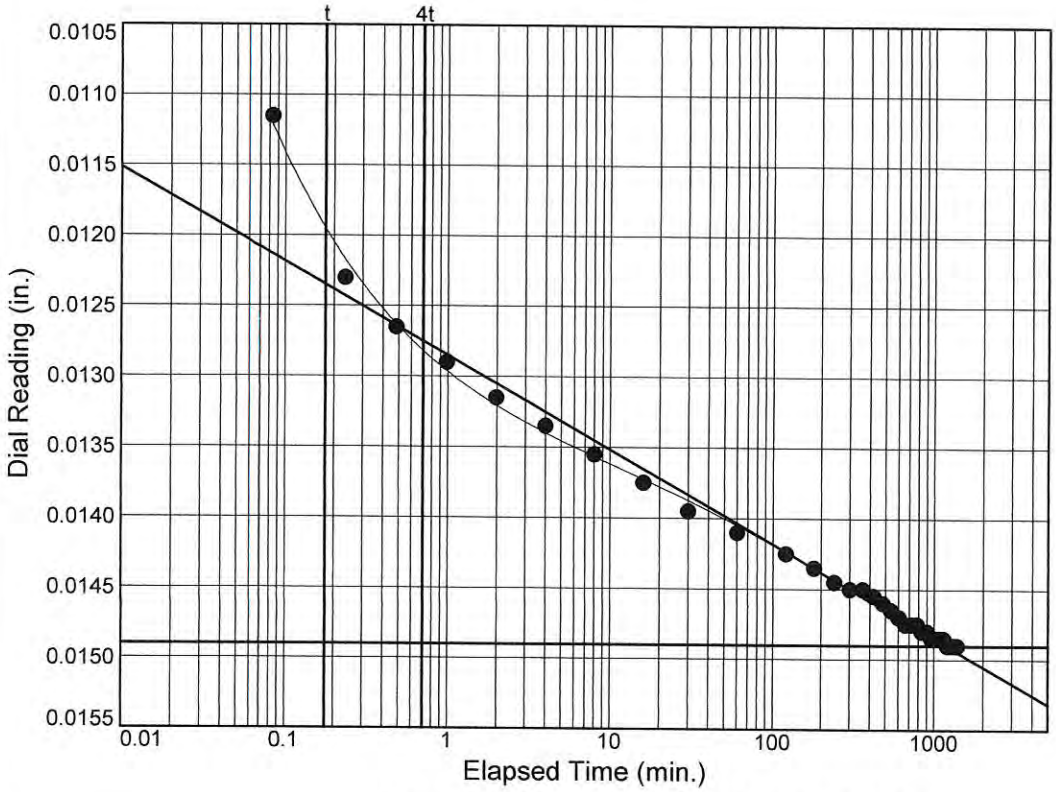
Source of Sample: SJGB047 Depth: 48



Load No.= 6
Load= 1.75 tsf
D_0 = 0.0070
D_{50} = 0.0084
D_{100} = 0.0099
T_{50} = 1.02 min.

C_v @ T_{50}
97.0 ft.^{2}/yr.

C_α = 0.000



Load No.= 7
Load= 3.49 tsf
D_0 = 0.0111
D_{50} = 0.0130
D_{100} = 0.0149
T_{50} = 1.06 min.

C_v @ T_{50}
91.8 ft.^{2}/yr.

C_α = 0.000

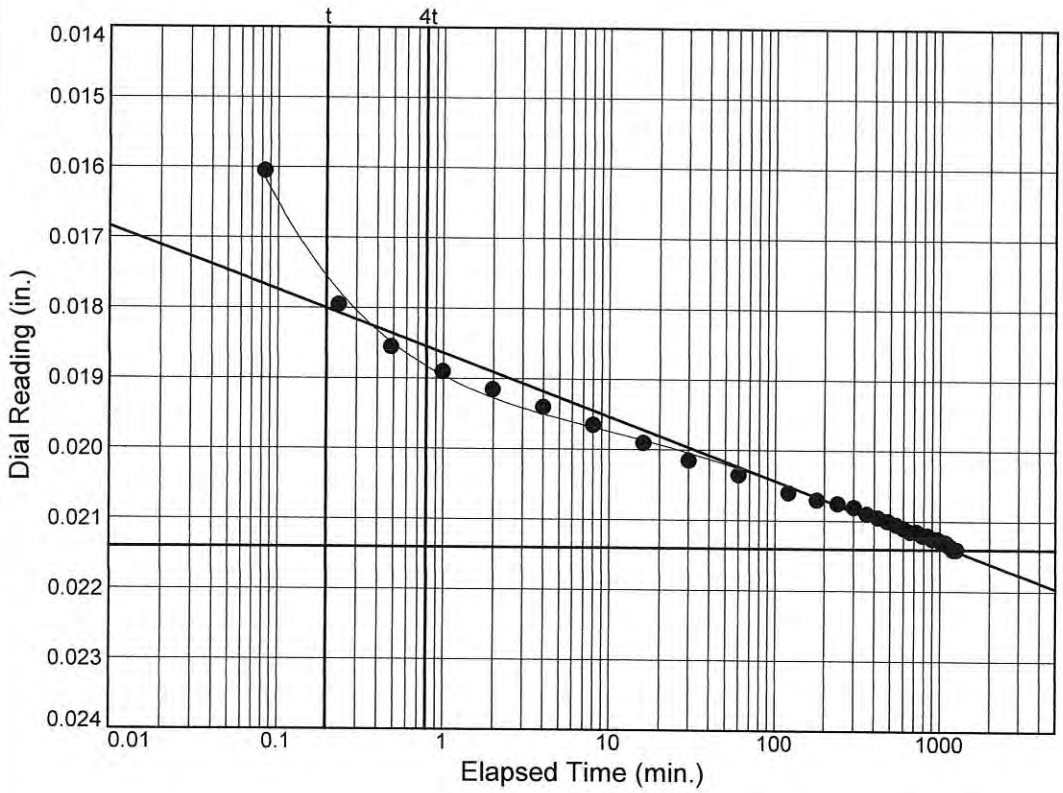
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

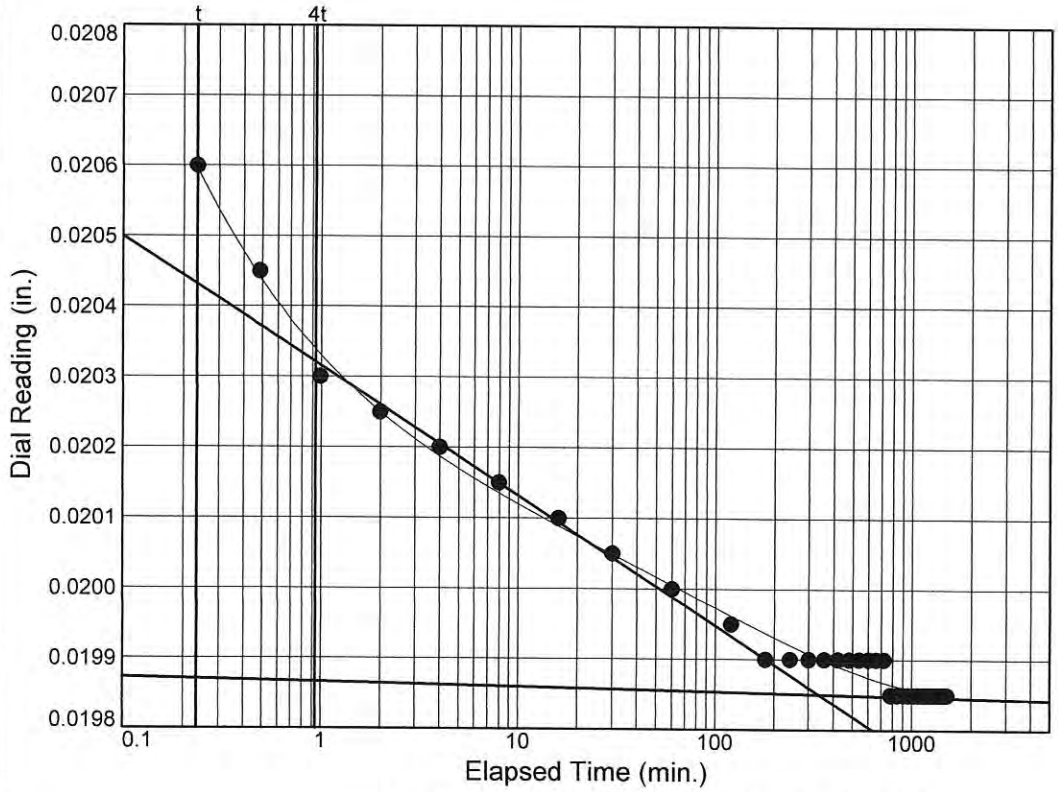
Source of Sample: SJGB047 Depth: 48



Load No.= 8
Load= 6.87 tsf
D_0 = 0.0163
D_{50} = 0.0188
D_{100} = 0.0214
T_{50} = 0.80 min.

C_v @ T_{50}
120.5 ft.^{2}/yr.

C_α = 0.000



Load No.= 9
Load= 1.75 tsf
D_0 = 0.0209
D_{50} = 0.0204
D_{100} = 0.0199
T_{50} = 0.86 min.

C_v @ T_{50}
111.7 ft.^{2}/yr.

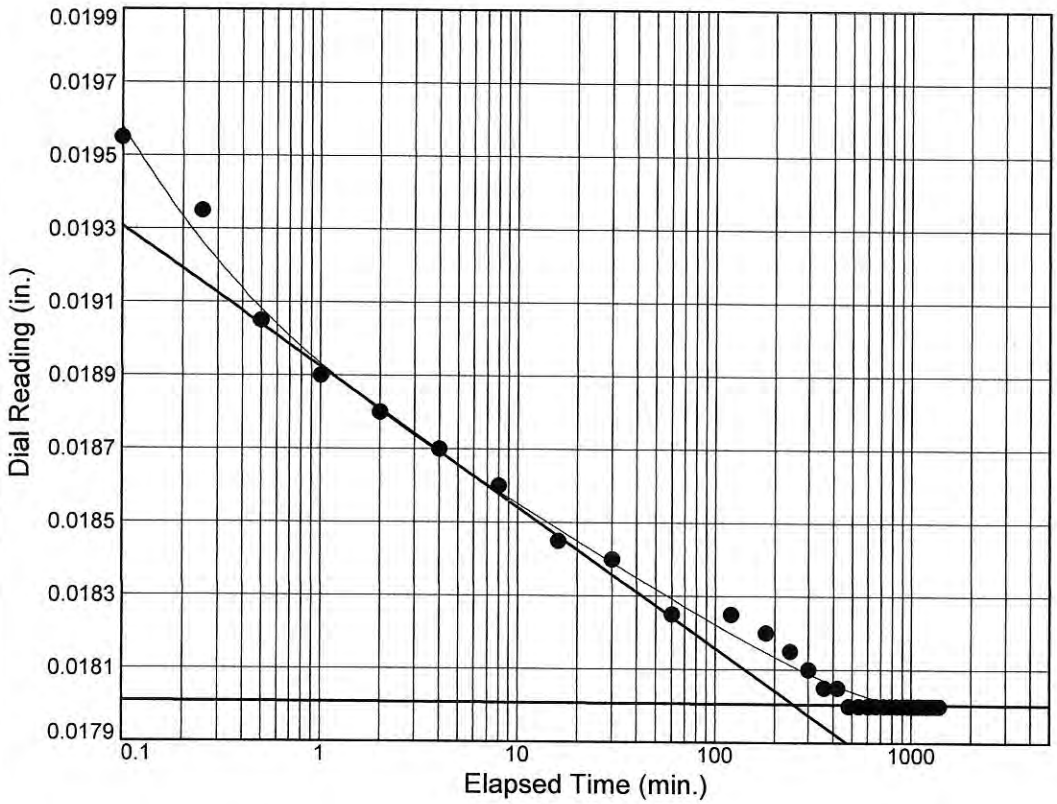
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

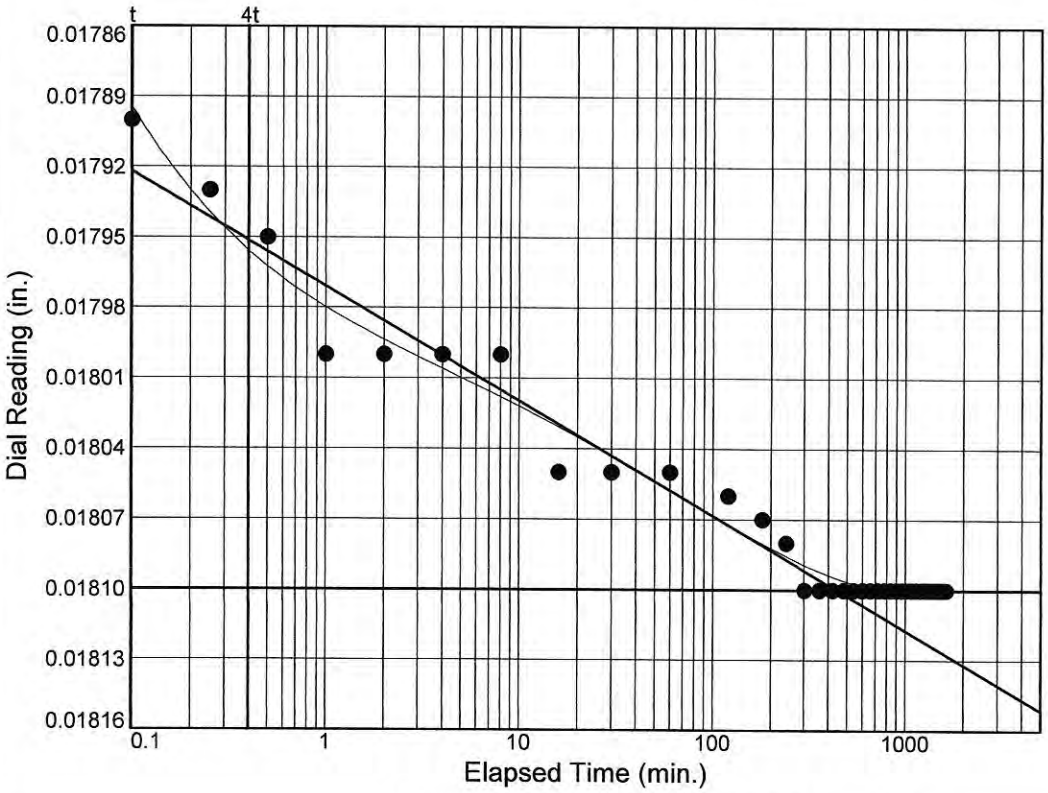
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 Depth: 48



Load No.= 10
Load= 0.43 tsf
D_0 = 0.0198
D_{50} = 0.0189
D_{100} = 0.0180
T_{50} = 1.02 min.

C_v @ T_{50}
94.0 ft.^{2}/yr.



Load No.= 11
Load= 0.86 tsf
D_0 = 0.0178
D_{50} = 0.0180
D_{100} = 0.0181
T_{50} = 0.58 min.

C_v @ T_{50}
167.3 ft.^{2}/yr.

C_α = 0.000

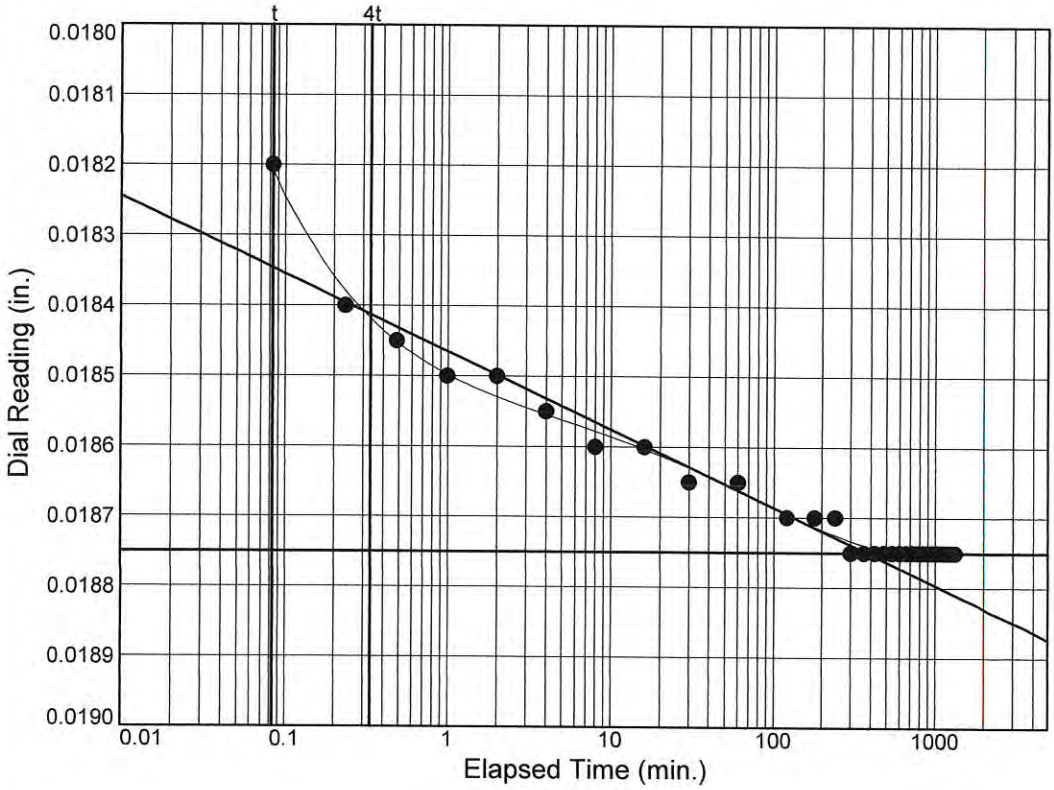
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

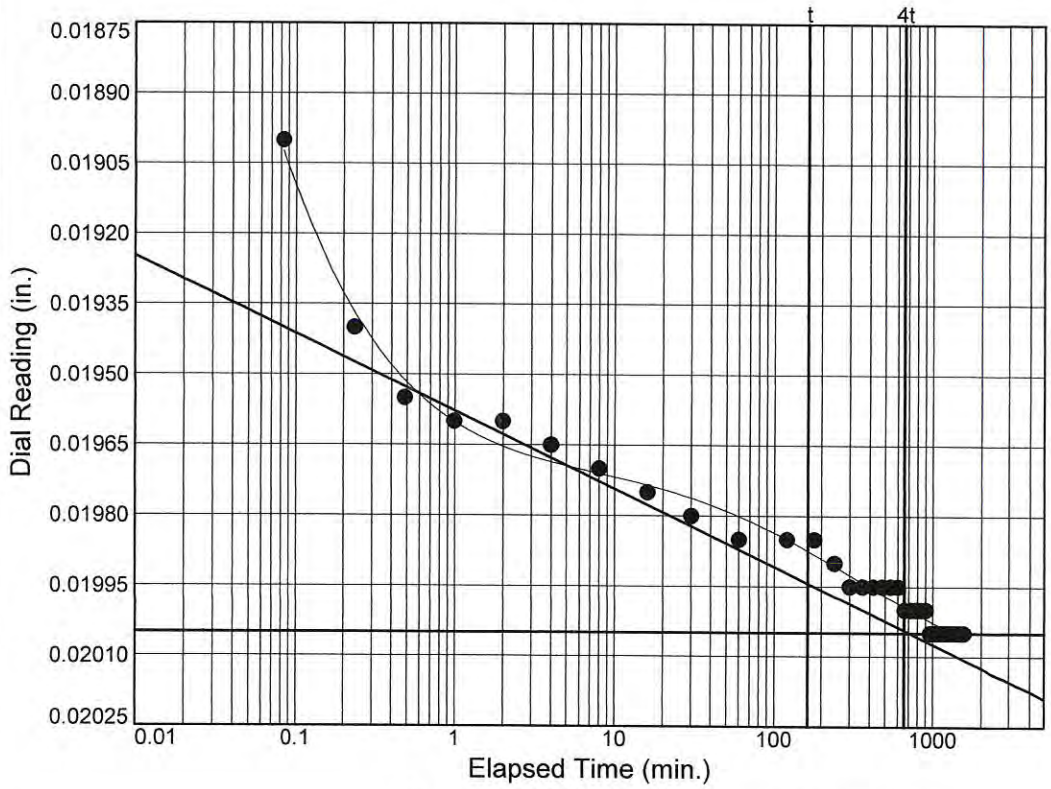
Source of Sample: SJGB047 Depth: 48



Load No.= 12
Load= 1.75 tsf
D_0 = 0.0180
D_{50} = 0.0184
D_{100} = 0.0187
T_{50} = 0.22 min.

C_v @ T_{50}
429.3 ft.^{2}/yr.

C_α = 0.000



Load No.= 13
Load= 3.49 tsf
D_0 = 0.0198
D_{50} = 0.0199
D_{100} = 0.0200
T_{50} = 229.49 min.

C_v @ T_{50}
0.4 ft.^{2}/yr.

C_α = 0.000

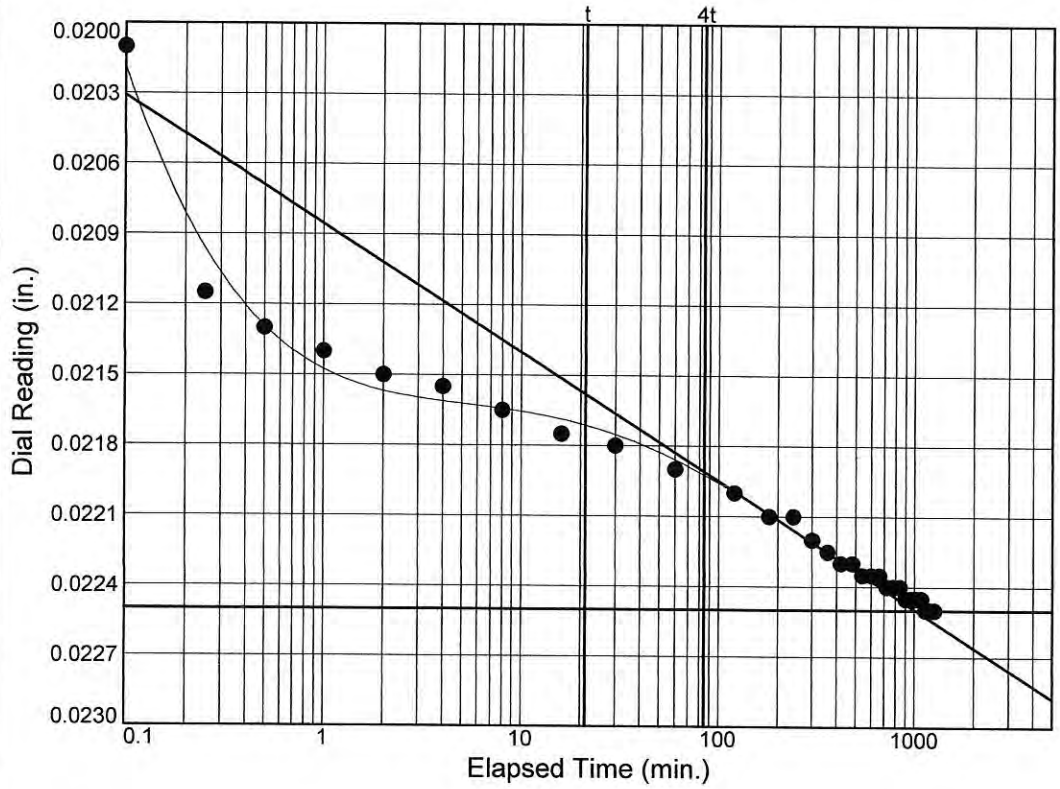
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

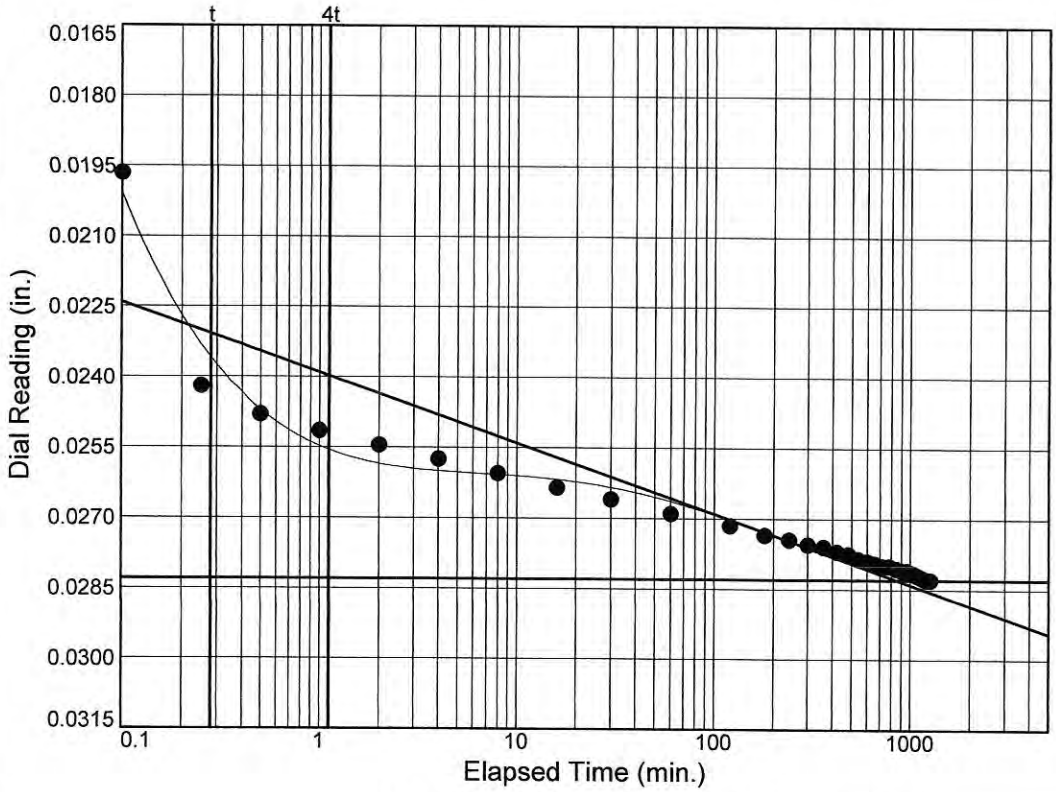
Source of Sample: SJGB047 Depth: 48



Load No.= 14
Load= 6.87 tsf
D_0 = 0.0215
D_{50} = 0.0220
D_{100} = 0.0225
T_{50} = 122.02 min.

C_v @ T_{50}
0.8 ft.^{2}/yr.

C_α = 0.000



Load No.= 15
Load= 13.75 tsf
D_0 = 0.0216
D_{50} = 0.0250
D_{100} = 0.0283
T_{50} = 0.60 min.

C_v @ T_{50}
157.4 ft.^{2}/yr.

C_α = 0.000

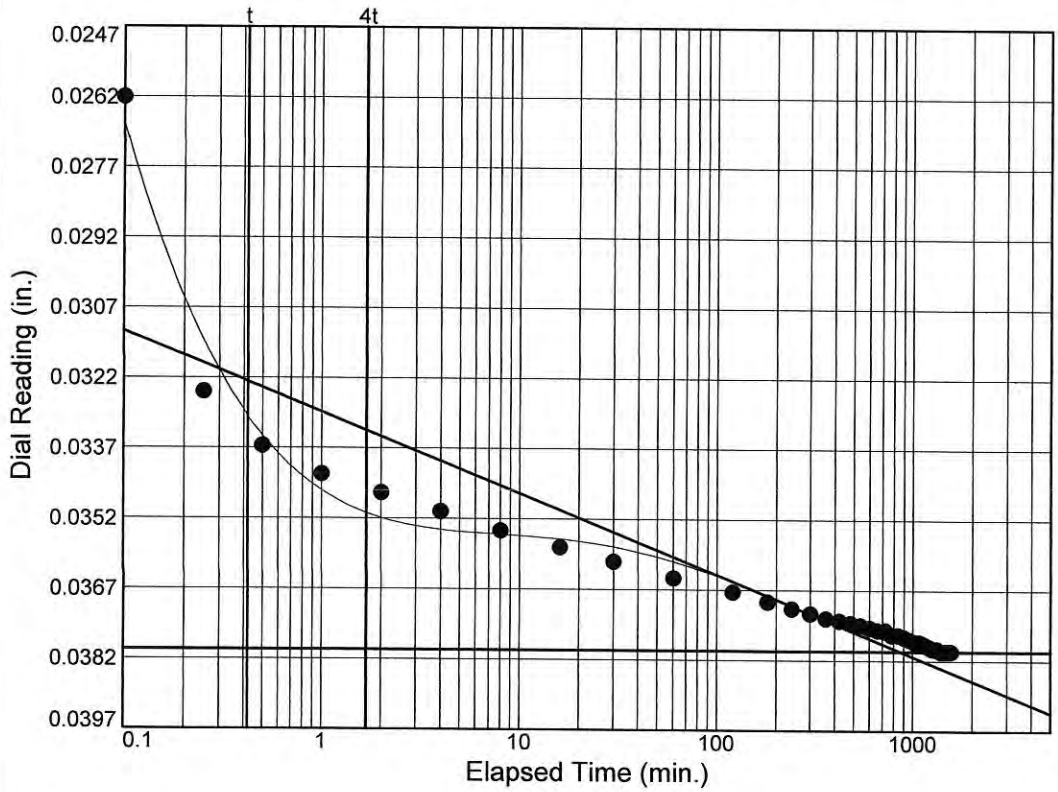
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

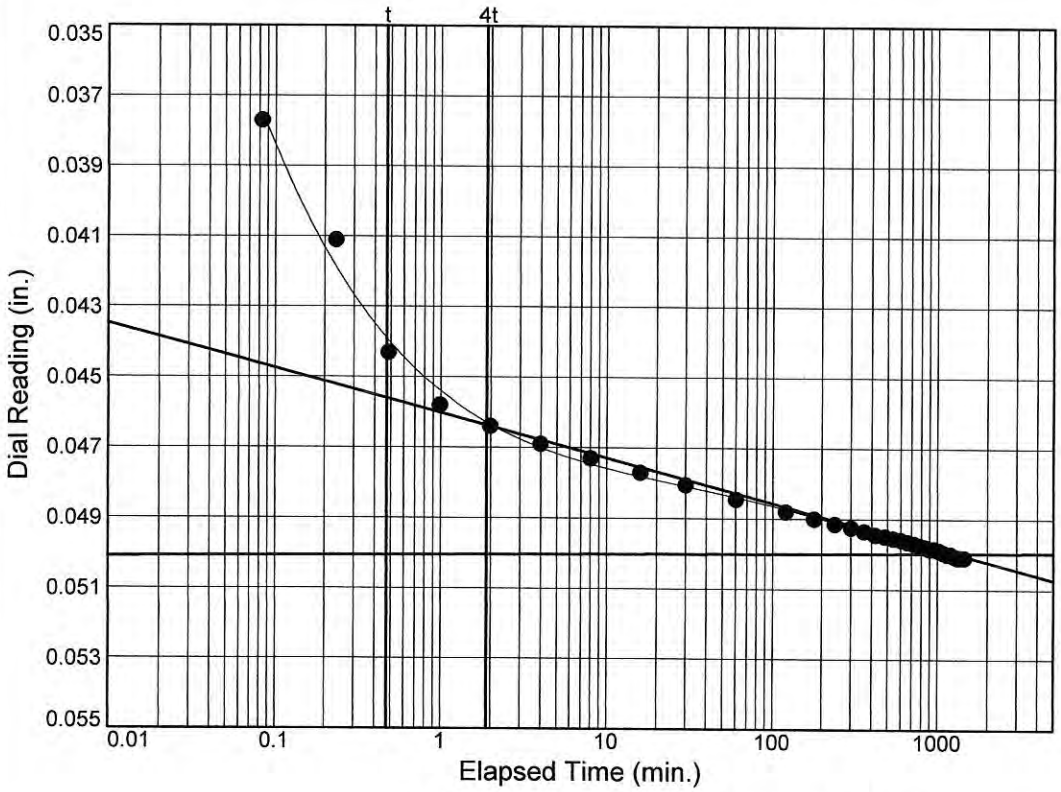
Source of Sample: SJGB047 Depth: 48



Load No.= 16
Load= 27.50 tsf
D_0 = 0.0310
D_{50} = 0.0345
D_{100} = 0.0380
T_{50} = 0.91 min.

C_v @ T_{50}
101.3 ft.^{2}/yr.

C_α = 0.000



Load No.= 17
Load= 54.99 tsf
D_0 = 0.0415
D_{50} = 0.0457
D_{100} = 0.0500
T_{50} = 1.24 min.

C_v @ T_{50}
71.9 ft.^{2}/yr.

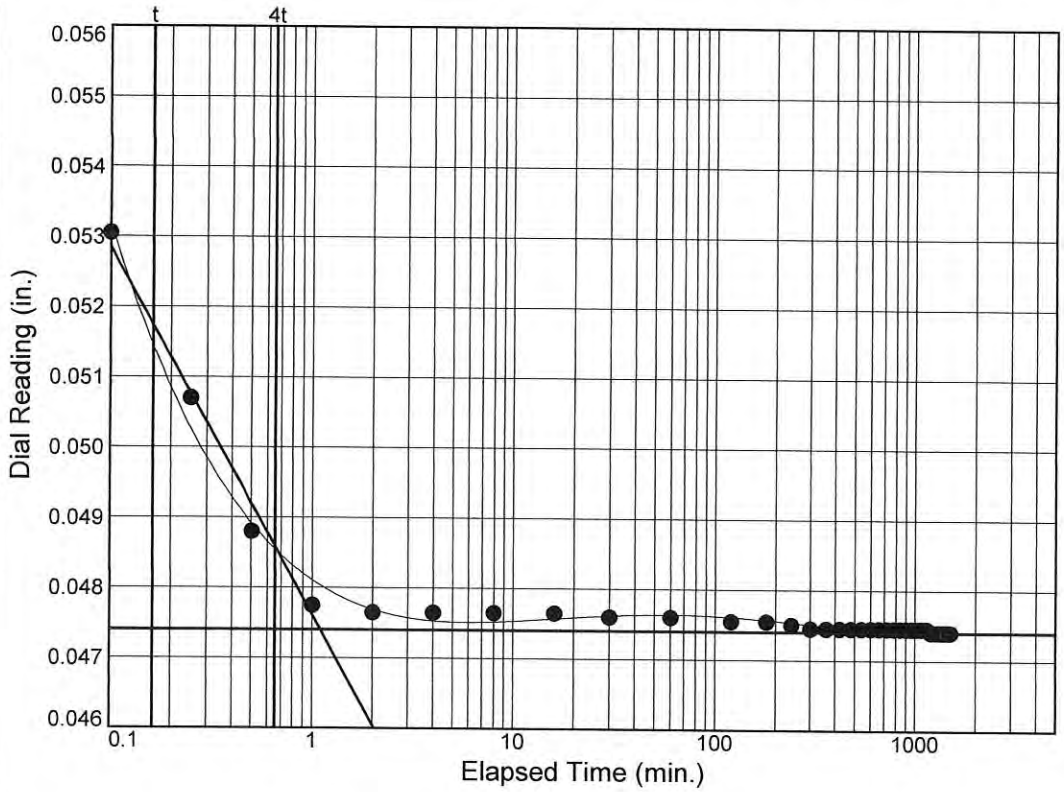
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

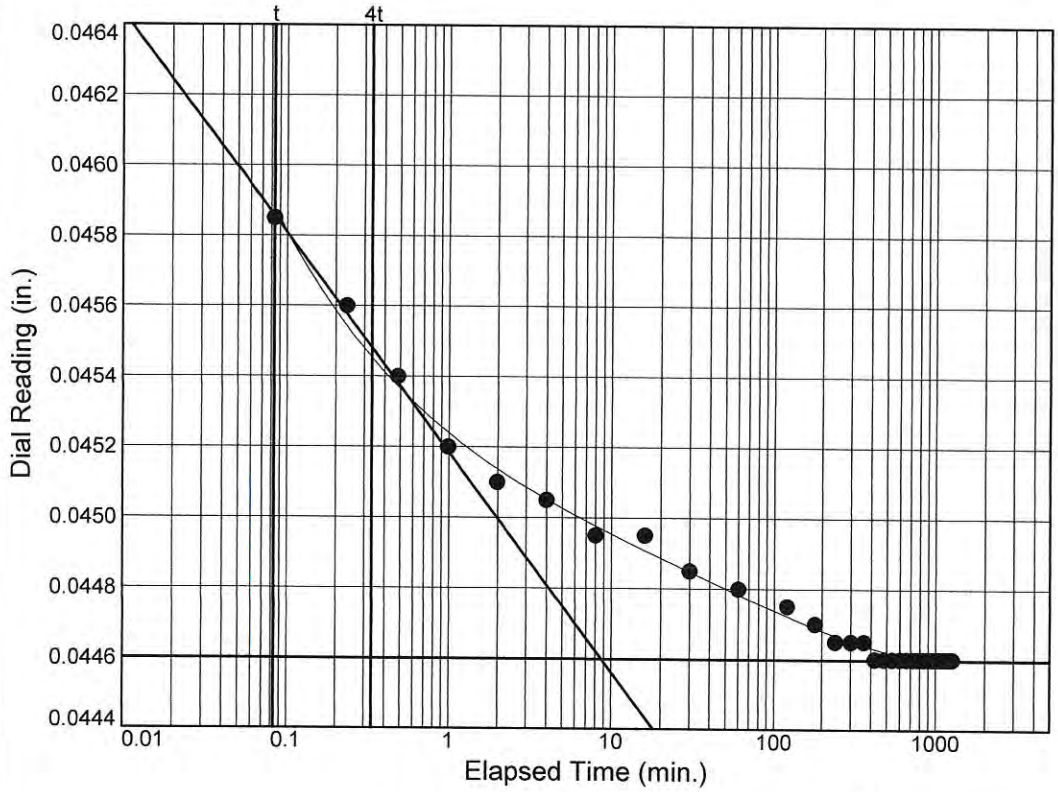
Source of Sample: SJGB047 Depth: 48



Load No.= 18
Load= 13.75 tsf
D_0 = 0.0543
D_{50} = 0.0509
D_{100} = 0.0474
T_{50} = 0.20 min.

C_v @ T_{50}
444.5 ft.^{2}/yr.

C_α = 0.000



Load No.= 19
Load= 3.49 tsf
D_0 = 0.0463
D_{50} = 0.0455
D_{100} = 0.0446
T_{50} = 0.34 min.

C_v @ T_{50}
265.7 ft.^{2}/yr.

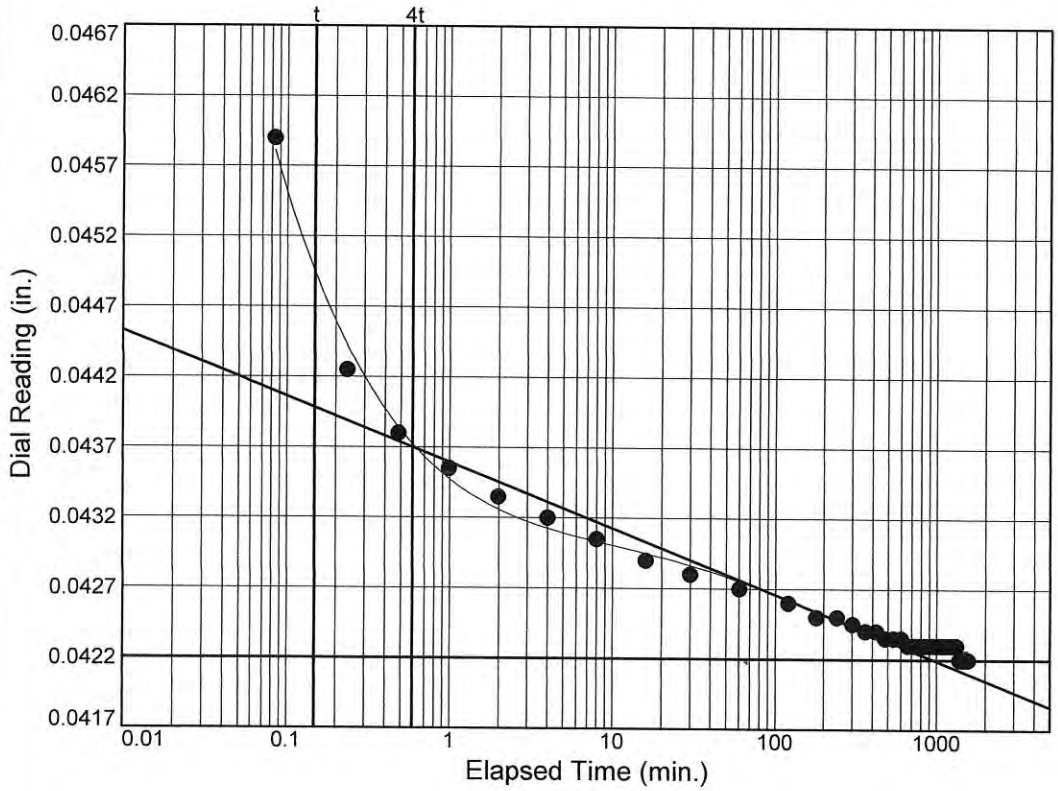
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

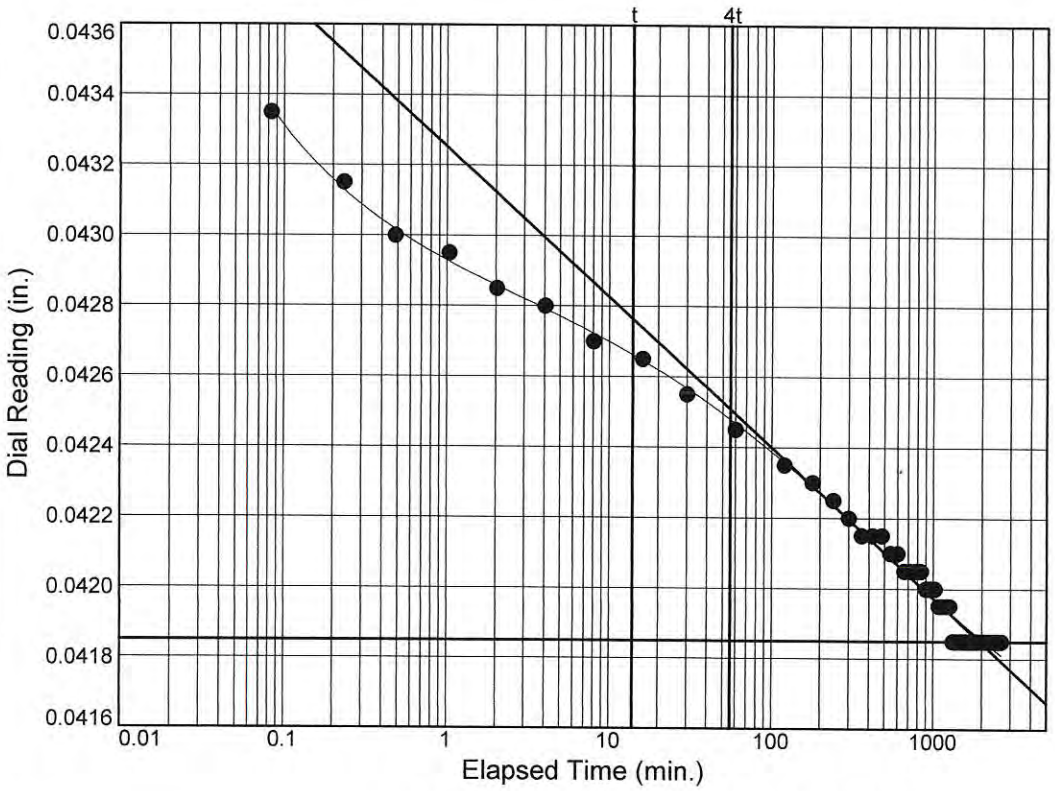
Source of Sample: SJGB047 Depth: 48



Load No.= 20
Load= 0.86 tsf
D_0 = 0.0462
D_{50} = 0.0442
D_{100} = 0.0422
T_{50} = 0.30 min.

C_v @ T_{50}
295.9 ft.^{2}/yr.

C_α = 0.000



Load No.= 21
Load= 0.43 tsf
D_0 = 0.0428
D_{50} = 0.0423
D_{100} = 0.0418
T_{50} = 126.68 min.

C_v @ T_{50}
0.7 ft.^{2}/yr.

C_α = 0.000

TOLUNAY-WONG ENGINEERS, INC.

Figure

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJGB024

Ardaman & Associates, Inc.

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

File: 18-2876
Date: 9/7/19
Logged by: Breanna North
Driller: TWE
Rig: Tracked Geoprobe

Location: Lat. 29° 47' 36.74"
Long. 95° 3' 44.65"
Ground Surface Elevation: 2.64 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA									
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
											2.6		
☒			No (P)	1.31 t=0.3	19	123							Medium Stiff to Stiff brown and black FAT CLAY (CH) w/ sand
			No (P)	0.91 t=1.0	28	114							
	5		No (P)	0.56 t=1.7	29	116	86	31	55		-2.4		
			No (P)		31		78	23	55	94			
			No (P)	0.21 t=3.1	29	115				43			Loose gray and brown CLAYEY SAND (SC)
	10		No (P)	3.34 t=3.8	75	94	133	51	82	91	-7.4		Very Stiff brown FAT CLAY (CH)
			No (P)	0.22 t=4.5	32	109				76			Very Soft black and brown LEAN CLAY (CL) w/ sand
	15		No (P)	0.44 t=5.2	27	116	32	19	13	44	-12.4		Loose gray and brown CLAYEY SAND (SC)
			No (P)	0.94 t=6.6	25	123				26			
	20										-17.4		Soft brown FAT CLAY (CH)
			No (P)	0.39 t=8.3	50	99				92			
	25										-22.4		
			No (P)	0.28 t=10.1	61	95	122	58	64				
	30										-27.4		Boring completed at 30 ft.
	35										-32.4		
	40										-37.4		
	45										-42.4		
	50										-47.4		

Ground Water Level Data	Boring Advancement Method	Notes
☒ Free Water not Reported	Hollowstem Auger 0 to 30 ft.	t = Lateral Confining Pressure (psi).
	Boring Abandonment Method Not Reported	

Attachment Figure B.3-1

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJGB025

Ardaman & Associates, Inc.

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

File: 18-2876
Date: 9/10/19
Logged by: Breanna North
Driller: TWE
Rig: Tracked Geoprobe

Location: Lat. 29° 47' 38.65"
Long. 95° 3' 48.91"
Ground Surface Elevation: 4.98 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA									
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
☒		X	27 b/f 30-18-9		14					25	5.0		Medium Dense gray and tan SILTY SAND (SM) w/ gravel
			No (P)	1.05 t=1.0	16	134	36	18	18	82			Stiff brown LEAN CLAY (CL) w/ sand
	5		No (P)	0.84 t=1.7	19	134	34	17	17		0.0		Medium Stiff gray LEAN CLAY (CL) w/ sand
			No (P)		20								
			No (P)		20	129	43	16	27	84			
	10		No (P)		21					47	-5.0		Loose gray CLAYEY SAND (SC)
			No (P)	1.68 t=4.5	19	136	33	17	16	56			Medium Stiff to Stiff brown SANDY LEAN CLAY (CLs)
	15		No (P)		24					62	-10.0		
		○											No Recovery
	20	X	34 b/f 6-14-20		22					22	-15.0		Dense gray SILTY SAND (SM)
		X	6 b/f 2-2-4		34					44			Loose gray SILTY SAND (SC)
	25	X	5 b/f 1-2-3		34		NP	NP	NP		-20.0		
		X	18 b/f 5-7-11		23					31			Medium Dense gray CLAYEY SAND (SC)
	30										-25.0		Boring completed at 29.5 ft.
	35										-30.0		
	40										-35.0		
	45										-40.0		
	50										-45.0		

Ground Water Level Data	Boring Advancement Method	Notes
☒ Free Water not Reported	Hollowstem Auger 0 to 30 ft.	t = Lateral Confining Pressure (psi).
	Boring Abandonment Method Not Reported	

Attachment Figure B.3-2

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJGB026

Ardaman & Associates, Inc.

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

File: 18-2876
Date: 9/9/19
Logged by: Breanna North
Driller: TWE
Rig: Tracked Geoprobe

Location: Lat. 29° 47' 39.24"
Long. 95° 3' 49.86"
Ground Surface Elevation: 5.34 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA									
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
											5.3		
☒			No (P)		13		NP	NP	NP	81			Loose brown SILT (ML) w/ sand
			No (P)		21	129				98			Medium Stiff to Stiff tan and gray LEAN CLAY (CL)
	5		No (P)	1.42 t=1.7	19	125	41	18	23	84	0.3		
			No (P)	0.69 t=2.4	19	125				97			
			No (P)	0.87 t=3.1	21	126	35	17	18	83			w/ sand
	10										-4.7		
			No (P)		23					50			Loose gray CLAYEY SAND (SC)
			No (P)	1.72 t=4.5	21	132	NP	NP	NP	66			Stiff tan and gray SANDY SILT (MLs) w/ clay
	15	○									-9.7		No Recovery
		○											No Recovery
	20										-14.7		
		╳	6 b/f 4-3-3		26					55			Loose gray and brown SANDY SILT (MLs)
													Boring completed at 21.5 ft.
	25										-19.7		
	30										-24.7		
	35										-29.7		
	40										-34.7		
	45										-39.7		
	50										-44.7		

Ground Water Level Data	Boring Advancement Method	Notes
☒ Free Water not Reported	Hollowstem Auger 0 to 22 ft.	t = Lateral Confining Pressure (psi).
	Boring Abandonment Method Not Reported	

Attachment Figure B.3-3

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJGB027

Ardaman & Associates, Inc.

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

File: 18-2876
Date: 12/4/19
Logged by: Breanna North
Driller: TWE
Rig: CME Truck

Location: Lat. 29° 47' 41.34"
Long. 95° 3' 47.36"
Ground Surface Elevation: 3.92 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA									
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
☒					11						3.9		Loose tan SILTY GRAVEL (GM)
			0.50 (P)	0.17 t=2.0	140	78	151	44	107	81			Very Soft dark gray ORGANIC CLAY (OH) w/ sand
	5		1.75 (P)	0.18 t=3.5	23	128	41	21	20	44	-1.1		Loose gray CLAYEY SAND (SC)
			1.25 (P)	1.15 t=4.0	20	129	37	17	20	56			Medium Stiff dark gray SANDY LEAN CLAY (CLs)
			1.25 (P)	0.73 t=5.0	18	131	39	18	21				
	10				23	131	30	17	13	81	-6.1		
			0 b/f		32		49	19	30	31			Very Loose dark gray CLAYEY SAND (SC)
	15		0 b/f		27		24	16	8	27	-11.1		
	20		4 b/f 0-2-2		28		NP	NP	NP	40	-16.1		Very Loose to Loose dark gray SILTY SAND (SM)
	25		2 b/f 1-1-1		21		NP	NP	NP	8	-21.1		Very Loose gray Sand (SP-SM) w/ silt
	30		9 b/f 2-3-6		22		26	16	10	11	-26.1		Loose gray SAND (SP-SC) w/ clay
	35		9 b/f 3-4-5		16		32	17	15	36	-31.1		Loose gray CLAYEY SAND (SC)
	40		1.75 (P)		20	128	40	18	22	79	-36.1		Stiff reddish brown SANDY LEAN CLAY (CLs)
	45		2.50 (P)		41		49	19	30		-41.1		Stiff reddish brown FAT CLAY (CH)
	50		2.75 (P)	1.95 t=21.0	31	121	59	21	38		-46.1		Boring completed at 50 ft.
	55										-51.1		
	60										-56.1		
	65										-61.1		
	70										-66.1		
	75										-71.1		
	80										-76.1		

Ground Water Level Data

☒ No free water encountered

Boring Advancement Method

4" Nom. Dia. Short Flight Auger:
0 to 14 ft.
4" Dia. Rotary Wash:
14 to 50 ft.

Boring Abandonment Method

Not Reported

Notes

t = Lateral Confining Pressure (psi).

Attachment Figure B.3-4

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJSB047-G

Ardaman & Associates, Inc.

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

File: 18-2876
Date:
Logged by: Stephen Saller
Driller: TWE
Rig: CME Truck on Barge

Location: Lat. 29° 47' 38.5"
Long. 95° 3' 41.9"
Ground Surface Elevation: -3.4 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA									
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
											-3.4		
		☒	0 b/f		31					97			Loose brown SILT (ML)
		☒	0 b/f		37								
	5	☒	0 b/f		43					94	-8.4		
		☒	0 b/f										Soft brown SANDY LEAN CLAY (CLs)
		☒	0 b/f		30					70			
	10	☒	0 b/f		39		39	20	19	74	-13.4		
		☒	0 b/f		64								Soft brown FAT CLAY (CH)
	15	☒	1 b/f 0-0-1		58					97	-18.4		
	20	■	0.25 (P)	0.29 t=6.6	38	99	79	24	55	56	-23.4		Soft gray SANDY FAT CLAY (CHs)
	25	■	2.50 (P)	1.44 t=8.3	20	136	42	18	24	73	-28.4		Stiff gray LEAN CLAY (CL) w/ sand
	30	■	1.75 (P)		16		27	21	6	60	-33.4		Stiff reddish brown SANDY SILTY CLAY (CL-ML)
	35	■	3.25 (P)	1.00 t=11.8	29	124	59	39	20	98	-38.4		Stiff reddish brown SILT (MH)
	40	■	3.00 (P)	1.73 t=13.5	31	126	74	34	40	100	-43.4		Stiff reddish brown FAT CLAY (CH)
	45	■	1.50 (P)	3.36 t=15.3	19	138	42	18	24	84	-48.4		Very Stiff reddish brown LEAN CLAY (CL)
	50	■	3.50 (P)		18		30	19	11	76	-53.4		
	55	☒	14 b/f 8-8-6		20					93	-58.4		Medium Dense to Dense gray SILT (ML)
	60	☒	33 b/f 12-16-17		23					92	-63.4		
	65	☒	2 b/f 3-1-1		27		NP	NP	NP	93	-68.4		Very Loose gray SILT (ML)
	70	☒	29 b/f 4-8-21		26					98	-73.4		Medium Dense gray SILT (ML)
	75	☒	51 b/f 15-21-30		23					82	-78.4		Very Dense gray SILT (ML) w/ sand
	80	☒	75 b/f 25-31-44		22					68	-83.4		Very Dense gray SANDY SILT (MLs)
	85	☒	50 b/f 17-23-27		19		NP	NP	NP	46	-88.4		Very Dense gray SILTY SAND (SM)
	90	☒	53 b/f 16-23-30		18					39	-93.4		
	95	☒	65 b/f 25-35-30		18		NP	NP	NP	26	-98.4		
	100	■	2.00 (P)	0.33 t=35.0	21	119	73	23	50		-103.4		Stiff tan and gray FAT CLAY (CH)
	105										-108.4		Boring completed at 100 ft.

Ground Water Level Data	Boring Advancement Method	Notes
	4" Dia. Rotary Wash: to 100 ft.	t = Lateral Confining Pressure (psi).
	Boring Abandonment Method	
	Not Reported	

Attachment Figure B.3-5

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJSB050-G

Ardaman & Associates, Inc.

File: 18-2876
Date: 11/20/19
Logged by: Stephen Saller
Driller: TWE
Rig: CME Truck

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

Location: Lat. 29° 47' 41.36"
Long. 95° 3' 40.53"
Ground Surface Elevation: -3.6 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA									
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
											-3.6		
☒		X	0 b/f		100					98			Very Soft brown FAT CLAY (CH)
		X	0 b/f		82					41			Very Loose brown CLAYEY SAND (SC)
	5			0.30 t=1.7	29	109	32	16	16		-8.6		Very Soft to Soft brown LEAN CLAY (CL)
				0.08 t=2.4	33	113	34	17	17	43			Very Loose gray CLAYEY SAND (SC)
		X	0 b/f		56					86			Very Soft to Soft gray LEAN CLAY (CL)
	10	X	0 b/f		49		41	18	23	83	-13.6		
		X	1 b/f 0-0-1		47					70			Very Soft to Soft brown LEAN CLAY (CL) w/ sand
	15	X	10 b/f 3-5-5		23					52	-18.6		Loose gray SANDY SILTY (MLs)
		X	1 b/f 1-1-0		37					10			Very Loose gray SAND (SP-SM)
	20										-23.6		Boring completed at 19.5 ft.
	25										-28.6		
	30										-33.6		
	35										-38.6		
	40										-43.6		
	45										-48.6		
	50										-53.6		

Ground Water Level Data

☒ Free Water not Reported

Boring Advancement Method

4" Dia. Rotary Wash:
to 19.5 ft.

Boring Abandonment Method

Not Reported

Notes

t = Lateral Confining Pressure (psi).

Attachment Figure B.3-6

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJSB053-G

Ardaman & Associates, Inc.

File: 18-2876
Date: 11/19/19
Logged by: Stephen Saller
Driller: TWE
Rig: CME Truck on Barge

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

Location: Lat. 29° 47' 43.62"
Long. 95° 3' 42.93"

Ground Surface Elevation: -9.7 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA									
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
☒		☒	0 b/f		31					41	-9.7		Very Loose brown CLAYEY SAND (SC)
		☒	0 b/f		57								Very Soft brown SANDY FAT CLAY (CHs)
	5	☒	0 b/f		66						-14.7		
		☒	0 b/f		61		55	22	33	60			
		☒	12 b/f 2-6-6		44		36	20	16		-19.7		Medium Dense gray SANDY LEAN CLAY (CLs)
	10	☒	0 b/f 1-0-0		42								Very Soft to Soft brown and gray SANDY LEAN CLAY (CLs)
		☒	1 b/f 0-0-1		71					78			
	15	☒	1 b/f 0-0-1		31					47	-24.7		Very Loose brown and gray CLAYEY SAND (SC)
	20	■	3.50 (P)	3.27 t=6.6	17	136	45	22	23		-29.7		Very Stiff gray LEAN CLAY (CL) w/ sand
	25	■	3.50 (P)	3.32 t=8.3	17	136	46	21	25		-34.7		Very Stiff tan LEAN CLAY (CL) w/ sand
	30	■	2.50 (P)		16						-39.7		
	35	■	3.50 (P)	1.43 t=11.8	28	123	70	37	33		-44.7		Medium Dense reddish brown SILT (MH)
	40	■	3.50 (P)		24		69	24	45	100	-49.7		Medium Stiff reddish brown FAT CLAY (CH)
	45	■	2.00 (P)	1.87 t=15.3	27	123	71	35	36		-54.7		Medium Dense gray SILT (MH)
	50	■	1.50 (P)	1.87 t=16.9	21	129	47	21	26		-59.7		Stiff gray LEAN CLAY (CL)
	55	■	2.00 (P)		18						-64.7		
	60	☒	18 b/f 10-11-7		24					42	-69.7		Medium Dense tan CLAYEY SAND (SC)
	65	☒	65 b/f 19-18-47		24					34	-74.7		Very Dense tan CLAYEY SAND (SC)
	70	☒	67 b/f 19-28-39		21					15	-79.7		
	75	☒	27 b/f 10-11-16		24					47	-84.7		Medium Dense to Very Dense gray CLAYEY SAND (SC)
	80	☒	80 b/f 12-30-50		18					43	-89.7		
	85	☒	26 b/f 8-12-14		18					35	-94.7		
	90	☒	15 b/f 10-7-8		25		64	24	40	62	-99.7		Stiff to Very Stiff gray SANDY FAT CLAY (CHs)
	95	■	2.00 (P)	3.33 t=32.6	112	88	144	78	66	90	-104.7		Medium Dense brown and black SILT (MH) w/ wood & organics
	100	■	2.50 (P)	2.59 t=34.4	24	126	71	23	48		-109.7		Very Stiff gray FAT CLAY (CH)
													Boring completed at 100 ft.
	105										-114.7		

Ground Water Level Data

☒ Boring performed from barge in open water

Boring Advancement Method

4" Dia. Rotary Wash: to 100 ft.

Boring Abandonment Method

Not Reported

Notes

t = Lateral Confining Pressure (psi).

- 93-95' Organic Content = 29.2%

Attachment Figure B.3-7

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJSB057-G

Ardaman & Associates, Inc.

File: 18-2876
Date: 11/8/19
Logged by: Stephen Saller
Driller: TWE
Rig: CME Truck on Barge

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

Location: Lat. 29° 47' 45.29"
Long. 95° 3' 46.74"

Ground Surface Elevation: -17.1 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type / Description
☒		☒	0 b/f		109		102	64	38	46	-17.1	Very Loose dark brown CLAYEY SAND (SC)
		☒	2 b/f 2-1-1		94		51	24	27	28		
	5	☒	1 b/f 0-0-1		60					18	-22.1	Very Loose brown CLAYEY SAND (SC)
		☒	2 b/f 1-1-1		37		66	21	45	19		
		☒	1 b/f 0-0-1		89							Very Loose gray CLAYEY SAND (SC) w/ shell fragments
	10	☒	10 b/f 3-4-6		23					49	-27.1	
		■	0.50 (P)	2.29 t=3.8	20	134	66	23	43	85		Medium Dense gray SILTY SAND (SM) w/ gravel
	15	■	1.25 (P)		12	122					-32.1	
	20	■	3.00 (P)	2.27 t=6.6	19	134	45	16	29	68	-37.1	Very Stiff gray and brown FAT CLAY (CH) w/ sand
	25	■	2.50 (P)		18	135					-42.1	Very Stiff tan SANDY LEAN CLAY (CLs)
	30	■	3.50 (P)		28						-47.1	Very Stiff reddish brown FAT CLAY (CH)
	35	■	3.00 (P)	2.31 t=10.8	27	125	65	22	43	100	-52.1	
	40	■	3.00 (P)		26	127					-57.1	
	45	■	2.50 (P)	3.70 t=13.6	21	127	56	19	37	98	-62.1	Stiff to Very Stiff gray FAT CLAY (CH)
	50	■	1.50 (P)	1.67 t=15.0	36	125	52	19	33	98	-67.1	
	55	■	1.50 (P)		27						-72.1	
	60	■	1.00 (P)	1.49 t=20.5	24	132	52	20	32	84	-77.1	w/ sand
	65	☒	77 b/f 14-21-56		19					25	-82.1	Very Dense brown and gray SILTY SAND (SM)
	70	☒	65 b/f 15-21-44		23					35	-87.1	Very Dense brown and gray CLAYEY SAND (SC)
	75	☒	13 b/f 4-6-7		22		23	18	5	65	-92.1	Stiff gray SANDY SILTY CLAY (CL-ML)
	80	☒	97 b/f 15-55-42		20					54	-97.1	Very Stiff to Hard gray SANDY LEAN CLAY (CLs)
	85	☒	88 b/f 15-33-55		20					71	-102.1	
	90	☒	26 b/f 4-11-15		95		169	92	77	44	-107.1	Dense gray CLAYEY SAND (SC)
	95	■	1.50 (P)	1.67 t=32.6	26	126	41	18	23	98	-112.1	Stiff gray LEAN CLAY (CL)
	100	■	No (P)		22					99	-117.1	
												Boring completed at 100 ft.
	105										-122.1	

Ground Water Level Data

☒ Boring performed from barge in open water

Boring Advancement Method

4" Dia. Rotary Wash: to 100 ft.

Boring Abandonment Method

Not Reported

Notes

t = Lateral Confining Pressure (psi).

Attachment Figure B.3-8

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJSB058-G

Ardaman & Associates, Inc.

File: 18-2876
Date: 10/13/19
Logged by: Breanna North
Driller: TWE
Rig: Tracked Geoprobe

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

Location: Lat. 29° 47' 42.79"
Long. 95° 3' 48.02"

Ground Surface Elevation: 0.62 (ft., NAVD 88)

FIELD DATA				LABORATORY DATA									
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
											0.6		
☒			No (P)		15								Loose brown and tan SILTY SAND (SM)
			No (P)		66		30	16	14	53			Soft gray SANDY LEAN CLAY (CLs)
	5		No (P)	0.92 t=1.6	26	112				97	-4.4		Medium Stiff to Stiff gray LEAN CLAY (CL)
			No (P)	1.21 t=2.6	35	117	42	18	24	96			
			No (P)	0.85 t=3.1	31	115				96			
	10										-9.4		
			No (P)		33		44	17	27	93			
			7 b/f 1-1-6		24		NP	NP	NP	42			Very Loose to Loose gray SILTY SAND (SM)
	15		3 b/f 1-1-2		24		NP	NP	NP	43	-14.4		
			47 b/f 6-17-30		20					44			Dense gray SILTY SAND (SM)
	20										-19.4		Boring completed at 20 ft.
	25										-24.4		
	30										-29.4		
	35										-34.4		
	40										-39.4		

Ground Water Level Data	Boring Advancement Method	Notes
☒ Free Water not Reported	Hollowstem Auger 0 to 20 ft.	t = Lateral Confining Pressure (psi).
	Boring Abandonment Method Not Reported	

Attachment Figure B.3-9

Strata Boundaries May Not Be Exact

19-2853 18-2876.GPJ LOG01.GDT 5/27/20

Attachment C Supplemental Design Investigation (SDI) Geotechnical Data Report

Supplemental Design Investigation – Geotechnical Data Report

San Jacinto River Waste Pits Site
Northern Impoundment
Harris County, Texas

International Paper Company and McGinnes Industrial Maintenance Corporation

June 27, 2022

The Power of Commitment

Contents

1. Introduction **1**

2. Previous Investigations and Geological Conditions **1**

3. Methods of Investigation **2**

3.1 Field Procedures 2

3.1.1 Geotechnical Borings 3

3.1.2 CPT Soundings 3

3.1.3 Pressuremeter Testing 4

3.1.4 Vane Shear Tests 4

3.2 Geotechnical Laboratory Testing 4

4. Subsurface Conditions **4**

4.1 Surficial Alluvions/Sediments 5

4.2 Beaumont Clay Deposit 6

4.3 Beaumont Sand Deposit 7

5. Groundwater Conditions **7**

6. Hydraulic Heave **8**

7. References **9**

Table index

Table 4-1 Geotechnical Boring and CPT Coordinates, Depths, and Elevations 4

Table 4-2 Laboratory Testing 4

Table 5-1 Atterberg Limit and UU Test Results - Surficial Alluvions 6

Table 5-2 Results of Grain Size Distribution - Beaumont Clay Deposit 7

Table 5-3 Atterberg Limit and UU test Results - Beaumont Clay Deposit 7

Figure index

Figure 5-1 Vane Shear Strength Values in Surficial Alluvions 6

Figure 6-1 Variation of the Water Levels in the Beaumont Sand Formation and the San Jacinto River 8

Figure 1 SDI Geotechnical Boring Location Plan

Appendices

Appendix A SDI Geotechnical Boring Logs
Appendix B SDI Cone Penetration Test (CPT) Results
Appendix C SDI Pressuremeter Testing (PMT) Results
Appendix D SDI Geotechnical Laboratory Test Results

1. Introduction

GHD Services Inc. (GHD), on behalf of International Paper Company (IPC) and McGinnes Industrial Maintenance Corporation (MIMC; collectively referred to herein as the Respondents), completed a supplemental geotechnical investigation as part of the 2021 Supplemental Design Investigation (SDI) to support the Pre-Final 90% Remedial Design (90% RD) for the Northern Impoundment of the San Jacinto River Waste Pits Superfund Site (Site).

The purpose of the SDI geotechnical investigation was to provide additional data critical to inform the 90% RD and evaluate the subsurface soil and groundwater conditions along the optimized alignment of the cofferdam wall (referred to herein as the best management practice [BMP]). This was accomplished by means of two deep geotechnical borings, 13 Cone Penetration Test (CPT) soundings, shear vane measurements, pressuremeter testing (PMT) and geotechnical laboratory testing. The results of this investigation were used to refine fundamental design recommendations such as excavation depths, excavation horizontal limits, and the alignment of the BMP. The design includes major adjustments to the excavation contours and alignment of the BMP from what was included in the *Preliminary 30% Remedial Design - Northern Impoundment* (30% RD), dated May 28, 2020 (GHD, 2020).

This SDI Geotechnical Data Report (Report) is accompanied by a series of four appendices:

- Appendix A - SDI Geotechnical Boring Logs.
- Appendix B - SDI Cone Penetration Test (CPT) Results.
- Appendix C - SDI Pressuremeter Testing (PMT) Results.
- Appendix D - SDI Geotechnical Laboratory Test Results.

The investigation was carried out in accordance with GHD's *Supplemental Design Investigation Sampling Plan - Revision 1*, dated May 21, 2021 (GHD, 2021), approved by the United States Environmental Protection Agency (EPA) June 4, 2021 (EPA, 2021). This Report is subject to a number of limiting conditions due to the inherent nature of geological, geotechnical, and hydrogeological profiles determined by investigative fieldwork. The applicable limitations of the study described in this Report are explained in Section 8.

2. Previous Investigations and Geological Conditions

The geology in the vicinity of the Northern Impoundment is somewhat variable given the natural meander of the San Jacinto River over time. Based on the Geologic Atlas of Texas, Houston (1982), the near surface of the western bank of the San Jacinto River is comprised predominantly by Holocene Alluvium, which is comprised of clay, silt, sand, and can include organic matter. These alluvium deposits can be comprised of point-bar, natural levee, stream channel, back-swamp, and coastal marsh deposits. The near surface of the eastern bank of the San Jacinto River is comprised predominantly of the Pleistocene Beaumont Formation, which is made up of mostly clay, silt, and sand.

Previous geotechnical investigations were conducted during the Remedial Investigation (RI), as well as during the First Phase Pre-Design Investigation (PDI-1) and the Second Phase Pre-Design Investigation (PDI-2). A general characterization of the Northern Impoundment indicates that it is underlain by a combination of cohesive clay layers intermixed with granular sandy layers.

The RI geotechnical investigation was conducted by Anchor QEA in March 2011 and May 2012. The RI included installation of eight borings to total depths ranging from 7.5 to 12.5 feet below ground surface (ft bgs) to characterize waste material chemistry, the results of which provided the basis for the selected remedial alternative summarized in the 2017 EPA Record of Decision (EPA, 2017).

The PDI-1 geotechnical investigation was conducted by Integral and Anchor QEA between November 5, 2018, and December 9, 2018. The geotechnical investigation during PDI-1 included installation of 17 borings to maximum depths ranging from 22 to 62 ft bgs to fill data gaps from the RI and to evaluate the geotechnical properties of the soil around the perimeter of the Northern Impoundment. Four monitoring wells were also installed, and an aquifer test was conducted. A roto-sonic drilling rig was utilized to install the 17 geotechnical borings. Six geotechnical boring locations (SJGB018, SJGB019, SJGB020, SJGB021, SJGB022, and SJGB023) were located under water, outside the extent of the TCRA cap. For these locations, a barge-mounted roto-sonic drilling rig was used. At locations accessible by standard terrestrial equipment, material from time critical removal action (TCRA) armored cap was removed, and the geotextile liner was cut prior to drilling activities. At the conclusion of drilling, the borings were grouted to the top, the geotextile liner was repaired, and the armored cap material was replaced. Undisturbed samples were collected using Shelby tube samplers and analyzed for consolidated undrained (CU) triaxial shear strength, direct shear strength testing, one-dimensional consolidation testing, and bulk density.

The PDI-1 geotechnical results identified the presence of interbedded clay, silt, and sand in the areas of the Northern Impoundment in which the geotechnical samples were collected. Soils down to 6 to 10 ft bgs showed a high moisture content, with moisture content decreasing as depth increases. Atterberg classification of clay soils indicated that most of the clays are high plasticity, fat clays, with a slightly fewer number of samples classified as low plasticity, lean clays. Interspersed within these clays were samples showing high gravel/sand content.

The PDI-2 geotechnical investigation was conducted by GHD from September 4, 2019, through December 13, 2019. A total of nine geotechnical borings (SJGB024 through SJGB027, SJSB047, SJSB050, SJSB053, SJSB057, and SJSB058) were installed during PDI-2. Geotechnical borings were installed using a Central Mine Equipment (CME) mud-rotary drilling rig. Samples were collected and analyzed for moisture content (per American Society for Testing and Materials [ASTM] D2216), grain size with hydrometer (per ASTM D6913 and ASTM D7928), plasticity (Atterberg limits; per ASTM D4318), torvane shear (per ASTM D2537), and Unconsolidated Undrained (UU) Triaxial shear strength (per ASTM D2850) to depths ranging from 20 to 100 ft bgs. Geotechnical samples were sent to Tolunay-Wong Engineers, Inc. (TWE) for analysis.

Prior to the PDI-2, the Northern Impoundment soil lithology was characterized as being comprised of interbedded Recent Alluvial Sediments (silts, sands, and clays) to an approximate depth of -30 ft North American Vertical Datum of 1988 (NAVD88), which was confirmed during the PDI-2. The previous investigations, based on information available at the time, determined that the Beaumont Clay formation extended below this reference elevation (-30 ft NAVD88) to a minimum elevation of -60 ft NAVD88 on the western side of the Northern Impoundment and to approximately -50 ft NAVD88 on the eastern side of the Northern Impoundment. Additional geotechnical borings installed during the PDI-2 (specifically boring SJSB057) determined however, that the Beaumont Clay formation extends to approximately -80 ft NAVD88 (an additional 20 ft of thickness) on the western side, and on the eastern side, clays were encountered between approximately -50 to -65 ft NAVD88 (up to an additional 15 ft of thickness). Additionally, prior to PDI-2, it was believed that there was a sand formation extending below the clay formation across the Northern Impoundment to approximately -80 ft NAVD88. These sands, although encountered in PDI-2, were not found to be as consistent across the Northern Impoundment as had been initially understood.

The SDI was conducted by GHD in 2021 to fill data gaps and to support the design of the optimized BMP.

3. Methods of Investigation

3.1 Field Procedures

The following bullets briefly summarize the field and laboratory work scope completed during the SDI:

– Installation of two deep borings, identified as borings SJMW-016, and SJMW-017. Borings were advanced to depths of 70 and 75 ft bgs using mud rotary drilling technique. The location of the completed borings is shown in

the SDI Geotechnical Boring Location Plan (Figure 1). Two shallower borings were installed at borings SJMW-014 and SJMW-015, but they were not a part of the geotechnical investigation.

- Installation of two temporary monitoring wells, one in each boring, to evaluate the groundwater conditions at selected boring locations. Temporary monitoring wells were also installed at borings SJMW-014 and SJMW-015, but data collected was utilized to inform hydraulic conductivity of the waste material to verify design assumptions for water management.
- Installation of a vibrating wire piezometer in each of the two investigative borings at the bottom depth of borings, for long-term monitoring of piezometric pressures in the subsurface units.
- Completion of 13 CPT soundings and completion of nine vane profiles near the CPT soundings. The CPTs were evenly distributed along the BMP alignment to evaluate the thickness of the underlying clay deposit and the geotechnical strength parameters along the BMP alignment.
- Completion of PMT tests within the borings at various depths, including five PMT runs in boring SJMW-016 and five PMT tests in boring SJMW-017.
- Geotechnical laboratory testing on selected representative soil samples collected throughout field investigation activities.

3.1.1 Geotechnical Borings

Geotechnical borings SJMW-016 and SJMW-017 were installed between July 12, 2021, and August 10, 2021, with a CME track mounted drill rig, under the supervision of GHD. A mini-excavator was used to remove TCRA cap rock, then the geotextile liner was cut prior to drilling activities. A site plan showing the location of geotechnical borings and CPT soundings is provided as Figure 1.

Sampling procedures started at 15 ft bgs at both boring locations. Shelby tube samples were collected continuously to a depth of 60 ft bgs, and generally on 5 to 10-ft intervals. Discrete Standard Penetration Test (SPT) sampling was carried out starting at a depth of 60 ft bgs to the termination depth. The SPT test consists of driving a 2-inch diameter split-spoon sampler 1 foot into the soil with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler gives an indication of the consistency and density of the material. Sampling procedures within the overburden were performed in accordance with ASTM D1587 for Shelby tube sampling and ASTM D1586 for SPT sampling.

The undrained shear strength of the encountered surficial clayey soils was measured in-situ using hand-held vane equipment. At the conclusion of drilling at all boring locations, the borings were backfilled with silica sand within the screen depths and then grouted to the top, the geotextile liner was repaired, and the TCRA cap rock was replaced.

The completed SDI boring logs, including the monitoring well installation schematics are included in Appendix A.

3.1.2 CPT Soundings

The CPTs were carried out on 13 selected locations across the Northern Impoundment. The CPTs were performed according to the requirements of the ASTM D5778-12. The tests were terminated at probe penetration or deviation refusal depths ranging from 24.3 to 75.2 ft bgs. Within CPTs, the tip resistance (q_t), the pore pressure (u_2) generated by the probe penetration, and the skin friction (f_s) were measured at depth intervals of 0.06 ft allowing continuous profiles of these parameters to be obtained. These parameters were used to estimate various soil parameters based on documented correlations such as undrained shear strength, elastic modulus, friction angle etc. These parameters are required for the detailed geotechnical analysis performed by Ardaman and Associates.

The CPT sounding locations are shown on Figure 1 and the CPT reports are included in Appendix B. Table 4-1 provides a summary of the geotechnical boring and CPT sounding coordinates, depths, and elevations.

Table 4-1 Geotechnical Boring and CPT Coordinates, Depths, and Elevations

Sounding ID	Termination Depth (ft)	Coordinates (NAD83)		Ground Surface Elevation (ft) (NAVD88)
		Northing	Easting	
SJMW-016	70	13857581.37	3216869.54	5.0
SJMW-017	75	13857083.84	3217204.37	5.0
SJCPT-01	64.5	13857688.78	3216614.40	-3.0
SJCPT-02	32.5	13857834.15	3216717.41	-15.0
SJCPT-02A	30.2	13857904.06	3216740.44	-13.5
SJCPT-03	24.3	13857982.73	3216807.61	-16.5
SJCPT-04	30.9	13858108.10	3216965.24	-16.2
SJCPT-05	38.9	13858074.11	3217144.10	-9.0
SJCPT-06	39.2	13857978.00	3217315.53	-10.0
SJCPT-06A	34.9	13857898.68	3217445.14	-7.0
SJCPT-07	28.4	13857757.37	3217570.49	-14.0
SJCPT-08	32.6	13857511.94	3217629.54	-8.5
SJCPT-09	44.9	13857347.87	3217619.20	-9.0
SJCPT-10	43.1	13857068.56	3217428.67	-13.5
SJCPT-11	75.2	13857566.47	3216891.12	5.0

3.1.3 Pressuremeter Testing

PMT tests were conducted by Braun Intertec using a Texam-E type equipment. In total, five tests were completed in boring SJMW-016 at depths ranging from 22 to 50 ft bgs, and six tests were completed in boring SJMW-017 at depths ranging from 15 to 60 ft bgs. The corresponding PMT reports are included in Appendix C.

3.1.4 Vane Shear Tests

Nine vane shear tests were performed near CPT locations SJCPT-01 to SJCPT-03 and SJCPT-05 to SJCPT-10 to define the shear strength values within the surficial alluvions and to calibrate the CPT results. The measured shear strength values are illustrated on Figure and the corresponding CPT Reports are included in Appendix B.

3.2 Geotechnical Laboratory Testing

Selected soil samples were sent to Thompson Engineering for laboratory testing to determine their geotechnical properties. Laboratory tests are summarized in Table .

Table 4-2 Laboratory Testing

Laboratory Test	ASTM Reference	Quantity of Tests Undertaken
Water Content Determination	D2216	8
Atterberg Limits	D4318	6
Sieve and Hydrometer Analysis	D6913/D422/D1140	5 (among them 4 hydrometer)
UU Triaxial	D2580	7
Organic Content	D297	4-6

The laboratory test results are included in **Error! Reference source not found.**. Results of the laboratory testing were u sed to confirm site soil logging and are discussed in the relevant subsurface conditions in Section 4.

4. Subsurface Conditions

According to the previous geotechnical investigations, soils encountered down to elevation of -30 ft NAVD88, are fairly heterogenous consisting of silty sands, sands silts, lean clays, and sandy clays. Below this reference elevation, the western and eastern sides of the Northern Impoundment become more distinguishable. On the western side, sandy

lean clays extend to an elevation of approximately -45 ft NAVD88 and are underlain by medium stiff to very stiff fat clay to an elevation of approximately -80 ft NAVD88. More granular medium dense to very dense clayey sands, silty sands and sandy lean clays extend to an elevation of approximately -108 ft NAVD88 and are underlain by stiff gray lean clay to at least an elevation of approximately -117 ft NAVD88, the maximum explored depth of boring SJSB057. On the eastern side alternating layers of silts and clays extend below an elevation of approximately -30 ft NAVD88. These appear to be coarser towards the north and finer towards the south, with soil boring SJSGB0S3 (north) indicating more granular medium dense to very dense clayey sands at an elevation of approximately -68 ft NAVD88, and soil boring SJSB047 (south) indicating silty sands at an elevation of approximately -84 ft NAVD88. These more granular soils extend to an elevation of approximately -98 ft NAVD88 where stiff to very stiff fat clays and silts were encountered to at least an elevation of approximately-110 ft NAVD88, the maximum explored depth of the borings.

To delineate the subsurface stratigraphy along or in reasonable proximity to the current conceptual BMP alignment, GHD took 13 CPT soundings. Two additional deep geotechnical borings were drilled inside the limits of the impoundment. The CPT soundings and geotechnical borings confirmed the following strata:

– Western side of the Northern Impoundment - consists of approximately 20 ft of soft to firm sediments overlying a stiff to very stiff clayey soil layer (Beaumont Clay) that extends to termination depths ranging from 20 to 31 ft bgs and was proven to extend to depth of 58 ft (elevation of -60 ft NAVD88) at the boring locations of SJSCPT-01 and SJSCPT-11. The Beaumont Sand layer was confirmed below the clay layer at depths of 58 ft (elevation of -60 ft NAVD88).
– Eastern side of the Northern Impoundment - consists of approximately 20 ft of soft sediments overlying the stiff to very stiff Beaumont Clay formation. The clayey soil layer was not fully penetrated in any of the CPT locations but was proven to extend to depths ranging from 28 to 45 ft bgs (elevations of -41 to -56 ft NAVD88). Interlayered thin granular deposits were present within the clayey soil.

The CPTs indicated that the Beaumont Clay strata consisted predominantly of one layer on the west side but on the east side, this layer may be interlayered by thin occasional granular lenses. The CPTs also provided a continuous profile of the shear strength to the termination depth of the tests. Hence, a more detailed description of sand and clay layers with interpretation of the test results is provided in the subsection below.

4.1 Surficial Alluvions/Sediments

Alluvium deposits/surficial sediments consisting of clay, silt, and sand with organic matter contents ranging from 0.7 percent to 9.7 percent were encountered at the surface at all borings and CPT locations. The alluvium deposit is black to grey in color with specific gravity ranging from 2.58 to 2.79 and dry bulk density ranging from 45.3 pounds per cubic feet (pcf) to 95.0 pcf.

The results for Atterberg Limits determination conducted on one sample of the clayey alluvions is summarized in Table 5-1 and presented in Appendix D. Atterberg limit results show a liquid limit of 68 percent, and a plasticity index of 44 percent, indicating a high plasticity clay.

Nine vane shear tests performed near CPT locations SJCPT-01 to SJCPT-03 and SJCPT-05 to SJCPT-10 indicated shear strengths values ranging from very low values to 1,800 pounds per square feet (psf), indicating very soft to stiff consistency. The results of vane shear strength measurements are shown on Figure , below.

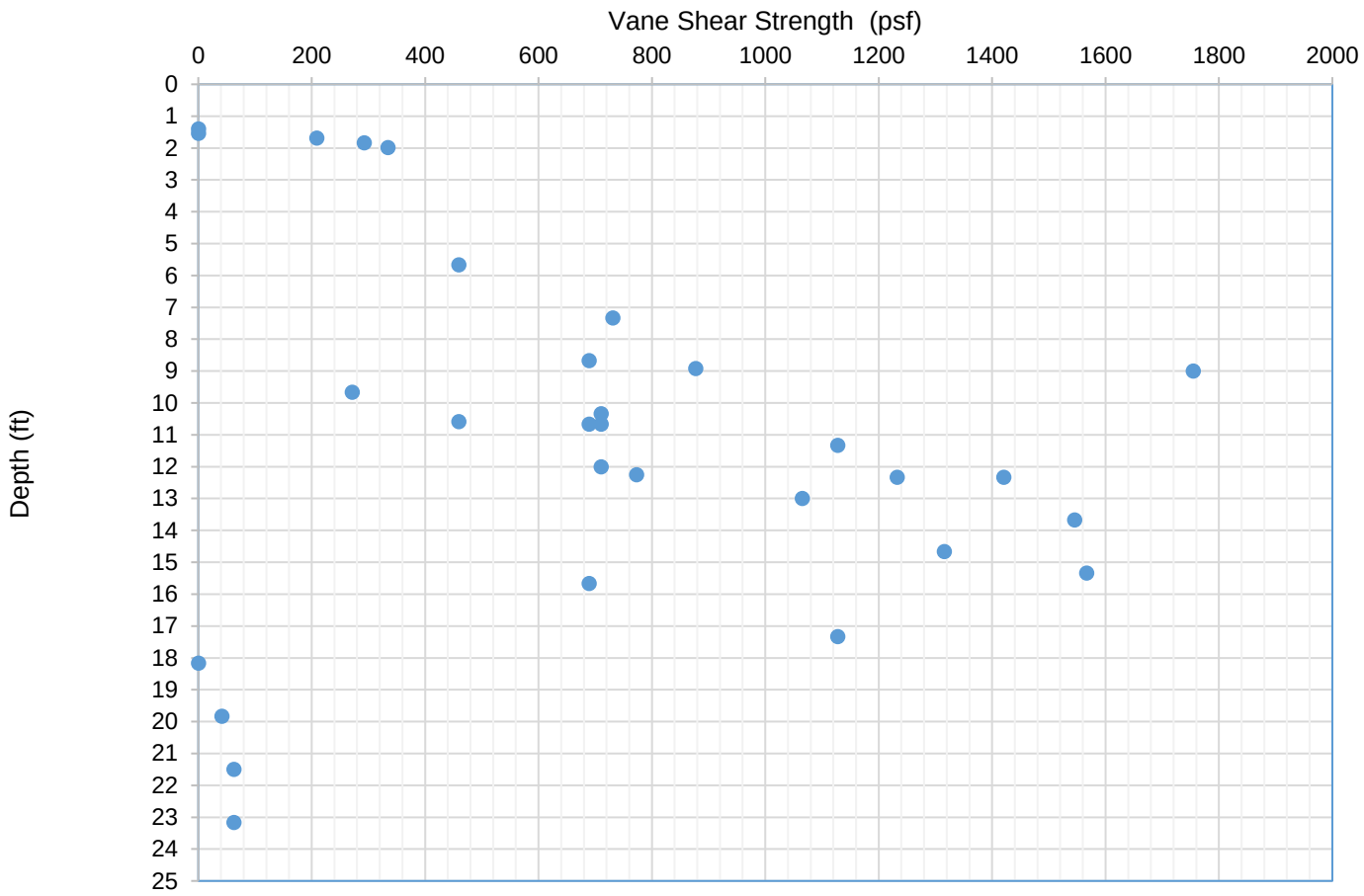


Figure 5-1 Vane Shear Strength Values in Surficial Alluvions

The shear strength of the surficial alluvions were also obtained from one UU triaxial compression test. The measured value is presented in Table 5-1.

Table 5-1 Atterberg Limit and UU Test Results - Surficial Alluvions

Boring	Sample No.	Depth (ft)	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	UU Shear Strength (psf)
SJMW-17	ST-1	23-25	47.4	68	24	44	346

4.2 Beaumont Clay Deposit

The surficial sediments are underlain by native clayey soils, which extend to the termination depth of the CPTs and was proven to extend to a depth of 58 ft bgs on the western side of the Northern Impoundment (as observed in borings SJCPT-01 and SJCPT-11) and to a depth of 65 ft bgs on the eastern side of the Northern Impoundment (as observed in SJMW-017). The native clayey deposit comprises clayey silt/clay/silt and clay, with some deposits being characterized as sand to sandy.

The clayey deposit has various color from reddish brown to gray, blue and black color and is typically stiff to very stiff.

The natural moisture content of the samples recovered from the clay deposit generally ranged from 19 percent to 29 percent, indicating moist to moist-wet conditions.

Thirteen undisturbed samples of the clay deposit were collected using Shelby tube sampler, as well as four disturbed samples collected using a SPT sampler. These samples were collected for geotechnical laboratory testing, consisting

of grain size distribution analyses, Atterberg limits, unconfined compressive strength tests, unit weight, and UU triaxial compression tests.

The grain-size distribution and hydrometer test results conducted on four samples of clay deposit are summarized in Table 5-2, and the detailed results are presented in **Error! Reference source not found.**. The grain size analyses s how a sand content of 0 to 23 percent, silt content of 42 to 54 percent, and a clay content of 23 to 58 percent.

Table 5-2 Results of Grain Size Distribution - Beaumont Clay Deposit

Boring	Sample No.	Depth (ft)	Water Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
SJMW-16	ST-3	35-37	19.1	0	8.6	42.5	48.9
SJMW-16	ST-6	48-50	29.3	0	0.2	41.8	58
SJMW-16	ST-8	56-58	18	0	22.9	54.1	23
SJMW-17	ST-3	40-42	21.8	0	11.8	53.3	34.9

The results for Atterberg Limits determination conducted on five samples of the clay deposit is summarized in Table 5-3 and presented in **Error! Reference source not found.**. Atterberg limit results show a liquid limit in the r ange of 27 to 55 percent, and a plasticity index of 13 to 38 percent, indicating medium to high plasticity clay.

Shear strengths were obtained from six UU triaxial compression testing on the clay samples. The measured values are presented in Table 5-3 and range from about 1,300 to 3,400 psf. The clay deposit can be characterized as stiff to very stiff.

Table 5-3 Atterberg Limit and UU test Results - Beaumont Clay Deposit

Boring	Sample No.	Depth (ft)	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	UU Shear Strength (psf)
SJMW-16	ST-3	35-37	19.1	40	16	24	2750
SJMW-16	ST-5	43-45	28	55	17	38	1358
SJMW-16	ST-6	48-50	32.9	-	-	-	2092
SJMW-16	ST-8	56-58	17.4	27	14	13	3316
SJMW-17	ST-3	40-42	20.1	50	14	36	2188
SJMW-17	ST-5	60-62	21	37	14	23	3356

4.3 Beaumont Sand Deposit

The Beaumont Sand layer was confirmed below a depth of 58 ft bgs on the western side of the Northern Impoundment in boring locations SJCPT-01 and SJCPT-11, and below a depth of 65 ft bgs on the eastern side of the Northern Impoundment, in boring SJMW-017. Within these CPTs and geotechnical borings, the sand layer extends to the refusal depth at approximately 75 ft bgs. The sand deposit consists of silty sand to clayey sand and is gray in color.

SPT 'N' values obtained for the silty clay to clayey silt deposits vary between 15 and 36, indicating compact to dense state of packing.

The grain size analyses conducted on one representative sand sample indicated a sand content of 57 percent with silt/clay content of 43 percent. The detailed results of grain size distribution are presented in Appendix D.

5. Groundwater Conditions

The Northern Impoundment is located on the San Jacinto River; therefore, the groundwater will fluctuate over time as the river rises and falls during periods of rain and drought. During previous investigations, groundwater measurements were not able to be recorded at all of the boring locations, as some of the soil borings were collected from marine vessels in open water, and groundwater was assumed to be near surface. The actual depth of the groundwater at the

Northern Impoundment will fluctuate due to climatic conditions, local surface water control and drainage features, the San Jacinto River stage, and other factors.

During the SDI, piezometers were installed in borings SJMW-16 and SJMW-17 and the water levels were logged in these piezometers at regular time intervals. Figure shows the variation of the piezometric level (blue line) in the piezometer (SJMW-16) installed in the Beaumont Sand for the period between August 13 and September 13, 2021. The water level in the San Jacinto River was measured by a transducer installed in the river during PDI-2. That data (orange line) is also shown in this figure for the same period. As shown below, groundwater elevations ranged from -1.5 to -4.5 ft NAVD88.

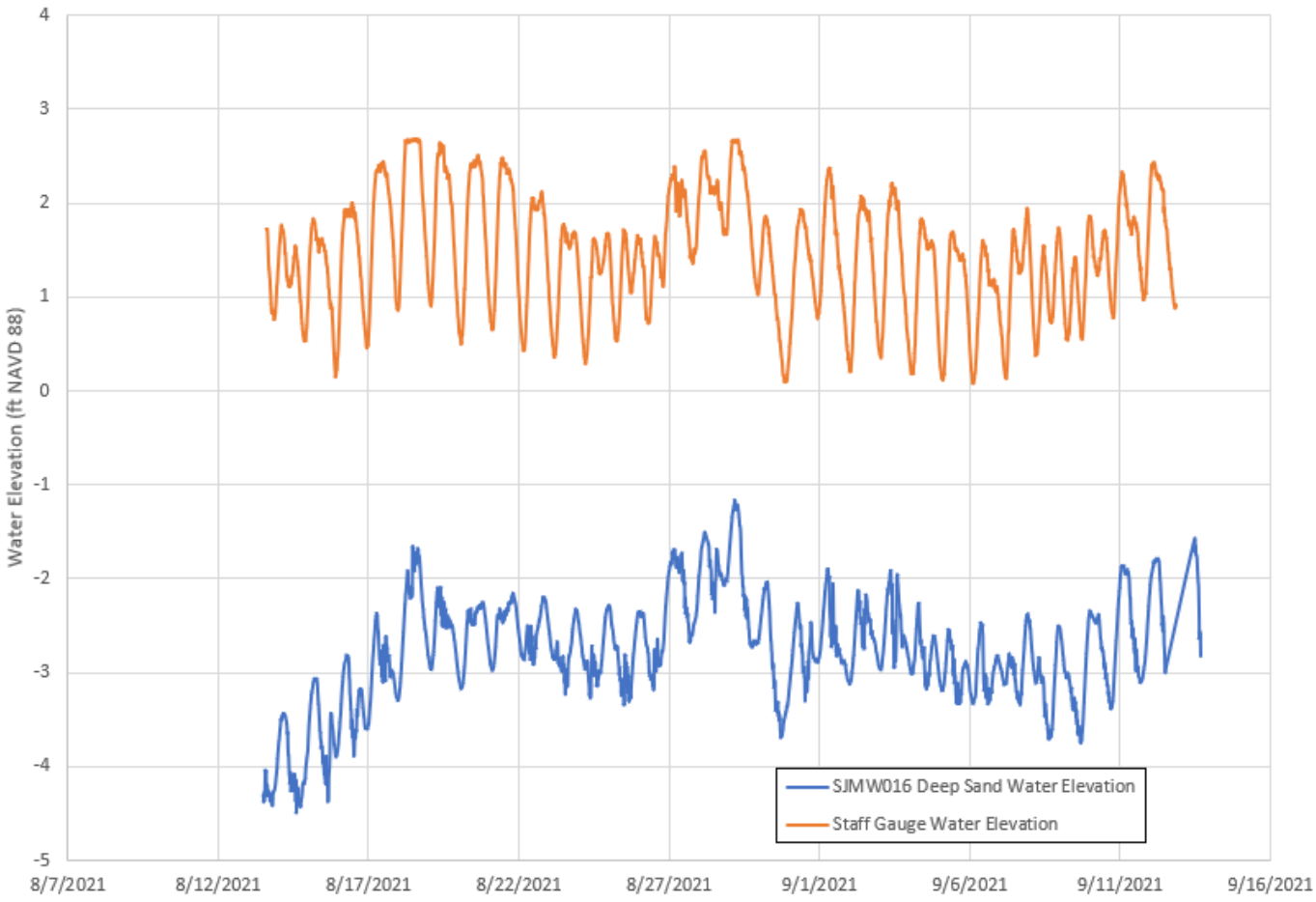


Figure 6-1 Variation of the Water Levels in the Beaumont Sand Formation and the San Jacinto River

6. Hydraulic Heave

Based upon the increased depths of impacted material encountered during the SDI, a hydraulic heave evaluation was conducted following receipt of the SDI data.

The concern associated with hydraulic heave is that removal of the soils, including impacted material, and water during excavation in the deeper areas would reduce the downward forces to the extent that the upward hydraulic pressures in the underlying permeable strata would cause a failure of the excavation bottom. During this phenomenon, water and/or “flowing sands” could rapidly fill the excavation and cause an irreversible and catastrophic failure of the excavation.

The evaluation examined the thicknesses of the underlying strata beneath the Northern Impoundment including the alluvium and underlying Beaumont Clay and the interface between the Beaumont Clay and the Beaumont Sand. The pore pressures of the Beaumont Sand, as measured in the deep piezometers was also evaluated to determine the hydraulic head level. Finally, the evaluation examined the properties of the material, including the unit weight of the clay and overlying alluvium and the presence of sand lenses in some parts of the clay layer. This evaluation was to assess whether the pore pressures within the Beaumont Sand and/or sand layers within the clay would be sufficient to overcome the weight of the overburden considering the planned excavation depths.

The analysis concluded that there are areas of the Northern Impoundment in which excavation to the deepest elevations of impact will result in an unacceptable risk of hydraulic heave. While there are multiple areas across the Northern Impoundment that show Factor of Safety (FS) values below the target value of 1.25, risk is most pronounced in the northwest corner where FS values are less than 1.0 and approximately 10 to 14 ft of waste material could not be removed based upon the elevations calculated to be protective against hydraulic heave. While the northwest corner presents the most pronounced risk of hydraulic heave, a significant portion of the rest of the Northern Impoundment is on the threshold of triggering the risk of hydraulic heave.

The detailed hydraulic heave evaluation was detailed in a Hydraulic Heave Analysis Report, submitted to the EPA on December 9, 2021, and included as Attachment E to the main Geotechnical Engineering Report.

7. References

– EPA, 2017. Record of Decision, San Jacinto River Waste Pits. Harris County, Texas. EPA ID: TXN000606611. U.S. Environmental Protection Agency, Region 6. Dallas, Texas. October 2017.

– EPA, 2020. Letter to C. Munce, GHD Services Inc. regarding comments on the Preliminary 30% Remedial Design - Northern Impoundment, dated July 16, 2020. U.S. Environmental Protection Agency.

– EPA, 2021. Letter to C. Munce, GHD Services Inc. regarding approval of the *Supplemental Design Investigation Sampling Plan - Revision 1*, dated June 4, 2021. U.S. Environmental Protection Agency.

– GHD, 2020. *Preliminary 30% Remedial Design - Northern Impoundment*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. May 28, 2020.

– GHD, 2021. *Supplemental Design Investigation Work Plan - Revision 1*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. May 21, 2021.

– Integral and Anchor QEA, 2019. *Northwest Slope Enhancement Completion Report*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. August 2019.

Paper Size ANSI B

0 30 60 90 120

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

N

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
NORTHERN IMPOUNDMENT

GEOTECHNICAL BORING LOCATION PLAN

Project No. 11215702
Revision No. -
Date Jun 2, 2022

FIGURE 1

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Print date: 02 Jun 2022 - 18:09

Data source: Imagery - Google, 2019.

Appendices

Appendix A

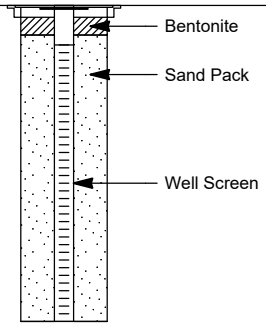
SDI Geotechnical Boring Logs

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJMW-14
DATE COMPLETED: 23 July 2021
DRILLING METHOD: Hollow Stem Auger
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	ML-SANDY SILT, grey, saturated		Bentonite				
	ML-CLAYEY SILT, grey, wet	1.00	Sand Pack				
2							
4			Well Screen				
6							
	CL-SILTY CLAY, grey, moist	7.00					
8	END OF BOREHOLE @ 8.00ft BGS	8.00					
10							
12							
14							
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							



WELL DETAILS
Screened interval:
1.00 to 8.00ft BGS
Length: 7ft
Diameter: 2in
Slot Size: 0.01 in
Material: PVC
Sand Pack:
0.75 to 8.00ft BGS
Material: 20/40

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

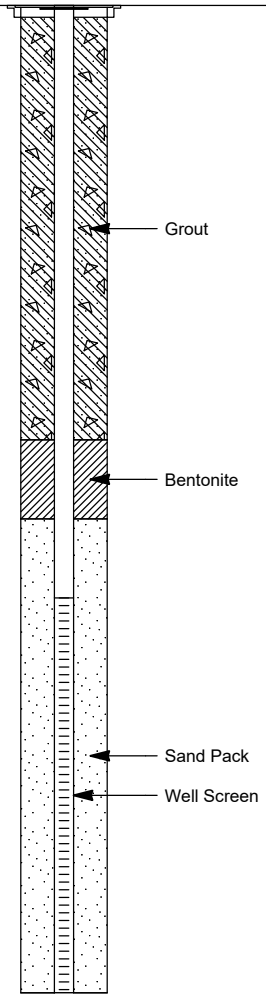
File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJMW-15
DATE COMPLETED: 24 July 2021
DRILLING METHOD: Hollow Stem Auger
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	ML-SANDY SILT, with gravel, grey, saturated						
	ML-CLAYEY SILT, grey, wet - brown at 2.00ft BGS - wood at 4.50ft BGS	1.00	Grout			65	
	CL-SILTY CLAY, grey, moist - silty zone at 8.50ft BGS	7.00				70	
	SP-SAND, with clay, grey, saturated, few gravelly sand, clay in interbedded layers	11.50	Bentonite			70	
	CL-SILTY CLAY, grey, moist	15.00					
	SP-SAND, with clay, grey, saturated, fine grained sand, clay in interbedded layers	17.50	Sand Pack Well Screen			80	
	END OF BOREHOLE @ 25.00ft BGS	25.00					



WELL DETAILS
Screened interval:
15.00 to 25.00ft BGS
Length: 10ft
Diameter: 2in
Slot Size: 0.01 in
Material: PVC
Sand Pack:
13.00 to 25.00ft BGS
Material: 20/40

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJMW-16
DATE COMPLETED: 10 August 2021
DRILLING METHOD: Mud Rotary
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
2, 4, 6, 8, 10, 12, 14, 16	Not Sampled						
18, 20, 22, 24, 26, 28	SC-CLAYEY SAND, grey, wet	17.00	Grout	ST-1, PMT-1, ST-2			
30, 32, 34	SP-SAND, grey, saturated	29.00		PMT-2			
36, 38	CL-SILTY CLAY, grey	35.00		ST-3 PMT-3			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJMW-16
DATE COMPLETED: 10 August 2021
DRILLING METHOD: Mud Rotary
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78	CH-CLAY, grey, moist	40.00		ST-4, ST-5 PMT-4, ST-6 PMT-5, ST-7, ST-8 PMT-6, SPT-1, SPT-2			11/13/23, 8/11/15
	CL-CLAY, with sand, grey, moist	56.00	Bentonite				
	SM-SILTY SAND, grey, saturated	60.00	Sand Pack, Well Screen				
	END OF BOREHOLE @ 70.00ft BGS	70.00					

WELL DETAILS
Screened interval:
60.00 to 70.00ft BGS
Length: 10ft
Diameter: 2in
Slot Size: 0.01 in
Material: PVC
Sand Pack:
58.00 to 70.00ft BGS
Material: 20/40

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJMW-17
DATE COMPLETED: 12 August 2021
DRILLING METHOD: Mud Rotary
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	Not Sampled						
16	SP-SAND, grey, wet	15.00		PMT-1			
24	CL-SILTY CLAY, grey, wet	23.00		ST-1 PMT-2			
30	CL-SILTY CLAY, slight silt, grey, wet	30.00	Grout	ST-2 PMT-3			
40	CH-CLAY, grey with oxidation mottling, moist	40.00		ST-3 PMT-4			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJMW-17
DATE COMPLETED: 12 August 2021
DRILLING METHOD: Mud Rotary
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98	CH-CLAY, blue-grey, moist	60.00	Bentonite	ST-4 PMT-5			
				ST-5 PMT-6			
	SC-CLAYEY SAND, grey, wet	65.00	Sand Pack; Well Screen	SPT-1			4/5/10
				SPT-2 PMT-7			11/11/15
	END OF BOREHOLE @ 75.00ft BGS	75.00					

WELL DETAILS
Screened interval:
65.00 to 75.00ft BGS
Length: 10ft
Diameter: 2in
Slot Size: 0.01 in
Material: PVC
Sand Pack:
63.00 to 75.00ft BGS
Material: 20/40

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB072
DATE COMPLETED: 20 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	ML-CLAYEY SILT, with shells, light grey, saturated		0-2ft			
2	ML/CL-CLAYEY SILT to SILTY CLAY, dark brown, saturated to wet	2.00	2-4ft		50	
4			4-6ft			
6			6-8ft			
8	CL-SILTY CLAY, with sand, fine grained, grey, moist to wet	7.50	8-10ft		60	
10			10-12ft			
12	SM-SILTY SAND, with slight clay, fine grained sand, grey, wet	11.00	12-14ft		75	
14	SP-SAND, fine grained, grey, saturated	14.00	14-16ft			
16	SM-SILTY SAND, with clay, grey, saturated	16.00	16-18ft		90	
18	- fine grained sand from 19.00 to 19.50ft BGS		18-20ft			
20			20-22ft			
22	- medium grained sand from 22.00 to 22.50ft BGS		22-24ft		100	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB073
DATE COMPLETED: 20 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	SM-SILTY SAND, with gravel, brown, saturated		0-2ft			
2	ML-CLAYEY SILT, grey, wet, slight wood debris and gravel	2.00	2-4ft		40	
4			4-6ft			
6	- glossy black silt, wet at 7.00ft BGS		6-8ft		80	
8			8-10ft			
10	CL-SANDY CLAY, dark grey, wet	10.00	10-12ft			
12	SM-SILTY SAND, with clay, grey, saturated	12.00	12-14ft		50	
14			14-16ft			
16			16-18ft		90	
18	CL-SANDY CLAY, grey, wet	18.00				
	SP-SAND, fine to medium grained, grey, saturated	19.00	18-20ft			
20			20-22ft			
22	- 2-inch clay zone at 21.50ft BGS		22-24ft		80	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB074
DATE COMPLETED: 22 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	SC-CLAYEY SAND, with shells, brown, saturated	1.00	0-2ft			
2	ML-CLAYEY SILT, grey, wet		2-4ft		40	
4	SM-SILTY SAND, with clay, brown, saturated, clay laminations	4.00	4-6ft			
6			6-8ft		75	
8	- sandy clay zone from 9.00 to 10.00ft BGS		8-10ft			
10			10-12ft			
12			12-14ft		60	
14	- fine to medium grained sand zone from 14.50 to 15.00ft BGS	15.00	14-16ft			
16	SP-SAND, with clay, fine grained sand, brown, saturated, clay interbedded in zones - 6-inch clay zone at 16.00ft BGS		16-18ft		50	
18	- 2-inch clay zone at 18.00ft BGS		18-20ft			
20			20-22ft			
22	- 3-inch clay zone at 23.00ft BGS		22-24ft		100	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB075
DATE COMPLETED: 20 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
2, 4, 6	ML-CLAYEY SILT, grey, wet, shells		0-2ft, 2-4ft, 4-6ft		50	
8, 10	CL-SILTY CLAY, light grey, moist	7.00	6-8ft, 8-10ft, 10-12ft		70	
12, 14, 16, 18, 20, 22	SM-SILTY SAND, slight clay, grey, wet - sand zone, fine grained, saturated from 14.50 to 15.00ft BGS - clayey zone from 15.50 to 16.00ft BGS - medium grained sand zone, saturated from 19.00 to 19.50ft BGS - saturated sands with some interbedded clay at 20.00ft BGS - medium grained sand zone, saturated from 23.00 to 23.50ft BGS	12.00	12-14ft, 14-16ft, 16-18ft, 18-20ft, 20-22ft, 22-24ft		60, 80, 75	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26, 28, 30, 32, 34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB076
DATE COMPLETED: 22 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	SM-GRAVELLY SILTY SAND, brown, saturated, shells	1.00				
2	ML-CLAYEY SILT, grey, wet		0-2ft		60	
			2-4ft			
4			4-6ft			
6	CL-SILTY CLAY, grey, moist, sparse shells	6.00				
			6-8ft		40	
8			8-10ft			
10	CL-SANDY CLAY, grey, moist, thin interbedded sand lenses	10.00				
			10-12ft		60	
12			12-14ft			
14	SP-SAND, with clay, fine grained sand, grey, saturated	14.50	14-16ft			
16	- 3-inch clay zone at 17.00ft BGS		16-18ft		75	
18	- 6-inch clay zone at 18.00ft BGS		18-20ft			
20			20-22ft			
22			22-24ft		100	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB077
DATE COMPLETED: 21 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	SM-SILTY SAND, with gravel, brown, saturated, shells, rootlets		0-2ft			
2	ML-SANDY SILT, brown, saturated, slight odor	2.00	2-4ft		40	
4			4-6ft			
	ML-CLAYEY SILT, dark brown, saturated to wet	5.00				
6			6-8ft		70	
8	- shift to dark grey at 8.00ft BGS		8-10ft			
10			10-12ft			
12	SM-SILTY SAND, grey, saturated	12.00	12-14ft		30	
14			14-16ft			
16			16-18ft		50	
	SP-SAND, fine grained, grey, saturated, with clay layers interbedded	17.00				
18			18-20ft			
20	- 3-inch clay layer at 21.00ft BGS		20-22ft		80	
22	- 2-inch clay layer at 23.00ft BGS		22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB078
DATE COMPLETED: 21 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	ML-CLAYEY SILT, with sand, grey, saturated		0-2ft			
2					50	
	- sandy silt zone from 3.00 to 4.00ft BGS		2-4ft			
4			4-6ft			
6		6.50				
	CL-SILTY CLAY, grey, moist		6-8ft		80	
8			8-10ft			
10		11.00	10-12ft			
	SM-SILTY SAND, with clay, grey, saturated				80	
12			12-14ft			
14	- fine grained sand, saturated from 14.50 to 15.00ft BGS		14-16ft			
16		16.00				
	SP-SAND, with clay, grey, saturated		16-18ft		50	
18	- 2-inch clay zone at 18.50ft BGS		18-20ft			
20	- 2-inch clay zone at 20.00ft BGS		20-22ft			
22			22-24ft		100	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
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NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB079
DATE COMPLETED: 25 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	SW-GRAVELLY SAND, brown, saturated, shells					
	ML-CLAYEY SILT, dark grey, moist to wet	1.00	0-2ft			
2			2-4ft		40	
4	- wood at 4.00ft BGS		4-6ft			
	- wood at 5.50ft BGS					
6			6-8ft		45	
8			8-10ft			
10						
	SP-SAND, with clay, fine grained sand, grey, saturated, clay interbedded in small layers	11.00	10-12ft			
12			12-14ft		40	
14	- 2-inch clay layer at 14.50ft BGS		14-16ft			
16			16-18ft		75	
18	- sandy clay layer from 18.00 to 18.50ft BGS		18-20ft			
20	- 1-inch clay layer at 20.50ft BGS		20-22ft		60	
22			22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB080
DATE COMPLETED: 22 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	ML-CLAYEY SILT, with shell gravel, brown, saturated		0-2ft			
2	SC-CLAYEY SAND, grey, wet, with wood debris and gravel	2.00	2-4ft		55	
4	SM-SILTY SAND, with shells, brown, saturated	5.00	4-6ft			
6			6-8ft		15	
8			8-10ft			
10	SP-SAND, with clay, fine grained sand, grey, saturated, interbedded clay zones	11.00	10-12ft			
12			12-14ft		45	
14	- 2-inch clay zone at 13.50ft BGS - medium to fine grained sand zone at 14.50ft BGS		14-16ft			
16	- 3-inch clay zone at 16.00ft BGS		16-18ft		70	
18			18-20ft			
20	- 1-inch clay zone at 19.50ft BGS					
22	- 2-inch clay zone at 21.00ft BGS		20-22ft		70	
24	END OF BOREHOLE @ 24.00ft BGS	24.00	22-24ft			
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB081
DATE COMPLETED: 5 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, cohesive, grey, wet, odor		0-2ft		90	
2			2-4ft			
	CL-SILTY CLAY, cohesive, dark grey, dry -4-inch very thin layer of tan/grey fine to medium sand, loose, damp at 3ft BGS	3.00				
4			4-6ft		90	
	SP-SAND, fine to medium grained, loose, grey/tan, damp, some organics	5.00				
6			6-8ft			
	CL-SILTY CLAY, some fine to medium sand, grey, wet	7.50				
8			8-10ft			
10					100	
	SC-CLAYEY SAND, fine to coarse grained, slightly cohesive, grey, damp	10.50	10-12ft			
12			12-14ft			
14					80	
			14-16ft			
16	SP-SAND, medium to coarse grained, loose, tan/grey, wet	16.00				
			16-18ft			
18					50	
			18-20ft			
20						
			20-22ft			
22					60	
	CH-CLAY, very cohesive, slight plasticity, grey, dry	22.50	22-24ft			
	SP-SAND, medium to coarse grained, loose, tan/grey, damp	23.50				
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB082
DATE COMPLETED: 9 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, cohesive, grey, damp, odor		0-2ft, 2-4ft		100	
	SP-SAND, fine to medium grained, loose, grey, wet, odor	3.50				
	CL-SANDY CLAY, silty, fine grained, slightly cohesive, grey, wet to damp	4.50	4-6ft, 6-8ft		100	
	SC-CLAYEY SAND, silty, fine grained, loose, grey, damp	7.00	8-10ft			
	CL-SILTY CLAY, with thin interbedded sand layers, grey, damp	10.00	10-12ft		100	
	SC-CLAYEY SAND, medium to coarse grained, loose, grey, damp	12.00	12-14ft			
	CL-SANDY CLAY, silty, medium grained, cohesive, low plasticity, grey, damp	14.00	14-16ft, 16-18ft, 18-20ft		100, 80	
	SP-SAND, fine to coarse grained, some clay, grey/tan, wet	19.50	20-22ft, 22-24ft		80	
	END OF BOREHOLE @ 24.00ft BGS	24.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB083
DATE COMPLETED: 22 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	SW-SAND, medium to coarse grained, some silt, loose, grey, wet, odor	1.00	0-2ft			
	SP-SAND, fine to medium grained, loose, grey	2.00			60	
2	CL-SILTY SANDY CLAY, fine grained, slightly cohesive, grey/brown, damp, odor		2-4ft			
4			4-6ft			
6	CL-SILTY CLAY, some medium gravel, slightly cohesive, grey, wet, odor	6.00	6-8ft		45	
8			8-10ft			
10	SC-CLAYEY SAND, medium to coarse grained, very low cohesiveness, grey, damp	10.00	10-12ft		100	
12			12-14ft			
14			14-16ft		70	
16						
	SP-SAND, fine to coarse grained, loose, tan/grey, damp	17.00	16-18ft			
18			18-20ft		60	
20			20-22ft			
22	- shells observed in sand at 23.00ft BGS		22-24ft		50	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB084
DATE COMPLETED: 21 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, loose, grey, wet, some cohesiveness, odor		0-2ft		60	
2			2-4ft			
	SC-CLAYEY SAND, loose, grey, wet	3.50				
4			4-6ft		100	
	CL-SANDY CLAY, silty, fine grained sand, grey, damp, some cohesiveness	5.00				
6			6-8ft			
8			8-10ft		60	
10	- very thin interbedded layers of fine to medium tan sand at 11.00ft BGS		10-12ft			
12			12-14ft		80	
14	- very thin interbedded layers of fine to medium tan sand at 14.00ft BGS		14-16ft			
16			16-18ft		100	
18	- light brown/tan medium sand at 18.00ft BGS					
	CL-SANDY CLAY, fine grained sand, hard, light grey and brown, dry	18.50	18-20ft			
20	- thin interbedded light tan fine to medium sand at 20.00ft BGS		20-22ft		100	
22			22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB085
DATE COMPLETED: 23 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, loose, slightly cohesive, dark grey, wet, odor		0-2ft			
2			2-4ft		50	
	- some organics at 3.50ft BGS					
4	SP-SAND, fine to medium grained, grey, damp	4.00	4-6ft			
6			6-8ft		90	
	SC-SANDY CLAY, silty, fine grained, grey, damp	7.00				
8	SP-SAND, fine grained, grey	8.00	8-10ft			
10			10-12ft		55	
	CL-SILTY CLAY, cohesive, grey, damp, very thin interbedded tan fine sand layers	11.00				
12			12-14ft			
14			14-16ft		60	
16			16-18ft			
18					80	
	CL-SANDY CLAY, compact, slightly cohesive, low plasticity, very fine sand, grey/tan	19.00	18-20ft			
20			20-22ft			
22					90	
			22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB086
DATE COMPLETED: 4 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, with some medium sand-gravel, cohesive, grey, damp, odor		0-2ft			
2	SC-CLAYEY SAND, fine to medium grained, slightly loose, grey/tan, damp, some organics	2.00	2-4ft		60	
4	CL-SILTY CLAY, cohesive, low plasticity, grey, damp	4.50	4-6ft			
6	SC-CLAYEY SAND, fine to medium grained, slightly loose, grey/tan, damp	6.00	6-8ft		60	
8			8-10ft			
10					80	
12	CL-SANDY CLAY, silty, fine grained, dense, cohesive, some plasticity, grey, dry	11.00	10-12ft			
14			12-14ft		100	
16	CL-SILTY CLAY, cohesive, loose, grey, damp	16.00	14-16ft			
18	- hard from 19.00 to 19.50ft BGS		16-18ft		80	
20	SP-SAND, medium to coarse grained, loose, tan/brown, damp	19.50	18-20ft			
22			20-22ft		60	
	CH-CLAY, hard, cohesive, very low plasticity, grey, dry	23.00	22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB087
DATE COMPLETED: 10 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	GW-SAND AND GRAVEL, loose, tan/brown, damp	0.20				
	CL-SILTY CLAY, cohesive, some plasticity, grey, damp - odor from 1.00 to 4.00ft BGS		0-2ft 2-4ft		70	
			4-6ft 6-8ft		60	
	- grey, fine to coarse sand, loose at 7.50ft BGS		8-10ft			
	SC-CLAYEY SAND, fine to medium grained, slightly cohesive to loose, grey, damp	9.50			100	
	CL-SILTY CLAY, cohesive, grey, damp	11.00	10-12ft			
	SC-CLAYEY SAND, grey, damp	12.50	12-14ft		100	
			14-16ft			
	CL-SILTY CLAY, cohesive, grey, damp	15.50				
	SC-CLAYEY SAND, fine to medium grained, slightly cohesive, grey, damp, some shells	16.00	16-18ft 18-20ft		80	
	SW-SAND, medium to coarse grained, loose, grey/tan, wet, some shells	21.00	20-22ft 22-24ft		100	
	END OF BOREHOLE @ 24.00ft BGS	24.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB088
DATE COMPLETED: 6 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SANDY CLAY, silty, fine grained, slightly cohesive, brown, wet		0-2ft			
	CL-SANDY CLAY, silty, fine grained, cohesive, grey, damp	1.50	2-4ft		70	
2			4-6ft			
4			6-8ft		80	
6		7.50				
8	SC-CLAYEY SAND, fine to coarse grained, grey/tan, damp	8.00				
	CL-SANDY CLAY, fine to medium grained, grey, damp		8-10ft			
10	SM-SILTY SAND, fine grained, with some clay, grey, damp	10.00	10-12ft		100	
12			12-14ft			
14			14-16ft		100	
16	CL-SILTY CLAY, some fine sand, cohesive, low plasticity, grey, damp	16.00	16-18ft			
18			18-20ft		100	
20	SW-SAND, medium to coarse grained, with some clay, grey/tan, damp	20.00	20-22ft			
22			22-24ft		80	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB089
DATE COMPLETED: 7 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	CL-SANDY CLAY, silty, fine grained sand, cohesive, some gravel and organics, grey, damp, odor		0-2ft			
2					60	
			2-4ft			
		3.50				
4	SP-SAND, fine to medium grained, grey, damp	4.00				
	SC-CLAYEY SAND, medium to coarse grained,d slightly cohesive, grey, damp		4-6ft			
6					90	
			6-8ft			
8						
			8-10ft			
10					100	
		10.50				
	CL-SILTY CLAY, slightly cohesive, grey, damp	11.00	10-12ft			
12	SW-SAND, medium to coarse grained, loose, some clay, grey/tan, damp					
			12-14ft			
14					50	
			14-16ft			
		15.50				
16	CL-SILTY CLAY, cohesive, grey, dry	16.00				
	SP-SAND, medium to coarse grained, loose, grey/tan, wet		16-18ft			
18		18.00			50	
	SW-SAND, coarse sand, with gravel, tan/grey, damp	18.50				
	CH-CLAY, hard, cohesive, very low plasticity, grey, dry		18-20ft			
20	- Refusal at 20.00ft BGS	20.00				
	END OF BOREHOLE @ 20.00ft BGS					
22						
24						
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB090
DATE COMPLETED: 2 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	SW-SAND, fine to medium grained, some gravel, organics, grey/tan, damp	1.00	0-2ft			
2	CL-SANDY CLAY, fine to medium grained sand, slightly cohesive, grey-tan, damp, odor		2-4ft		60	
4			4-6ft			
6		6.50			65	
	SC-CLAYEY SAND, fine to medium grained, some organics, grey/tan, damp		6-8ft			
8	CL-SANDY CLAY, silty, fine grained sand, slightly cohesive, grey, damp	8.00	8-10ft			
10	SP-SAND, some clay, fine to medium grained, loose, grey, damp	9.50	10-12ft		80	
12	CL-SILTY CLAY, cohesive, low plasticity, grey	11.50	12-14ft			
14	- interbedded thin grey/tan fine to medium sand layers at 13.50ft BGS		14-16ft		100	
16	- interbedded thin grey/tan fine to medium sand layers at 15.50ft BGS					
	- interbedded thin grey/tan fine to medium sand layers at 17.00ft BGS		16-18ft			
18			18-20ft		60	
20	- interbedded thin grey/tan fine to medium sand layers at 20.50ft BGS		20-22ft			
22			22-24ft		50	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB091
DATE COMPLETED: 3 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, cohesive, low plasticity, grey, damp, some broken shells, organics		0-2ft		60	
2			2-4ft			
	SP-SAND, fine to medium grained, grey/tan/brown	3.00				
4			4-6ft			
	CL-SILTY CLAY, cohesive, low plasticity, grey, damp	5.00			80	
6			6-8ft			
8			8-10ft			
10					100	
	- thin interbedded grey/tan fine to coarse grained sand layers at 11.00ft BGS		10-12ft			
12			12-14ft			
14					60	
			14-16ft			
16	- thin interbedded grey/tan fine to coarse grained sand layers at 16.00ft BGS		16-18ft			
18					70	
	SP-SAND, medium to coarse grained, loose, grey/tan, damp	19.00	18-20ft			
20	CH-CLAY, hard, cohesive, some plasticity, light grey/reddish brown, with some sand intrusions	20.00	20-22ft			
22					100	
			22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB092
DATE COMPLETED: 25 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	CL-SANDY CLAY, fine grained, silty, some small gravel, loose, dark grey, wet, odor		0-2ft, 2-4ft		40	
2, 4	CL-SANDY CLAY, fine to medium grained sand, silty, slightly cohesive, low plasticity, grey/brown, wet	4.00	4-6ft, 6-8ft		80	
6, 8, 10	- very thin interbedded grey/tan medium sand layers, wet at 11.00ft BGS		8-10ft, 10-12ft		100	
12, 14	SP-SAND, medium to coarse grained, loose, grey/tan, wet	14.50	12-14ft, 14-16ft		100	
16, 18	CH-CLAY, hard, cohesive, some plasticity, grey-reddish brown, damp	19.00	16-18ft, 18-20ft		80	
20, 22, 24	END OF BOREHOLE @ 24.00ft BGS	24.00	20-22ft, 22-24ft		100	
26, 28, 30, 32, 34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB093
DATE COMPLETED: 24 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	SM-SILTY SAND, medium to coarse grained, grey, wet, odor	1.00	0-2ft			
2	CL-SILTY CLAY, cohesive, low plasticity, grey, damp	3.50	2-4ft		100	
4	SC-CLAYEY SAND, fine to medium grained, some cohesiveness, grey, damp	7.00	4-6ft			
6			6-8ft		90	
8	CL-SILTY CLAY, soft, some cohesiveness, grey, damp		8-10ft			
10			10-12ft		100	
12			12-14ft			
14			14-16ft		100	
16	SC-CLAYEY SAND, silty, fine to medium grained, grey, damp, with some shells	15.50	16-18ft			
18	SW-SAND, tan and grey, wet, with shells and gravel	17.00	18-20ft		50	
20			20-22ft			
22			22-24ft		50	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB094
DATE COMPLETED: 26 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SANDY CLAY, silty, fine grained, loose, slightly cohesive, dark grey, wet, odor		0-2ft, 2-4ft, 4-6ft, 6-8ft		90, 100	
	SP-SAND, loose, grey/tan, wet	8.50	8-10ft		100	
	CL-SANDY CLAY, silty, medium grained, cohesive, low plasticity, grey, damp	10.50	10-12ft, 12-14ft, 14-16ft		50	
	SP-SAND, loose, grey/tan, wet	16.00				
	CH-CLAY, hard, cohesive, some plasticity, grey-reddish brown, dry	16.50	16-18ft, 18-20ft, 20-22ft, 22-24ft		60, 60	
	END OF BOREHOLE @ 24.00ft BGS	24.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB095
DATE COMPLETED: 28 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	CL-SANDY CLAY, silty, fine grained, cohesive, low plasticity, dark grey, damp, odor		0-2ft		100	
	SC-CLAYEY SAND, fine to medium grained, slightly cohesive to loose, grey, damp	3.00	2-4ft, 4-6ft, 6-8ft		90	
	CL-SILTY CLAY, slightly cohesive to loose, grey, wet	8.50	8-10ft			
	SC-CLAYEY SAND, fine to medium grained, slightly cohesive to loose, grey, damp	9.50	10-12ft, 12-14ft		100, 85	
	SP-SAND, medium to coarse grained, loose, grey, wet	15.00	14-16ft, 16-18ft, 18-20ft		100	
	CH-CLAY, hard, grey-reddish brown, dry, some shells	21.00	20-22ft, 22-24ft		80	
	END OF BOREHOLE @ 24.00ft BGS	24.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB096
DATE COMPLETED: 27 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SANDY CLAY, silty, fine grained, cohesive, loose, grey, wet, odor		0-2ft, 2-4ft		70	
4	SC-CLAYEY SAND, fine to medium grained, some cohesiveness, loose, grey, damp	4.00	4-6ft, 6-8ft		70	
8	CL-SANDY CLAY, silty, fine grained, cohesive, loose, grey, damp	7.50	8-10ft, 10-12ft		100	
12	SP-SAND, fine to coarse grained, some clay, slightly cohesive, loose, grey, wet	12.00	12-14ft, 14-16ft, 16-18ft		75	
18	CH-CLAY, some medium to coarse gravel, low plasticity, hard, cohesive, light grey	18.00	18-20ft, 20-22ft, 22-24ft		80, 60	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB097
DATE COMPLETED: 22 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	ML-SILT, with some clay, loose, non cohesive, dark grey, wet	1.00	0-2ft			
	SW-SAND, with large gravel, medium to coarse grained, tan, damp	1.50				
2	CL-SILTY CLAY, slightly cohesive, low plasticity, fine sand, grey, damp		2-4ft		50	
4	SP-SAND, medium to coarse grained, loose, grey/tan, wet	4.00	4-6ft			
6			6-8ft		30	
8	CL-SILTY CLAY, grey, dry, very thin reddish brown sand layer at 8.5ft BGS	7.50	8-10ft			
10	CH-CLAY, hard, cohesive, some plasticity, reddish brown/grey mix, dry	9.50	10-12ft		50	
12			12-14ft			
14			14-16ft		100	
16	- Refusal at 16.00ft BGS	16.00				
	END OF BOREHOLE @ 16.00ft BGS					
18						
20						
22						
24						
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB098
DATE COMPLETED: 20 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, with some large coarse gravel, loose, dark grey, wet	1.00	0-2ft			
2	GW-GRAVEL, coarse grained, with some medium sand, tan/brown, wet	3.00	2-4ft		60	
4	CL-SILTY CLAY, with some coarse gravel, dark grey, wet - soupy from 4.00 to 8.00ft BGS		4-6ft			
6			6-8ft		25	
8	- cohesive, soft from 8.00 to 10.00ft BGS		8-10ft			
10	SC-CLAYEY SAND, fine to medium grained, slightly cohesive, grey, damp	10.00	10-12ft		25	
12	CL-SANDY CLAY, silty, fine grained, slightly cohesive, grey, damp	12.00	12-14ft			
14			14-16ft		25	
16	SC-CLAYEY SAND, medium to coarse grained, loose, grey, damp SW-SAND, with coarse gravel, fine to medium grained sand, loose, tan/grey, damp to wet	15.50 16.00	16-18ft			
18			18-20ft		45	
20			20-22ft			
22			22-24ft		15	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB099
DATE COMPLETED: 24 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	GW-SANDY GRAVEL, with shells, brown, saturated					
	ML-CLAYEY SILT, dark grey, saturated, shells	1.00	0-2ft			
2			2-4ft		30	
4		5.00	4-6ft			
	CL-SILTY CLAY, with shells, grey, moist	6.00				
6	CL-SANDY CLAY, grey, wet to moist, sand in interbedded layers		6-8ft		50	
8			8-10ft			
10			10-12ft			
12	SC-CLAYEY SAND, few gravel, sand with clay, grey, saturated, organics layers, 1-inch rootlets and wood at 12ft BGS - wood at 13.50ft BGS	12.00	12-14ft		90	
14			14-16ft			
16			16-18ft		80	
18	SP-SAND, with clay, fien grained sand, grey, saturated, clay in interbedded layers	18.00	18-20ft			
20	- clay less with depth, saturated sand at 21.00ft BGS		20-22ft		80	
22			22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB100
DATE COMPLETED: 23 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, very slight cohesiveness, loose, grey, wet		0-2ft		30	
2			2-4ft			
	SC-CLAYEY SAND, silty, very fine grained, grey, damp	3.00				
4			4-6ft			
6			6-8ft		40	
8			8-10ft			
10	SP-SAND, medium to coarse grained, loose, grey/tan, damp, with some shells	9.50	10-12ft		75	
12	CH-CLAY, hard, cohesive, with some gravel, reddish-brown, dry	11.50				
	CH-CLAY, cohesive, very hard, low plasticity, grey, dry	12.50	12-14ft			
14			14-16ft		90	
16	- Refusal at 16.00ft BGS	16.00				
	END OF BOREHOLE @ 16.00ft BGS					
18						
20						
22						
24						
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB101
DATE COMPLETED: 25 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	SW-GRAVELLY SAND, brown, saturated, shells	0.50				
	ML-CLAYEY SILT, dark grey, saturated		0-2ft			
2			2-4ft		40	
4			4-6ft			
6	CL-SILTY CLAY, grey, moist	6.00				
	SC-CLAYEY SAND, grey to light brown, saturated	7.00	6-8ft		70	
8			8-10ft			
10						
	CL-SANDY CLAY, grey, wet	11.00	10-12ft			
12					70	
	SP-SAND, with clay, grey, saturated, clay interbedded in small layers	13.00	12-14ft			
14			14-16ft			
16			16-18ft		80	
18	- 1-inch clay zone at 18.00ft BGS		18-20ft			
20			20-22ft			
22	- 1-inch clay zone at 22.00ft BGS		22-24ft		40	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB102
DATE COMPLETED: 19 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, cohesive, slightly plastic, grey, damp to wet, odor to 5ft BGS - thin tan interbedded fine to medium sand at 1.00ft BGS - thin tan interbedded fine to medium sand at 2.00ft BGS - thin tan interbedded fine to medium sand at 3.50ft BGS		0-2ft 2-4ft 4-6ft		90	
	SP-SAND, fine to medium grained, some clay, some organics, tan/grey	6.00	6-8ft		60	
	CL-SANDY CLAY, silty, fine grained, slightly cohesive, soft, low plasticity, grey, wet - loose from 16.00 to 19.00ft BGS - cohesive, hard, slightly plastic, dry at 20.00ft BGS	8.50	8-10ft 10-12ft 12-14ft 14-16ft 16-18ft 18-20ft 20-22ft 22-24ft		100 100 90 80	
	END OF BOREHOLE @ 24.00ft BGS	24.00				

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB103
DATE COMPLETED: 21 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value	SAMPLE PID (ppm)
	SP-SAND, fine to medium grained, loose, grey/tan, wet		0-2ft				
2			2-4ft				10
4			4-6ft				
6			6-8ft				20
8	SW-SAND, with some gravel, medium to very coarse grained, loose, tan, wet, some shells	8.00	8-10ft				
10			10-12ft				30
12	CH-CLAY, very hard, cohesive, slight plasticity, grey, dry	12.00	12-14ft				100
14	- Refusal at 14.00ft BGS	14.00					
	END OF BOREHOLE @ 14.00ft BGS						
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB104
DATE COMPLETED: 24 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, with some gravel, slightly cohesive, dark grey, wet		0-2ft, 2-4ft		90	
	SP-SAND, fine to medium grained, with some clay, loose, grey, wet	3.50				
	CL-SANDY CLAY, silty, fine grained, slightly cohesive, low plasticity, grey, damp	4.00	4-6ft, 6-8ft		100	
			8-10ft, 10-12ft		100	
	SP-SAND, medium to coarse grained, loose, light grey/tan, damp	12.00	12-14ft, 14-16ft		45	
	CL-SANDY CLAY, fine grained sand, hard, cohesive, some plasticity, grey/brown, dry	16.00	16-18ft, 18-20ft		55	
	- Refusal at 20.00ft BGS	20.00				
	END OF BOREHOLE @ 20.00ft BGS					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB105
DATE COMPLETED: 23 July 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SANDY CLAY, silty, fine grained sand, slightly cohesive, grey, wet		0-2ft, 2-4ft		60	
	SP-SAND, some clay, fine to medium gtrained, loose, slightly cohesive, grey, damp	5.00	4-6ft		100	
	CL-SANDY CLAY, silty, fine grained sand, slightly cohesive, grey, wet	6.50	6-8ft, 8-10ft		80	
	SC-CLAYEY SAND, fine to medium grained, loose, grey, damp	11.00	10-12ft, 12-14ft		100	
	CL-SILTY CLAY, cohesive, low plasticity, grey, damp	15.00	14-16ft			
	SP-SAND, fine to very fine, compact, with some clay, grey, damp	17.00	16-18ft		90	
	CH-CLAY, hard, cohesive, low plasticity, some medium to coarse gravel, grey/tan, dry	19.00	18-20ft, 20-22ft, 22-24ft		60	
	END OF BOREHOLE @ 24.00ft BGS	24.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
PROJECT NUMBER: 11215702
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
LOCATION: Channelview, TX

HOLE DESIGNATION: SJSB106
DATE COMPLETED: 8 August 2021
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, some fine sand, cohesive, brown, wet, some organics		0-2ft			
2	CL-SILTY CLAY, cohesive, dark grey, damp, odor	2.00	2-4ft		60	
4			4-6ft			
6	SC-CLAYEY SAND, fine to medium grained, loose, grey, damp	6.00	6-8ft		60	
8	CL-SILTY CLAY, cohesive, dark grey, damp, odor	8.00	8-10ft			
10	CL-SANDY CLAY, silty, fine grained, cohesive, some plasticity, grey/brown, damp	9.50	10-12ft		95	
12			12-14ft			
14			14-16ft		100	
16			16-18ft			
18			18-20ft		100	
20	SP-SAND, medium to coarse grained, loose, grey/tan, damp	19.00	20-22ft			
22	CH-CLAY, hard, cohesive, low plasticity, with some gravel, grey, dry, interbedded reddish brown	20.00	22-24ft		100	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

File: \\GHDNET\GHD\US\BATON ROUGE\PROJECTS\562\11215702\TECH\GINT\GINT-SDI LOGS\11215702-MI.GPJ Library File: GHD_ENVIRO_V04.GLB Report: OVERBURDEN LOG Date: 11/11/21

Appendix B

SDI Cone Penetration Test (CPT) Results

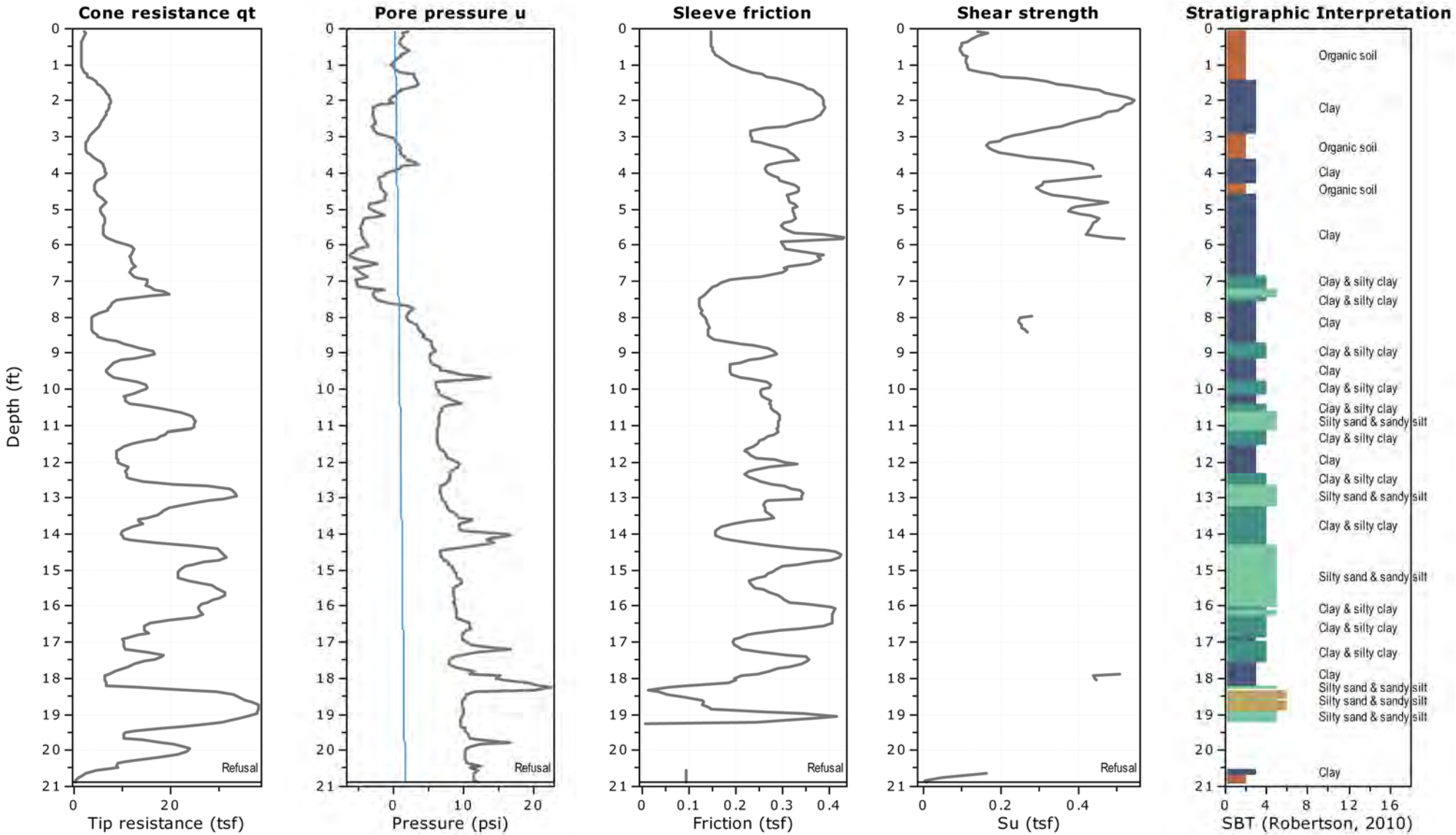
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-01B

Total depth: 20.89 ft, Date: 9/8/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



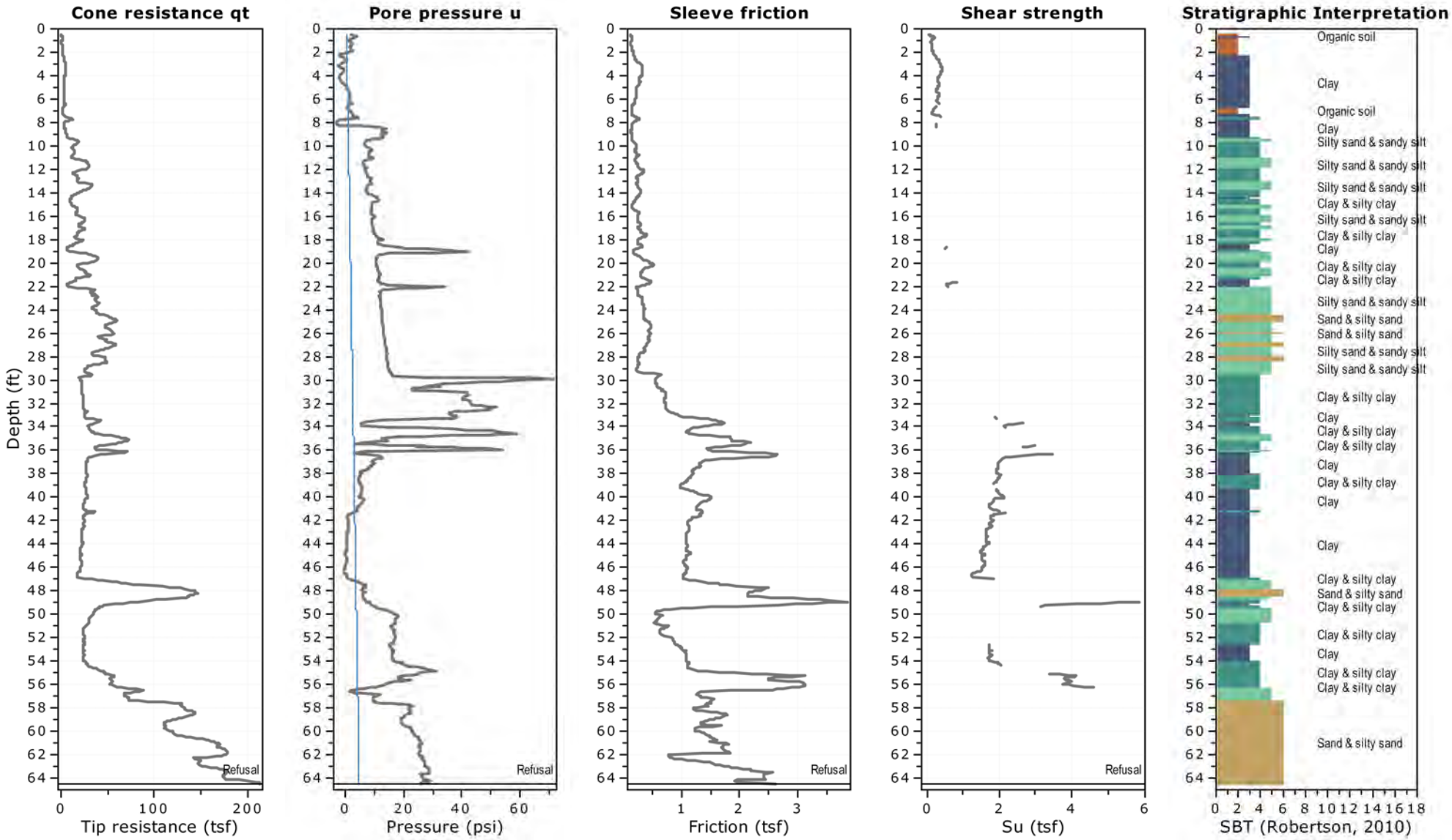
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-01D

Total depth: 64.45 ft, Date: 9/9/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



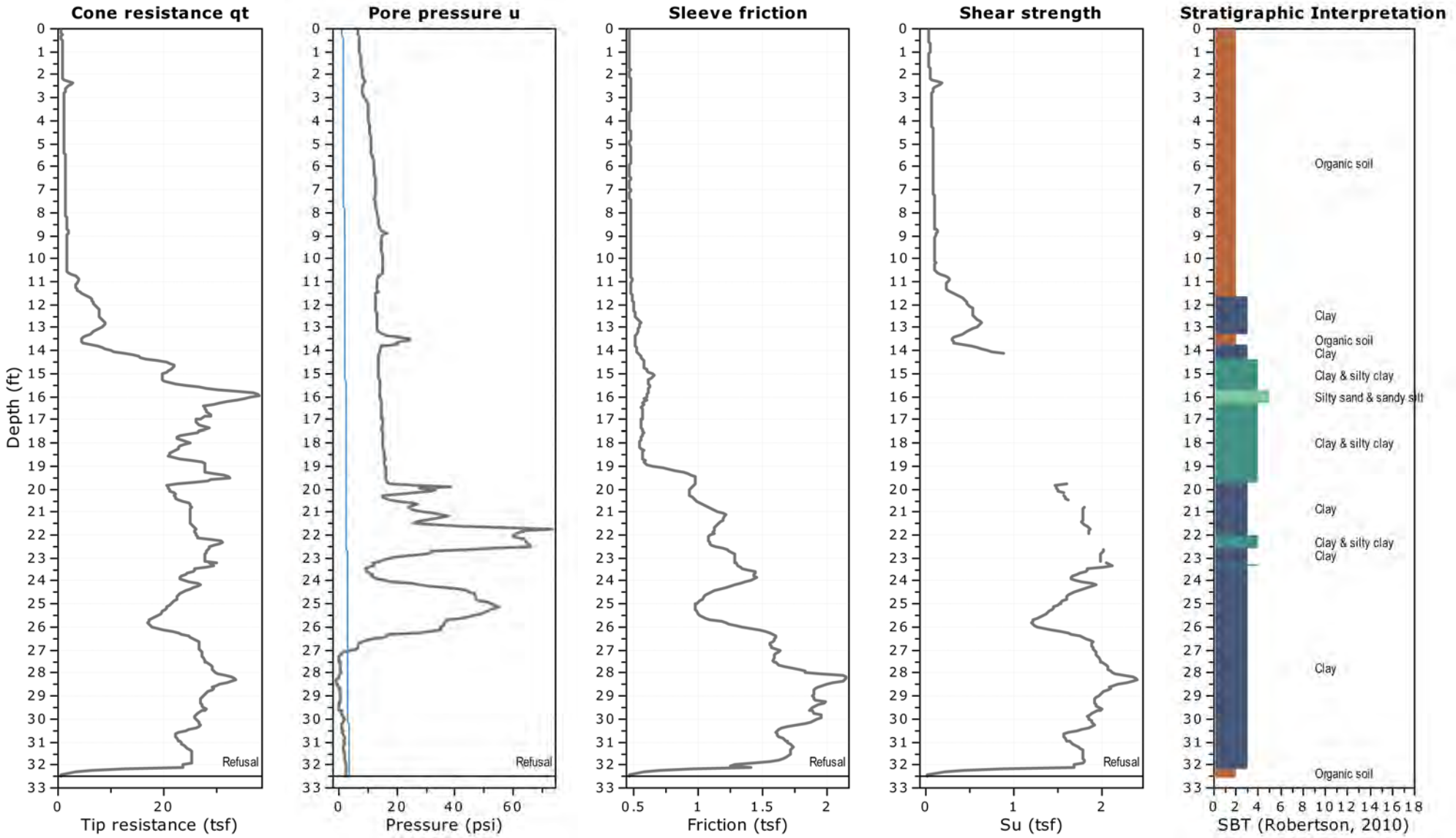
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-02

Total depth: 32.50 ft, Date: 9/10/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



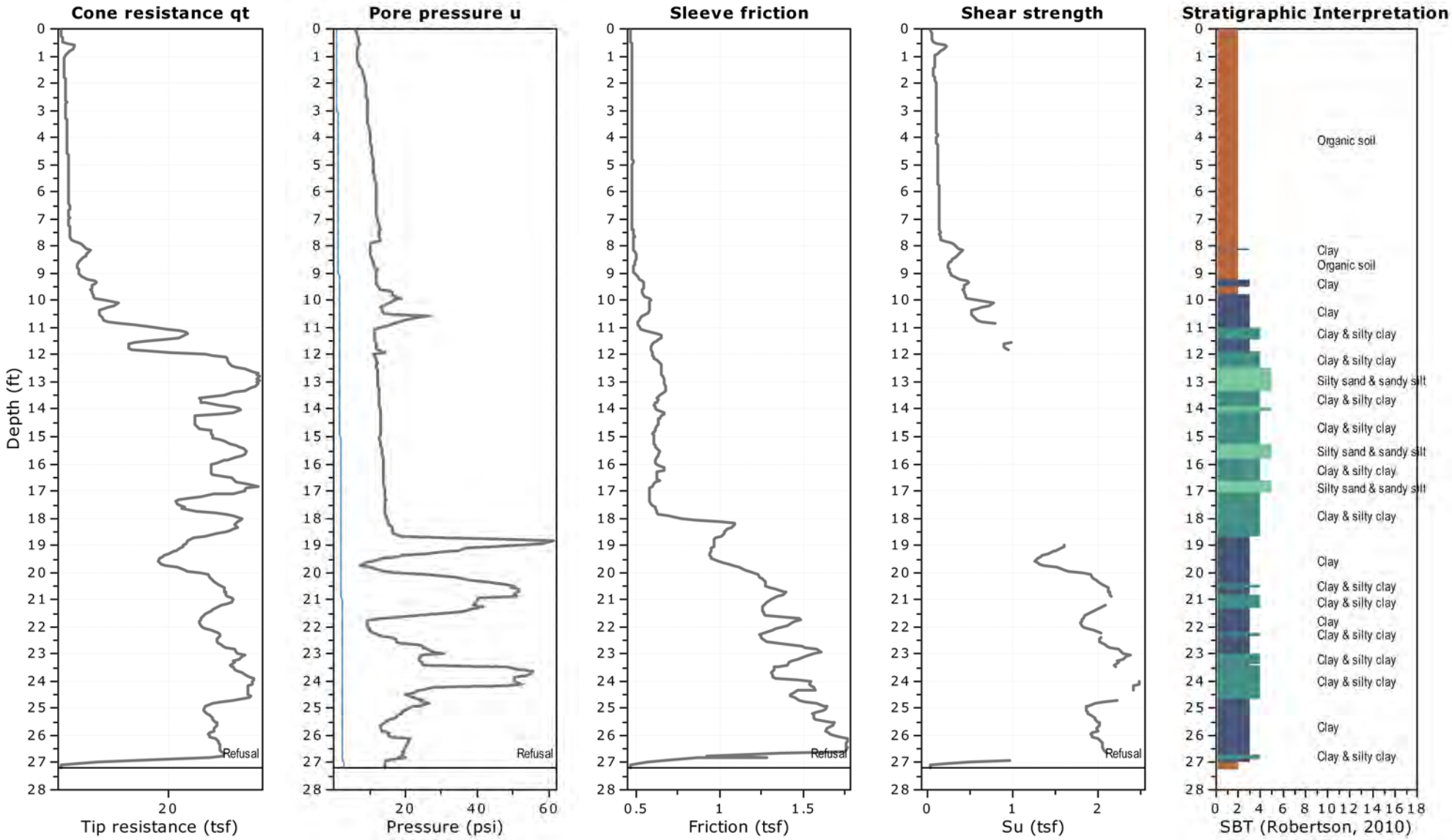
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-02A

Total depth: 27.17 ft, Date: 9/10/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



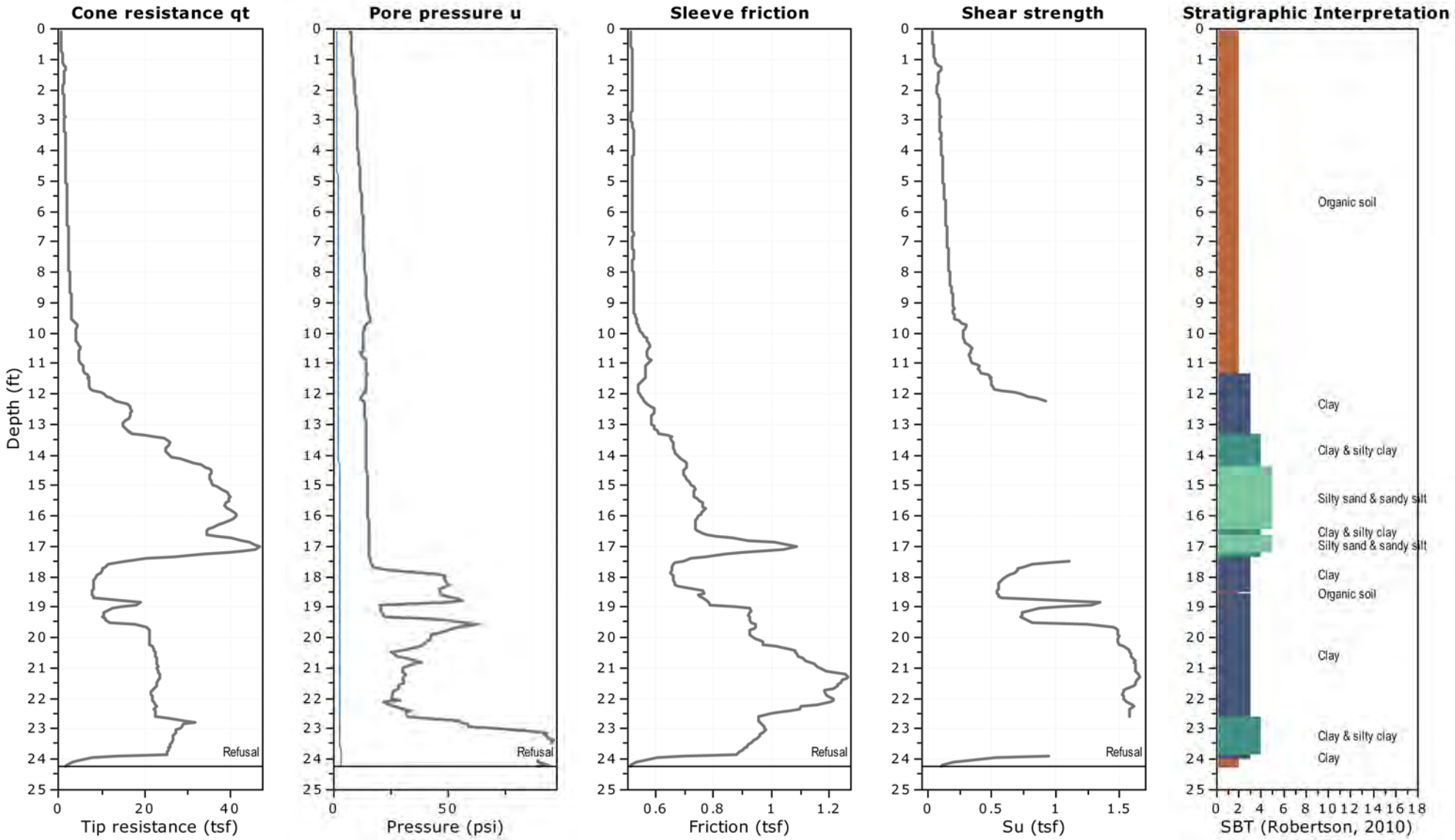
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-03

Total depth: 24.24 ft, Date: 9/12/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



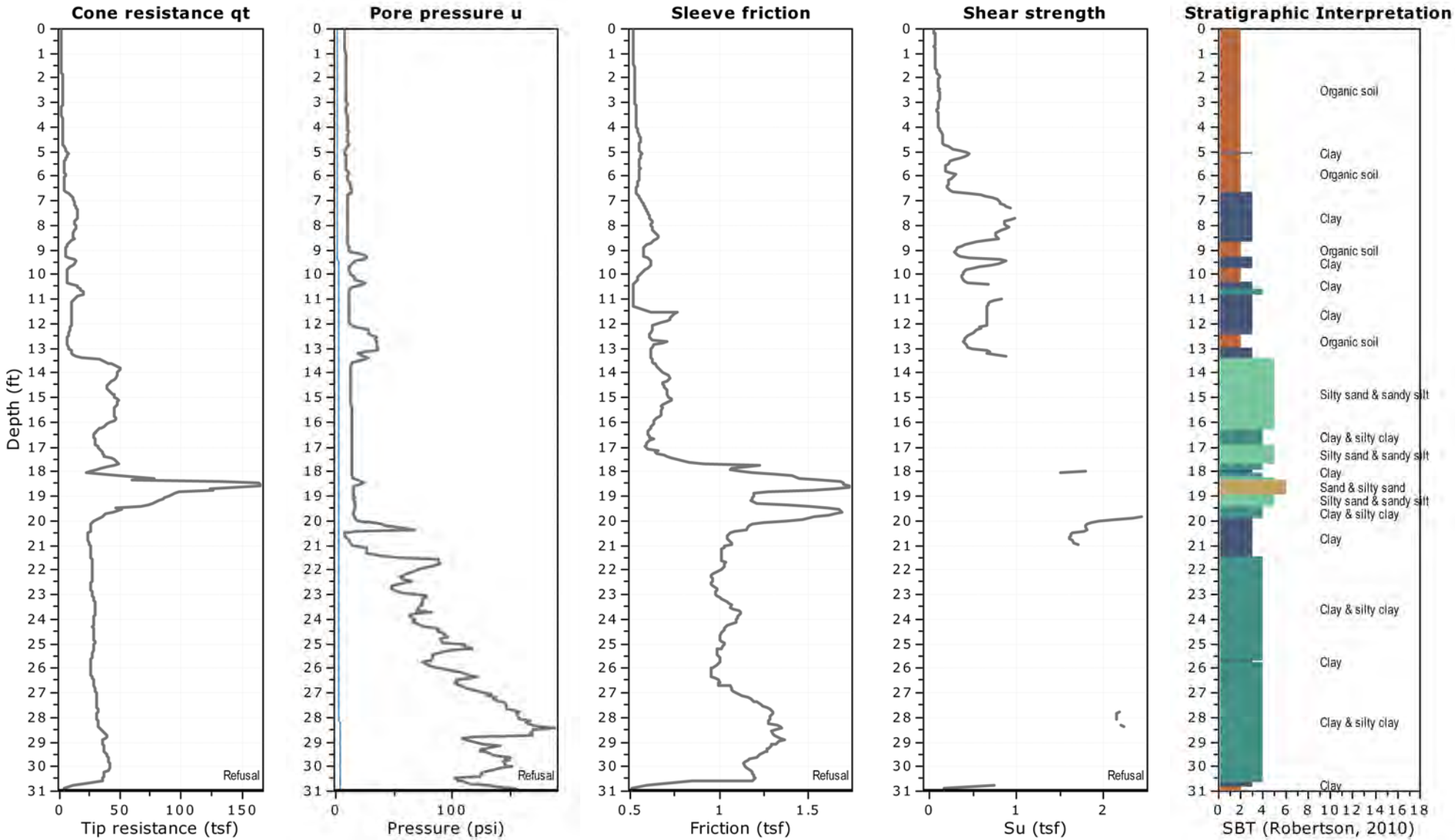
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-04

Total depth: 30.93 ft, Date: 9/12/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



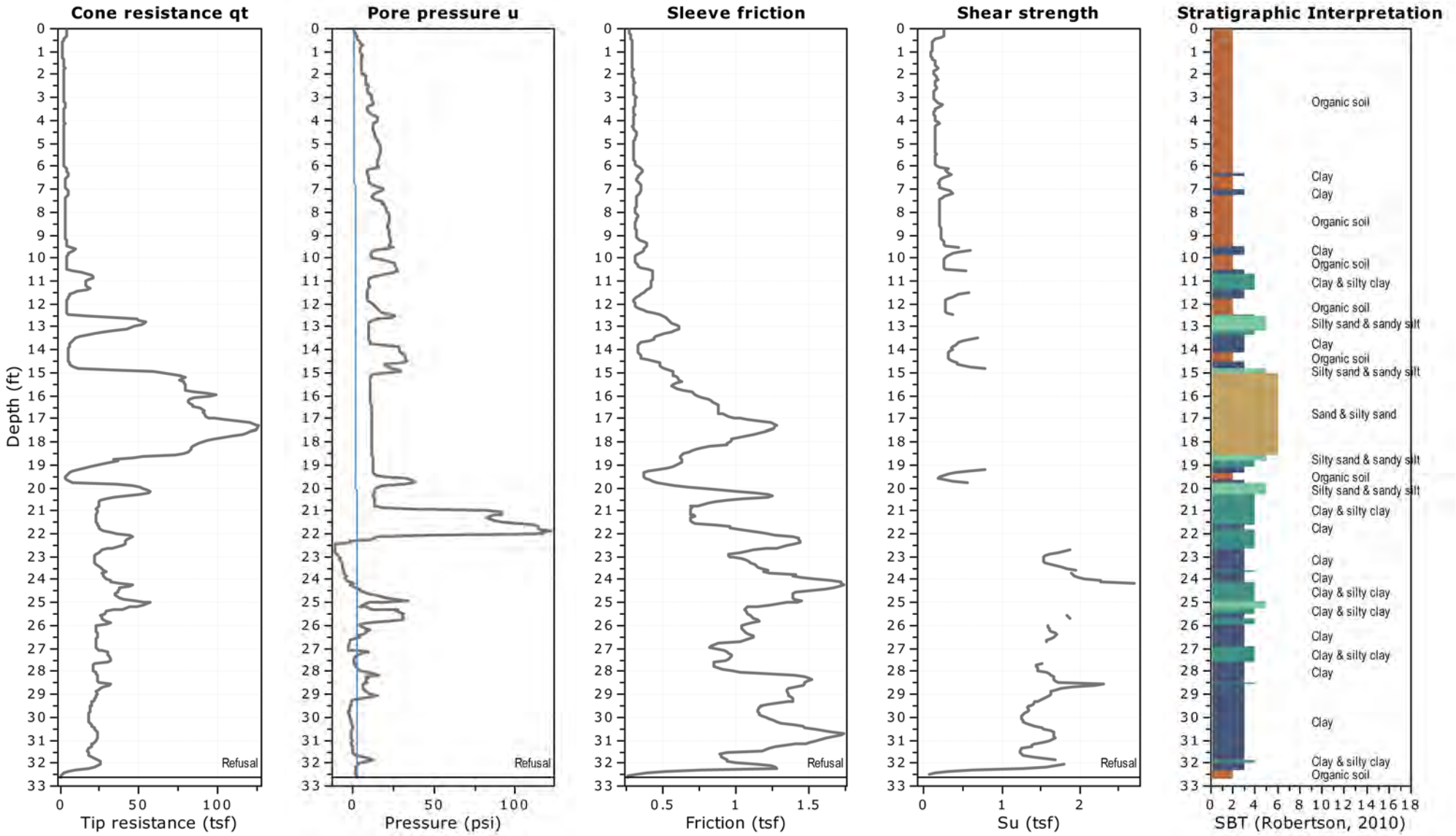
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-08

Total depth: 32.62 ft, Date: 9/11/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



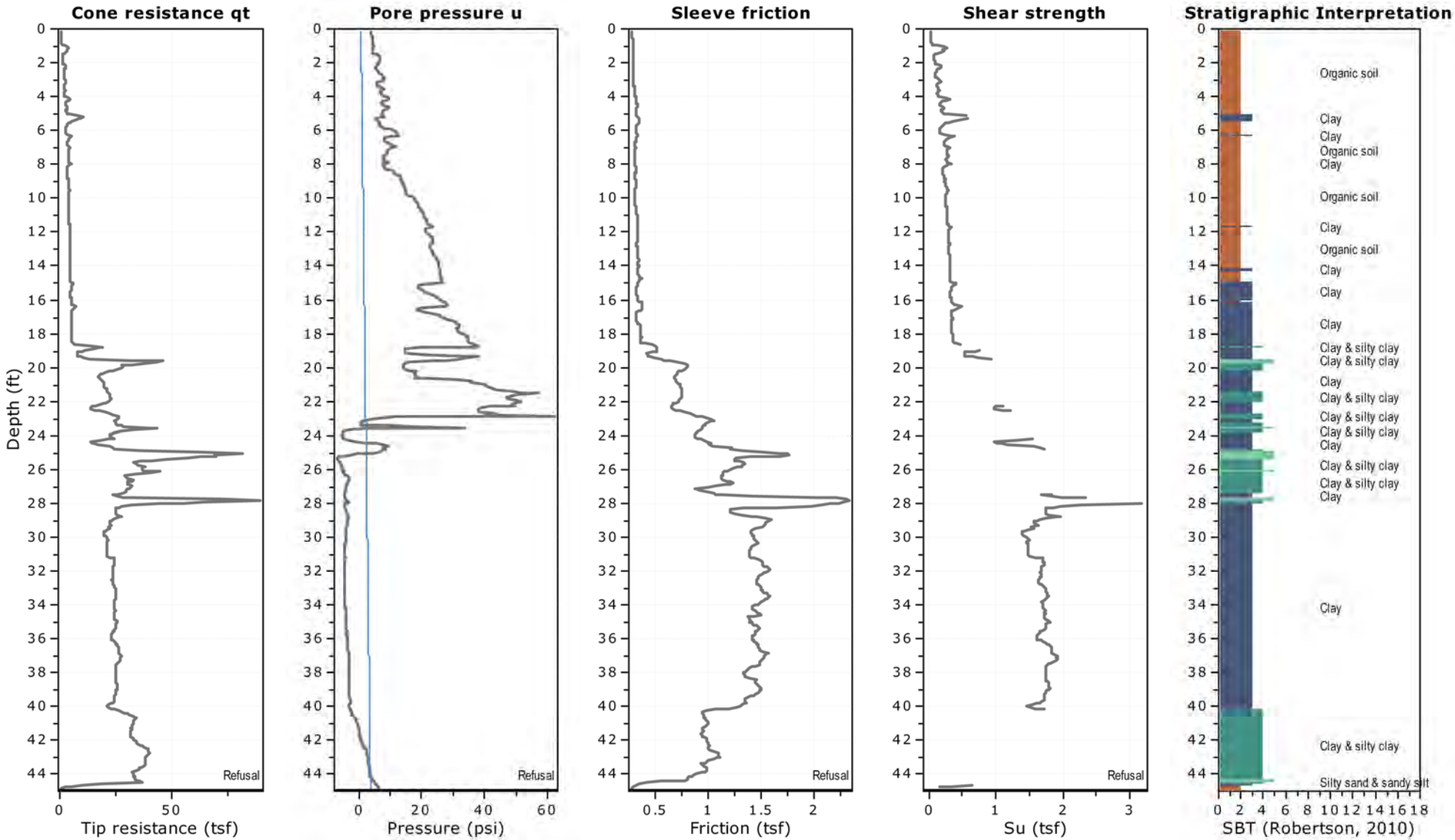
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-09

Total depth: 44.91 ft, Date: 9/11/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



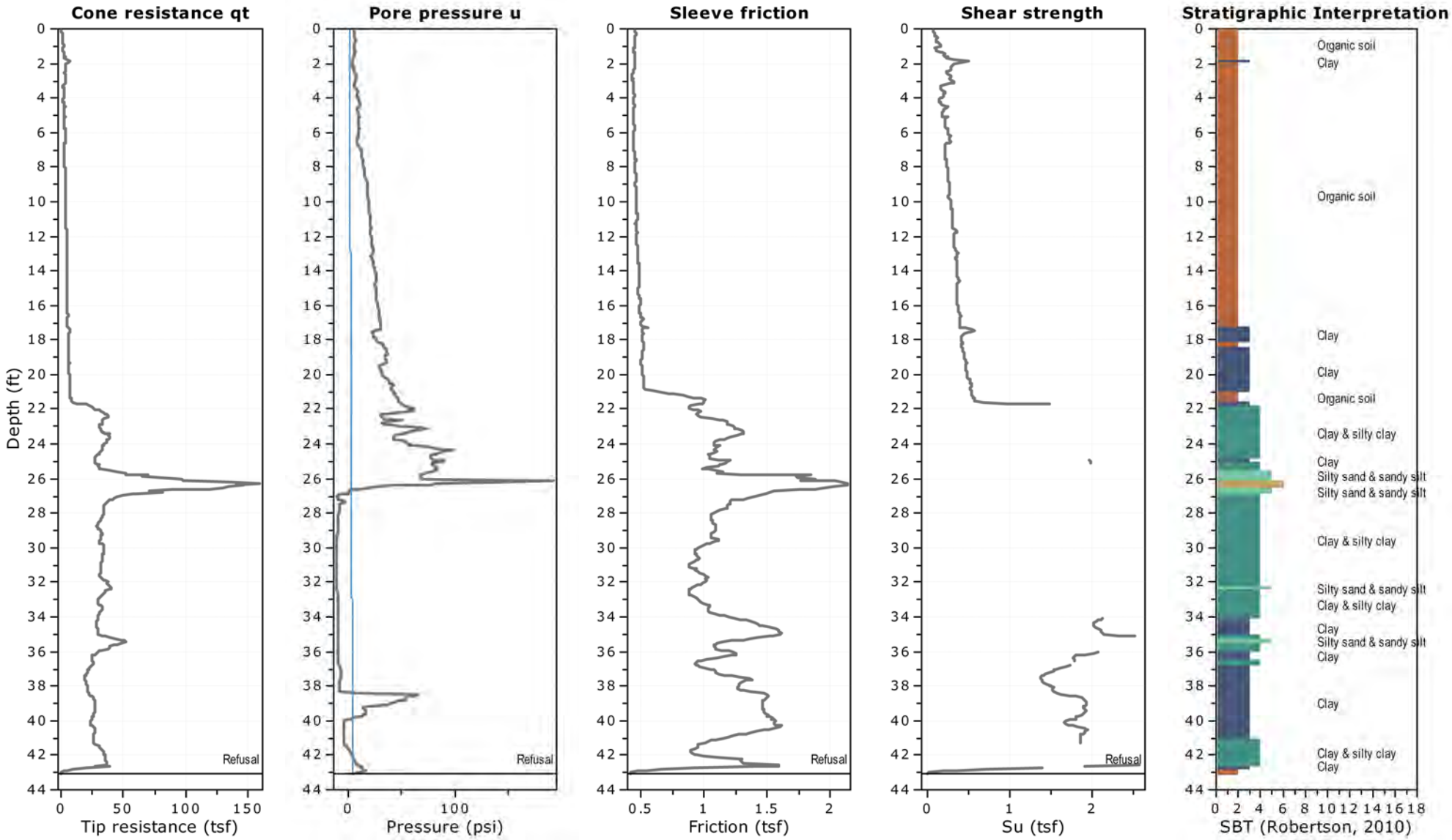
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-10

Total depth: 43.05 ft, Date: 9/11/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



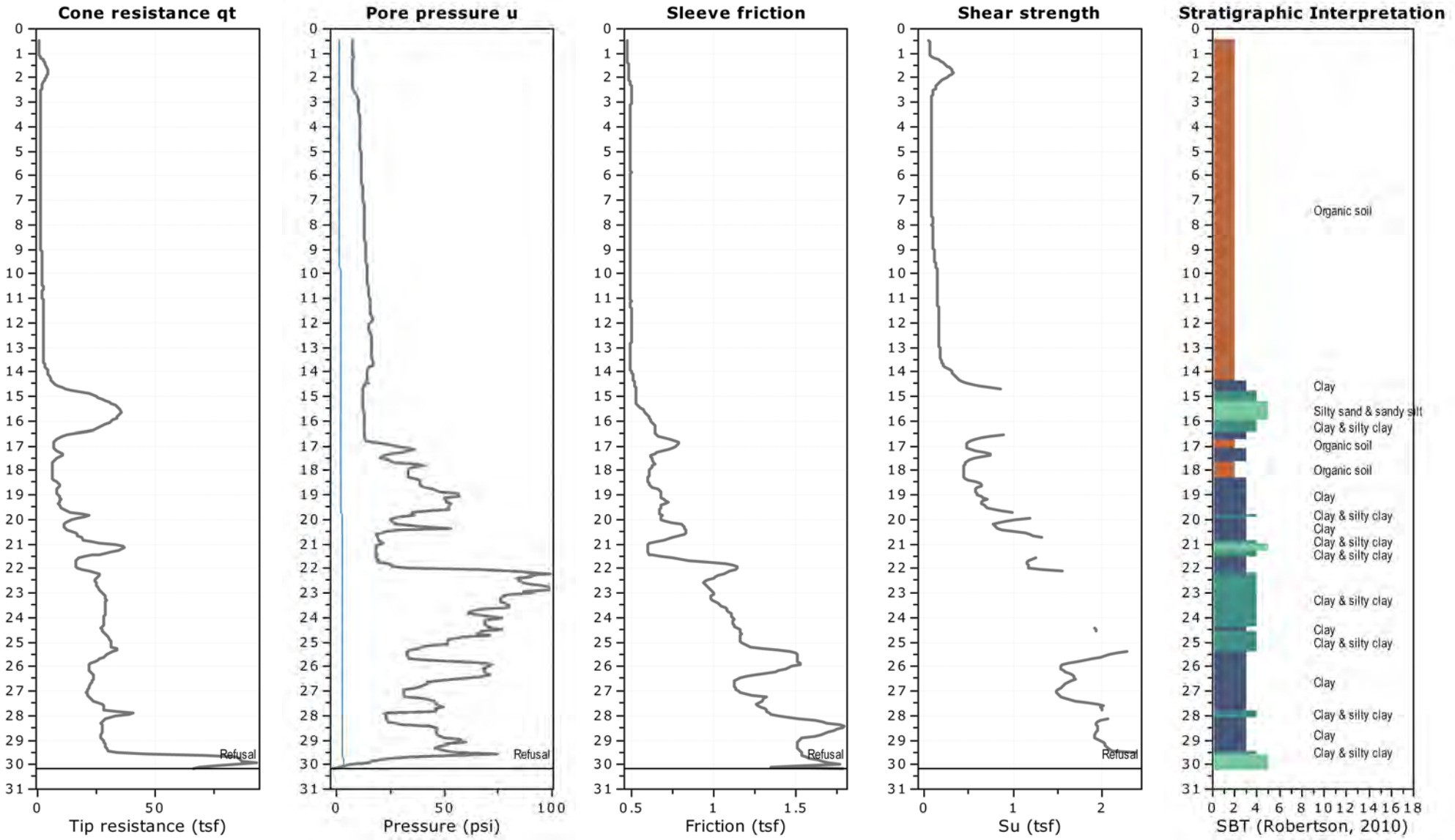
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-02A-002

Total depth: 30.19 ft, Date: 9/16/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



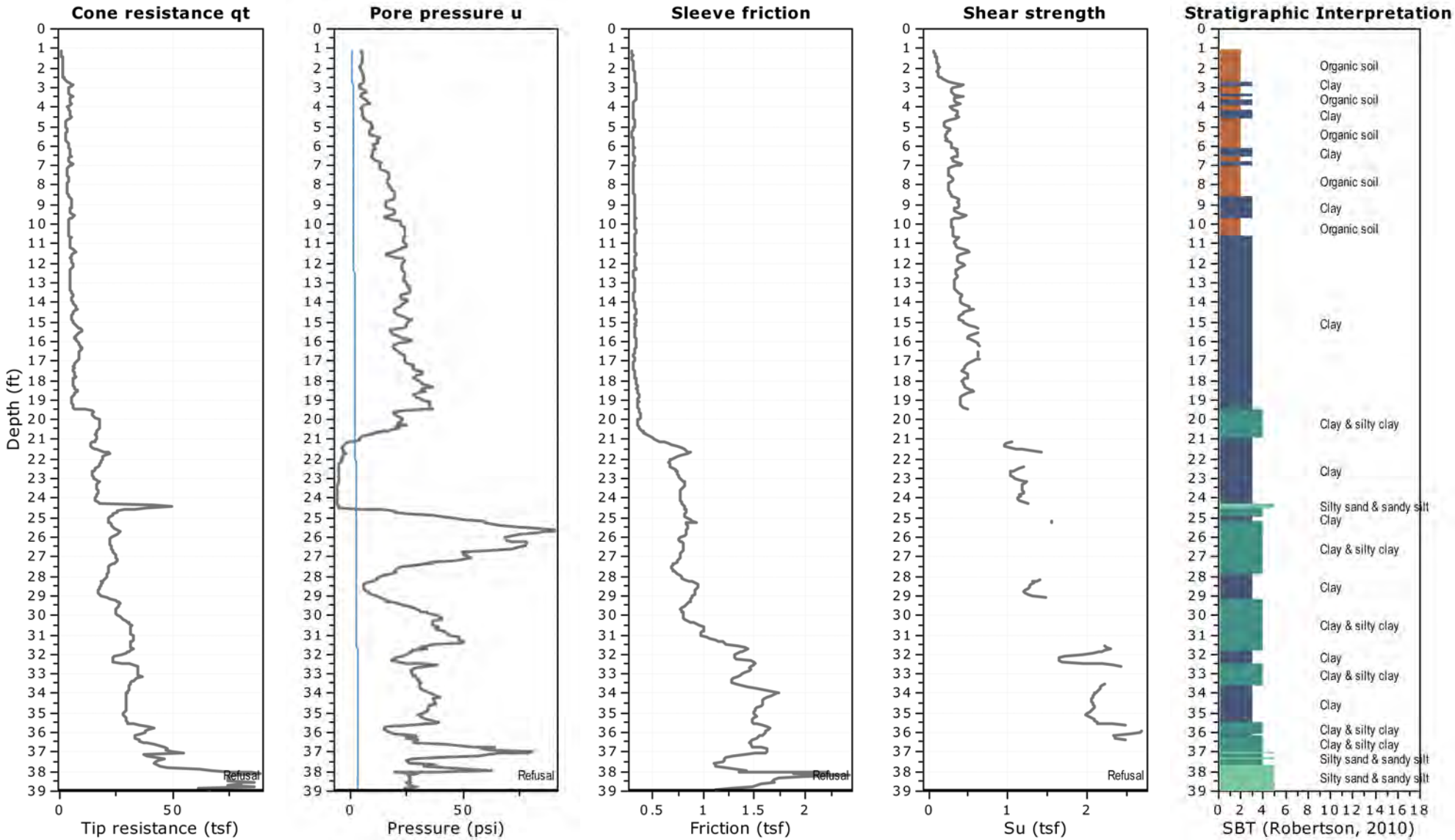
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-05

Total depth: 38.92 ft, Date: 9/10/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



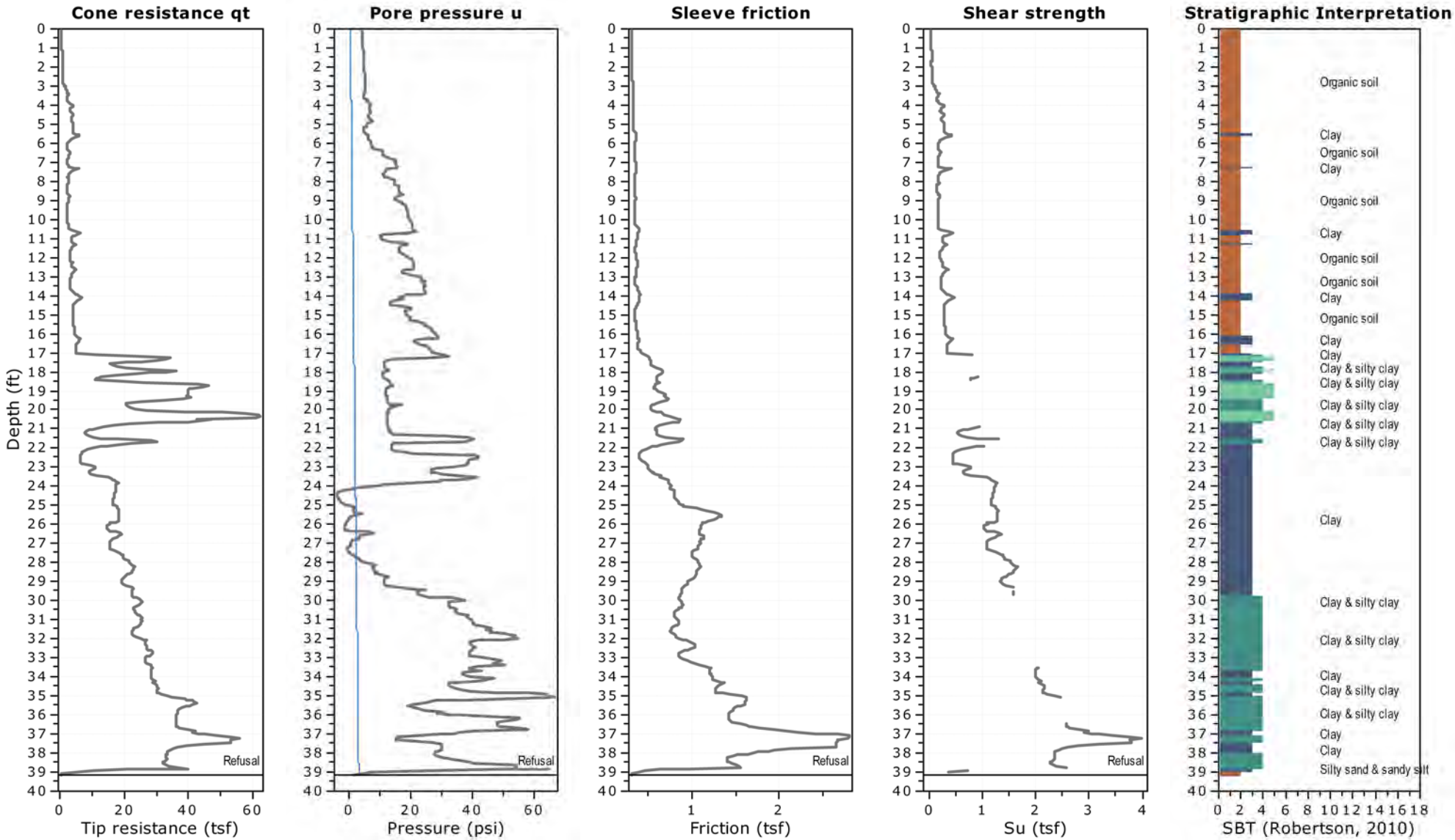
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-06

Total depth: 39.13 ft, Date: 9/15/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



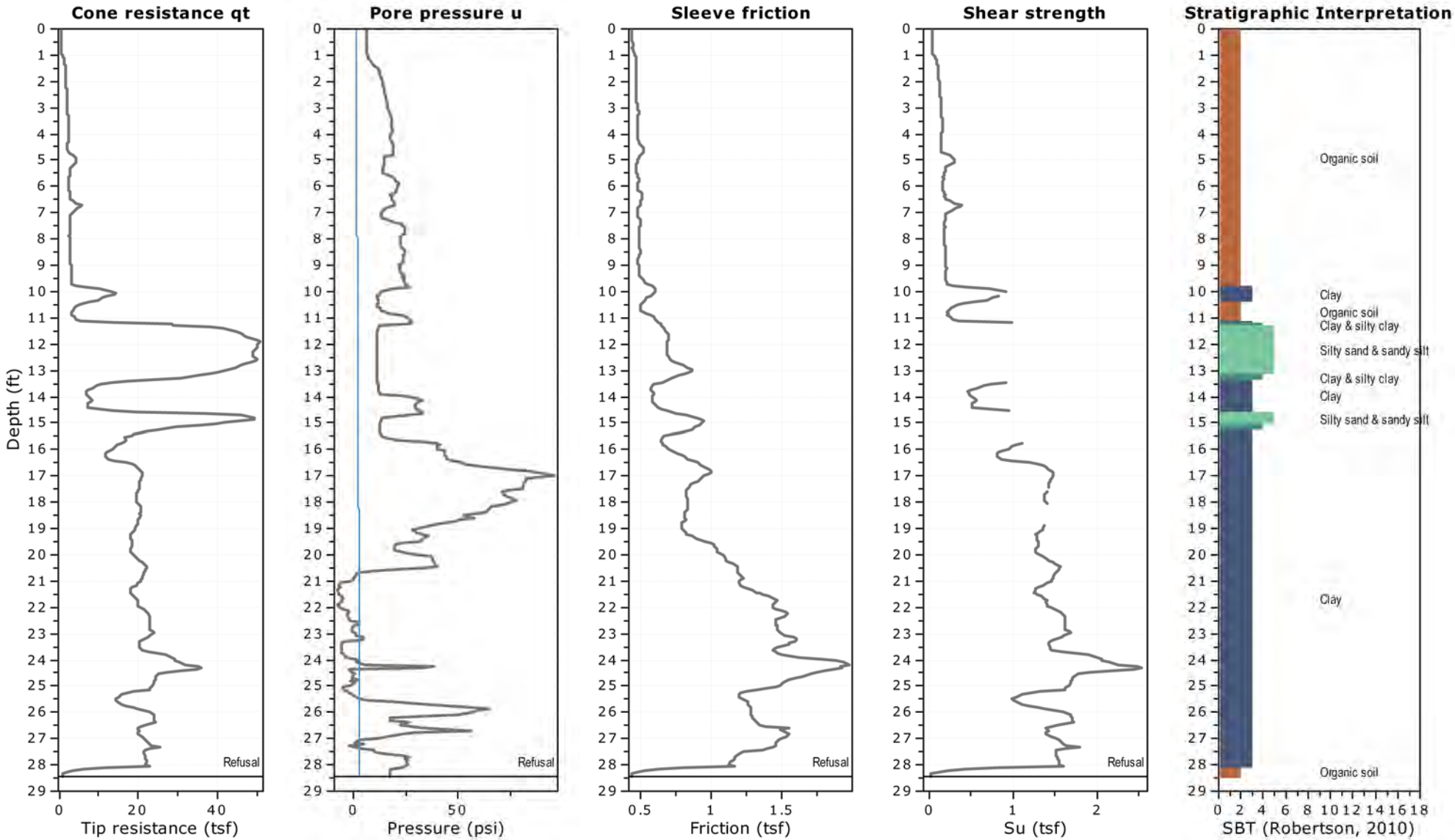
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-07A

Total depth: 28.41 ft, Date: 9/15/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



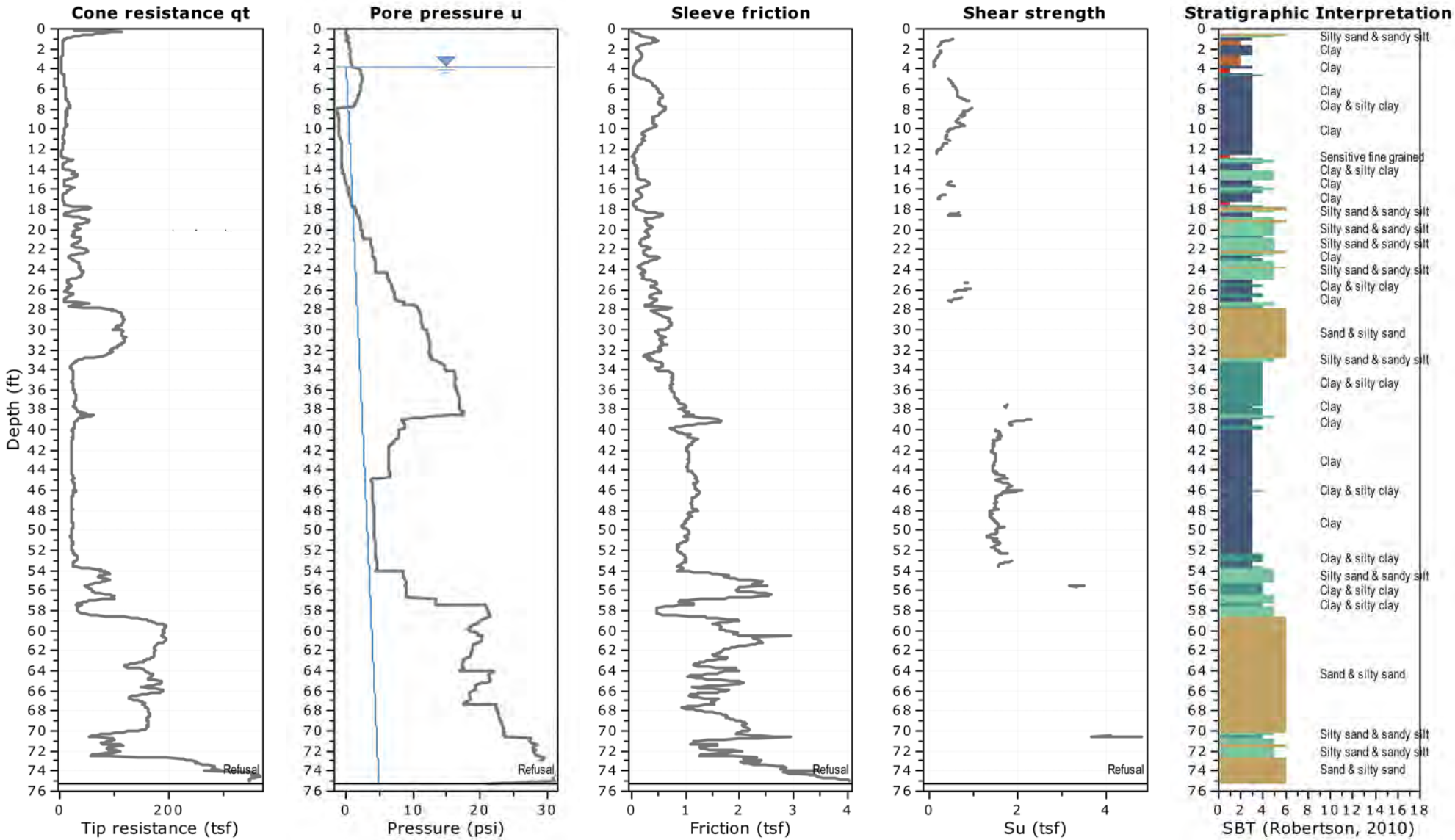
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-11

Total depth: 75.24 ft, Date: 8/3/2021

Cone Operator: Walker-Hill Environmental



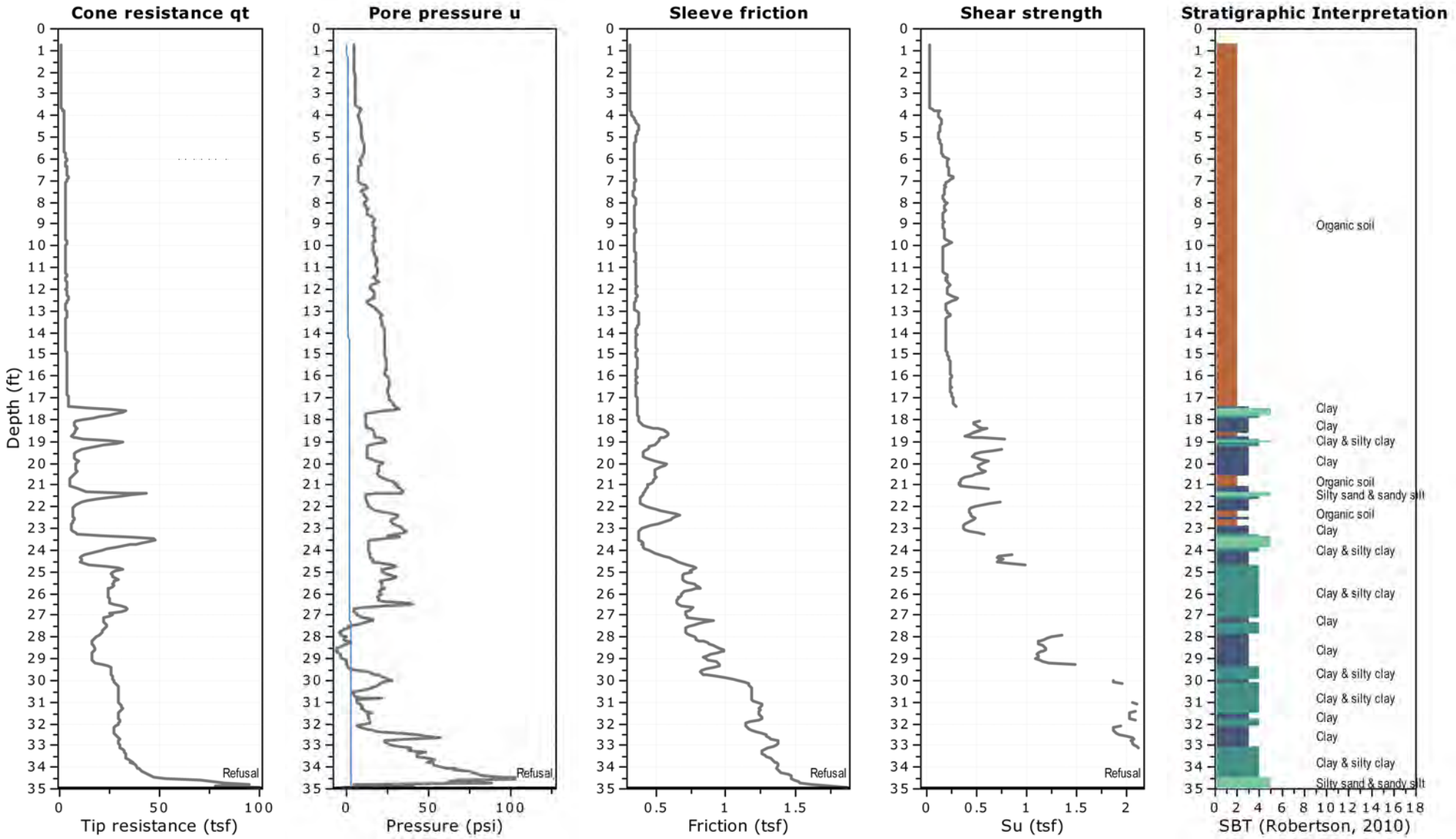
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-06A

Total depth: 34.92 ft, Date: 9/16/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



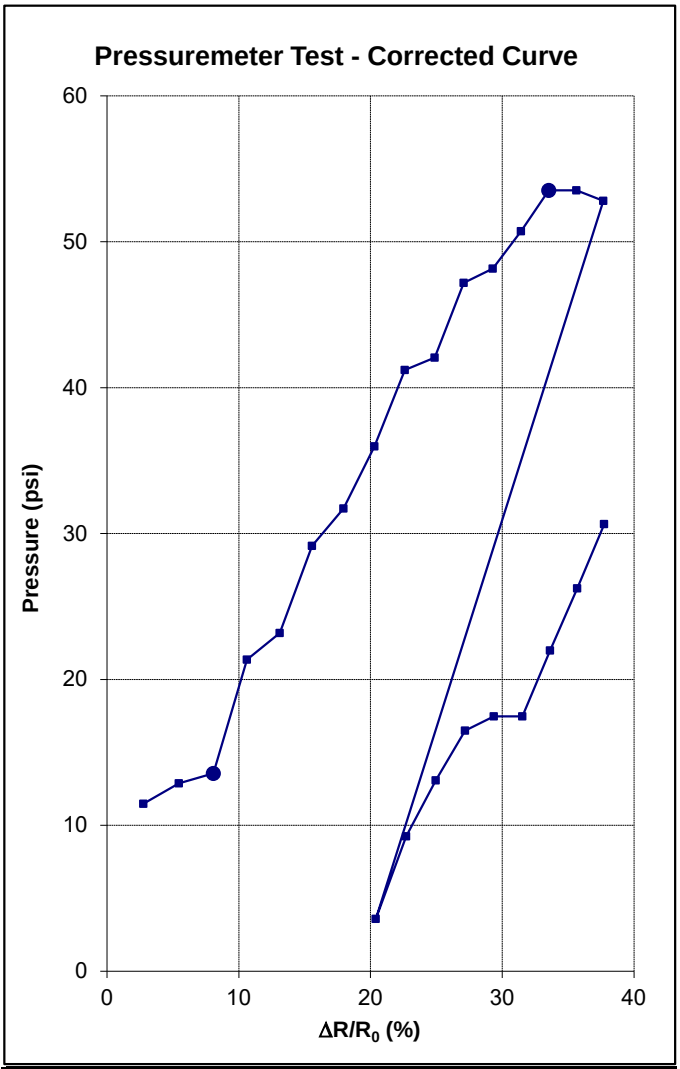
Appendix C

SDI Pressuremeter Testing (PMT) Results

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW16**	Test depth:	22	ft
Test date: (dd/mm/yyyy)	09/08/2021	Poisson's ratio:	0.33	
Test number:	PMT1	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test	15	min

Raw Readings		Corrected Readings			
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %	
4	4.9	11	4.9	2.76	
6	9.8	13	9.7	5.45	
9	14.6	14	14.6	8.07	◄
17	19.5	21	19.4	10.62	
20	24.4	23	24.3	13.12	
26	29.3	29	29.1	15.56	
28	34.2	32	34.0	17.96	
32	39.1	36	38.8	20.30	
38	43.9	41	43.7	22.60	
39	48.8	42	48.6	24.87	
44	53.7	47	53.4	27.08	
46	58.6	48	58.3	29.27	
49	63.5	51	63.1	31.42	
53	68.3	54	68.0	33.53	◄
53	73.2	54	72.9	35.62	◄
53	78.1	53	77.8	37.68	
0	39.1	4	39.1	20.41	
6	43.9	9	43.9	22.70	
10	48.8	13	48.8	24.96	
14	53.7	16	53.6	27.18	
15	58.6	17	58.5	29.36	◄Er1
15	63.5	17	63.4	31.52	◄Er1
21	68.3	22	68.2	33.62	
26	73.2	26	73.1	35.70	
31	78.1	31	77.9	37.74	◄Er2



Interpreted Test Results

Ep	**255 psi**
Pl	**60 psi**
E / Pl:	**4.3**
Py	**54 psi**
Poh	**13 psi**
Er	**848 psi**

Time before recording readings : 30 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

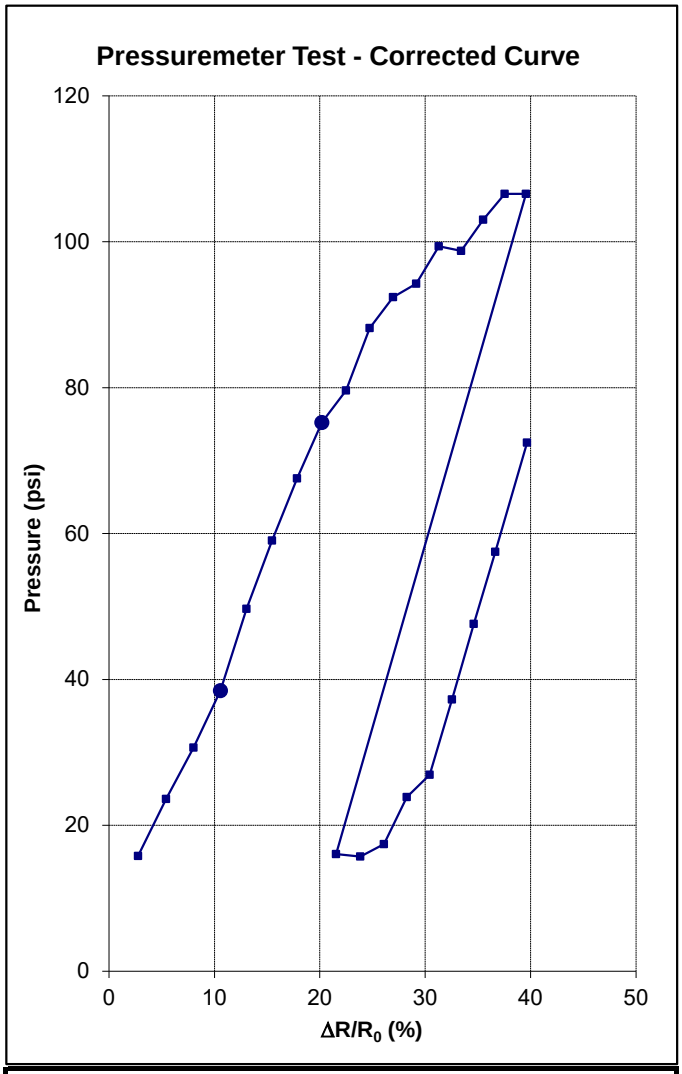
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW16**	Test depth:	32.00	ft
Test date: (dd/mm/yyyy)	09/08/2021	Poisson's ratio:	0.33	
Test number:	PMT2	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test:	15	min

Raw Readings		Corrected Readings			
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %	
4	4.9	16	4.9	2.76	
13	9.8	24	9.7	5.43	
21	14.6	31	14.5	8.03	
30	19.5	38	19.3	10.57	◄
42	24.4	50	24.1	13.04	
51	29.3	59	28.9	15.47	
60	34.2	68	33.8	17.85	
67	39.1	75	38.6	20.19	◄
72	43.9	80	43.5	22.49	
81	48.8	88	48.3	24.74	
85	53.7	92	53.1	26.96	
88	58.6	94	58.0	29.15	
93	63.5	99	62.8	31.29	
94	68.3	99	67.7	33.41	
98	73.2	103	72.6	35.49	
102	78.1	107	77.4	37.54	
102	83.0	107	82.3	39.57	
9	41.5	16	41.4	21.54	
9	46.4	16	46.3	23.83	
10	51.3	17	51.2	26.08	
17	56.1	24	56.0	28.27	
20	61.0	27	60.9	30.43	◄Er1
32	65.9	37	65.7	32.54	
43	70.8	48	70.5	34.61	
53	75.7	57	75.3	36.65	
68	83.0	72	82.5	39.66	◄Er2



Interpreted Test Results

Ep	**588 psi**
Pl	**110 psi**
E / Pl:	**5.3**
Py	**75 psi**
Poh	**38 psi**
Er	**1,420,816 psi**

Time before recording readings : 30 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

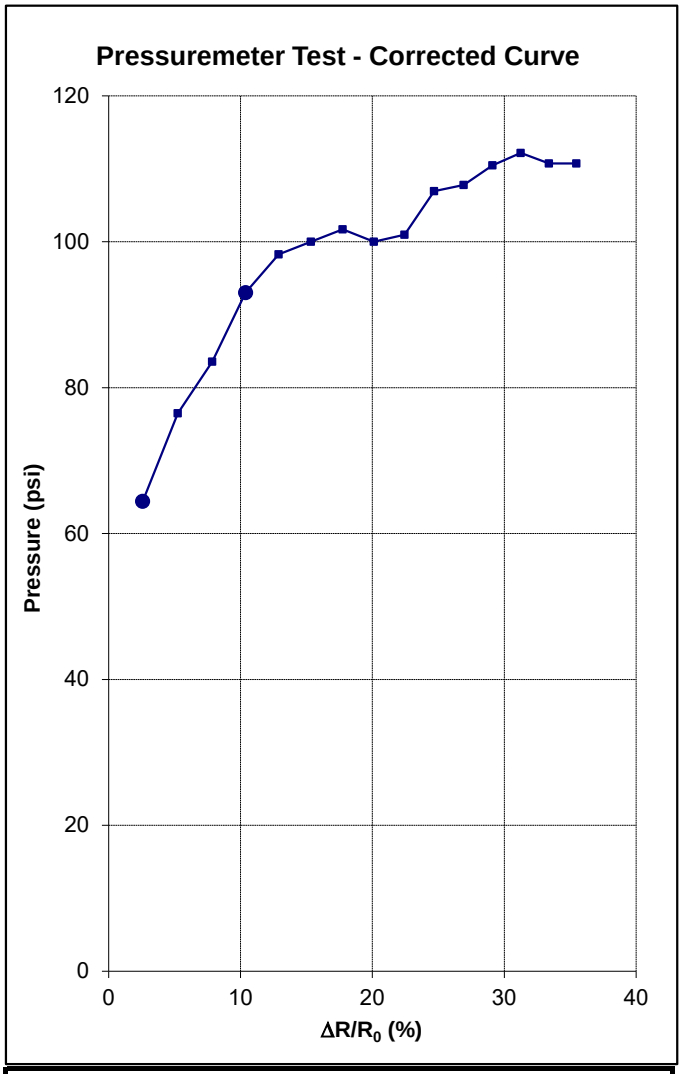
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW16**	Test depth:	36	ft
Test date: (dd/mm/yyyy)	09/08/2021	Poisson's ratio:	0.33	
Test number:	PMT3	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test:	15	min

Raw Readings		Corrected Readings		
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %
51	4.9	64	4.5	2.58 ◄
64	9.8	76	9.3	5.24
72	14.6	84	14.2	7.85
83	19.5	93	19.0	10.39 ◄
89	24.4	98	23.8	12.88
90	29.3	100	28.7	15.34
92	34.2	102	33.6	17.75
90	39.1	100	38.5	20.12
92	43.9	101	43.3	22.43
98	48.8	107	48.2	24.69
99	53.7	108	53.0	26.92
102	58.6	110	57.9	29.11
104	63.5	112	62.8	31.26
104	68.3	111	67.7	33.38
104	73.2	111	72.5	35.48



Interpreted Test Results

Ep	**520 psi**
Pl	**112 psi**
E / Pl:	**4.7**
Py	**93 psi**
Poh	**n.a. psi**
Er	**n.a. psi**

Time before recording readings : 30 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

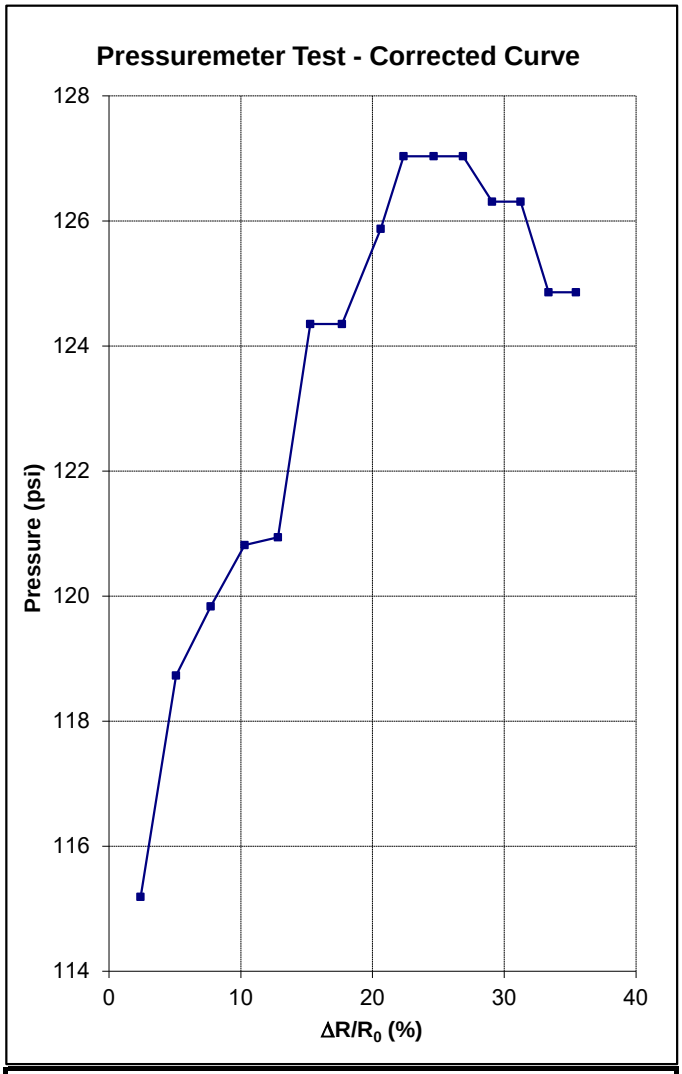
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW16**	Test depth:	45	ft
Test date: (dd/mm/yyyy)	10/08/2021	Poisson's ratio:	0.33	
Test number:	PMT4	Probe initial volume:	1423	cm^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test	15	min

Raw Readings		Corrected Readings		
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %
98	4.9	115	4.2	2.40
102	9.8	119	9.1	5.10
105	14.6	120	13.9	7.73
107	19.5	121	18.8	10.30
107	24.4	121	23.7	12.82
111	29.3	124	28.6	15.27
111	34.2	124	33.4	17.69
112	40.3	126	39.5	20.63
114	43.9	127	43.2	22.36
114	48.8	127	48.1	24.64
114	53.7	127	52.9	26.87
114	58.6	126	57.8	29.07
114	63.5	126	62.7	31.23
114	68.3	125	67.6	33.35
114	73.2	125	72.5	35.45



Interpreted Test Results

Ep	**n.a.**
Pl	**130 psi**
E / Pl:	**n.a.**
Py	**n.a.**
Poh	**n.a.**
Er	**n.a.**

Time before recording readings : 30 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

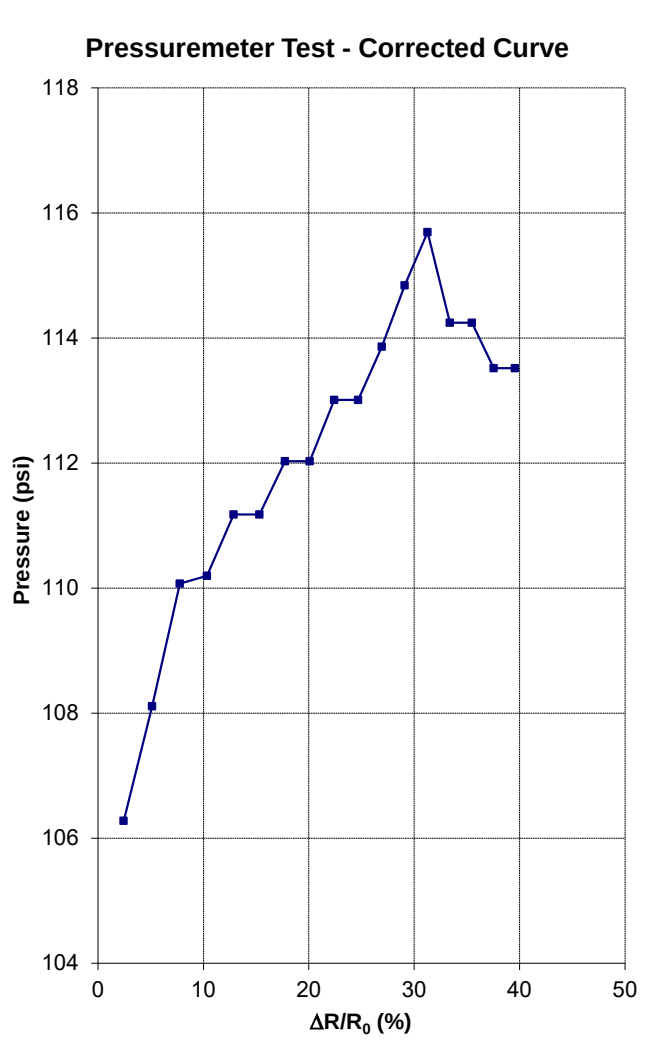
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW16**	Test depth:	50	ft
Test date: (dd/mm/yyyy)	10/08/2021	Poisson's ratio:	0.33	
Test number:	PMT5	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test:	15	min

Raw Readings		Corrected Readings		
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %
87	4.9	106	4.3	2.45
89	9.8	108	9.2	5.15
93	14.6	110	14.0	7.77
94	19.5	110	18.9	10.35
95	24.4	111	23.8	12.86
95	29.3	111	28.7	15.33
96	34.2	112	33.5	17.73
96	39.1	112	38.4	20.10
98	43.9	113	43.3	22.41
98	48.8	113	48.2	24.69
99	53.7	114	53.0	26.92
101	58.6	115	57.9	29.11
101	63.5	116	62.8	31.27
101	68.3	114	67.7	33.39
101	73.2	114	72.6	35.48
101	78.1	114	77.4	37.54
101	83.0	114	82.3	39.57



Interpreted Test Results

Ep	**n.a.**
Pl	**118 psi**
E / Pl:	**n.a.**
Py	**n.a.**
Poh	**n.a.**
Er	**n.a.**

Time before recording readings : 30 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

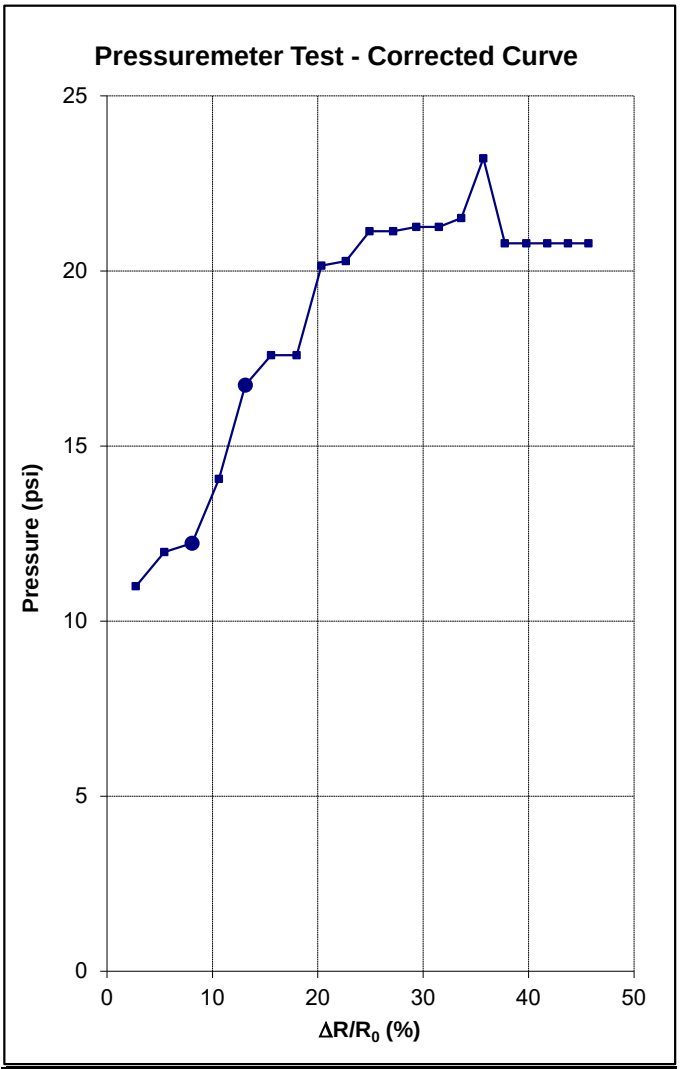
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW17**	Test depth:	15	ft
Test date: (dd/mm/yyyy)	11/08/2021	Poisson's ratio:	0.33	
Test number:	PMT1	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test:	15	min

Raw Readings		Corrected Readings			
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %	
7	4.9	11	4.8	2.75	
9	9.8	12	9.7	5.44	
10	14.6	12	14.6	8.07	◄
13	19.5	14	19.4	10.63	
16	24.4	17	24.3	13.13	◄
17	29.3	18	29.2	15.59	
17	34.2	18	34.1	17.99	
20	39.1	20	38.9	20.34	
20	43.9	20	43.8	22.66	
21	48.8	21	48.7	24.92	
21	53.7	21	53.6	27.15	
22	58.6	21	58.4	29.34	
22	63.5	21	63.3	31.50	
24	68.3	22	68.2	33.62	
26	73.2	23	73.1	35.70	
24	78.1	21	78.0	37.76	
24	83.0	21	82.8	39.78	
24	87.9	21	87.7	41.78	
24	92.8	21	92.6	43.75	
24	97.6	21	97.5	45.69	



Interpreted Test Results

Ep	**131 psi**
Pl	**23 psi**
E / Pl:	**5.8**
Py	**17 psi**
Poh	**12 psi**
Er	**n.a. psi**

Time before recording readings : 30 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

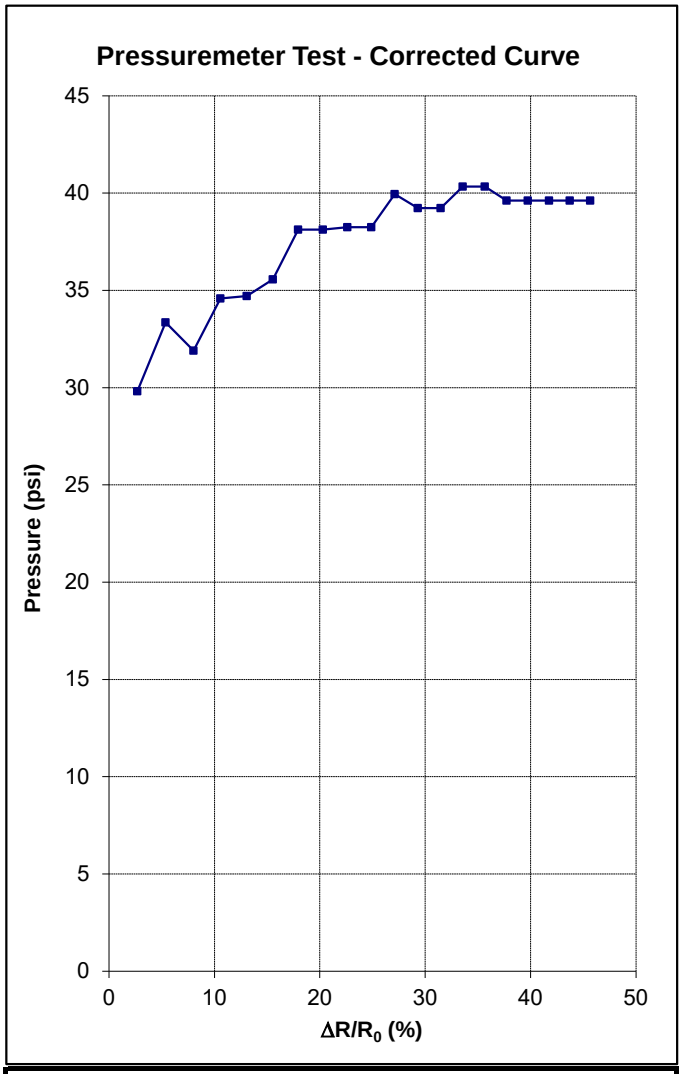
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW17**	Test depth:	25	ft
Test date: (dd/mm/yyyy)	11/08/2021	Poisson's ratio:	0.33	
Test number:	PMT2	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test	15	min

Raw Readings		Corrected Readings		
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %
21	4.9	30	4.7	2.69
26	9.8	33	9.6	5.38
26	14.6	32	14.5	8.01
29	19.5	35	19.3	10.57
30	24.4	35	24.2	13.09
31	29.3	36	29.1	15.54
33	34.2	38	34.0	17.94
33	39.1	38	38.8	20.30
34	43.9	38	43.7	22.61
34	48.8	38	48.6	24.88
36	53.7	40	53.5	27.11
36	58.6	39	58.3	29.30
36	63.5	39	63.2	31.46
38	68.3	40	68.1	33.57
38	73.2	40	73.0	35.66
38	78.1	40	77.9	37.72
38	83.0	40	82.7	39.74
38	87.9	40	87.6	41.74
38	92.8	40	92.5	43.71
38	97.6	40	97.4	45.65



Interpreted Test Results

Ep	**n.a.**
Pl	**40 psi**
E / Pl:	**n.a.**
Py	**n.a.**
Poh	**n.a.**
Er	**n.a.**

Time before recording readings : 30 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

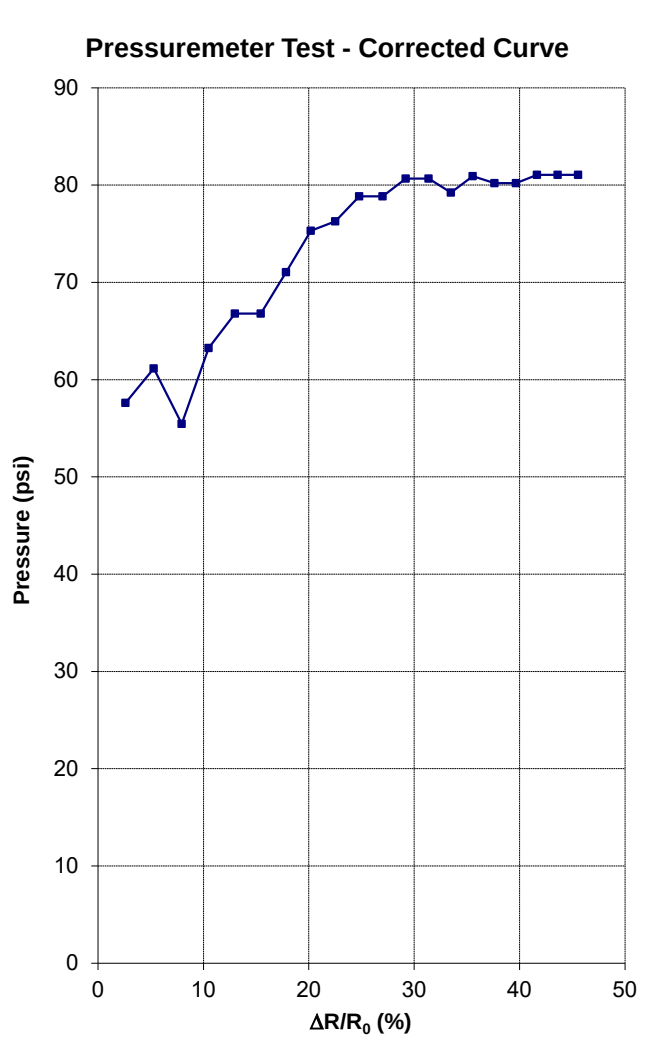
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW17**	Test depth:	40	ft
Test date: (dd/mm/yyyy)	12/08/2021	Poisson's ratio:	0.33	
Test number:	PMT4	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test:	15	min

Raw Readings		Corrected Readings		
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %
43	4.9	58	4.6	2.61
47	9.8	61	9.5	5.30
43	14.6	55	14.4	7.95
51	19.5	63	19.2	10.50
55	24.4	67	24.0	13.00
55	29.3	67	28.9	15.46
60	34.2	71	33.8	17.85
64	39.1	75	38.6	20.20
66	43.9	76	43.5	22.51
68	48.8	79	48.4	24.78
68	53.7	79	53.2	27.01
71	58.6	81	58.1	29.20
71	63.5	81	63.0	31.36
71	68.3	79	67.9	33.48
72	73.2	81	72.7	35.56
72	78.1	80	77.6	37.62
72	83.0	80	82.5	39.65
73	87.9	81	87.4	41.65
73	92.8	81	92.3	43.62
73	97.6	81	97.1	45.56



Interpreted Test Results

Ep	**n.a.**
Pl	**83 psi**
E / Pl:	**n.a.**
Py	**n.a.**
Poh	**n.a.**
Er	**n.a.**

Time before recording readings : 15 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

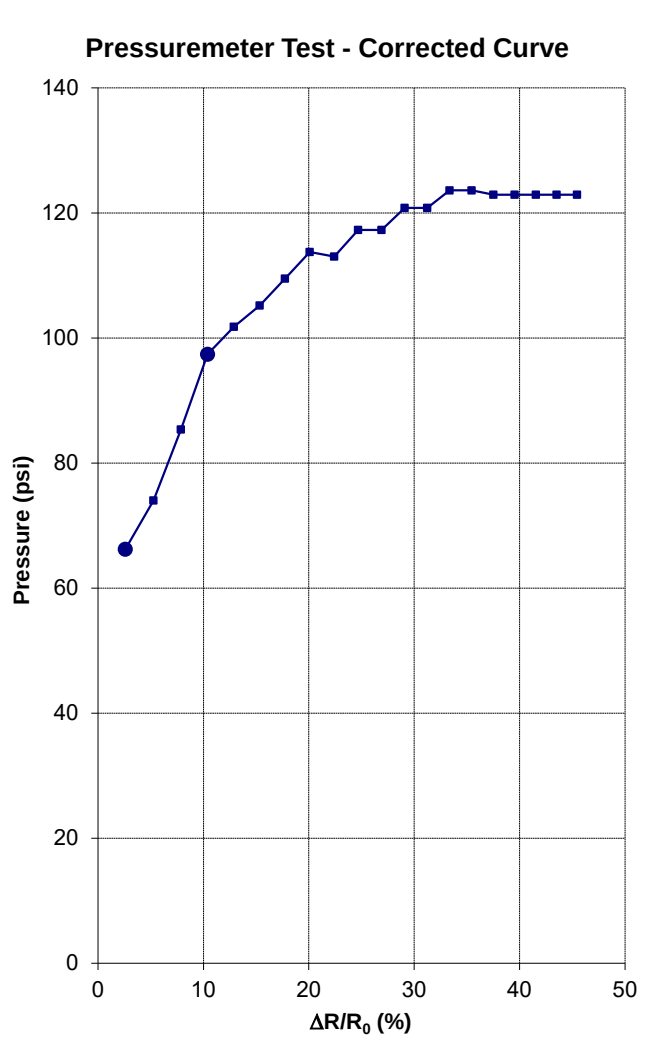
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW17**	Test depth:	50	ft
Test date: (dd/mm/yyyy)	12/08/2021	Poisson's ratio:	0.33	
Test number:	PMT5	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test:	15	min

Raw Readings		Corrected Readings			
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %	
47	4.9	66	4.6	2.60	◄
55	9.8	74	9.4	5.27	
68	14.6	85	14.2	7.86	
81	19.5	97	19.0	10.39	◄
86	24.4	102	23.8	12.89	
89	29.3	105	28.7	15.35	
94	34.2	109	33.5	17.74	
98	39.1	114	38.4	20.09	
98	43.9	113	43.3	22.41	
102	48.8	117	48.1	24.67	
102	53.7	117	53.0	26.91	
107	58.6	121	57.9	29.09	
107	63.5	121	62.8	31.25	
111	68.3	124	67.6	33.36	
111	73.2	124	72.5	35.46	
111	78.1	123	77.4	37.52	
111	83.0	123	82.3	39.55	
111	87.9	123	87.1	41.55	
111	92.8	123	92.0	43.52	
111	97.6	123	96.9	45.46	



Interpreted Test Results

Ep	**567 psi**
Pl	**125 psi**
E / Pl:	**4.5**
Py	**97 psi**
Poh	**n.a. psi**
Er	**n.a. psi**

Time before recording readings : 15 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

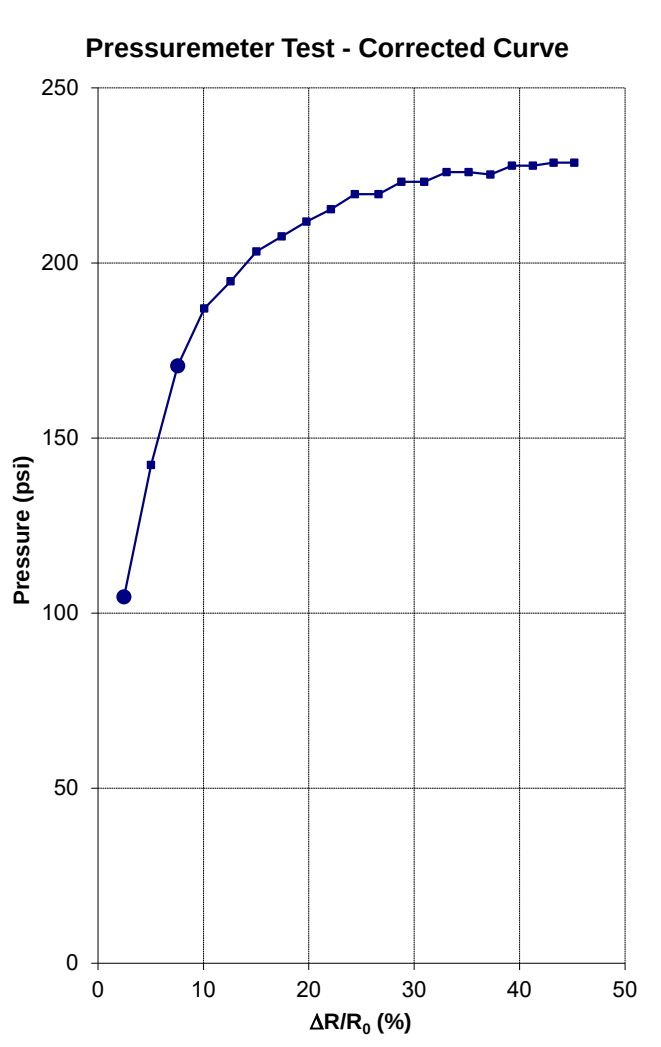
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW17**	Test depth:	60	ft
Test date: (dd/mm/yyyy)	12/08/2021	Poisson's ratio:	0.33	
Test number:	PMT6	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test	15	min

Raw Readings		Corrected Readings			
Pressure psi	Volume in³	Pressure psi	Volume in³	$\Delta R/R_0$ %	
81	4.9	105	4.3	2.47	◄
119	9.8	142	9.0	5.04	
149	14.6	171	13.6	7.57	◄
166	19.5	187	18.4	10.10	
175	24.4	195	23.2	12.59	
183	29.3	203	28.1	15.03	
187	34.2	208	32.9	17.44	
192	39.1	212	37.8	19.79	
196	43.9	215	42.6	22.10	
200	48.8	220	47.5	24.37	
200	53.7	220	52.4	26.61	
205	58.6	223	57.2	28.80	
205	63.5	223	62.1	30.96	
209	68.3	226	66.9	33.08	
209	73.2	226	71.8	35.18	
209	78.1	225	76.7	37.24	
211	83.0	228	81.6	39.27	
211	87.9	228	86.5	41.27	
212	92.8	229	91.3	43.25	
212	97.6	229	96.2	45.19	



Interpreted Test Results

Ep	**1,808 psi**
Pl	**228 psi**
E / Pl:	**7.9**
Py	**171 psi**
Poh	**n.a. psi**
Er	**n.a. psi**

Time before recording readings : 15 sec.

Method for estimating Pl : 1/V vs P as per ASTM D4719

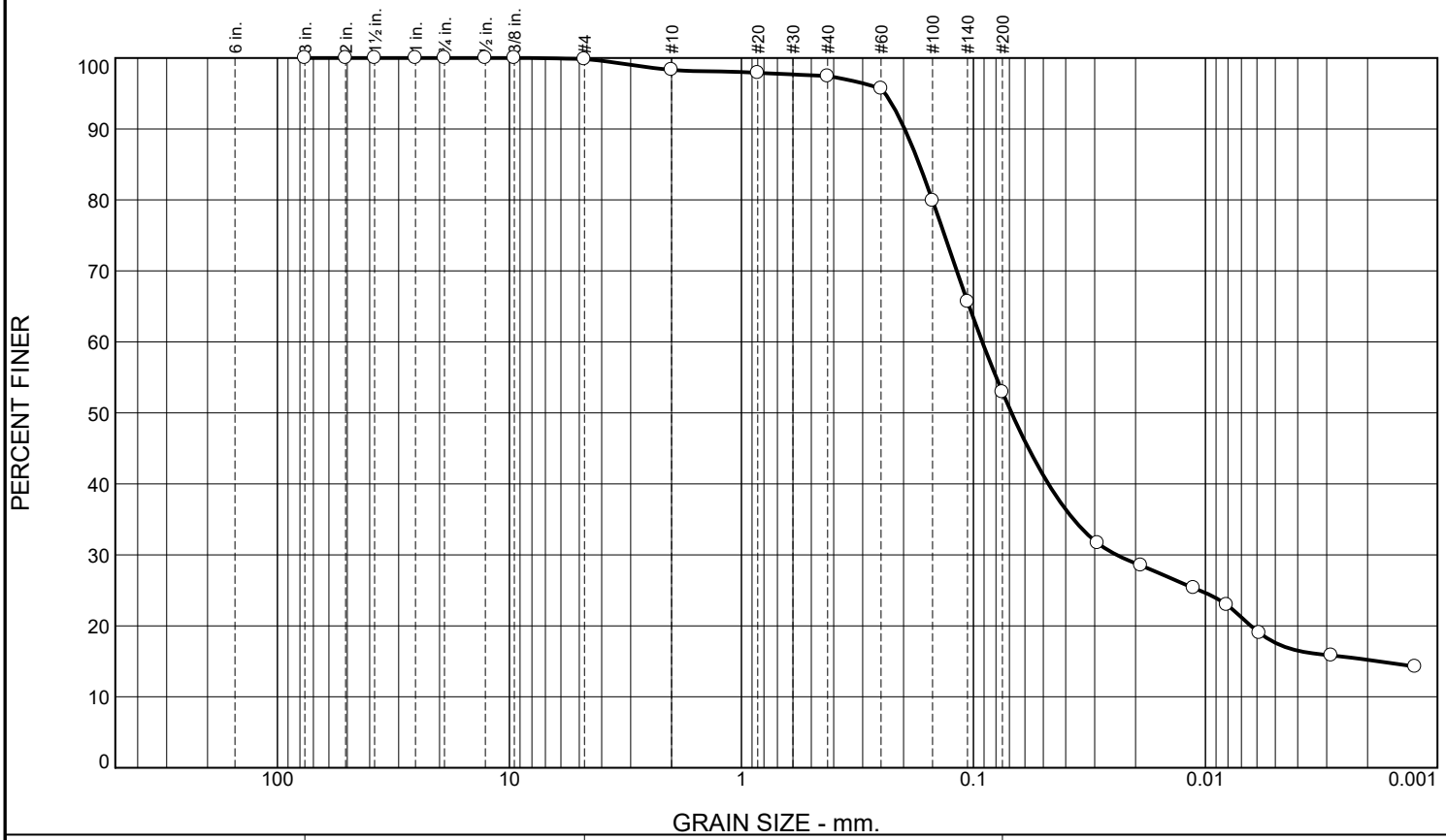
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

TEXAM COMPANION V.3.4.25

Appendix D

SDI Geotechnical Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	1.5	0.9	44.5	35.3	17.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	99.8		
#10	98.3		
#20	97.9		
#40	97.4		
#60	95.7		
#100	79.9		
#140	65.7		
#200	52.9		

* (no specification provided)

Material Description

Dark gray, fine to medium grained, CLAYEY SAND (Slightly Sticky)

Atterberg Limits

PL= 15 LL= 20 PI= 5

Coefficients

D_{90}= 0.1978 D_{85}= 0.1711 D_{60}= 0.0916
D_{50}= 0.0685 D_{30}= 0.0242 D_{15}= 0.0018
D_{10}= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(0)

Remarks

Natural Moisture: 33.1%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-001

Date: 8/26/2021

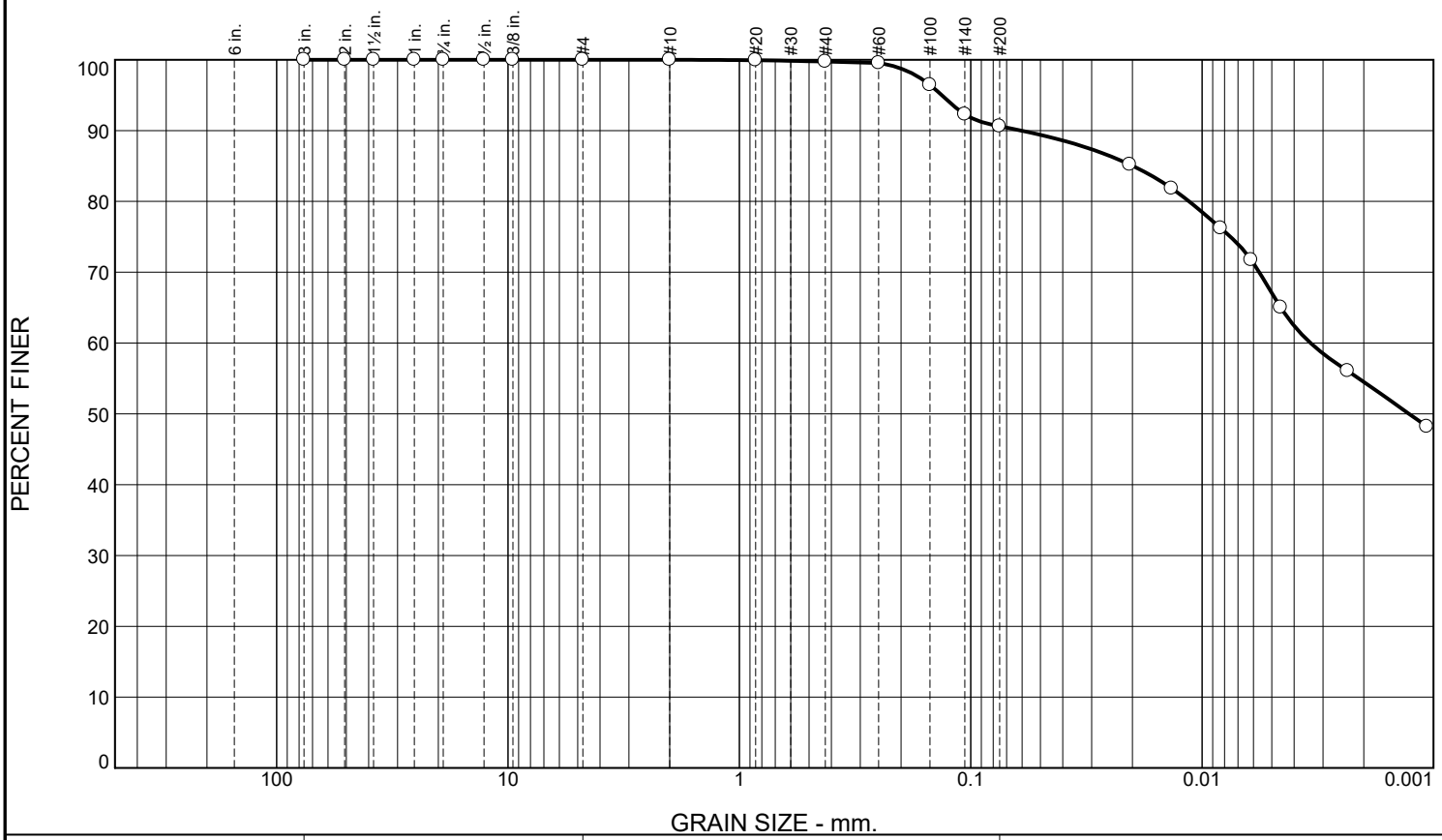
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	9.1	23.5	67.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.7		
#60	99.5		
#100	96.4		
#140	92.3		
#200	90.6		

* (no specification provided)

Material Description

Black, CLAY, wet (Slightly Sticky)

Atterberg Limits

PL= 36 LL= 103 PI= 67

Coefficients

D_{90}= 0.0606 D_{85}= 0.0199 D_{60}= 0.0034
D_{50}= 0.0013 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-5(72)

Remarks

Natural Moisture: 168.6%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-002

Date: 8/26/2021

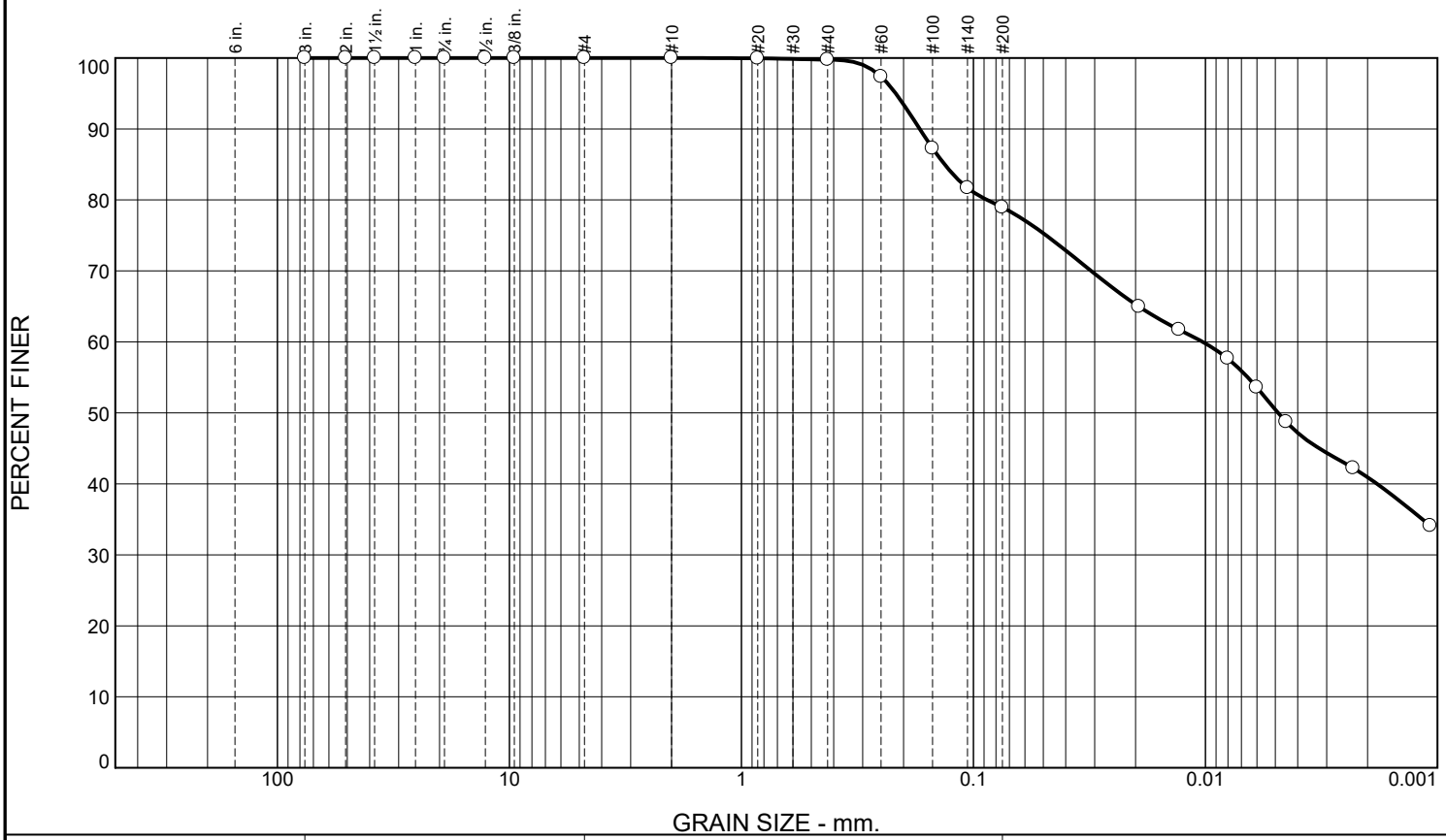
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	20.8	28.5	50.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	97.4		
#100	87.3		
#140	81.7		
#200	79.0		

* (no specification provided)

Material Description

Black, CLAY, wet (Slightly Sticky)

Atterberg Limits

PL= 28 LL= 99 PI= 71

Coefficients

D_{90}= 0.1704 D_{85}= 0.1331 D_{60}= 0.0103
D_{50}= 0.0049 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(61)

Remarks

Natural Moisture: 163.0%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-003

Date: 8/26/2021

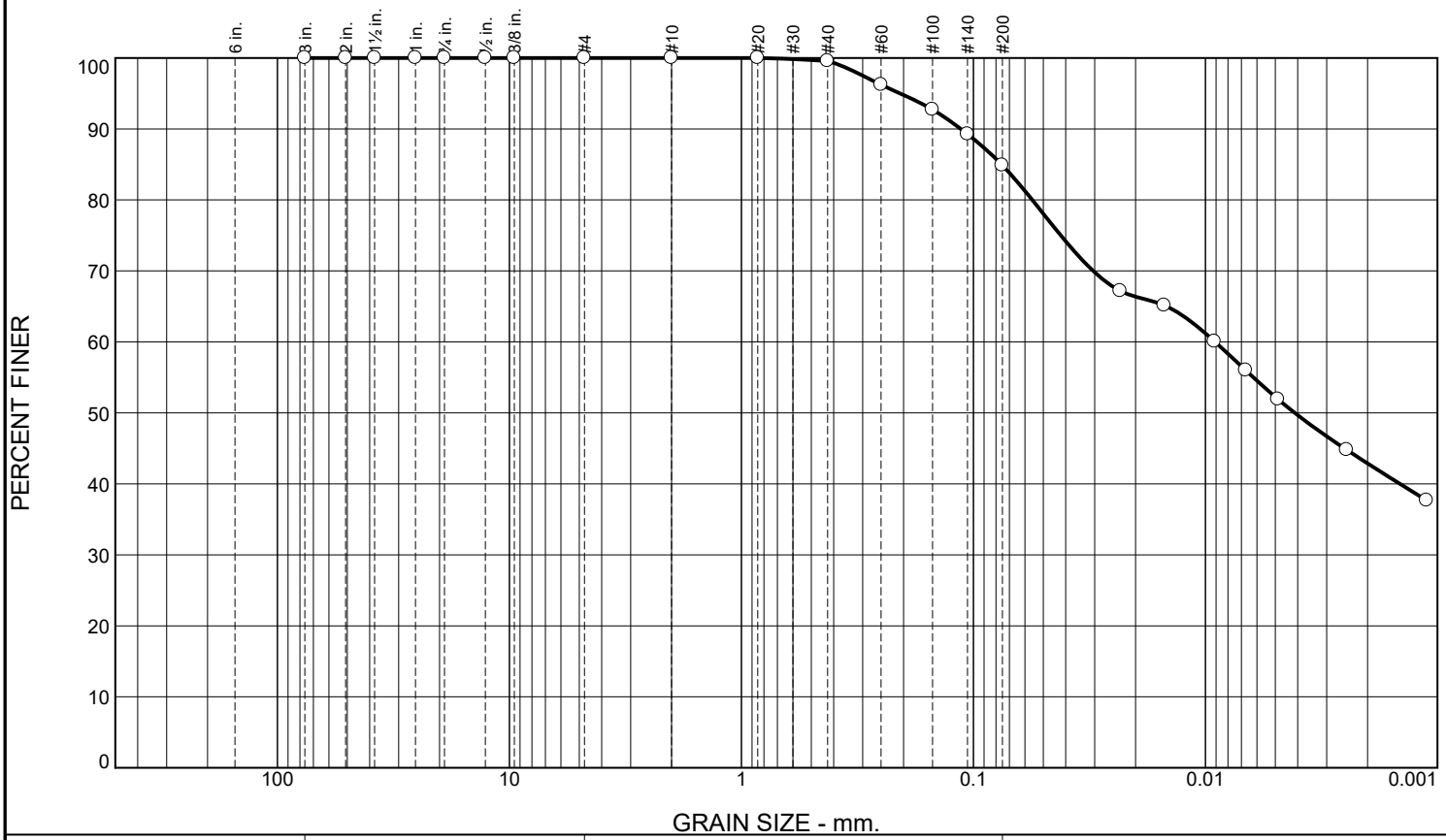
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	14.7	32.7	52.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.6		
#60	96.2		
#100	92.7		
#140	89.3		
#200	84.9		

* (no specification provided)

Material Description

Black, CLAY, wet (Slightly Sticky)

Atterberg Limits

PL= 20 LL= 77 PI= 57

Coefficients

D_{90}= 0.1133 D_{85}= 0.0757 D_{60}= 0.0091
D_{50}= 0.0041 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(52)

Remarks

Natural Moisture: 145.2%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-004

Date: 8/26/2021

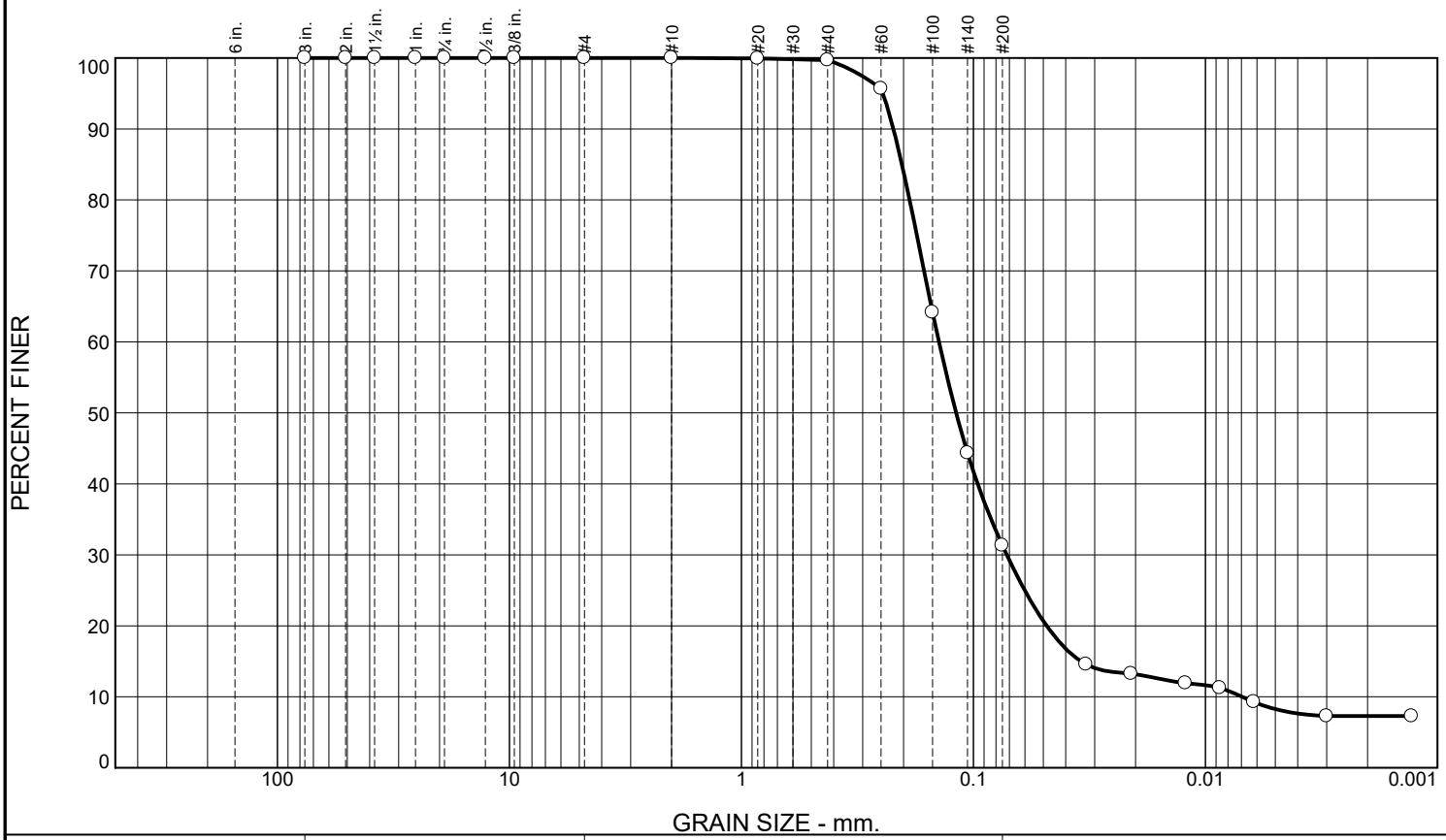
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	68.4	23.0	8.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.7		
#60	95.7		
#100	64.2		
#140	44.3		
#200	31.3		

* (no specification provided)

Material Description

Gray, fine grained, SLIGHTLY SILTY SAND, trace shell (Slightly Sticky)

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.2211 D_{85}= 0.2032 D_{60}= 0.1408
D_{50}= 0.1187 D_{30}= 0.0718 D_{15}= 0.0344
D_{10}= 0.0069 C_u= 20.28 C_c= 5.28

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Natural Moisture: 21.4%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-005

Date: 8/26/2021

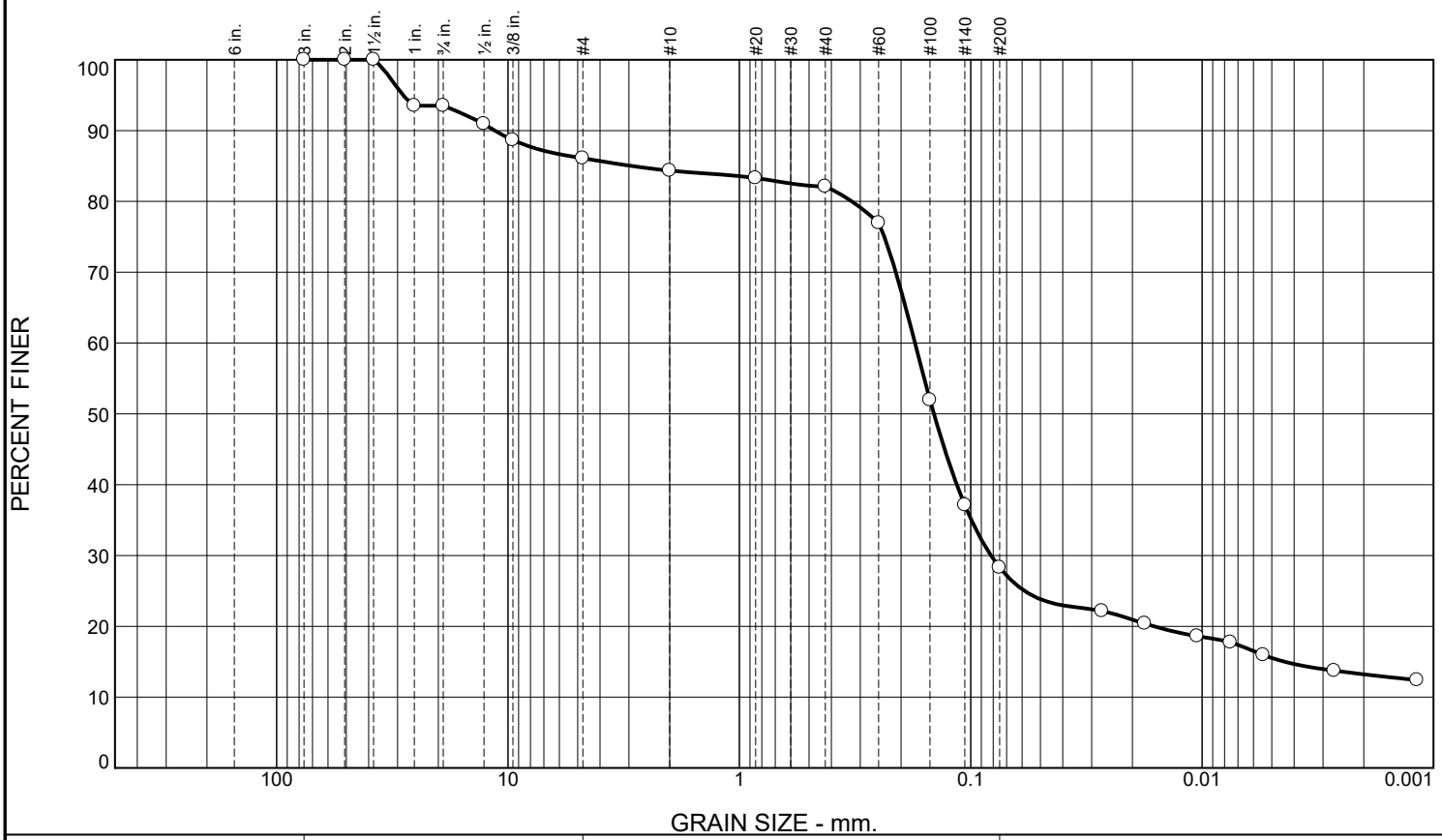
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.5	7.4	1.8	2.2	53.8	12.8	15.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	93.5		
.75	93.5		
.50	90.9		
.375	88.7		
#4	86.1		
#10	84.3		
#20	83.3		
#40	82.1		
#60	77.0		
#100	52.0		
#140	37.1		
#200	28.3		

* (no specification provided)

Material Description

Dark gray, fine grained, CLAYEY SAND, with shell

Atterberg Limits

PL= 14 LL= 19 PI= 5

Coefficients

D_{90}= 11.4103 D_{85}= 2.9173 D_{60}= 0.1742
D_{50}= 0.1443 D_{30}= 0.0818 D_{15}= 0.0044
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-2-4(0)

Remarks

Natural Moisture: 35.6%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-006

Date: 8/26/2021

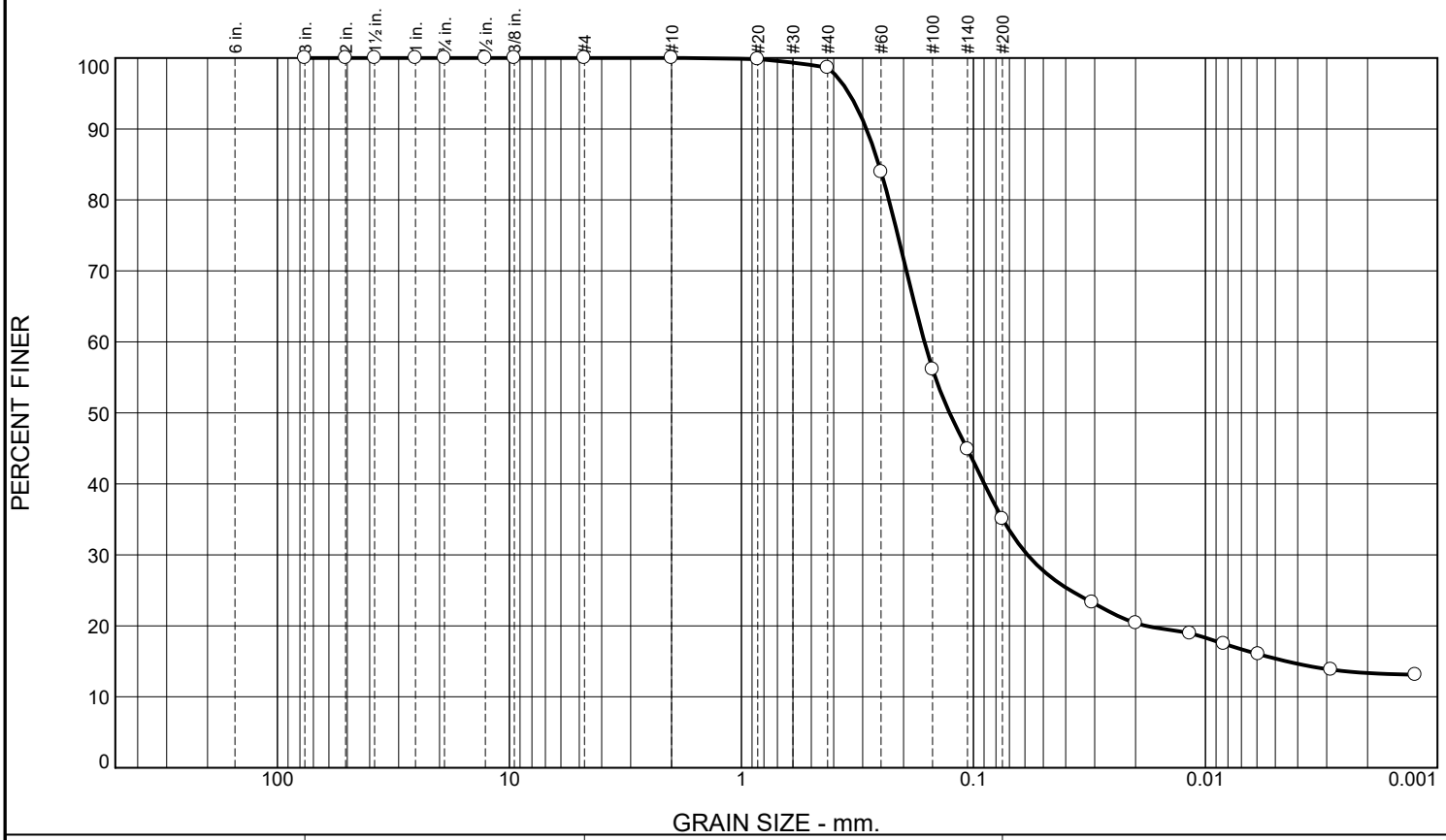
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.4	63.5	19.7	15.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	98.6		
#60	84.0		
#100	56.1		
#140	44.9		
#200	35.1		

* (no specification provided)

Material Description

Very dark gray, fine to medium grained, SILTY SAND (Slightly Sticky)

Atterberg Limits

PL= 12 LL= 30 PI= 18

Coefficients

D_{90}= 0.2891 D_{85}= 0.2556 D_{60}= 0.1626
D_{50}= 0.1268 D_{30}= 0.0585 D_{15}= 0.0045
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(2)

Remarks

Natural Moisture: 52.5%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-007

Date: 8/26/2021

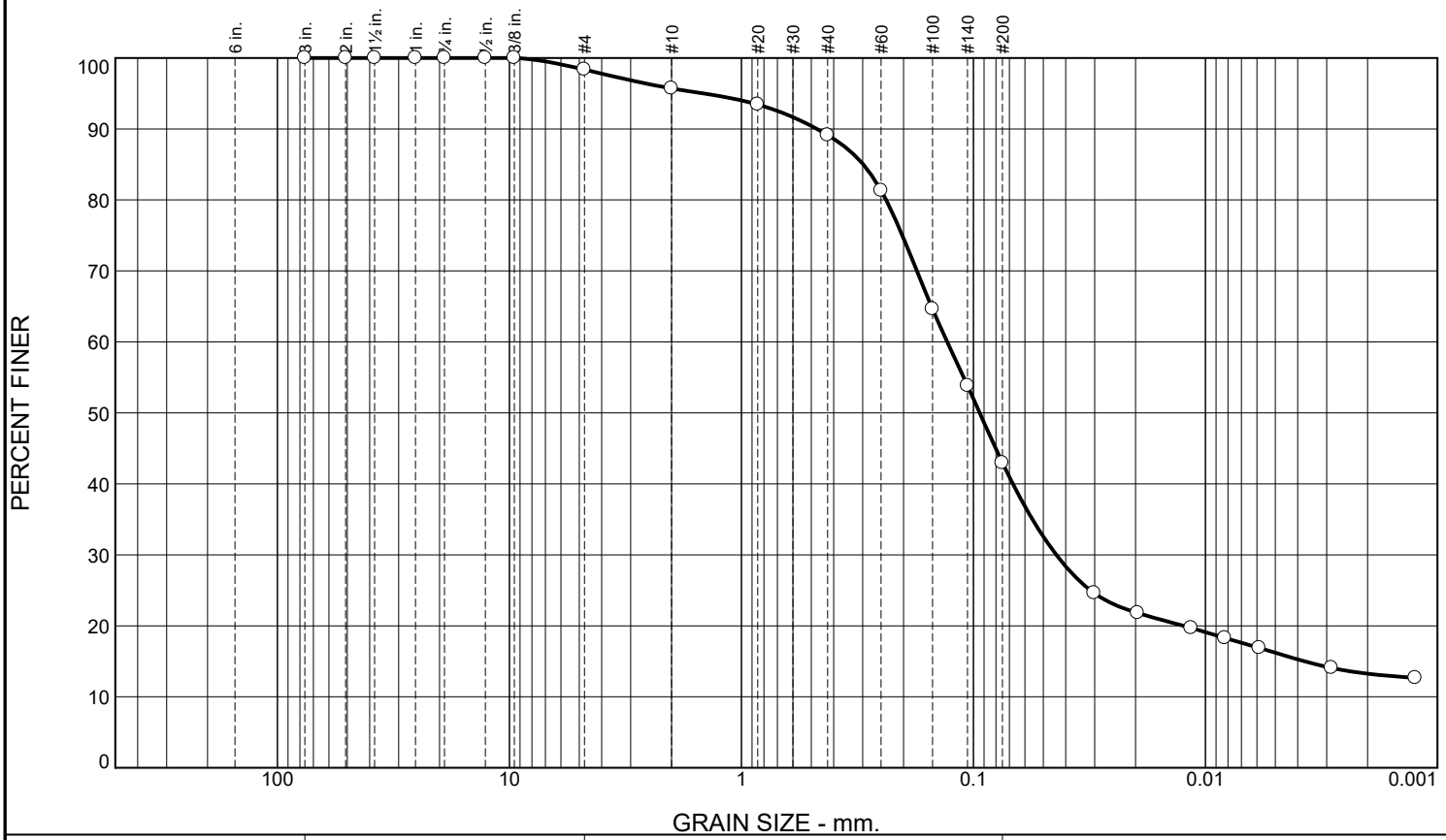
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.6	2.7	6.6	46.1	26.8	16.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	98.4		
#10	95.7		
#20	93.4		
#40	89.1		
#60	81.3		
#100	64.6		
#140	53.8		
#200	43.0		

* (no specification provided)

Material Description

Black, fine to medium grained, SLIGHTLY SILTY SAND, trace organics, wet, (Slightly Sticky)

Atterberg Limits

PL= 18 LL= 28 PI= 10

Coefficients

D_{90}= 0.4730 D_{85}= 0.2984 D_{60}= 0.1297
D_{50}= 0.0939 D_{30}= 0.0439 D_{15}= 0.0037
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Natural Moisture: 72.6%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-008

Date: 8/26/2021

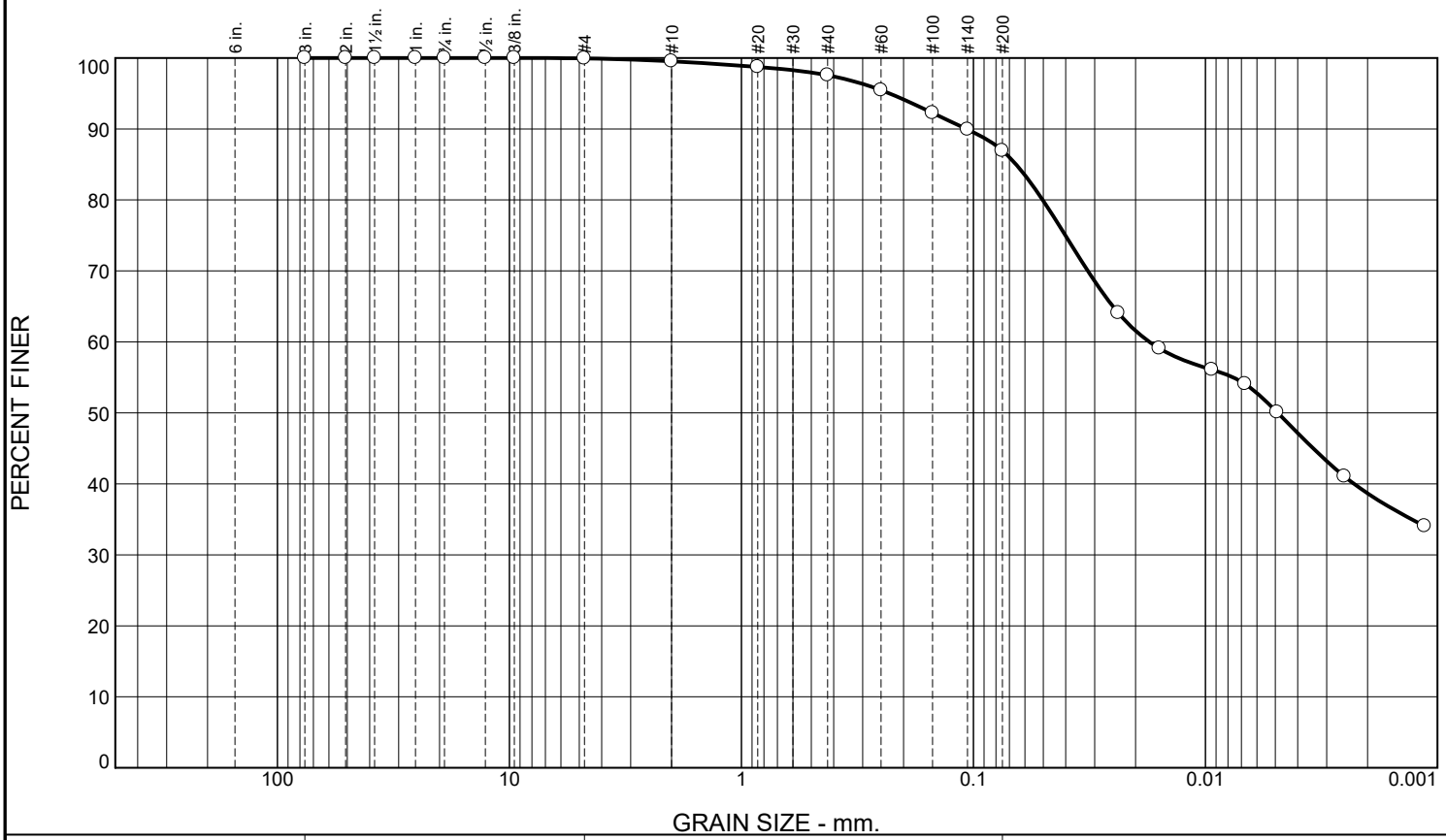
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.4	1.9	10.7	36.6	50.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	99.9		
#10	99.5		
#20	98.7		
#40	97.6		
#60	95.5		
#100	92.3		
#140	89.9		
#200	86.9		

* (no specification provided)

Material Description

Very dark gray, fine grained, CLAYEY SAND, with trace organics, wet (Moderately Sticky)

Atterberg Limits

PL= 21 LL= 48 PI= 27

Coefficients

D_{90}= 0.1074 D_{85}= 0.0655 D_{60}= 0.0174
D_{50}= 0.0049 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(25)

Remarks

Natural Moisture: 128.7%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-009

Date: 8/26/2021

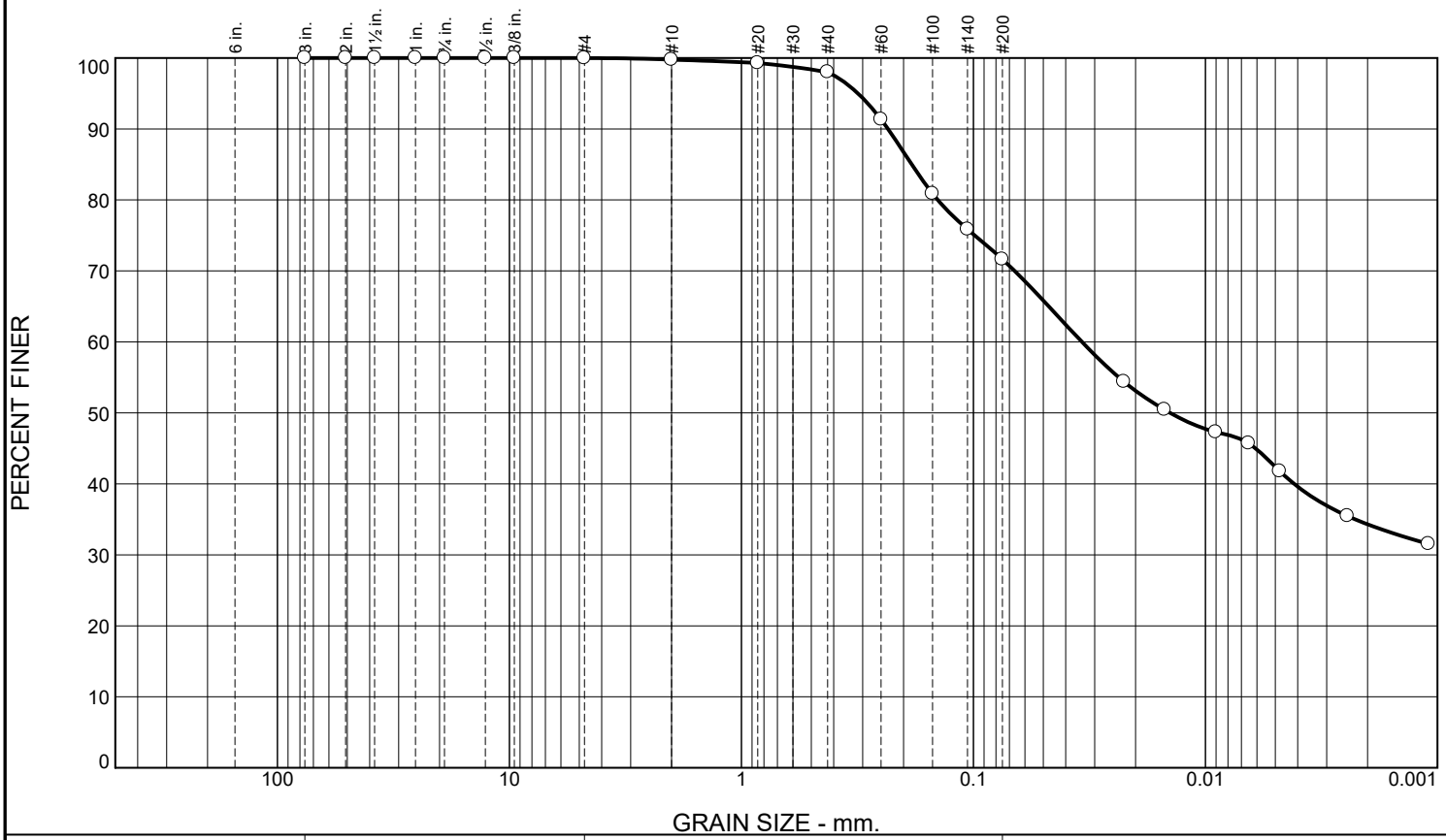
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.8	26.4	29.2	42.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.3		
#40	98.0		
#60	91.3		
#100	80.9		
#140	75.9		
#200	71.6		

* (no specification provided)

Material Description

Gray, fine to medium grained, CLAYEY SAND, trace organics, wet, (Moderately Sticky)

Atterberg Limits

PL= 31 LL= 114 PI= 83

Coefficients

D_{90}= 0.2334 D_{85}= 0.1844 D_{60}= 0.0340
D_{50}= 0.0142 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-5(63)

Remarks

Natural Moisture: 98.3%

Source of Sample: Lab #9143 (SJCPT)
Sample Number: SJCPT-010

Date: 8/26/2021

Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	57.1	42.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.7		
#60	96.5		
#100	81.0		
#140	63.7		
#200	42.6		

* (no specification provided)

Material Description

Light gray, fine grained, SLIGHTLY SILTY SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.1910 D_{85}= 0.1655 D_{60}= 0.0993
D_{50}= 0.0843 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: Lab #9143 (SJMW-16)
Sample Number: SJMW-16-SPT-2

Date: 8/26/2021

Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	8.6	42.5	48.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#60	99.9		
#100	99.6		
#140	98.0		
#200	91.4		

* (no specification provided)

Material Description

Gray, CLAY

Atterberg Limits

PL= 16 LL= 40 PI= 24

Coefficients

D_{90}= 0.0700 D_{85}= 0.0532 D_{60}= 0.0159
D_{50}= 0.0053 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(22)

Remarks

Natural Moisture: 19.1%

Source of Sample: Lab #9143 (SJMW-16)
Sample Number: SJMW-16-ST-3

Date: 8/26/2021

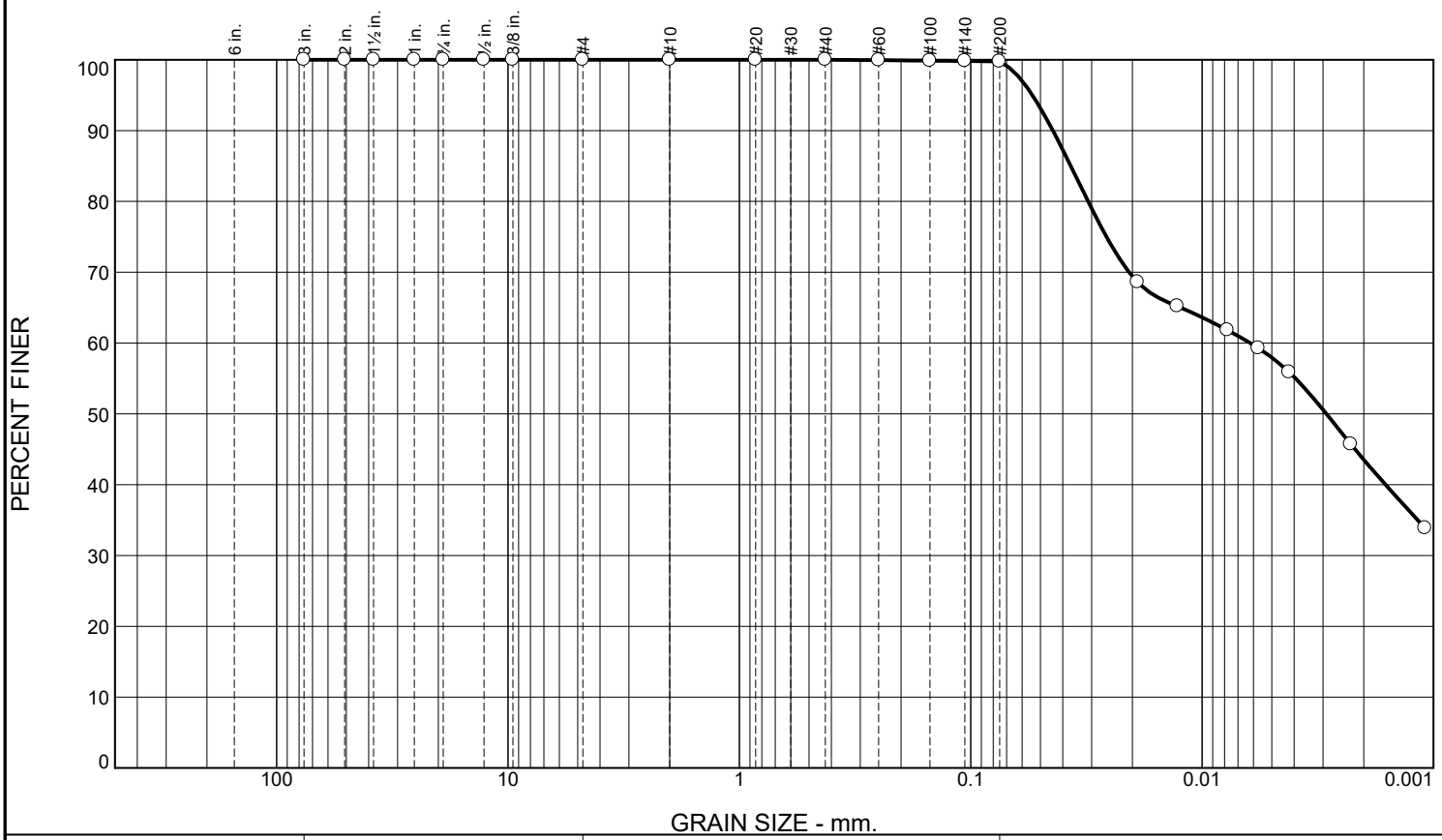
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.2	41.8	58.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#60	100.0		
#100	99.9		
#140	99.8		
#200	99.8		

* (no specification provided)

Material Description

Red, CLAY

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0441 D_{85}= 0.0370 D_{60}= 0.0062
D_{50}= 0.0029 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural Moisture: 29.3%

Source of Sample: Lab #9143 (SJMW-16)
Sample Number: SJMW-16-ST-6

Date: 8/26/2021

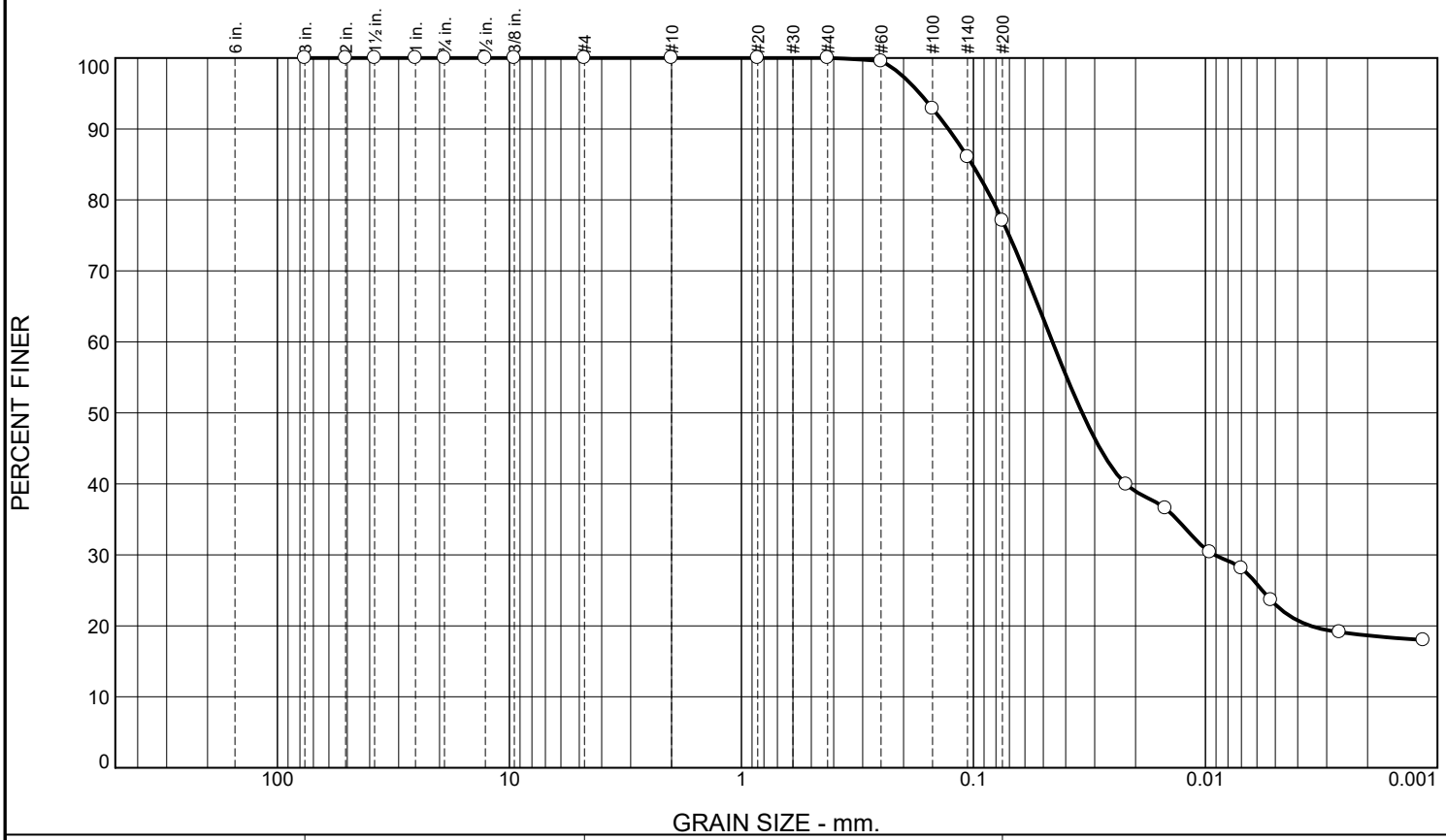
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	22.9	54.1	23.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#60	99.6		
#100	92.9		
#140	86.1		
#200	77.1		

* (no specification provided)

Material Description

Light gray, SANDY CLAY

Atterberg Limits

PL= 14 LL= 27 PI= 13

Coefficients

D_{90}= 0.1283 D_{85}= 0.1011 D_{60}= 0.0456
D_{50}= 0.0340 D_{30}= 0.0092 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(8)

Remarks

Natural Moisture: 18.0%

Source of Sample: Lab #9143 (SJMW-16)
Sample Number: SJMW-16-ST-8

Date: 8/26/2021

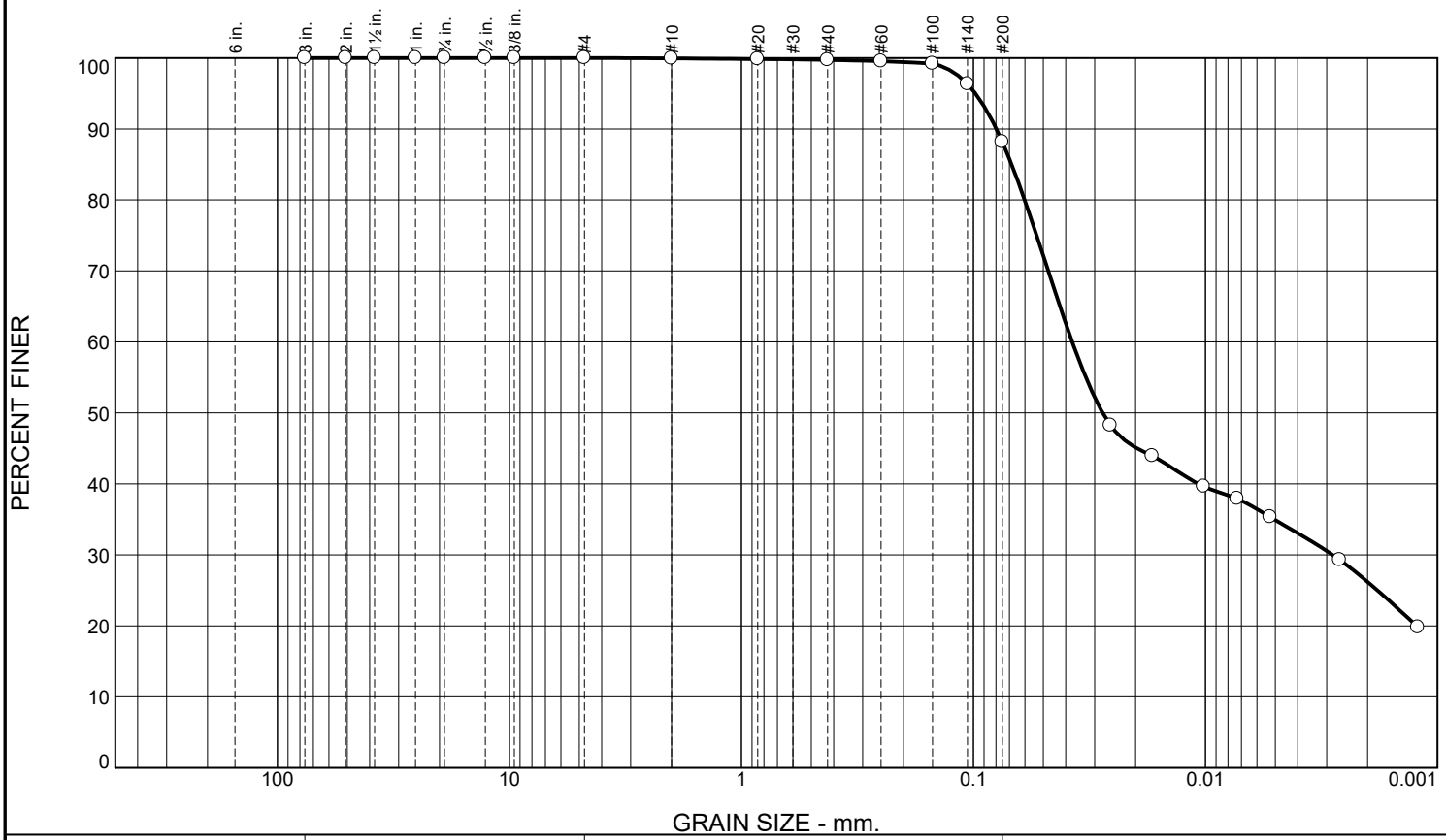
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.2	11.5	53.3	34.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.50	100.0		
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.7		
#60	99.5		
#100	99.2		
#140	96.3		
#200	88.2		

* (no specification provided)

Material Description

Green, CLAY

Atterberg Limits

PL= 14 LL= 50 PI= 36

Coefficients

D_{90}= 0.0796 D_{85}= 0.0684 D_{60}= 0.0375
D_{50}= 0.0277 D_{30}= 0.0028 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(32)

Remarks

Natural Moisture: 21.8%

Source of Sample: Lab #9143 (SJMW-17)
Sample Number: SJMW-17-ST-3

Date: 8/21/2021

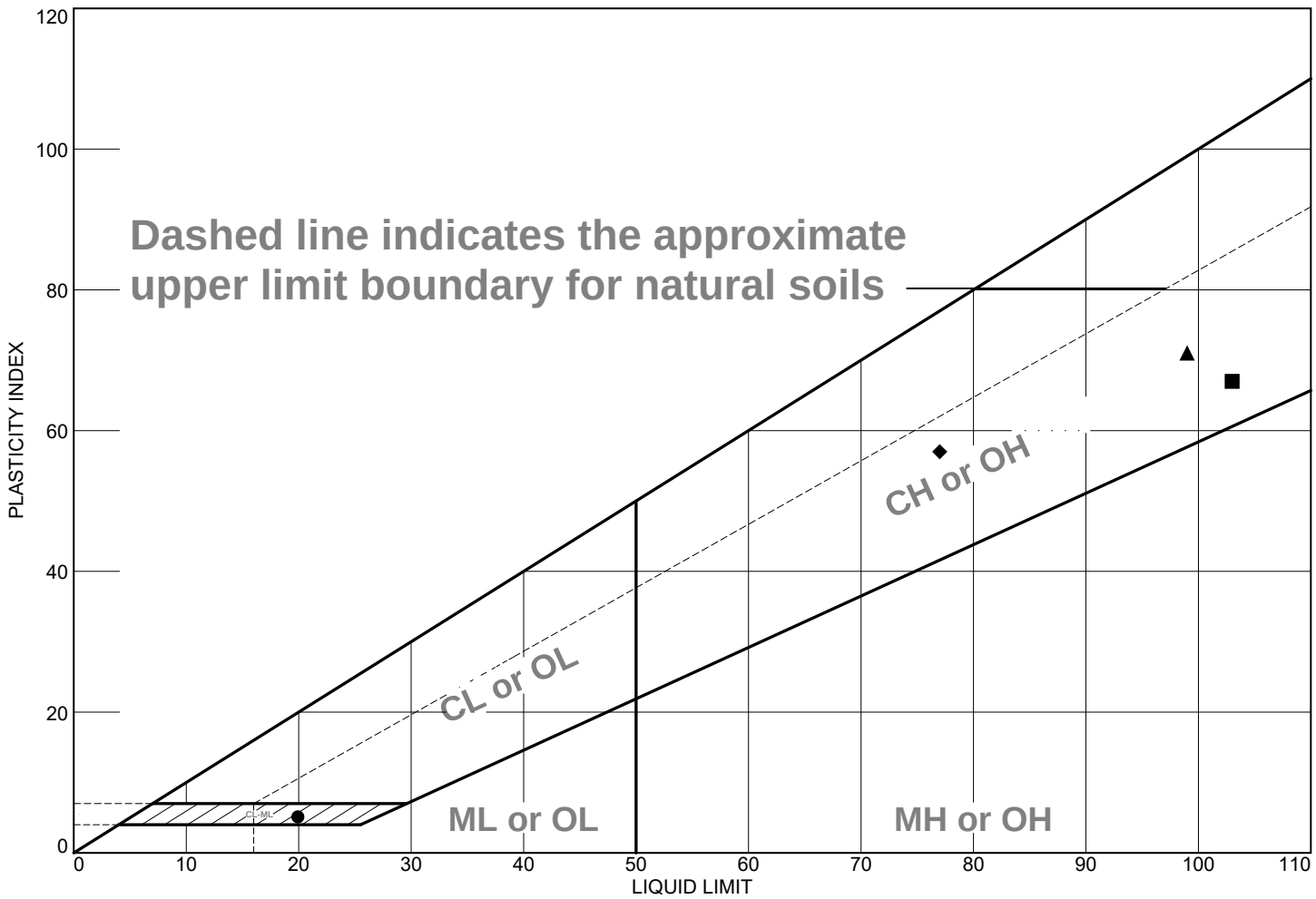
Thompson Engineering

Mobile, Alabama

Client: GHD
Project: San Jacinto Waste Piles
Project No: 2111020111 **Figure**

Tested By: L.Stokes **Checked By:** J.Fancher

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gray, fine to medium grained, CLAYEY SAND (Slightly Sticky)	20	15	5	97.4	52.9	CL-ML
■	Black, CLAY, wet (Slightly Sticky)	103	36	67	99.7	90.6	CH
▲	Black, CLAY, wet (Slightly Sticky)	99	28	71	99.8	79.0	CH
◆	Black, CLAY, wet (Slightly Sticky)	77	20	57	99.6	84.9	CH
▼	Gray, fine grained, SLIGHTLY SILTY SAND, trace shell (Slightly Sticky)	NV	NP	NP	99.7	31.3	SM

Project No. 2111020111 **Client:** GHD

Project: San Jacinto Waste Piles

●**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-001
■**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-002
▲**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-003
◆**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-004
▼**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-005

Remarks:
●Date: 8/26/2021
■Date: 8/26/2021
▲Date: 8/26/2021
◆Date: 8/26/2021
▼Date: 8/26/2021

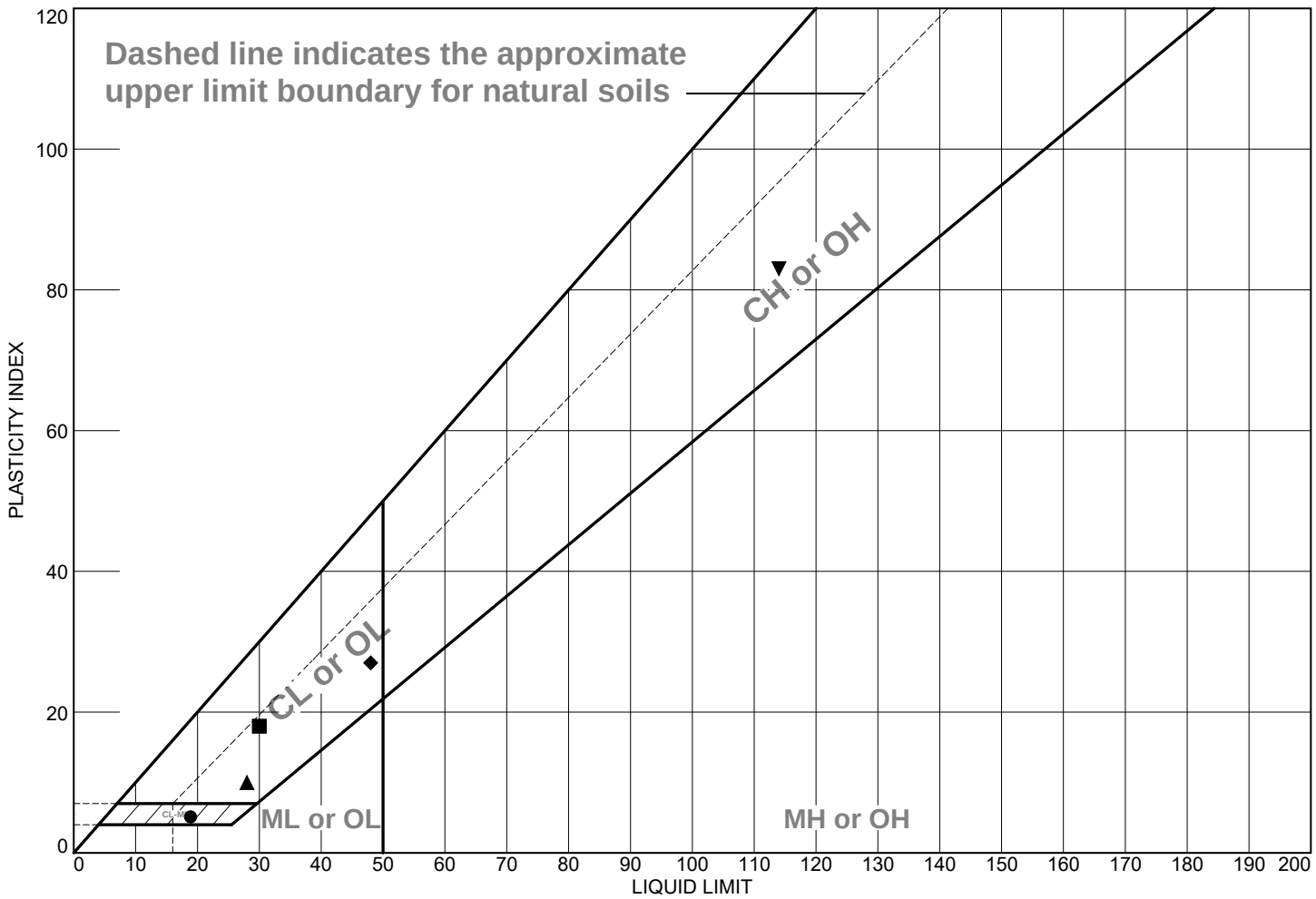
Thompson Engineering

Mobile, Alabama

Figure

Tested By: L.Stokes **Checked By:** J.Fancher

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gray, fine grained, CLAYEY SAND, with shell	19	14	5	82.1	28.3	SC-SM
■	Very dark gray, fine to medium grained, SILTY SAND (Slightly Sticky)	30	12	18	98.6	35.1	SC
▲	Black, fine to medium grained, SLIGHTLY SILTY SAND, trace organics, wet, (Slightly Sticky)	28	18	10	89.1	43.0	SC
◆	Very dark gray, fine grained, CLAYEY SAND, with trace organics, wet (Moderately Sticky)	48	21	27	97.6	86.9	CL
▼	Gray, fine to medium grained, CLAYEY SAND, trace organics, wet, (Moderately Sticky)	114	31	83	98.0	71.6	CH

Project No. 2111020111 **Client:** GHD

Project: San Jacinto Waste Piles

●**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-006
■**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-007
▲**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-008
◆**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-009
▼**Source of Sample:** Lab #9143 (SJCPT) **Sample Number:** SJCPT-010

Remarks:
●Date: 8/26/2021
■Date: 8/29/2021
▲Date: 8/26/201
◆Date: 8/26/2021
▼Date: 8/26/2021

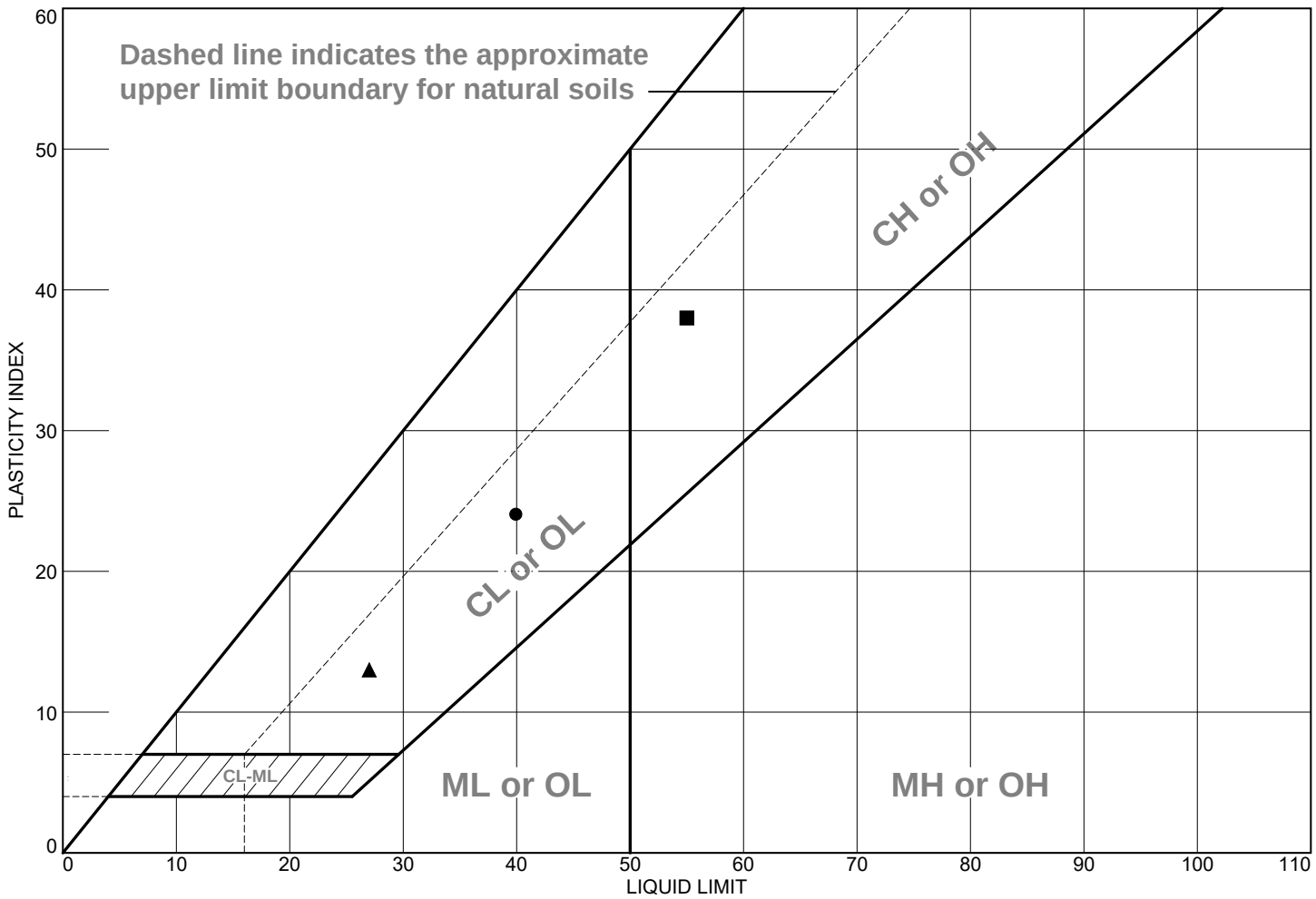
Thompson Engineering

Mobile, Alabama

Figure

Tested By: L.Stokes **Checked By:** J.Fancher

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, CLAY	40	16	24	100.0	91.4	CL
■	Light gray, CLAY, with sand pockets	55	17	38			
▲	Light gray, SANDY CLAY	27	14	13	100.0	77.1	CL
◆	Gray, CLAY						

Project No. 2111020111 **Client:** GHD

Project: San Jacinto Waste Piles

●**Source of Sample:** Lab #9143 (SJMW-16) **Sample Number:** SJMW-16-ST-3
■**Source of Sample:** Lab #9143 (SJMW-16) **Sample Number:** SJMW-16-ST-5
▲**Source of Sample:** Lab #9143 (SJMW-16) **Sample Number:** SJMW-16-ST-8
◆**Source of Sample:** Lab #9143 (SJMW-16) **Sample Number:** SJMW-16-ST-1

Remarks:
●Date: 8/26/2021
■Date: 8/26/2021
▲Date: 8/26/2021
◆Date: 8/26/2021

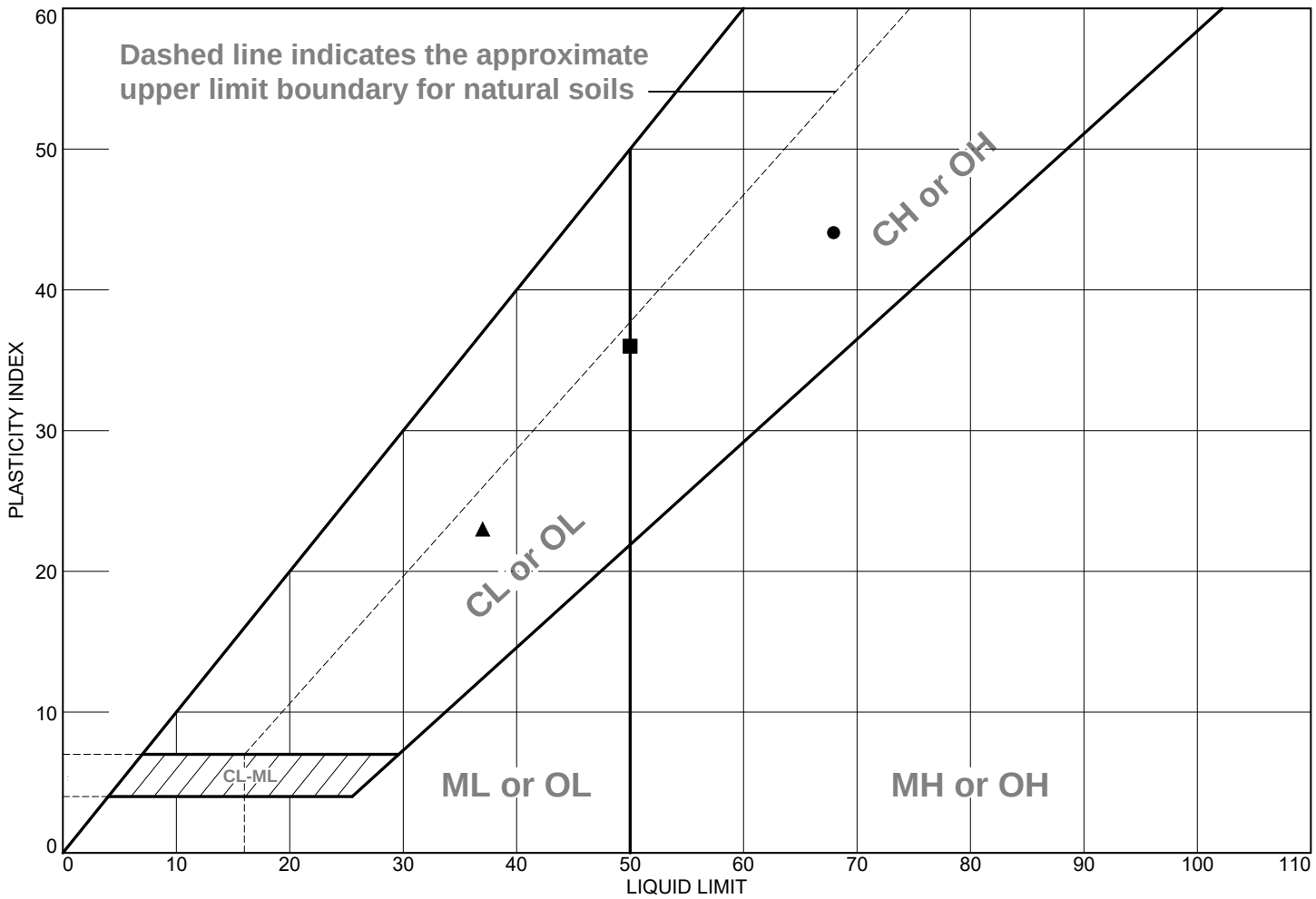
Thompson Engineering

Mobile, Alabama

Figure

Tested By: L.Stokes **Checked By:** J.Fancher

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gray, CLAY	68	24	44			
■	Green, CLAY	50	14	36	99.7	88.2	CH
▲	Green, CLAY	37	14	23			

Project No. 2111020111 **Client:** GHD

Project: San Jacinto Waste Piles

●**Source of Sample:** Lab #9143 (SJMW-17) **Sample Number:** SJMW-17-ST-1

■**Source of Sample:** Lab #9143 (SJMW-17) **Sample Number:** SJMW-17-ST-3

▲**Source of Sample:** Lab #9143 (SJMW-17) **Sample Number:** SJMW-17-ST-5

Remarks:

●Date: 8/26/2021

■Date: 8/21/2021

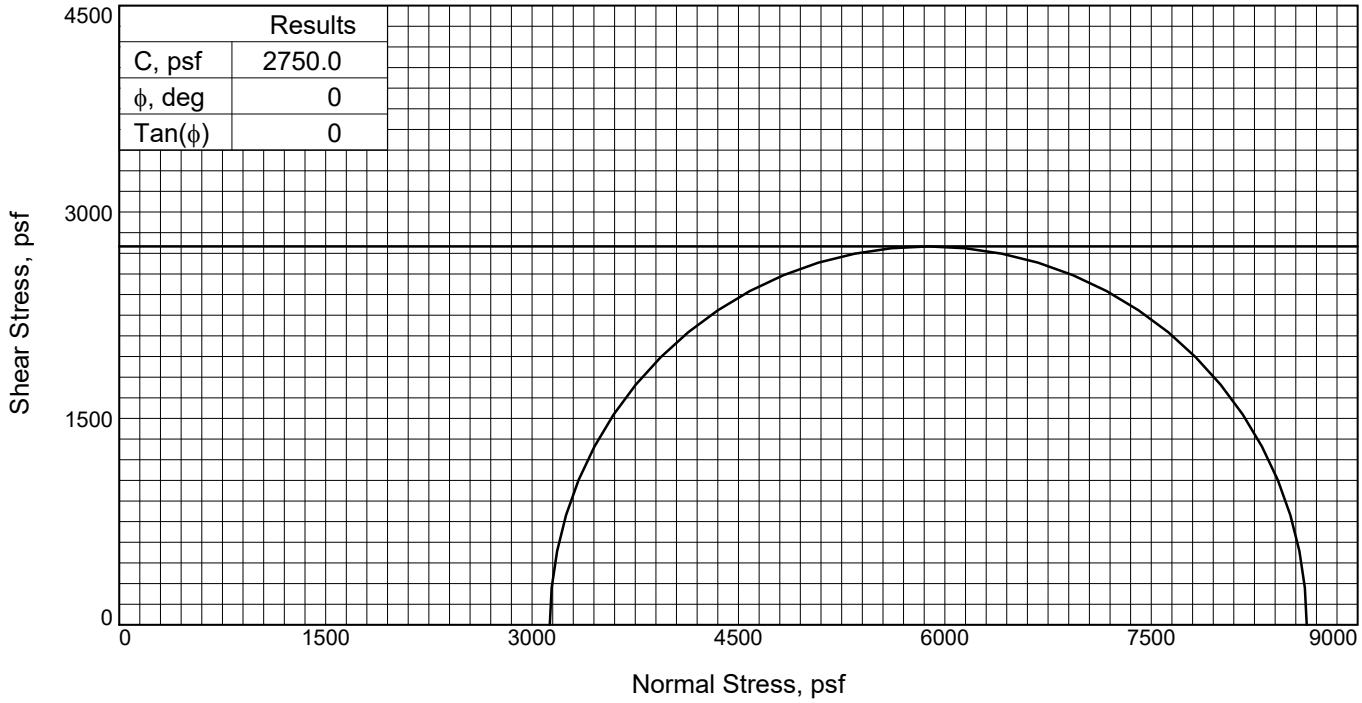
▲Date: 8/21/2021

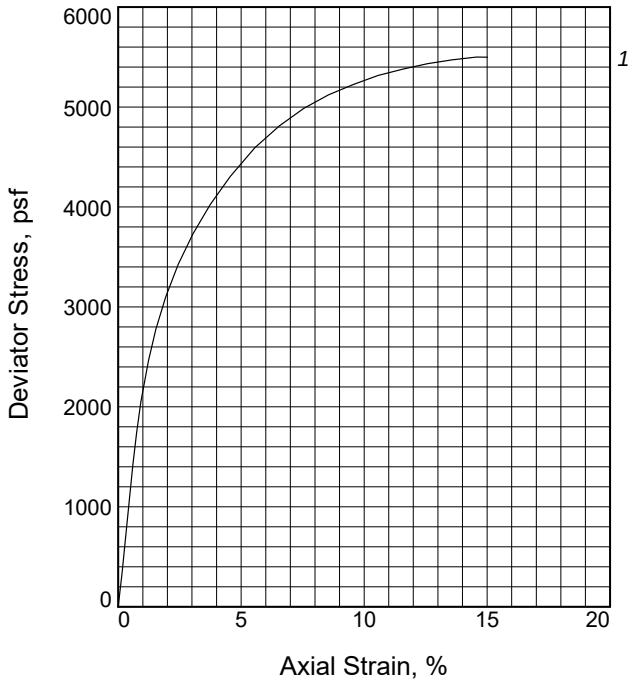
Thompson Engineering

Mobile, Alabama

Figure

Tested By: L.Stokes **Checked By:** J.Fancher





Specimen No.		1
Initial	Water Content, %	19.1
	Dry Density, pcf	110.9
	Saturation, %	102.2
	Void Ratio	0.4971
	Diameter, in.	2.866
	Height, in.	5.331
At Test	Water Content, %	18.6
	Dry Density, pcf	110.9
	Saturation, %	99.6
	Void Ratio	0.4971
	Diameter, in.	2.866
	Height, in.	5.331
Strain at peak, %		14.6
Back Pressure, psf		0.0
Cell Pressure, psf		3129.1
Fail. Stress, psf		5500.1
Strain, %		14.6
Ult. Stress, psf		5500.1
Strain, %		14.6
σ_1 Failure, psf		8629.2
σ_3 Failure, psf		3129.1

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: Gray, CLAY

LL= 40 **PL=** 16 **PI=** 24

Assumed Specific Gravity= 2.66

Remarks: Compression Failure Mode: Symmetrical Bulge

Figure _____

Client: GHD

Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16)

Sample Number: SJMW-16-ST-3

Proj. No.: 2111020111 **Date Sampled:** 8/26/2021

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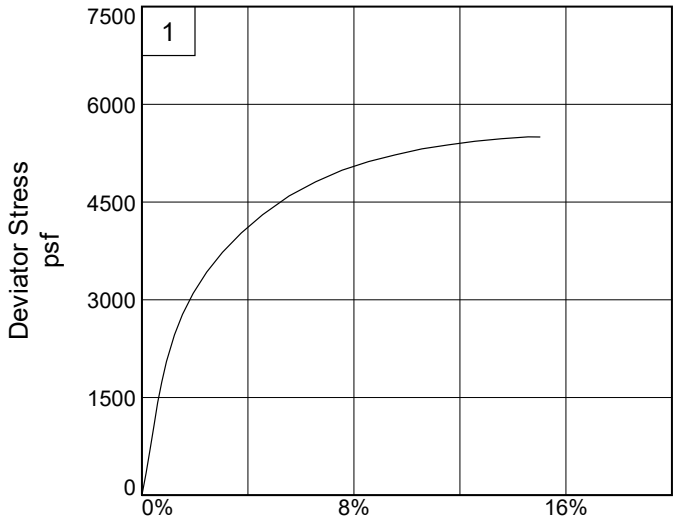
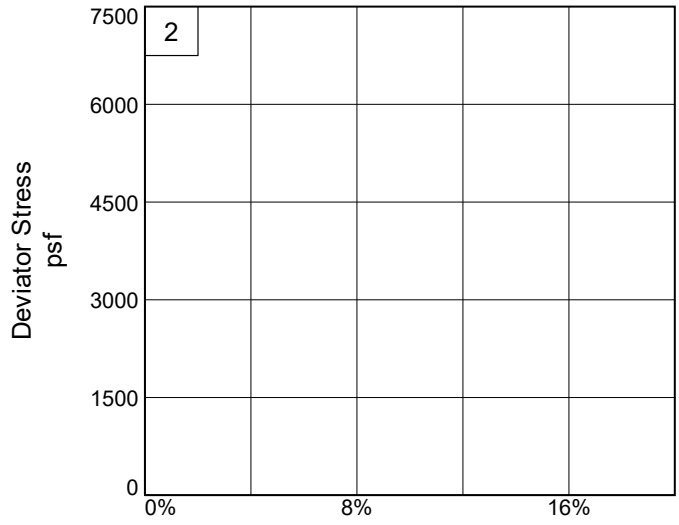
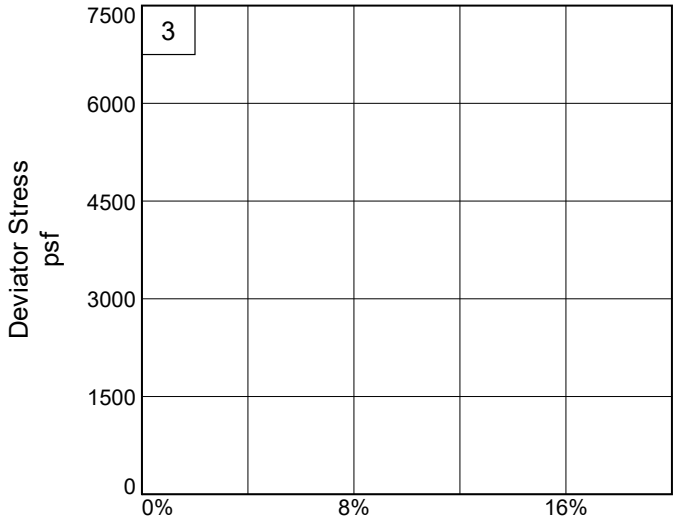
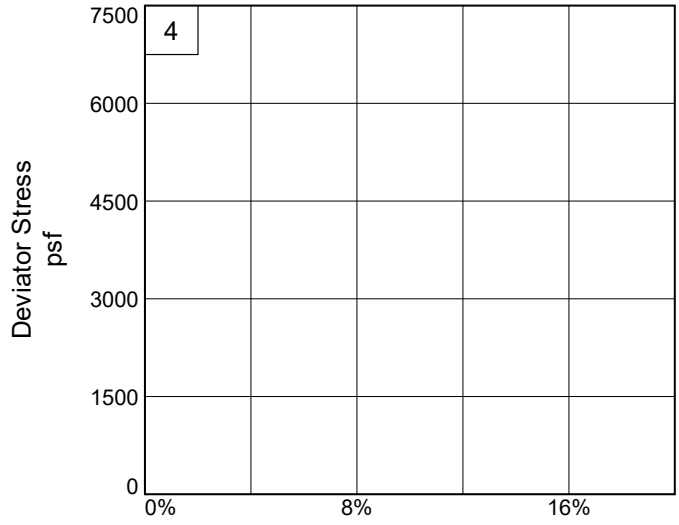
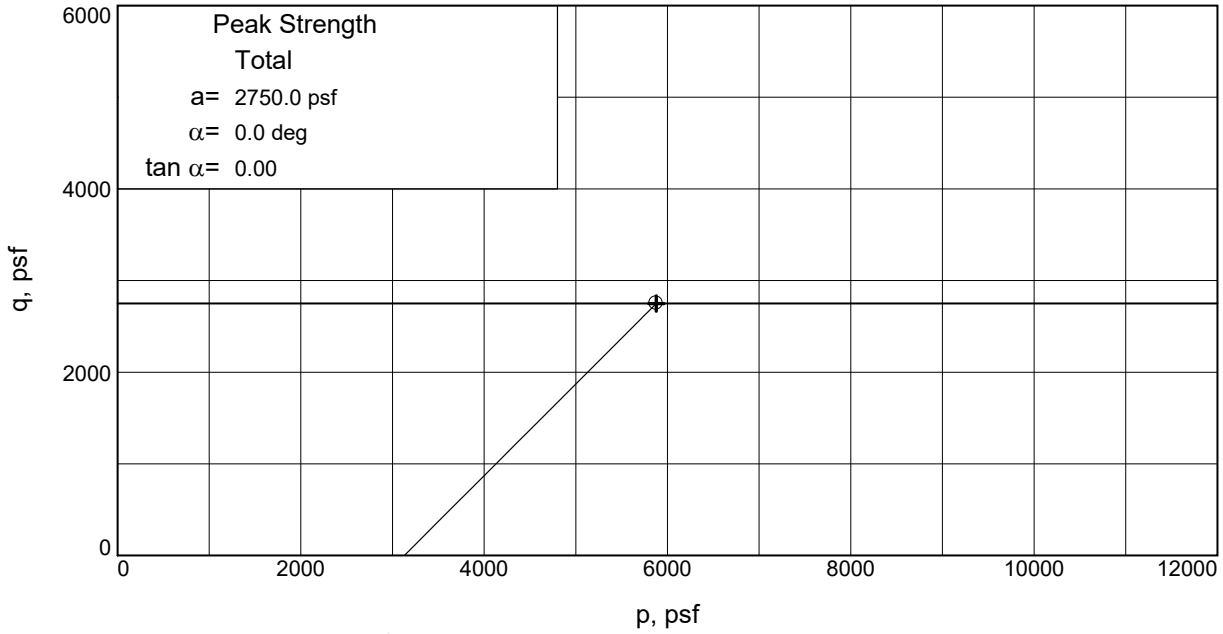
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

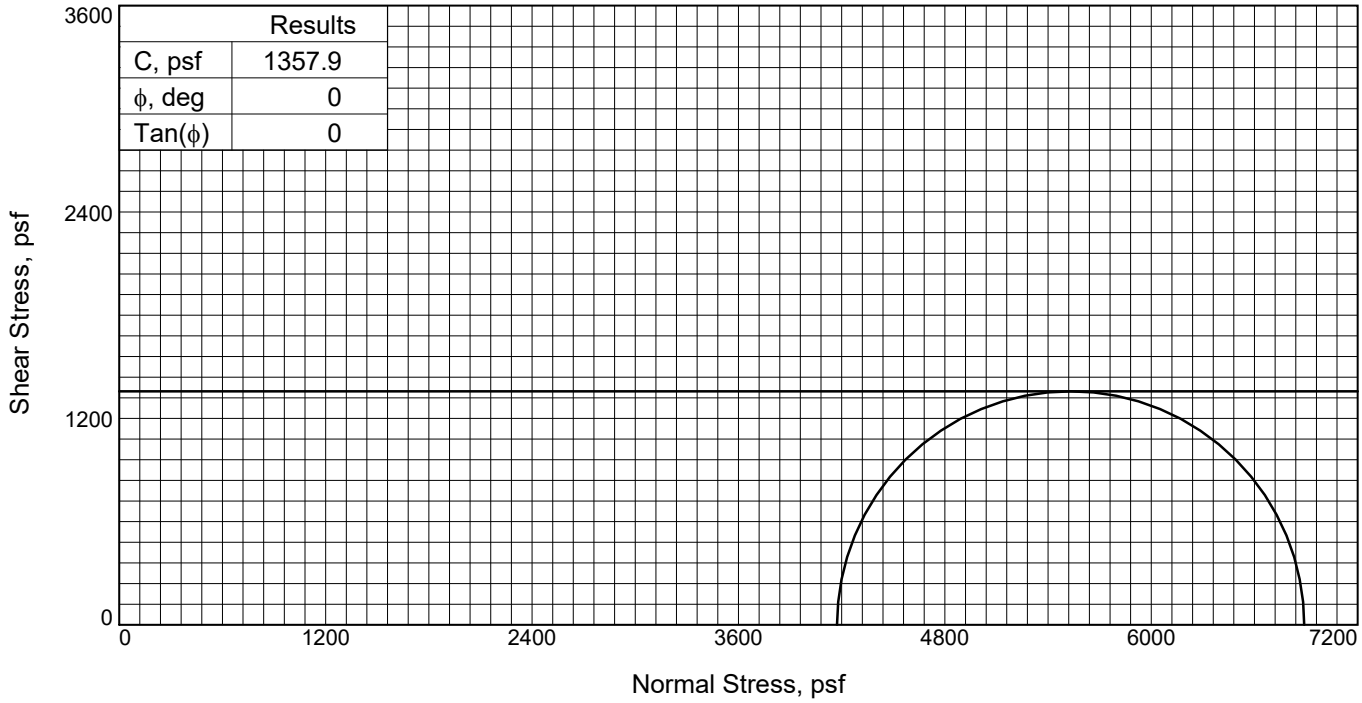
Client: GHD

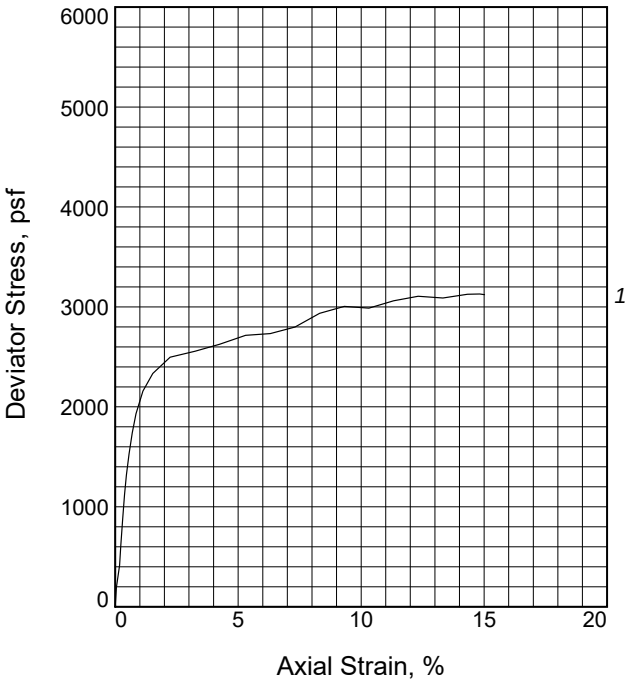
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16) **Sample Number:** SJMW-16-ST-3

Project No.: 2111020111 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	28.0
	Dry Density, pcf	98.4
	Saturation, %	108.4
	Void Ratio	0.6871
	Diameter, in.	2.859
	Height, in.	5.487
At Test	Water Content, %	24.7
	Dry Density, pcf	98.4
	Saturation, %	95.7
	Void Ratio	0.6871
	Diameter, in.	2.859
	Height, in.	5.487
Strain at peak, %		5.3
Back Pressure, psf		0.0
Cell Pressure, psf		4173.1
Fail. Stress, psf		2715.8
Strain, %		5.3
Ult. Stress, psf		2715.8
Strain, %		5.3
σ_1 Failure, psf		6888.9
σ_3 Failure, psf		4173.1

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: Light gray, CLAY, with sand pockets

LL= 55 **PL=** 17 **PI=** 38

Assumed Specific Gravity= 2.66

Remarks: Compression Failure Mode: Asymmetrical Shear Plane

Figure _____

Client: GHD

Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16)

Sample Number: SJMW-16-ST-5

Proj. No.: 2111020111 **Date Sampled:**

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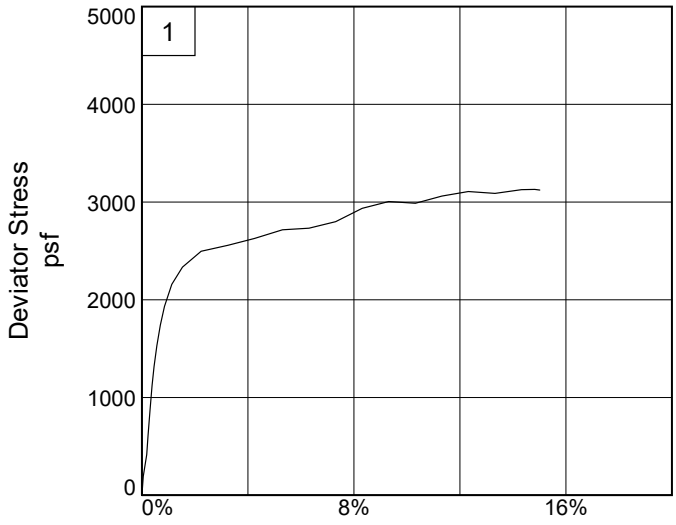
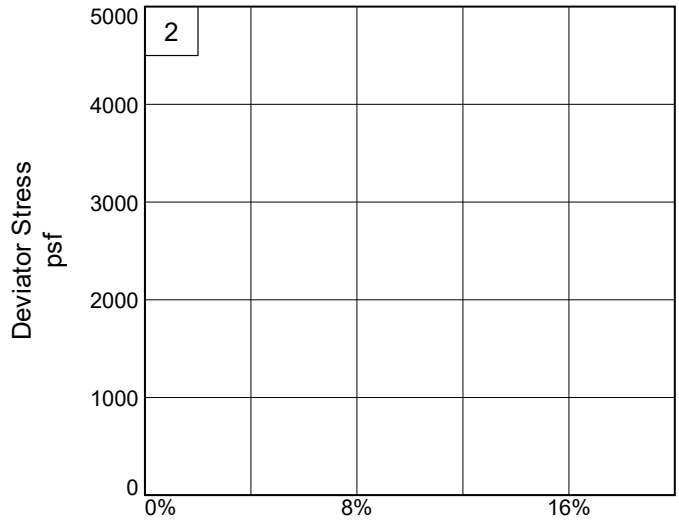
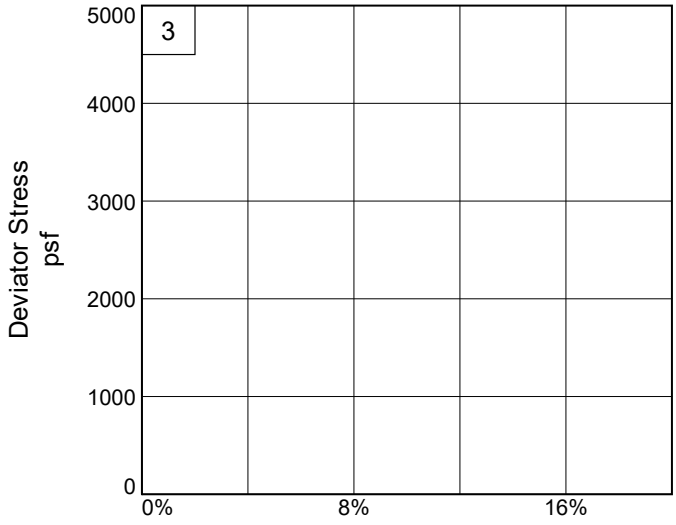
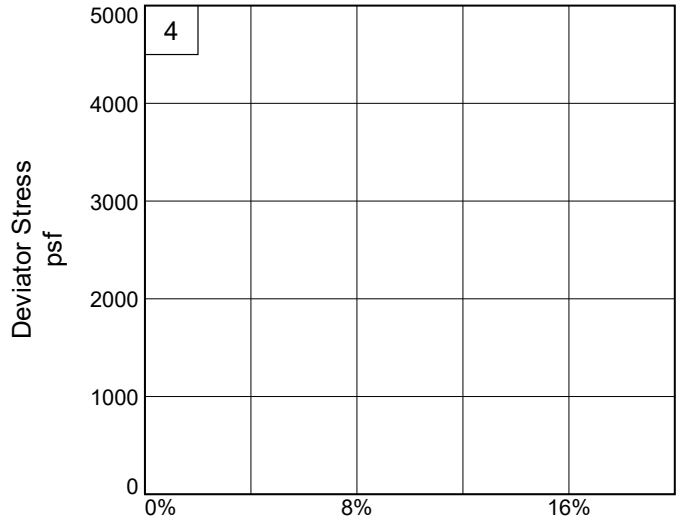
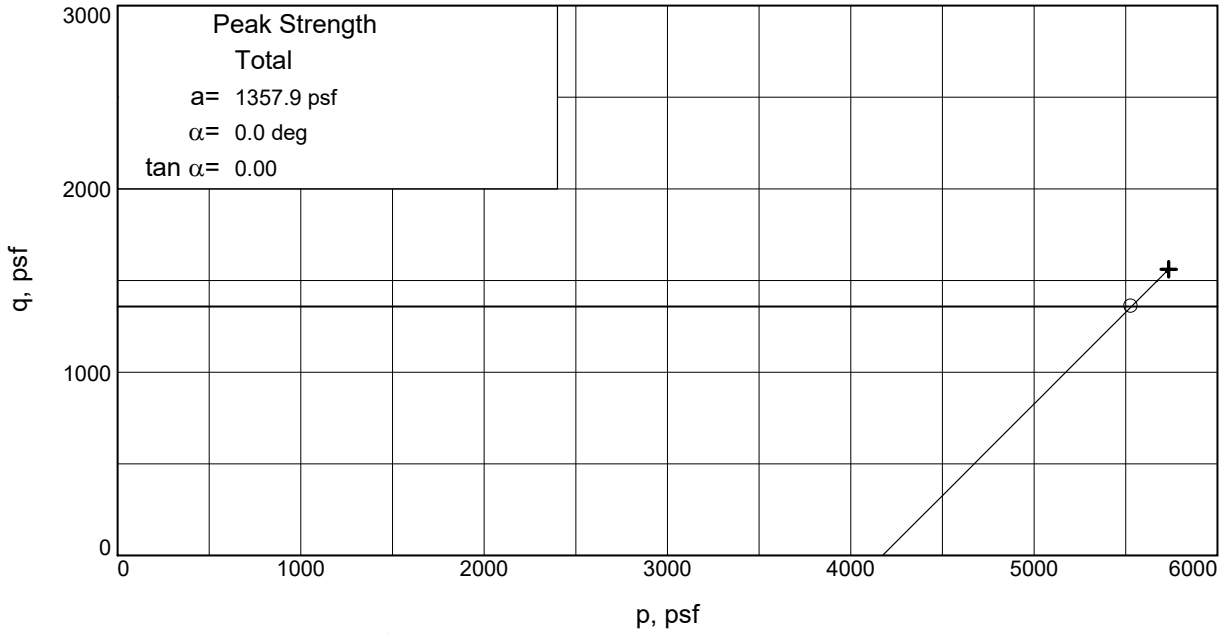
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

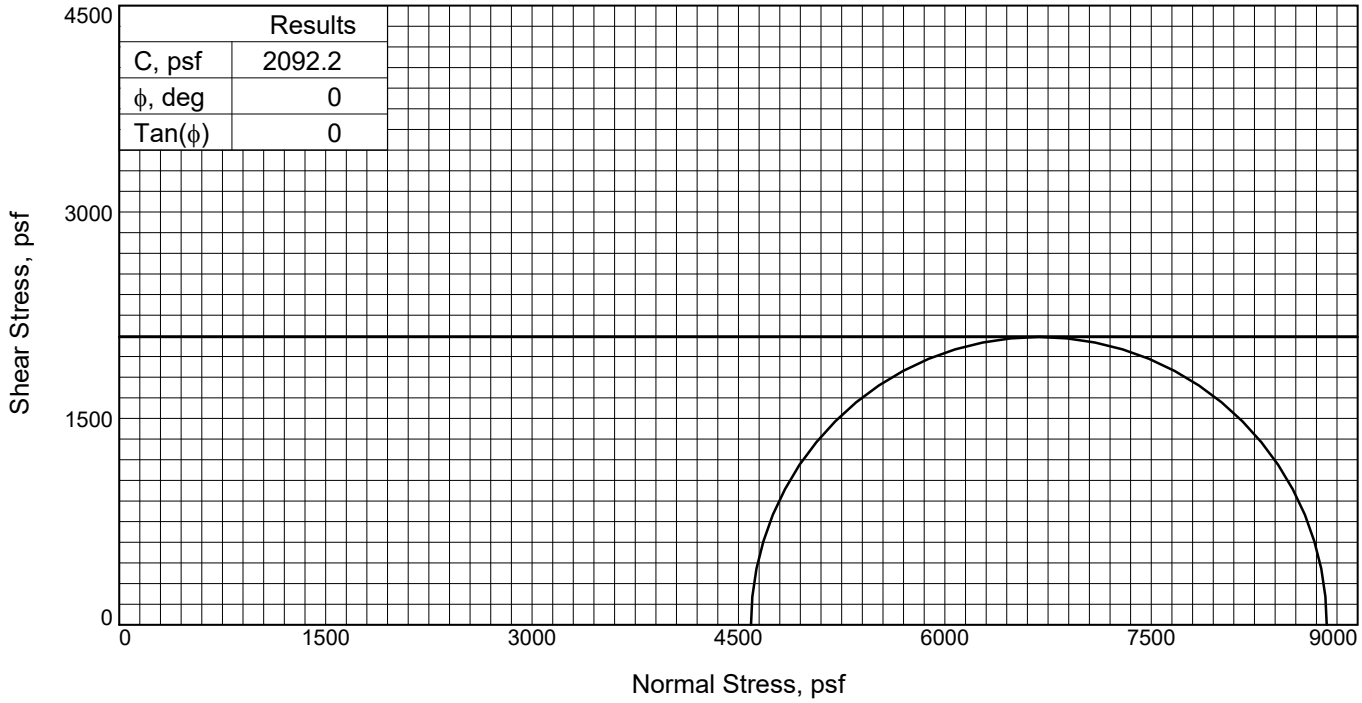
Client: GHD

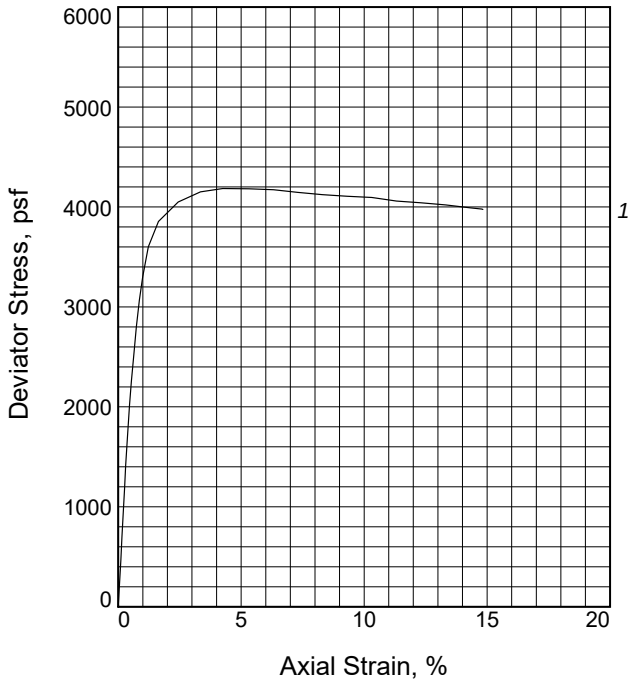
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16) **Sample Number:** SJMW-16-ST-5

Project No.: 2111020111 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	32.9
	Dry Density, pcf	90.4
	Saturation, %	104.4
	Void Ratio	0.8379
	Diameter, in.	2.865
	Height, in.	5.540
At Test	Water Content, %	32.7
	Dry Density, pcf	90.4
	Saturation, %	103.9
	Void Ratio	0.8379
	Diameter, in.	2.865
	Height, in.	5.540
Strain at peak, %		4.2
Back Pressure, psf		0.0
Cell Pressure, psf		4590.7
Fail. Stress, psf		4184.5
Strain, %		4.2
Ult. Stress, psf		4184.5
Strain, %		4.2
σ_1 Failure, psf		8775.2
σ_3 Failure, psf		4590.7

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: Red, CLAY

Assumed Specific Gravity= 2.66

Remarks: Compression Failure Mode: Asymmetrical Shear Plane

Figure _____

Client: GHD

Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16)

Sample Number: SJMW-16-ST-6

Proj. No.: 2111020111 **Date Sampled:** 8/26/2021

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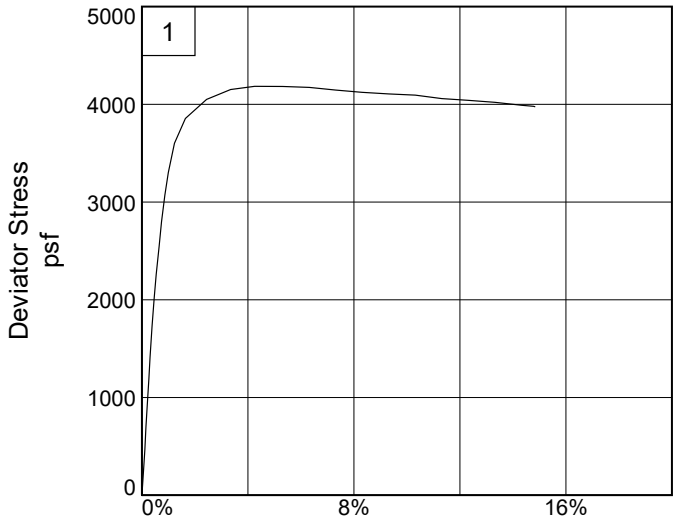
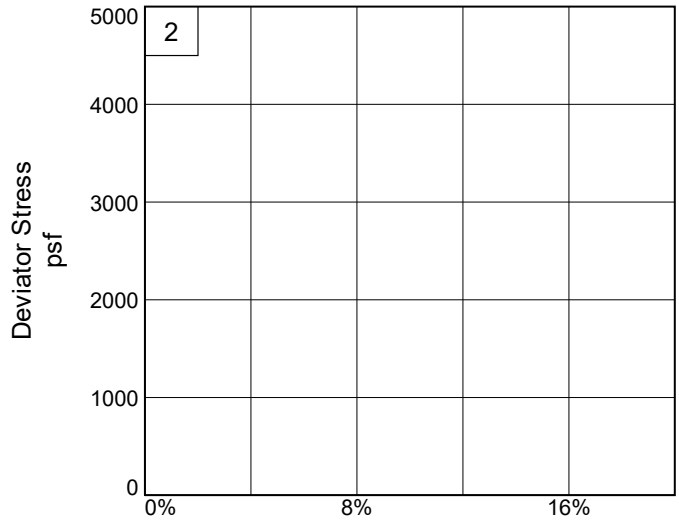
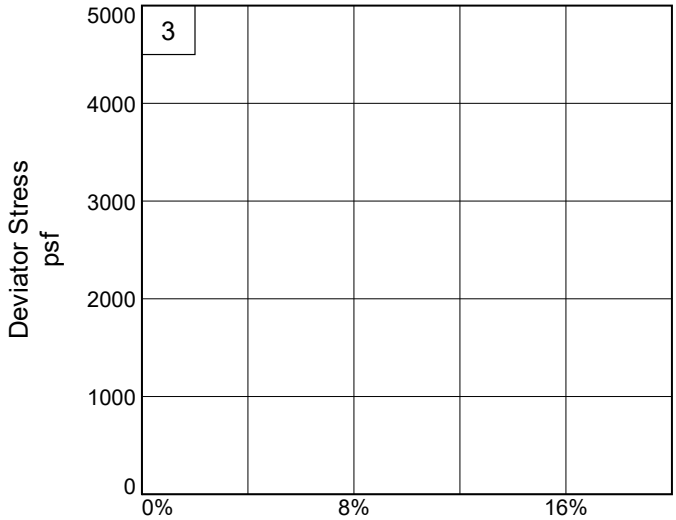
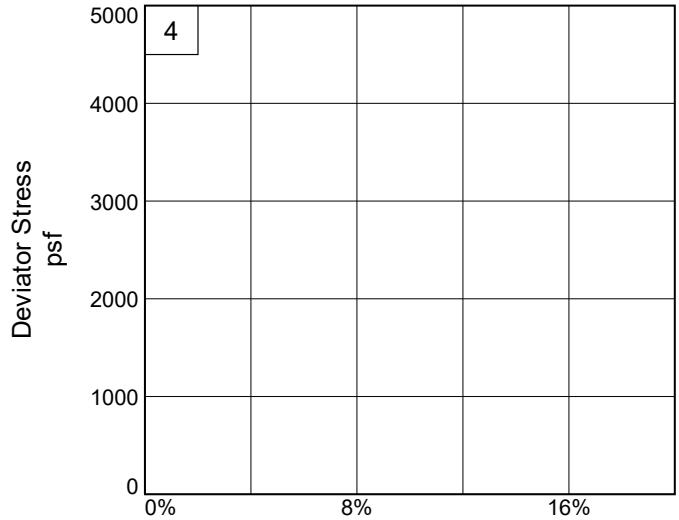
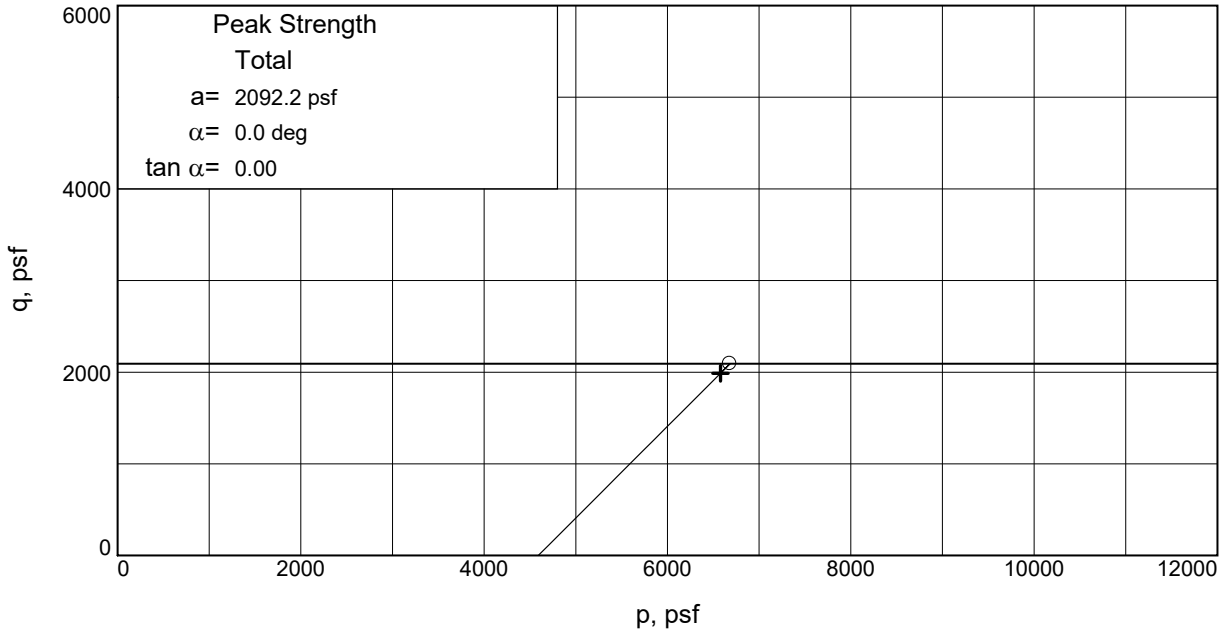
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

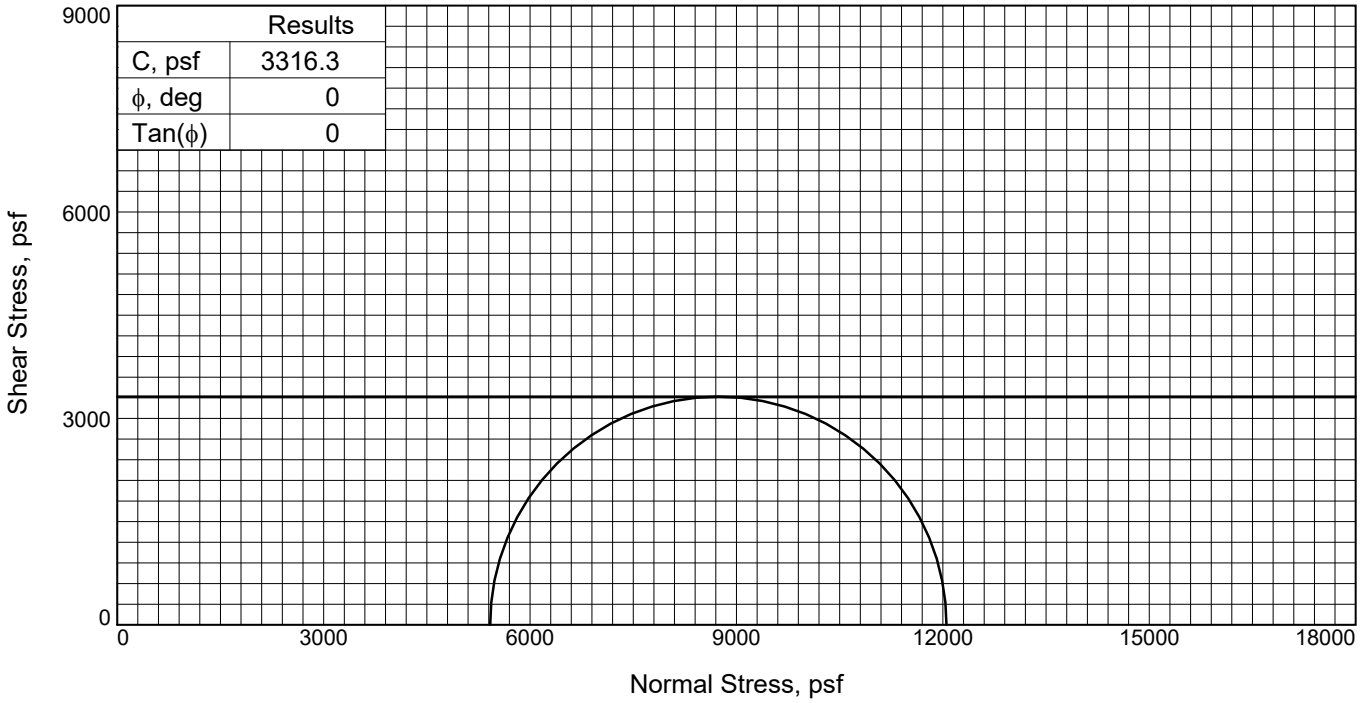
Client: GHD

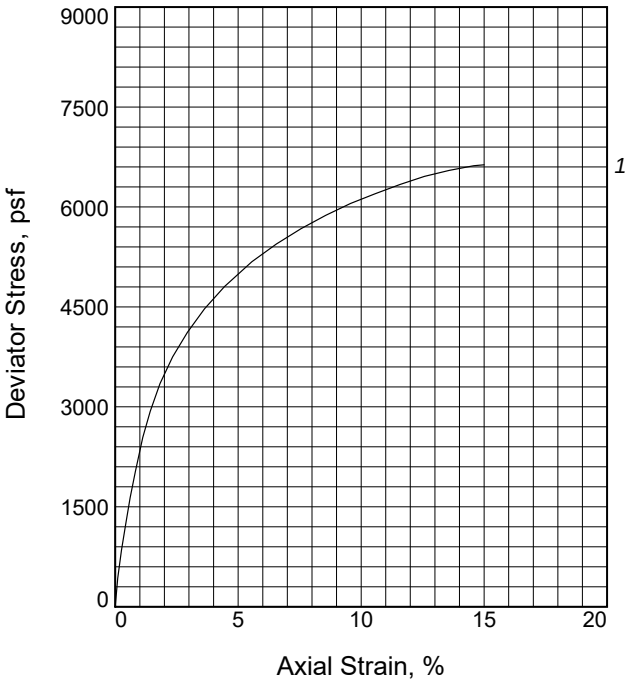
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16) **Sample Number:** SJMW-16-ST-6

Project No.: 2111020111 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	17.4
	Dry Density, pcf	113.8
	Saturation, %	100.4
	Void Ratio	0.4596
	Diameter, in.	2.849
	Height, in.	5.449
At Test	Water Content, %	17.7
	Dry Density, pcf	113.8
	Saturation, %	102.4
	Void Ratio	0.4596
	Diameter, in.	2.849
	Height, in.	5.449
Strain at peak, %		15.0
Back Pressure, psf		0.0
Cell Pressure, psf		5420.2
Fail. Stress, psf		6632.5
Strain, %		15.0
Ult. Stress, psf		6632.5
Strain, %		15.0
σ_1 Failure, psf		12052.7
σ_3 Failure, psf		5420.2

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: Light gray, SANDY CLAY

LL= 27 **PL=** 14 **PI=** 13

Assumed Specific Gravity= 2.66

Remarks: Compression Failure Mode: Symmetrical Bulge

Figure _____

Client: GHD

Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16)

Sample Number: SJMW-16-ST-8

Proj. No.: 2111020111 **Date Sampled:** 8/26/2021

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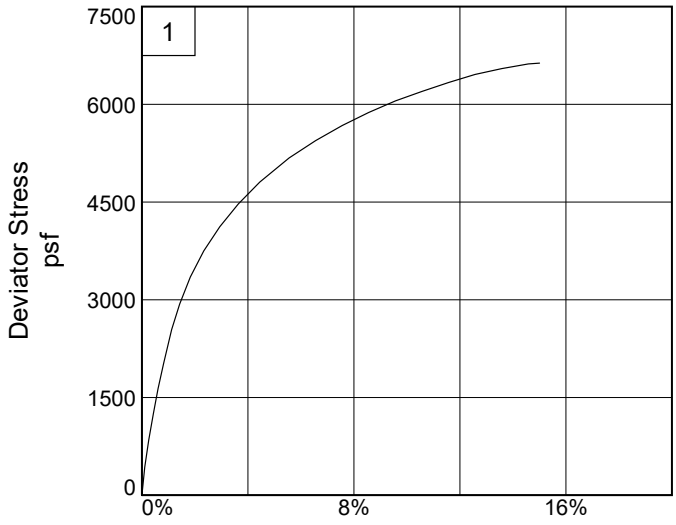
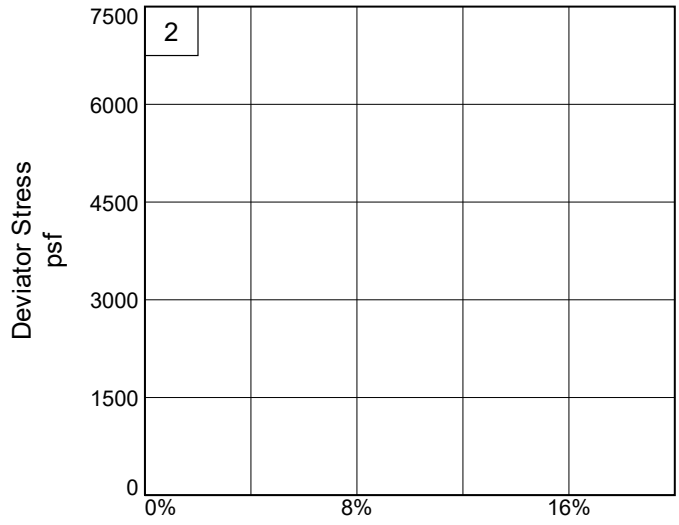
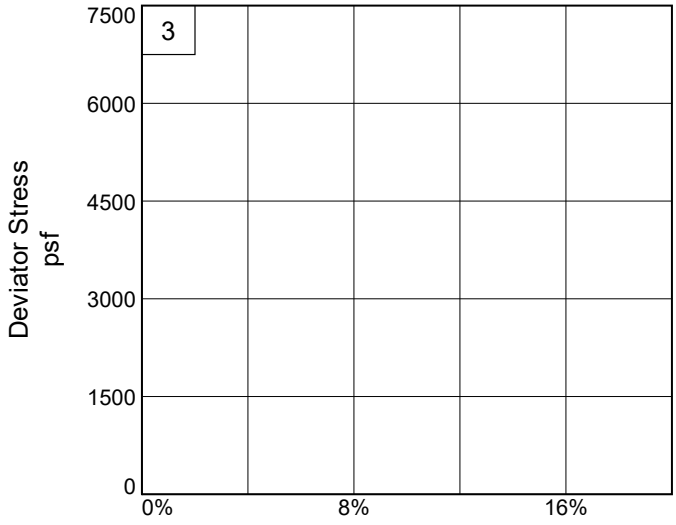
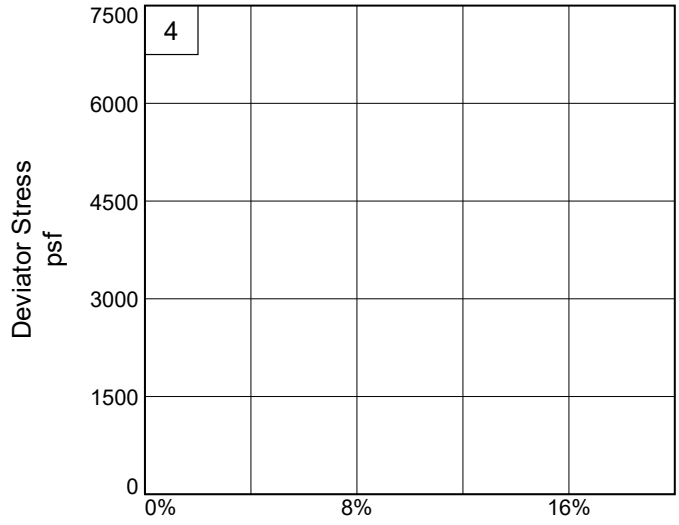
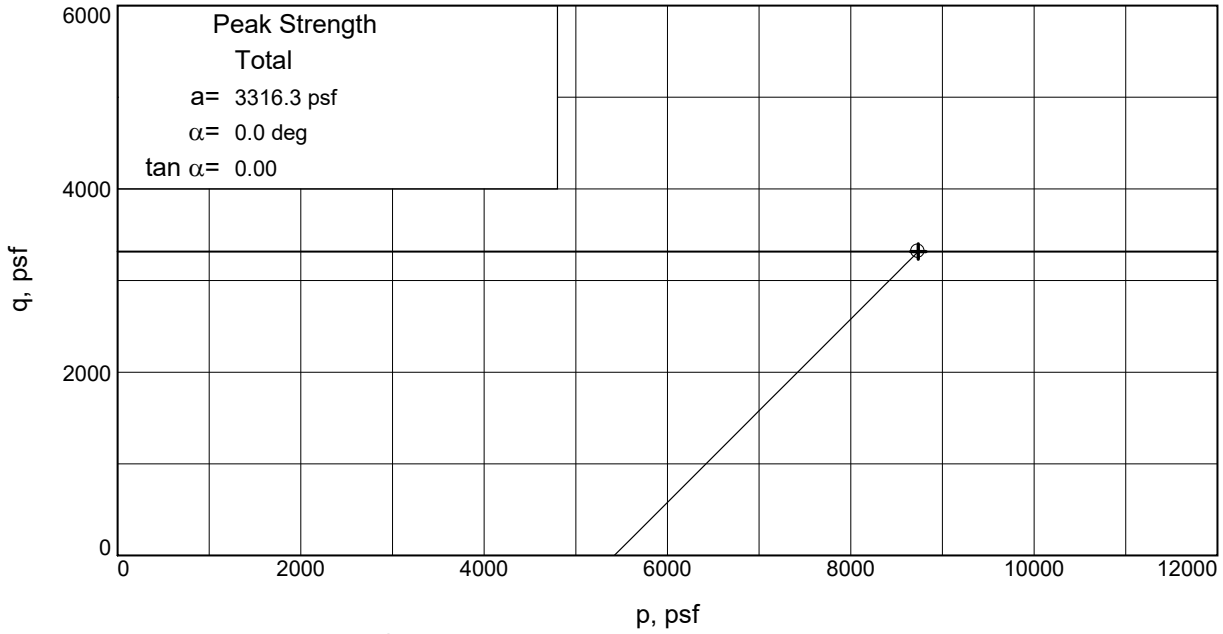
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

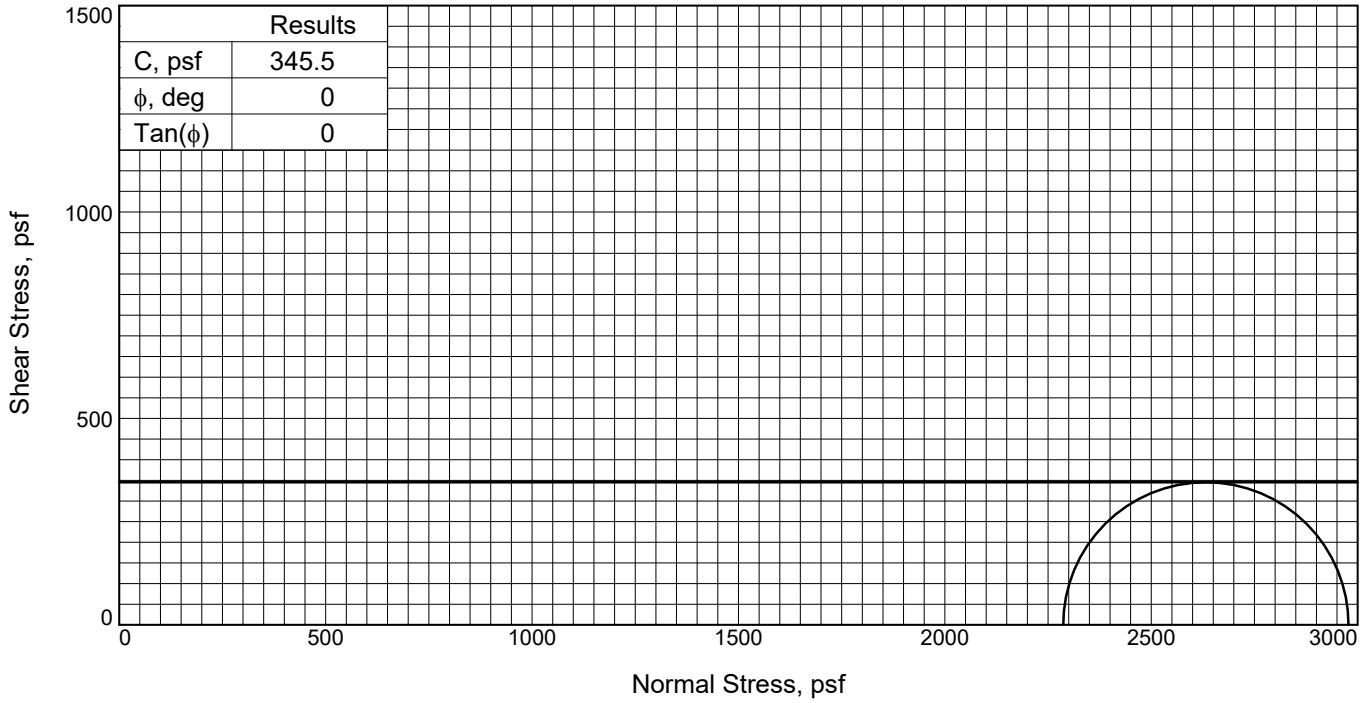
Client: GHD

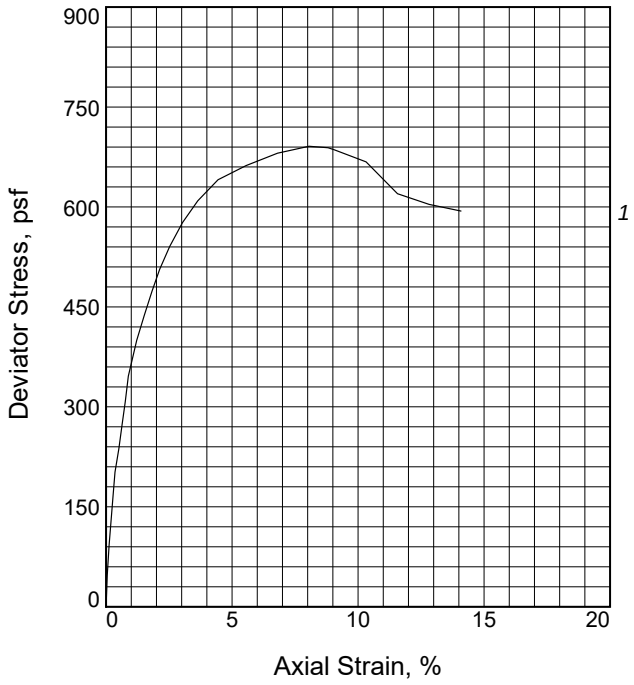
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16) **Sample Number:** SJMW-16-ST-8

Project No.: 2111020111 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	47.4
	Dry Density, pcf	73.1
	Saturation, %	99.1
	Void Ratio	1.2711
	Diameter, in.	2.805
	Height, in.	4.940
At Test	Water Content, %	49.4
	Dry Density, pcf	73.1
	Saturation, %	103.4
	Void Ratio	1.2711
	Diameter, in.	2.805
	Height, in.	4.940
Strain at peak, %		8.1
Back Pressure, psf		0.0
Cell Pressure, psf		2286.7
Fail. Stress, psf		691.1
Strain, %		8.1
Ult. Stress, psf		691.1
Strain, %		8.1
σ_1 Failure, psf		2977.8
σ_3 Failure, psf		2286.7

Type of Test: Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: Dark gray, CLAY

LL= 68 **PL=** 24 **PI=** 44

Assumed Specific Gravity= 2.66

Remarks: Compression Failure Mode: Asymmetrical Shear Plane

Figure _____

Client: GHD

Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-17)

Sample Number: SJMW-17-ST-1

Proj. No.: 2111020111 **Date Sampled:**

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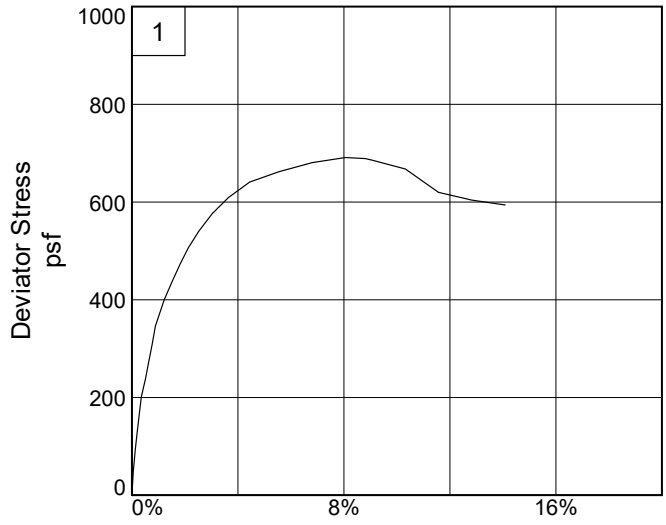
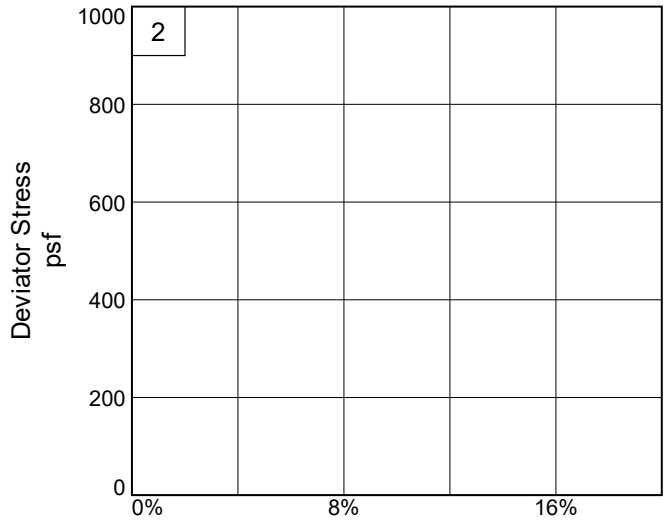
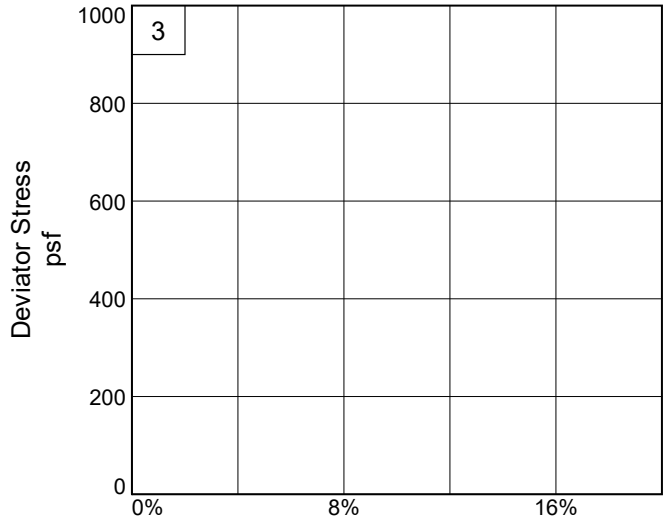
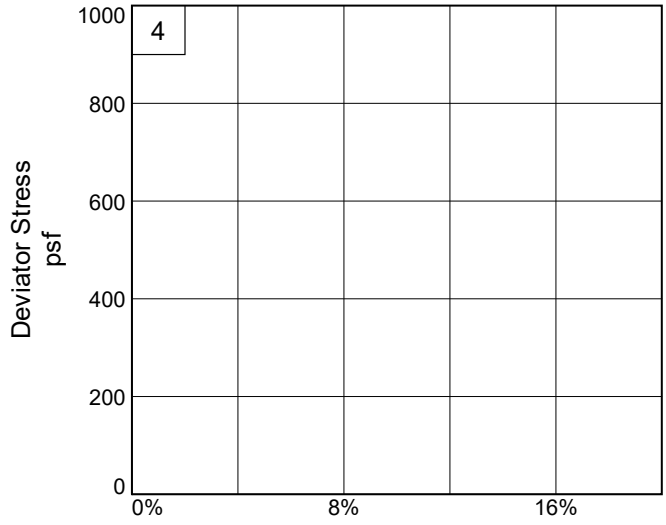
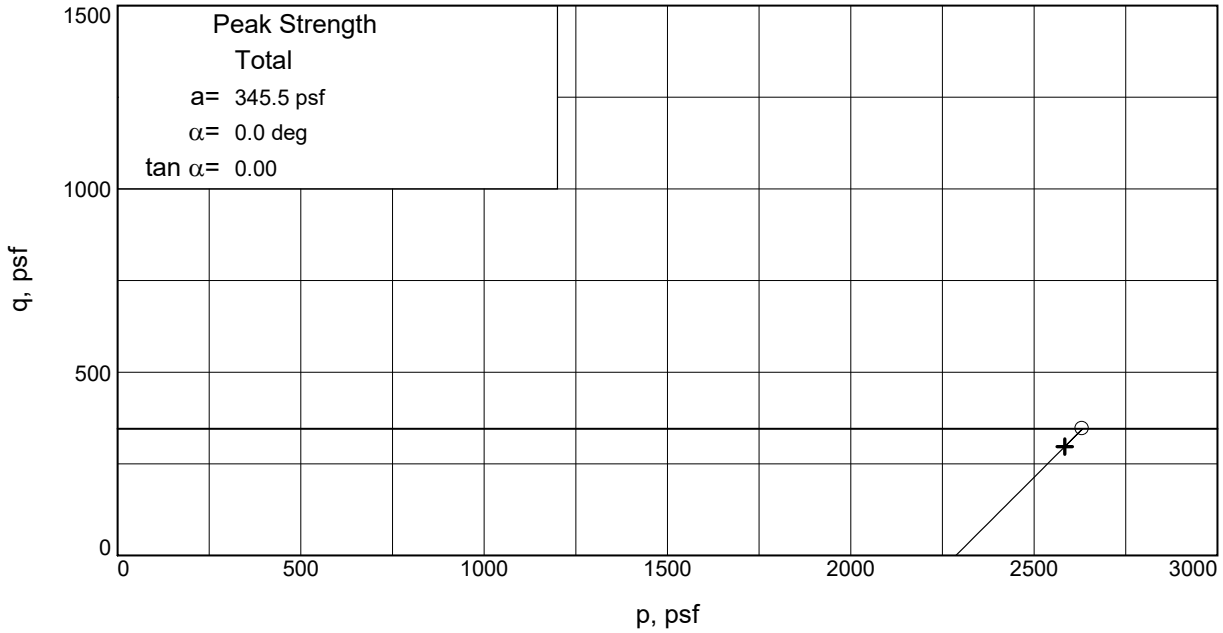
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

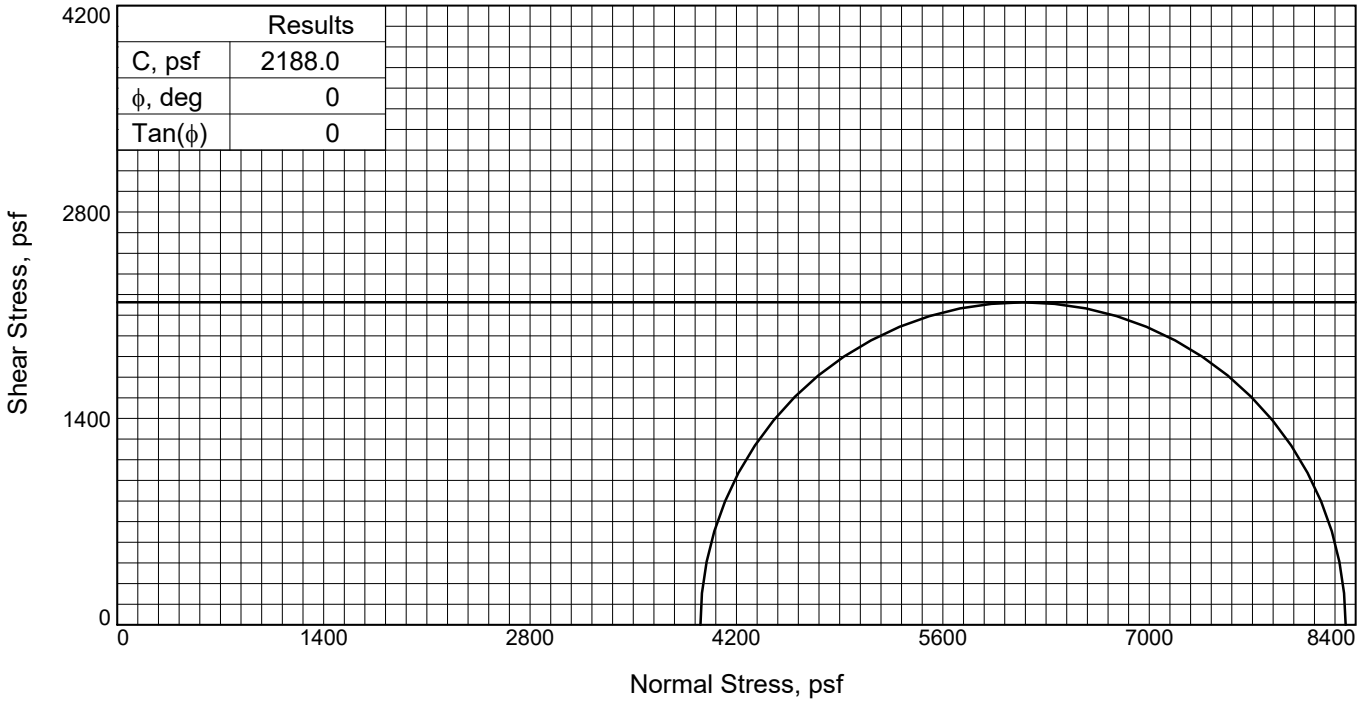
Client: GHD

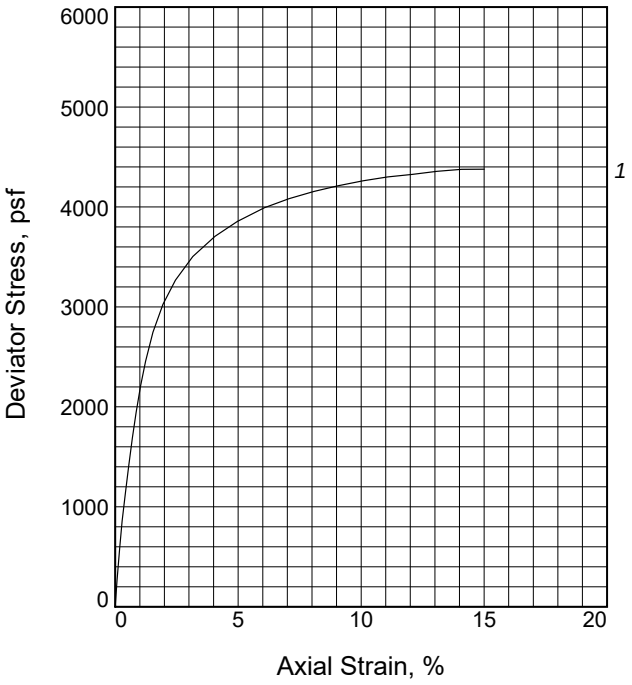
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-17) **Sample Number:** SJMW-17-ST-1

Project No.: 2111020111 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	20.1
	Dry Density, pcf	107.9
	Saturation, %	99.3
	Void Ratio	0.5396
	Diameter, in.	2.857
	Height, in.	5.603
At Test	Water Content, %	21.5
	Dry Density, pcf	107.9
	Saturation, %	106.0
	Void Ratio	0.5396
	Diameter, in.	2.857
	Height, in.	5.603
Strain at peak, %		14.1
Back Pressure, psf		0.0
Cell Pressure, psf		3955.7
Fail. Stress, psf		4376.0
Strain, %		14.1
Ult. Stress, psf		4376.0
Strain, %		14.1
σ_1 Failure, psf		8331.7
σ_3 Failure, psf		3955.7

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: Green, CLAY

LL= 50 **PL=** 14 **PI=** 36

Assumed Specific Gravity= 2.66

Remarks: Compression Failure Mode: Asymmetrical Shear Plane

Figure _____

Client: GHD

Project: San Jacinto Waste Piles

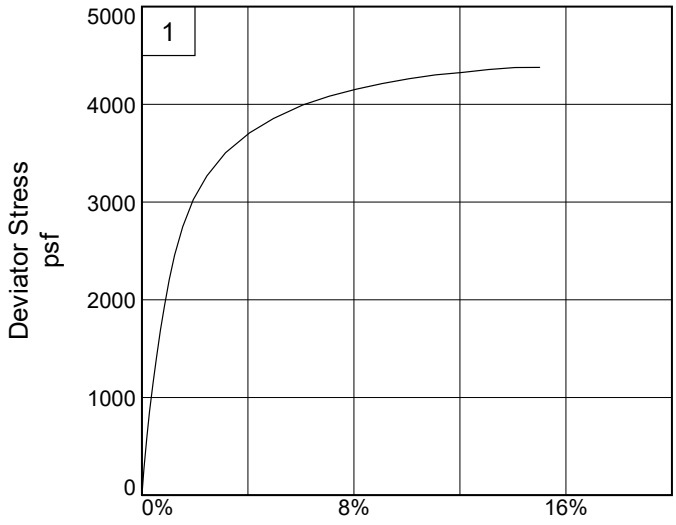
Source of Sample: Lab #9143 (SJMW-17)

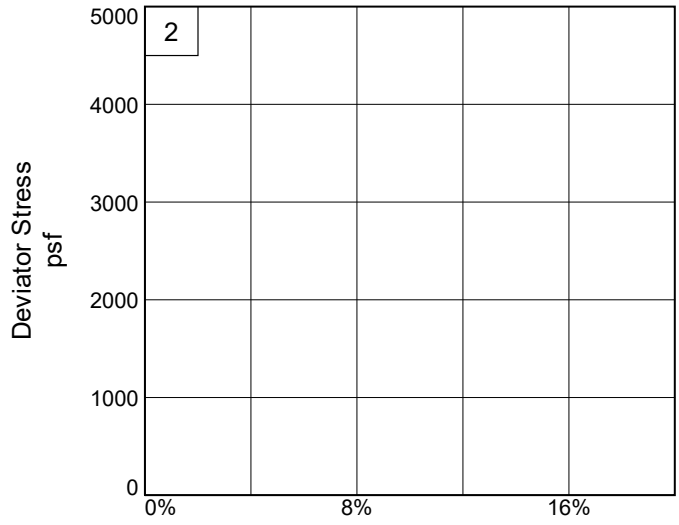
Sample Number: SJMW-17-ST-3

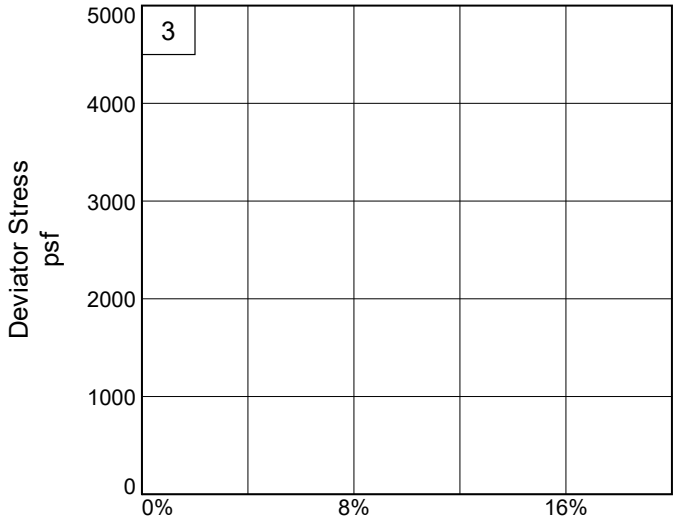
Proj. No.: 2111020111 **Date Sampled:** 8/21/2021

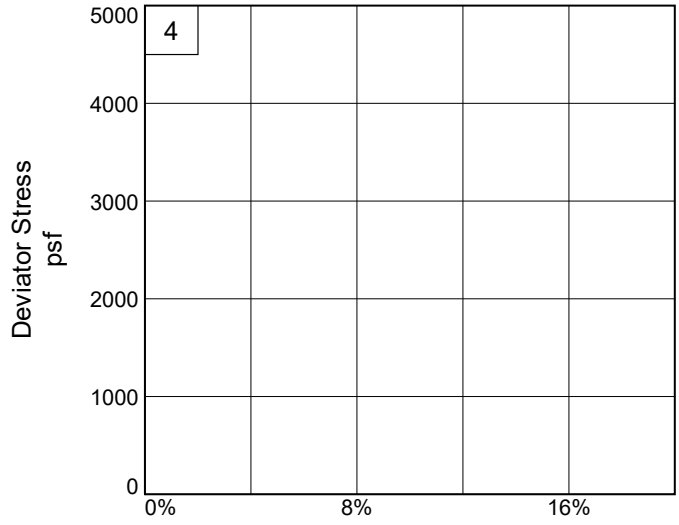
TRIAXIAL SHEAR TEST REPORT

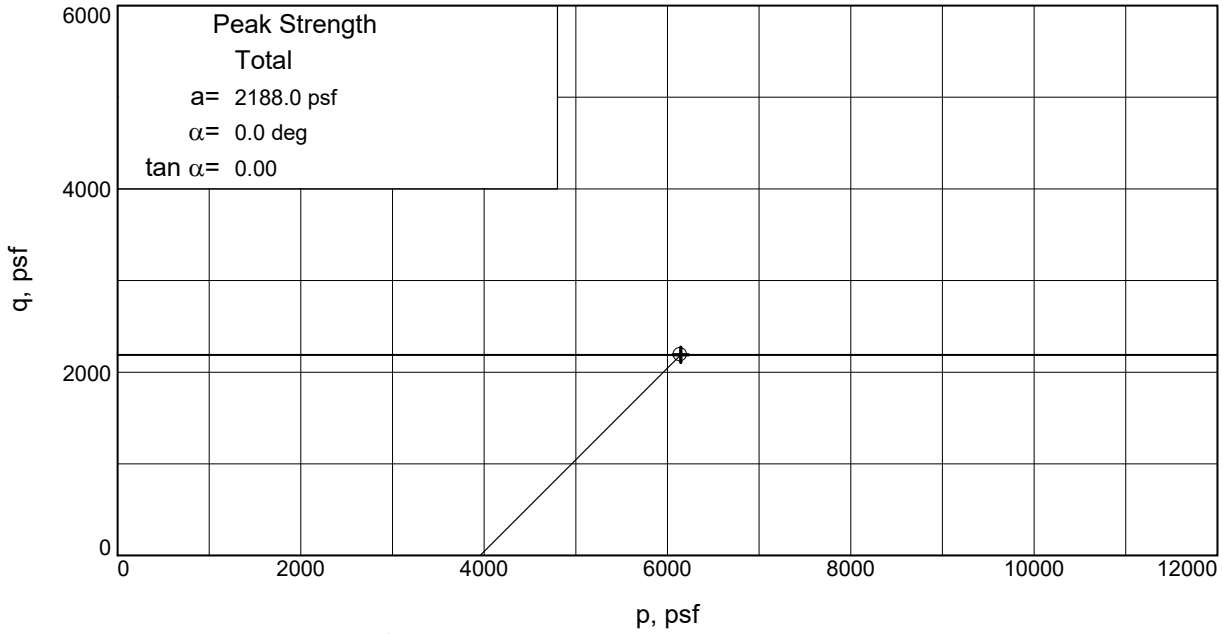
Thompson Engineering
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

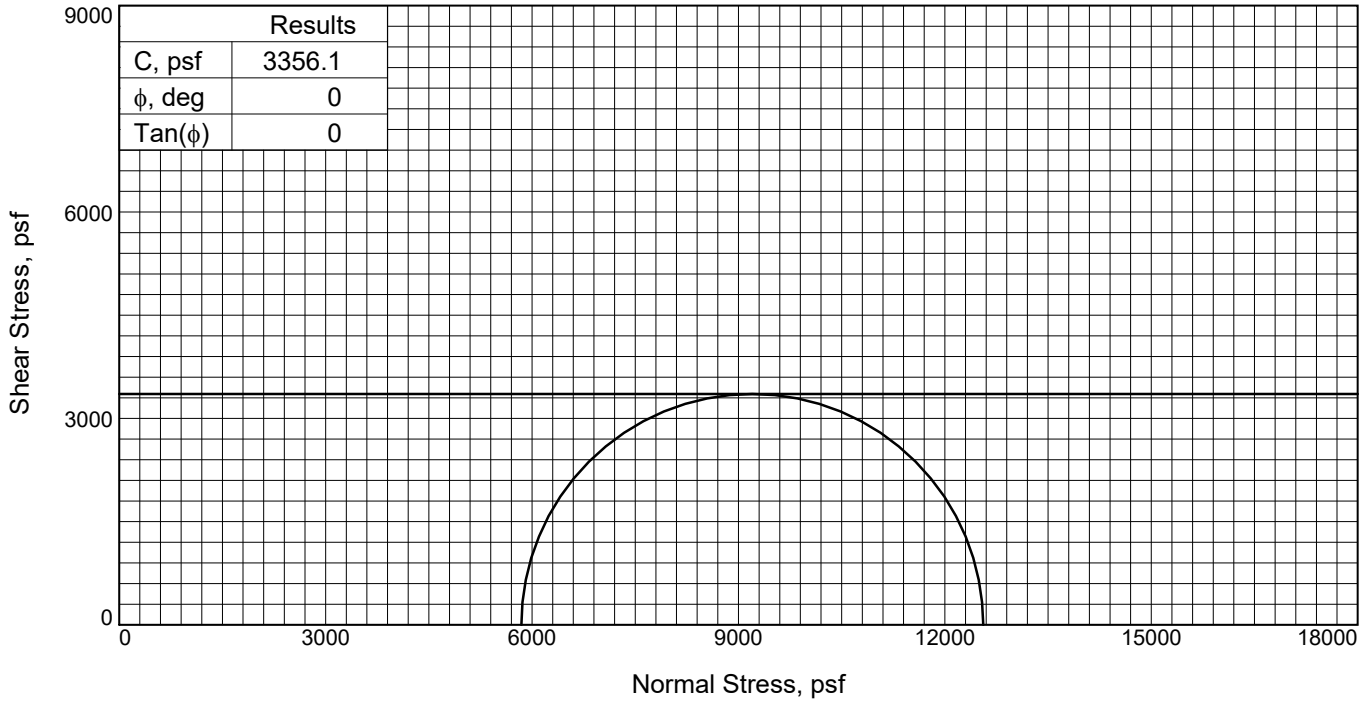
Client: GHD

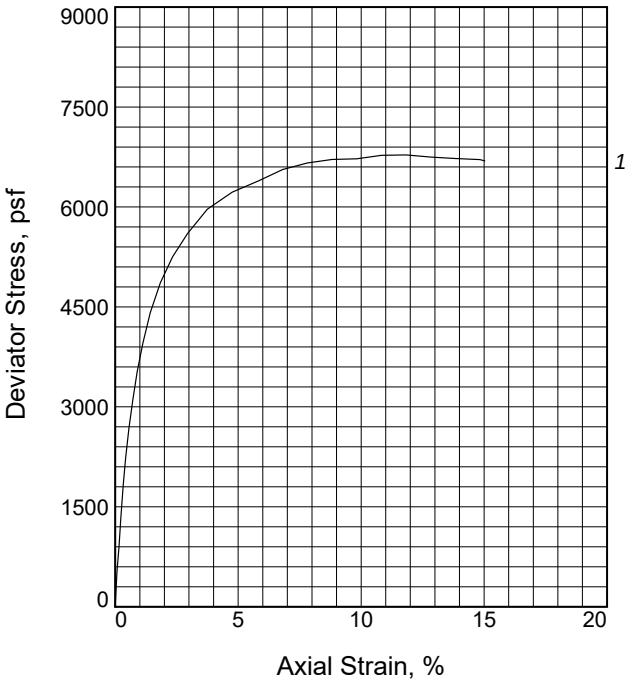
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-17) **Sample Number:** SJMW-17-ST-3

Project No.: 2111020111 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	21.0
	Dry Density, pcf	105.6
	Saturation, %	97.8
	Void Ratio	0.5724
	Diameter, in.	2.862
	Height, in.	5.418
At Test	Water Content, %	21.5
	Dry Density, pcf	105.6
	Saturation, %	100.0
	Void Ratio	0.5724
	Diameter, in.	2.862
	Height, in.	5.418
Strain at peak, %		8.8
Back Pressure, psf		0.0
Cell Pressure, psf		5845.0
Fail. Stress, psf		6712.2
Strain, %		8.8
Ult. Stress, psf		6712.2
Strain, %		8.8
σ_1 Failure, psf		12557.2
σ_3 Failure, psf		5845.0

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: Green, CLAY

LL= 37 **PL=** 14 **PI=** 23

Assumed Specific Gravity= 2.66

Remarks: Compression Failure Mode: Asymmetrical Shear Plane

Figure _____

Client: GHD

Project: San Jacinto Waste Piles

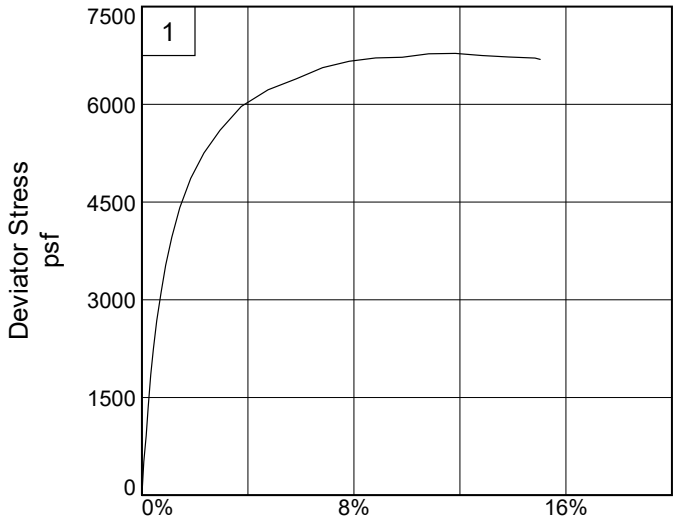
Source of Sample: Lab #9143 (SJMW-17)

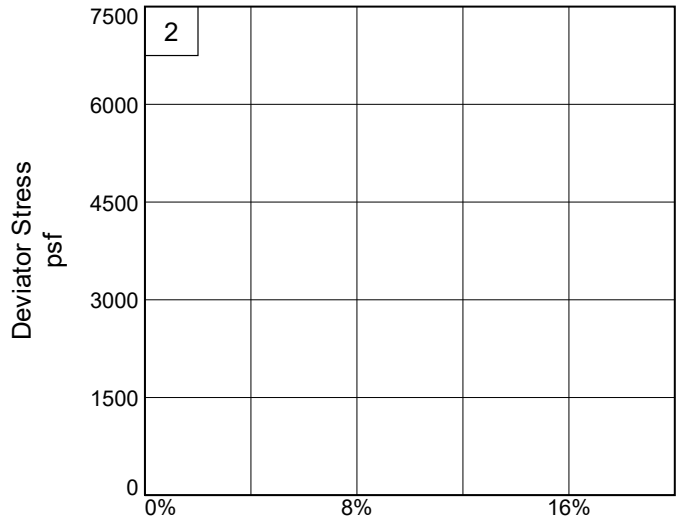
Sample Number: SJMW-17-ST-5

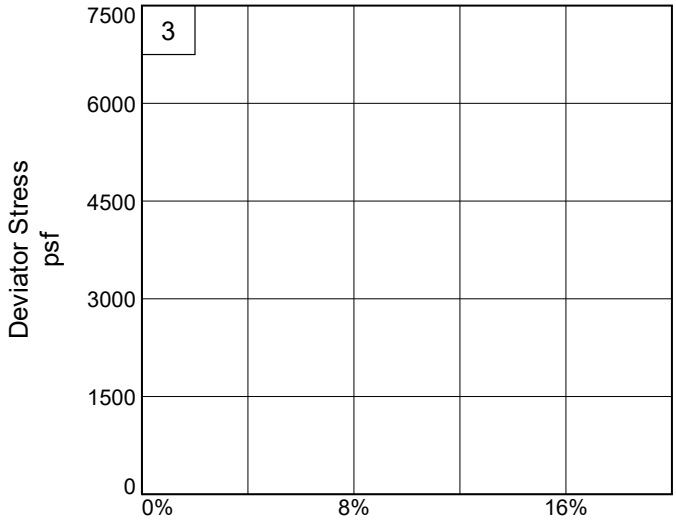
Proj. No.: 2111020111 **Date Sampled:**

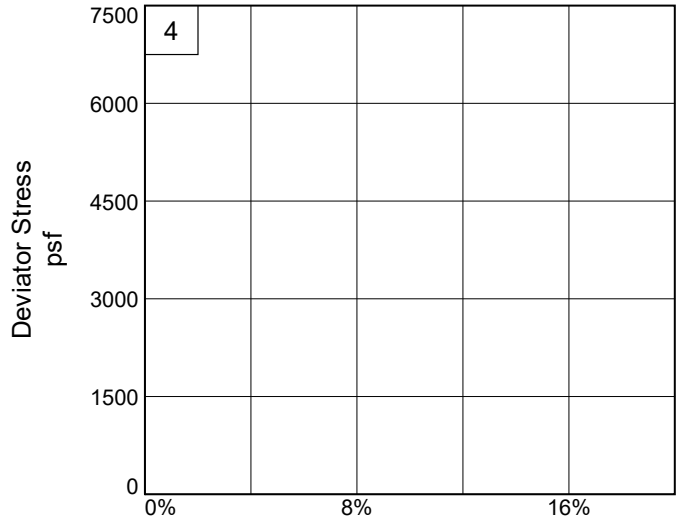
TRIAXIAL SHEAR TEST REPORT

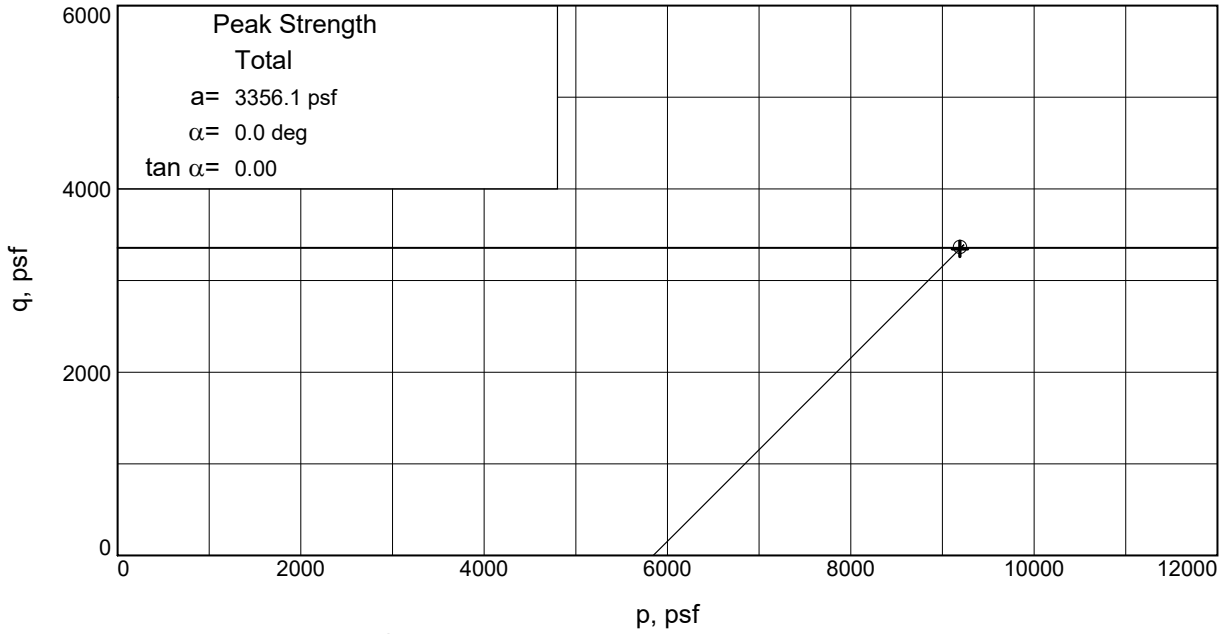
Thompson Engineering
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

Client: GHD

Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-17) **Sample Number:** SJMW-17-ST-5

Project No.: 2111020111 **Figure** _____

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION
USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-001
SAMPLE DESCRIPTION: DARK GRAY, FINE TO MEDIUM GRAINED, CLAYEY SAND

DATES	TECHNICIAN
SAMPLED: 8/20/2021	SAMPLED: CLIENT
TESTED: 9/8/2021	TESTED: B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	16.040
(b): SAMPLE DIAMETER (cm):	7.233
(c): SAMPLE AREA (cm^2):	41.085
(d): SAMPLE VOLUME (cm^3):	659.010
(e): MASS OF WET SPECIMEN (g):	1074.54
(f): MASS OF DRY SPECIMEN (g):	679.71
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**101.75**
(n): DRY BULK DENSITY (PCF):	**64.36**
(o): SPECIFITY GRAVITY OF SOIL	2.772
(p): VOLUME OF SOIL:	245.21
(q): VOLUME OF VOIDS:	413.80
(r): VOID RATIO:	1.69
(s): POROSITY:	**0.63**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION
USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-002
SAMPLE DESCRIPTION: BLACK, CLAY, WET

DATES	TECHNICIAN
SAMPLED: 8/20/2021	SAMPLED: CLIENT
TESTED: 9/8/2021	TESTED: B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	15.450
(b): SAMPLE DIAMETER (cm):	7.207
(c): SAMPLE AREA (cm^2):	40.797
(d): SAMPLE VOLUME (cm^3):	630.296
(e): MASS OF WET SPECIMEN (g):	731.59
(f): MASS OF DRY SPECIMEN (g):	462.78
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**72.43**
(n): DRY BULK DENSITY (PCF):	**45.82**
(o): SPECIFITY GRAVITY OF SOIL	2.580
(p): VOLUME OF SOIL:	179.37
(q): VOLUME OF VOIDS:	450.93
(r): VOID RATIO:	2.51
(s): POROSITY:	**0.72**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-003
SAMPLE DESCRIPTION: BLACK, CLAY, WET

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	9/8/2021	TESTED:	B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	15.831
(b): SAMPLE DIAMETER (cm):	7.233
(c): SAMPLE AREA (cm^2):	41.085
(d): SAMPLE VOLUME (cm^3):	650.400
(e): MASS OF WET SPECIMEN (g):	747.24
(f): MASS OF DRY SPECIMEN (g):	472.68
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**71.69**
(n): DRY BULK DENSITY (PCF):	**45.35**
(o): SPECIFITY GRAVITY OF SOIL	2.787
(p): VOLUME OF SOIL:	169.60
(q): VOLUME OF VOIDS:	480.80
(r): VOID RATIO:	2.83
(s): POROSITY:	**0.74**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION
USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-004
SAMPLE DESCRIPTION: BLACK, CLAY, WET

DATES	TECHNICIAN
SAMPLED: 8/20/2021	SAMPLED: CLIENT
TESTED: 9/8/2021	TESTED: B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	14.878
(b): SAMPLE DIAMETER (cm):	7.233
(c): SAMPLE AREA (cm^2):	41.085
(d): SAMPLE VOLUME (cm^3):	611.267
(e): MASS OF WET SPECIMEN (g):	786.92
(f): MASS OF DRY SPECIMEN (g):	497.78
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**80.33**
(n): DRY BULK DENSITY (PCF):	**50.81**
(o): SPECIFITY GRAVITY OF SOIL	2.598
(p): VOLUME OF SOIL:	191.60
(q): VOLUME OF VOIDS:	419.67
(r): VOID RATIO:	2.19
(s): POROSITY:	**0.69**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION
USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-005
SAMPLE DESCRIPTION: GRAY, FINE GRAINED, SLIGHTLY SILTY SAND, WITH TRACE SHELL

DATES	TECHNICIAN
SAMPLED: 8/20/2021	SAMPLED: CLIENT
TESTED: 9/8/2021	TESTED: B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	14.719
(b): SAMPLE DIAMETER (cm):	7.245
(c): SAMPLE AREA (cm^2):	41.230
(d): SAMPLE VOLUME (cm^3):	606.870
(e): MASS OF WET SPECIMEN (g):	1244.71
(f): MASS OF DRY SPECIMEN (g):	787.36
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**127.98**
(n): DRY BULK DENSITY (PCF):	**80.96**
(o): SPECIFITY GRAVITY OF SOIL	2.596
(p): VOLUME OF SOIL:	303.30
(q): VOLUME OF VOIDS:	303.57
(r): VOID RATIO:	1.00
(s): POROSITY:	**0.50**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION
USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-007
SAMPLE DESCRIPTION: VERY DARK GRAY, FINE TO MEDIUM GRAINED, SILTY SAND

DATES	TECHNICIAN
SAMPLED: 8/20/2021	SAMPLED: CLIENT
TESTED: 9/8/2021	TESTED: B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	10.662
(b): SAMPLE DIAMETER (cm):	6.172
(c): SAMPLE AREA (cm^2):	29.921
(d): SAMPLE VOLUME (cm^3):	319.003
(e): MASS OF WET SPECIMEN (g):	768.07
(f): MASS OF DRY SPECIMEN (g):	485.85
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**150.24**
(n): DRY BULK DENSITY (PCF):	**95.04**
(o): SPECIFITY GRAVITY OF SOIL	2.726
(p): VOLUME OF SOIL:	178.23
(q): VOLUME OF VOIDS:	140.77
(r): VOID RATIO:	0.79
(s): POROSITY:	**0.44**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-008

SAMPLE DESCRIPTION: BLACK, FINE TO MEDIUM GRAINED, SLIGHTLY SILTY SAND, TRACE ORGANICS, WET

DATES	TECHNICIAN
SAMPLED: 8/20/2021	SAMPLED: CLIENT
TESTED: 9/8/2021	TESTED: B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	13.430
(b): SAMPLE DIAMETER (cm):	7.195
(c): SAMPLE AREA (cm^2):	40.653
(d): SAMPLE VOLUME (cm^3):	545.986
(e): MASS OF WET SPECIMEN (g):	957.65
(f): MASS OF DRY SPECIMEN (g):	605.77
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**109.45**
(n): DRY BULK DENSITY (PCF):	**69.23**
(o): SPECIFITY GRAVITY OF SOIL	2.688
(p): VOLUME OF SOIL:	225.36
(q): VOLUME OF VOIDS:	320.62
(r): VOID RATIO:	1.42
(s): POROSITY:	**0.59**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION
USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-009

SAMPLE DESCRIPTION: VERY DARK GRAY, FINE GRAINED, CLAYEY SAND, TRACE ORGANICS, WET

DATES	TECHNICIAN
SAMPLED: 8/20/2021	SAMPLED: CLIENT
TESTED: 9/8/2021	TESTED: B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	14.675
(b): SAMPLE DIAMETER (cm):	7.163
(c): SAMPLE AREA (cm^2):	40.295
(d): SAMPLE VOLUME (cm^3):	591.329
(e): MASS OF WET SPECIMEN (g):	801.97
(f): MASS OF DRY SPECIMEN (g):	507.30
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**84.63**
(n): DRY BULK DENSITY (PCF):	**53.53**
(o): SPECIFITY GRAVITY OF SOIL	2.690
(p): VOLUME OF SOIL:	188.59
(q): VOLUME OF VOIDS:	402.74
(r): VOID RATIO:	2.14
(s): POROSITY:	**0.68**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: LABORATORY DETERMINATION OF UNIT WEIGHTS, VOID RATIO, POROSITY, AND DEGREE SATURATION
USCOE EM 1110-2-1906 APPENDIX II (VOLUMETRIC METHOD)

SAMPLE IDENTIFICATION: SJCPT-010

SAMPLE DESCRIPTION: GRAY, FINE TO MEDIUM GRAINED, CLAYEY SAND, TRACE ORGANICS, WET

DATES	TECHNICIAN
SAMPLED: 8/20/2021	SAMPLED: CLIENT
TESTED: 9/8/2021	TESTED: B.HAK

.... LABORATORY RESULTS ....

(a): SAMPLE HEIGHT (cm):	14.103
(b): SAMPLE DIAMETER (cm):	7.214
(c): SAMPLE AREA (cm^2):	40.869
(d): SAMPLE VOLUME (cm^3):	576.390
(e): MASS OF WET SPECIMEN (g):	896.06
(f): MASS OF DRY SPECIMEN (g):	566.81
(g): MASS OF CONTAINER (g):	25.14
(h): MASS OF CONTAINER & WET SAMPLE (g):	74.19
(i): MASS OF CONTAINER & DRY SAMPLE (g):	61.01
(j): MASS OF WATER (g):	13.18
(k): MASS OF DRY SAMPLE (g):	35.87
(l): WATER CONTENT (%):	**36.74**
(m): WET BULK DENSITY (PCF):	**97.01**
(n): DRY BULK DENSITY (PCF):	**61.36**
(o): SPECIFITY GRAVITY OF SOIL	2.781
(p): VOLUME OF SOIL:	203.82
(q): VOLUME OF VOIDS:	372.57
(r): VOID RATIO:	1.83
(s): POROSITY:	**0.65**

NOTE: THIS SAMPLE WAS RECEIVED IN A DISTURBED CONDITION AND WAS COMPACTED IN THE LABORATORY FOR DENSITY DETERMINATION. RESULTS ARE AN INDICATION OF, BUT NOT NECESSARILY REPRESENTATIVE OF, IN-SITU DENSITY.

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-001
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	140.48
Wt. Pan + Dry Soil (Gms) =	213.12
Wt. Dry Soil (Gms) =	72.640
500 ml. Pycnometer No:	21
Pycnometer Temperature (Deg. C) =	20.32
Wt. Pycnometer (Gms) =	178.5
Wt. Pycnometer + Water (Gms @ T) =	676.834
Wt. Pycnometer + Soil + Water (Gms @ T) =	723.27
Specific Gravity @ T =	2.772
Water Relative Density Corr. Factor @ T =	0.99994

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.772

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-002
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	138.19
Wt. Pan + Dry Soil (Gms) =	159.3
Wt. Dry Soil (Gms) =	21.110
500 ml. Pycnometer No:	22
Pycnometer Temperature (Deg. C) =	19.99
Wt. Pycnometer (Gms) =	179.21
Wt. Pycnometer + Water (Gms @ T) =	677.673
Wt. Pycnometer + Soil + Water (Gms @ T) =	690.60
Specific Gravity @ T =	2.580
Water Relative Density Corr. Factor @ T =	1.00001

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.580

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-003
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	111.27
Wt. Pan + Dry Soil (Gms) =	143.11
Wt. Dry Soil (Gms) =	31.840
500 ml. Pycnometer No:	13
Pycnometer Temperature (Deg. C) =	19.29
Wt. Pycnometer (Gms) =	166.3
Wt. Pycnometer + Water (Gms @ T) =	665.137
Wt. Pycnometer + Soil + Water (Gms @ T) =	685.55
Specific Gravity @ T =	2.786
Water Relative Density Corr. Factor @ T =	1.00015

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.787

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-004
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	85.73
Wt. Pan + Dry Soil (Gms) =	121.54
Wt. Dry Soil (Gms) =	35.810
500 ml. Pycnometer No:	27
Pycnometer Temperature (Deg. C) =	19.93
Wt. Pycnometer (Gms) =	176.65
Wt. Pycnometer + Water (Gms @ T) =	675.425
Wt. Pycnometer + Soil + Water (Gms @ T) =	697.45
Specific Gravity @ T =	2.598
Water Relative Density Corr. Factor @ T =	1.00002

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.598

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-005
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	108.82
Wt. Pan + Dry Soil (Gms) =	208.57
Wt. Dry Soil (Gms) =	99.750
500 ml. Pycnometer No:	29
Pycnometer Temperature (Deg. C) =	19.95
Wt. Pycnometer (Gms) =	178.52
Wt. Pycnometer + Water (Gms @ T) =	677.093
Wt. Pycnometer + Soil + Water (Gms @ T) =	738.42
Specific Gravity @ T =	2.596
Water Relative Density Corr. Factor @ T =	1.00002

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.596

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-006
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	241.91
Wt. Pan + Dry Soil (Gms) =	315.21
Wt. Dry Soil (Gms) =	73.300
500 ml. Pycnometer No:	21
Pycnometer Temperature (Deg. C) =	20.8
Wt. Pycnometer (Gms) =	178.5
Wt. Pycnometer + Water (Gms @ T) =	676.763
Wt. Pycnometer + Soil + Water (Gms @ T) =	723.63
Specific Gravity @ T =	2.773
Water Relative Density Corr. Factor @ T =	0.99984

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.773

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-007
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	241.55
Wt. Pan + Dry Soil (Gms) =	316
Wt. Dry Soil (Gms) =	74.450
500 ml. Pycnometer No:	30
Pycnometer Temperature (Deg. C) =	19.98
Wt. Pycnometer (Gms) =	172.61
Wt. Pycnometer + Water (Gms @ T) =	671.350
Wt. Pycnometer + Soil + Water (Gms @ T) =	718.49
Specific Gravity @ T =	2.726
Water Relative Density Corr. Factor @ T =	1.00001

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.726

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-008
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	108.98
Wt. Pan + Dry Soil (Gms) =	209.16
Wt. Dry Soil (Gms) =	100.180
500 ml. Pycnometer No:	22
Pycnometer Temperature (Deg. C) =	20.87
Wt. Pycnometer (Gms) =	179.21
Wt. Pycnometer + Water (Gms @ T) =	677.545
Wt. Pycnometer + Soil + Water (Gms @ T) =	740.46
Specific Gravity @ T =	2.688
Water Relative Density Corr. Factor @ T =	0.99983

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.688

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-009
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	111.38
Wt. Pan + Dry Soil (Gms) =	148.39
Wt. Dry Soil (Gms) =	37.010
500 ml. Pycnometer No:	13
Pycnometer Temperature (Deg. C) =	21.2
Wt. Pycnometer (Gms) =	166.3
Wt. Pycnometer + Water (Gms @ T) =	664.945
Wt. Pycnometer + Soil + Water (Gms @ T) =	688.20
Specific Gravity @ T =	2.691
Water Relative Density Corr. Factor @ T =	0.99976

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.690

Comments:

Test Result within reasonable range of inorganic soil material

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LABORATORY REPORT
SPECIFIC GRAVITY OF SOILS
ASTM D-854 - AASHTO T-100

Project No.:	21-1102-0111
Sample No.:	SJCPT-010
Test Completion Date:	9/9/2021
Testing Technician:	J.Flukinger

Test Data:

Wt. Pan (Gms) =	85.86
Wt. Pan + Dry Soil (Gms) =	136.57
Wt. Dry Soil (Gms) =	50.710
500 ml. Pycnometer No:	27
Pycnometer Temperature (Deg. C) =	21.61
Wt. Pycnometer (Gms) =	176.65
Wt. Pycnometer + Water (Gms @ T) =	675.252
Wt. Pycnometer + Soil + Water (Gms @ T) =	707.73
Specific Gravity @ T =	2.781
Water Relative Density Corr. Factor @ T =	0.99967

Test Result:

Specific Gravity (@ 20 Deg. C) = 2.781

Comments:

Test Result within reasonable range of inorganic soil material

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-001

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	16.73
TARE AND WET WEIGHT(g):	74.1
TARE AND DRY WEIGHT(g):	59.82
OVEN-DRIED MOISTURE CONTENT (%):	33.1

TARE WEIGHT(g):	12.5900
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	28.7200
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	28.3700
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	16.1300
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	15.7800
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	0.3500
PERCENTAGE OF ASH "UNBURNED MATTER"	97.83
PERCENTAGE OF ORGANIC MATTER (%):	**2.17**

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-002

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	14.49
TARE AND WET WEIGHT(g):	67.78
TARE AND DRY WEIGHT(g):	34.33
OVEN-DRIED MOISTURE CONTENT (%):	168.6

TARE WEIGHT(g):	12.4400
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	26.1700
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	25.4300
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	13.7300
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	12.9900
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	0.7400
PERCENTAGE OF ASH "UNBURNED MATTER"	94.61
PERCENTAGE OF ORGANIC MATTER (%):	**5.39**

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-003

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	16.04
TARE AND WET WEIGHT(g):	61.33
TARE AND DRY WEIGHT(g):	33.26
OVEN-DRIED MOISTURE CONTENT (%):	163.0

TARE WEIGHT(g):	11.8900
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	25.3100
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	24.6500
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	13.4200
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	12.7600
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	0.6600
PERCENTAGE OF ASH "UNBURNED MATTER"	95.08
PERCENTAGE OF ORGANIC MATTER (%):	**4.92**

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-004

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	15.66
TARE AND WET WEIGHT(g):	68.49
TARE AND DRY WEIGHT(g):	37.21
OVEN-DRIED MOISTURE CONTENT (%):	145.2

TARE WEIGHT(g):	11.5500
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	24.3400
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	23.8700
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	12.7900
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	12.3200
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	0.4700
PERCENTAGE OF ASH "UNBURNED MATTER"	96.33
PERCENTAGE OF ORGANIC MATTER (%):	**3.67**

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CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-005

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	15.89
TARE AND WET WEIGHT(g):	86.06
TARE AND DRY WEIGHT(g):	73.71
OVEN-DRIED MOISTURE CONTENT (%):	21.4

TARE WEIGHT(g):	11.9000
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	28.9700
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	28.8500
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	17.0700
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	16.9500
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	0.1200
PERCENTAGE OF ASH "UNBURNED MATTER"	99.30
PERCENTAGE OF ORGANIC MATTER (%):	**0.70**

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CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-006

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	16.01
TARE AND WET WEIGHT(g):	67.43
TARE AND DRY WEIGHT(g):	29.95
OVEN-DRIED MOISTURE CONTENT (%):	268.9

TARE WEIGHT(g):	8.0300
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	23.7100
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	23.4400
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	15.6800
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	15.4100
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	0.2700
PERCENTAGE OF ASH "UNBURNED MATTER"	98.28
PERCENTAGE OF ORGANIC MATTER (%):	**1.72**

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CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-007

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	15.37
TARE AND WET WEIGHT(g):	79.92
TARE AND DRY WEIGHT(g):	57.69
OVEN-DRIED MOISTURE CONTENT (%):	52.5

TARE WEIGHT(g):	12.7500
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	27.1400
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	26.8700
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	14.3900
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	14.1200
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	0.2700
PERCENTAGE OF ASH "UNBURNED MATTER"	98.12
PERCENTAGE OF ORGANIC MATTER (%):	**1.88**

MATERIALS ENGINEERING LABORATORY

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-008

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	17.26
TARE AND WET WEIGHT(g):	73.62
TARE AND DRY WEIGHT(g):	49.92
OVEN-DRIED MOISTURE CONTENT (%):	72.6

TARE WEIGHT(g):	12.5700
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	24.3800
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	24.0100
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	11.8100
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	11.4400
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	0.3700
PERCENTAGE OF ASH "UNBURNED MATTER"	96.87
PERCENTAGE OF ORGANIC MATTER (%):	**3.13**

MATERIALS ENGINEERING LABORATORY

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-009

	DATES		TECHNICIAN
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	18.27
TARE AND WET WEIGHT(g):	82.14
TARE AND DRY WEIGHT(g):	46.2
OVEN-DRIED MOISTURE CONTENT (%):	128.7

TARE WEIGHT(g):	11.9100
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	24.7700
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	23.5200
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	12.8600
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	11.6100
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	1.2500
PERCENTAGE OF ASH "UNBURNED MATTER"	90.28
PERCENTAGE OF ORGANIC MATTER (%):	**9.72**

MATERIALS ENGINEERING LABORATORY

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September 9, 2021

CLIENT: GHD
PROJECT: San Jacinto Waste Piles

JOB #: 21-1102-0111
LAB #: 9143

REPORT OF: MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS ASTM D 2974

SAMPLE IDENTIFICATION: SJCPT-010

DATES		TECHNICIAN	
SAMPLED:	8/20/2021	SAMPLED:	CLIENT
TESTED:	8/26/2021	TESTED:	L.Stokes

>>>> LABORATORY RESULTS <<<<

MOISTURE CONTENT:	
TARE WEIGHT(g):	14.62
TARE AND WET WEIGHT(g):	68.77
TARE AND DRY WEIGHT(g):	41.93
OVEN-DRIED MOISTURE CONTENT (%):	98.3

TARE WEIGHT(g):	12.2700
TARE WT. AND DRIED SAMPLE AT 110 DEGREES CENTIGRADE (g):	25.7900
TARE WT. AND ASHED SAMPLE AT 440 DEGREES CENTIGRADE (g):	24.5700
SPECIMEN DRIED WEIGHT AT 110 DEGREES CENTIGRADE (g):	13.5200
SPECIMEN ASHED WEIGHT AT 440 DEGREES CENTIGRADE (g):	12.3000
LOSS ON IGNITION AT 440 DEGREES CENTIGRADE (g):	1.2200
PERCENTAGE OF ASH "UNBURNED MATTER"	90.98
PERCENTAGE OF ORGANIC MATTER (%):	**9.02**

MATERIALS ENGINEERING LABORATORY

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Attachment D Pile Drivability Analysis

This Attachment contains the following:

D.1 WEAP Results (SJGB053)

D.2 WEAP Results (SJGB057)

***** Press any key to continue *****

San Jacinto Waste Pits : 03/19/2020 : GF 03/30/2020

Ardaman and Associates, Inc. GRLWEAP VERSION 2010

Delmag D80-42 (SJGB053)

Depth ft	G-Ls G-Lt	Rult kips	Set inch	BlCt Bl/ft	TopFx kips	MxCS ksi	MxTS ksi	ENTHRU kip-ft	ActRes kips	Stroke ft
Hammer+Pile Weight > Rult: Pile Runs										
0.1	1.00/1.00	0	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
2.0	1.00/1.00	2	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
2.0	1.00/1.00	4	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
5.0	1.00/1.00	17	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
8.0	1.00/1.00	31	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
8.0	1.00/1.00	34	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
9.0	1.00/1.00	37	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
10.0	1.00/1.00	41	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
10.0	1.00/1.00	38	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
12.0	1.00/1.00	47	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
14.0	1.00/1.00	56	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
14.0	1.00/1.00	63	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
15.5	1.00/1.00	72	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
17.0	1.00/1.00	81	7.40	1.6	3285.2	16.088	10.982	97.9	81	6.47
17.0	1.00/1.00	101	6.55	1.8	3372.8	16.517	11.011	99.9	101	6.58
24.5	1.00/1.00	201	3.08	3.9	3934.6	19.295	11.565	88.4	201	7.29
32.0	1.00/1.00	300	1.66	7.2	4137.3	20.324	10.888	82.4	300	7.67
32.0	1.00/1.00	284	1.81	6.6	4121.5	20.220	10.934	82.7	284	7.63
39.5	1.00/1.00	421	1.03	11.7	4319.1	21.221	9.820	78.6	421	8.04
47.0	1.00/1.00	558	0.69	17.3	4471.3	21.981	9.190	76.5	558	8.36
47.0	1.00/1.00	562	0.68	17.5	4482.8	22.014	9.174	76.5	562	8.37
52.0	1.00/1.00	662	0.55	21.9	4543.7	22.323	8.780	75.2	662	8.50
57.0	1.00/1.00	762	0.44	27.0	4637.2	22.768	8.442	74.7	762	8.69
57.0	1.00/1.00	772	0.43	27.7	4623.5	22.781	8.451	74.7	772	8.70
59.5	1.00/1.00	870	0.37	32.1	4679.5	23.040	8.633	74.2	867	8.81
62.0	1.00/1.00	974	0.33	36.4	4725.1	23.198	8.675	73.4	969	8.89
62.0	1.00/1.00	1003	0.31	38.8	4736.8	23.257	8.555	73.3	991	8.90
67.0	1.00/1.00	1273	0.24	50.6	4821.0	23.694	8.110	72.7	1254	9.12
72.0	1.00/1.00	1567	0.21	57.8	4865.7	24.004	7.459	73.5	1545	9.25
72.0	1.00/1.00	1651	0.18	66.4	4899.5	24.078	7.180	73.8	1594	9.27
80.0	1.00/1.00	2415	0.12	97.7	5010.6	24.612	4.523	75.6	2341	9.52
88.0	1.00/1.00	3267	0.08	152.3	5106.5	25.246	4.562	77.8	3181	9.81
88.0	1.00/1.00	3164	0.10	125.8	5112.3	25.167	4.852	77.6	3145	9.80
90.5	1.00/1.00	3202	0.10	125.6	5128.1	25.274	6.456	77.5	3184	9.82
93.0	1.00/1.00	3241	0.10	126.0	5137.5	25.270	7.963	77.4	3222	9.84
93.0	1.00/1.00	3244	0.10	126.2	5151.7	25.268	8.000	77.5	3224	9.84
94.0	1.00/1.00	3259	0.09	126.8	5125.5	25.316	8.527	77.2	3239	9.83
95.0	1.00/1.00	3275	0.09	127.5	5137.2	25.253	8.898	76.9	3254	9.83

Attachment Figure D.1-1

***** Press any key to continue *****

San Jacinto Waste Pits : 03/19/2020 : GF 03/30/2020

Ardaman and Associates, Inc. GRLWEAP VERSION 2010

Delmag D100-42 (SJGB053)

Depth ft	G-Ls G-Lt	Rult kips	Set inch	BlCt Bl/ft	TopFx kips	MxCS ksi	MxTS ksi	ENTHRU kip-ft	ActRes kips	Stroke ft
Hammer+Pile Weight > Rult: Pile Runs										
0.1	1.00/1.00	0	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
2.0	1.00/1.00	2	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
2.0	1.00/1.00	4	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
5.0	1.00/1.00	17	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
8.0	1.00/1.00	31	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
8.0	1.00/1.00	34	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
9.0	1.00/1.00	37	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
10.0	1.00/1.00	41	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
10.0	1.00/1.00	38	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
12.0	1.00/1.00	47	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
14.0	1.00/1.00	56	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
14.0	1.00/1.00	63	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
15.5	1.00/1.00	72	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
17.0	1.00/1.00	81	10.59	1.1	3020.0	14.845	9.958	128.9	81	5.96
17.0	1.00/1.00	101	9.22	1.3	3202.1	15.762	10.444	132.3	101	6.18
24.5	1.00/1.00	201	3.97	3.0	3889.9	19.229	11.826	115.9	201	6.98
32.0	1.00/1.00	300	2.15	5.6	4151.5	20.582	11.409	107.0	300	7.48
32.0	1.00/1.00	284	2.32	5.2	4134.3	20.480	11.469	107.9	284	7.43
39.5	1.00/1.00	421	1.33	9.1	4345.4	21.593	10.378	101.2	421	7.88
47.0	1.00/1.00	558	0.89	13.5	4530.3	22.520	9.456	98.6	558	8.25
47.0	1.00/1.00	562	0.88	13.7	4538.2	22.526	9.449	98.6	562	8.26
52.0	1.00/1.00	662	0.70	17.1	4634.3	23.021	9.148	97.4	662	8.48
57.0	1.00/1.00	762	0.58	20.6	4675.5	23.351	8.918	95.6	762	8.59
57.0	1.00/1.00	772	0.57	21.1	4678.4	23.372	8.878	95.6	772	8.60
59.5	1.00/1.00	870	0.50	23.9	4731.2	23.604	9.038	95.2	870	8.71
62.0	1.00/1.00	974	0.44	27.4	4788.8	23.839	9.111	94.6	974	8.81
62.0	1.00/1.00	1003	0.41	29.1	4795.6	23.887	8.978	94.7	1001	8.83
67.0	1.00/1.00	1273	0.32	38.0	4909.4	24.408	8.624	93.8	1262	9.08
72.0	1.00/1.00	1567	0.27	45.3	4982.6	24.806	8.004	93.8	1550	9.25
72.0	1.00/1.00	1651	0.24	51.0	4997.3	24.885	7.657	94.2	1608	9.29
80.0	1.00/1.00	2415	0.18	68.5	5099.4	25.416	5.067	96.5	2354	9.52
88.0	1.00/1.00	3267	0.12	99.3	5167.5	25.722	3.542	98.0	3191	9.71
88.0	1.00/1.00	3164	0.14	86.5	5181.8	25.686	3.860	97.9	3148	9.70
90.5	1.00/1.00	3202	0.14	87.0	5190.5	25.709	5.181	97.9	3186	9.73
93.0	1.00/1.00	3241	0.14	87.8	5199.1	25.691	6.449	97.8	3225	9.75
93.0	1.00/1.00	3244	0.14	88.0	5203.8	25.658	6.486	97.9	3227	9.75
94.0	1.00/1.00	3259	0.14	88.3	5195.0	25.693	6.948	97.8	3241	9.75
95.0	1.00/1.00	3275	0.14	88.9	5208.1	25.674	7.454	97.5	3257	9.76

Attachment Figure D.1-2

***** Press any key to continue *****

San Jacinto Waste Pits : 03/19/2020 : GF 03/20/2020

Ardaman and Associates, Inc. GRLWEAP VERSION 2010

Delmag D80-42 (SJGB057)

Depth ft	G-Ls G-Lt	Rult kips	Set inch	BlCt Bl/ft	TopFx kips	MxCS ksi	MxTS ksi	ENTHRU kip-ft	ActRes kips	Stroke ft
Hammer+Pile Weight > Rult: Pile Runs										
5.0	1.00/1.00	6	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
10.0	1.00/1.00	20	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
10.0	1.00/1.00	25	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
11.0	1.00/1.00	30	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
12.0	1.00/1.00	36	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
12.0	1.00/1.00	47	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
19.5	1.00/1.00	190	3.32	3.6	4030.2	19.736	11.481	89.9	190	7.24
27.0	1.00/1.00	333	1.46	8.2	4338.4	21.246	10.578	82.6	333	7.78
27.0	1.00/1.00	334	1.45	8.3	4315.8	21.209	10.576	82.5	334	7.78
33.5	1.00/1.00	457	0.93	12.8	4512.8	22.100	9.481	79.3	457	8.13
40.0	1.00/1.00	580	0.67	17.9	4675.1	22.895	8.513	77.5	580	8.42
40.0	1.00/1.00	594	0.65	18.5	4678.2	22.910	8.453	77.4	594	8.44
42.5	1.00/1.00	627	0.60	19.8	4679.4	22.916	8.344	76.3	627	8.42
45.0	1.00/1.00	660	0.57	21.2	4700.0	23.017	8.434	76.1	660	8.49
45.0	1.00/1.00	639	0.59	20.2	4693.9	22.987	8.531	76.0	639	8.47
54.5	1.00/1.00	813	0.42	28.7	4863.3	23.816	8.347	75.1	812	8.79
64.0	1.00/1.00	988	0.30	40.4	4985.9	24.417	8.357	74.2	984	9.04
64.0	1.00/1.00	1110	0.23	53.2	4979.3	24.469	7.890	74.4	1068	9.10
65.5	1.00/1.00	1228	0.22	55.7	5020.7	24.610	7.561	74.1	1182	9.18
67.0	1.00/1.00	1348	0.20	58.7	5058.8	24.788	7.176	74.7	1299	9.24
67.0	1.00/1.00	1351	0.20	58.7	5079.2	24.874	7.166	74.7	1302	9.25
70.0	1.00/1.00	1604	0.18	65.8	5142.4	25.183	6.406	75.9	1548	9.38
73.0	1.00/1.00	1869	0.16	75.1	5167.8	25.337	5.771	76.9	1805	9.50
73.0	1.00/1.00	1751	0.20	61.2	5168.3	25.317	6.120	76.8	1744	9.48
75.0	1.00/1.00	1834	0.19	63.4	5196.2	25.447	6.311	77.1	1827	9.53
77.0	1.00/1.00	1920	0.18	66.0	5233.5	25.629	6.975	77.4	1913	9.57
77.0	1.00/1.00	1945	0.17	68.8	5237.4	25.648	6.902	77.4	1926	9.57
82.0	1.00/1.00	2018	0.17	71.6	5277.7	25.846	8.646	77.7	1998	9.64
87.0	1.00/1.00	2091	0.16	75.2	5310.8	26.008	9.545	77.8	2072	9.70
87.0	1.00/1.00	2096	0.16	75.5	5308.9	25.999	9.498	77.8	2075	9.70
90.0	1.00/1.00	2297	0.14	86.2	5315.3	26.030	9.109	77.9	2274	9.77
93.0	1.00/1.00	2505	0.12	100.2	5335.1	26.163	8.488	78.2	2481	9.83
93.0	1.00/1.00	2481	0.13	95.7	5330.9	26.151	8.559	78.2	2472	9.83
94.0	1.00/1.00	2501	0.12	97.4	5364.3	26.270	8.548	78.2	2492	9.84
95.0	1.00/1.00	2521	0.12	99.3	5387.2	26.382	8.513	78.2	2512	9.86

***** Press any key to continue *****

San Jacinto Waste Pits : 03/19/2020 : GF 03/20/2020

Ardaman and Associates, Inc. GRLWEAP VERSION 2010

Delmag D100-42 (SJGB057)

Depth ft	G-Ls G-Lt	Rult kips	Set inch	BlCt Bl/ft	TopFx kips	MxCS ksi	MxTS ksi	ENTHRU kip-ft	ActRes kips	Stroke ft
Hammer+Pile Weight > Rult: Pile Runs										
5.0	1.00/1.00	6	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
10.0	1.00/1.00	20	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
10.0	1.00/1.00	25	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
11.0	1.00/1.00	30	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
12.0	1.00/1.00	36	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
Hammer+Pile Weight > Rult: Pile Runs										
12.0	1.00/1.00	47	39.60	0.3	0.0	0.000	0.000	0.0	0	11.25
19.5	1.00/1.00	190	4.30	2.8	3858.2	19.100	11.638	117.6	190	6.92
27.0	1.00/1.00	333	1.86	6.5	4212.5	20.866	10.852	106.0	333	7.59
27.0	1.00/1.00	334	1.85	6.5	4211.2	20.885	10.852	106.0	334	7.60
33.5	1.00/1.00	457	1.19	10.1	4392.0	21.959	9.971	101.2	457	7.97
40.0	1.00/1.00	580	0.84	14.2	4551.1	22.777	9.197	98.6	580	8.29
40.0	1.00/1.00	594	0.81	14.8	4553.7	22.836	9.153	98.5	594	8.32
42.5	1.00/1.00	627	0.76	15.9	4594.4	22.943	9.400	97.9	627	8.40
45.0	1.00/1.00	660	0.71	17.0	4625.1	23.258	9.644	98.0	660	8.48
45.0	1.00/1.00	639	0.74	16.2	4616.0	23.218	9.758	97.9	639	8.45
54.5	1.00/1.00	813	0.53	22.6	4731.6	23.896	9.522	95.4	813	8.70
64.0	1.00/1.00	988	0.38	31.4	4844.5	24.427	9.068	93.8	986	8.95
64.0	1.00/1.00	1110	0.29	41.5	4888.5	24.574	8.500	94.0	1084	9.04
65.5	1.00/1.00	1228	0.26	46.0	4919.8	24.654	8.175	93.6	1193	9.12
67.0	1.00/1.00	1348	0.25	48.2	4953.8	24.965	7.812	93.5	1310	9.20
67.0	1.00/1.00	1351	0.25	48.3	4951.7	24.951	7.805	93.4	1313	9.20
70.0	1.00/1.00	1604	0.22	53.7	5007.9	25.169	6.958	94.5	1558	9.32
73.0	1.00/1.00	1869	0.20	60.2	5053.0	25.387	6.048	95.3	1815	9.42
73.0	1.00/1.00	1751	0.24	51.0	5037.2	25.287	6.462	94.8	1745	9.39
75.0	1.00/1.00	1834	0.23	52.2	5057.2	25.278	6.593	95.0	1828	9.42
77.0	1.00/1.00	1920	0.22	53.4	5071.0	25.520	6.646	95.4	1914	9.46
77.0	1.00/1.00	1945	0.22	55.2	5064.5	25.531	6.566	95.4	1929	9.46
82.0	1.00/1.00	2018	0.21	56.5	5106.7	25.572	7.399	95.7	2002	9.54
87.0	1.00/1.00	2091	0.21	58.4	5138.8	25.774	9.308	95.7	2075	9.59
87.0	1.00/1.00	2096	0.20	58.7	5136.1	25.792	9.310	95.7	2078	9.59
90.0	1.00/1.00	2297	0.19	63.7	5159.0	25.822	9.533	95.9	2278	9.65
93.0	1.00/1.00	2505	0.17	69.7	5185.4	25.925	9.088	96.0	2485	9.69
93.0	1.00/1.00	2481	0.18	67.5	5183.2	25.895	9.137	96.0	2474	9.69
94.0	1.00/1.00	2501	0.18	68.3	5184.7	25.907	9.144	96.0	2493	9.69
95.0	1.00/1.00	2521	0.17	69.2	5175.0	25.822	9.104	95.7	2513	9.70

Attachment E Hydraulic Heave Analysis Report

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Our Ref.: 11215702-Howard-16

December 9, 2021

Ms. Ashley Howard
Environmental Protection Agency Remedial Project Manager
1201 Elm Street, Suite 500
Dallas, Texas 75270

Hydraulic Heave Analysis

Dear Ms. Howard:

GHD Services Inc. (GHD), on behalf of International Paper Company (IPC) and McGinnes Industrial Maintenance Corporation (MIMC; collectively referred to as the Respondents), hereby submits to the United States Environmental Protection Agency (EPA) a Hydraulic Heave Analysis report. The report provides details on the geological and geotechnical context, methodology, and results of a hydraulic heave analysis performed by GHD on data collected at the Northern Impoundment of the San Jacinto River Waste Pits Superfund Site.

GHD conducted a Supplemental Design Investigation (SDI) at the Northern Impoundment from June 28 through September 16, 2021, in accordance with the *Supplemental Design Investigation Sampling Plan - Revised*, approved by the EPA on June 4, 2021. The SDI included the installation of 25 analytical soil borings and 15 geotechnical soil borings, including 11 cone penetration test (CPT) borings and four piezometers. As preliminary data was received, GHD began evaluating and updating the understanding of the depths of impact (dioxins/furans concentrations above 30 nanograms per kilogram [ng/kg] TEQ) and the geological/geotechnical conditions at the Northern Impoundment. All preliminary (unvalidated) data was received by October 1, 2021. Data from the SDI indicated that exceedances of the clean-up level were present at deeper elevations than previously understood (as deep as -28.4 feet North American Vertical Datum of 1988 [NAVD88]) which raised concerns about the potential for hydraulic heave during excavation activities.

A preliminary evaluation of hydraulic heave was performed and presented at a Technical Working Group (TWG) meeting on October 19, 2021. Following that meeting, a more focused, detailed evaluation was performed. The results of this more detailed evaluation were presented during the November 16, 2021, TWG meeting. During this meeting the EPA indicated that the United States Army Corps of Engineers (USACE) would be performing a detailed review of GHD's hydraulic heave analysis and requested that the data and calculations used in the analysis be provided to them. GHD provided the requested raw data and analyses that had been completed at that time to the EPA and USACE on November 19, 2021. Following the Thanksgiving holiday on November 30, 2021, GHD participated in a call with the EPA, USACE, and the Texas Commission on Environmental Quality (TCEQ) to discuss the data provided and answer questions. Several additional documents were requested during that meeting. GHD provided those documents to the EPA and USACE on December 7, 2021.

The enclosed report includes a wholistic summary of the hydraulic heave evaluation performed, including data reviewed, methodology utilized, and the results and conclusions of the evaluation. This report is intended to provide context, clarity, and interpretation of the data that has already been provided to the EPA and USACE.

It is the Respondents' understanding that the EPA prefers to withhold approval of the Respondents' October 1, 2021, Request for Extension of the *Pre-Final 90% Remedial Design - Northern Impoundment* (Northern Impoundment 90% RD) until the USACE has completed its evaluation of the hydraulic heave analysis. While the enclosed report should help facilitate the timely completion of that review, the currently

pending January 2022 deadline for the Northern Impoundment 90% RD is weeks away and the Respondents need to have written approval of an extension of that deadline issued without further delay. As detailed in the October 1, 2021, Request for Extension, the extension was necessitated by the need to collect, analyze, and incorporate the SDI data in the Northern Impoundment 90% RD, a process that was recognized months ago could not be completed by the current January 2022 deadline. The hydraulic heave issue is independent of the issues necessitating the extension and a review of the hydraulic heave analysis is not necessary, in order for the EPA to approve the extension. The Respondents request that the EPA proceed to approve the extension request without further delay.

Should you have any questions or require additional information regarding this submittal, please contact GHD at (225) 292-9007.

Regards,

GHD

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KJ/jlf/16

Encl.: Hydraulic Heave Analysis

cc: Lauren Poulos, EPA
Katie Delbecq, TCEQ
Phil Slowiak, IPC
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Judy Armour, MIMC

Hydraulic Heave Analysis

Northern Impoundment
San Jacinto River Waste Pits Superfund Site
Harris County, Texas

International Paper Company and McGinnes Industrial Maintenance Corporation

December 9, 2021

Contents

1. Introduction 1

2. Brief Geological Conditions Description 1

3. Geotechnical Conditions 1

3.1 Geotechnical Soundings 1

3.2 Subsurface Conditions 2

3.3 Hydraulic Conditions 2

4. Required Excavation Depths 3

5. Hydraulic Heave Assessment 4

5.1 Principle of Hydraulic Heave 4

5.1.1 Hydraulic Heave Mechanism 4

5.1.2 Total Stress Approach 4

5.1.3 Effective Stress Approach 5

5.2 Assessment Methodology 5

5.2.1 Stratigraphic Unit Thicknesses 5

5.2.2 Geotechnical/Hydraulic Parameters 7

5.2.3 Uplift Pore Pressures 7

5.3 Assessment Results 8

5.3.1 For a Complete Removal of Impacted Material 8

5.3.2 Safe Hydraulic Heave Excavation Surface 8

6. Conclusions 8

7. Scope and Limitations 9

Table index

Table 3.1 Geotechnical Soundings Considered in the Hydraulic Heave Analysis 2

Table 5.1 Mean and Design Unit Weights 7

Table 1A Hydraulic Heave Safety Factors for Total Removal of Exceedances of Clean-Up Level - Assumption 1

Table 1B Hydraulic Heave Safety Factors for Total Removal of Exceedances of Clean-Up Level - Assumption 2

Table 2A Elevations of Excavation to Maintain Hydraulic Heave FS of 1.25 - Assumption 1

Table 2B Elevations of Excavation to Maintain Hydraulic Heave FS of 1.25 - Assumption 2

Table 3 Elevations of Excavation to Maintain Hydraulic Heave FS of 1.25 - Assumptions 1 and 2

Table 4 Hydraulic Heave Evaluation Summary

Figure index

Figure 3.1	Variation of the Water Levels in the Beaumont Sand Formation and the San Jacinto River	3
Figure 5.1	Artesian Groundwater Conditions Below Excavation	4
Figure 5.2	Assumptions 1 and 2 Considered to Estimate the Beaumont Clay Thickness	6
Figure 5.3	Variation of Unit Weights with Elevation	7
Figure 1	Site Locations Plan - Sounding Locations	
Figure 2	Geologic Cross-Section A-A’	
Figure 3	Geologic Cross-Section B-B’	
Figure 4	Beaumont Clay Thickness Contour	

Appendices

Appendix A Beaumont Clay Sample Photographs

1. Introduction

GHD Services Inc. (GHD), on behalf of the International Paper Company and McGinnes Industrial Maintenance Corporation (collectively referred to as the Respondents), submits to the United States Environmental Protection Agency (EPA) this *Hydraulic Heave Analysis* performed for the Northern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas.

Following completion and receipt of data from the Supplemental Design Investigation (SDI) in September and October 2021, GHD performed a hydraulic heave analysis to evaluate the geological and geotechnical conditions of the Northern Impoundment with respect to the Northern Impoundment 90% Remedial Design (RD). The Northern Impoundment 90% RD is being developed based on the 2017 EPA Record of Decision (ROD) which specifies that the selected remedy for the Northern Impoundment is the full removal of all waste material in the dry that exceeds the clean-up level of 30 nanograms per kilogram (ng/kg) for dioxins/furans. Data from the SDI found impacts above the clean-up level at deeper elevations than had been previously understood, prompting concern around the risk of hydraulic heave associated with the resulting excavation work. The geological and geotechnical context, methodology, and results of this analysis are described hereafter in this report.

2. Brief Geological Conditions Description

The San Jacinto River Waste Pits Site is located in Harris County, Texas, east of the City of Houston. The Northern Impoundment is located immediately north of the Interstate Highway 10 (I-10) bridge over the San Jacinto River.

The geology in the vicinity of the Northern Impoundment is somewhat variable given the natural meander of the San Jacinto River over time. Based on the Geologic Atlas of Texas, Houston (1982), the near surface of the western bank of the San Jacinto River is comprised predominantly by Holocene Alluvium, which is comprised of clay, silt, and sand, and can include organic matter. These alluvium deposits can be comprised of point-bar, natural levee, stream channel, back-swamp, and coastal marsh deposits. The near surface of the eastern bank of the San Jacinto River is comprised predominantly of the Pleistocene Beaumont Formation, which is made up of mostly clay, silt, and sand.

Historical topographic maps of the area from the United States Geological Survey (USGS) indicate that the near surface in the vicinity of the Northern Impoundment may have been comprised of backswamp and/or swamp deposits. It is unclear the extent to which these were scoured out and/or eroded over time, as well as how much was physically removed due to industrialization.

3. Geotechnical Conditions

3.1 Geotechnical Soundings

In order to define the geotechnical conditions of the Northern Impoundment, four geotechnical investigation events were carried out and are listed below:

- Remediation investigation (RI) in 2011.
- First Phase Pre-Design Investigation (PDI-1) in 2018.
- Second Phase Pre-Design Investigation (PDI-2) in 2019.
- SDI in 2021.

During these four investigations, a total of 43 geotechnical boreholes were drilled. During the recent SDI, four piezometers were installed and cone penetrations tests (CPT) were also performed at 13 locations in the Northern Impoundment. Figure 1 shows the locations of the geotechnical soundings.

Table 3.1 below presents the list of the deepest geotechnical soundings in which the Beaumont sand formation was reached. These soundings were used for the hydraulic heave assessment.

Table 3.1 Geotechnical Soundings Considered in the Hydraulic Heave Analysis

Geotechnical Investigation	Sounding ID	Termination Depth (feet below ground surface [ft bgs])	Coordinates (NAD83)		Ground Surface Elevation (ft NAVD88)
			Easting	Northing	
RI (2011)	SJGB-001	60	3216751.135	13857514.92	3.50
	SJGB-002	59.5	3216860.608	13857743.81	0.75
	SJGB-003	119.5	3217161.011	13857865.43	-10.67
	SJGB-004	59.5	3217397.812	13857774.85	-3.25
	SJGB-005	61.5	3217542.386	13857614.08	-4.50
	SJGB-007	119.5	3217417.804	13857330.12	-3.25
	SJGB-008	59.5	3217332.707	13857191.39	-3.0
PDI-1 (2018)	SJGB-018	52	3216809.986	13857802.24	-13.43
	SJGB-019	59	3216887.243	13857986.27	-14.82
	SJGB-020	62	3217105.993	13858004.5	-8.17
	SJGB-021	56	3217609.928	13857456.24	-5.15
	SJGB-022	47	3217485.032	13857183.95	-9.39
	SJGB-023	60	3216651.132	13857586.97	-1.86
PDI-2 (2019)	SJGB-047	100	3217421.371	13857278.32	-3.40
	SJGB-053	100	3217301.198	13857799.52	-9.70
	SJGB-057	100	3216960.196	13857956.45	-17.1
SDI (2021)	SJMW-16	70	3216869.538	13857581.37	5.0
	SJMW-17	72	3217204.371	13857083.84	5.0
	SJCPT-11	76	3216891.118	13857566.47	3.0

3.2 Subsurface Conditions

According to information provided by the various geotechnical investigations, the general subsurface stratigraphy noted within the Northern Impoundment is as follows:

- ***Surficial Alluvium Sediments:*** fairly heterogenous, consisting of silty sands, sands silts, lean clays, and sandy clays. When cohesive, the sediments are typically very soft to firm. When granular (cohesionless), these sediments are loose-to-compact.
- ***Beaumont Clay Formation:*** generally encountered at elevations ranging between -20 to -30 feet (ft) North American Vertical Datum of 1988 (NAVD88), this formation is composed of a stiff-to-very-stiff high plasticity clay (fat clay). Interspersed within this deposit are seams/lenses of sandy materials, as evidenced in the boring logs and photographs from three different borings, all in the vicinity of the northwest corner of the Northern Impoundment. The lateral extents of these particular features remain unknown.
- ***Beaumont Sand Formation:*** encountered at elevations ranging between -50 to -70 ft NAVD88, this formation is essentially composed of compact-to-dense silty sand to clayey sand.

Subsurface geological conditions are shown in two cross-sections included as Figures 2 and 3. The interpolated thickness of the Beaumont clay is shown on the attached Figure 4.

3.3 Hydraulic Conditions

During the SDI, piezometers were installed in boreholes SJMW-16 and SJMW-17 and the water levels were logged in these piezometers at regular time intervals. Figure 3.1 below shows the variation of the piezometric level (red line) in

the piezometer (SJMW-16) installed in the Beaumont sand for the period between August 13 and September 13, 2021. The water level in the San Jacinto River (blue line) is also shown in this figure for the same period.

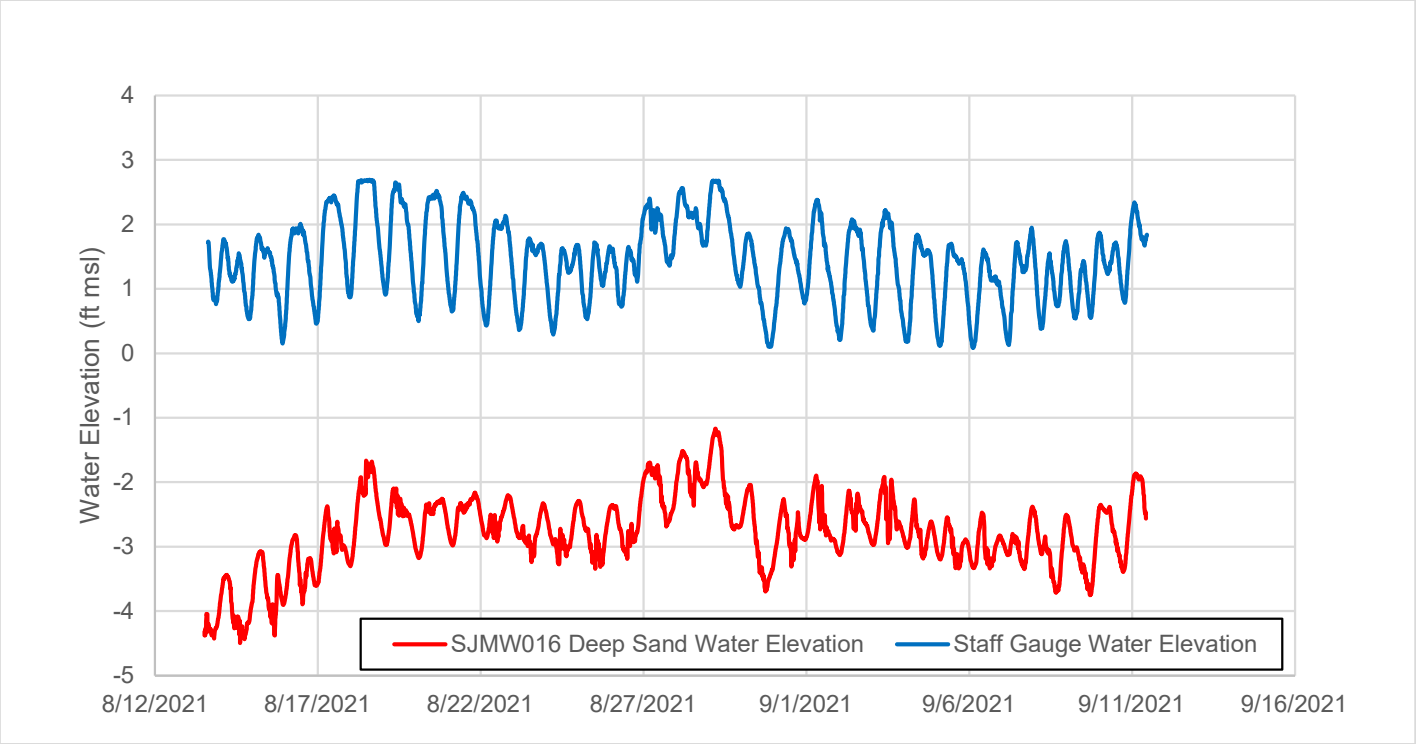

Figure 3.1 Variation of the Water Levels in the Beaumont Sand Formation and the San Jacinto River

Water level readings shown on Figure 3.1 suggest that:

- The water level in the river fluctuates with the tides between 0 to 3 ft (with an average elevation of 1.5 ft).
- The piezometric level in the Beaumont sand fluctuates between -4 to -1 ft (with an average value of about -2.5 ft) and seems to be tidally connected.

The piezometer was removed from SJMW-16 on September 13, 2021, at the direction of the EPA in advance of an approaching hurricane.

4. Required Excavation Depths

The compiled analytical results show the presence of exceedances of the clean-up level at various depths in the surficial alluvium in the Northern Impoundment. Based on these results, the deepest exceedances have been detected at elevations close to -28.4 ft NAVD88 within the northwest corner of the Northern Impoundment.

A complete removal of the impacted material, as specified in the ROD would thus require excavation down to elevations of -28.4 ft NAVD88, and potentially to lower elevations depending on the results of post-confirmation testing to be done during excavation.

An assessment of the hydraulic heave risk assuming a complete removal of the impacted alluvions has been performed. The calculated factor of safety (FS) values at the location of each analytical borehole are presented in the attached Tables 1A and 1B. These tables present results that are based on Assumptions 1 and 2, respectively. Details on these assumptions are presented in Section 5.2.1.2.

5. Hydraulic Heave Assessment

5.1 Principle of Hydraulic Heave

5.1.1 Hydraulic Heave Mechanism

When an excavation is dug into a clay deposit underlain by a pervious stratum under artesian pressure, pressure and seepage may result, leading to instability of the excavation.

The above-mentioned conditions are illustrated for the Northern Impoundment case on Figure 5.1. The hydrostatic head in the deep Beaumont sand below the impervious Beaumont clay layer is higher than the bottom of the excavation. If the effective stress at point A approaches zero, the situation becomes unstable. Therefore, if the pore pressure at point A exceeds the total vertical stress at this point., heave may occur in the bottom of the excavation.

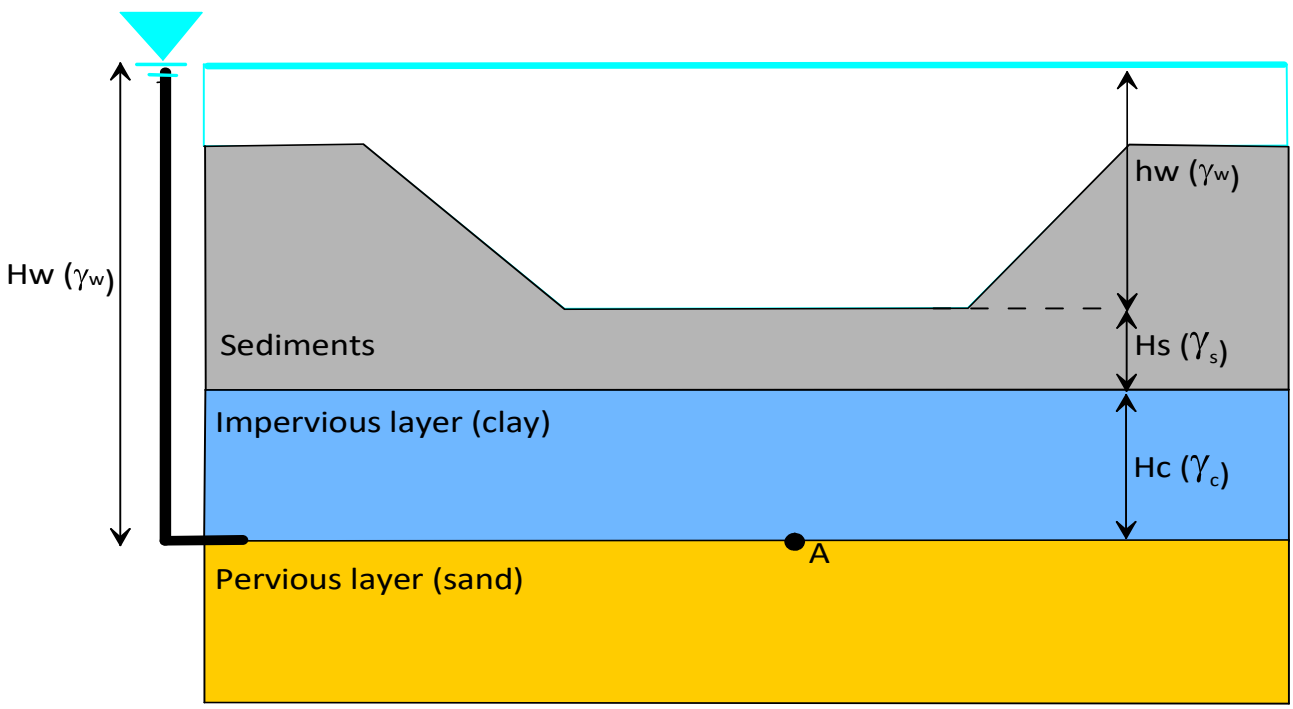

Figure 5.1 Artesian Groundwater Conditions Below Excavation

There are two accepted methods to evaluate uplift pressures which could result in a heave situation: the total stress approach and the effective stress approach. GHD initially limited this evaluation to the total stress approach as it is more appropriate evaluation for this application. At the request of the United States Army Corps of Engineers (USACE), GHD also performed the analysis using the effective stress approach to serve as a validation step. The results of both evaluations are included in Tables 1A, 1B, 2A, and 2B.

5.1.2 Total Stress Approach

For the total stress approach, the heave assessment is solely based on the ratio of total stresses and uplift pore pressures.

For this approach, the FS protective of hydraulic heave is expressed using the following equation:

$$FS_{Total} = (Hs.\ \gamma_s + Hc.\ \gamma_c) / Hw.\ \gamma_w \qquad [1]$$

In this equation, Hs and Hc are the thicknesses of the sediments and the clay layers, respectively and Hw is the water head in the pervious layer. γ_s and γ_c are the total unit weights of the sediments and the clay respectively. γ_w corresponds to the water unit weight.

In order to prevent hydraulic heave with a sufficient security margin, pore pressure at point A should not exceed 80 percent of the total vertical stress at this point, corresponding to a factor of safety (FS_{Total}) of 1.25.

5.1.3 Effective Stress Approach

When the difference in water heads between the bottom of the excavation and the surrounding soils outside the excavation reaches a critical value, hydraulic heave (potentially piping) may occur. In relation with Figure 5.1, the effective stress factor of safety ($FS_{Effective}$) is expressed by the following equation:

$$FS_{Effective} = (Hs.\ \gamma'_s + Hc.\ \gamma'_c)/\ (h_w.\ \gamma_w) \qquad [2]$$

In this equation, hw is the water head between the free water surface (river) and the bottom of the excavation while γ'_s and γ'_c are the buoyant unit weights of the sediments and the clay, respectively. For the effective stress approach, a FS of 1.5 was targeted.

5.2 Assessment Methodology

To assess the risk of hydraulic heave, the FS to protect against hydraulic heave was determined at the location of 77 boreholes (both geotechnical and analytical).

The evaluation of hydraulic heave FS requires the knowledge of (1) the thickness and unit weight of each stratigraphic units and (2) uplift pore pressures (water head) in the underlaying pervious sandy formation (Beaumont sand).

The methodology and the assumptions used for the determination of the required parameters are described in the following sections.

5.2.1 Stratigraphic Unit Thicknesses

5.2.1.1 Surficial Sediments Layer

The sediment layer thickness was defined and is known for all boreholes considered for the hydraulic heave FS assessment.

5.2.1.2 Beaumont Clay

The Beaumont clay thickness was only determined in the geotechnical boreholes listed in Table 3.1. At the location of the analytical boreholes, two assumptions were considered to define the interface elevation between the Beaumont Clay and the Beaumont Sand as shown on Figure 5.2:

– ***Assumption 1:*** Hs(A) + Hc(A) equals the thickness of the Beaumont clay measured in the closest geotechnical borehole.
– ***Assumption 2:*** The Clay/Sand interface (at the base of Hc(A)) was defined assuming that the elevation of the Beaumont sand for the considered analytical borehole is equal to the one measured in the closest geotechnical borehole.

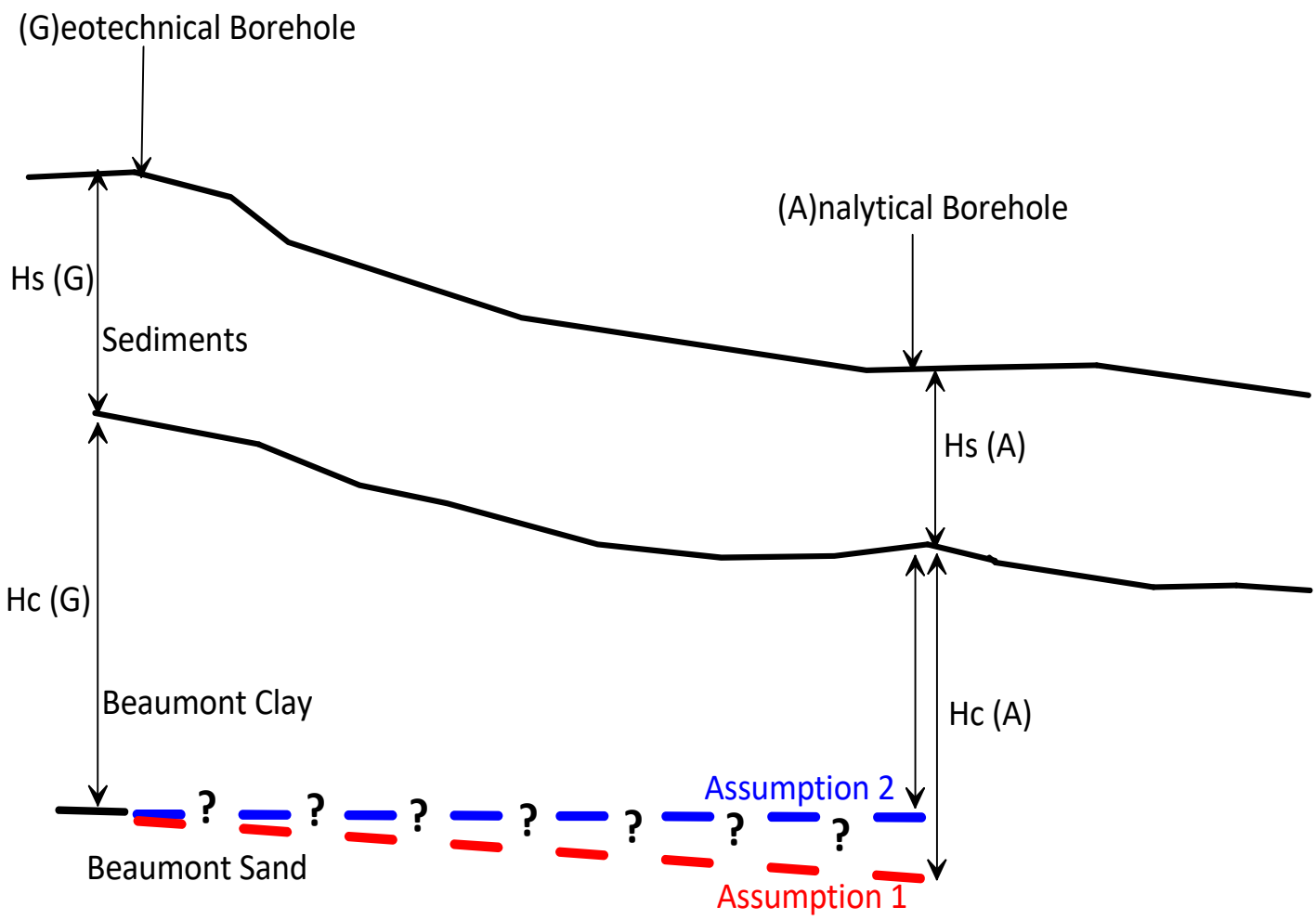

Figure 5.2 Assumptions 1 and 2 Considered to Estimate the Beaumont Clay Thickness

The data was evaluated using both assumptions and the results of each are included in Tables 1A, 1B, 2A, and 2B (the "A" tables correspond to Assumption 1 and the "B" tables correspond to Assumption 2).

As previously mentioned in Section 3.2, sand seams/lenses ranging from a few inches to few feet thick were encountered in the Beaumont clay layer at depths ranging between 35 to 60 feet below ground surface (ft bgs) corresponding to an elevation close to -50 to -70 ft. These lenses were found in boreholes SJGB-018, SJGB-019, SJGB-020, and SJGB-057 all drilled in the northwest corner of the Northern Impoundment. Photographs of these features are presented in Appendix A.

To calculate a FS at each analytical boring location, stratigraphic data from the closest geotechnical boring(s) was assumed for each analytical boring. In some instances, as shown in Tables 1A and 1B, the conditions at two geotechnical borings were applied to the target excavation elevations at a particular analytical boring to calculate the FS. In these situations, it is necessary to assume the more conservative conditions of the two to ensure that the design is sufficiently protective of hydraulic heave.

5.2.2 Geotechnical/Hydraulic Parameters

5.2.2.1 Unit Weights

The unit weights were evaluated based on the natural moisture content (w) and specific gravity (G) of samples recovered from the sediments and native clay deposit, and assuming that these soils are saturated. Figure 5.3 shows unit weight values for both deposits based on laboratory testing.

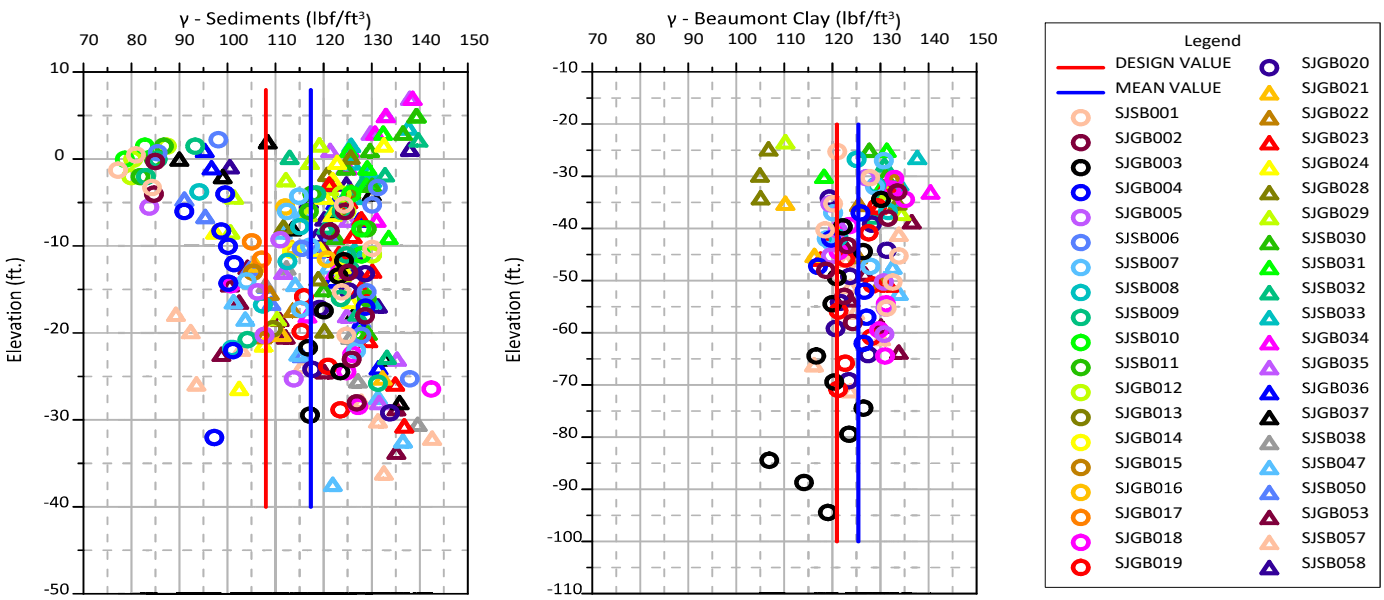

Figure 5.3 Variation of Unit Weights with Elevation

Table 5.1 below summarizes the mean and design values considered for the hydraulic heave assessment.

Table 5.1 Mean and Design Unit Weights

Stratigraphic Unit	Total Unit Weight, γ (pounds per cubic feet [pcf])	
	Mean Value	Design Value
Surficial alluvium	117	108
Beaumont clay formation	125	121

5.2.3 Uplift Pore Pressures

The uplift pore pressures were evaluated based on a piezometric level at elevation -2 ft (water level in the river - see Section 3.3). These uplift pore pressures were considered acting at the interface between the Beaumont clay and the underlaying sand. At the location of the analytical boreholes, where this interface was not defined, the interface elevation was estimated for both Assumptions 1 and 2 as described in Section 5.2.1.2.

In locations where sand lenses were encountered in the Beaumont clay, the top elevation of those sand lenses was assumed to be the interface elevation for uplift pore pressures.

Note, that the water conditions considered for the hydraulic heave assessment exclude water level variations induced by hurricane season, since excavation activities would not be conducted during that time.

5.3 Assessment Results

5.3.1 For a Complete Removal of Impacted Material

The FS values for an excavation surface down to the deepest elevations of impacted material are presented in the attached Tables 1A and 1B. The FS values show that for both assumptions for uplift pore pressures, the total and effective stress approach FS are larger than the target values in the majority of the Northern Impoundment. In the northwest corner, where sand lenses are present, FS values were lower than 1.0 for both the total and effective stress approaches (SJSB-057 and SJSB-098). Such values indicate that hydraulic heave will occur in this area if excavation activities are conducted to the deepest elevations of known impact.

While the majority of the area outside the northwest corner does not show calculated FS below the target values, much of this area is approaching elevations that would be at risk of heave. This is important to note, given that excavation depths could increase based upon post-confirmation sampling. The calculated FS values shown in the attached Tables 1A and 1B correspond to the minimum required depth of the excavation required to remove the impacted materials. If the results of confirmation testing indicate that deeper excavation is required, the currently assumed FS will be reduced.

5.3.2 Safe Hydraulic Heave Excavation Surface

A surface excavation for which both total and effective FS are higher than 1.25 and 1.5, respectively, was established. Tables 2A and 2B present the minimum excavation elevation at the location of each borehole that is protective of hydraulic heave. The two tables show the results of the assessments considering the two different assumptions for the clay thickness. Table 3 provides a consolidated set of values in which the more conservative elevation (shallower) was selected for each boring location.

Table 4 provides a summary of the data, including the excavation limits protective of hydraulic heave, the target excavation depth based on an approach to excavate everything above the clean-up level, and the delta (in feet) between the two elevations.

6. Conclusions

The hydraulic heave analysis indicates that there are areas of the Northern Impoundment in which excavation to the target elevations under a full removal scenario will result in an unacceptable risk of hydraulic heave. The presence of sand lenses is evident in logs and photographs from four geotechnical borings in the northwest corner so this reality must be taken into account when developing a design that is sufficiently protective of hydraulic heave risks.

While there are multiple areas across the Northern Impoundment that show FS values below the target values, the risk is most pronounced in the northwest corner where FS values are less than 1.0 for both the total and effective stress approaches. In this area, approximately 10 to 14 ft of waste material could not be removed based upon the elevations calculated to be protective against hydraulic heave, as shown in Table 4.

While the northwest corner presents the most pronounced risk of hydraulic heave, a significant portion of the rest of the Northern Impoundment is on the threshold of triggering the risk of hydraulic heave. Table 4 depicts the delta between the calculated excavation limit needed to maintain a FS of 1.25 and the target excavation elevations based on exceedances of the clean-up level. Values highlighted in red indicate the existence of hydraulic heave risk and valued highlighted in yellow indicate a high sensitivity (0 to 5 ft) to hydraulic heave. This will need to be taken into consideration when developing the approach to post-confirmation sampling.

7. Scope and Limitations

The recommendations made in this report are in accordance with our present understanding of the project, the ground surface elevations and current conditions at the Northern Impoundment, and are based on the work scope described in the report. The services were performed in a manner consistent with that level of care and skill ordinarily exercised by members of geotechnical engineering professions currently practicing under similar conditions in the same locality.

All details of design and construction are rarely known at the time of completion of a geotechnical study. The recommendations and comments made in this report are based on our subsurface investigation and resulting understanding of the project, as defined at the time of the study. GHD will review our recommendations when the remedial design drawings and specifications are complete.

It is important to emphasize that a soil investigation is, in fact, a random sampling of a site and the comments included in this report are based on the results obtained at the test locations only. The subsurface conditions confirmed at the test locations may vary at other locations.

Table 1A

Hydraulic Heave Safety Factors For Total Removal of Exceedances of Clean-Up Level - Assumption 1
Hydraulic Heave Analysis
Northern Impoundment - San Jacinto River Waste Pits Superfund Site

Location	Northing (NAD83)	Easting (NAD83)	Surface/Riverbed Elevation	Reference Borehole	BS Elevation in Reference Borehole (ft)	Distance From Borehole (ft)	Aquifer Piezo Elevation (ft)	BC Depth (ft)	BC Elevation (ft)	BS Depth (ft)	BS Elevation (ft)	Sediment Thickness (ft)	BC Thickness (ft)	Excavation Floor Elevation (ft)	Pressure Head (ft)	Uplift Porepressure (psf)	Remaining Sediment Thickness (ft)	Sediments Layer Total Pressure (psf)	BC Layer Total Pressure (psf)	FS (Total)	FS (Effective)
SJGB010	13857411.203	3216753.589	3.00	SJGB001	-56	107	-2	29	-26	59.5	-56.50	29	30.5	-6.3	54.5	3400	20	2132	3689	1.71	10.02
SJGB011	13857474.591	3216925.733	3.00	SJCPT-011	-53.4	83	-2	33	-30	58.4	-55.40	33	25.4	-9.6	53.4	3331	20	2208	3072	1.58	5.11
SJGB012	13857611.312	3216819.464	3.00	SJCPT-011	-53.4	93	-2	33	-30	58.4	-55.40	33	25.4	-7.6	53.4	3331	22	2424	3072	1.65	7.20
SJSB013	13857852.438	3216918.897	-12.4	SJGB018	-53.43	113	-2	30	-42.4	37.5	-49.90	30	7.5	-16	47.9	2988	26	2857	907	1.26	1.89
SJGB014	13857716.960	3217158.780	-1.50	SJGB053	-69	166	-2	15	-16.5	81	-82.50	15	66	-9.2	80.5	5022	7	790	7983	1.75	9.35
SJGB016	13857551.031	3217162.509	-0.50	SJCPT-011	-53.4	267	-2	33	-33.5	58.4	-58.90	33	25.4	-6.1	56.9	3550	27	2965	3072	1.70	10.73
SJGB017	13857352.164	3217191.717	-1.85	SJGB008	-61	207	-2	23	-24.85	58	-59.85	23	35	-17.85	57.85	3609	7	758	4233	1.38	2.40
SJSB028	13857067.126	3217256.398	1.25	SJGB008	-61	264	-2	23	-25.26	58	-56.75	23	32.8	-9.09	54.75	3416	16	1750	3967	1.67	6.02
SJSB029	13857119.314	3217153.087	2.68	SJGB008	-61	193	-2	23	-20.32	58	-55.32	23	35	2.68	53.32	3326	23	2489	4233	2.02	N/A
SJSB030	13857220.516	3216971.008	4.33	SJMW17	-60	120	-2	23	-18.67	63	-58.67	23	40	4.33	56.67	3535	23	2489	4838	2.07	N/A
SJSB031	13857295.051	3216774.912	5.12	SJMW17	-60	120	-2	23	-17.88	63	-57.88	23	40	5.12	55.88	3486	23	2489	4838	2.10	N/A
SJSB032	13857444.802	3216651.498	3.21	SJGB001	-56	120	-2	29	-25.79	59.5	-56.29	29	30.5	-8.3	54.29	3387	17	1893	3689	1.65	6.58
SJSB033	13857624.835	3216746.671	4.59	SJGB023	-61.66	100	-2	29.5	-24.91	59.8	-55.21	29.5	30.3	-8.9	53.21	3320	16	1733	3665	1.63	5.83
SJSB034	13857689.491	3217045.977	6.99	SJCPT-011	-53.4	200	-2	33	-26.01	58.4	-51.41	33	25.4	6.99	49.41	3083	33	3571	3072	2.16	N/A
SJSB035	13857460.903	3217021.623	6.64	SJCPT-011	-53.4	167	-2	33	-26.36	58.4	-51.76	33	25.4	6.64	49.76	3104	33	3571	3072	2.14	N/A
SJSB036	13857475.106	3216859.930	2.00	SJCPT-011	-53.4	97	-2	33	-31	58.4	-56.40	33	25.4	-10.75	54.4	3394	20	2191	3072	1.55	4.43
SJSB037	13857687.402	3216908.317	3.00	SJGB002	-58.75	73	-2	33.5	-30.5	59.5	-56.50	33.5	26	-9.6	54.5	3400	21	2262	3145	1.59	5.23
SJSB038	13857563.077	3217138.458	-0.50	SJCPT-011	-53.4	240	-2	33	-33.5	58.4	-58.90	33	25.4	-12.96	56.9	3550	21	2223	3072	1.49	3.55
SJSB045	13857135.810	3217343.067	-2.10	SJGB008	-61	57	-2	23	-25.1	58	-60.10	23	35	-2.1	58.1	3625	23	2489	4233	1.85	497.55
SJSB045-C1	13857149.350	3217285.350	-1.30	SJGB008	-61	63	-2	23	-24.3	58	-59.30	23	35	-13.3	57.3	3575	11	1190	4233	1.52	3.62
SJSB046	13857183.750	3217236.016	-2.00	SJGB008	-61	96	-2	23	-25	58	-60.00	23	35	-20	58	3618	5	541	4233	1.32	2.03
SJSB046-C1	13857229.000	3217174.000	-2.39	SJGB008	-61	150	-2	23	-25.39	58	-60.39	23	35	-20.4	58.39	3643	5	540	4233	1.31	1.98
SJSB047	13857278.320	3217421.371	-2.10	SJGB047	-53.4	0	-2	22	-24.1	50	-52.10	22	28	-2.1	50.1	3126	22	2381	3387	1.85	424.49
SJSB047-C1	13857302.550	3217340.988	-4.00	SJGB047	-53.4	80	-2	22	-26	50	-54.00	22	28	-20	52	3244	6	649	3387	1.24	1.71
SJSB048	13857396.530	3217503.368	-2.40	SJGB007	-67.75	107	-2	23	-25.4	64.5	-66.90	23	41.5	-2.4	64.9	4049	23	2489	5020	1.85	139.64
SJSB048-C1	13857398.780	3217445.299	-4.00	SJGB007	-67.75	67	-2	23	-27	64.5	-68.50	23	41.5	-22	66.5	4149	5	541	5020	1.34	2.13
SJSB049	13857406.390	3217395.258	-5.10	SJGB007	-67.75	77	-2	23	-28.1	64.5	-69.60	23	41.5	-19.1	67.6	4217	9	974	5020	1.42	2.66
SJSB050	13857546.330	3217527.884	-3.40	SJGB005	-65	67	-2	26	-29.4	60.5	-63.90	26	34.5	-3.4	61.9	3862	26	2814	4173	1.81	36.78
SJSB050-C1	13857558.160	3217389.116	-6.30	SJGB005	-65	120	-2	26	-32.3	60.5	-66.80	26	34.5	-6.3	64.8	4043	26	2814	4173	1.73	11.97
SJSB051	13857682.020	3217424.684	-2.70	SJGB004	-62.75	93	-2	28	-30.7	59.5	-62.20	28	31.5	-2.7	60.2	3756	28	3030	3810	1.82	71.63
SJSB052	13857661.470	3217319.770	-5.70	SJGB004	-62.75	133	-2	28	-33.7	59.5	-65.20	28	31.5	-5.7	63.2	3943	28	3030	3810	1.73	13.55
SJSB052-C1	13857626.750	3217222.469	-2.20	SJGB053	-66.7	190	-2	17	-19.2	57	-59.20	17	40	-2.2	57.2	3569	17	1840	4838	1.87	250.20
SJSB053	13857799.520	3217301.198	-9.70	SJGB053	-66.7	0	-2	17	-26.7	57	-66.70	17	40	-9.7	64.7	4036	17	1840	4838	1.65	6.50
SJSB053-C1	13857775.270	3217268.406	-7.40	SJGB053	-66.7	40	-2	17	-24.4	57	-64.40	17	40	-7.4	62.4	3893	17	1840	4838	1.72	9.27
SJSB054	13857745.960	3217282.887	-7.40	SJGB053	-66.7	57	-2	17	-24.4	57	-64.40	17	40	-23.4	62.4	3893	1	108	4838	1.27	1.79
SJSB055	13857915.360	3217183.420	-4.90	SJGB003	-95.17	60	-2	33	-37.9	84.5	-89.40	33	51.5	-13.5	87.4	5453	24	2641	6229	1.63	5.76
	13857915.360	3217183.420	-4.90	SJGB020	-48.17	113	1.5	22	-26.9	40	-44.90	22	18	-13.5	46.4	2895	13	1450	2177	1.25	1.78
SJSB055-C1	13857843.355	3217150.478	-9.54	SJGB003	-96.5	30	-2	33	-42.54	84.5	-94.04	33	51.5	-13.54	92.04	5742	29	3138	6229	1.63	6.04
SJSB056	13857942.460	3217077.154	-12.40	SJBG057	-73.1	113	-2	17	-29.4	56	-68.40	17	39	-12.4	66.4	4142	17	1840	4717	1.58	4.72
	13857942.460	3217077.154	-12.40	SJGB020	-48.17	100	1.5	22	-34.4	40	-52.40	22	18	-12.4	53.9	3363	22	2381	2177	1.36	2.38
SJSB056-C1	13857851.608	3217058.119	-4.29	SJSB003	-95.17	100	-2	33	-37.29	84.5	-88.79	33	51.5	-4.29	86.79	5415	33	3571	6229	1.81	31.70
SJSB057	13857956.449	3216960.196	-17.1	SJSB057	-73.1	0	-2	17	-34.1	56	-73.10	17	39	-26.4	71.1	4436	8	833	4717	1.25	1.73
	13857956.449	3216960.196	-17.1	SJGB019	-49.82	77	1.5	20	-37.1	35	-52.10	20	15	-26.4	53.6	3344	11	1158	1814	0.89	0.79
SJSB058	13857700.162	3216855.509	0.62	SJGB002	-58.7	43	-2	33.5	-32.88	59.5	-58.88	33.5	26	-17.4	56.88	3549	15	1675	3145	1.36	2.32
SJSB070	13857778.065	3216886.192	-1.17	SJGB002	-58.7	43	-2	33.5	-34.67	59.5	-60.67	33.5	26	-15.2	58.67	3660	19	2107	3145	1.43	2.93
SJSB071	13857719.189	3216821.133	-0.8	SJGB002	-58.7	43	-2	33.5	-34.3	59.5	-60.30	33.5	26	-18.8	58.3	3637	16	1677	3145	1.33	2.13
SJSB072	13857614.250	3216842.652	1.42	SJCPT-011	-53.4	67	-2	33	-31.58	58.4	-56.98	33.00	25.40	-20.56	54.98	3430	11	1193	3072	1.24	1.72
SJSB073	13857593.160	3216960.041	1.29	SJCPT-011	-53.4	67	-2	33	-31.71	58.4	-57.11	33.00	25.40	-10.71	55.11	3438	21	2273	3072	1.55	4.51
SJSB074	13857543.710	3216728.114	3.34	SJGB001	-56	33	-2	29	-25.66	59.5	-56.16	29.00	30.50	-4.66	54.16	3379	21	2273	3689	1.76	16.56
SJSB075	13857486.820	3216843.803	2.28	SJGB001	-56	93	-2	29	-26.72	59.5	-57.22	29.00	30.50	-9.72	55.22	3445	17	1840	3689	1.60	5.33
SJSB076	13857508.770	3216910.806	2.26	SJCPT-011	-53.4	60	-2	33	-30.74	58.4	-56.14	33.00	25.40	-9.74	54.14	3378	21	2273	3072	1.58	5.07
SJSB077	13857411.880	3216736.668	1.42	SJGB001	-56	100	-2	29	-27.58	59.5	-58.08	29.00	30.50	-14.58	56.08	3499	13	1407	3689	1.46	3.04
SJSB078	13857430.030	3216823.139	1.82	SJGB001	-56	107	-2	29	-27.18	59.5	-57.68	29.00	30.50	-20.18	55.68	3474	7	758	3689	1.28	1.86
SJSB079	13857381.900	3216888.271	1.05	SJMW17	-58	177	-2	23	-21.95	63	-61.95	23.00	40.00	-10.95	59.95	3740	11	1190	4838	1.61	5.10
SJSB080	13857320.220	3216827.045	1.77	SJMW17	-58	100	-2	23	-21.23	63	-61.23	23.00	40.00	-8.23	59.23	3695	13	1407	4838	1.69	7.56
SJSB081	13857276.460	3217054.335	-2.26	SJMW17	-58	120	-2	23	-25.26	63	-65.26	23.00	40.00	-14.26	63.26	3947	11	1190	4838	1.53	3.72
SJSB082	13857216.120	3217091.823	-1.75	SJMW17	-58	200	-2	23	-24.75	63	-64.75	23.00	40.00	-11.75	62.75	3915	13	1407	4838	1.60	4.83
SJSB083	13857242.260	3217187.497	-2.93	SJGB008	-61	153	-2	23	-25.93	58	-60.93	23.00	35.00	-14.93	58.93	3676	11	1190	4233	1.48	3.17
SJSB084	13857243.090	3217292.257	-3.86	SJGB008	-61	67	-2	23	-26.86	58	-61.86	23.00	35.00	-9.86	59.86	3734	17	1840	4233	1.63	5.77
SJSB085	13857350.670	3217370.887	-5.67	SJGB007	-67.75	53	-2	23	-28.67	64.5	-70.17	23.00	41.50	-13.67	68.17	4253	15	1623	5020	1.56	4.28
SJSB086	13857292.630	3217249.901	-2.72	SJGB008	-61	130	-2	23	-25.72	58	-60.72	23.00	35.00	-2.72	58.72	3663	23	2489	4233	1.84	69.10
SJSB087	13857311.470	3217114.943	-3.01	SJMW17	-58	240	-2	23	-26.01	63	-66.01	23.00	40.00	-19.01	64.01	3993	7	758	4838	1.40	2.51
SJSB088	13857488.390	3217119.275	-2.12	SJCPT-011	-53.4	240	-2	33	-35.12	58.4	-60.52	33.00	25.40	-20.52	58.52	3651	15	1580	3072	1.27	1.87
SJSB089	13857426.020	3217214.579	-2.88	SJGB007	-67.75	220	-2	23	-25.88	49.9	-52.78	23.00	26.90	-14.88	50.78	3168	11	1190	3254	1.40	2.59
SJSB090	13857506.130	3217218.409	-1.50	SJGB007	-67.75	267	-2	23	-24.50	49.9	-51.40	23.00	26.90	-11.50	49.40	3082	13	1407	3254	1.51	3.66
SJSB091	13857487.240	3217383.273	-3.58	SJGB007	-68.5	160	-2	23	-26.58	54.6	-58.18	23.00	31.60	-3.58	56.18	3505	23	2489	3822	1.80	29.47
SJSB092	13857618.600	3217303.607	-4.93	SJGB053	-66.7	187	-2	17	-21.93	57	-61.93	17.00	40.00	-18.93	59.93	3739	3	325	4838	1.38	2.35
SJSB093	13857582.780	3217129.479	-1.53	SJCPT-011	-66.7	200	-2	33	-34.53	58.4	-59.93	33.00	25.40	-15.53	57.93	3614	19	2056	3072	1.42	2.79
SJSB094	13857691.550	3217241.216	-4.22	SJSB053	-66.7	120	-2	17	-21.22	57	-61.22	17.00	40.00	-16.22	59.22	3695	5	541	4838	1.46	2.90
SJSB095	13857790.230	3217133.851	-2.07	SJGB003	-95.17	80	-2	33	-35.07	84.5	-86.57	33.00	51.50	-18.07	84.57	5276	17	1840	6229	1.53	3.79
SJSB096	13857798.660	3217196.291	-6.55	SJGB003	-95.17	73	-2	33	-39.55	84.5	-91.05	33.00	51.50	-18.55	89.05	5556	21	2273	6229	1.53	3.85
SJSB097	13857955.960	3217030.737	-15.64	SJSB057	-73.1	67	-2	17	-32.64	56	-71.64	17.00	39.00	-15.54	69.64	4345	17	1851	4717	1.51	3.63
	13857955.960	3217030.737	-15.64	SJGB020	-48.17	80	1.5	22	-37.64	32	-47.64	22.00	10.00	-15.54	49.14	3066	22	2392	1210	1.17	1.50
SJSB098	13857874.760	3216977.358	-14.36	SJGB019	-49.82	137	1.5	20	-34.36	35.1	-49.46	20.00	15.10	-28.36	50.96	3179	6	649	1826	0.78	0.62
	13857874.760	3216977.358	-14.36	SJSB057	-73.1	80	-2	17	-31.36	56	-70.36	17.00	39.00	-28.36	68.36	4265	3	325	4717	1.18	1.47
SJSB099	13857764.250	3216947.207	-0.61	SJGB002	-58.75	80	-2	34	-34.11	59.5	-60.11	33.50	26.00	-12.61	58.11	3625	22	2327	3145	1.51	3.79
SJSB100	13857919.310	3216899.688	-13.36	SJSB057	-73.1	67	-2	17	-30.36	56	-69.36	17.00	39.00	-15.36	67.36	4202	15	1623	4717	1.51	3.57
	13857919.310	3216899.688	-13.36	SJGB019	-48.82	67	1.5	20	-33.36	35	-48.36	20.00	15.00	-15.36	49.86	3111	18	1948	1814	1.21	1.62
SJSB101	13857709.580	3216809.881	-0.15	SJGB002	-58.75	63	-2	34	-33.65	59.5	-59.65	33.50	26.00	-12.15	57.65	3597	22	2327	3145	1.52	3.96
SJSB102	13857180.230	3217192.143	-2.05	SJGB008	-61	133	-2	23	-25.05	58	-60.05	23.00	35.00	-20.15	58.05	3622	5	530	4233	1.32	2.01
SJSB103	13857998.430	3216974.835	-15.36	SJSB057	-73.1	43	-2	17	-32.36	56	-71.36	17.00	39.00	-15.36	69.36	4327	17	1840	4717	1.52	3.68
	13857998.430	3216974.835	-15.36	SJGB020	-48.17	87	1.5	22	-37.36	32	-47.36	22.00	10.00	-15.36	48.86	3048	22	2381	1210	1.18	1.52
SJSB104	13857613.240	3217397.901	-5.49	SJBG005	-65	140	-2	26	-31.49	60.5	-65.99	26.00	34.50	-5.49	63.99	3992	26	2814	4173	1.75	14.75
SJSB105	13857485.550	3217440.440	-4.36	SJGB007	-67.75	153	-2	23	-27.36	64.5	-68.86	23.00	41.50	-20.36	66.86	4171	7	758	5020	1.39	2.40
SJSB106	13857469.990	3217311.018	-3.10	SJGB007	-67.75	173	-2	23	-26.10	64.5	-67.60	23.00	41.50	-5.10	65.60	4093	21	2273	5020	1.78	17.54

Total BC Unit Weight	19.0	kN/m^3	121.0	pcf
Total BC Unit Weight	19.5	kN/m^3	124.1	pcf
Total Sediment Unit Weight	17.0	kN/m^3	108.2	pcf
Water Unit Weight	9.8	kN/m^3	62.4	pcf
Total FS	1.25			
Effective BC Unit Weight	9.2	kN/m^3	58.6	pcf
Effective BS Unit Weight	9.7	kN/m^3	61.8	pcf
Effective Sediment Unit Weight	7.2	kN/m^3	45.8	pcf
Effective FS	1.5			
Conversion kN/m^3 to pcf	6.37			

Notes:
- ft = feet
- NAD83 = North American Datum of 1983
- piezo = piezometer
- BC = Beaumont Clay
- BS = Beaumont Sand
- psf = pounds per square foot
- kN/m^3 = kilonewtons per cubic meter
- pcf = pounds per cubic foot
- FS = Factor of Safety
- Orange highlighted rows indicate instances where geotechnical conditions from the closest two geotechnical borings were applied to those locations to assess hydraulic heave. The more conservative of the two assumptions will be carried forward for the basis of design.
- Red highlighted rows indicate a FS that is less than the target FS protective of hydraulic heave.

Table 1B

Hydraulic Heave Safety Factors For Total Removal of Exceedances of Clean-Up Level - Assumption 2
Hydraulic Heave Analysis
Northern Impoundment - San Jacinto River Waste Pits Superfund Site

Location	Northing (NAD83)	Easting (NAD83)	Surface/Riverbed Elevation	Reference Borehole	BS Elevation in Reference Borehole (ft)	Distance From Borehole (ft)	Aquifer Piezo Elevation (ft)	BC Depth (ft)	BC Elevation (ft)	BS Depth (ft)	BS Elevation (ft)	Sediment Thickness (ft)	BC Thickness (ft)	Excavation Floor Elevation	Pressure Head (ft)	Uplift Porepressure (psf)	Remaining Sediment Thickness (ft)	Sediments Layer Total Pressure (psf)	BC Layer Total Pressure (psf)	FS (Total)	FS (Effective)
SJGB010	13857411.203	3216753.589	3.00	SJGB001	-56	107	-2	30	-27	59.5	-56	30	29	-6.3	54	3369	21	2240	3508	1.71	9.87
SJGB011	13857474.591	3216925.733	3.00	SJCPT-011	-53.4	83	-2	19.7	-16.7	58.4	-53.4	19.7	36.7	-9.6	51.4	3207	7	768	4439	1.62	5.22
SJGB012	13857611.312	3216819.464	3.00	SJCPT-011	-53.4	93	-2	19.7	-16.7	58.4	-53.4	19.7	36.7	-7.6	51.4	3207	9	985	4439	1.69	7.35
SJSB013	13857852.438	3216918.897	-12.4	SJGB018	-53.43	113	-2	19.7	-32.1	37.5	-53.43	19.7	21.33	-16	51.43	3209	16	1742	2580	1.35	2.28
SJGB014	13857716.960	3217158.780	-1.50	SJGB053	-66.7	166	-2	25.9	-27.4	81	-66.7	25.9	39.3	-9.2	64.7	4036	18	1970	4753	1.67	6.98
SJGB016	13857551.031	3217162.509	-0.50	SJCPT-011	-53.4	267	-2	19.7	-20.2	58.4	-53.4	19.7	33.2	-6.1	51.4	3207	14	1526	4016	1.73	10.13
SJGB017	13857352.164	3217191.717	-1.85	SJGB008	-61	207	-2	25	-26.85	58	-61	25	34.15	-17.85	59	3681	9	974	4131	1.39	2.44
SJSB028	13857067.126	3217256.398	1.25	SJGB008	-61	264	-2	23	-25.26	58	-61	23	32.8	-9.09	56.06	3497	16	1750	3967	1.63	6.02
SJSB029	13857119.314	3217153.087	2.68	SJGB008	-61	193	-2	23	-20.32	58	-61	23	40.68	2.68	59	3681	23	2489	4920	2.01	N/A
SJSB030	13857220.516	3216971.008	4.33	SJMW17	-60	120	-2	30	-25.67	63	-60	30	34.33	4.33	58	3618	30	3247	4152	2.04	N/A
SJSB031	13857295.051	3216774.912	5.12	SJMW17	-60	120	-2	30	-24.88	63	-60	30	35.12	5.12	58	3618	30	3247	4248	2.07	N/A
SJSB032	13857444.802	3216651.498	3.21	SJGB001	-56	120	-2	30	-26.79	59.5	-56	30	29.21	-8.3	54	3369	18	2001	3533	1.64	6.51
SJSB033	13857624.835	3216746.671	4.59	SJGB023	-61.66	100	-2	29.9	-25.31	59.8	-61.66	29.9	36.35	-8.9	59.66	3722	16	1776	4397	1.66	6.69
SJSB034	13857689.491	3217045.977	6.99	SJCPT-011	-53.4	200	-2	19.7	-12.71	58.4	-53.4	19.7	40.69	6.99	51.4	3207	20	2132	4922	2.20	N/A
SJSB035	13857460.903	3217021.623	6.64	SJCPT-011	-53.4	167	-2	19.7	-13.06	58.4	-53.4	19.7	40.34	6.64	51.4	3207	20	2132	4879	2.19	N/A
SJSB036	13857475.106	3216859.930	2.00	SJCPT-011	-53.4	97	-2	30	-10.75	58.4	-53.4	12.75	42.65	-10.75	51.4	3207	0	0	5159	1.61	4.58
SJSB037	13857687.402	3216908.317	3.00	SJGB002	-58.75	73	-2	34.4	-31.4	59.5	-58.75	34.4	27.35	-9.6	56.75	3540	22	2359	3308	1.60	5.49
SJSB038	13857563.077	3217138.458	-0.50	SJCPT-011	-53.4	240	-2	19.7	-20.2	58.4	-53.4	19.7	33.2	-12.96	51.4	3207	7	784	4016	1.50	3.33
SJSB045	13857135.810	3217343.067	-2.10	SJGB008	-61	57	-2	23	-25.1	58	-61	23	35.9	-2.1	59	3681	23	2489	4342	1.86	506.00
SJSB045-C1	13857149.350	3217285.350	-1.30	SJGB008	-61	63	-2	23	-24.3	58	-61	23	36.7	-13.3	59	3681	11	1190	4439	1.53	3.76
SJSB046	13857183.750	3217236.016	-2.00	SJGB008	-61	96	-2	23	-25	58	-61	23	36	-20	59	3681	5	541	4354	1.33	2.08
SJSB046-C1	13857229.000	3217174.000	-2.39	SJGB008	-61	150	-2	23	-25.39	58	-61	23	35.61	-20.4	59	3681	5	540	4307	1.32	2.02
SJSB047	13857278.320	3217421.371	-2.10	SJGB047	-53.4	0	-2	34	-36.1	50	-53.4	34	17.3	-2.1	51.4	3207	34	3680	2093	1.80	412.20
SJSB047-C1	13857302.550	3217340.988	-4.00	SJGB047	-53.4	80	-2	34	-38	50	-53.4	34	15.4	-20	51.4	3207	18	1948	1863	1.19	1.54
SJSB048	13857396.530	3217503.368	-2.40	SJGB007	-67.75	107	-2	25	-27.4	64.5	-67.75	25	40.35	-2.4	65.75	4102	25	2706	4880	1.85	140.62
SJSB048-C1	13857398.780	3217445.299	-4.00	SJGB007	-67.75	67	-2	25	-29	64.5	-67.75	25	38.75	-22	65.75	4102	7	758	4687	1.33	2.08
SJSB049	13857406.390	3217395.258	-5.10	SJGB007	-67.75	77	-2	25	-30.1	64.5	-67.75	25	37.65	-19.1	65.75	4102	11	1190	4554	1.40	2.54
SJSB050	13857546.330	3217527.884	-3.40	SJGB005	-65	67	-2	24.4	-27.8	60.5	-65	24.4	37.2	-3.4	63	3930	24	2641	4499	1.82	37.75
SJSB050-C1	13857558.160	3217389.116	-6.30	SJGB005	-65	120	-2	24.4	-30.7	60.5	-65	24.4	34.3	-6.3	63	3930	24	2641	4149	1.73	11.66
SJSB051	13857682.020	3217424.684	-2.70	SJGB004	-62.75	93	-2	24	-26.7	59.5	-62.75	24	36.05	-2.7	60.75	3790	24	2597	4360	1.84	73.54
SJSB052	13857661.470	3217319.770	-5.70	SJGB004	-62.75	133	-2	24	-29.7	59.5	-62.75	24	33.05	-5.7	60.75	3790	24	2597	3998	1.74	13.15
SJSB052-C1	13857626.750	3217222.469	-2.20	SJGB053	-66.7	190	-2	25.9	-28.1	57	-66.7	25.9	38.6	-2.2	64.7	4036	26	2803	4669	1.85	276.33
SJSB053	13857799.520	3217301.198	-9.70	SJGB053	-66.7	0	-2	25.9	-35.6	57	-66.7	25.9	31.1	-9.7	64.7	4036	26	2803	3762	1.63	6.26
SJSB053-C1	13857775.270	3217268.406	-7.40	SJGB053	-66.7	40	-2	25.9	-33.3	57	-66.7	25.9	33.4	-7.4	64.7	4036	26	2803	4040	1.70	9.33
SJSB054	13857745.960	3217282.887	-7.40	SJGB053	-66.7	57	-2	25.9	-33.3	57	-66.7	25.9	33.4	-23.4	64.7	4036	10	1071	4040	1.27	1.81
SJSB055	13857915.360	3217183.420	-4.90	SJGB003	-95.17	60	-2	18	-22.9	84.5	-95.17	18	72.27	-13.5	93.17	5813	9	1017	8741	1.68	6.50
	13857915.360	3217183.420	-4.90	SJGB020	-48.17	113	1.5	22	-26.9	40	-48.17	22	21.27	-13.5	49.67	3099	13	1450	2573	1.30	1.99
SJSB055-C1	13857843.355	3217150.478	-9.54	SJGB003	-96.5	30	-2	18	-27.54	84.5	-96.5	18	68.96	-13.54	94.5	5896	14	1515	8341	1.67	6.50
SJSB056	13857942.460	3217077.154	-12.40	SJBG057	-73.1	113	-2	18	-30.4	56	-73.1	18	42.7	-12.4	71.1	4436	18	1948	5165	1.60	5.13
	13857942.460	3217077.154	-12.40	SJGB020	-48.17	100	1.5	19.5	-31.9	40	-48.17	19.5	16.27	-12.4	49.67	3099	20	2110	1968	1.32	2.13
SJSB056-C1	13857851.608	3217058.119	-4.29	SJSB003	-95.17	100	-2	19.7	-23.99	84.5	-95.17	19.7	71.18	-4.29	93.17	5813	20	2132	8610	1.85	35.50
SJSB057	13857956.449	3216960.196	-17.1	SJSB057	-73.1	0	-2	19.7	-36.8	56	-73.1	19.7	36.3	-26.4	71.1	4436	10	1126	4391	1.24	1.71
	13857956.449	3216960.196	-17.1	SJGB019	-49.82	77	1.5	19.5	-36.6	35	-49.82	19.5	13.22	-26.4	51.32	3202	10	1104	1599	0.84	0.71
SJSB058	13857700.162	3216855.509	0.62	SJGB002	-58.7	43	-2	34.4	-33.78	59.5	-58.7	34.4	24.92	-17.4	56.7	3537	16	1773	3014	1.35	2.30
SJSB070	13857778.065	3216886.192	-1.17	SJGB002	-58.7	43	-2	23	-24.17	59.5	-58.7	23	34.53	-15.2	56.7	3537	9	971	4177	1.46	2.96
SJSB071	13857719.189	3216821.133	-0.8	SJGB002	-58.7	43	-2	34.4	-35.2	59.5	-58.7	34.4	23.5	-18.8	56.7	3537	16	1775	2842	1.31	2.03
SJSB072	13857614.250	3216842.652	1.42	SJCPT-011	-53.4	67	-2	19.7	-18.28	58.4	-53.40	19.70	35.12	-20.56	51.40	3207	-2	-247	4248	1.25	1.69
SJSB073	13857593.160	3216960.041	1.29	SJCPT-011	-53.4	67	-2	19.7	-18.41	58.4	-53.40	19.70	34.99	-10.71	51.40	3207	8	833	4232	1.58	4.42
SJSB074	13857543.710	3216728.114	3.34	SJGB001	-56	33	-2	29.8	-26.46	59.5	-56.00	29.80	29.54	-4.66	54.00	3369	22	2359	3573	1.76	16.45
SJSB075	13857486.820	3216843.803	2.28	SJGB001	-56	93	-2	34	-31.72	59.5	-56.00	34.00	24.28	-9.72	54.00	3369	22	2381	2937	1.58	5.05
SJSB076	13857508.770	3216910.806	2.26	SJCPT-011	-53.4	60	-2	19.7	-17.44	58.4	-53.40	19.70	35.96	-9.74	51.40	3207	8	833	4350	1.62	5.09
SJSB077	13857411.880	3216736.668	1.42	SJGB001	-56	100	-2	30.00	-28.58	59.5	-56.00	30.00	27.42	-14.58	54.00	3369	14	1515	3317	1.43	2.86
SJSB078	13857430.030	3216823.139	1.82	SJGB001	-56	107	-2	30.00	-28.18	59.5	-56.00	30.00	27.82	-20.18	54.00	3369	8	866	3365	1.26	1.76
SJSB079	13857381.900	3216888.271	1.05	SJMW17	-58	177	-2	19.7	-18.65	63	-58.00	19.70	39.35	-10.95	56.00	3494	8	833	4760	1.60	4.76
SJSB080	13857320.220	3216827.045	1.77	SJMW17	-58	100	-2	19.7	-17.93	63	-58.00	19.70	40.07	-8.23	56.00	3494	10	1050	4847	1.69	7.18
SJSB081	13857276.460	3217054.335	-2.26	SJMW17	-58	120	-2	23.00	-25.26	63	-58.00	23.00	32.74	-14.26	56.00	3494	11	1190	3960	1.47	3.17
SJSB082	13857216.120	3217091.823	-1.75	SJMW17	-58	200	-2	23.00	-24.75	63	-58.00	23.00	33.25	-11.75	56.00	3494	13	1407	4022	1.55	4.18
SJSB083	13857242.260	3217187.497	-2.93	SJGB008	-61	153	-2	23.00	-25.93	58	-61.00	23.00	35.07	-14.93	59.00	3681	11	1190	4242	1.48	3.17
SJSB084	13857243.090	3217292.257	-3.86	SJGB008	-61	67	-2	23.00	-26.86	58	-61.00	23.00	34.14	-9.86	59.00	3681	17	1840	4129	1.62	5.67
SJSB085	13857350.670	3217370.887	-5.67	SJGB007	-67.75	53	-2	25.00	-30.67	64.5	-67.75	25.00	37.08	-13.67	65.75	4102	17	1840	4485	1.54	4.05
SJSB086	13857292.630	3217249.901	-2.72	SJGB008	-61	130	-2	25.00	-27.72	58	-61.00	25.00	33.28	-2.72	59.00	3681	25	2706	4025	1.83	68.90
SJSB087	13857311.470	3217114.943	-3.01	SJMW17	-58	240	-2	19.7	-22.71	63	-58.00	19.70	35.29	-19.01	56.00	3494	4	400	4268	1.34	2.11
SJSB088	13857488.390	3217119.275	-2.12	SJCPT-011	-53.4	240	-2	19.7	-21.82	58.4	-53.40	19.70	31.58	-20.52	51.40	3207	1	141	3820	1.24	1.65
SJSB089	13857426.020	3217214.579	-2.88	SJGB007	-67.75	220	-2	25.00	-27.88	49.9	-67.75	25.00	39.87	-14.88	65.75	4102	13	1407	4822	1.52	3.65
SJSB090	13857506.130	3217218.409	-1.50	SJGB007	-67.75	267	-2	25.00	-26.50	49.9	-67.75	25.00	41.25	-11.50	65.75	4102	15	1623	4989	1.61	5.24
SJSB091	13857487.240	3217383.273	-3.58	SJGB007	-68.5	160	-2	24.40	-27.98	54.6	-68.50	24.40	40.52	-3.58	66.50	4149	24	2641	4901	1.82	35.42
SJSB092	13857618.600	3217303.607	-4.93	SJGB053	-66.7	187	-2	24.40	-29.33	57	-66.70	24.40	37.37	-18.93	64.70	4036	10	1126	4520	1.40	2.52
SJSB093	13857582.780	3217129.479	-15.53	SJCPT-011	-66.7	200	-2	19.7	-35.23	58.4	-66.70	19.70	31.47	-15.53	64.70	4036	20	2132	3806	1.47	3.25
SJSB094	13857691.550	3217241.216	-4.22	SJSB053	-66.7	120	-2	25.90	-30.12	57	-66.70	25.90	36.58	-16.22	64.70	4036	14	1504	4424	1.47	3.13
SJSB095	13857790.230	3217133.851	-2.07	SJGB003	-95.17	80	-2	18.00	-20.07	84.5	-95.17	18.00	75.10	-18.07	93.17	5813	2	216	9084	1.60	4.48
SJSB096	13857798.660	3217196.291	-6.55	SJGB003	-95.17	73	-2	21.90	-28.45	84.5	-95.17	21.90	66.72	-18.55	93.17	5813	10	1071	8070	1.57	4.22
SJSB097	13857955.960	3217030.737	-15.64	SJSB057	-73.1	67	-2	19.70	-35.34	56	-73.10	19.70	37.76	-15.54	71.10	4436	20	2143	4567	1.51	3.69
	13857955.960	3217030.737	-15.64	SJGB020	-48.17	80	1.5	22.00	-37.64	32	-48.17	22.00	10.53	-15.54	49.67	3099	22	2392	1274	1.18	1.53
SJSB098	13857874.760	3216977.358	-14.36	SJGB019	-49.82	137	1.5	19.50	-33.86	35.1	-49.82	19.50	15.96	-28.36	51.32	3202	6	595	1930	0.79	0.64
	13857874.760	3216977.358	-14.36	SJSB057	-73.1	80	-2	27.00	-41.36	56	-73.10	27.00	31.74	-28.36	71.10	4436	13	1407	3839	1.18	1.49
SJSB099	13857764.250	3216947.207	-0.61	SJGB002	-58.75	80	-2	34.40	-35.01	59.5	-58.75	34.40	23.74	-12.61	56.75	3540	22	2424	2871	1.50	3.65
SJSB100	13857919.310	3216899.688	-13.36	SJSB057	-73.1	67	-2	19.70	-33.06	56	-73.10	19.70	40.04	-15.36	71.10	4436	18	1916	4843	1.52	3.79
	13857919.310	3216899.688	-13.36	SJGB019	-49.82	67	1.5	19.70	-33.06	35	-49.82	19.70	16.76	-15.36	51.32	3202	18	1916	2027	1.23	1.70
SJSB101	13857709.580	3216809.881	-0.15	SJGB002	-58.75	63	-2	34.40	-34.55	59.5	-58.75	34.40	24.20	-12.15	56.75	3540	22	2424	2927	1.51	3.86
SJSB102	13857180.230	3217192.143	-2.05	SJGB008	-61	133	-2	23.00	-25.05	58	-61.00	23.00	35.95	-20.15	59.00	3681	5	530	4348	1.33	2.06
SJSB103	13857998.430	3216974.835	-15.36	SJSB057	-73.1	43	-2	19.70	-35.06	56	-73.10	19.70	38.04	-15.36	71.10	4436	20	2132	4601	1.52	3.76
	13857998.430	3216974.835	-15.36	SJGB020	-48.17	87	1.5	22.00	-37.36	32	-48.17	22.00	10.81	-15.36	49.67	3099	22	2381	1308	1.19	1.56
SJSB104	13857613.240	3217397.901	-5.59	SJBG005	-65	140	-2	24.40	-29.99	60.5	-65.00	24.40	35.01	-5.49	63.00	3930	25	2651	4235	1.75	14.57
SJSB105	13857485.550	3217440.440	-4.36	SJGB007	-67.75	153	-2	24.40	-28.76	64.5	-67.75	24.40	38.99	-20.36	65.75	4102	8	909	4716	1.37	2.33
SJSB106	13857469.990	3217311.018	-3.10	SJGB007	-67.75	173	-2	25.00	-28.10	64.5	-67.75	25.00	39.65	-5.10	65.75	4102	23	2489	4796	1.78	17.46

Total BC Unit Weight	19.0	kN/m3	121.0	pcf
Total BC Unit Weight	19.5	kN/m3	124.1	pcf
Total Sediment Unit Weight	17.0	kN/m3	108.2	pcf
Water Unit Weight	9.8	kN/m3	62.4	pcf
Total FS	1.25			
Effective BC Unit Weight	9.2	kN/m3	58.6	pcf
Effective BS Unit Weight	9.7	kN/m3	61.8	pcf
Effective Sediment Unit Weight	7.2	kN/m3	45.8	pcf
Effective FS	1.5			
Conversion kN/m3 to pcf	6.37			

Notes:
ft = feet
NAD83 = North American Datum of 1983
piezo = piezometer
BC = Beaumont Clay
BS = Beaumont Sand
psf = pounds per square foot
kN/m^3 = kilonewtons per cubic meter
pcf = pounds per cubic foot
FS = Factor of Safety
Orange highlighted rows indicate instances where geotechnical conditions from the closest two geotechnical borings were applied to those locations to assess hydraulic heave. The more conservative of the two assumptions will be carried forward for the basis of design.
Red highlighted rows indicate a FS that is less than the target FS protective of hydraulic heave.

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Table 2A

Elevations of Excavation to Maintain Hydraulic Heave Safety Factor of 1.25 - Assumption 1
Hydraulic Heave Analysis
Northern Impoundment - San Jacinto River Waste Pits Superfund Site

Location	Northing (NAD83)	Easting (NAD83)	Surface/Riverbed Elevation (ft)	Reference Borehole	BS Elevation in Reference Borehole (ft)	Distance From Borehole (ft)	Aquifer Piezo Elevation (ft)	BC Depth (ft)	BC Elevation (Ft)	BS Depth (ft)	BS Elevation (ft)	Sediment Thickness (ft)	BC Thickness (ft)	Pressure Head (ft)	Uplift Porepressure (psf)	BC Layer Total Pressure (psf)	FS	Required Sediment Thickness (ft)	Total Analysis Required Minimum Excavation Elevation (ft)	Corresponding Effective Analysis FS
SJGB010	13857411.203	3216753.589	3.00	SJGB001	-56	107	-2	29	-26	59.5	-56.50	29	30.5	54.5	3400	3689	1.25	5.18	-20.82	1.72
SJGB011	13857474.591	3216925.733	3.00	SJCPT-011	-53.4	83	-2	33	-30	58.4	-55.40	33	25.4	53.4	3331	3072	1.25	10.09	-19.91	1.75
SJGB012	13857611.312	3216819.464	3.00	SJCPT-011	-53.4	93	-2	33	-30	58.4	-55.40	33	25.4	53.4	3331	3072	1.25	10.09	-19.91	1.75
SJSB013	13857852.438	3216918.897	-12.5	SJGB018	-53.43	113	-2	30	-42.5	37.5	-50.00	30	7.5	48	2995	907	1.25	26.21	-16.29	1.84
SJGB014	13857716.960	3217158.780	-1.50	SJGB053	-66.7	166	-2	15	-16.5	81	-82.50	15	66	80.5	5022	7983	1.25	-15.76	-32.26	1.67
SJGB016	13857551.031	3217162.509	-0.50	SJCPT-011	-53.4	267	-2	33	-33.5	58.4	-58.90	33	25.4	56.9	3550	3072	1.25	12.61	-20.89	1.75
SJGB017	13857352.164	3217191.717	-0.50	SJGB008	-61	207	-2	23	-23.5	58	-58.50	23	35	56.5	3525	4233	1.25	1.60	-21.90	1.71
SJSB028	13857067.126	3217256.398	1.25	SJGB008	-61	264	-2	23	-25.26	58	-56.75	23	32.8	56.06	3497	3967	1.25	3.74	-21.48	1.72
SJSB029	13857119.314	3217153.087	2.64	SJGB008	-61	193	-2	23	-20.36	58	-55.36	23	35	53.36	3329	4233	1.25	-0.67	-21.03	1.70
SJSB030	13857220.516	3216971.008	4.33	SJMW17	-58	120	-2	23	-18.67	63	-58.67	23	40	56.67	3535	4838	1.25	-3.87	-22.54	1.69
SJSB031	13857295.051	3216774.912	6.00	SJMW17	-58	120	-2	23	-17	63	-57.00	23	40	55	3431	4838	1.25	-5.07	-22.07	1.68
SJSB032	13857444.802	3216651.498	3.21	SJGB001	-56	120	-2	29	-25.79	59.5	-56.29	29	30.5	54.29	3387	3689	1.25	5.03	-20.76	1.72
SJSB033	13857624.835	3216746.671	4.59	SJGB023	-61.66	100	-2	29.5	-24.91	59.8	-55.21	29.5	30.3	53.21	3320	3665	1.25	4.48	-20.43	1.72
SJSB034	13857689.491	3217045.977	8.00	SJCPT-011	-53.4	200	-2	33	-25	58.4	-50.40	33	25.4	48.4	3020	3072	1.25	6.49	-18.51	1.73
SJSB035	13857460.903	3217021.623	8.00	SJCPT-011	-53.4	167	-2	33	-25	58.4	-50.40	33	25.4	48.4	3020	3072	1.25	6.49	-18.51	1.73
SJSB036	13857475.106	3216859.930	2.00	SJCPT-011	-53.4	97	-2	33	-10.75	58.4	-56.40	12.75	45.65	54.4	3394	5522	1.25	-11.82	-22.57	1.66
SJSB037	13857687.402	3216908.317	2.00	SJGB002	-58.75	73	-2	33.5	-31.5	59.5	-57.50	33.5	26	55.5	3462	3145	1.25	10.93	-20.57	1.75
SJSB038	13857563.077	3217138.458	-0.50	SJCPT-011	-53.4	240	-2	33	-33.5	58.4	-58.90	33	25.4	56.9	3550	3072	1.25	12.61	-20.89	1.75
SJSB045	13857135.810	3217343.067	-2.10	SJGB008	-61	57	-2	23	-25.1	58	-60.10	23	35	58.1	3625	4233	1.25	2.75	-22.35	1.71
SJSB045-C1	13857149.350	3217285.350	-1.30	SJGB008	-61	63	-2	23	-24.3	58	-59.30	23	35	57.3	3575	4233	1.25	2.17	-22.13	1.71
SJSB046	13857183.750	3217236.016	-2.00	SJGB008	-61	96	-2	23	-25	58	-60.00	23	35	58	3618	4233	1.25	2.68	-22.32	1.71
SJSB046-C1	13857229.000	3217174.000	-2.39	SJGB008	-61	150	-2	23	-25.39	58	-60.39	23	35	58.39	3643	4233	1.25	2.96	-22.43	1.71
SJSB047	13857278.320	3217421.371	-2.10	SJGB047	-53.4	0	-2	22	-24.1	50	-52.10	22	28	50.1	3126	3387	1.25	4.81	-19.29	1.72
SJSB047-C1	13857302.550	3217340.988	-4.00	SJGB047	-53.4	80	-2	22	-26	50	-54.00	22	28	52	3244	3387	1.25	6.18	-19.82	1.73
SJSB048	13857396.530	3217503.368	-2.40	SJGB007	-67.75	107	-2	23	-25.4	64.5	-66.90	23	41.5	64.9	4049	5020	1.25	0.38	-25.02	1.70
SJSB048-C1	13857398.780	3217445.299	-4.00	SJGB007	-67.75	67	-2	23	-27	64.5	-68.50	23	41.5	66.5	4149	5020	1.25	1.54	-25.46	1.71
SJSB049	13857406.390	3217395.258	-5.10	SJGB007	-67.75	77	-2	23	-28.1	64.5	-69.60	23	41.5	67.6	4217	5020	1.25	2.33	-25.77	1.71
SJSB050	13857546.330	3217527.884	-3.40	SJGB005	-65	67	-2	26	-29.4	60.5	-63.90	26	34.5	61.9	3862	4173	1.25	6.05	-23.35	1.72
SJSB050-C1	13857558.160	3217389.116	-6.30	SJGB005	-65	120	-2	26	-32.3	60.5	-66.80	26	34.5	64.8	4043	4173	1.25	8.14	-24.16	1.73
SJSB051	13857682.020	3217424.684	-2.70	SJGB004	-62.75	93	-2	28	-30.7	59.5	-62.20	28	31.5	60.2	3756	3810	1.25	8.17	-22.53	1.73
SJSB052	13857661.470	3217319.770	-5.70	SJGB004	-62.75	133	-2	28	-33.7	59.5	-65.20	28	31.5	63.2	3943	3810	1.25	10.34	-23.36	1.74
SJSB052-C1	13857626.750	3217222.469	-2.20	SJGB053	-66.7	190	-2	17	-19.2	57	-59.20	17	40	57.2	3569	4838	1.25	-3.49	-22.69	1.69
SJSB053	13857799.520	3217301.198	-9.70	SJGB053	-66.7	0	-2	17	-26.7	57	-66.70	17	40	64.7	4036	4838	1.25	1.92	-24.78	1.71
SJSB053-C1	13857775.270	3217268.406	-7.40	SJGB053	-66.7	40	-2	17	-24.4	57	-64.40	17	40	62.4	3893	4838	1.25	0.26	-24.14	1.70
SJSB054	13857745.960	3217282.887	-7.40	SJGB053	-66.7	57	-2	17	-24.4	57	-64.40	17	40	62.4	3893	4838	1.25	0.26	-24.14	1.70
SJSB055	13857915.360	3217183.420	-4.90	SJGB003	-95.17	60	-2	33	-37.9	84.5	-89.40	33	51.5	87.4	5453	6229	1.25	5.42	-32.48	1.72
	13857915.360	3217183.420	-4.90	SJGB020	-48.17	113	1.5	22	-26.9	40	-44.90	22	18	46.4	2895	2177	1.25	13.32	-13.58	1.77
SJSB055-C1	13857843.355	3217150.478	-9.54	SJGB003	-95.17	30	-2	33	-42.54	84.5	-94.04	33	51.5	92.04	5742	6229	1.25	8.76	-33.78	1.72
SJSB056	13857942.460	3217077.154	-12.40	SJBG057	-73.1	113	-2	17	-29.4	63	-75.40	17	46	73.4	4579	5564	1.25	1.48	-27.92	1.71
	13857942.460	3217077.154	-12.40	SJGB020	-48.17	100	1.5	22	-34.4	40	-52.40	22	18	53.9	3363	2177	1.25	18.72	-15.68	1.78
SJSB056-C1	13857851.608	3217058.119	-4.29	SJSB003	-95.17	100	-2	33	-37.29	84.5	-88.79	33	51.5	86.79	5415	6229	1.25	4.98	-32.31	1.72
SJSB057	13857956.449	3216960.196	-17.1	SJSB057	-73.1	0	-2	17	-34.1	63	-80.10	17	46	78.1	4872	5564	1.25	4.87	-29.23	1.72
	13857956.449	3216960.196	-17.1	SJGB019	-49.82	77	1.5	20	-37.1	35.1	-52.20	20	15.1	53.7	3350	1826	1.25	21.82	-15.28	1.80
SJSB058	13857700.162	3216855.509	0.62	SJGB002	-58.75	43	-2	33.5	-32.88	59.5	-58.88	33.5	26	56.88	3549	3145	1.25	11.93	-20.95	1.75
SJSB070	13857778.065	3216886.192	-1.17	SJGB002	-58.75	43	-2	33.5	-34.67	59.5	-60.67	33.5	26	58.67	3660	3145	1.25	13.22	-21.45	1.75
SJSB071	13857719.189	3216821.133	-0.8	SJGB002	-58.75	43	-2	33.5	-34.3	59.5	-60.30	33.5	26	58.3	3637	3145	1.25	12.95	-21.35	1.75
SJSB072	13857614.250	3216842.652	1.42	SJCPT-011	-53.4	67	-2	33	-31.58	58.4	-56.98	33.00	25.40	54.98	3430	3072	1.25	11.23	-20.35	1.75
SJSB073	13857593.160	3216960.041	1.29	SJCPT-011	-53.4	67	-2	33	-31.71	58.4	-57.11	33.00	25.40	55.11	3438	3072	1.25	11.32	-20.39	1.75
SJSB074	13857543.710	3216728.114	3.34	SJGB001	-56	33	-2	29	-25.66	59.5	-56.16	29.00	30.50	54.16	3379	3689	1.25	4.94	-20.72	1.72
SJSB075	13857486.820	3216843.803	2.28	SJGB001	-56	93	-2	29	-26.72	59.5	-57.22	29.00	30.50	55.22	3445	3689	1.25	5.70	-21.02	1.73
SJSB076	13857508.770	3216910.806	2.26	SJCPT-011	-53.4	60	-2	33	-30.74	58.4	-56.14	33.00	25.40	54.14	3378	3072	1.25	10.62	-20.12	1.75
SJSB077	13857411.880	3216736.668	1.42	SJGB001	-56	100	-2	29	-27.58	59.5	-58.08	29.00	30.50	56.08	3499	3689	1.25	6.32	-21.26	1.73
SJSB078	13857430.030	3216823.139	1.82	SJGB001	-56	107	-2	29	-27.18	59.5	-57.68	29.00	30.50	55.68	3474	3689	1.25	6.03	-21.15	1.73
SJSB079	13857381.900	3216888.271	1.05	SJMW17	-60	177	-2	23	-21.95	63	-61.95	23.00	40.00	59.95	3740	4838	1.25	-1.51	-23.46	1.70
SJSB080	13857320.220	3216827.045	1.77	SJMW17	-60	100	-2	23	-21.23	63	-61.23	23.00	40.00	59.23	3695	4838	1.25	-2.03	-23.26	1.70
SJSB081	13857276.460	3217054.335	-2.26	SJMW17	-60	120	-2	23	-25.26	63	-65.26	23.00	40.00	63.26	3947	4838	1.25	0.88	-24.38	1.71
SJSB082	13857216.120	3217091.823	-1.75	SJMW17	-60	200	-2	23	-24.75	63	-64.75	23.00	40.00	62.75	3915	4838	1.25	0.51	-24.24	1.71
SJSB083	13857242.260	3217187.497	-2.93	SJGB008	-61	153	-2	23	-25.93	58	-60.93	23.00	35.00	58.93	3676	4233	1.25	3.35	-22.58	1.72
SJSB084	13857243.090	3217292.257	-3.86	SJGB008	-61	67	-2	23	-26.86	58	-61.86	23.00	35.00	59.86	3734	4233	1.25	4.02	-22.84	1.72
SJSB085	13857350.670	3217370.887	-5.67	SJGB007	-68.5	53	-2	23	-28.67	64.5	-70.17	23.00	41.50	68.17	4253	5020	1.25	2.74	-25.93	1.71
SJSB086	13857292.630	3217249.901	-2.72	SJGB008	-61	130	-2	23	-25.72	58	-60.72	23.00	35.00	58.72	3663	4233	1.25	3.20	-22.52	1.72
SJSB087	13857311.470	3217114.943	-3.01	SJMW17	-60	240	-2	23	-26.01	63	-66.01	23.00	40.00	64.01	3993	4838	1.25	1.42	-24.59	1.71
SJSB088	13857488.390	3217119.275	-2.12	SJCPT-011	-53.4	240	-2	33	-35.12	58.4	-60.52	33.00	25.40	58.52	3651	3072	1.25	13.78	-21.34	1.76
SJSB089	13857426.020	3217214.579	-2.88	SJGB007	-67.75	220	-2	23	-25.88	49.9	-52.78	23.00	26.90	50.78	3168	3254	1.25	6.53	-19.35	1.73
SJSB090	13857506.130	3217218.409	-1.50	SJGB007	-67.75	267	-2	23	-24.50	49.9	-51.40	23.00	26.90	49.40	3082	3254	1.25	5.53	-18.97	1.73
SJSB091	13857487.240	3217383.273	-3.58	SJGB007	-67.75	160	-2	23	-26.58	54.6	-58.18	23.00	31.60	56.18	3505	3822	1.25	5.17	-21.42	1.72
SJSB092	13857618.600	3217303.607	-4.93	SJGB053	-66.7	187	-2	17	-21.93	57	-61.93	17.00	40.00	59.93	3739	4838	1.25	-1.52	-23.45	1.70
SJSB093	13857582.780	3217129.479	-1.53	SJCPT-011	-53.4	200	-2	33	-34.53	58.4	-59.93	33.00	25.40	57.93	3614	3072	1.25	13.36	-21.17	1.76
SJSB094	13857691.550	3217241.216	-4.22	SJSB053	-69	120	-2	17	-21.22	57	-61.22	17.00	40.00	59.22	3695	4838	1.25	-2.03	-23.25	1.70
SJSB095	13857790.230	3217133.851	-2.07	SJGB003	-95.17	80	-2	33	-35.07	84.5	-86.57	33.00	51.50	84.57	5276	6229	1.25	3.38	-31.69	1.71
SJSB096	13857798.660	3217196.291	-6.55	SJGB003	-95.17	73	-2	33	-39.55	84.5	-91.05	33.00	51.50	89.05	5556	6229	1.25	6.61	-32.94	1.72
SJSB097	13857955.960	3217030.737	-15.64	SJSB057	-73.1	67	-2	17	-32.64	57	-72.64	17.00	40.00	70.64	4407	4838	1.25	6.20	-26.44	1.72
	13857955.960	3217030.737	-15.64	SJGB020	-48.17	80	-2	22	-37.64	32	-47.64	22.00	10.00	45.64	2847	1210	1.25	21.71	-15.93	1.82
SJSB098	13857874.760	3216977.358	-14.36	SJGB019	-49.82	137	1.5	20	-34.36	35.1	-49.46	20.00	15.10	50.96	3179	1826	1.25	19.84	-14.52	1.80
	13857874.760	3216977.358	-14.36	SJSB057	-73.1	80	-2	17	-31.36	58.2	-72.56	17.00	41.20	70.56	4402	4983	1.25	4.80	-26.56	1.72
SJSB099	13857764.250	3216947.207	-0.61	SJGB002	-58.75	80	-2	34	-34.11	59.5	-60.11	33.50	26.00	58.11	3625	3145	1.25	12.81	-21.30	1.75
SJSB100	13857919.310	3216899.688	-13.36	SJSB057	-73.1	67	-2	17	-30.36	63	-76.36	17.00	46.00	74.36	4639	5564	1.25	2.17	-28.19	1.71
	13857919.310	3216899.688	-13.36	SJGB019	-49.82	67	1.5	20	-33.36	35	-48.36	20.00	15.00	49.86	3111	1814	1.25	19.16	-14.20	1.79
SJSB101	13857709.580	3216809.881	-0.15	SJGB002	-58.75	63	-2	34	-33.65	59.5	-59.65	33.50	26.00	57.65	3597	3145	1.25	12.48	-21.17	1.75
SJSB102	13857180.230	3217192.143	-2.05	SJGB008	-61	133	-2	23	-25.05	58	-60.05	23.00	35.00	58.05	3622	4233	1.25	2.71	-22.34	1.71
SJSB103	13857998.430	3216974.835	-30.72	SJSB057	-73.1	43	-2	17	-47.72	57	-87.72	17.00	40.00	85.72	5348	4838	1.25	17.06	-30.66	1.75
	13857998.430	3216974.835	-15.35	SJGB020	-48.17	87	1.5	22	-37.35	32	-47.35	22.00	10.00	48.85	3048	1210	1.25	24.02	-13.33	1.82
SJSB104	13857613.240	3217397.901	-5.49	SJBG005	-65	140	-2	26	-31.49	60.5	-65.99	26.00	34.50	63.99	3992	4173	1.25	7.55	-23.94	1.73
SJSB105	13857485.550	3217440.440	-4.36	SJGB007	-67.75	153	-2	23	-27.36	64.5	-68.86	23.00	41.50	66.86	4171	5020	1.25	1.80	-25.56	1.71
SJSB106	13857469.990	3217311.018	-3.10	SJGB007	-67.75	173	-2	23	-26.10	64.5	-67.60	23.00	41.50	65.60	4093	5020	1.25	0.89	-25.21	1.71

Total BC Unit Weight	19.0	kN/m3	121.0	pcf
Total BC Unit Weight	19.5	kN/m3	124.1	pcf
Total Sediment Unit Weight	17.0	kN/m3	108.2	pcf
Water Unit Weight	9.8	kN/m3	62.4	pcf
Total FS	1.25			
Effective BC Unit Weight	9.2	kN/m3	58.6	pcf
Effective BS Unit Weight	9.7	kN/m3	61.8	pcf
Effective Sediment Unit Weight	7.2	kN/m3	45.8	pcf
Effective FS	1.5			
Conversion kN/m3 to pcf	6.37			

Notes:
ft = feet
NAD83 = North American Datum of 1983
piezo = piezometer
BC = Beaumont Clay
BS = Beaumont Sand
psf = pounds per square foot
kN/m^3 = kilonewtons per cubic meter
pcf = pounds per cubic foot
FS = Factor of Safety
Orange highlighted rows indicate instances where geotechnical conditions from the closest two geotechnical borings were applied to those locations to assess hydraulic heave. The more conservative of the two assumptions will be carried forward for the basis of design.

Table 2B

Elevations of Excavation to Maintain Hydraulic Heave Safety Factor of 1.25 - Assumption 2
Hydraulic Heave Analysis
Northern Impoundment - San Jacinto River Waste Pits Superfund Site

Location	Northing (NAD83)	Easting (NAD83)	Surface/Riverbed Elevation	Reference Borehole	BS Elevation in Reference Borehole (ft)	Distance From Borehole (ft)	Aquifer Piezo Elevation (ft)	BC Depth (ft)	BC Elevation (ft)	BS Depth (ft)	BS Elevation (ft)	Sediment Thickness (ft)	BC Thickness (ft)	Pressure Head (ft)	Uplift Porepressure (psf)	BC Layer Total Pressure (psf)	FS	Required Sediment Thickness (ft)	Total Analysis Required Minimum Excavation Elevation (ft)	Corresponding Effective Analysis FS
SJGB010	13857411.203	3216753.589	3.00	SJGB001	-56	107	-2	29	-26	59.5	-56	29	30	54	3369	3629	1.25	5.38	-20.62	1.73
SJGB011	13857474.591	3216925.733	3.00	SJCPT-011	-53.4	83	-2	33	-30	58.4	-53.4	33	23.4	51.4	3207	2830	1.25	10.89	-19.11	1.75
SJGB012	13857611.312	3216819.464	3.00	SJCPT-011	-53.4	93	-2	33	-30	58.4	-53.4	33	23.4	51.4	3207	2830	1.25	10.89	-19.11	1.75
SJSB013	13857852.438	3216918.897	-12.5	SJGB018	-53.43	113	-2	30	-42.5	37.5	-53.43	30	10.93	51.43	3209	1322	1.25	24.84	-17.66	1.82
SJGB014	13857716.960	3217158.780	-1.50	SJGB053	-66.7	166	-2	15	-16.5	81	-66.7	15	50.2	64.7	4036	6072	1.25	-9.48	-25.98	1.67
SJGB016	13857551.031	3217162.509	-0.50	SJCPT-011	-53.4	267	-2	33	-33.5	58.4	-53.4	33	19.9	51.4	3207	2407	1.25	14.80	-18.70	1.77
SJGB017	13857352.164	3217191.717	-0.50	SJGB008	-61	207	-2	23	-23.5	58	-61	23	37.5	59	3681	4536	1.25	0.60	-22.90	1.71
SJSB028	13857067.126	3217256.398	1.25	SJGB008	-61	264	-2	23	-25.26	58	-61	23	32.8	56.06	3497	3967	1.25	3.74	-21.48	1.72
SJSB029	13857119.314	3217153.087	2.64	SJGB008	-61	193	-2	23	-20.36	58	-61	23	40.64	59	3681	4916	1.25	-2.91	-23.27	1.69
SJSB030	13857220.516	3216971.008	4.33	SJMW17	-58	120	-2	23	-18.67	63	-58	23	39.33	56	3494	4757	1.25	-3.60	-22.27	1.69
SJSB031	13857295.051	3216774.912	6.00	SJMW17	-58	120	-2	23	-17	63	-58	23	41	56	3494	4959	1.25	-5.47	-22.47	1.68
SJSB032	13857444.802	3216651.498	3.21	SJGB001	-56	120	-2	29	-25.79	59.5	-56	29	30.21	54	3369	3654	1.25	5.15	-20.64	1.72
SJSB033	13857624.835	3216746.671	4.59	SJGB023	-61.66	100	-2	29.5	-24.91	59.8	-61.66	29.5	36.75	59.66	3722	4445	1.25	1.92	-22.99	1.71
SJSB034	13857689.491	3217045.977	8.00	SJCPT-011	-53.4	200	-2	33	-25	58.4	-53.4	33	28.4	51.4	3207	3435	1.25	5.30	-19.70	1.73
SJSB035	13857460.903	3217021.623	8.00	SJCPT-011	-53.4	167	-2	33	-25	58.4	-53.4	33	28.4	51.4	3207	3435	1.25	5.30	-19.70	1.73
SJSB036	13857475.106	3216859.930	2.00	SJCPT-011	-53.4	97	-2	33	-10.75	58.4	-53.4	12.75	42.65	51.4	3207	5159	1.25	-10.63	-21.38	1.66
SJSB037	13857687.402	3216908.317	2.00	SJGB002	-58.75	73	-2	33.5	-31.5	59.5	-58.75	33.5	27.25	56.75	3540	3296	1.25	10.44	-21.06	1.74
SJSB038	13857563.077	3217138.458	-0.50	SJCPT-011	-53.4	240	-2	33	-33.5	58.4	-53.4	33	19.9	51.4	3207	2407	1.25	14.80	-18.70	1.77
SJSB045	13857135.810	3217343.067	-2.10	SJGB008	-61	57	-2	23	-25.1	58	-61	23	35.9	59	3681	4342	1.25	2.39	-22.71	1.71
SJSB045-C1	13857149.350	3217285.350	-1.30	SJGB008	-61	63	-2	23	-24.3	58	-61	23	36.7	59	3681	4439	1.25	1.50	-22.80	1.71
SJSB046	13857183.750	3217236.016	-2.00	SJGB008	-61	96	-2	23	-25	58	-61	23	36	59	3681	4354	1.25	2.28	-22.72	1.71
SJSB046-C1	13857229.000	3217174.000	-2.39	SJGB008	-61	150	-2	23	-25.39	58	-61	23	35.61	59	3681	4307	1.25	2.72	-22.67	1.71
SJSB047	13857278.320	3217421.371	-2.10	SJGB047	-53.4	0	-2	22	-24.1	50	-53.4	22	29.3	51.4	3207	3544	1.25	4.29	-19.81	1.72
SJSB047-C1	13857302.550	3217340.988	-4.00	SJGB047	-53.4	80	-2	22	-26	50	-53.4	22	27.4	51.4	3207	3314	1.25	6.41	-19.59	1.73
SJSB048	13857396.530	3217503.368	-2.40	SJGB007	-67.75	107	-2	23	-25.4	64.5	-67.75	23	42.35	65.75	4102	5122	1.25	0.05	-25.35	1.70
SJSB048-C1	13857398.780	3217445.299	-4.00	SJGB007	-67.75	67	-2	23	-27	64.5	-67.75	23	40.75	65.75	4102	4929	1.25	1.83	-25.17	1.71
SJSB049	13857406.390	3217395.258	-5.10	SJGB007	-67.75	77	-2	23	-28.1	64.5	-67.75	23	39.65	65.75	4102	4796	1.25	3.06	-25.04	1.71
SJSB050	13857546.330	3217527.884	-3.40	SJGB005	-65	67	-2	26	-29.4	60.5	-65	26	35.6	63	3930	4306	1.25	5.61	-23.79	1.72
SJSB050-C1	13857558.160	3217389.116	-6.30	SJGB005	-65	120	-2	26	-32.3	60.5	-65	26	32.7	63	3930	3955	1.25	8.85	-23.45	1.73
SJSB051	13857682.020	3217424.684	-2.70	SJGB004	-62.75	93	-2	28	-30.7	59.5	-62.75	28	32.05	60.75	3790	3877	1.25	7.96	-22.74	1.73
SJSB052	13857661.470	3217319.770	-5.70	SJGB004	-62.75	133	-2	28	-33.7	59.5	-62.75	28	29.05	60.75	3790	3514	1.25	11.31	-22.39	1.74
SJSB052-C1	13857626.750	3217222.469	-2.20	SJGB053	-66.7	190	-2	17	-19.2	57	-66.7	17	47.5	64.7	4036	5745	1.25	-6.47	-25.67	1.68
SJSB053	13857799.520	3217301.198	-9.70	SJGB053	-66.7	0	-2	17	-26.7	57	-66.7	17	40	64.7	4036	4838	1.25	1.92	-24.78	1.71
SJSB053-C1	13857775.270	3217268.406	-7.40	SJGB053	-66.7	40	-2	17	-24.4	57	-66.7	17	42.3	64.7	4036	5116	1.25	-0.65	-25.05	1.70
SJSB054	13857745.960	3217282.887	-7.40	SJGB053	-66.7	57	-2	17	-24.4	57	-66.7	17	42.3	64.7	4036	5116	1.25	-0.65	-25.05	1.70
SJSB055	13857915.360	3217183.420	-4.90	SJGB003	-95.17	60	-2	33	-37.9	84.5	-95.17	33	57.27	93.17	5813	6927	1.25	3.13	-34.77	1.71
	13857915.360	3217183.420	-4.90	SJGB020	-48.17	113	1.5	22	-26.9	40	-48.17	22	21.27	49.67	3099	2573	1.25	12.02	-14.88	1.76
SJSB055-C1	13857843.355	3217150.478	-9.54	SJGB003	-95.17	30	-2	33	-42.54	84.5	-95.17	33	52.63	93.17	5813	6366	1.25	8.32	-34.22	1.72
SJSB056	13857942.460	3217077.154	-12.40	SJBG057	-73.1	113	-2	17	-29.4	63	-73.1	17	43.7	71.1	4436	5286	1.25	2.39	-27.01	1.71
	13857942.460	3217077.154	-12.40	SJGB020	-48.17	100	1.5	22	-34.4	40	-48.17	22	13.77	49.67	3099	1666	1.25	20.40	-14.00	1.80
SJSB056-C1	13857851.608	3217058.119	-4.29	SJSB003	-95.17	100	-2	33	-37.29	84.5	-95.17	33	57.88	93.17	5813	7001	1.25	2.45	-34.84	1.71
SJSB057	13857956.449	3216960.196	-17.1	SJSB057	-73.1	0	-2	17	-34.1	63	-73.1	17	39	71.1	4436	4717	1.25	7.65	-26.45	1.73
	13857956.449	3216960.196	-17.1	SJGB019	-49.82	77	1.5	20	-37.1	35.1	-49.82	20	12.72	51.32	3202	1539	1.25	22.76	-14.34	1.81
SJSB058	13857700.162	3216855.509	0.62	SJGB002	-58.75	43	-2	33.5	-32.88	59.5	-58.75	33.5	25.87	56.75	3540	3129	1.25	11.98	-20.90	1.75
SJSB070	13857778.065	3216886.192	-1.17	SJGB002	-58.75	43	-2	33.5	-34.67	59.5	-58.75	33.5	24.08	56.75	3540	2913	1.25	13.98	-20.69	1.76
SJSB071	13857719.189	3216821.133	-0.8	SJGB002	-58.75	43	-2	33.5	-34.3	59.5	-58.75	33.5	24.45	56.75	3540	2957	1.25	13.57	-20.73	1.76
SJSB072	13857614.250	3216842.652	1.42	SJCPT-011	-53.4	67	-2	33	-31.58	58.4	-53.40	33.00	21.82	51.40	3207	2639	1.25	12.65	-18.93	1.76
SJSB073	13857593.160	3216960.041	1.29	SJCPT-011	-53.4	67	-2	33	-31.71	58.4	-53.40	33.00	21.69	51.40	3207	2623	1.25	12.80	-18.91	1.76
SJSB074	13857543.710	3216728.114	3.34	SJGB001	-56	33	-2	29	-25.66	59.5	-56.00	29.00	30.34	54.00	3369	3670	1.25	5.00	-20.66	1.72
SJSB075	13857486.820	3216843.803	2.28	SJGB001	-56	93	-2	29	-26.72	59.5	-56.00	29.00	29.28	54.00	3369	3542	1.25	6.19	-20.53	1.73
SJSB076	13857508.770	3216910.806	2.26	SJCPT-011	-53.4	60	-2	33	-30.74	58.4	-53.40	33.00	22.66	51.40	3207	2741	1.25	11.71	-19.03	1.75
SJSB077	13857411.880	3216736.668	1.42	SJGB001	-56	100	-2	29.00	-27.58	59.5	-56.00	29.00	28.42	54.00	3369	3438	1.25	7.15	-20.43	1.73
SJSB078	13857430.030	3216823.139	1.82	SJGB001	-56	107	-2	29.00	-27.18	59.5	-56.00	29.00	28.82	54.00	3369	3486	1.25	6.70	-20.48	1.73
SJSB079	13857381.900	3216888.271	1.05	SJMW17	-60	177	-2	23	-21.95	63	-60.00	23.00	38.05	58.00	3618	4602	1.25	-0.73	-22.68	1.70
SJSB080	13857320.220	3216827.045	1.77	SJMW17	-60	100	-2	23	-21.23	63	-60.00	23.00	38.77	58.00	3618	4689	1.25	-1.54	-22.77	1.70
SJSB081	13857276.460	3217054.335	-2.26	SJMW17	-60	120	-2	23.00	-25.26	63	-60.00	23.00	34.74	58.00	3618	4202	1.25	2.97	-22.29	1.71
SJSB082	13857216.120	3217091.823	-1.75	SJMW17	-60	200	-2	23.00	-24.75	63	-60.00	23.00	35.25	58.00	3618	4264	1.25	2.40	-22.35	1.71
SJSB083	13857242.260	3217187.497	-2.93	SJGB008	-61	153	-2	23.00	-25.93	58	-61.00	23.00	35.07	59.00	3681	4242	1.25	3.32	-22.61	1.72
SJSB084	13857243.090	3217292.257	-3.86	SJGB008	-61	67	-2	23.00	-26.86	58	-61.00	23.00	34.14	59.00	3681	4129	1.25	4.36	-22.50	1.72
SJSB085	13857350.670	3217370.887	-5.67	SJGB007	-68.5	53	-2	23.00	-28.67	64.5	-68.50	23.00	39.83	66.50	4149	4818	1.25	3.40	-25.27	1.71
SJSB086	13857292.630	3217249.901	-2.72	SJGB008	-61	130	-2	23.00	-25.72	58	-61.00	23.00	35.28	59.00	3681	4267	1.25	3.08	-22.64	1.71
SJSB087	13857311.470	3217114.943	-3.01	SJMW17	-60	240	-2	23	-26.01	63	-60.00	23.00	33.99	58.00	3618	4111	1.25	3.81	-22.20	1.72
SJSB088	13857488.390	3217119.275	-2.12	SJCPT-011	-53.4	240	-2	33	-35.12	58.4	-53.40	33.00	18.28	51.40	3207	2211	1.25	16.61	-18.51	1.78
SJSB089	13857426.020	3217214.579	-2.88	SJGB007	-67.75	220	-2	23.00	-25.88	49.9	-67.75	23.00	41.87	65.75	4102	5064	1.25	0.58	-25.30	1.71
SJSB090	13857506.130	3217218.409	-1.50	SJGB007	-67.75	267	-2	23.00	-24.50	49.9	-67.75	23.00	43.25	65.75	4102	5231	1.25	-0.96	-25.46	1.70
SJSB091	13857487.240	3217383.273	-3.58	SJGB007	-67.75	160	-2	23.00	-26.58	54.6	-67.75	23.00	41.17	65.75	4102	4980	1.25	1.37	-25.21	1.71
SJSB092	13857618.600	3217303.607	-4.93	SJGB053	-66.7	187	-2	17.00	-21.93	57	-66.70	17.00	44.77	64.70	4036	5415	1.25	-3.42	-25.35	1.69
SJSB093	13857582.780	3217129.479	-1.53	SJCPT-011	-53.4	200	-2	33	-34.53	58.4	-53.40	33.00	18.87	51.40	3207	2282	1.25	15.95	-18.58	1.77
SJSB094	13857691.550	3217241.216	-4.22	SJSB053	-69	120	-2	17.00	-21.22	57	-69.00	17.00	47.78	67.00	4180	5779	1.25	-5.12	-26.34	1.69
SJSB095	13857790.230	3217133.851	-2.07	SJGB003	-95.17	80	-2	33.00	-35.07	84.5	-95.17	33.00	60.10	93.17	5813	7269	1.25	-0.03	-35.10	1.70
SJSB096	13857798.660	3217196.291	-6.55	SJGB003	-95.17	73	-2	33.00	-39.55	84.5	-95.17	33.00	55.62	93.17	5813	6727	1.25	4.97	-34.58	1.72
SJSB097	13857955.960	3217030.737	-15.64	SJSB057	-73.1	67	-2	17.00	-32.64	57	-73.10	17.00	40.46	71.10	4436	4894	1.25	6.01	-26.63	1.72
	13857955.960	3217030.737	-15.64	SJGB020	-48.17	80	1.5	22.00	-37.64	32	-48.17	22.00	10.53	49.67	3099	1274	1.25	24.02	-13.62	1.82
SJSB098	13857874.760	3216977.358	-14.36	SJGB019	-49.82	137	1.5	20.00	-34.36	35.1	-49.82	20.00	15.46	51.32	3202	1870	1.25	19.70	-14.66	1.79
	13857874.760	3216977.358	-14.36	SJSB057	-73.1	80	-2	17.00	-31.36	58.2	-73.10	17.00	41.74	71.10	4436	5049	1.25	4.58	-26.78	1.72
SJSB099	13857764.250	3216947.207	-0.61	SJGB002	-58.75	80	-2	33.50	-34.11	59.5	-58.75	33.50	24.64	56.75	3540	2980	1.25	13.35	-20.76	1.76
SJSB100	13857919.310	3216899.688	-13.36	SJSB057	-73.1	67	-2	17.00	-30.36	63	-73.10	17.00	42.74	71.10	4436	5170	1.25	3.47	-26.89	1.71
	13857919.310	3216899.688	-13.36	SJGB019	-49.82	67	1.5	20.00	-33.36	35	-49.82	20.00	16.46	51.32	3202	1991	1.25	18.58	-14.78	1.79
SJSB101	13857709.580	3216809.881	-0.15	SJGB002	-58.75	63	-2	33.50	-33.65	59.5	-58.75	33.50	25.10	56.75	3540	3036	1.25	12.84	-20.81	1.75
SJSB102	13857180.230	3217192.143	-2.05	SJGB008	-61	133	-2	23.00	-25.05	58	-61.00	23.00	35.95	59.00	3681	4348	1.25	2.34	-22.71	1.71
SJSB103	13857998.430	3216974.835	-30.72	SJSB057	-73.1	43	-2	17.00	-47.72	57	-73.10	17.00	25.38	71.10	4436	3070	1.25	22.87	-24.85	1.78
	13857998.430	3216974.835	-15.35	SJGB020	-48.17	87	1.5	22.00	-37.35	32	-48.17	22.00	10.82	49.67	3099	1309	1.25	23.70	-13.65	1.82
SJSB104	13857613.240	3217397.901	-5.49	SJBG005	-65	140	-2	26.00	-31.49	60.5	-65.00	26.00	33.51	63.00	3930	4053	1.25	7.94	-23.55	1.73
SJSB105	13857485.550	3217440.440	-4.36	SJGB007	-67.75	153	-2	23.00	-27.36	64.5	-67.75	23.00	40.39	65.75	4102	4885	1.25	2.24	-25.12	1.71
SJSB106	13857469.990	3217311.018	-3.10	SJGB007	-67.75	173	-2	23.00	-26.10	64.5	-67.75	23.00	41.65	65.75	4102	5038	1.25	0.83	-25.27	1.71

Total BC Unit Weight	19.0	kN/m3	121.0	pcf
Total BC Unit Weight	19.5	kN/m3	124.1	pcf
Total Sediment Unit Weight	17.0	kN/m3	108.2	pcf
Water Unit Weight	9.8	kN/m3	62.4	pcf
Total FS	1.25			
Effective BC Unit Weight	9.2	kN/m3	58.6	pcf
Effective BS Unit Weight	9.7	kN/m3	61.8	pcf
Effective Sediment Unit Weight	7.2	kN/m3	45.8	pcf
Effective FS	1.5			
Conversion kN/m3 to pcf	6.37			

Notes:
- ft = feet
- NAD83 = North American Datum of 1983
- piezo = piezometer
- BC = Beaumont Clay
- BS = Beaumont Sand
- psf = pounds per square foot
- kN/m^3 = kilonewtons per cubic meter
- pcf = pounds per cubic foot
- FS = Factor of Safety
- Orange highlighted rows indicate instances where geotechnical conditions from the closest two geotechnical borings were applied to those locations to assess hydraulic heave. The more conservative of the two assumptions will be carried forward for the basis of design.

Table 3

Elevations of Excavation to Maintain Hydraulic Heave Safety Factor of 1.25 - Assumption 1 and 2
Hydraulic Heave Analysis
Northern Impoundment - San Jacinto River Waste Pits Superfund Site

Boring Location	Required Elevations for Assumption 1 (')	Required Elevations for Assumption 2 (')	Recommended Elevations for Excavation Surface (')
SJGB010	-20.82	-20.62	**-20.62**
SJGB011	-19.91	-19.11	**-19.11**
SJGB012	-19.91	-19.11	**-19.11**
SJSB013	-16.29	-17.66	**-16.29**
SJGB014	-32.26	-25.98	**-25.98**
SJGB016	-20.89	-18.70	**-18.70**
SJGB017	-21.90	-22.90	**-21.90**
SJSB028	-21.48	-21.48	**-21.48**
SJSB029	-21.03	-23.27	**-21.03**
SJSB030	-22.54	-22.27	**-22.27**
SJSB031	-22.07	-22.47	**-22.07**
SJSB032	-20.76	-20.64	**-20.64**
SJSB033	-20.43	-22.99	**-20.43**
SJSB034	-18.51	-19.70	**-18.51**
SJSB035	-18.51	-19.70	**-18.51**
SJSB036	-22.57	-21.38	**-21.38**
SJSB037	-20.57	-21.06	**-20.57**
SJSB038	-20.89	-18.70	**-18.70**
SJSB045	-22.35	-22.71	**-22.35**
SJSB045-C1	-22.13	-22.80	**-22.13**
SJSB046	-22.32	-22.72	**-22.32**
SJSB046-C1	-22.43	-22.67	**-22.43**
SJSB047	-19.29	-19.81	**-19.29**
SJSB047-C1	-19.82	-19.59	**-19.59**
SJSB048	-25.02	-25.35	**-25.02**
SJSB048-C1	-25.46	-25.17	**-25.17**
SJSB049	-25.77	-25.04	**-25.04**
SJSB050	-23.35	-23.79	**-23.35**
SJSB050-C1	-24.16	-23.45	**-23.45**
SJSB051	-22.53	-22.74	**-22.53**
SJSB052	-23.36	-22.39	**-22.39**
SJSB052-C1	-22.69	-25.67	**-22.69**
SJSB053	-24.78	-24.78	**-24.78**
SJSB053-C1	-24.14	-25.05	**-24.14**
SJSB054	-24.14	-25.05	**-24.14**
SJSB055	-32.48	-34.77	**-13.58**
	-13.58	-14.88	
SJSB055-C1	-33.78	-34.22	**-33.78**
SJSB056	-27.92	-27.01	**-14.00**
	-15.68	-14.00	
SJSB056-C1	-32.31	-34.84	**-32.31**
SJSB057	-29.23	-26.45	**-14.34**
	-15.28	-14.34	
SJSB058	-20.95	-20.90	**-20.90**
SJSB070	-21.45	-20.69	**-20.69**
SJSB071	-21.35	-20.73	**-20.73**
SJSB072	-20.35	-18.93	**-18.93**
SJSB073	-20.39	-18.91	**-18.91**
SJSB074	-20.72	-20.66	**-20.66**
SJSB075	-21.02	-20.53	**-20.53**
SJSB076	-20.12	-19.03	**-19.03**
SJSB077	-21.26	-20.43	**-20.43**
SJSB078	-21.15	-20.48	**-20.48**
SJSB079	-23.46	-22.68	**-22.68**
SJSB080	-23.26	-22.77	**-22.77**
SJSB081	-24.38	-22.29	**-22.29**
SJSB082	-24.24	-22.35	**-22.35**
SJSB083	-22.58	-22.61	**-22.58**
SJSB084	-22.84	-22.50	**-22.50**
SJSB085	-25.93	-25.27	**-25.27**
SJSB086	-22.52	-22.64	**-22.52**
SJSB087	-24.59	-22.20	**-22.20**
SJSB088	-21.34	-18.51	**-18.51**
SJSB089	-19.35	-25.30	**-19.35**
SJSB090	-18.97	-25.46	**-18.97**
SJSB091	-21.42	-25.21	**-21.42**
SJSB092	-23.45	-25.35	**-23.45**
SJSB093	-21.17	-18.58	**-18.58**
SJSB094	-23.25	-26.34	**-23.25**
SJSB095	-31.69	-35.10	**-31.69**
SJSB096	-32.94	-34.58	**-32.94**
SJSB097	-26.44	-26.63	**-13.62**
	-15.93	-13.62	
SJSB098	-14.52	-14.66	**-14.52**
	-26.56	-26.78	
SJSB099	-21.30	-20.76	**-20.76**
SJSB100	-28.19	-26.89	**-14.20**
	-14.20	-14.78	
SJSB101	-21.17	-20.81	**-20.81**
SJSB102	-22.34	-22.71	**-22.34**
SJSB103	-30.66	-24.85	**-13.33**
	-13.33	-13.65	
SJSB104	-23.94	-23.55	**-23.55**
SJSB105	-25.56	-25.12	**-25.12**
SJSB106	-25.21	-25.27	**-25.21**

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Table 4

Hydraulic Heave Evaluation Summary
Hydraulic Heave Analysis
Northern Impoundment - San Jacinto River Waste Pits Superfund Site

Boring Location	FS = 1.25 Excavation Limit (')	Minimum Excavation Elevation (')*	Heave Concern (Delta ')	Elevation of Water Level Needed to Counter Heave (')
SJGB010	-20.62	-6.32	-14.30	-
SJGB011	-19.11	-9.59	-9.52	-
SJGB012	-19.11	-7.57	-11.54	-
SJSB013	-16.29	-16.04	-0.25	-
SJGB014	-25.98	-9.22	-16.76	-
SJGB016	-18.70	-6.07	-12.63	-
SJGB017	-21.90	-17.85	-4.05	-
SJSB028	-21.48	-1.52	-19.96	-
SJSB029	-21.03	2.68	-23.71	-
SJSB030	-22.27	4.33	-26.60	-
SJSB031	-22.07	5.12	-27.19	-
SJSB032	-20.64	-8.29	-12.35	-
SJSB033	-20.43	-8.88	-11.55	-
SJSB034	-18.51	6.99	-25.50	-
SJSB035	-18.51	6.64	-25.15	-
SJSB036	-21.38	-10.75	-10.63	-
SJSB037	-20.57	-9.57	-11.00	-
SJSB038	-18.70	-12.98	-5.72	-
SJSB045	-22.35	-2.10	-20.25	-
SJSB045-C1	-22.13	-13.30	-8.83	-
SJSB046	-22.32	-20.00	-2.32	-
SJSB046-C1	-22.43	-20.39	-2.04	-
SJSB047	-19.29	-2.10	-17.19	-
SJSB047-C1	-19.59	-20.00	0.41	-
SJSB048	-25.02	-2.40	-22.62	-
SJSB048-C1	-25.17	-22.00	-3.17	-
SJSB049	-25.04	-19.10	-5.94	-
SJSB050	-23.35	-3.40	-19.95	-
SJSB050-C1	-23.45	-6.30	-17.15	-
SJSB051	-22.53	-2.70	-19.83	-
SJSB052	-22.39	-5.70	-16.69	-
SJSB052-C1	-22.69	-2.20	-20.49	-
SJSB053	-24.78	-9.70	-15.08	-
SJSB053-C1	-24.14	-7.40	-16.74	-
SJSB054	-24.14	-23.40	-0.74	-
SJSB055	-13.58	-4.90	-8.68	-
SJSB055-C1	-33.78	-13.54	-20.24	-
SJSB056	-14.00	-12.40	-1.60	-
SJSB056-C1	-32.31	-4.29	-28.02	-
SJSB057	-14.34	-26.39	12.05	-7.50
SJSB058	-20.90	-17.38	-3.52	-
SJSB070	-20.69	-15.17	-5.52	-
SJSB071	-20.73	-18.80	-1.93	-
SJSB072	-18.93	-20.58	1.65	-
SJSB073	-18.91	-10.71	-8.20	-
SJSB074	-20.66	-4.66	-16.00	-
SJSB075	-20.53	-9.72	-10.81	-
SJSB076	-19.03	-9.74	-9.29	-
SJSB077	-20.43	-14.58	-5.85	-
SJSB078	-20.48	-20.18	-0.30	-
SJSB079	-22.68	-10.95	-11.73	-
SJSB080	-22.77	-8.23	-14.54	-
SJSB081	-22.29	-14.26	-8.03	-
SJSB082	-22.35	-11.75	-10.60	-
SJSB083	-22.58	-14.93	-7.65	-
SJSB084	-22.50	-9.86	-12.64	-
SJSB085	-25.27	-13.67	-11.60	-
SJSB086	-22.52	-2.72	-19.80	-
SJSB087	-22.20	-19.01	-3.19	-
SJSB088	-18.51	-20.12	1.61	-
SJSB089	-19.35	-14.88	-4.47	-
SJSB090	-18.97	-11.50	-7.47	-
SJSB091	-21.42	-3.58	-17.84	-
SJSB092	-23.45	-18.93	-4.52	-
SJSB093	-18.58	-15.53	-3.05	-
SJSB094	-23.25	-16.22	-7.03	-
SJSB095	-31.69	-18.07	-13.62	-
SJSB096	-32.94	-18.55	-14.39	-
SJSB097	-13.62	-15.64	2.02	-
SJSB098	-14.52	-28.36	13.84	-4.45
SJSB099	-20.76	-12.61	-8.15	-
SJSB100	-14.20	-15.36	1.16	-
SJSB101	-20.81	-12.15	-8.66	-
SJSB102	-22.34	-20.05	-2.29	-
SJSB103	-13.33	-15.36	2.03	-
SJSB104	-23.55	-5.49	-18.06	-
SJSB105	-25.12	-20.36	-4.76	-
SJSB106	-25.21	-5.10	-20.11	-

Note:

* Elevation of deepest concentration >30 nanograms per kilogram (ng/kg) TEQ. Some boring locations may require deeper excavation based on the final grading plan.

FS = Factor of Safety

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SJCPT-004
SJCPT-005
SJGB020
SJCPT-006
SJCPT-006A
SJCPT-008
SJGB019
SJSB057
SJCPT-002A
SJCPT-002
SJGB013
SJGB003
SJGB018
SJSB053
SJGB004
SJCPT-007
SJGB002
SJGB014
SJCPT-001
SJSB058
SJSB037
SJSB034
SJSB033
SJGB012
SJMW-014
SJGB023
SJMW-016
SJMW-015
SJCPT-011
SJGB006
SJSB038
SJGB016
SJGB015
SJSB050
SJCPT-008
SJGB001
SJGB027
SJSB036
SJGB011
SJSB035
SJSB051
SJGB021
SJSB032
SJGB010
SJGB017
SJSB046
SJCPT-009
SJGB026
SJGB009
SJGB007
SJSB031
SJSB047
SJGB025
SJSB044
SJSB030
SJGB008
SJGB022
SJSB029
SJGB024
SJMW-017
SJSB028
SJCPT-010
DRAFT
Legend
SDI CPT Boring Location
CPT Calibration Boring
Shear Vane Testing
SDI Shallow Piezometer Location
SDI Intermediate Piezometer Location
SDI Deep Piezometer Location
SDI Deep Piezometer with SPT and Shelby Tubes Location
RI Geotechnical Core with Primary and Secondary COPCs
RI Geotechnical Core
PDI-1 Geotechnical Boring Location
PDI-1 Analytical and Geotechnical Boring Location
PDI-2 Analytical Geotechnical Boring Location
PDI-2 Geotechnical Boring Location
SDI Geotechnical Stratigraphy Borings
Conceptual BMP Alignment
Non-impacted Berm Area
TCRA Cap Perimeter
Extent of ACBM
Paper Size ANSI B
0 30 60 90 120
Feet
N
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet
GHD
SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
SITE LOCATIONS PLAN - SOUNDING LOCATIONS
Project No. 11215702
Revision No. -
Date Dec 7, 2021
FIGURE 1
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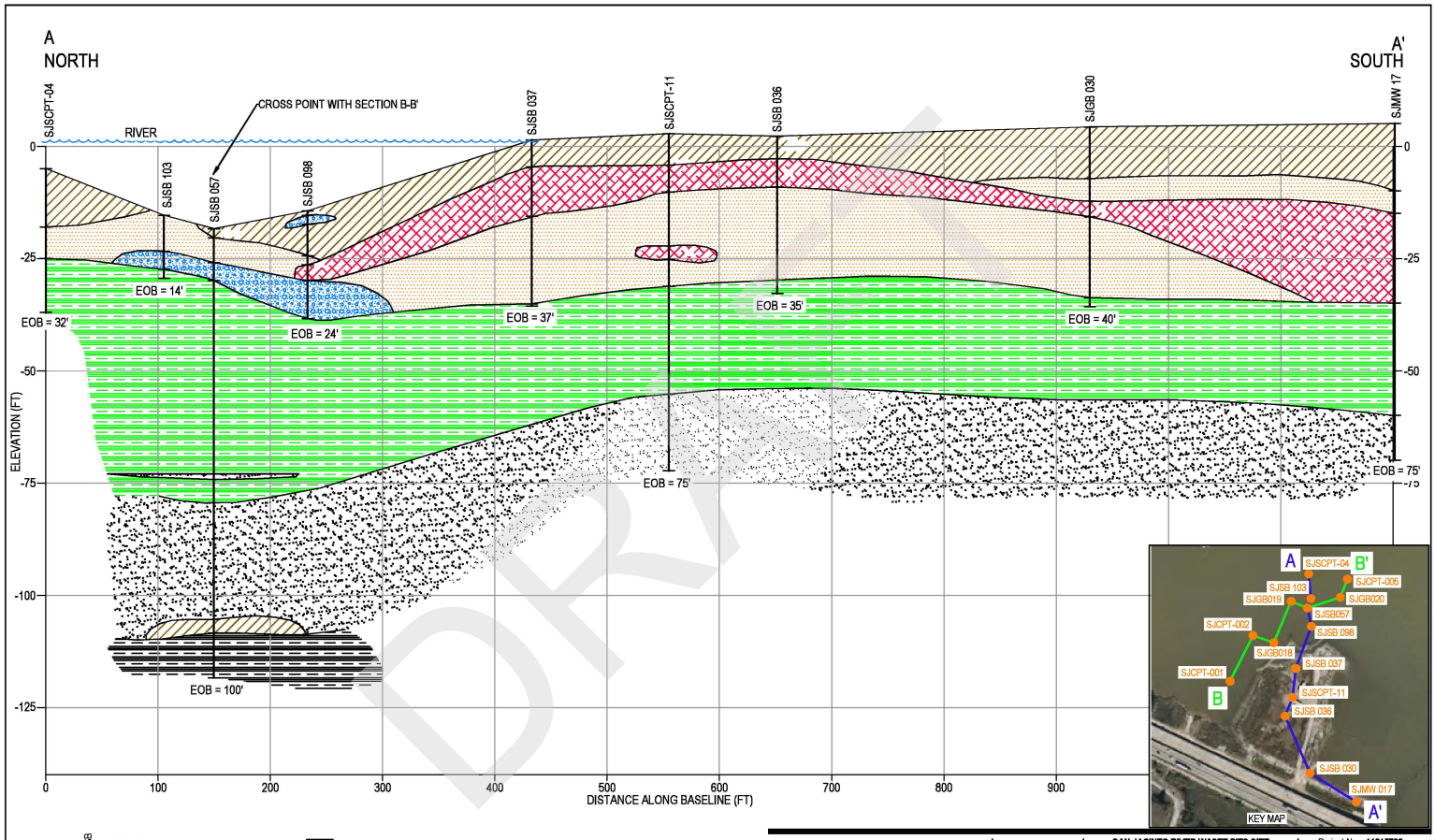

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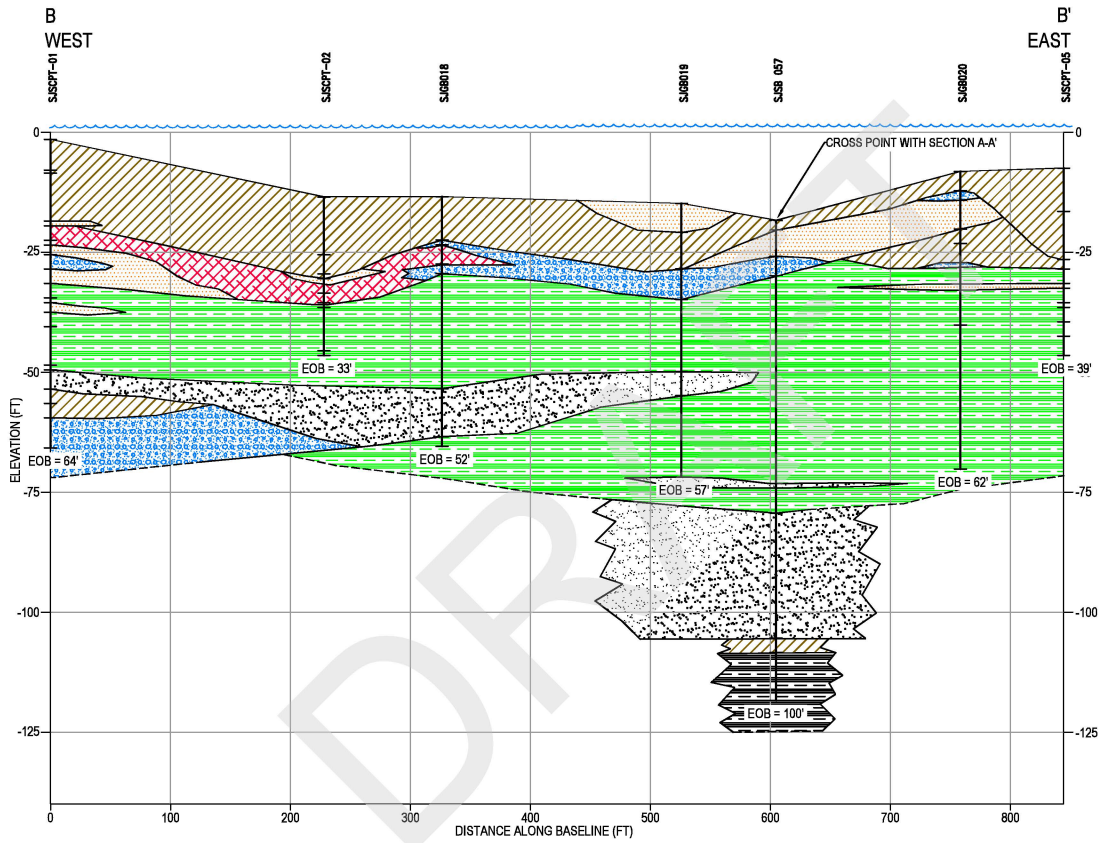

SJSB — WELL ID
— GROUND
— WELL

EOB = END OF BORING

SILTY CLAY TO CLAYEY SILT, SOFT (CL-ML)
SILTY SAND WITH CLAY (SM)
BEAUMONT CLAY (CH)
SANDY TO SILTY CLAY (CL)
CLAYEY SILTY SAND (SC-SM)
GRAVELLY SAND (SW)
GRAY CLAY (CH)

HORIZONTAL
1" = 80 ft
0 40 80Ft
0 10 20Ft
1" = 20 ft
VERTICAL

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS

GEOLOGIC CROSS-SECTION B-B'

Project No. 11215702
Date December 2021

FIGURE 3

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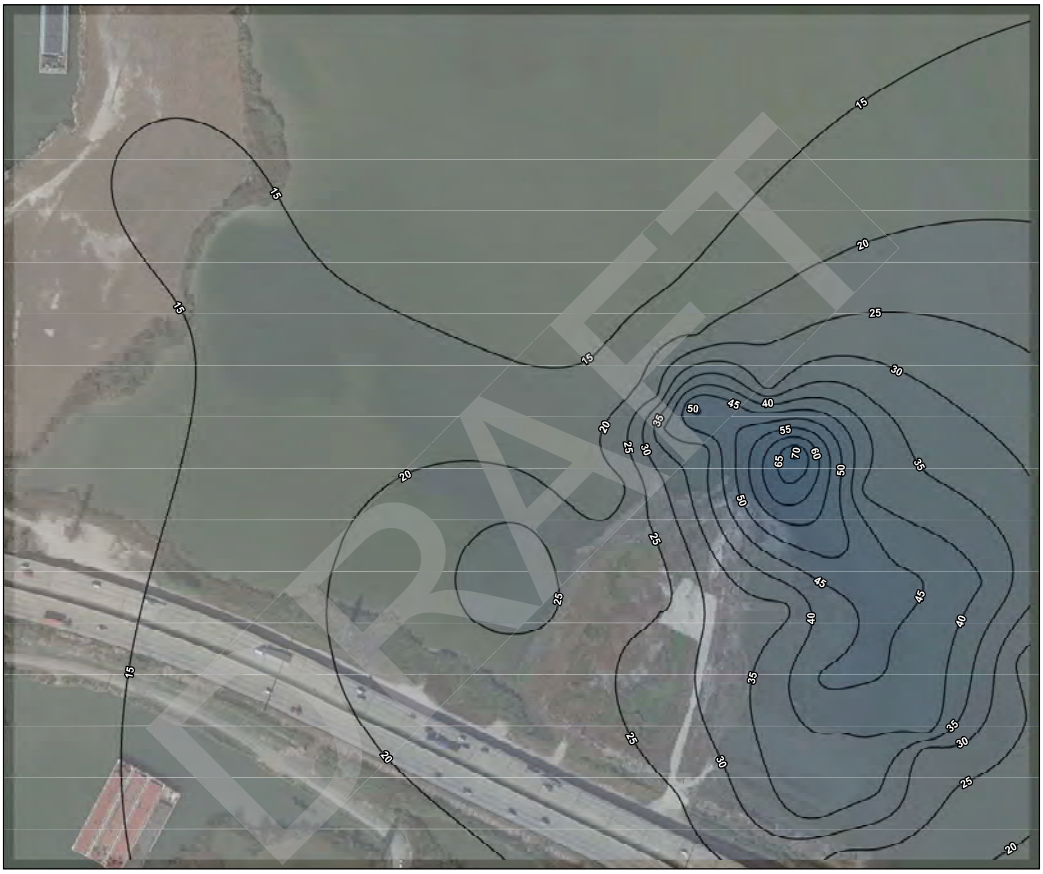

Legend

- Contour

Thickness (ft)

- 0 - 15
- 15 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- 70 - 75

Paper Size ANSI B

0 50 100 150 200

Feet

N

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

GHD

SAN JACINTO RIVER WASTE PITS
CHANNELVIEW, HARRIS COUNTY, TEXAS

BEAUMONT CLAY
THICKNESS CONTOUR

Project No. **11215702**
Revision No. **-**
Date **Dec 6, 2021**

FIGURE 4

Q:\GIS\PROJECTS\11215000e\11215702\Beaumont Clay\11215702_202111_BeaumontClay_GIS004.mxd

Data source: Google Earth, Imagery Date 11/16/2020

Appendices

Appendix A

Beaumont Clay Sample Photographs

Site Photographs

Photo 1 Figure D.1: Sample G11 (40 to 42 feet (ft) deep in borehole SJSB-018).

Photo 2 Figure D.2: Sample G07 (30 to 32 ft deep in borehole SJSB-019).

Photo 3 ***Figure D.3: Sample G14 (40 to 42 ft deep) in borehole SJSB-020.***